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FLAHERTY-GIAVARA ASSOCIATES NEW HAVEN CT

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NATIONAL DAM SAFETY PROGRAM. LITTLE CHOCONUT WATERSHED SITE 2E --ETC(U)

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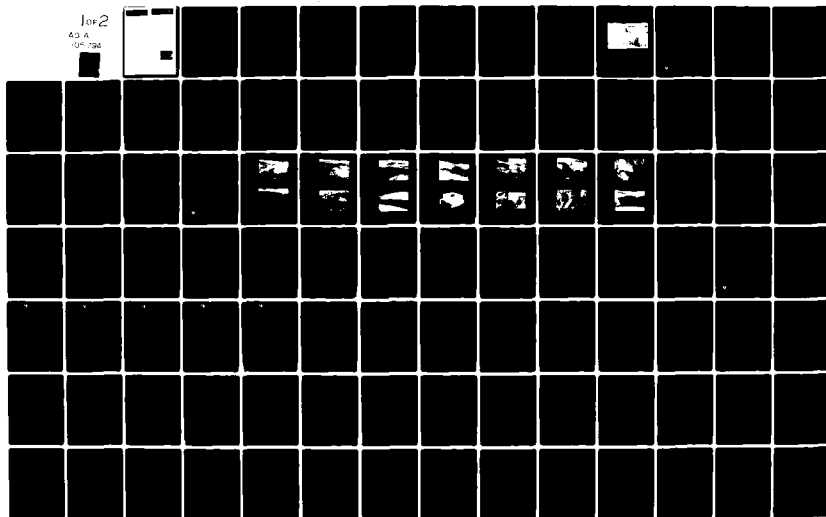
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⑥ National Dam Safety Program. Little Choconut
Watershed Site 2E Dam (Inventory Number NY 723)
Susquehanna River Basin, Broome County, New
York. Phase I Inspection Report.

17. KEY WORDS (Continue on reverse side if necessary and identify by block number) Dam Safety National Dam Safety Program Visual Inspection Hydrology, Structural Stability		Little Choconut Watershed Site 2E Dam Broome County Susquehanna River Basin
18. 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 minor deficiencies which need to be remedied.		

Hydrologic/hydraulic analyses performed in accordance with the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams indicate that the principal spillway and the emergency spillway would pass 100 percent of the outflow from the Probable Maximum Flood (PMF) without overtopping the dam. Therefore, the combined spillway capacity is adjudged to be adequate.

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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 aid 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
LITTLE CHOCONUT WATERSHED SITE 2E DAM
INVENTORY NO. NY 723
SUSQUEHANNA RIVER BASIN
BROOME COUNTY, NEW YORK

TABLE OF CONTENTS

	<u>PAGE NO.</u>
ASSESSMENT	-
OVERVIEW PHOTOGRAPH	-
LOCATION MAP	i
1 - PROJECT INFORMATION	1
1.1 GENERAL	1
1.2 DESCRIPTION OF PROJECT	1
1.3 PERTINENT DATA	4
2 - ENGINEERING DATA	6
2.1 GEOTECHNICAL DATA	6
2.2 DESIGN RECORDS	7
2.3 CONSTRUCTION RECORDS	7
2.4 OPERATION RECORDS	7
2.5 EVALUATION OF DATA	7
3 - VISUAL INSPECTION	8
3.1 FINDINGS	8
3.2 EVALUATION OF OBSERVATIONS	10
4 - OPERATION AND MAINTENANCE PROCEDURES	12
4.1 PROCEDURE	12
4.2 MAINTENANCE OF DAM	12
4.3 WARNING SYSTEM	12
4.4 EVALUATION	12

5 - HYDROLOGIC/HYDRAULIC	13
5.1 DRAINAGE AREA CHARACTERISTICS	13
5.2 ANALYSIS CRITERIA	13
5.3 SPILLWAY CAPACITY	13
5.4 RESERVOIR CAPACITY	14
5.5 FLOODS OF RECORD	15
5.6 OVERTOPPING POTENTIAL	15
5.7 EVALUATION	15
6 - STRUCTURAL STABILITY	16
6.1 EVALUATION OF STRUCTURAL STABILITY	16
7 - ASSESSMENT/RECOMMENDATIONS	18
7.1 ASSESSMENT	18
7.2 RECOMMENDED MEASURES	18

APPENDICES

- A. PHOTOGRAPHS
- B. VISUAL INSPECTION CHECKLIST
- C. HYDROLOGIC/HYDRAULIC ENGINEERING DATA
AND COMPUTATIONS
- D. PREVIOUS INSPECTION REPORTS/AVAILABLE
DOCUMENTS
- E. REFERENCES
- F. DRAWINGS

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam: Little Choconut Watershed Site 2E Dam
State Located: New York
County: Broome
Watershed: Susquehanna River Basin
Stream: Unnamed Tributary of Little Choconut Creek
Date of Inspection: December 15, 1980

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 minor deficiencies which need to be remedied.

Hydrologic/hydraulic analyses performed in accordance with the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams indicate that the principal spillway and the emergency spillway would pass 100 percent of the outflow from the Probable Maximum Flood (PMF) without overtopping the dam. Therefore, the combined spillway capacity is adjudged to be adequate.

The dam has only minor deficiencies. The following corrective measures should be completed within 12 months from the final approval date of this report:

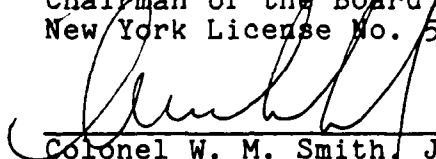
1. Repair the small eroded area on the downstream slope at the right abutment using granular fill and broken stone to permit drainage.
2. Mow the grassed slopes of the embankment and emergency spillway channel at least annually.
3. Restore the riprap support or shorten the toe drain outlet pipes.
4. Control access and vehicular traffic and take necessary measures to prevent further rutting of the crest.

In the interim, a detailed flood warning and emergency evacuation plan should be developed and implemented to alert the public in the event conditions occur which could result in failure of the dam.

Submitted by: FLAHERTY GIAVARA ASSOCIATES, P.C.



Hugh C. Flaherty, P.E. & L.S.
Chairman of the Board
New York License No. 58508

Approved by: 

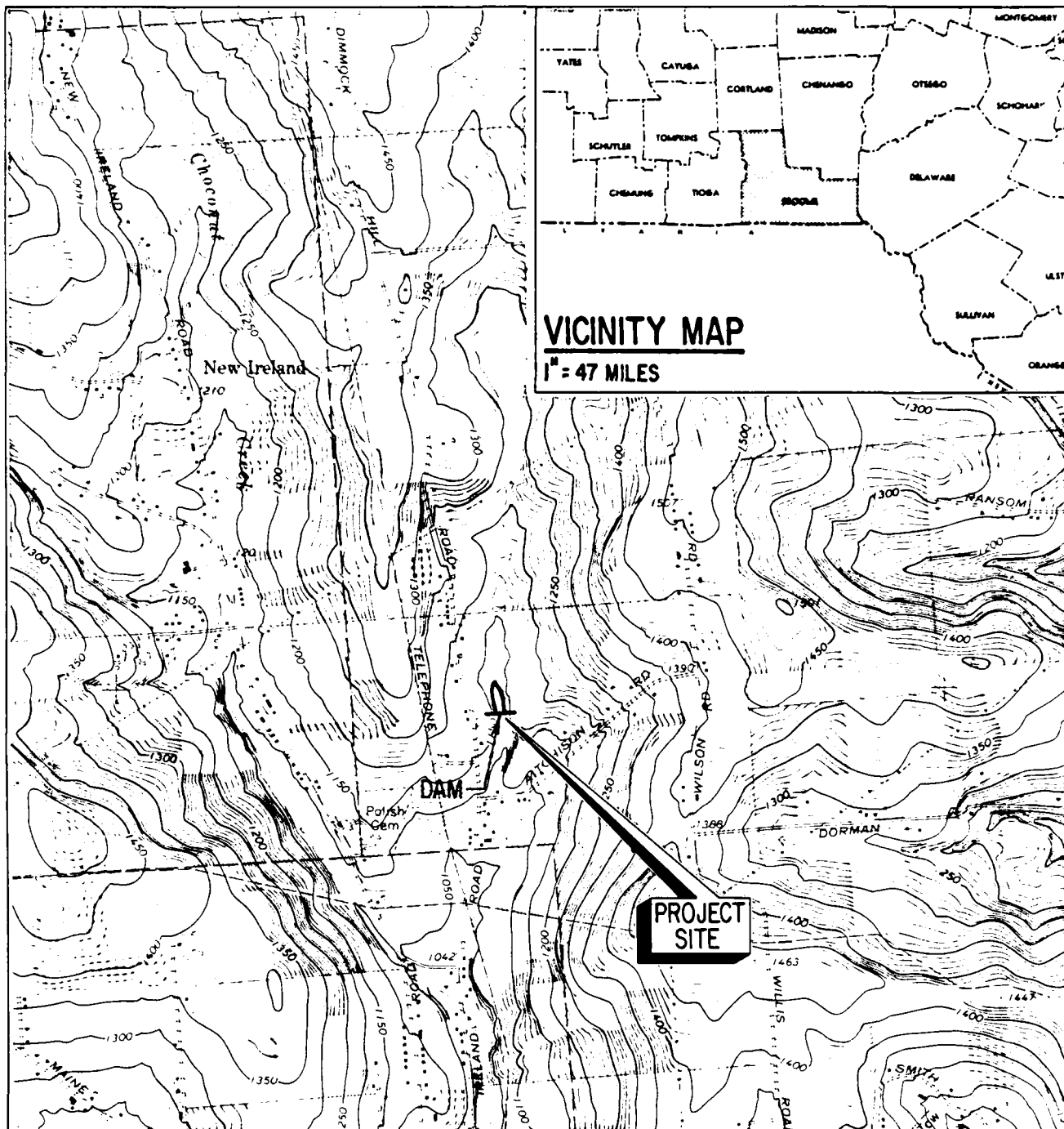
Colonel W. M. Smith, Jr.
New York District Engineer

Date:

30 JUN 1981



PHOTO #1: Overview of
Little Choconut Watershed Site 2E Dam
Inventory No. NY 725



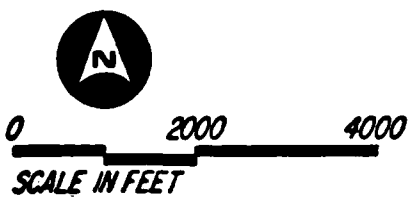
VICINITY MAP

1" = 47 MILES

LOCATION MAP

LITTLE CHOCONUT WATERSHED SITE 2E DAM
INVENTORY No. NY 723

SUSQUEHANNA RIVER BASIN
BROOME COUNTY
CHENANGO, NEW YORK



FLAHERTY • GIAVARA ASSOCIATES, P.C.

NATIONAL DAM SAFETY PROGRAM
PHASE I INSPECTION REPORT
LITTLE CHOCONUT WATERSHED SITE 2E DAM
INVENTORY NO. NY 723
D.E.C. NO. 96A-3623
SUSQUEHANNA RIVER BASIN
BROOME 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. Flaherty Giavara Associates, P.C. has been retained by the New York District to inspect and report on selected dams in the State of New York. Authorization and notice to proceed was issued to Flaherty Giavara Associates, P.C. under a letter of December 24, 1980 from W. M. Smith, Jr., Colonel, Corps of Engineers. Contract No. DACW 51-81-C-0006 has been assigned by the Corps of Engineers for this work.

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 life and property and recommend remedial measures where necessary.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam and Appurtenances

Little Choconout Watershed Site 2E Dam consists of an earthen embankment with a concrete pipe principal spillway under the center of the embankment and a vegetated emergency spillway channel around the left abutment. It is one of eight floodwater retarding dams in the Little Choconut, Finch Hollow, and Trout Brook watersheds designed to reduce floodwater damages. Plans, profiles and sections prepared for the project by the U.S. Department of Agriculture, Soil Conservation Service (SCS) are shown on drawings in Appendix F.

The dam embankment is approximately 410 feet long, 58 feet high and has an upstream slope of 3 horizontal to 1 vertical and a downstream slope of 2.5 to 1. The crest of

the dam is 16 feet in width and its elevation varies from 1161.8 to 1163.3 (NGVD). There is a 10 foot wide berm at the toe of the upstream slope just below normal pond level. The embankment has a homogeneous cross section of compacted glacial till. A 12 to 18 foot wide cutoff also of compacted glacial till extends 4 to 10 feet below the original ground surface. The cutoff extends into glacial till under the abutment slopes and floodplain. The upstream and downstream slopes are provided with grass cover (crown vetch) for erosion protection. Riprap is in place around the principal spillway outlet. The embankment has an internal drain constructed in pervious fill near the downstream toe extending for about half its length. An 8 inch diameter perforated bituminous-coated corrugated metal pipe is embedded in the drain fill on either side of the principal spillway outlet, with each pipe discharging adjacent to the spillway pipe outlet.

The principal spillway is a drop inlet structure consisting of a reinforced concrete riser, a 30 inch diameter prestressed concrete cylinder pipe (PCCP), and a circular plunge pool to dissipate energy at the outlet end of the conduit.

The emergency spillway is a curved 120 foot wide channel with 3 to 1 side slopes cut into the earth of the left abutment sidehill. It is 680 feet long, and terminates at a steep earthen slope leading down to the original floodplain and stream channel. The emergency spillway slopes gently downward both upstream and downstream from a 30 foot wide level section (the spillway crest) that is close to the left end of the dam crest. Approximately 150 feet of the right channel slope is formed by a spur dike which has a 12 foot wide crest that varies in elevation from 1157.3 to 1161.8 (NGVD). It connects to the left end of the dam embankment and has a grass covered channel bottom and side slopes.

b. Location

The Little Choconut Watershed Site 2E Dam is located off Dimmock Hill Road approximately 1.7 miles north of Choconut Center in the Town of Chepango, New York. The dam is located at latitude north 42°-10.0' and longitude west 75°-56.3' on the U.S. Geological Survey 7.5 minute series topographic map "Castle Creek, New York". The Location Map on page i indicates where the dam is situated.

c. Size Classification

The maximum height of the dam is 58 feet and the maximum storage capacity is 179 acre-feet. Therefore, Little

Choconut Watershed Site 2E Dam is classified as an "Intermediate" dam as defined by the Recommended Guidelines for Safety Inspection of Dams.

d. Hazard Classification

There are approximately 7 dwellings within the dam failure flood hazard area. Aitchison Road and Stella Ireland Road are located downstream of the dam. Therefore, the dam is in the High Hazard category as defined by the Recommended Guidelines for Safety Inspection of Dams.

e. Ownership

The dam is owned by the County of Broome and maintained by the Broome County Soil & Water Conservation District. Their addresses and telephone numbers are as follows:

Owner

Contact: Carl S. Young, Broome County Executive
Broome County Building
Government Plaza
P.O. Box 1766
Binghamton, New York 13902

Telephone: (607) 772-2109

Maintenance

Contact: William Maxian, District Manager
Broome County Soil & Water Conservation
District
840 Front Street
Binghamton, New York 13905

Telephone: (607) 773-2691

f. Purpose

The primary purpose of this dam is flood control in the Little Choconut Creek watershed to reduce floodwater damages.

g. Design and Construction History

This dam was designed by the Soil Conservation Service (SCS) of the U.S. Department of Agriculture (USDA) in 1965 and 1966. It was constructed in 1968 by the Talson Construction Company of Herkimer, New York. No major post construction modifications have been made to the dam.

h. Normal Operating Procedures

The intake riser is always open; therefore, the water level is maintained at the elevation of the crest of the intake orifice for normal flows. There are no regular operating procedures.

1.3 PERTINENT DATA

a. Drainage Area (Square Miles) 1.02

b. Discharge at Dam Site (CFS)

- Top of Dam	3410
- Crest of Emergency Spillway	32
- Crest of Principal Spillway	2
- Reservoir Drain Inlet	-

c. Elevations (NGVD)

- Top of Dam	1161.8
- Design High Water Level	1158.9
- Crest of Emergency Spillway	1156.9
- Crest of Principal Spillway	1131.5
- Reservoir Drain Inlet	1122.5

d. Reservoir Surface Area (Acres)

- Top of Dam	17.7
- Design High Water Level	15.5
- Crest of Emergency Spillway	13.9
- Crest of Principal Spillway	1.2

e. Storage (Acre-Feet)

- Top of Dam	227
- Design High Water Level	179
- Crest of Emergency Spillway	150
- Crest of Principal Spillway	4

f. Dam

- Type: Homogeneous compacted earthfill with a glacial till cutoff	
- Length (Feet)	410
- Upstream Slope (H:V)	3:1
- Downstream Slope (H:V)	2.5:1
- Crest Width (Feet)	16

g. Emergency Spillway

- Type: Excavated earthen channel; right bank is part of spur dike

- Length (Feet)	680
- Bottom Width (Feet)	120
- Side Slopes (H:V)	3:1
- Channel Bottom Slopes (Feet/Foot)	
upstream	0.020
downstream	0.032

h. Principal Spillway

- Type: Drop inlet structure consisting of a single stage reinforced concrete riser, a 30 inch diameter prestressed concrete cylinder pipe (254 feet long) and a circular plunge pool at the outlet end of the conduit
- Control: None

i. Reservoir Drain

- Type: 6 inch diameter cast iron mechanical joint pipe (53 feet long) with a trash rack and concrete pad and draining into the reinforced concrete riser
- Control: 6 inch flat frame slide gate gate located at the inlet to the reinforced concrete riser

j. Toe Drain

- Type: Two 8 inch diameter perforated bituminous-coated corrugated metal pipes in pervious fill
- Control: None

SECTION 2 - ENGINEERING DATA

2.1 GEOTECHNICAL DATA

a. Geology

The Little Choconut Watershed Site 2E Dam is located in the Appalachian Plateau physiographic province of New York State. The glacial ice that modified the topography drastically in some areas of this state had little effect on this section. The ice sheet terminated approximately 40 miles south of Binghamton; therefore, it was relatively thin in this area.

Relief ranges from an elevation of 800 feet in the Susquehanna River valley to more than 1500 feet in the vicinity of this site. In many localized areas, the creation of late-stage glacial lakes resulted in substantial filling of valleys with lacustrine deposits and a decrease in relief.

The geologic history of this site appears to be one of glacial scour of the north-south oriented valley, with subsequent deposition of till uniformly over the entire site area. Two distinct tills are logged in the drill holes, on a color basis. This may represent evidence of multiple glaciation of this site. Postglacial erosion has incised a rather steep gradient, V-shaped valley into this till.

b. Subsurface Investigations

1. Centerline of Dam

Both abutments of this site are a dense glacial till to an unknown depth. The floodplain of this site generally consists of 4 to 5 feet of reworked till, underlain by a sequence of gray and brown dense tills.

A pocket of heavy, bouldery gravel exists in the vicinity of TP (test pit) 4 and DH (drill hole) 51 (See Appendix F - Profiles). This material extends down to a depth of 9 feet and is underlain gray till.

Permeable materials exist on the surface of this floodplain to a depth of about 4 feet and also below a depth of 23 feet. Only moderate seepage was encountered in the surface gravels at the time of the investigation.

Slight artesian pressure was encountered in the zone of gravel at the 23 and 28 foot depths. Water rose in the casing to a height of approximately 4 to 5 feet above ground level and maintained a minimal flow.

2. Principal Spillway

The entire length of the principal spillway is quite uniformly underlain by 4 to 5 feet of reworked till. Beneath this material, a blue-gray dense till was logged to an average depth of 16 feet, and then a third zone of the gray-brown sequence mentioned in the centerline of dam narrative was encountered.

3. Emergency Spillway

The emergency spillway excavation, as well as most of the entire hillside, is a fairly uniform glacial till. The only variations that occur in this till consist of zones where slightly more material larger than 6 inches in diameter was encountered, or where sandy streaks existed near the bottom of the test pits. Minor seepage was noted in some of these sandy zones.

2.2 DESIGN RECORDS

This dam was designed by the SCS in 1965 and 1966. As part of the design process, a design report, a geology report and soils testing were completed for this site. This data is included in Appendix D.

2.3 CONSTRUCTION RECORDS

The dam was constructed in 1968 by the Talson Construction Company of Herkimer, New York. The contract drawings which were prepared have been updated to reflect "As-Built" conditions and are included in Appendix F. In addition, detailed records kept by the SCS during construction are available at their office in Syracuse, New York.

2.4 OPERATION RECORDS

There were no operation records available for this dam.

2.5 EVALUATION OF DATA

The data presented herein was obtained primarily from the SCS office located in Syracuse, New York and also from the files of the New York State Department of Environmental Conservation (DEC). This information appears to be reliable and adequate for the purposes of a Phase I Inspection Report.

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection of the Little Choconut Watershed Site 2E Dam was conducted on December 15, 1980. The weather was hazy and the temperature was approximately 20+°F. At the time of this inspection, there was approximately 2 inches of snow on the ground, and water was flowing in the principal spillway outlet pipe (See Photo No. 11).

b. Dam

The earthfill embankment of the dam is generally in good condition. There was no visible evidence of settlement, lateral movement, major seepage or erosion, or other serious defects.

The following specific items were noted:

1. There is a small area of slight erosion into glacial till along the lower part of the contact between the downstream embankment slope and the right abutment. Very slight seepage was evident at approximately the same elevation as the water in the storage pool (See Photo No. 13).
2. The grass has been cut short on the relatively level surfaces, but is about 18 inches high on the embankment and cut slopes (See Photos No. 2, 3, 4, 5, 6, 7 and 8). However, the absence of brush is indicative of past periodic cutting.
3. Toe drain outlet pipes on either side of principal spillway outlet pipe project unsupported for about 5 feet, and have been bent slightly downward (See Photo No. 10).
4. The gate was open and apparently traffic has worn slight ruts along the crest (See Photo No. 3).
5. A small quantity of broken rock was evident at the contact between the upstream embankment slope and the left abutment. This may indicate past erosion.
6. A few animal burrows were noted in the steep slope of the emergency spillway where it discharges to the floodplain below (See Photo No. 14).

c. Principal Spillway

1. Drop Inlet Structure

The reinforced concrete drop inlet structure is in excellent condition. However, there was a moderate amount of debris on and in front of the metal trash rack (See Photo No. 9). The gate stem for the low level drain was observed but not operated during the inspection.

2. Principal Spillway Conduit

The visible portions of the interior of the prestressed concrete cylinder pipe was in good condition. The exterior surface of the pipe has numerous cracks as shown in Photo No. 11 and the loss of concrete at the end of the pipe has exposed the prestressed steel strands which are rusting. The cast-in-place concrete cradle that supports the cantilevered discharge pipe is in good condition.

3. Principal Spillway Outlet

The projecting end of the conduit discharges into a 30+ foot diameter plunge pool just beyond the toe of the downstream embankment (See Photo No. 10). The riprap lining within the plunge pool appeared to be in good condition where visible. The bottom was not visible due to deep water. A tree trunk lying across the outlet from the plunge pool could obstruct flows at moderate stages.

4. Principal Spillway Discharge Channel

The channel downstream from the plunge pool has a typical width of 4 feet. The bed and banks are partially covered with a layer of cobbles, and are overgrown with shrubs. The west side of the channel has had some bank erosion about 100 feet downstream of the plunge pool (See Photo No. 12).

d. Emergency Spillway

The emergency spillway is 120 feet wide and is located on the left abutment. It has a vegetated surface consisting of 6 inch high grass. The approach channel, level crest, and exit channel are generally in good condition (See Photos No. 6, 7 and 8). The grass cover on the spillway and along the crest of the earth dike separating the spillway from the embankment has been disturbed in several areas by footpaths and motor vehicles. The crest of the spillway and bottom of the exit channel appear to

be convex along their widths and would tend to concentrate flow along the edges.

e. Downstream Channel

The downstream channel is in good condition, with no signs of degradation or aggradation (See Photo No. 12).

f. Reservoir - Storage Pool Area

The floodwater storage area is bordered by gently to moderately sloping fields and wooded areas, with local steep slopes close to the upstream face of the dam (See Photo No. 15). There is no significant probability of landslides into the storage pool affecting the safety of the dam. Sedimentation is not a factor with regard to safety because of the low normal pool level.

3.2 EVALUATION OF OBSERVATIONS

The visual inspection revealed some minor deficiencies. The following observations were made:

- a. Slight erosion was observed on the downstream embankment slope at the right abutment.
- b. The grass was cut short on the relatively level surfaces, but it is about 18+ inches high on the embankment and cut slopes.
- c. Toe drain pipes discharging on either side of the principal spillway outlet pipe project unsupported for about 5 feet.
- d. The gate was open and apparently traffic has worn slight ruts along the crest.
- e. The exterior surface of the principal spillway conduit has numerous cracks and the loss of concrete at the end of the pipe has exposed the prestressed steel strands which are rusting.
- f. A small quantity of broken rock was evident at the contact between the upstream embankment slope and the left abutment.
- g. Debris was observed on the trash rack at the orifice of the principal spillway concrete riser.
- h. A few small animal burrows were noted in the steep slope at the exit to the emergency spillway.

Based on the visual examination conducted on December 15, 1980, the Little Choconut Watershed Site 2E Dam is considered to be in good condition. The minor deficiencies which have been observed should not have a serious effect on the performance or the safety of the structure.

SECTION 4 - OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The normal water surface level is maintained by the orifice of the drop inlet structure at elevation 1131.5 (NGVD). No operational procedures are in effect at this time.

4.2 MAINTENANCE OF DAM

The dam is maintained by the Broome County Soil & Water Conservation District. Presently the following yearly maintenance items are performed:

- a. Mowing the dam crest and the bottom of the emergency spillway channel; however, the mowing of the slopes of the embankment and emergency spillway is only done every three years.
- b. Maintenance of riprap.
- c. Maintenance of the trash rack on the drop inlet structure.
- d. Inspection of concrete and pipes.
- e. Inspection of the dam embankment for seepage.
- f. Operation of the gate used to drain the impoundment.
- g. Repairs to fences and roads are made as necessary.

4.3 WARNING SYSTEM

No warning system is now in effect; however, the Broome County Soil & Water Conservation District is in the process of preparing an emergency action plan and warning system for the dam to be implemented in the event of dam failure.

4.4. EVALUATION

The operation and maintenance procedures of the dam and appurtenances are satisfactory. However, increased maintenance efforts are required to correct the minor deficiencies noted.

SECTION 5 - HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA

The dam is located on an unnamed tributary 4700+ feet upstream of Little Choconut Creek. This unnamed tributary joins Little Choconut Creek near Choconut Center, approximately four miles upstream of the Susquehanna River at Johnson City, New York.

The watershed (shown on the Watershed Map in Appendix C) consists of 653 acres (1.02 square miles) of rolling to hilly uplands with typical slopes of 10 percent. Land use within the watershed is largely undeveloped with extensive open fields and woodlands. There is a 30+ acre swamp located upstream of the dam in the center of the watershed.

The watercourse upon which the dam is located is a small perennial stream with a typical flow width of 10 feet and a typical flow depth of 6 inches.

5.2 ANALYSIS CRITERIA

The purpose of the hydrologic/hydraulic analysis is to evaluate the spillway capacity and the potential for overtopping. 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 - Dam Safety Version. The procedure included determining the Probable Maximum Flood (PMF) runoff from the watershed and routing the inflow hydrograph through the impoundment to determine the outflow hydrograph. The unit hydrograph was defined by the Snyder Synthetic Unit Hydrograph method and the modified Puls routing procedure was incorporated. The initial rainfall loss was assumed to be 1.0 inches, and the uniform rainfall loss was assumed to be 0.1 inches per hour.

In accordance with recommended guidelines of the Corps of Engineers the Probable Maximum Precipitation (PMP) was 23.5 inches (6 hour duration, 10 square mile area).

The analysis was conducted for both the full PMF and for several fractional PMF conditions. The PMF inflow of 2518 CFS was routed through the reservoir and the peak outflow was determined to be 2482 CFS.

5.3 SPILLWAY CAPACITY

The total outlet capacity is the sum of discharges from the principal spillway and the emergency spillway.

The principal spillway consists of a drop inlet structure, conduit and plunge pool. Its flow capacity was evaluated as-

suming that its capacity was controlled by the inlet elevation 1131.5 (NGVD), which acts as an orifice when submerged by water stages more than one foot above its invert. The area of the orifice is 1.2 square feet, the coefficient of discharge is 0.6, and the centerline elevation is 1132.0 (NGVD).

The emergency spillway is a 120 foot wide, trapezoidalshaped vegetated channel. The SCS design information indicates the emergency spillway was designed to be used only by a flood event with an average return frequency of more than 100 years.

The stage discharge curve for the combined principal and emergency spillways was obtained from the Soil Conservation Service design report for the stages above and including elevation 1156.9 (NGVD).

<u>Stage (Feet)</u>	<u>Discharge Capacity (CFS)</u>	<u>Element of Structure</u>
1131.5	0	Sediment Pool
1135.0	11.1	--
1140.0	18.1	--
1145.0	23.1	--
1150.0	27.1	--
1156.9	31.9	Emergency Spillway
		Crest
1158.9	750	Design High Water
		Level
1161.8	3410	Top of Dam

The total spillway capacity at the top of dam is 3410 CFS.

The principal spillway can pass approximately 18 percent of the PMF event before use of the vegetated emergency spillway would be required.

The energy grade line of the PMF discharge would be 3.9 feet above the crest of the emergency spillway. The average flow velocity in the emergency spillway discharge channel would be 10.6 feet per second (FPS).

5.4 RESERVOIR CAPACITY

The storage capacity of the reservoir was obtained from the Soil Conservation Service design report, as indicated below:

<u>Stage (Feet)</u>	<u>Storage (Acre-Feet)</u>	<u>Storage (Inches of runoff)</u>
1131.5	4	0.08
1156.9	150	2.76

1158.9	179	3.29
1161.8	227	4.17

5.5 FLOODS OF RECORD

The maximum floods of record for this dam are summarized below:

<u>Date</u>	<u>Event</u>	<u>Maximum Flood Stage Elevation (NGVD)</u>	<u>Feet Below Crest of Emergency Spillway (El. 1156.9)</u>
6/24/72	Hurricane	1148.5	8.4
	Agnes		
9/26/75	Hurricane	1148.3	8.6
	Eloise		
2/24/75	--	1142.4	14.5

It should be noted that floodwaters have never reached the emergency spillway crest.

5.6 OVERTOPPING POTENTIAL

The results of the HEC-1 DB computer analysis indicate that the crest of the dam is not overtopped by the PMF event. The peak discharge rate of 2482 CFS would occur at a peak flood stage of 1160.8 feet, which is 1.0 feet below the crest of the dam.

The results of the analysis are tabulated below:

<u>Flood Condition</u>	<u>Peak Inflow (CFS)</u>	<u>Peak Outflow (CFS)</u>	<u>Maximum Stage Elevation (NGVD)</u>
0.5 PMF	1259	1241	1159.4
1.0 PMF	2518	2482	1160.8

5.7 EVALUATION

Using the Corps of Engineers' screening criteria for the initial review of spillway adequacy, it has been determined that the dam would not be overtopped by either the full Probable Maximum Flood (PMF) or one half the PMF. Approximately 1.0 feet of freeboard would exist between the PMF maximum water level and the crest of the dam. Therefore, the spillway is adjudged to be adequate.

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

There was no visible evidence of settlement, lateral movement or other signs of structural instability of the dam during the site inspection. However, the pool level was approximately 30 feet below the top of the dam at the time, with the result that the forces tending to cause instability were much lower than design levels. Based on the conditions that were observed, there is no reason to question the static structural stability of the dam.

b. Design and Construction Data

Soil Conservation Service record drawings for the Little Choconut Watershed Site 2E Dam (see Appendix F) show a configuration and cross section for the embankment that generally corresponds to the information presented and analyzed in the SCS Geology Report, dated February 1966; Memorandum presenting test results and stability analyses, dated May 6, 1966; and Design Report, dated October 1966.

While there is no construction data available to confirm the actual physical properties of the earthfill in the embankment, the design properties presented in the SCS reports are considered to be reasonable, and the dam would be expected to have adequate safety margins with respect to stability under static loading conditions. Additionally, the toe drains control the phreatic surface and provide a safe outlet for foundation seepage.

A slope stability analysis was performed by the SCS on the embankment of the dam using the Swedish Circle method and adopted design data (See page D-7 of Appendix D). The results of the analysis are tabulated below:

<u>Location</u>	<u>Slope (H:V)</u>	<u>Conditions</u>	<u>Factor of Safety</u>
Upstream slope	3:1	Full drawdown; 10' berm; radius = 158.5 feet	1.64
Upstream slope	3:1	Full drawdown; 10' berm; radius = 113.0 feet	1.58
Upstream slope	3:1	Full drawdown; 10' berm; radius = 77.0 feet	1.54
Downstream slope	2.5:1	No berm; drain @ c/b=0.6; radius = 68.0 feet	1.70

Downstream 2.5:1 No berm; drain @ $c/b=0.6$; 1.56
slope radius = 101.0 feet

Downstream 2.5:1 No berm; drain @ $c/b=0.6$; 1.71
slope radius = 142.5 feet

The assumptions and method used are considered reasonable;
therefore, the resulting factors of safety are adequate.

c. Seismic Stability

The Little Choconut Watershed Site 2E Dam is located in
Seismic Zone 1, and in accordance with recommended Phase I
guidelines does not require seismic analysis.

SECTION 7 - ASSESSMENTS/RECOMMENDATIONS

7.1 DAM ASSESSMENT

a. Condition

On the basis of the visual examination, the Little Chocanut Watershed Site 2E Dam is considered to be in good condition. There were no signs of impending structural failure or other conditions which would warrant urgent remedial action, and only minor deficiencies were noted.

b. Adequacy of Information

The evaluation of this dam is based primarily on visual examination, reference to available SCS plans, approximate hydraulic and hydrologic computations, and application of engineering judgement. The visual examination was somewhat hampered by low pool level and light snow cover; however, the available information that was obtained was adequate for the purposes of a Phase I assessment.

c. Need for Additional Investigations

No additional investigations are required for this dam.

d. Urgency

The recommended measures presented in Section 7.2 should be completed within 12 months of the final approval date of this report. In the interim, a detailed flood warning and emergency evacuation plan should be developed and implemented.

7.2 RECOMMENDED MEASURES

Although the dam is generally in good condition, it is considered important that the following items be accomplished:

1. Repair the small eroded area on the downstream slope at the right abutment using granular fill and broken stone to permit drainage.
2. Mow the grassed slopes of the embankment and emergency spillway channel at least annually.
3. Restore the riprap support or shorten the toe drain outlet pipes.
4. Control access and vehicular traffic and take necessary measures to prevent further rutting of the crest.

APPENDIX A
PHOTOGRAPHS

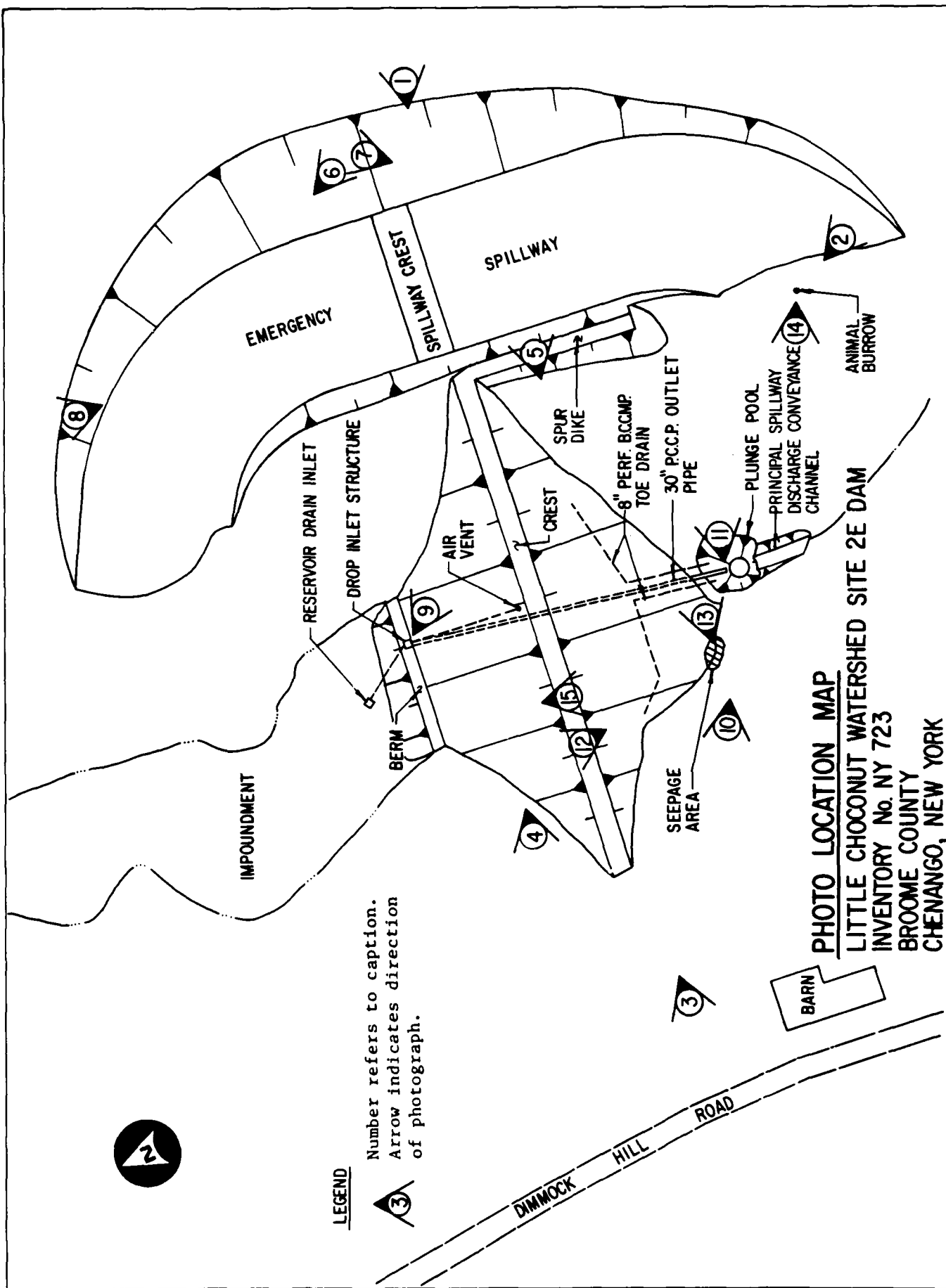




PHOTO #2: Overview of downstream face of dam



PHOTO #3: Crest of dam looking toward left abutment



PHOTO #4: Upstream face of dam



PHOTO #5: Downstream face of dam



PHOTO #6: Emergency spillway looking upstream



PHOTO #7: Emergency spillway looking downstream



PHOTO #8: Crest of emergency spillway looking downstream



PHOTO #9: Drop inlet structure



PHOTO #10: Outlet works: 30" prestressed concrete cylinder pipe (P.C.C.P.) and plunge pool



PHOTO #11: Cracks in 30" outlet pipe



PHOTO #12: Downstream channel conditions



PHOTO #13: Seepage Area

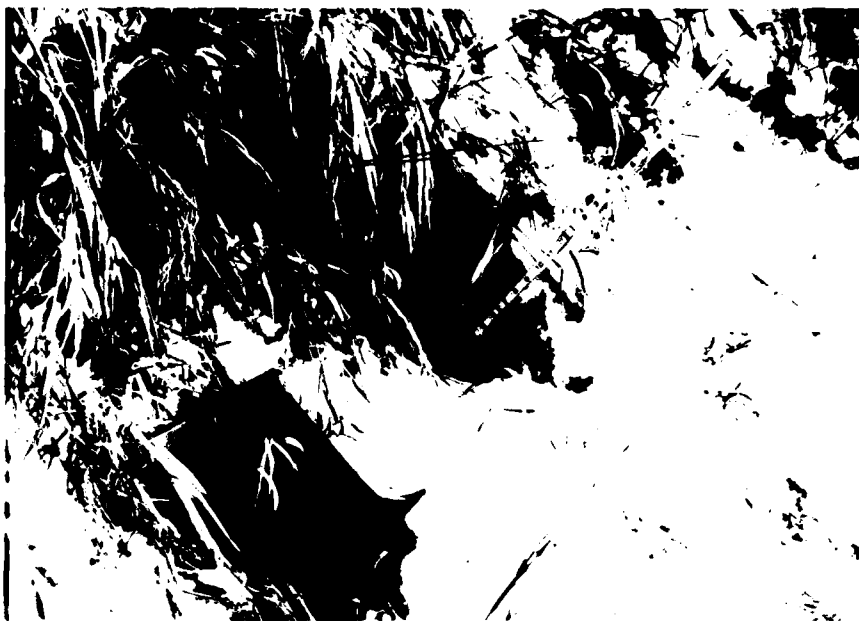


PHOTO #14: Animal burrow



PHOTO #15: Impoundment

APPENDIX B
VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam Little Choconut Watershed Site 2E Dam

Fed. I.D. # NY 723

DEC Dam No. 96A-3623

River Basin Susquehanna

Location: Town Chenango

County Broome

Stream Name Unnamed

Tributary of Little Choconut Creek

Latitude (N) 42°-10.0'

Longitude (W) 75°-56.3'

Type of Dam Earthen embankment

Hazard Category High

Date(s) of Inspection December 15, 1980

Weather Conditions Hazy, 20°± F.

Reservoir Level at Time of Inspection Elevation 1131.5

b. Inspection Personnel R.C. Smith, T.L. Ward and J.G. MacBroom of Flaherty Giavara Associates, P.C.; P.L. LeCount and J.J. Rixner of Haley & Aldrich, Inc.; S. Dhawan and L. Comrie of Salmon Associates

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

Gary L. Page

Donald W. Lake, Jr.

Binghamton Watershed Office

Soil Conservation Service

Soil Conservation Service

771 Federal Building

P.O. Box 1255

100 South Clinton Street

Broome County Airport

Syracuse, N.Y. 13260

Binghamton, N.Y. 13902

(315) 423-5505

(607) 773-2751

d. History:

Date Constructed 1968

Date(s) Reconstructed Never

Designer Soil Conservation Service

Constructed By Talson Construction

Owner County of Broome

2) Embankment

a. Characteristics

- (1) Embankment Material Fairly well-graded silty and clayey gravel
- (2) Cutoff Type Compacted glacial till
- (3) Impervious Core None
- (4) Internal Drainage System Two 8" perforated BCCMP toe drains on either side of the principal spillway outlet; no flow in either drain
- (5) Miscellaneous No comments

b. Crest

- (1) Vertical Alignment Excellent; slightly crowned at the center of the dam
- (2) Horizontal Alignment Excellent; substantially straight
- (3) Surface Cracks None observed
- (4) Miscellaneous Minor wheel rutting; mowed grass

c. Upstream Slope

- (1) Slope (Estimate - V:H) 1:3
- (2) Undesirable Growth or Debris, Animal Burrows None observed
- (3) Sloughing, Subsidence or Depressions Slight erosion at upstream junction of embankment and left abutment

(4) Slope Protection 18⁺ inch high grass

(5) Surface Cracks or Movement at Toe None evident

d. Downstream Slope

(1) Slope (Estimate - V:H) 1:2.5

(2) Undesirable Growth or Debris, Animal Burrows None observed

(3) Sloughing, Subsidence or Depressions None evident

(4) Surface Cracks or Movement at Toe None evident

(5) Seepage Minor seepage at the downstream junction of the embankment
and the right abutment

(6) External Drainage System (Ditches, Trenches, Blanket) None observed

(7) Condition Around Outlet Structure Riprap surrounds the outlets of the
principal spillway and the toe drains and has fallen away from both
of them

(8) Seepage Beyond Toe None observed

e. Abutments - Embankment Contact

Good condition

(1) Erosion at Contact None evident

(2) Seepage Along Contact None observed

3) Drainage System

a. Description of System Drop inlet structure consisting of a reinforced concrete riser, a 30 inch diameter conduit and a plunge pool

b. Condition of System Excellent

c. Discharge from Drainage System Riprap-lined plunge pool

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

Monumentation of centerline of dam

5) Reservoir

- a. Slopes Gently to moderately sloping fields and wooded areas with local steep slopes close to the upstream face of dam
- b. Sedimentation Design figures for storage allow for 10.9 acre-feet of sediment
- c. Unusual Conditions Which Affect Dam Low sediment pool level

6) Area Downstream of Dam

- a. Downstream Hazard (No. of Homes, Highways, etc.) Approximately 7 dwellings are within the dam failure flood hazard area as well as Aitchison Road and Stella Ireland Road
- b. Seepage, Unusual Growth None observed
- c. Evidence of Movement Beyond Toe of Dam None observed
- d. Condition of Downstream Channel Good; no aggradation or degradation

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

Principal spillway, emergency spillway and discharge conveyance channel

- a. General Principal spillway and discharge conveyance channel handle normal flows, while the emergency spillway conveys flood events with average return frequencies greater than 100 years
- b. Condition of Principal Spillway Good; however, debris has collected on the trash rack and would hinder flow through the orifice. Also, the exterior of the projecting outlet pipe has numerous cracks and the loss of concrete has exposed the prestressed steel strands which have rusted

c. Condition of Emergency Spillway Very good; however, the vegetated cover has been disturbed by foot paths and motor vehicles. The spillway crest and the exit channel appear to be convex along their width and would tend to concentrate flow along the edges of the spillway.

d. Condition of Discharge Conveyance Channel Good; the bed and banks are partially covered with a layer of cobbles, and the west side has some bank erosion.

8) Reservoir Drain/Outlet

Type: Pipe Two Conduit _____ Other _____

Material: Concrete X Metal X Other _____

Size: Concrete: 30 inch, Metal: 6 inch Length 254 feet and 53 feet

Invert Elevations: Entrance 1122.5 Exit 1113.0

Physical Condition (Describe): _____ Unobservable X

Material: Prestressed concrete cylinder and cast iron

Joints: Rubber/Steel and Mechanical Alignment Straight

Structural Integrity: Excellent

Hydraulic Capability: Good

Means of Control: Gate Flat Frame Slide Gate _____ Valve _____ Uncontrolled _____

Operation: Operable X Inoperable _____ Uncontrolled _____

Present Condition (Describe): Each pipe is in excellent conditon

9) Structural

a. Concrete Surfaces Excellent Condition

b. Structural Cracking Exterior cracks observed on the principal spillway
outlet pipe

c. Movement - Horizontal & Vertical Alignment (Settlement) None evident

d. Junctions with Abutments or Embankments Not applicable

e. Drains - Foundation, Joint, Face Not applicable

f. Water Passages, Conduits, Sluices Not applicable

g. Seepage or Leakage None observed

h. Joints - Construction, etc. Not applicable

i. Foundation Not applicable

j. Abutments Not applicable

k. Control Gates 6" flat frame slide gate on the reservoir drain at its inlet
to the reinforced concrete riser

l. Approach & Outlet Channels Not applicable

m. Energy Dissipators (Plunge Pool, etc.) Plunge pool at the principal spillway
outlet

n. Intake Structures Reinforced concrete riser has a 14" x 12" orifice

o. Stability No evidence of structural instability

p. Miscellaneous No comments

10

1

1

APPENDIX C

HYDROLOGIC/HYDRAULIC ENGINEERING DATA AND COMPUTATIONS

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

AREA-CAPACITY DATA:

	<u>Elevation</u> (ft.)	<u>Surface Area</u> (acres)	<u>Storage Capacity</u> (acre-ft.)
1) Top of Dam	<u>1161.8</u>	<u>17.7</u>	<u>227</u>
2) Design High Water (Max. Design Pool)	<u>1158.9</u>	<u>15.5</u>	<u>179</u>
3) Emergency Spillway Crest	<u>1156.9</u>	<u>13.9</u>	<u>150</u>
4) Pool Level with Flashboards	<u>--</u>	<u>--</u>	<u>--</u>
5) Principal Spillway Crest	<u>1131.5</u>	<u>1.2</u>	<u>4</u>

DISCHARGES:

	<u>Volume</u> (cfs)
1) Average Daily	<u>Unknown</u>
2) Emergency Spillway @ Maximum High Water (Top of Dam)	<u>3375</u>
3) Emergency Spillway @ Design High Water	<u>717</u>
4) Principal Spillway @ Emergency Spillway Crest	<u>32</u>
5) Low Level Outlet @ Principal Spillway Crest	<u>2</u>
6) Total (of all facilities) @ Maximum High Water	<u>3410</u>
7) Maximum Known Flood	<u>Unknown</u>
8) At Time of Inspection	<u>1±</u>

CREST:

ELEVATION: 1161.8

Type Vegetated earthen embankment

Width 16 Feet

Length 420 Feet

Spillover Vegetated emergency spillway

Location Left abutment

SPILLWAY:

PRINCIPAL

EMERGENCY

1131.5

Elevation

1156.9

Drop inlet structure

Type

Earth excavated

14" x 12" vertical orifice

Width

120 Feet

Orifice

Type of Control

Weir

Uncontrolled

-

Controlled

-

Type:
(Flashboards; gate)

One

Number

One

30 inch/254 feet

Size/Length

120 Feet/680 Feet

Concrete

Invert Material

Vegetated cover on earth

-

Anticipated Length
of Operating Service

-

Not applicable

Chute Length

320 Feet

1.0 foot

Height Between
Spillway Crest
& Approach Channel
Invert (Weir Flow)

Slope = 0.020 on the approach channel

Type: _____

Location: _____

Records:

Date June 24, 1972

Max. Reading Elevation 1148.5 (NGVD)

FLOOD WATER CONTROL SYSTEM:

Warning System Under preparation by the Broome County Soil & Water Conservation
District

Method of Controlled Releases (mechanisms) Manually controlled slide gate
to drain the impoundment

DRAINAGE AREA: 653 acres = 1.02 sq. miles

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type Rural, agriculture

Terrain - Relief Hilly to steep slopes

Surface - Soil Glacial till

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

Moderate to high runoff due to steep slopes

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:**

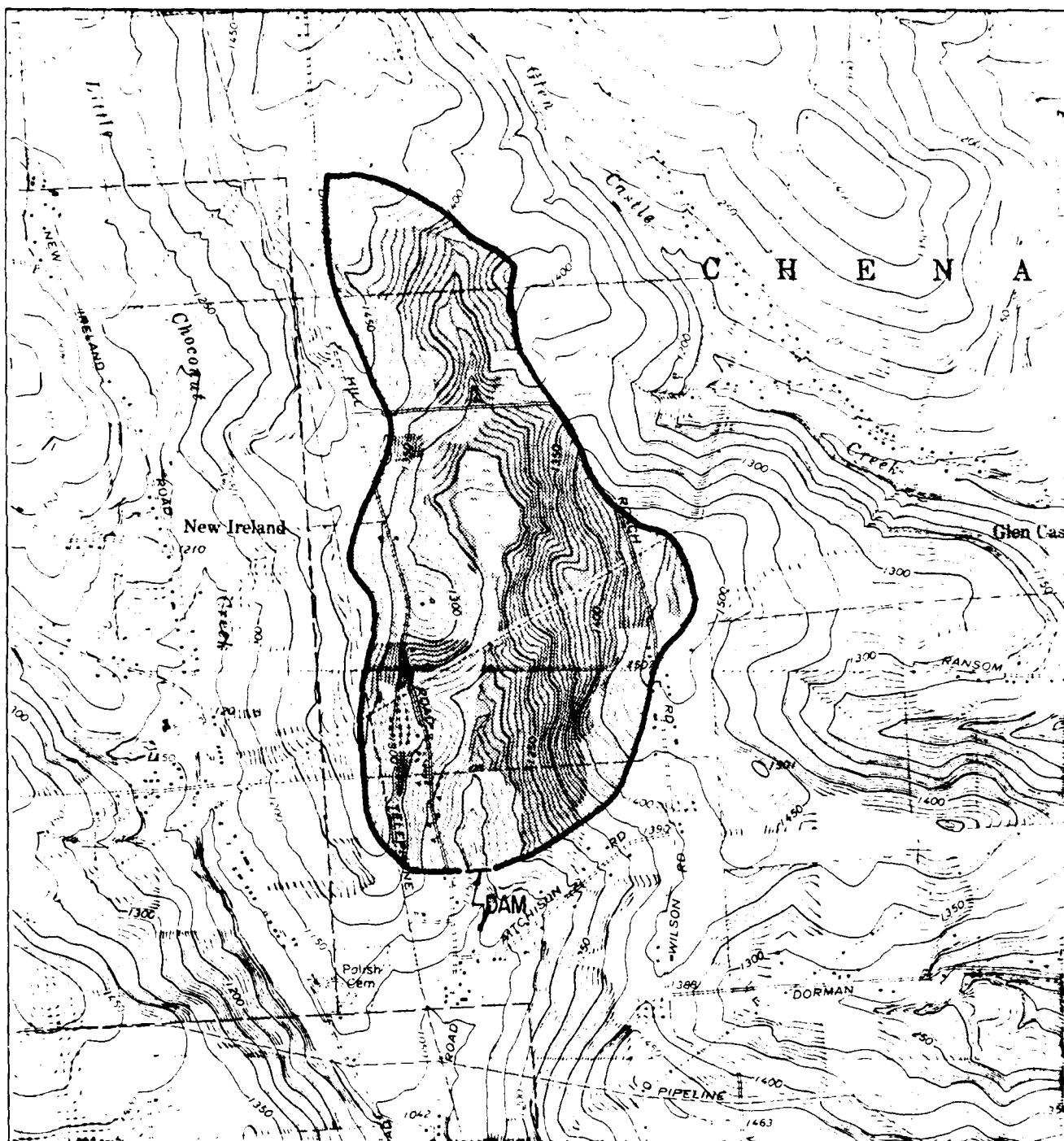
Location: Spur dike at the left end of dam embankment

Elevation: 1157.3 to 1161.8 (NGVD)

Reservoir:

Length @ Maximum Pool 2000 feet = 0.4 miles (Miles)

Length of Shoreline (@ Spillway Crest) 4500[±] feet 0.8 miles (Miles)



WATERSHED MAP

LITTLE CHOCONUT WATERSHED SITE 2E DAM
INVENTORY No. NY 723

SUSQUEHANNA RIVER BASIN
BROOME COUNTY
CHENANGO, NEW YORK



0 2000 4000
SCALE IN FEET

FLAHERTY · GIAVARA ASSOCIATES, PC

CALCULATIONS

WATERCHIEF DATA

FOR HEC-1, SNYLER HYDROGRAPH METHOD

1) TIME TO PEAK (T_p)

$$T_p = C_T \left(\frac{L \times L_c}{\sqrt{S}} \right)^N \quad \text{FROM LINSLEY, KOHLER ET AL.$$

$$L = 11,000 \text{ FT} = 2.09 \text{ MILES}$$

$$L_c = 4300 \text{ FT} = 0.81 \text{ MILES}$$

$$\Delta h = 1490' - 1120' = 370 \text{ FEET}$$

$$S = \frac{370'}{11,000'} = 0.0336 \text{ FT/FT}$$

AVG VALLEY SIDE SLOPE = 10% τ USE $C_T = 1.2$ FOR STEEP AREAS

$$T_p = 1.2 \left(\frac{2.09 \times 0.81}{\sqrt{0.0336}} \right)^{0.38} = 2.79 \text{ HOURS}$$

2) SET $C_p = 0.625$ FOR HIGHLAND AREA

3) % IMPERVIOUS

$$\begin{aligned} \text{ROADS } 7700' \times 25' &= 192,500 \text{ FT}^2 \\ \text{HOUSES } 25 \times 1000' &= 25,000 \text{ FT}^2 \\ \hline &= 217,500 \text{ FT}^2 \\ &= 5.0 \text{ ACRES} \end{aligned}$$

$$\frac{5.0}{663} = 0.75\% \text{ SAY } 1\%$$

4) WATERCHIEF AREA = 663 AC = 1.25 MI²

PROJECT CORUS DAMS
N. 723



FLAHERTY-GIAVARA ASSOCIATES
ENVIRONMENTAL DESIGN CONSULTANTS
ONE COLUMBUS PLAZA NEW HAVEN CONN 06510/203/789-1200

SHEET NO. 2 OF 5
BY SGM DATE 3/7/83
CHK'D BY SGM DATE 3/7/83

5. RAINFALL DATA FOR PMP EVENT
FROM HR#33 DATA AS REPRINTED IN
"DESIGN OF SMALL DAMS"

6 HOUR DURATION PMP = 23.5 INCHES
FOR 10 SQUARE MILES . ADJUSTMENT
FACTORS FOR OTHER DURATIONS ARE :

<u>DURATION, HRS</u>	<u>ADJ FACTOR, %</u>
6	100
12	110
24	120
48	127



PRINCIPAL SPILLWAY STAGE-DISCHARGE CURVE

PRINCIPAL SPILLWAY ACTS AS AN ORIFICE

¢ ELEVATION IS $1131.5' + 0.5' = 1132 \text{ FT}$
 AREA = 1.33 FT^2
 $C = 0.6$

$$Q = CA \sqrt{2GH} = CA \sqrt{2G} (H)^{1/2}$$

$$Q = (0.6)(1.33)(\sqrt{64.4}) H^{1/2} = 6.40 H^{1/2}$$

STAGE (FEET)	HEAD, FT (STAGE - 1132)	DISCHARGE, CFS $6.40(H)^{1/2}$
1131.5	—	0
1135	3	11.1
1140	8	18.1
1145	13	23.1
1150	18	27.1
1156.9	24.9	31.9
1158.9	26.9	33.2
1161.8	29.8	34.4

SCS STAGE-DISCHARGE DATA FROM DESIGN REPORT

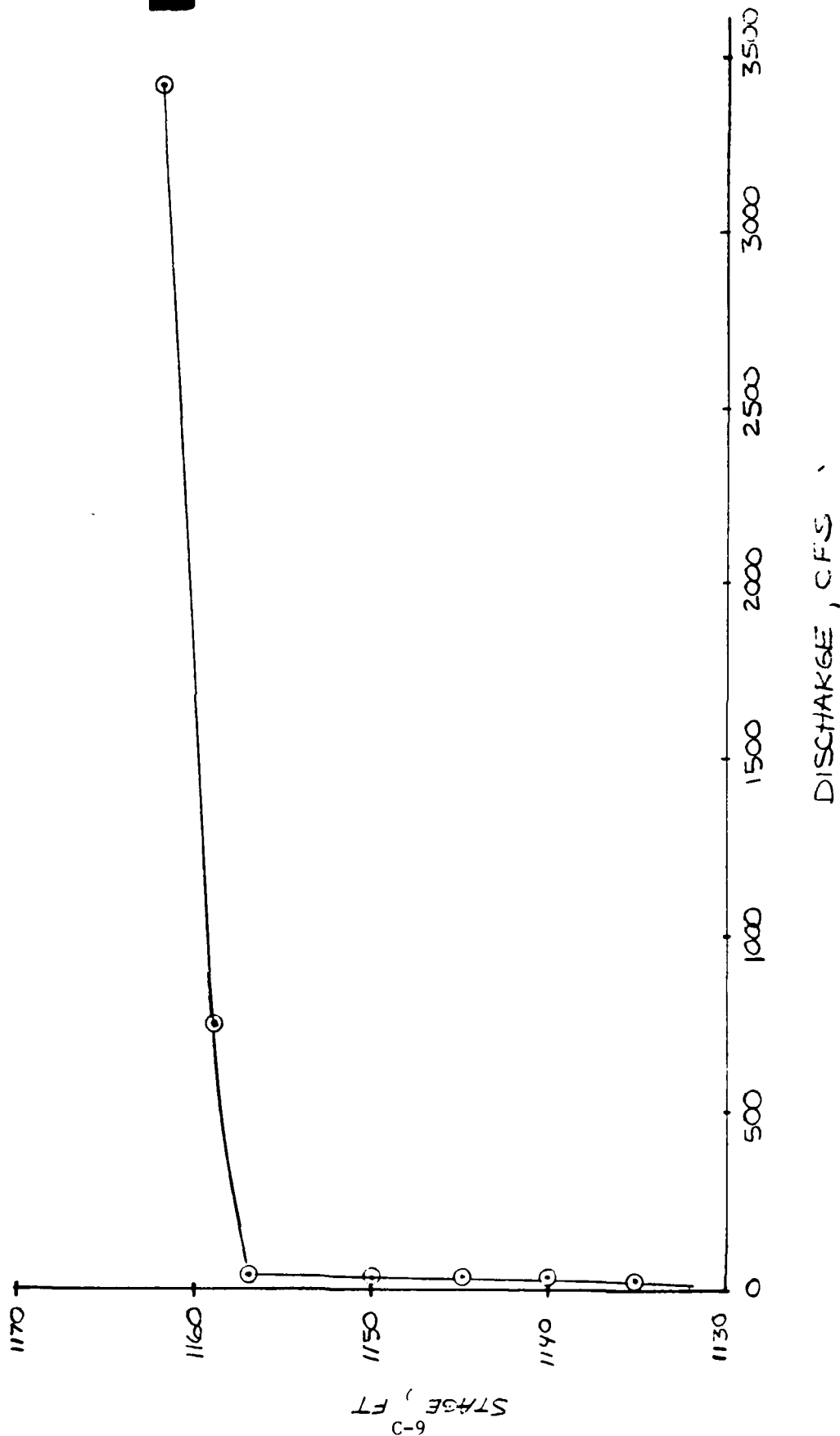
STAGE (FEET)	DISCHARGE (TOTAL CFS)
1158.9	750
1161.8	3410

PROJECT CROSS DAMS
NY # 723



FLAHERTY-GIAVARA ASSOCIATES
ENVIRONMENTAL DESIGN CONSULTANTS
ONE COLUMBUS PLAZA NEW HAVEN CONN 06510/203/789-1280

SHEET NO. 4 OF 5
BY JGM DATE 2/2/81
CHK'D. BY RAC DATE 2/2/81





EMERGENCY SPILLWAY DISCHARGE CHANNEL

$b = 120 \text{ FT}$ (VARICE PLUS $\frac{1}{2}$ RADIUS)
 $z = 3:1$
 $S = 3.2 \%$
 $N = 0.040$
 $Q = 2482 \pm \text{CFS}$ (PMF DISCHARGE)

FIND D, A, V

$Q = \frac{K'}{N} b^{8/3} S^{1/2}$ (KINGS HANDED... THE L 7-11)

$K' = \frac{2482 (0.04)}{(120)^{2.67} (0.032)^{0.5}} = 0.00156$

INTERPOLATE : $\frac{0.00156 - 0.00070}{0.00223 - 0.00070} = 0.562$

$\frac{D}{b} = 0.0156$

$D = 0.0156 (120) = 1.87 \text{ FT}$

$A = 1.87' (120) + 1.87(3) (\frac{1}{2}) (1.87) (\pi) = 234.9$

$\text{AVE. VEL.} = \frac{Q}{A} = \frac{2482}{234.9} = 10.6 \text{ FPS} \pm$

THIS VELOCITY MAY HAVE SOME EFFECT
 OF VEGETATED SPILLWAY

HEC-1 FLOOD HYDROGRAPH COMPUTATIONS


```

4      120      0      30      0      0      0      0      2      0      0
5      B1      5
6      J1      1
7      J1      0.1      0.2      0.3      0.4      0.5      0.6      0.7      0.8      1.0
8      K1      0
9      K1      0
10     M1      1
11     P1      0
12     T1      0
13     W1      2.79      0.625
14     X1      -2.0      2.0      1.0
15     K1      1
16     K1      1
17     Y1      1
18     Y1      3
19     Y41131.5      1135.0      1140.0      1145.0      1150.0      1156.9      1158.9      1161.8
20     Y5      0.0      11.1      18.1      23.1      27.1      31.9      3410.0
21     Y6      1.2      3.4      7.5      13.9      15.5      17.7      21.5
22     Y61131.5      1140.0      1148.0      1156.9      1158.9      1161.8      1164.0
23     Y61156.9
24     Y61161.8      2.5      1.5      415.0
25     K1      99

```

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

```

RUNOFF HYDROGRAPH AT      1
ROUTE HYDROGRAPH TO      1
END OF NETWORK

```

```

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

```

```

RUN DATE# 81/02/05.
TIME# 10.25.14.

```

NATIONAL DAM INSPECTION PROGRAM PHASE 1 REPORT CORPS OF ENGINEERS
DAM I.D. #NY723 SITE 2-E BROOME COUNTY NEW YORK 2/3/81
PREPARED BY FLAHERTY GIAVARA ASSOC., NEW HAVEN CONNECTICUT

```

NO      NHR      NHIN      IDAY      IHR      IMIN      METRC      IPLT      IPRT      NSTAN
120      0      30      0      0      0      0      2      0      0
JOPER      NWT      LROFT      TRACE
5      0      0      0

```

MULTI-PLAN ANALYSES TO BE PERFORMED
NPLAN= 1 NRTIO= 9 LRTIO= 1

```

RTIOS= .10 .20 .30 .40 .50 .60 .70 .80 1.00

```

```

*****
SUB-AREA RUNOFF COMPUTATION
*****

```

INFLOW HYDROGRAPH, SNYDER METHOD

```

ISIAQ      ICOMF      IECON      ITAFE      JFLT      JFRT      INAME      ISTAGE      IAUO
1      0      0      0      0      0      1      0      0

```

HYDROGRAPH DATA

INHYD	IUHG	IAREA	SNAP	TRSDA	TRSF	RATIO	ISNOW	ISAME	LOCAL
1	1	1.02	0.00	1.02	1.00	0.000	0	1	0

PRECIP DATA

SPFE	FMS	R6	R12	R24	R48	R72	R96
0.00	23.50	100.00	110.00	120.00	127.00	0.00	0.00

LOSS DATA

LROFT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOL	STRTL	CNSTL	ALSHX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.10	0.00	.01

UNIT HYDROGRAPH DATA
TF= 2.79 CP= .63 NTA= 0

RECESSION DATA
STRTQ= -2.00 QKCSN= 2.00 RTIOR= 1.00
APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 6.45 AND R= 5.16 INTERVALS

UNIT HYDROGRAPH 31 END-OF-PERIOD ORIGINATES, LAG= 2.81 HOURS, CP= .63 VOL= 1.00

MO.	HR.	MM	PERIOD	RAIN	EXCS	LOSS	CONF
10.	37.	72.	109.	136.	148.	139.	117.
66.	54.	44.	37.	30.	25.	20.	17.
9.	8.	6.	5.	4.	4.	3.	2.
1.							

END-OF-PERIOD FLOW

MO.	HR.	MM	PERIOD	RAIN	EXCS	LOSS	COMP	MO.	HR.	MM	PERIOD	RAIN	EXCS	LOSS	CONF
1.01	1.00	1.00	1	.00	.00	.00	2.	1.02	6.30	61	.20	.15	.05	.36.	
1.01	1.30	1.00	2	.00	.00	.00	2.	1.02	7.00	62	.20	.15	.05	.41.	
1.01	2.00	1.00	3	.00	.00	.00	2.	1.02	7.30	63	.20	.15	.05	.50.	
1.01	2.30	1.00	4	.00	.00	.00	2.	1.02	8.00	64	.20	.15	.05	.64.	
1.01	3.00	1.00	5	.00	.00	.00	2.	1.02	8.30	65	.20	.15	.05	.80.	
1.01	3.30	1.00	6	.00	.00	.00	2.	1.02	9.00	66	.20	.15	.05	.98.	
1.01	4.00	1.00	7	.00	.00	.00	2.	1.02	9.30	67	.20	.15	.05	.115.	
1.01	4.30	1.00	8	.00	.00	.00	2.	1.02	10.00	68	.20	.15	.05	.129.	
1.01	5.00	1.00	9	.00	.00	.00	2.	1.02	10.30	69	.20	.15	.05	.140.	
1.01	5.30	1.00	10	.00	.00	.00	2.	1.02	11.00	70	.20	.15	.05	.150.	
1.01	6.00	1.00	11	.00	.00	.00	2.	1.02	11.30	71	.20	.15	.05	.158.	
1.01	6.30	1.00	12	.00	.00	.00	2.	1.02	12.00	72	.20	.15	.05	.164.	
1.01	7.00	1.00	13	.01	.00	.01	2.	1.02	12.30	73	1.18	1.13	.05	.180.	
1.01	7.30	1.00	14	.01	.00	.01	2.	1.02	13.00	74	1.18	1.13	.05	.220.	
1.01	8.00	1.00	15	.01	.00	.01	2.	1.02	13.30	75	1.41	1.36	.05	.297.	
1.01	8.30	1.00	16	.01	.00	.01	2.	1.02	14.00	76	1.41	1.36	.05	.415.	
1.01	9.00	1.00	17	.01	.00	.01	2.	1.02	14.30	77	1.76	1.71	.05	.571.	
1.01	9.30	1.00	18	.01	.00	.01	2.	1.02	15.00	78	1.76	1.71	.05	.757.	
1.01	10.00	1.00	19	.01	.00	.01	2.	1.02	15.30	79	2.14	2.09	.05	.956.	
1.01	10.30	1.00	20	.01	.00	.01	2.	1.02	16.00	80	6.79	6.74	.05	.1206.	
1.01	11.00	1.00	21	.01	.00	.01	2.	1.02	16.30	81	1.65	1.60	.05	.1528.	
1.01	11.30	1.00	22	.01	.00	.01	2.	1.02	17.00	82	1.65	1.60	.05	.1876.	
1.01	12.00	1.00	23	.01	.00	.01	2.	1.02	17.30	83	1.29	1.24	.05	.2195.	
1.01	12.30	1.00	24	.01	.00	.01	2.	1.02	18.00	84	1.29	1.24	.05	.2424.	
1.01	13.00	1.00	25	.07	.00	.07	2.	1.02	18.30	85	.12	.07	.05	.2518.	
1.01	13.30	1.00	26	.07	.00	.07	2.	1.02	19.00	86	.12	.07	.05	.2445.	
1.01	14.00	1.00	27	.08	.00	.08	2.	1.02	19.30	87	.12	.07	.05	.2243.	
1.01	14.30	1.00	28	.08	.00	.08	2.	1.02	20.00	88	.12	.07	.05	.1990.	
1.01	15.00	1.00	29	.10	.00	.10	2.	1.02	20.30	89	.12	.07	.05	.1721.	
1.01	15.30	1.00	30	.10	.00	.10	3.	1.02	21.00	90	.12	.07	.05	.1457.	
1.01	16.00	1.00	31	.13	.00	.12	3.	1.02	21.30	91	.12	.07	.05	.1220.	
1.01	16.30	1.00	32	.40	.19	.20	5.	1.02	22.00	92	.12	.07	.05	.1020.	
1.01	17.00	1.00	33	.10	.05	.05	10.	1.02	22.30	93	.12	.07	.05	.856.	
1.01	17.30	1.00	34	.10	.05	.05	19.	1.02	23.00	94	.12	.07	.05	.721.	
1.01	18.00	1.00	35	.08	.03	.05	29.	1.02	23.30	95	.12	.07	.05	.609.	
1.01	18.30	1.00	36	.08	.03	.05	39.	1.03	0.00	96	.12	.07	.05	.518.	
1.01	18.30	1.00	37	.01	.00	.01	46.	1.03	.30	97	0.00	0.00	.00	.442.	

1.01	19.30	39	.01	.00	.01	45.	1.03	1.30	99	0.00	0.00	0.00	321.
1.01	20.00	40	.01	.00	.01	40.	1.03	2.00	100	0.00	0.00	0.00	271.
1.01	20.30	41	.01	.00	.01	35.	1.03	2.30	101	0.00	0.00	0.00	227.
1.01	21.00	42	.01	.00	.01	30.	1.03	3.00	102	0.00	0.00	0.00	189.
1.01	21.30	43	.01	.00	.01	25.	1.03	3.30	103	0.00	0.00	0.00	156.
1.01	22.00	44	.01	.00	.01	21.	1.03	4.00	104	0.00	0.00	0.00	127.
1.01	22.30	45	.01	.00	.01	18.	1.03	4.30	105	0.00	0.00	0.00	104.
1.01	23.00	46	.01	.00	.01	15.	1.03	5.00	106	0.00	0.00	0.00	85.
1.01	23.30	47	.01	.00	.01	13.	1.03	5.30	107	0.00	0.00	0.00	68.
1.02	0.00	48	.01	.00	.01	11.	1.03	6.00	108	0.00	0.00	0.00	55.
1.02	.30	49	.08	.03	.05	10.	1.03	6.30	109	0.00	0.00	0.00	44.
1.02	1.00	50	.08	.03	.05	9.	1.03	7.00	110	0.00	0.00	0.00	34.
1.02	1.30	51	.08	.03	.05	10.	1.03	7.30	111	0.00	0.00	0.00	21.
1.02	2.00	52	.08	.03	.05	13.	1.03	8.00	112	0.00	0.00	0.00	16.
1.02	2.30	53	.08	.03	.05	16.	1.03	8.30	113	0.00	0.00	0.00	12.
1.02	3.00	54	.08	.03	.05	20.	1.03	9.00	114	0.00	0.00	0.00	9.
1.02	3.30	55	.08	.03	.05	23.	1.03	9.30	115	0.00	0.00	0.00	6.
1.02	4.00	56	.08	.03	.05	26.	1.03	10.00	116	0.00	0.00	0.00	5.
1.02	4.30	57	.08	.03	.05	29.	1.03	10.30	117	0.00	0.00	0.00	5.
1.02	5.00	58	.08	.03	.05	31.	1.03	11.00	118	0.00	0.00	0.00	4.
1.02	5.30	59	.08	.03	.05	32.	1.03	11.30	119	0.00	0.00	0.00	4.
1.02	6.00	60	.08	.03	.05	34.	1.03	12.00	120	0.00	0.00	0.00	3.

SUM 29.84 26.17 3.67 34518.
(758.)(665.)(93.)(977.44)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL
CFS	2518.	1894.	700.	288.	34513.
CMS	71.	54.	20.	8.	977.
INCHES		17.28	25.53	26.23	26.23
MM		438.79	648.46	666.23	666.23
AC-FT		939.	1388.	1426.	1426.
THOUS CU M		1159.	1712.	1759.	1759.

1#0UF*

STATION 1

	INFLW(I),	OUTFLOW(O)	AND OBSERVED FLOW(*)										
	800.	1200.	1600.	2000.	2400.	2800.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
.30	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1.00	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1.30	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
2.00	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
2.30	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
3.00	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
3.30	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
4.00	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
4.30	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5.00	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5.30	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
6.00	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
6.30	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
7.00	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
7.30	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
8.00	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
8.30	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
9.00	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
9.30	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10.00	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10.30	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11.00	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

[illegible]

1152.3 1152.2 1152.0 1151.9 1151.8 1151.7 1151.6 1151.5 1151.4 1151.2

PEAK OUTFLOW IS 29. AT TIME 50.00 HOURS

PEAK 6-HOUR 24-HOUR 72-HOUR TOTAL VOLUME
 29. 25. 11. 1357.
 1. 1. 0. 38.
 CFS
 CMS
 INCHES
 MM
 AC-FT
 THOUS CU M

180VUF*

STATION 1

	INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)									
	40.	80.	120.	160.	200.	240.	280.	0.	0.	0.
.30 110	.	.	.	.	.	.	.	.	.	.
1.00 210	.	.	.	.	.	.	.	.	.	.
1.30 310	.	.	.	.	.	.	.	.	.	.
2.00 410	.	.	.	.	.	.	.	.	.	.
3.30 510	.	.	.	.	.	.	.	.	.	.
3.00 610	.	.	.	.	.	.	.	.	.	.
3.30 710	.	.	.	.	.	.	.	.	.	.
4.00 810	.	.	.	.	.	.	.	.	.	.
4.30 910	.	.	.	.	.	.	.	.	.	.
5.00 1010	.	.	.	.	.	.	.	.	.	.
5.30 1110	.	.	.	.	.	.	.	.	.	.
6.00 1210	.	.	.	.	.	.	.	.	.	.
6.30 131	.	.	.	.	.	.	.	.	.	.
7.00 141	.	.	.	.	.	.	.	.	.	.
7.30 151	.	.	.	.	.	.	.	.	.	.
8.00 161	.	.	.	.	.	.	.	.	.	.
8.30 171	.	.	.	.	.	.	.	.	.	.
9.00 181	.	.	.	.	.	.	.	.	.	.
9.30 191	.	.	.	.	.	.	.	.	.	.
10.00 201	.	.	.	.	.	.	.	.	.	.
10.30 211	.	.	.	.	.	.	.	.	.	.
11.00 221	.	.	.	.	.	.	.	.	.	.
11.30 231	.	.	.	.	.	.	.	.	.	.
12.00 241	.	.	.	.	.	.	.	.	.	.
12.30 251	.	.	.	.	.	.	.	.	.	.
13.00 261	.	.	.	.	.	.	.	.	.	.
13.30 271	.	.	.	.	.	.	.	.	.	.
14.00 281	.	.	.	.	.	.	.	.	.	.
14.30 291	.	.	.	.	.	.	.	.	.	.
15.00 301	.	.	.	.	.	.	.	.	.	.
15.30 311	.	.	.	.	.	.	.	.	.	.
16.00 321	.	.	.	.	.	.	.	.	.	.
16.30 331	.	.	.	.	.	.	.	.	.	.
17.00 341	.	.	.	.	.	.	.	.	.	.
17.30 3501	.	.	.	.	.	.	.	.	.	.
18.00 3601	.	.	.	.	.	.	.	.	.	.
18.30 3701	.	.	.	.	.	.	.	.	.	.
19.00 3801	.	.	.	.	.	.	.	.	.	.
19.30 3901	.	.	.	.	.	.	.	.	.	.
20.00 40.1	.	.	.	.	.	.	.	.	.	.
20.30 41.1	.	.	.	.	.	.	.	.	.	.
21.00 42.1	.	.	.	.	.	.	.	.	.	.
21.30 43.1	.	.	.	.	.	.	.	.	.	.
22.00 44.1	.	.	.	.	.	.	.	.	.	.
22.30 4510	.	.	.	.	.	.	.	.	.	.

8.301131 0
 9.001141 0
 9.301151 0
 10.001161 0
 10.301171 0
 11.001181 0
 11.301191 0
 12.001201 0

1*00N*

STATION 1, PLAN 1, RATIO 2
 END-OF-PERIOD HYDROGRAPH ORDINATES

		OUTFLOW											
5.	4.	5.	4.	5.	4.	5.	4.	5.	4.	5.	4.	5.	4.
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.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
7.	8.	8.	11.	11.	13.	10.	13.	10.	13.	22.	28.	36.	36.
46.	59.	75.	93.	112.	131.	150.	166.	166.	166.	166.	166.	166.	166.
165.	163.	162.	161.	160.	159.	158.	157.	157.	157.	157.	157.	156.	156.
156.	156.	155.	155.	155.	154.	153.	152.	152.	152.	152.	152.	151.	151.
150.	149.	147.	146.	145.	144.	142.	141.	141.	140.	140.	140.	139.	139.

		STAGE											
1133.2	1133.1	1133.0	1132.9	1132.8	1132.7	1132.6	1132.5	1132.4	1132.3	1132.2	1132.1	1132.0	1131.9
1132.3	1132.2	1132.1	1132.0	1131.9	1131.8	1131.7	1131.6	1131.5	1131.4	1131.3	1131.2	1131.1	1131.0
1131.9	1131.8	1131.7	1131.6	1131.5	1131.4	1131.3	1131.2	1131.1	1131.0	1130.9	1130.8	1130.7	1130.6
1131.7	1131.6	1131.5	1131.4	1131.3	1131.2	1131.1	1131.0	1130.9	1130.8	1130.7	1130.6	1130.5	1130.4
1132.9	1132.8	1132.7	1132.6	1132.5	1132.4	1132.3	1132.2	1132.1	1132.0	1131.9	1131.8	1131.7	1131.6
1132.6	1132.5	1132.4	1132.3	1132.2	1132.1	1132.0	1131.9	1131.8	1131.7	1131.6	1131.5	1131.4	1131.3
1133.0	1132.9	1132.8	1132.7	1132.6	1132.5	1132.4	1132.3	1132.2	1132.1	1132.0	1131.9	1131.8	1131.7
1135.6	1135.5	1135.4	1135.3	1135.2	1135.1	1135.0	1134.9	1134.8	1134.7	1134.6	1134.5	1134.4	1134.3
1145.8	1145.7	1145.6	1145.5	1145.4	1145.3	1145.2	1145.1	1145.0	1144.9	1144.8	1144.7	1144.6	1144.5
1157.6	1157.5	1157.4	1157.3	1157.2	1157.1	1157.0	1156.9	1156.8	1156.7	1156.6	1156.5	1156.4	1156.3
1157.0	1156.9	1156.8	1156.7	1156.6	1156.5	1156.4	1156.3	1156.2	1156.1	1156.0	1155.9	1155.8	1155.7

PEAK OUTFLOW IS 319. AT TIME 44.50 HOURS						
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL	VOLUME
CFS	319.	189.	70.	30.		3606.
CMS	9.	5.	2.	1.		102.

MM
AC-FI
THOUS CU M

43.77 64.66 69.61
94. 138. 149.
116. 171. 184.

1#0VF*

STATION 1

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

	0.	100.	200.	300.	400.	500.	600.	0.	0.	0.	0.	0.	0.
.30	110	.	.	.	.	.	.	.	.	.	.	.	.
1.00	210	.	.	.	.	.	.	.	.	.	.	.	.
1.30	31	.	.	.	.	.	.	.	.	.	.	.	.
2.00	41	.	.	.	.	.	.	.	.	.	.	.	.
2.30	51	.	.	.	.	.	.	.	.	.	.	.	.
3.00	61	.	.	.	.	.	.	.	.	.	.	.	.
3.30	71	.	.	.	.	.	.	.	.	.	.	.	.
4.00	81	.	.	.	.	.	.	.	.	.	.	.	.
4.30	91	.	.	.	.	.	.	.	.	.	.	.	.
5.00	101	.	.	.	.	.	.	.	.	.	.	.	.
5.30	111	.	.	.	.	.	.	.	.	.	.	.	.
6.00	121	.	.	.	.	.	.	.	.	.	.	.	.
6.30	131	.	.	.	.	.	.	.	.	.	.	.	.
7.00	141	.	.	.	.	.	.	.	.	.	.	.	.
7.30	151	.	.	.	.	.	.	.	.	.	.	.	.
8.00	161	.	.	.	.	.	.	.	.	.	.	.	.
8.30	171	.	.	.	.	.	.	.	.	.	.	.	.
9.00	181	.	.	.	.	.	.	.	.	.	.	.	.
9.30	191	.	.	.	.	.	.	.	.	.	.	.	.
10.00	201	.	.	.	.	.	.	.	.	.	.	.	.
10.30	211	.	.	.	.	.	.	.	.	.	.	.	.
11.00	221	.	.	.	.	.	.	.	.	.	.	.	.
11.30	231	.	.	.	.	.	.	.	.	.	.	.	.
12.00	241	.	.	.	.	.	.	.	.	.	.	.	.
12.30	251	.	.	.	.	.	.	.	.	.	.	.	.
13.00	261	.	.	.	.	.	.	.	.	.	.	.	.
13.30	271	.	.	.	.	.	.	.	.	.	.	.	.
14.00	281	.	.	.	.	.	.	.	.	.	.	.	.
14.30	291	.	.	.	.	.	.	.	.	.	.	.	.
15.00	301	.	.	.	.	.	.	.	.	.	.	.	.
15.30	311	.	.	.	.	.	.	.	.	.	.	.	.
16.00	321	.	.	.	.	.	.	.	.	.	.	.	.
16.30	331	.	.	.	.	.	.	.	.	.	.	.	.
17.00	341	.	.	.	.	.	.	.	.	.	.	.	.
17.30	3501	.	.	.	.	.	.	.	.	.	.	.	.
18.00	3601	.	.	.	.	.	.	.	.	.	.	.	.
18.30	3701	.	.	.	.	.	.	.	.	.	.	.	.
19.00	3801	.	.	.	.	.	.	.	.	.	.	.	.
19.30	3901	.	.	.	.	.	.	.	.	.	.	.	.
20.00	4001	.	.	.	.	.	.	.	.	.	.	.	.
20.30	4101	.	.	.	.	.	.	.	.	.	.	.	.
21.00	4201	.	.	.	.	.	.	.	.	.	.	.	.
21.30	4301	.	.	.	.	.	.	.	.	.	.	.	.
22.00	441	.	.	.	.	.	.	.	.	.	.	.	.
22.30	451	.	.	.	.	.	.	.	.	.	.	.	.
23.00	461	.	.	.	.	.	.	.	.	.	.	.	.
23.30	471	.	.	.	.	.	.	.	.	.	.	.	.
0.00	481	.	.	.	.	.	.	.	.	.	.	.	.
.30	491	.	.	.	.	.	.	.	.	.	.	.	.
1.00	501	.	.	.	.	.	.	.	.	.	.	.	.
1.30	511	.	.	.	.	.	.	.	.	.	.	.	.
2.00	521	.	.	.	.	.	.	.	.	.	.	.	.
2.30	531	.	.	.	.	.	.	.	.	.	.	.	.
3.00	541	.	.	.	.	.	.	.	.	.	.	.	.

180VNH

STATION 1, PLAN 1, RATIO 3
END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW	
5.	5.
3.	2.
1.	1.
1.	1.
6.	1.
5.	6.
7.	5.
14.	8.
27.	15.
439.	30.
81.	370.
32.	47.
32.	32.
3.	3.
3.	4.
2.	2.
1.	1.
1.	1.
1.	1.
6.	5.
6.	6.
6.	6.
14.	12.
25.	23.
514.	588.
96.	114.
32.	32.
31.	31.

STORAGE	
2.	2.
1.	1.
1.	1.
0.	0.
0.	0.
3.	3.
2.	2.
3.	3.
11.	34.
72.	178.
171.	158.
157.	153.
152.	141.
2.	2.
1.	1.
1.	1.
0.	0.
0.	0.
3.	3.
2.	2.
3.	3.
12.	27.
92.	180.
169.	159.
156.	154.
151.	142.
2.	2.
1.	1.
1.	1.
0.	0.
0.	0.
3.	3.
2.	2.
3.	3.
11.	34.
72.	178.
171.	158.
157.	153.
152.	141.

STAGE	
1133.2	1132.9
1132.3	1132.2
1131.9	1131.9
1131.8	1131.8
1131.5	1131.6
1133.2	1133.1
1133.6	1133.6
1133.8	1134.1
1137.3	1137.8
1151.6	1151.6
1157.8	1157.8
1157.0	1157.0
1156.6	1156.6
1132.5	1132.5
1132.0	1132.0
1131.8	1131.8
1133.4	1133.4
1133.3	1133.3
1133.5	1133.5
1136.8	1136.8
1147.3	1147.3
1158.2	1158.2
1157.1	1157.1
1156.7	1156.7
1155.8	1155.8
1132.4	1132.4
1132.0	1132.0
1131.8	1131.8
1133.2	1133.2
1133.4	1133.4
1133.5	1133.5
1136.2	1136.2
1145.4	1145.4
1158.4	1158.4
1157.2	1157.2
1156.8	1156.8
1155.9	1155.9

PEAK OUTFLOW IS 669. AT TIME 43.50 HOURS

PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
669.	421.	139.	58.	7004.
19.	12.	4.	2.	198.
	3.84	5.07	5.32	5.32
	97.63	128.71	135.21	135.21
	209.	276.	289.	289.
	258.	340.	357.	357.

180VNF

STATION 1

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

	0.	100.	200.	300.	400.	500.	600.	700.	800.	0.	0.	0.	0.
.30 110	.	.	.	.	.	.	.	.	.	.	.	.	.
1.00 210	.	.	.	.	.	.	.	.	.	.	.	.	.
1.30 31	.	.	.	.	.	.	.	.	.	.	.	.	.
2.00 41	.	.	.	.	.	.	.	.	.	.	.	.	.
2.30 51	.	.	.	.	.	.	.	.	.	.	.	.	.
3.00 61	.	.	.	.	.	.	.	.	.	.	.	.	.
3.30 71	.	.	.	.	.	.	.	.	.	.	.	.	.
4.00 81	.	.	.	.	.	.	.	.	.	.	.	.	.
4.30 91	.	.	.	.	.	.	.	.	.	.	.	.	.
5.00 101	.	.	.	.	.	.	.	.	.	.	.	.	.
5.30 111	.	.	.	.	.	.	.	.	.	.	.	.	.
6.00 121	.	.	.	.	.	.	.	.	.	.	.	.	.
6.30 131	.	.	.	.	.	.	.	.	.	.	.	.	.
7.00 141	.	.	.	.	.	.	.	.	.	.	.	.	.
7.30 151	.	.	.	.	.	.	.	.	.	.	.	.	.
8.00 161	.	.	.	.	.	.	.	.	.	.	.	.	.
8.30 171	.	.	.	.	.	.	.	.	.	.	.	.	.
9.00 181	.	.	.	.	.	.	.	.	.	.	.	.	.
9.30 191	.	.	.	.	.	.	.	.	.	.	.	.	.
10.00 201	.	.	.	.	.	.	.	.	.	.	.	.	.
10.30 211	.	.	.	.	.	.	.	.	.	.	.	.	.
11.00 221	.	.	.	.	.	.	.	.	.	.	.	.	.
11.30 231	.	.	.	.	.	.	.	.	.	.	.	.	.
12.00 241	.	.	.	.	.	.	.	.	.	.	.	.	.
12.30 251	.	.	.	.	.	.	.	.	.	.	.	.	.
13.00 261	.	.	.	.	.	.	.	.	.	.	.	.	.
13.30 271	.	.	.	.	.	.	.	.	.	.	.	.	.
14.00 281	.	.	.	.	.	.	.	.	.	.	.	.	.
14.30 291	.	.	.	.	.	.	.	.	.	.	.	.	.
15.00 301	.	.	.	.	.	.	.	.	.	.	.	.	.
15.30 311	.	.	.	.	.	.	.	.	.	.	.	.	.
16.00 321	.	.	.	.	.	.	.	.	.	.	.	.	.
16.30 331	.	.	.	.	.	.	.	.	.	.	.	.	.
17.00 3401	.	.	.	.	.	.	.	.	.	.	.	.	.
17.30 3501	.	.	.	.	.	.	.	.	.	.	.	.	.
18.00 3601	.	.	.	.	.	.	.	.	.	.	.	.	.
18.30 3701	.	.	.	.	.	.	.	.	.	.	.	.	.
19.00 3801	.	.	.	.	.	.	.	.	.	.	.	.	.
19.30 39.1	.	.	.	.	.	.	.	.	.	.	.	.	.
20.00 40.1	.	.	.	.	.	.	.	.	.	.	.	.	.
20.30 41.1	.	.	.	.	.	.	.	.	.	.	.	.	.
21.00 42.1	.	.	.	.	.	.	.	.	.	.	.	.	.
21.30 43.1	.	.	.	.	.	.	.	.	.	.	.	.	.
22.00 44.1	.	.	.	.	.	.	.	.	.	.	.	.	.
22.30 45.1	.	.	.	.	.	.	.	.	.	.	.	.	.
23.00 4610	.	.	.	.	.	.	.	.	.	.	.	.	.
23.30 4710	.	.	.	.	.	.	.	.	.	.	.	.	.
0.00 4810	.	.	.	.	.	.	.	.	.	.	.	.	.
.30 4910	.	.	.	.	.	.	.	.	.	.	.	.	.
1.00 5010	.	.	.	.	.	.	.	.	.	.	.	.	.
1.30 5110	.	.	.	.	.	.	.	.	.	.	.	.	.
2.00 5210	.	.	.	.	.	.	.	.	.	.	.	.	.
2.30 5310	.	.	.	.	.	.	.	.	.	.	.	.	.
3.00 54.1	.	.	.	.	.	.	.	.	.	.	.	.	.
3.30 55.1	.	.	.	.	.	.	.	.	.	.	.	.	.
4.00 56.1	.	.	.	.	.	.	.	.	.	.	.	.	.
4.30 57.1	.	.	.	.	.	.	.	.	.	.	.	.	.
5.00 58.1	.	.	.	.	.	.	.	.	.	.	.	.	.
5.30 59.1	.	.	.	.	.	.	.	.	.	.	.	.	.
6.00 60.1	.	.	.	.	.	.	.	.	.	.	.	.	.
6.30 61.1	.	.	.	.	.	.	.	.	.	.	.	.	.
7.00 62.1	.	.	.	.	.	.	.	.	.	.	.	.	.
7.30 63.01	.	.	.	.	.	.	.	.	.	.	.	.	.

5.	5.	4.	4.	3.	3.
3.	2.	2.	2.	2.	2.
2.	1.	1.	1.	1.	1.
1.	1.	2.	3.	4.	5.
8.	9.	9.	8.	8.	7.
7.	7.	7.	7.	8.	8.
9.	10.	11.	12.	13.	14.
16.	17.	19.	20.	22.	25.
29.	30.	648.	952.	932.	838.
583.	494.	348.	293.	209.	740.
109.	91.	76.	51.	32.	152.
32.	32.	32.	31.	31.	32.
					31.

STORAGE

2.	2.	2.	2.	1.	1.
1.	1.	1.	1.	1.	1.
1.	1.	1.	0.	0.	0.
0.	1.	1.	1.	3.	3.
4.	4.	4.	4.	4.	4.
3.	3.	3.	3.	4.	4.
4.	5.	6.	7.	10.	11.
15.	17.	22.	30.	37.	47.
99.	126.	180.	188.	188.	184.
177.	174.	165.	164.	162.	161.
158.	157.	156.	155.	153.	155.
153.	152.	150.	148.	146.	143.

STAGE

1133.2	1133.1	1133.0	1132.9	1132.8	1132.7	1132.6	1132.5	1132.4
1132.4	1132.3	1132.3	1132.2	1132.2	1132.1	1132.1	1132.0	1132.0
1132.0	1131.9	1131.9	1131.9	1131.9	1131.9	1131.9	1131.9	1131.9
1131.9	1131.9	1131.9	1132.1	1132.3	1132.6	1133.0	1133.3	1133.6
1134.1	1134.2	1134.2	1134.2	1134.2	1134.2	1134.1	1134.0	1133.9
1133.8	1133.7	1133.7	1133.7	1133.7	1133.8	1133.9	1134.0	1133.8
1134.3	1134.5	1134.6	1134.9	1134.9	1135.7	1136.3	1136.9	1134.2
1138.8	1139.5	1140.1	1140.8	1141.7	1142.8	1144.3	1146.0	1138.2
1152.2	1154.6	1157.0	1158.6	1159.1	1159.2	1159.1	1159.0	1150.0
1158.4	1158.2	1158.0	1157.8	1157.6	1157.5	1157.4	1157.3	1158.7
1157.1	1157.1	1157.0	1157.0	1157.0	1156.9	1156.9	1156.9	1157.2
1156.7	1156.7	1156.6	1156.5	1156.4	1156.3	1156.2	1156.1	1156.8
								1156.0

PEAK OUTFLOW IS 996. AT TIME 43.00 HOURS

PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
996.	650.	209.	87.	10421.
28.	18.	6.	2.	295.
	5.93	7.61	7.92	
	150.66	193.26	201.17	201.17
	323.	414.	431.	431.
	398.	510.	531.	531.

1*OVF*

STATION 1

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

	400.	600.	800.	1000.	1200.	0.	0.	0.
0.	.	.	.	.	.	.	.	.
.30	11	.	.	.	.	.	.	.
1.00	21	.	.	.	.	.	.	.
1.30	31	.	.	.	.	.	.	.
2.00	41	.	.	.	.	.	.	.
2.30	51	.	.	.	.	.	.	.
3.00	61	.	.	.	.	.	.	.

696.	607.	516.	435.	366.	309.	262.	223.	190.	161.
136.	114.	95.	78.	64.	52.	43.	34.	32.	32.
32.	32.	32.	32.	32.	32.	31.	31.	31.	31.

STORAGE

2.	2.	2.	2.	2.	2.	2.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	2.	2.	3.	4.	4.
5.	5.	5.	5.	5.	5.	5.	5.	5.	4.
4.	4.	4.	4.	4.	4.	4.	5.	5.	5.
5.	6.	6.	7.	8.	9.	11.	13.	15.	17.
20.	22.	25.	28.	33.	39.	48.	61.	78.	99.
126.	158.	183.	192.	193.	193.	192.	190.	187.	185.
182.	178.	175.	171.	168.	166.	164.	163.	161.	160.
159.	158.	158.	157.	156.	156.	155.	155.	155.	154.
154.	153.	152.	151.	149.	148.	147.	146.	145.	143.

STAGE

1133.2	1133.1	1133.0	1132.9	1132.8	1132.7	1132.6	1132.5	1132.5
1132.4	1132.3	1132.3	1132.3	1132.2	1132.1	1132.1	1132.1	1132.1
1132.0	1132.0	1132.0	1132.0	1132.0	1132.0	1131.9	1131.9	1131.9
1131.9	1131.9	1132.0	1132.2	1132.5	1133.3	1133.7	1134.1	1134.4
1134.6	1134.7	1134.8	1134.8	1134.8	1134.7	1134.6	1134.5	1134.4
1134.3	1134.2	1134.2	1134.2	1134.3	1134.4	1134.6	1134.7	1134.8
1135.0	1135.1	1135.4	1135.7	1136.1	1136.7	1137.3	1138.0	1139.5
1140.2	1140.9	1141.6	1142.4	1143.4	1144.6	1146.1	1150.0	1152.2
1154.6	1157.1	1158.8	1159.4	1159.4	1159.4	1159.2	1159.1	1158.9
1158.7	1158.5	1158.2	1158.0	1157.8	1157.7	1157.5	1157.3	1157.3
1157.2	1157.1	1157.1	1157.0	1157.0	1157.0	1156.9	1156.9	1156.8
1156.8	1156.7	1156.6	1156.6	1156.5	1156.4	1156.3	1156.1	1156.0

PEAK OUTFLOW IS 1241. AT TIME 42.50 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL	VOLUME
CFS	1241.	865.	279.	115.	13847.	
CMS	35.	24.	8.	3.	392.	
INCHES		7.89	10.16	10.52	10.52	
MH		200.32	258.10	267.30	267.30	
AC-FT		429.	553.	572.	572.	
THOUS CU M		529.	682.	706.	706.	

1*0VF*

STATION 1

	INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(I*)	800.	1000.	1200.	1400.	0.
0.	400.	600.	800.	1000.	1200.	0.
.30						
1.00						
1.30						
2.00						
2.30						
3.00						
3.30						
4.00						
4.30						
5.00						
5.30						
6.00						
6.30						
7.00						
7.30						

6.	6.	6.	6.	6.	6.	6.	6.	6.	6.
5.	5.	5.	5.	5.	5.	5.	5.	5.	5.
7.	7.	8.	9.	10.	12.	14.	16.	19.	21.
24.	28.	31.	35.	41.	48.	60.	75.	95.	121.
153.	181.	192.	196.	197.	197.	196.	193.	190.	188.
185.	182.	178.	175.	171.	169.	166.	164.	163.	161.
160.	159.	158.	157.	157.	156.	156.	155.	155.	155.
154.	153.	152.	151.	150.	149.	148.	147.	145.	144.

1133.2	1133.1	1133.0	1132.9	1132.8	1132.7	1132.6	1132.5
1132.4	1132.3	1132.3	1132.3	1132.2	1132.2	1132.2	1132.1
1132.1	1132.1	1132.1	1132.1	1132.0	1132.0	1132.0	1132.0
1132.0	1132.0	1132.1	1132.3	1132.6	1133.1	1134.1	1134.9
1135.1	1135.3	1135.4	1135.4	1135.4	1135.4	1135.2	1135.0
1134.9	1134.8	1134.8	1134.8	1134.8	1134.9	1135.2	1135.3
1135.7	1135.9	1136.1	1136.5	1137.0	1137.6	1139.1	1140.7
1141.5	1142.3	1143.0	1143.8	1144.8	1146.1	1147.8	1149.7
1156.8	1158.7	1159.4	1159.6	1159.7	1159.7	1159.5	1159.3
1158.9	1158.8	1158.5	1158.3	1158.0	1157.8	1157.6	1157.4
1157.3	1157.2	1157.1	1157.1	1157.0	1157.0	1156.9	1156.9
1156.8	1156.8	1156.7	1156.6	1156.5	1156.5	1156.4	1156.2

PEAK OUTFLOW IS 1490. AT TIME 42.50 HOURS

PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL
1490.	1082.	349.	144.	17279.
42.	31.	10.	4.	489.
CFS				
CHS				
INCHES				
MM				
AC-FT				
THOUS CU M				

140VUF *

STATION 1

	400.	600.	800.	1000.	1200.	1400.	1600.	0.	0.	0.
0.	.	.	.	.	.	.	.	.	.	.
.30	.	.	.	.	.	.	.	.	.	.
1.00	.	.	.	.	.	.	.	.	.	.
1.30	.	.	.	.	.	.	.	.	.	.
2.00	.	.	.	.	.	.	.	.	.	.
2.30	.	.	.	.	.	.	.	.	.	.
3.00	.	.	.	.	.	.	.	.	.	.
3.30	.	.	.	.	.	.	.	.	.	.
4.00	.	.	.	.	.	.	.	.	.	.
4.30	.	.	.	.	.	.	.	.	.	.
5.00	.	.	.	.	.	.	.	.	.	.
5.30	.	.	.	.	.	.	.	.	.	.
6.00	.	.	.	.	.	.	.	.	.	.
6.30	.	.	.	.	.	.	.	.	.	.
7.00	.	.	.	.	.	.	.	.	.	.
7.30	.	.	.	.	.	.	.	.	.	.
8.00	.	.	.	.	.	.	.	.	.	.
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1159.0		1159.2		1157.4		1156.9	
1159.0	1159.6	1159.9	1160.1	1160.2	1160.2	1160.2	1160.1
1159.2	1159.0	1158.9	1158.7	1158.4	1158.2	1158.0	1157.8
1157.4	1157.3	1157.2	1157.2	1157.1	1157.0	1157.0	1156.9
1156.9	1156.8	1156.8	1156.7	1156.6	1156.5	1156.4	1156.3

FEAK OUTFLOW IS 1985. AT TIME 43.00 HOURS

FEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL	VOLUME
1985.	1490.	490.	201.	24153.	
56.	42.	14.	6.	684.	
CFS	13.59	17.88	18.36	18.36	
CMS	345.18	454.20	466.24	466.24	
INCHES	739.	972.	998.	998.	
MM	911.	1199.	1231.	1231.	
AC-FT					
THOUS CU M					

180UF #

STATION 1

	400.	800.	1200.	1600.	2000.	2400.	0.	0.	0.	0.	0.	0.
0.												
.30 11												
1.00 21												
1.30 31												
2.00 41												
2.30 51												
3.00 61												
3.30 71												
4.00 81												
4.30 91												
5.00 101												
5.30 111												
6.00 121												
6.30 131												
7.00 141												
7.30 151												
8.00 161												
8.30 171												
9.00 181												
9.30 191												
10.00 201												
10.30 211												
11.00 221												
11.30 231												
12.00 241												
12.30 251												
13.00 261												
13.30 271												
14.00 281												
14.30 291												
15.00 301												
15.30 311												
16.00 321												
16.30 331												
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17.30 3501												
18.00 3601												
18.30 3701												
19.00 3801												
19.30 3901												
20.00 4001												
20.30 4101												
21.00 4201												

[illegible]

CFS 1985. 632. 259. 31033.
 CMS 53. 18. 7. 879.
 INCHES 17.19 23.05 23.59
 MM 436.67 585.56 599.06
 AC-FT 935. 1253. 1282.
 THOUS CU M 1153. 1546. 1582.

180V6*

STATION 1

	0.	400.	800.	1200.	1600.	2000.	2400.	2800.	0.	0.	0.	0.
.30 11	.	.	.	.	.	.	.	.	.	.	.	.
1.00 21	.	.	.	.	.	.	.	.	.	.	.	.
1.30 31	.	.	.	.	.	.	.	.	.	.	.	.
2.00 41	.	.	.	.	.	.	.	.	.	.	.	.
2.30 51	.	.	.	.	.	.	.	.	.	.	.	.
3.00 61	.	.	.	.	.	.	.	.	.	.	.	.
3.30 71	.	.	.	.	.	.	.	.	.	.	.	.
4.00 81	.	.	.	.	.	.	.	.	.	.	.	.
4.30 91	.	.	.	.	.	.	.	.	.	.	.	.
5.00 101	.	.	.	.	.	.	.	.	.	.	.	.
5.30 111	.	.	.	.	.	.	.	.	.	.	.	.
6.00 121	.	.	.	.	.	.	.	.	.	.	.	.
6.30 131	.	.	.	.	.	.	.	.	.	.	.	.
7.00 141	.	.	.	.	.	.	.	.	.	.	.	.
7.30 151	.	.	.	.	.	.	.	.	.	.	.	.
8.00 161	.	.	.	.	.	.	.	.	.	.	.	.
8.30 171	.	.	.	.	.	.	.	.	.	.	.	.
9.00 181	.	.	.	.	.	.	.	.	.	.	.	.
9.30 191	.	.	.	.	.	.	.	.	.	.	.	.
10.00 201	.	.	.	.	.	.	.	.	.	.	.	.
10.30 211	.	.	.	.	.	.	.	.	.	.	.	.
11.00 221	.	.	.	.	.	.	.	.	.	.	.	.
11.30 231	.	.	.	.	.	.	.	.	.	.	.	.
12.00 241	.	.	.	.	.	.	.	.	.	.	.	.
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19.30 3901	.	.	.	.	.	.	.	.	.	.	.	.
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20.30 4101	.	.	.	.	.	.	.	.	.	.	.	.
21.00 4201	.	.	.	.	.	.	.	.	.	.	.	.
21.30 4301	.	.	.	.	.	.	.	.	.	.	.	.
22.00 4401	.	.	.	.	.	.	.	.	.	.	.	.
22.30 451	.	.	.	.	.	.	.	.	.	.	.	.
23.00 461	.	.	.	.	.	.	.	.	.	.	.	.
23.30 471	.	.	.	.	.	.	.	.	.	.	.	.
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PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIO	RATIOS APPLIED TO FLOWS							
					1	2	3	4	5	6	7	8
HYDROGRAPH AT	1	1.02	1	252.	504.	755.	1007.	1259.	1511.	1763.	2015.	2518.
	(	2.64)	(	7.13)	(	21.39)	(	28.52)	(	42.79)	(	57.05)
ROUTED TO	1	1.02	1	29.	319.	669.	996.	1241.	1490.	1738.	1985.	2482.
	(	2.64)	(	.83)	(	18.95)	(	28.22)	(	42.18)	(	56.22)

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1				INITIAL VALUE		SPILLWAY CREST		TOP OF DAM							
				ELEVATION											
				STORAGE											
				OUTFLOW											
RATIO OF FHF	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								
								.10	1153.03	0.00	107.	29.	0.00	50.00	0.00
								.20	1157.70	0.00	166.	319.	0.00	44.50	0.00
								.30	1158.68	0.00	181.	669.	0.00	43.50	0.00
								.40	1159.17	0.00	189.	996.	0.00	43.00	0.00
								.50	1159.44	0.00	193.	1241.	0.00	42.50	0.00
								.60	1159.71	0.00	197.	1490.	0.00	42.50	0.00
								.70	1159.98	0.00	202.	1738.	0.00	42.50	0.00
								.80	1160.25	0.00	206.	1985.	0.00	43.00	0.00
								1.00	1160.79	0.00	215.	2482.	0.00	43.00	0.00

FLOOD HYDROGRAPH FACNAGE (HEC-1)
DAM SAFETY VERSION JULY 1978
LAST MODIFICATION 26 FEB 79

APPENDIX D

PREVIOUS INSPECTION REPORTS/AVAILABLE DOCUMENTS

AD-A105 794

FLAHERTY-GIAVARA ASSOCIATES NEW HAVEN CT
NATIONAL DAM SAFETY PROGRAM. LITTLE CHOCONUT WATERSHED SITE 2E --ETC(U)
JUN 81 H C FLAHERTY

F/G 13/13

DACW51-81-C-0006

NL

UNCLASSIFIED

2 of 2

AD-A
UN 794

END
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DESIGN REPORT

LITTLE CHOCONUT, FINCH HOLLOW,
AND
TROUT BROOK WATERSHED PROTECTION PROJECT

DESIGN REPORT

SITE FILE

BROOME COUNTY, NEW YORK

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

This floodwater retarding structure is located on Little Chocanut Creek approximately 1.5 miles north of Chocanut Center, New York. Sheet 4 of this report, together with the Castle Creek, N.Y. 7.5' quadrangle published by the U.S. Geological Survey, may be used to locate this structure.

A summary of pertinent design information is given on Sheet 1 of this report.

Criteria and procedures used in this design are given in Soil Conservation Service publications.

This is one of eight proposed floodwater retarding dams in the Little Chocanut, Finch Hollow, and Trout Brook Watershed designed to reduce floodwater damages. It will retard a 100-year frequency storm without discharge occurring in the emergency spillway.

The results of hydrologic and hydraulic computations are given on Sheet 3 of this report.

The structure consists of a homogeneous compacted earth fill on a foundation of 4 ft. to 5 ft. of clean gravels, underlain by a sequence of gray and brown dense tills. Both abutments are a dense glacial till. A drainage system is located under the downstream portion of the earth fill to control the phreatic surface and provide safe outlet for foundation seepage. A cutoff trench is located along the dam to reduce seepage.

The principal spillway is a drop inlet structure consisting of a reinforced concrete riser, 30 inch diameter concrete water pipe, and a circular plunge pool to dissipate energy at the outlet end of the conduit.

The emergency spillway is designed as an earth cut in the east abutment.

U S DEPARTMENT OF AGRICULTURE — SOIL CONSERVATION SERVICE

DESIGN REPORT SUMMARY

I. Watershed data

A. Structure class	C
B. Drainage area	1753 Ac
C. Peak of outlet curve - T_c	1.74 hrs
D. Hydrologic curve - $r = C_u$	73
Maximum Outlet II	

II. Principal spillway

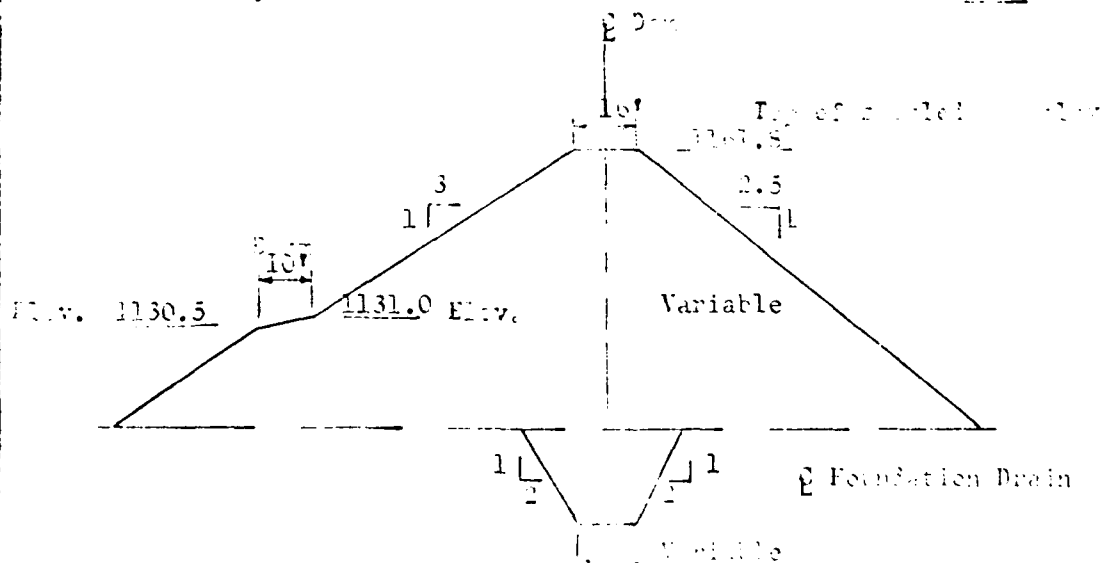
A. Outlet	30
1. Size (I.D.)	154.35
2. Length	
B. Risers	
1. Size orifice	2.5x2.5
2. Height (floor t./crest)	11.33
C. Orifice Size	1.33x1.0
D. Floor or drain size	6
E. Type of energy dissipator	flange pool

III. Emergency spillway

A. Width	120
B. Side slopes	5:1
C. Length of crest section	30
D. Exit slope	0.032
E. Maximum velocity - in crest section (FS)	8.3
F. Duration of flow (FS) through emergency spillway	7.7
G. Frequency of use	100 yrs.

IV. Arch Fall

A. Height	43
B. Volume	39,500
C. Capacity	C.Y.
Gates A	



U.S. DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

Element of Structure	Determining Factor	Elevation	Surface Area Acres	Storage		Inflow		Peak Outflow (c.f.s.)
				Acre-Feet	Inches [#]	Volume Inches	Rate (c.f.s.)	
Crest of orifice	50 yr. submerged sediment accumulation	1131.5	1.2	4.1 ^{1/2}	0.08			
Crest of emergency spillway	100 yr. frequency storm Moisture Condition II	1156.9	13.9	150 ^{2/3}	2.76			31.9
Bottom high water	1.00 x value from ** ES 1020 Sheet 4 of 5, Moisture Condition II	1158.9	15.5	179 ^{2/3}	3.29	5.98	1089	750
Top of dam	1.00 x value from ** ES 1020 Sheet 5 of 5, Moisture Condition II	1161.8	17.7	227 ^{2/3}	4.17	19.97	3400	3410

*Volume expressed in inches of runoff from controlled area of 653 acres. Hydrologic criteria in National Engineering Memorandum SES-27 (Rev.).

Time required to empty temporary storage = 8.0 days.

^{1/2} Storage allocated to empty temporary pool.

^{2/3} Does not include 10.9 ac.ft. of sediment.

U S DEPARTMENT OF AGRICULTURE — SOIL CONSERVATION SERVICE

42°00'00"



Site 1E

75°57'30"

75°55'00"

42°07'30"

Reference: USGS 7.5' Q. 4. 1:24,000

CASTLE CLARK, NEW MEXICO

U. S. DEPARTMENT OF AGRICULTURE — SOIL CONSERVATION SERVICE

Information pertaining to the criteria and procedures referred to in this report may be obtained from Mr. Wallace L. Anderson, State Conservationist, USDA, Soil Conservation Service, Syracuse, New York.

LeRoy C. Hilton
State Engineer

W. L. Anderson
State Conservation Engineer

SLOPE STABILITY ANALYSIS

MATERIALS U. S. DEPARTMENT of AGRICULTURE
TESTING REPORT SOIL CONSERVATION SERVICE

SUMMARY - SLOPE
STABILITY ANALYSIS

DATE 11/15/50 LOCATION, SITE, ETC. 11/15/50
METHOD OF ANALYSIS SWEDISH CIRCLE ANALYZED AT APPROVED BY

SOURCE AND USE OF MATERIALS	CLASSIFICATION	ADOPTED DESIGN DATA					REMARKS
		γ_d (pcf)	γ_m (pcf)	γ_{sat} (pcf)	ϕ (deg)	c (psf)	
(1) Green Spry - Emb.	CL	121.5	130.5	140.0	20.5	150	
(2)							
(3)							
(4)							
(5)							
(6)							
(7)							
(8)							
CONDITIONS							
TRIAL NO.	SLOPE						
1	3:1	Maximum Section					
2	2:1	Full drainage - 10' berm @ elev. 1130.5 - Arc cut from opp. shoulder first					
3	3:1	Flat 4. (D) only					
4	2:1	Full drainage - 10' berm @ elev. 1130.5 - Arc cut from opp. shoulder first					
5	2:1	Flat 4. (D) only					
6	2:1	No berm - Drain @ elev. 1130.5 - Arc cut from opp. shoulder first					
7	2:1	Flat 4. (D) only					
8	2:1	No berm - Drain @ elev. 1130.5 - Arc cut from opp. shoulder first					
9	2:1	Flat 4. (D) only					
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86	2:1	No berm - Drain @ elev. 1130.5 - Arc cut from opp. shoulder first					
87	2:1	Flat 4. (D) only					
88	2:1	No berm - Drain @ elev. 1130.5 - Arc cut from opp. shoulder first					
89	2:1	Flat 4. (D) only					
90	2:1	No berm - Drain @ elev. 1130.5 - Arc cut from opp. shoulder first					
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92	2:1	No berm - Drain @ elev. 1130.5 - Arc cut from opp. shoulder first					
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94	2:1	No berm - Drain @ elev. 1130.5 - Arc cut from opp. shoulder first					
95	2:1	Flat 4. (D) only					
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97	2:1	Flat 4. (D) only					
98	2:1	No berm - Drain @ elev. 1130.5 - Arc cut from opp. shoulder first					
99	2:1	Flat 4. (D) only					
100	2:1	No berm - Drain @ elev. 1130.5 - Arc cut from opp. shoulder first					

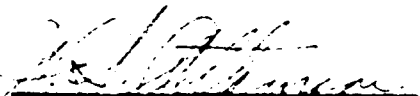
D-8

GEOLOGY REPORT

GEOLOGY REPORT

SITE 2-8
LITTLE CHOCONUT WATERSHED
MAINE TOWNSHIP
NEW YORK

APPROVAL:


W. S. Atkinson
State Conservation Engineer

PREPARED BY:


Bernard S. Ellis
Geologist

REFERENCE:

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

DRAWING NO.

NY-2019-G

SHEET ____ OF ____

DATE 2/66

10-59

DETAILED GEOLOGIC INVESTIGATION OF DAM SITES

State New York County Broome Watershed L. Choconut Subwatershed
Site number 2E Site group Structure class C Investigated by B.S. Ellis, Geologist Date 11/65
(signature and title)

INTERPRETATIONS AND CONCLUSIONS

CENTERLINE OF DAM

Both abutments of this site are a dense glacial till. While no deep holes were drilled in these abutments, I feel that blow count in this material would be very comparable to the count logged in the flood plain tills.

The foundation tills in the flood plain are mantled with a reworked till and one zone of bouldery material that apparently is a pocket.

Differential settlement, then, will not be a problem on this site. Uniform high bearing strength is available along the entire extent of the dam.

The reworked till in the flood plain is permeable. I suggest then a root zone cutoff in the abutments and through this permeable till in the flood plain. As shown on the C/L of the dam profile, there are also two zones of permeable till (or possibly gravel) at moderate depth (23') under the flood plain. Artesian pressures exist in these aquifers. As indicated in the logs, we had a maximum static head of about 6' A.G.L. in the flood plain and a flow equivalent to a $\frac{1}{4}$ " stream.

In my opinion, the depth and density of the till overlying these aquifers is such that the condition does not constitute a hazard to this dam. It is quite doubtful that there is any open connection between these gravels and the proposed flooded area upstream from the C/L. With regard to these aquifers and the drill holes into them - I visited the site a week or so after drilling was finished. Water was seeping out of the drill holes. D.H. 351 won't be a problem because of its location upstream from the cutoff and in an assumed saturated zone anyway. However, D.H. 51 could conceivably seep enough water to keep that section of the cutoff saturated. Proper adjustment of the cutoff and installation of a drainage system in the final design should take care of this situation.

The GWT is probably quite variable in the flood plain section of this dam. I would imagine that we at least have a perched water table condition in the cleaner gravels most of the year, the elevation of which would depend on the amount of flow in the stream. The main body, or ground water table, is probably close to the top of the gray till in the flood plain. In the abutment, I would estimate it at a depth of 15' or more. The seepage indicated at the bottom of some of the emergency spillway and borrow area pits is probably localized concentrations of water in sandier streaks.

Sheet _____ of _____
For Information Use Only

10-59

DETAILED GEOLOGIC INVESTIGATION OF DAM SITES

State New York County Broome Watershed L. Choconut Subwatershed _____
Site number 2E Site group _____ Structure class C Investigated by _____ Geologist Date 11/65
(signature and title)

INTERPRETATIONS AND CONCLUSIONS (Continued)

I was unable to obtain a sample of the overlying reworked till logged as symbol "B". Till samples from the spillway and borrow were taken at the time of the backhoe investigation. Floodplain samples were left to correlate with the D.H. samples. At the completion of drilling, the backhoe piles were frozen solid. If necessary, I can obtain a sample of this material this spring.

PRINCIPAL SPILLWAY

Foundation conditions for the principal spillway appear to be satisfactory. The blow count shown in D.H. 351 should be representative of foundation conditions along the extent of the pipe. I would recommend that the spillway trench be excavated down to the top of the gray till in order to negate the effects of any variations that might exist in the reworked till logged in the first 4' or 5' of the section.

EMERGENCY SPILLWAY

As indicated in the front of this report, the emergency spillway excavation will be a fairly uniform glacial till.

I do not believe that the water in the sandy zones will be a permanent problem, or at least enough of a problem to design drainage into the outer face of the spillway cut. In my opinion, these zones will drain out fairly well after construction and remain moderately dry. Normal evaporation from the sloped face of these zones should pretty well take care of any permanent seepage that might occur.

The lack of information down to design grade was mentioned in the front of this report, along with the opinion that bedrock would be absent in the emergency spillway excavation.

BORROW AREA

A supplemental borrow investigation was made for this structure. However, the intermediate stage design indicates an emergency spillway excavation of approximately 44,000 cu. yds. against a compacted fill requirement of 37,000 cu. yds.

In any event, the borrow area consists of the same till encountered in the emergency spillway area and, if used, should pose no construction problems other than minor seepage below a depth of 6'-7' in some areas.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

DETAILED GEOLOGIC INVESTIGATION OF DAM SITES

GENERAL

State New York County Broome Sec. 4 T. 4 R. 1 Watershed Little Choconut Crk.
 Subwatershed 1P-03 Fund class 1P-03 Site number 2-E Site group C
 Investigated by B.S. Ellis, Geologist Equipment used Backhoe, Drill Rig Date 11/65
 (signature and title) (Type, size, make, model, etc.)

SITE DATA

Drainage area size 1.02 sq. mi., 653 acres. Type of structure Earth Fill Purpose Floodwater Retarding
 Direction of valley trend (downstream) South Maximum height of fill 44.6 feet. Length of fill 410 feet.
 Estimated volume of compacted fill required 37,200 yards

STORAGE ALLOCATION

	Volume (ac. ft.)	Surface Area (acres)	Depth at Dam (feet)
Sediment	<u>4.1</u>	<u>1.2</u>	<u>9.5</u>
Floodwater	<u>135</u>	<u>15.6</u>	<u>37.2</u>

SURFACE GEOLOGY AND PHYSIOGRAPHY

Physiographic description Appalachian Plateau Topography Mod. Steep Attitude of beds: Dip NW-40° Strike S80° W
 Steepness of abutments: Left 15 percent; Right 25 percent. Width of floodplain at centerline of dam 70 feet

General geology of site: This site is located in the south central section of New York State, approximately 12 miles north of the Pennsylvania state line. Specifically, it is 5 miles due north of Johnson City, New York and 3 miles SW of the Broome County airport.

The glacial ice that modified the topography drastically in some areas of this state had little effect on this section. The ice sheet terminated approximately 40 miles south of Binghamton, so therefore it was relatively thin in this area.

Relief ranges from an elevation of 800' in the Susquehanna valley to 1500' plus in the vicinity of this site. In many localized areas, the creation of late-stage glacial lakes resulted in substantial filling of valleys with lacustrine deposits and a decrease in relief.

The geologic history of this site appears to be one of glacial scour of the north-south oriented valley, with subsequent deposition of till uniformly over the entire site area. Two distinct tills are logged in the drill holes, on a color basis. This may represent evidence of multiple glaciation of this site. Post-glacial erosion has incised a rather steep gradient, V-shaped valley into this till.

13-33

DETAILED GEOLOGIC INVESTIGATION OF DAM SITES

Centerline of Dam

(Centerline of Dam, Principal Spillway, Emergency Spillway, the Stream Channel, Investigations for Drainage of Structure, Borrow Area, Reservoir Basin, etc.)

DRILLING PROGRAM

Equipment Used	Number of Holes		Number of Samples Taken		
	Exploration	Sampling	Undisturbed (state type)	Disturbed Large	Small
Backhoe	5	--	--	--	--
Drill Rig	1	1	--	--	6 (Jar)
Total	6	1	--	--	6 (Jar)

SUMMARY OF FINDINGS

(include only factual data)

Both abutments of this site are a dense glacial till to an unknown depth.

The floodplain of this site generally consists of 4'-5' of reworked till, underlain by a sequence of gray and brown dense tills. Blow count, below a depth of 10', ranges approximately from 70 to 120 blows/ft.

A pocket of heavy, bouldery gravel exists in the vicinity of T.P. 4 and D.H. 51. This material extends down to a depth of 9' and is underlain by gray till.

Permeable materials exist on the surface of this floodplain to a depth of 4' or so and also below a depth of 23'. Only moderate seepage was encountered in the surface gravels at the time of the investigation.

Slight artesian pressure was encountered in the zone of gravel at the 23' depth and also at 28'. Water rose in the casing to a height of approximately 4'-5' above ground level and maintained a flow equivalent to a $\frac{1}{8}$ " stream.

12-59

DETAILED GEOLOGIC INVESTIGATION OF DAM SITES

FEATURE Principal Spillway

(Centerline of Dam, Principal Spillway, Emergency Spillway, the Stream Channel, Investigations for Drainage of Structure, Borrow Area, Reservoir Basin, etc.)

DRILLING PROGRAM

Equipment Used	Number of Holes		Number of Samples Taken		
	Exploration	Sampling	Undisturbed (state type)	Disturbed Large	Small
Backhoe	3	--	--	--	--
Drill Rig	1	1	--	--	6 (Jar)
Total	4	1	--	--	6 (Jar)

SUMMARY OF FINDINGS

(include only factual data)

The entire length of the principal spillway is quite uniformly underlain by 4'-5' of reworked till. Underneath this material, a blue gray dense till was logged to an average depth of 16'. Underneath this we have the gray-brown sequence mentioned in the C/L of dam narrative.

Blow count in these materials ranged from 28 at the 5' depth to a spread of 80 to 100 blows/ft from the 10' depth down to 30'.

13-57

DETAILED GEOLOGIC INVESTIGATION OF DAM SITES

FEATURE Emergency Spillway

(Centerline of Dam, Principal Spillway, Emergency Spillway, the Stream Channel, Investigations for Drainage of Structure, Borrow Area, Reservoir Basin, etc.)

DRILLING PROGRAM

Equipment Used	Number of Holes		Number of Samples Taken		
	Exploration	Sampling	Undisturbed (state type)	Disturbed Large	Small
Backhoe	3	1	--	1	—
Total	3	1	--	1	—

SUMMARY OF FINDINGS

(include only factual data)

The emergency spillway excavation, as well as most of the entire hillside, is a fairly uniform glacial till.

The variations that occur in this till consist of zones where slightly more +6" material was encountered, or where sandy streaks existed near the bottom of the test pits. Minor seepage was noted in some of these sandy zones.

Design grade of the spillway will probably all be in glacial till. In spite of the fact that test pit information does not reach grade, all the information gained from this investigation points to the absence of bedrock in the emergency spillway.

DETAILED GEOLOGIC INVESTIGATION OF DAM SITES

Location Borrow Area

(Centerline of Dam, Principal Spillway, Emergency Spillway, the Stream Channel, Investigations for Drainage of Structure, Borrow Area, Reservoir Basin, etc.)

DRILLING PROGRAM

Equipment Used	Number of Holes		Number of Samples Taken		
	Exploration	Sampling	Undisturbed (state type)	Disturbed Large	Small
Backhoe	5	2	--	2	--
Total	5	2	--	2	--

SUMMARY OF FINDINGS

(include only factual data)

The supplemental borrow area is located upstream from the emergency spillway, and adjacent to it.

The material is a fairly uniform glacial till. Variations exist in the form of an increase in some areas of +6" flaggy cobbles and in minor sandy streaks in the till.

SOILS CORRELATION TABLE
AND
ESTIMATED AVAILABLE BORROW QUANTITIES

Watershed: L. Choconut Creek Site No. 2-E State: N.Y. Prepared by: B.S. Ellis Date: 2/66

Sample

51.5*

351.3* These samples were taken to provide correlation data on the underlying gray till in the floodplain. Symbol C.

202.1 This sample is representative of the material logged in the emergency spillway excavation. Symbol A.

101.1

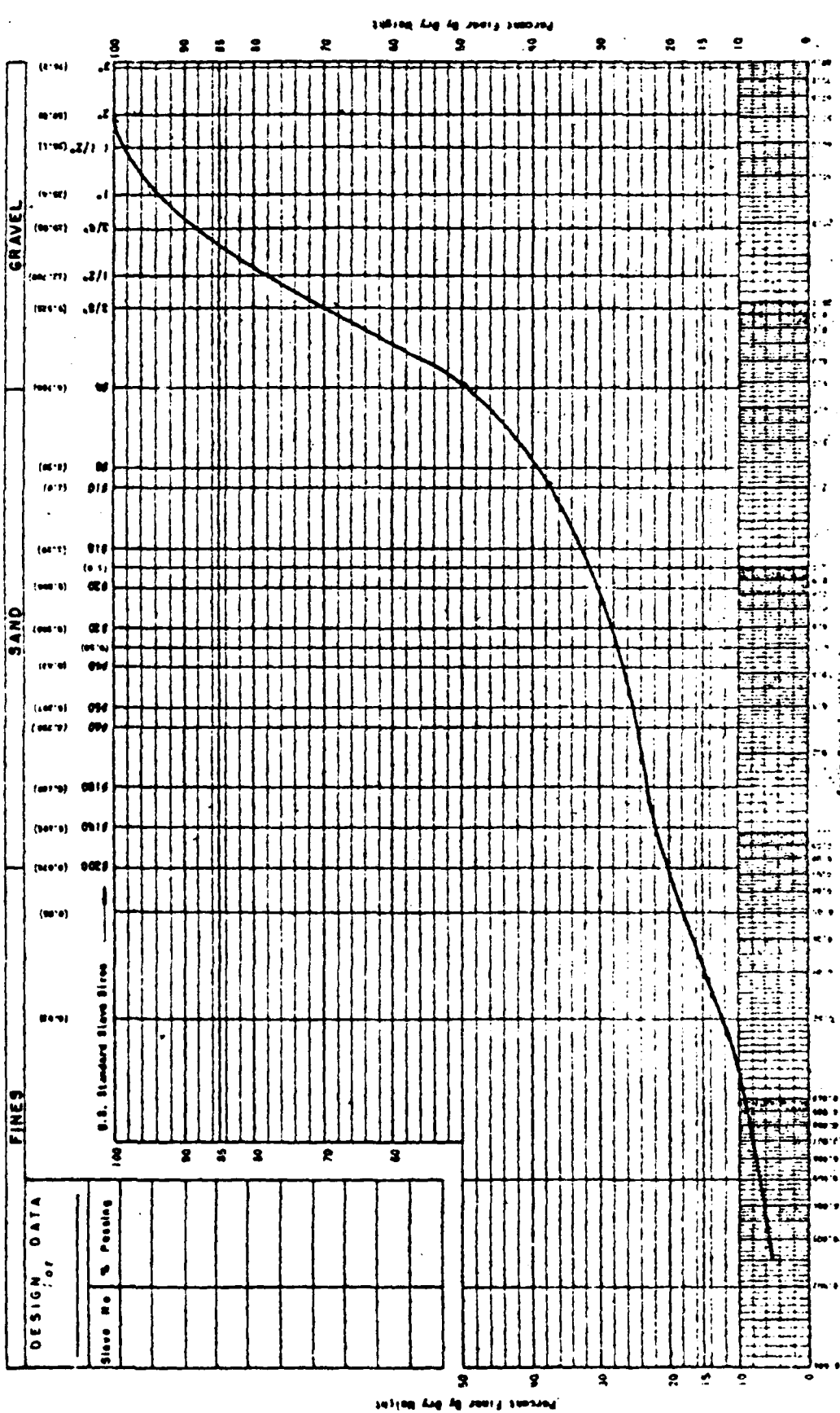
105.1 These samples were taken to provide lateral correlation of the till on this abutment. Sample 105.1 not submitted to lab due to the fact that all material will come from the emergency spillway excavation. Symbol A.

Notes: Symbol D was not sampled as it was too bouldery and is actually easily described.

* Processed in SCS State lab, Syracuse, New York.

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

GRAIN SIZE DISTRIBUTION GRAPH
Location BROOME CO.
Project LITTLE CHOCONUT SITE 2E
DH 51, SAMPLE 5 25' TO 26.5'



GM LL-21, PI-1

Sheet No. 1 of 1

GPO 921943

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

DH 351 SAMPLE 3 15' TO 16.5'

GRAIN SIZE DISTRIBUTION GRAPH

Location BROOME CO.

Project LITTLE CHOCONUT SITE 2-E

FINES

GRAVEL

SAND

DESIGN DATA

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U.S. Standard Sieve Size

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SOILS ANALYSES

UNITED STATES GOVERNMENT

Memorandum

TO : W. S. Atkinson, State Conservation
Engineer, SCS, Syracuse, New York 13210

DATE: May 6, 1966

FROM : Ray S. Decker, Head, Soil Mechanics Laboratory,
SCS, Lincoln, Nebraska 68508

SUBJECT: ENG 22-5, New York WP-08, Little Choconut Creek, Site No. 2-E
(Broome County)

ATTACHMENTS

1. Form SCS-354, Soil Mechanics Laboratory Data, 1 sheet.
2. Form SCS-355, Triaxial Shear Test Data, 1 sheet.
3. Form SCS-352, Compaction and Penetration Resistance, 2 sheets.
4. Form SCS-372, Summary - Slope Stability Analysis, 2 sheets.
5. Investigational Plans and Profiles

DISCUSSION

FOUNDATION

- A. Classification: Abutment material is glacial till classified GC with 35% to 40% fines. The narrow floodplain is blanketed to depths of 4' to 5' with clean gravels, classified GP. An 8' deep pocket of boulders with sand and gravel lies next to the right abutment. The underlying GM till is about 14' thick. Deeper layers include 3' of GP, 2.5' of GM, and the boring (DH 51) continued 2 more feet into GP.
- B. Blow Count: Tests taken in DH 51 indicate that foundation strength is high, and that consolidation potential is low.
- C. Permeability: The abutment till, GC, and the deeper till, GM, are described as slowly permeable. Field Sample No.s 3 from DH 351 and 5 from DH 51, both GM, contain 20% or more fines. Hydraulic pressure in the deeper GP layers also indicates that permeability of overlying GM is relatively low. The surface GP and bouldery material and the deeper GP layers are permeable.

Assuming that the effective weight of the GM till and floodplain gravels is 70 pcf, pressure of a 21' column is 1470 psf. It is doubtful that uplift pressure at the base of the GM will exceed 50% of the net head of 40' or 1250 psf. This would indicate that relief of the deep GP layers is not needed. In addition, surface gravels downstream from the cutoff will function as a blanket drain.

2 -- W. S. Atkinson -- 5/6/66

Rey S. Decker

Subj: ENG 22-5, New York WP-08, Little Choconut Creek, Site No. 2-E

EMBANKMENT

- A. Classification: Both samples, 66W2531 (202.1) and 66W2532 (101.1), are classified CL and contain 45% sand and gravel. Plus 3" material in the amounts of 10% and 5% is excluded from the gradations shown on Form SCS-354. These samples are from the GC till. Rock in this material has a unit surface dry weight of 162 pcf.
- B. Density: Maximum density, based on standard tests for minus #4 material, is 118.0 pcf for Sample 66W2531 and 117.5 pcf for Sample 66W2532.
- C. Shear Strength: Minus #4 material was compacted to 95% of standard density and saturated. Consolidated, undrained values are $\phi = 20.5^\circ$, $c = 450$ psf. Based on tests on similar material from other sites, it is concluded that the interpretation is somewhat conservative.
- D. Permeability: Permeability of compacted embankment soil will be low, based on gradation.

SLOPE STABILITY ANALYSIS

The embankment analysis, summarized on Form SCS-357, shows that 3:1 upstream and 2 1/2:1 downstream slopes are satisfactory. The foundation is considered to be non-yielding for slope stability.

RECOMMENDATIONS

- A. Cutoff and Drainage: Cutoff of disturbed surface soil is recommended for both abutments. Cutoff of permeable gravels and the boulder zone is recommended for the valley section.

Bottom width should be greater than normal to maintain a relatively low hydraulic gradient across the cutoff. It is suggested that the cutoff be located at the midpoint of the upstream slope, and that all permeable material be excavated from the floodplain upstream to the toe. Excavated material can be placed over the gravels downstream from the cutoff, enlarging the natural blanket drain. The outlet for this drain can be a rock toe and trench or a trench and perforated pipe, depending on availability of materials.

Drain filter materials for transitions can be determined in the field, when gradation of the gravels can be obtained.

- B. Principal Spillway: No problems are anticipated, regarding settlement and elongation.
- C. Embankment: The following are recommended:

3 -- W. S. Atkinson -- 5/6/66

Rey S. Decker

Subj: ENG 22-5, New York WP-08, Little Choconut Creek, Site No. 2-E

1. Selection of Material: Material represented by samples tested can be used anywhere in the embankment and for backfill of excavations.

Density control, based on 95% of standard, using either minus #4 or minus 3/4" material, is acceptable.

2. Slopes: Three to one upstream and 2 1/2:1 downstream slopes are recommended.
3. Settlement Allowance: An allowance of 1.5' is suggested for residual settlement in the fill and foundation. This is based on an average of 3% for the fill and 0.2' for the foundation.

Prepared by:

R. E. Nelson
Robert E. Nelson

Reviewed and Approved by:

R. B. Phillips
Roland B. Phillips

Attachments

cc: W. S. Atkinson
B. S. Ellis, Syracuse, New York
D. W. Shanklin, Binghamton, New York
H. M. Kautz, Upper Darby, Pennsylvania

MATERIALS TESTING REPORT U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE **TRIAxIAL SHEAR TEST**

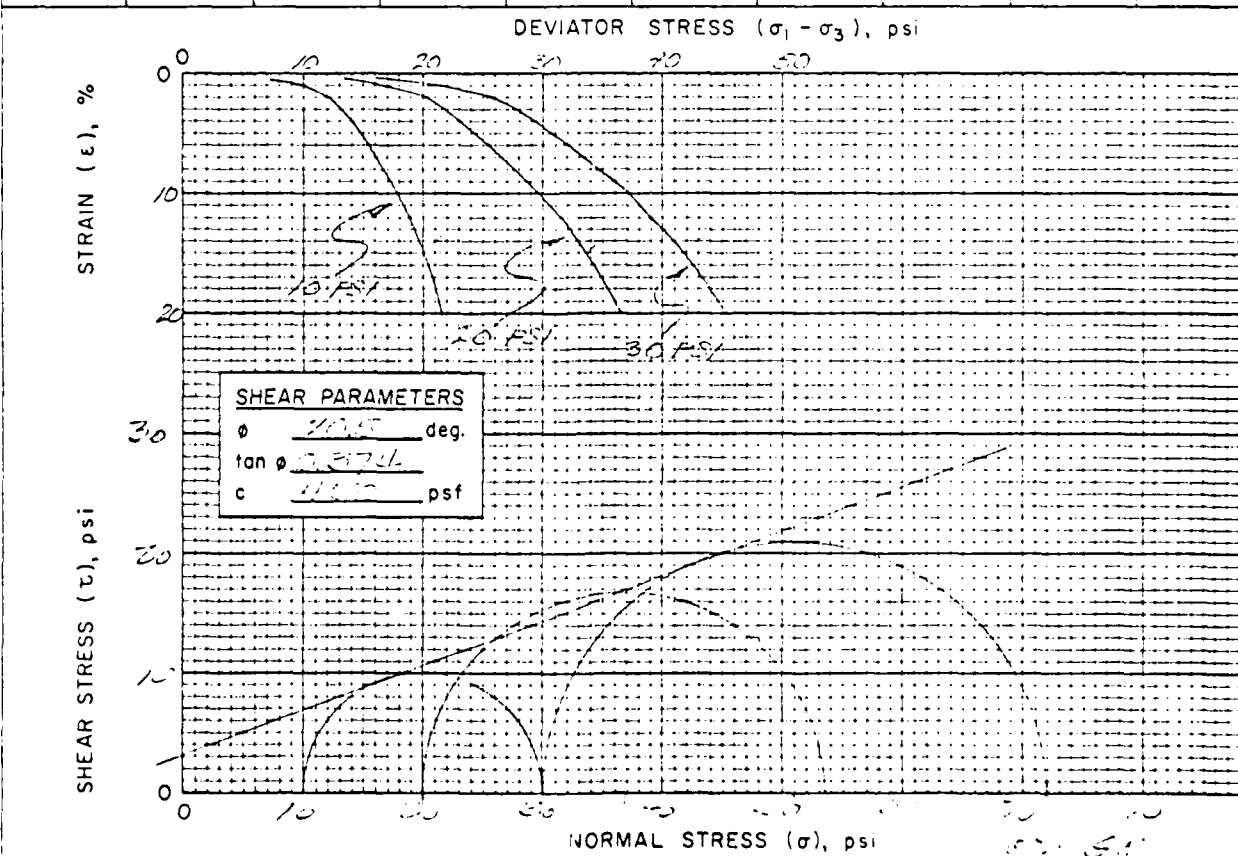
PROJECT and STATE COLEMAN, MISSISSIPPI SAMPLE LOCATION ROAD 1000 YD. S. OF BRIDGE

FIELD SAMPLE NO. 3331 DEPTH 20-17.0' GEOLOGIC ORIGIN G.I. - 1

TYPE OF SAMPLE TEST - 100 TESTED AT MISSISSIPPI APPROVED BY 1 DATE 1-1-66

INDEX TEST DATA		SPECIMEN DATA		TYPE OF TEST
USCS <u>LL</u>	LL <u>21</u>	PI <u>2</u>	HEIGHT <u>2.0</u> " ; DIAMETER <u>1.2</u> "	TEST
% FINER (mm): 0.002 <u>12</u> ; 0.005 <u>32</u> ;			MATERIALS TESTED PASSED <u>4</u> " SIEVE	UU ☐
0.074 (# 200) <u>55</u>			METHOD OF PREPARATION <u>STATIC</u>	CU ☒
G _s (-#4) <u>2.75</u> ; G _s (+#4) _____			<u>UNDISTURBED LIFTS</u>	CD ☐
STANDARD: γ_d MAX. <u>112.0</u> pcf ; w_0 <u>12.5</u> %			MOLDING MOISTURE <u>15.2</u> %	
MODIFIED: γ_d MAX. _____ pcf ; w_0 _____ %			MOLDED AT <u>95.3</u> % OF γ_d MAXIMUM	

DRY DENSITY		MOISTURE CONTENT, %			TIME OF CONSOLIDATION (hrs)	MINOR PRINCIPAL STRESS σ_3 (psi)	DEVIATOR STRESS $\sigma_1 - \sigma_3$ (psi)	AXIAL STRAIN AT FAILURE, ϵ (%)
INITIAL pcf ☐	CONSOLIDATED pcf ☒	START OF TEST	DEG. OF SAT. AT START OF TEST	END OF TEST				
111.1	113.6	14.7	70.1	17.2	5.60	1	22	15
115.6	117.4	14.4	76.8	16.5	5.48	20	38	15
112.4	116.1	13.1	92.3	16.4	5.65	30	45	15

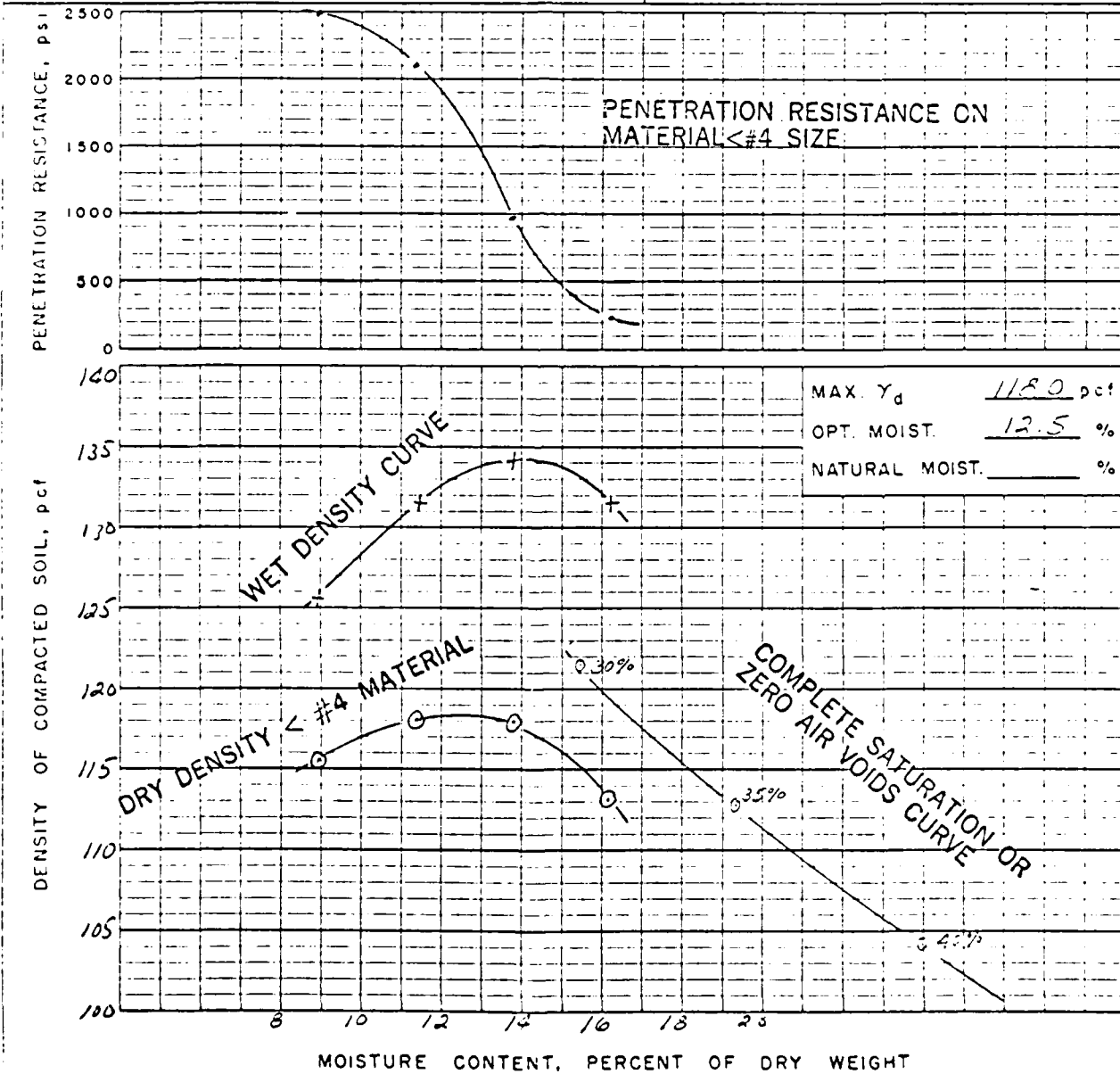


REMARKS TESTED @ 95.3% STD

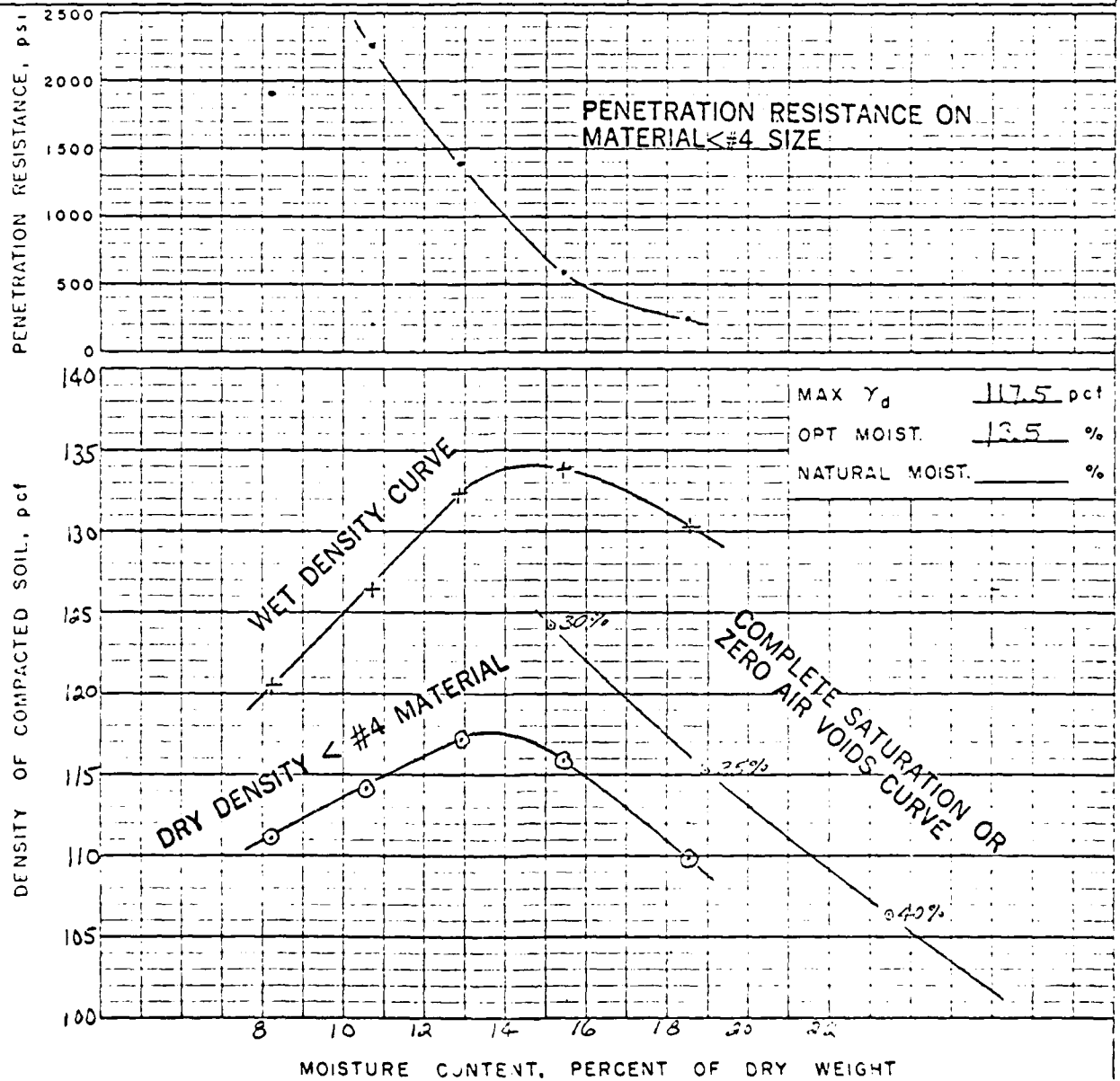
MATERIALS TESTING REPORT	U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	COMPACTION AND PENETRATION RESISTANCE
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PROJECT: <u>Little Chocoma Creek #2-E</u> <u>New York</u>		
FIELD SAMPLE NO. <u>502.1</u>	LOCATION <u>Emery Spwy.</u>	DEPTH <u>2'-12'</u>
TESTED AT <u>SML-LINCOLN</u>		APPROVED BY <u>[Signature]</u>
DATE <u>5-5-66</u>		

CLASSIFICATION <u>CL</u> LL <u>27</u> PI <u>2</u>	CURVE NO. <u>1</u> OF <u>2</u>
MAX. PARTICLE SIZE INCLUDED IN TEST <u>< #4</u> "	STD (ASTM D-698) ☒ METHOD <u>A</u>
SPECIFIC GRAVITY (G_s) {	MOD (ASTM D-1557) ☐ METHOD _____
	OTHER TEST ☐ (SEE REMARKS)
MINUS NO. 4 <u>2.73</u>	
PLUS NO. 4 _____	



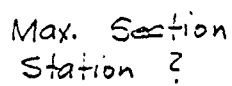
MATERIALS TESTING REPORT		U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE		COMPACTION AND PENETRATION RESISTANCE	
PROJECT AND STATE <u>Little Chaconut Creek # 2-E, New York</u>					
FIELD SAMPLE NO. <u>101-1</u>		LOCATION <u>Barrow</u>		DEPTH <u>2'-2'</u>	
SECTION NO. <u>51-1-1</u>		TESTED AT <u>SIML - LINCOLN</u>		APPROVED BY <u>SV</u>	
DATE <u>10-5-66</u>					
CLASSIFICATION <u>CL</u> LL <u>32</u> PI <u>12</u>				CURVE NO. <u>2</u> OF <u>2</u>	
MAX. PARTICLE SIZE INCLUDED IN TEST <u>< # 4</u>				STD. (ASTM D-698) ☒ METHOD <u>A</u>	
SPECIFIC GRAVITY (G _s) { MINUS NO. 4 <u>2.84</u>				MOD. (ASTM D-1557) ☐ METHOD <u></u>	
				PLUS NO. 4 <u></u>	
				OTHER TEST ☐ (SEE REMARKS)	



REMARKS

MATERIALS TESTING REPORT		U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE		SUMMARY - SLOPE STABILITY ANALYSIS		
PROJECT and STATE LITTLE CHOCOWUT, SITE "A-B" TEX. 2000				DATE 1-15-66		
METHOD OF ANALYSIS SWEDISH CIRCLE				ANALYZED AT C. L. LINCOLN, INC.		
APPROVED BY						
SOURCE AND USE OF MATERIALS	CLASSIFICATION	ADOPTED DESIGN DATA			REMARKS	
1) Fresh Spay. Emb.	CL	γ_d (pcf)	γ_{sat} (pcf)	γ_{sub} (pcf)	ϕ (deg)	
2)		121.5	140.0	77.5	20.5	
3)						
4)						
5)						
6)						
7)						
8)						
COEFFICIENT OF FRICTION μ ADHESION c (psf) INTERNAL FRICTION ANGLE ϕ (deg) 1.0 450 20.5						
TRIAL NO	SLOPE	CONDITIONS				F_s
1) Up	3:1	Maximum Section				1.64
2) Up	3:1	Full drawdown - 10' berm @ elev. 112.5 - Arc cut from opp. shoulder thru Mat'l. ① only.				1.55
3) Up	3:1	Full drawdown - 10' berm @ elev. 113.5 - Arc cut from opp. shoulder thru Mat'l. ① only.				1.54
4) Up	3:1	Full drawdown - 10' berm @ elev. 113.5 - Arc cut from opp. shoulder thru Mat'l. ① only.				1.70
5) Up	3:1	No berm - Drain @ elev. 113.5 - Arc cut from opp. shoulder thru Mat'l. ① only.				1.58
6) Up	3:1	No berm - Drain @ elev. 113.5 - Arc cut from opp. shoulder thru Mat'l. ① only.				1.7

NEW YORK



UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

TO : James W. Bickle, Administrative Officer,
Nebraska State Office 68508

FROM : Rey S. Decker, Head, Soil Mechanics
Laboratory, SCS, Lincoln, Nebraska 68508

SUBJECT: Reimbursement - Soil Analysis - FY 1966

INVOICE NO. 343-66

WORK ORDER NO. 66-337-W

Date May 9, 1966

~~O.S.O.~~ NY-14-66

The following reimbursements are for collection from the SCS State Office at:

Syracuse, New York for (WP-08) Little Choconut Creek, Site 2-E

Report Distribution: W. S. Atkinson, H. M. Kautz, B. S. Ellis, D. W. Shanklin

<u>1</u> each Mechanical Analysis (Hydrometer)	\$ 4.50	<u>4.50</u>
each Mechanical Analysis, Total Salt	7.50	
<u>1</u> each Mechanical Analysis, Dispersion	7.10	<u>7.10</u>
each Mechanical Analysis, Total Salt, Dispersion	10.10	
<u>2</u> each Sieve Analysis - Gravel	5.30	<u>10.60</u>
<u>2</u> each Sieve Analysis - Sand	3.20	<u>6.40</u>
each Core Opening and Description	7.05	
each Dry Unit Weight - Undisturbed Samples	7.60	
<u>2</u> each Atterberg Limits	7.50	<u>15.00</u>
<u>2</u> each Specific Gravity - Coarse Fraction	5.05	<u>10.10</u>
<u>2</u> each Specific Gravity - Fine Fraction	6.40	<u>12.80</u>
<u>2</u> each Moisture-Density (Compaction)	20.00	<u>40.00</u>
<u>1</u> each Triaxial Shear - 1.4" and 2.8" Diameter CU	101.80	<u>101.80</u>
each Triaxial Shear - $\geq$ 4.0" and 6.0" Diameter CU	210.25	
each Consolidation	82.50	
each		
each		

TOTAL \$ 208.30

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

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each Triaxial Shear - $\geq$ 4.0" and 6.0" Diameter CU	210.25	
each Consolidation	82.50	
each		
each		

TOTAL \$ 208.30

M E M O R A N D U M

November 22, 1966

TO: Mr. J. R. Stellato
Acting Asst. Supt. of Oper. & Maint.

Attention: Mr. A. D. Dickinson
Director of Engineering

FROM: Mr. Wm. P. Hofmann, Director
Bureau of Soil Mechanics

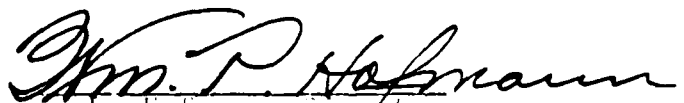
PROJECT: Finch Hollow, Little Choconut & Trout Brook
Water Shed Project
Floodwater Retarding Dam No. 2E
Broome County

SUBJECT: Review of Plans

In accordance with your request, we have reviewed the soils and foundations design aspects of the above dam. Our analysis was based on soil mechanics, geology and design reports plus the plans and specifications which were all transmitted directly to us by the Soil Conservation Service.

Our review of the subsurface data and the plans and specifications indicates that, in general, the design of this floodwater retarding dam is satisfactory and properly accounts for the anticipated soil and foundation conditions. We would suggest that a note be included on Sheet 5 of the plans specifying that the drain fill which is used as bedding for the rip-rap in the plunge pool be compacted.

We are enclosing the material transmitted to us by the U.S.D.A. Soil Conservation Service.


Wm. P. Hofmann, Director
Bureau of Soil Mechanics

ELL/mfk

Encl:

cc: Mr. C. W. McAlpin

PREVIOUS INSPECTION REPORTS

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DAM INSPECTION REPORT
(By Visual Inspection)

Dam Number	River Basin	Town	County	Hazard Class*	Date & Inspector
96A-3623	Susq.	Chenango	Broome	B	5-29-76 KDI

Type of Construction

- ☐ Earth w/concrete spillway
☒ Earth w/drop inlet ~~pipe~~
☐ Earth w/stone or riprap spillway
☐ Concrete
☐ Stone
☐ Timber

Use

- ☐ Water Supply
☒ ~~Dam~~ Flood Control
☐ Recreation
☐ Fish and Wildlife
☐ Farm Pond
☐ No Apparent Use-Abandoned

Estimated Impoundment Size

- ☐ 1-5 acres
☐ 5-10 acres
☒ Over 10 acres

Estimated Height of Dam above Streambed

- ☐ Under 10 feet
☐ 10-25 feet
☒ Over 25 feet 43'

Condition of Spillway

- ☒ Service satisfactory
☐ In need of repair or maintenance
☐ Auxiliary satisfactory
☐ In need of repair or maintenance

Explain: _____

Condition of Non-Overflow Section

- ☒ Satisfactory
☐ In need of repair or maintenance Explain: _____

Condition of Mechanical Equipment

- ☒ Satisfactory
☐ In need of repair or maintenance Explain: _____

Evaluation (From Visual Inspection)

- ☒ No defects observed beyond normal maintenance
☐ Repairs required beyond normal maintenance

*Explain Hazard Class, if Necessary _____

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

Chemung County Rural Urban Center, P.O. Box 353, Breesport, N.Y. 14816

SUBJECT: ENG - 40 Inspection of Dam Sites; Kanticoke 9A,
Little Chocoma 2C, 2B, 2E

DATE: September 19, 1979

TO: Herbert J. Lyford, Area Conservationist

On September 11, 1979 and September 12, 1979, I inspected the above structures to conform to Administrator's General Memorandum-16. Dick Crowe and Dan Walker accompanied me on the 11th and only Dan Walker on the 12th.

Hazard classification was not reviewed since all the structures were already hazard class C.

Overall the operation and maintenance was good. The only item I question is whether the mowing of the dam slopes will eventually kill the crown vetch. I understand that crown vetch should not be mowed annually.

On all structures the condition of the principal spillway system was the major item inspected. The slopes of the dam and the emergency spillway were looked at for any seeps or slips.

I did not have copies of the construction as-builts or of previous inspection reports available when the inspections were made. I recommend that these be on site during future inspections.

All the sites inspected with impact basins had evidence of deterioration of the joint filler around the outlet of the conduit. This should be checked annually for loss of soil from behind the back wall of the impact basin.

Attached are the individual reports for the above structures.

Dana C. Chapman, P.E.
Project Engineer

cc L. Thomas, R. Crowe, G. Page, R. Perritt

enc.



LITTLE CHOCONUT WATERSHED SITE 2E
Inspection Report
September 12, 1979

Principal Spillway Pipe

Only joint gaps greater than $\frac{1}{4}$ " are listed below

Joint Number From Construction drawings	Location of Measurement (looking downstream)			
	12 o'clock	3 o'clock	6 o'clock	9 o'clock
1	$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{1}{2}$ "	$\frac{1}{2}$ "
2	$\frac{3}{4}$ "	$\frac{3}{4}$ "	$\frac{1}{2}$ "	$\frac{1}{2}$ "
4	$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{1}{2}$ "	$\frac{3}{4}$ "
5	$\frac{1}{2}$ "	-	-	$\frac{3}{8}$ "
6	-	-	-	$\frac{1}{2}$ "
7	-	$\frac{3}{8}$ "	-	-
8	$\frac{3}{8}$ "	$\frac{3}{8}$ "	-	-
10	-	$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{1}{2}$ "
11	$\frac{3}{4}$ "	$\frac{3}{4}$ "	$\frac{3}{4}$ "	$\frac{3}{4}$ "
12	$\frac{1}{2}$ "	$\frac{3}{8}$ "	$\frac{3}{8}$ "	$\frac{3}{8}$ "
13	$\frac{3}{4}$ "	$\frac{3}{4}$ "	$\frac{1}{2}$ "	$\frac{1}{2}$ "
14	$\frac{3}{4}$ "	$\frac{3}{8}$ "	$\frac{3}{8}$ "	$\frac{3}{8}$ "
15	$\frac{3}{4}$ "	$\frac{1}{2}$ "	$\frac{1}{2}$ "	$\frac{3}{4}$ "
16	$\frac{1}{2}$ "	$\frac{1}{2}$ "	$\frac{1}{2}$ "	-

Maximum Joint Extensibility 2 $\frac{3}{4}$ "

The top of the pipe at the outlet has spalled off and is exposing the prestressed wire. This should be repaired.

Preparation - All loose concrete should be chipped off. The prestressed wire should be thoroughly cleaned. Do not hit wire during chipping process, the wire is under tension.

Repair - Use either the products listed in the report for Nanticoke Site 9A or Dural 207. Follow manufacturers recommendations

Plunge Pool OK

Drainage system is not flowing

The embankment and emergency spillway are OK

Dana C. Chapman



OPERATIONS & MAINTENANCE 1980 REPORT
BROOME COUNTY SOIL & WATER CONSERVATION DISTRICT

PL-566 Sites

1. Little Choconut #1
 - Mowed dike and emergency spillway
 - Removed debris from riser and pool area
 - Operated gate
2. Little Choconut #1A
 - Mowed dike and emergency spillway
 - Operated gate
 - Removed debris from riser and pool area
3. Little Choconut #2
 - Replaced stone-lined waterway - installed 482 tons
 - Removed sediment from pool - 150 c.y.
 - Mowed dike and emergency spillway
 - Debris removed from riser and pool area
 - Operated gate
4. Little Choconut #2A
 - Repaired barbed wire fence
 - Mowed dike and emergency spillway
 - Operated gate
 - Removed debris from riser and pool area
 - Replaced gate
5. Little Choconut #2B
 - Mowed dike and spillway
 - Operated gate
 - Removed debris from riser and pool area
6. Little Choconut #2C
 - Mowed dike and spillway
 - Operated gate
 - Repaired fence
 - Installed gate on access road
 - Removed debris from riser and pool area
7. Little Choconut #2E
 - Mowed dike and emergency spillway
 - Operated gate
 - Removed debris from riser and pool area
8. Little Choconut #3C
 - Mowed dike and spillway
 - Operated gate
 - Repaired gate
 - Attempted to unplug 6" drain into riser, will require pumping dry and dredging to uncap pool end

ENGINEERING OPERATIONS AND MAINTENANCE INSPECTION REPORT

WATERSHED _____ SITE NO. _____ DATE OF INSPECTION 11/20 DATE OF LAST INSP. _____
 SPONSOR WITH OPERATIONS AND MAINTENANCE RESPONSIBILITY Beaver County School
 PRESENT HAZARD CLASSIFICATION C NEW CLASSIFICATION IF WARRANTED C

O & M ITEMS

SATISFACTORY/UNSATISFACTORY - EXPLANATION

1. VEGETATION

- a.) Mowing _____/a.)
- b.) Reseeding _____/b.)
- c.) Fertilizing _____/c.)
- d.) Excessive other uses _____/d.)

2. FENCING

- a.) Intact and Functional _____/a.)
- b.) Debris in Fence _____/b.)
- c.) Gates, Locks _____/c.)

3. EMERGENCY SPILLWAY

- a.) Erosion _____/a.)
- b.) Excessive Seepage _____/b.)
- c.) Sedimentation _____/c.)
- d.) Obstructions in Channel _____/d.)
- e.) Slips, Slides, Location _____/e.)

4. EMBANKMENT

- a.) Cracking, excessive settling _____/a.)
- b.) Erosion _____/b.)
- c.) Seepage _____/c.)
- d.) Other Damage (Rodents...) _____/d.)

O & M ITEMS

SATISFACTORY/UNSATISFACTORY - EXPLANATION

3. RESERVOIR AREA a.) Undesirable Vegetation b.) Cut or Fallen Trees c.) Debris/Slash d.) Sedimentation	_____/a.) _____/b.) _____/c.) _____/d.)
6. OUTLET CHANNEL a.) Sedimentation b.) Cutting and Scouring c.) Woody Growth	_____/a.) _____/b.) _____/c.)
7. ROCK RIPRAP a.) Undermining b.) Adjacent Channel Scouring c.) Deterioration	_____/a.) _____/b.) _____/c.)
8. TRASH RACKS, GRATINGS a.) Accumulated Debris b.) Broken or Missing Parts c.) Galvanizing or Paint	_____/a.) _____/b.) _____/c.)
9. OTHER SPECIAL STRUCTURES a.) Diversions b.) Access Roads c.) Waterways d.) Other, list..... e.) Other, list.....	_____/a.) _____/b.) _____/c.) _____/d.) _____/e.)
10. PRINCIPLE SPILLWAY a.) Riser 1.) Condition of Concrete 2.) Seepage and Cracks 3.) Condition of Transition	_____/1.) _____/2.) _____/3.)

SATISFACTORY/UNSATISFACTORY - EXPLANATION

10. PRINCIPLE SPILLWAY

- b.) Impact Basin
 - 1.) Condition of Concrete
 - 2.) Sedimentation, Debris
 - 3.) Pipe Entrance Condition
- c.) Plunge Pool
 - 1.) Riprap Condition
 - 2.) Vegetative Treatment
- d.) Drain System
 - 1.) Seepage (Clean, Dirty)
 - 2.) Animal Guards
- e.) Pipe
 - 1.) Cracks, Seepage
 - 2.) Debris and Sedimentation
 - 3.) Listing of gaps greater

Maximum joint extensibility

[illegible]

Gap locations as looking downstream.

11. GATES AND VALVES

Estimated leakage with gate closed and adjusted _____ gpm.

General description of system

Operational Check: Satisfactory

UNSATISFACTORY

12. PUMP SYSTEMS

General condition report, including operations record, fuses broken or missing, broken or missing warning lights, faulty switches, lubrication required, excessive vibration

12. PUMP SYSTEMS

General condition report, continued:-----

13. SAFETY

List all hazards present: (including broken guards, rails, rope cuttings, diving boards on risers, evidence of pollution, garbage)

RECOMMENDED REPAIRS AND METHOD OF REPAIR: *Overhaul track rack @ repair yard*
with the water side 200 to 250 ft

INSPECTED BY *Bill Morgan*
TITLE *District Manager*
DUTY STATION *Birmingham, AL*

NOTE: DESIGNATE NOT APPLICABLE ITEMS BY MARKING N/A.

APPENDIX E
REFERENCES

REFERENCES

1. Chow, Ven Te, Editor - Handbook of Applied Hydrology. McGraw-Hill Book Company, New York, N.Y., 1964.
2. Hydrologic Engineering Center, U.S. Army Corps of Engineers, "HEC-1 Flood Hydrograph Package, Users Manual". Davis, Cal., January 1973.
3. Hydrologic Engineering Center, U.S. Army Corps of Engineers, "Flood Hydrograph Package (HEC-1), Users Manual for Dam Safety Investigations", Davis, Cal., September 1978.
4. King, Horace, and Brater, Ernest. Handbook of Hydraulics, 5th Edition. McGraw-Hill Book Company, New York, N.Y., 1963.
5. U.S. Department of the Interior. Design of Small Dams, 2nd Edition, Washington, D.C., 1973.

APPENDIX F

DRAWINGS

OFF
FINCH HOLLOW, LITTLE CHOCONUT
WATERSHED PROJ
FLOODWATER RETARDING DAM

DRAINAGE AREA

TOTAL STORAGE

(TO EMERGENCY SPILLWAY CREST)

WATER SURFACE AREA

(SEDIMENT POOL)

HEIGHT OF DAM

VOLUME OF FILL

41.3
43.0

BUILT UNDER THE WATERSHED PROTECTION
FLOOD PREVENTION ACT
BY

COUNTY OF BROOME

WITH THE ASSISTANCE OF THE
SOIL CONSERVATION SERVICE
OF THE

U S DEPARTMENT OF AGRICULTURE

INDEX

- SHEET 1 - COVER SHEET
- SHEET 2 - PLAN OF STORAGE AREA & FILL PLACEMENT
- SHEET 3 - PLAN OF STRUCTURAL WORKS
- SHEET 4 - PROFILES
- SHEET 5 - DRAINAGE SYSTEM DETAILS
- SHEET 6 - PROFILE OF PRINCIPAL SPILLWAY
- SHEET 7 - PROFILE OF PRINCIPAL SPILLWAY
- SHEET 8 - RISER STRUCTURAL DETAILS
- SHEET 9 - TRASH RACK, VENTING TUBE & ANIMAL GUARD
- SHEET 10 - POND DRAIN INLET DETAILS
- SHEET 11 - COLLAR, CRADLE, BEDDING, BENT, & MISC DETAILS
- SHEET 12 - LOGS OF TEST HOLES

AS BUILT

OFFICE COPY CHOCNUT & TROUT BROOK PROJECT

ING DAM NO. 2-E

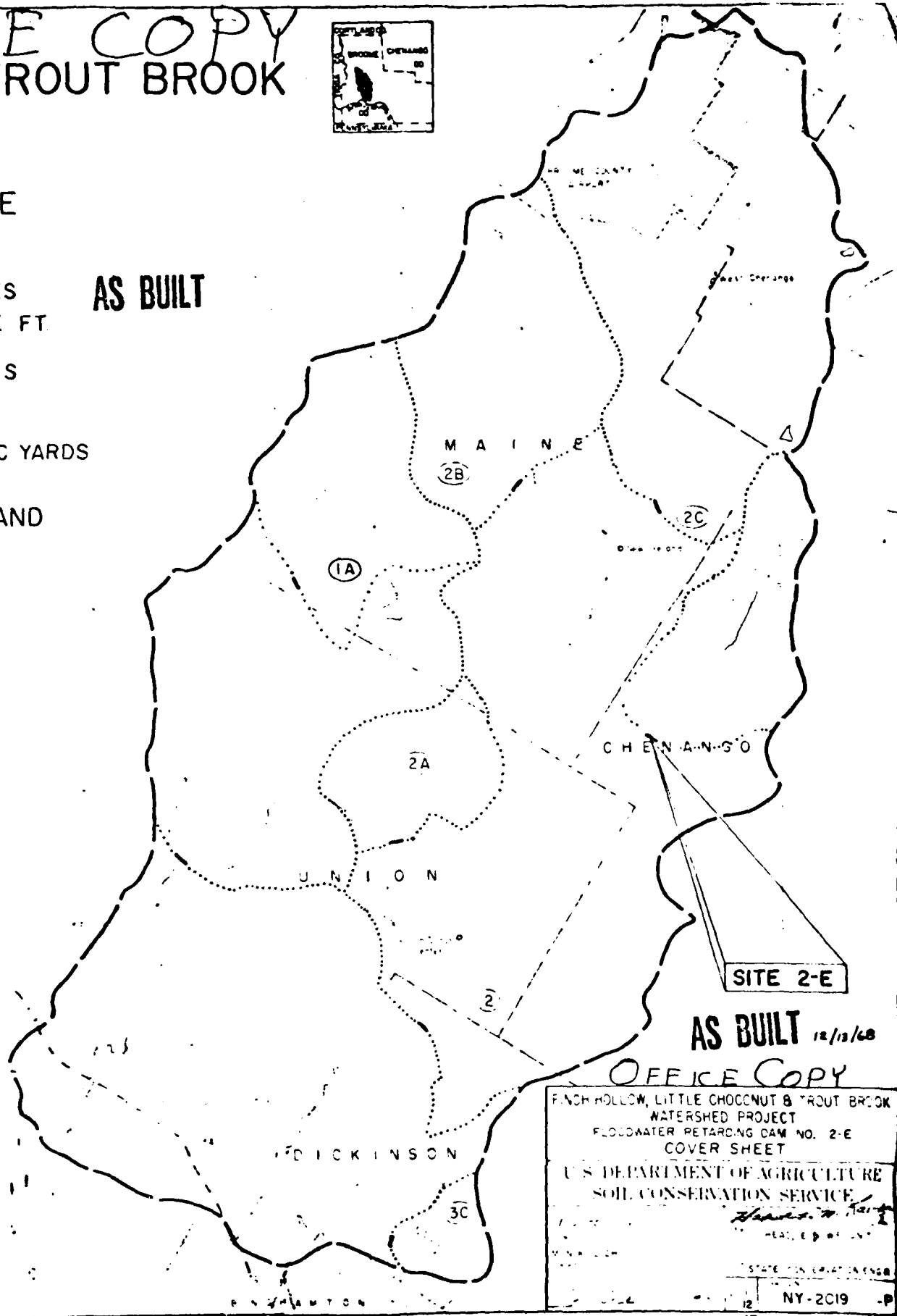
653 ACRES
162 ACRE FT
12 ACRES
43 FEET
~~41,300~~ CUBIC YARDS
43,098

AS BUILT

HED PROTECTION AND
TION ACT

RCME
NCE OF THE
ON SERVICE
AGRICULTURE

AS BUILT



AS BUILT 12/13/68

OFFICE COPY

FINCH HOLLOW, LITTLE CHOCNUT & TROUT BROOK
WATERSHED PROJECT
FLOODWATER RETARDING DAM NO. 2-E
COVER SHEET

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

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STATE OF NEW YORK

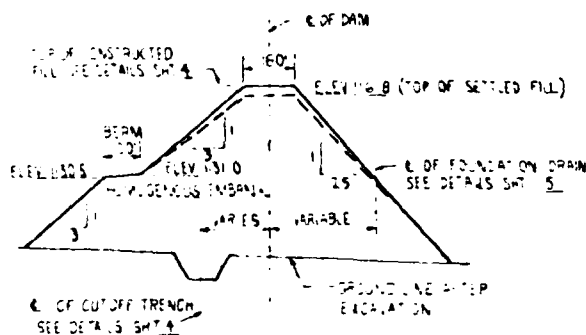
NY-2019 -P

GENERAL NOTES

1. AREAS UNDER THE DAM, Dike EMERGENCY SPILLWAY AND SUPPLEMENTAL BORROW AREA TO BE CLEARED AND GRUBBED. LIMITS OF AREA TO BE CLEARED AND GRUBBED SHALL BE AS SET-RED IN THE FIELD BY THE ENGINEER (SPEC 2A).
2. AREA UPSTREAM FROM DAM AND BELOW ELEVATION 132.5 (MSL) SHALL BE CLEARED. LIMITS OF AREA TO BE CLEARED SHALL BE AS STAKED IN THE FIELD BY THE ENGINEER (SPEC 3).
3. ALL TREES IN WORK AREA TO BE REMOVED AS STRUCTURAL REMOVAL (SPEC 3A).
4. BOTTOM SECTION OF EMERGENCY SPILLWAY TO BE COVERED WITH 6" OF TOPSOIL FROM STA 400' TO STA 450'. TOPSOIL THAT IS SUITABLE FOR USE WILL BE INCORPORATED WITHIN THE SLOPES OF THE EARTH FILL AS DIRECTED BY THE ENGINEER (SPEC 11).

SITE DATA

NO.	ELEV.	DESCRIPTION
1	1174.67	N. Chertage, G.V. & S. of, along Clem Castle Rd, thence 2.5 m along Dismal Hill Rd, 18' S of CL of road, telephone pole 49, 84d 80S also line, 1' above ground.
2	41.69	Black cherry tree - 11' in base of. 14' S of CL of S of 18' S of property line.
3	41.08	Two 4 in soft maple - 1' above top of 14' S of 18' S of 18' S of corner of road here.
4	10.41	Well in base of 10' in the approx 800' of T.M. 4, 1000' S of stream (left) near top.
5	41.36	Well & water in root of slope of soft maple - 1.9' above ground - 10 also & foundation, top of slope.
6	31.43	Well & water not horizontal in base of 8 in soft maple, left about 1000' S from CL den 150' S T.M. 1.
7	31.50	Well and water in root of slope of 2 soft maple 15 in, 14' S of of slope, 100' approx, west of str. well, 10' S T.M. 1.
Notes		Sta 1400 CL of dam
Notes		Sta 1411 CL of dam



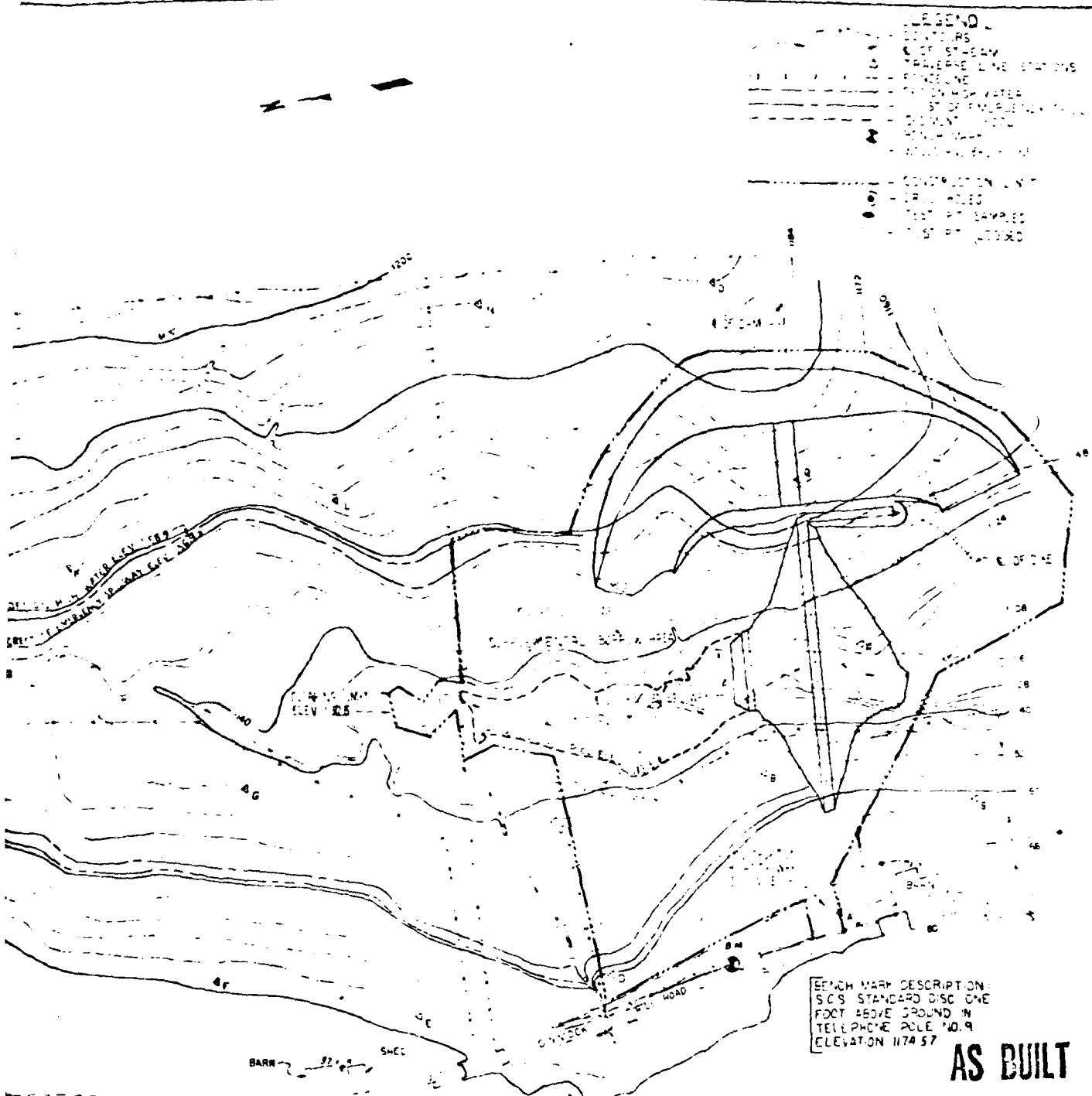
TYPICAL SECTION OF DAM

NOT TO SCALE

MATERIAL	MAX FILL SIZE	MAX WATER CONTENT	REQUIREMENTS
TYPE 1 FILL (TYPE 1 FILL) SHALL BE USED FOR THE MAIN BODY OF THE DAM. TYPE 2 FILL (TYPE 2 FILL) SHALL BE USED FOR THE FOUNDATION DRAIN AND SUPPLEMENTAL BORROW AREA REPRESENTED BY:	6	9	2 PERCENTAGE PTS. BELOW TO 2 PERCENTAGE PTS. ABOVE OPTIMUM
TYPE 1 FILL (TYPE 1 FILL) SHALL BE USED FOR THE MAIN BODY OF THE DAM. TYPE 2 FILL (TYPE 2 FILL) SHALL BE USED FOR THE FOUNDATION DRAIN AND SUPPLEMENTAL BORROW AREA REPRESENTED BY:	6	9	2 PERCENTAGE PTS. BELOW TO 2 PERCENTAGE PTS. ABOVE OPTIMUM

1. MAXIMUM FILL THICKNESS PRIOR TO COMPACTION
2. WATER CONTENT AT TIME OF COMPACTION
3. FOR TYPICAL COMPACTION CURVES SEE SHEET 12

NOTE: THE FOUNDATION SURFACE THRUOUT THE BASE AREA OF THE DAM SHALL BE SCARIFIED TO A DEPTH OF 6 INCHES AND COMPACTED PRIOR TO PLACEMENT OF FILL MATERIAL.



EACH MARK DESCRIPTION:
 SCS STANDARD DISC ONE
 FOOT ABOVE GROUND IN
 TELEPHONE POLE NO. 9
 ELEVATION 1174.57
AS BUILT

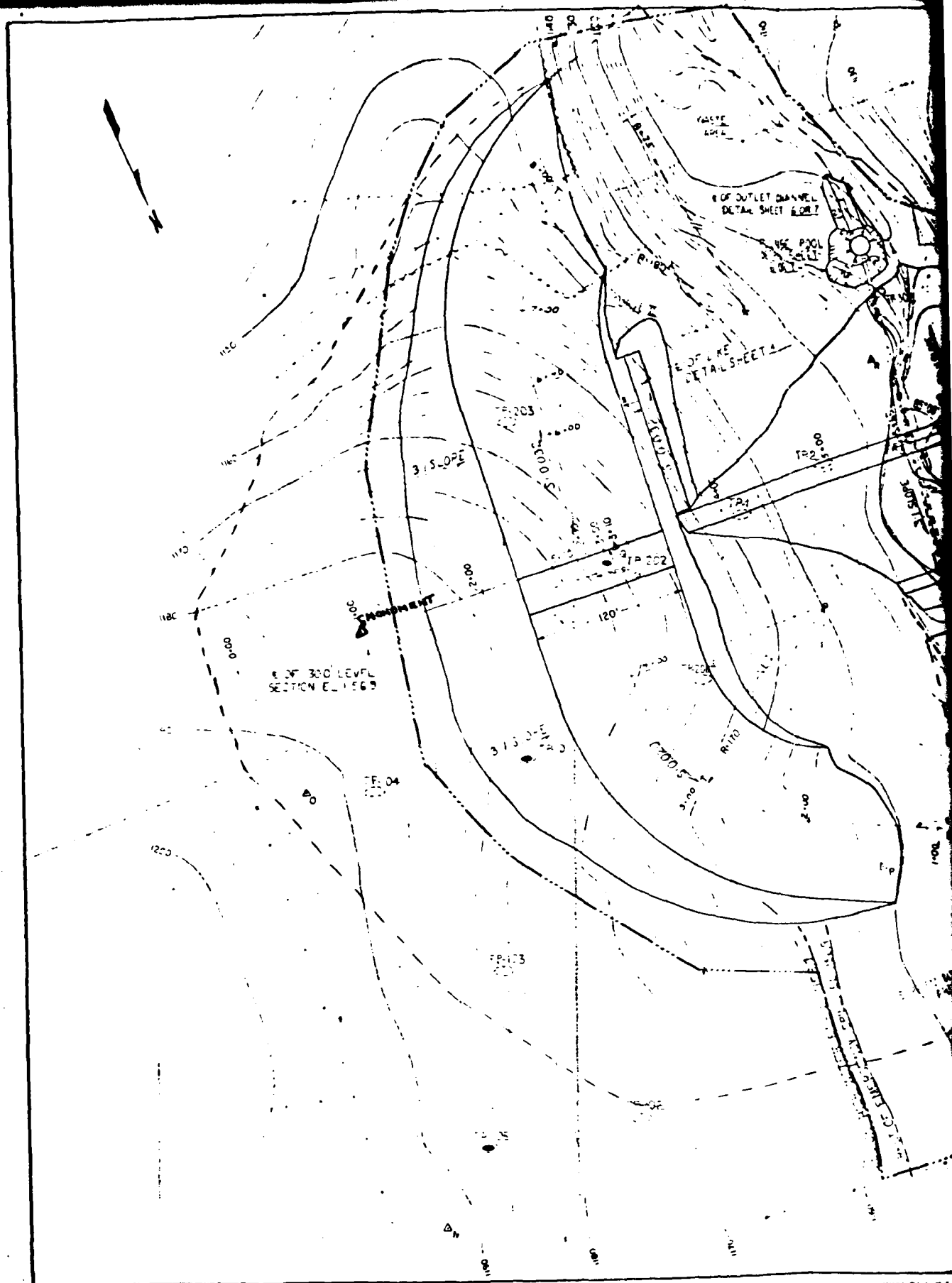
EARTH FILL PLACEMENT			
MAX. LAY. THICK.	REQ'D. WATER CONTENT	CLASS	COMPACTION
9	2 PERCENTAGE PTS. BELOW TO 2 PERCENTAGE PTS. ABOVE OPT. HUM.	A	95% MAX. DENSITY BY ASTM D698 METHOD

IMPACTION
 FOR
 E SHEET 12
 USE THE BASE AREA OF
 8 A DEPTH OF 6 INCHES
 WEIGHT OF FILL MATERIAL.

4' CONTOUR INTERVAL

FINCH HOLLOW, LITTLE CHOCONUT &
 TROUT BROOK WATERSHED PROJECT
 FLOODWATER RETARDING DAM NO 2-E
 LITTLE CHOCONUT CREEK
 PLAN OF STORAGE AREA & FILL PLACEMENT
 U. S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE

Engineer: H. H. HUNTER	Checked by: [Signature]
Drawn by: B. THOMAS, D. WATKINS	Approved by: [Signature]
Field Engineer: R. ALLEN	Field Engineer: [Signature]
Field Engineer: L. B.	Field Engineer: [Signature]
8/68	NY-2019-P



1. ALL ELEVATIONS FOR STRUCTURAL WORK SHALL BE BASED ON THE FOLLOWING DATUM: MEAN TIDE WATER OF THE HARTFORD HARBOR, CONNECTICUT, REPRESENTED BY THE MEAN OF THE LOWEST AND HIGHEST TIDES OF THE YEAR 1929. ALL ELEVATIONS SHALL BE IN FEET ABOVE THIS DATUM.

ANALYTICAL DATA FOR SHEET 1

2-6-724	T-3-38
2-6-724	E-24-54
2-6-724	M-28-57
2-6-724	

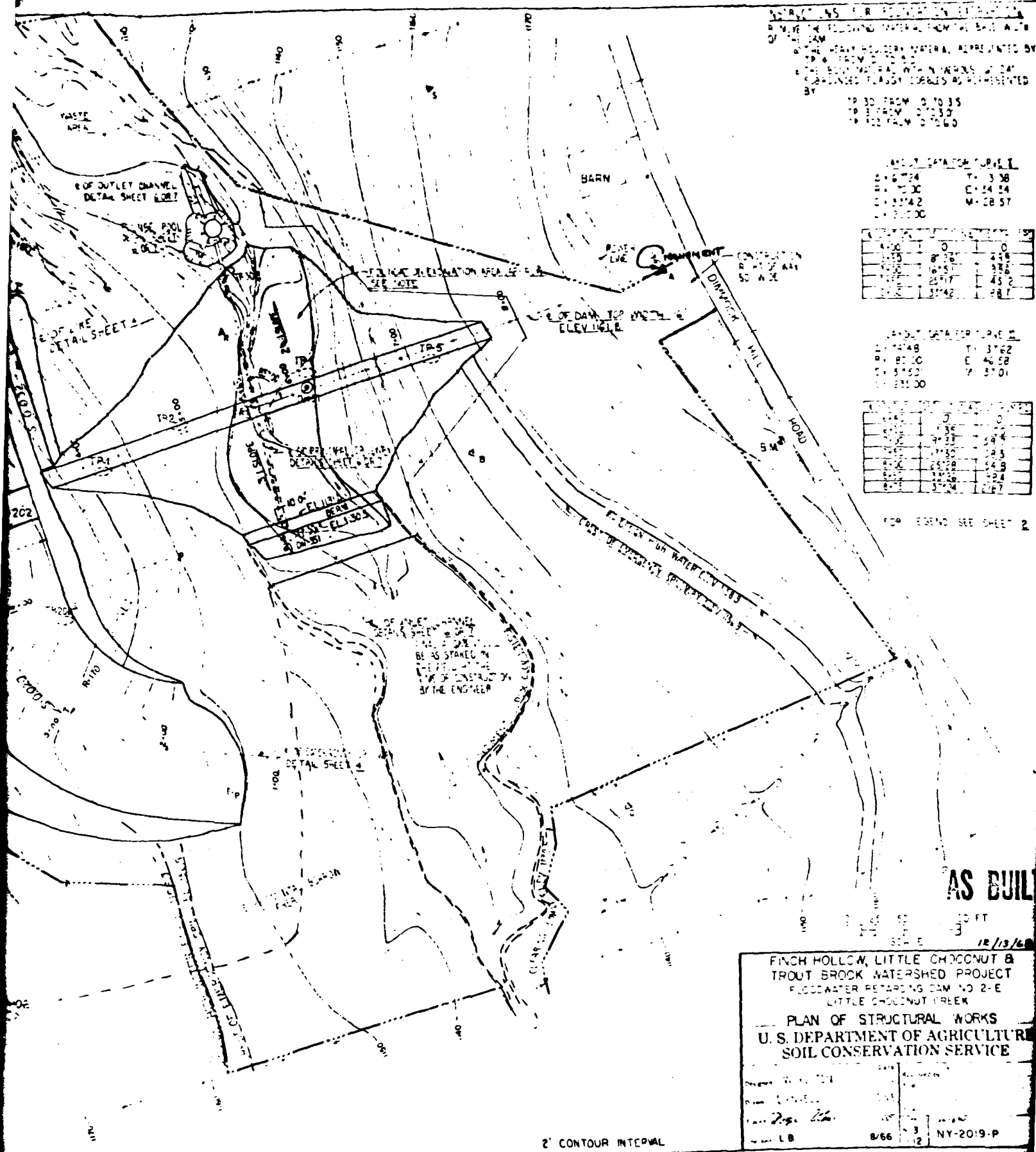
4-00	0	0
4-00	8-32	4-5
4-00	16-57	9-5
4-00	25-17	14-5
4-00	33-42	19-5

ANALYTICAL DATA FOR SHEET 2

2-6-724	T-3-38
2-6-724	E-24-54
2-6-724	M-28-57
2-6-724	

4-00	0	0
4-00	8-32	4-5
4-00	16-57	9-5
4-00	25-17	14-5
4-00	33-42	19-5

FOR LEGEND SEE SHEET 2



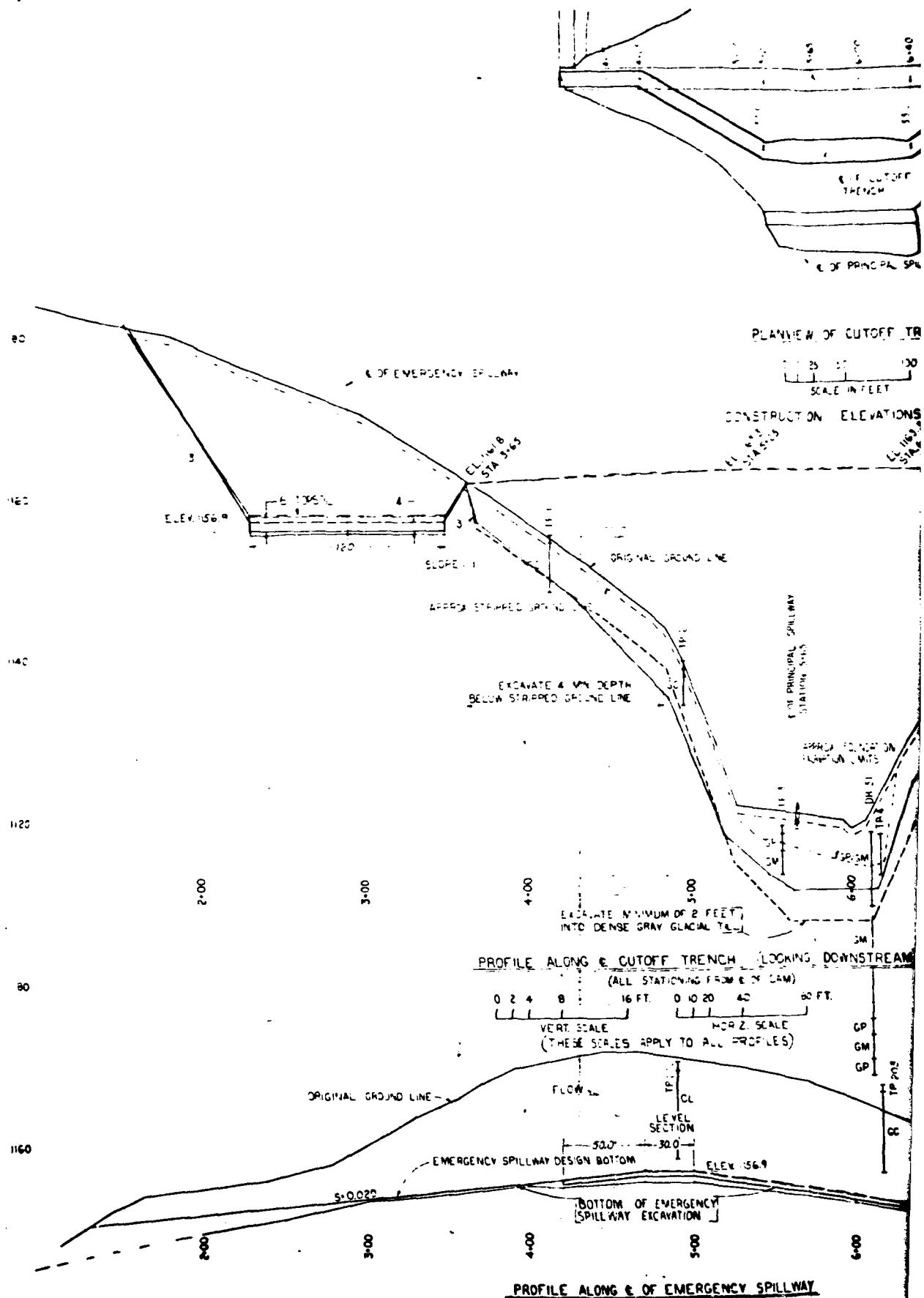
FINCH HOLLOW, LITTLE CHOCANUT & TROUT BROOK WATERSHED PROJECT
 FLOODWATER RETARDING DAM NO. 2-E
 LITTLE CHOCANUT CREEK

PLAN OF STRUCTURAL WORKS
 U.S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE

Project No. 1-1-101
 Date: 1-1-101
 Drawn: [Signature]
 Check: [Signature]
 Scale: 1" = 100'

12/13/68
 12-2019-P

2' CONTOUR INTERVAL



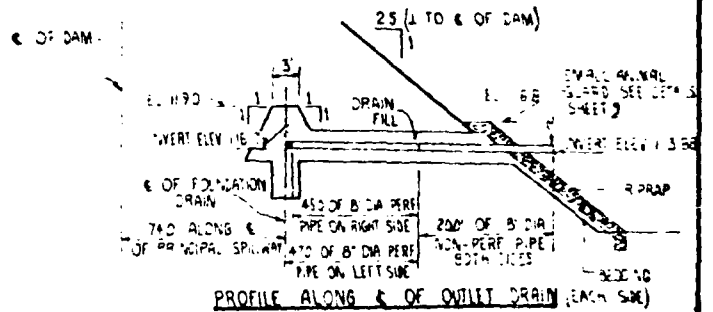
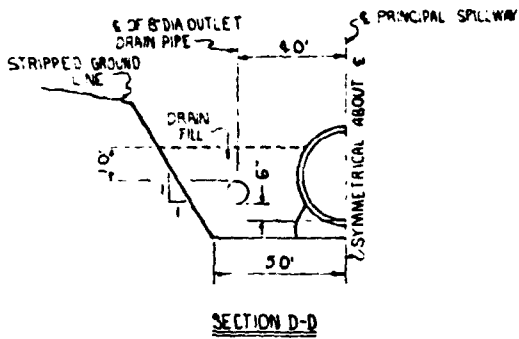
DRAINAGE SYSTEM NOTES

1. ALL DRAIN PIPE SHALL CONFORM TO SPECIFICATION NO. AND SHALL BE 8" DIA. SHAPE 1 CLASS 1 AND 1/2" CORRUGATIONS OR CLASS 2 (SPECIAL CORRUCTIONS), TYPE A FULLY BONDING COMPOSITE PIPE.
2. USE A MINIMUM OF 12" OF DRAIN FILL AROUND PIPES.
3. THE PROFILES OF THE BOTTOM OF ALL EXCAVATIONS AS SHOWN ARE ONLY APPROX. THE REQUIRED FINISHED GRADES WILL BE ESTABLISHED IN THE FIELD AT THE TIME OF CONSTRUCTION BY THE ENGINEER.

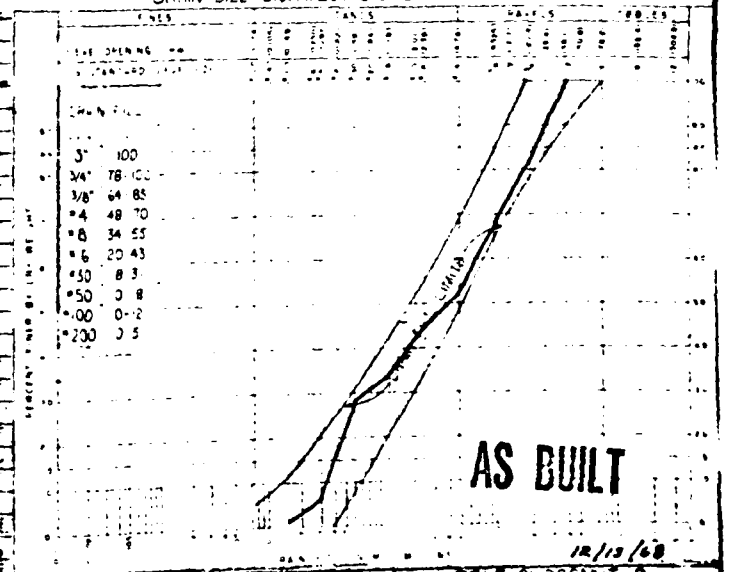
ELEV. 1100

DIA PERE PIPE

ELEV. 1100



GRAIN SIZE DISTRIBUTION GRAPH FOR DRAIN FILL



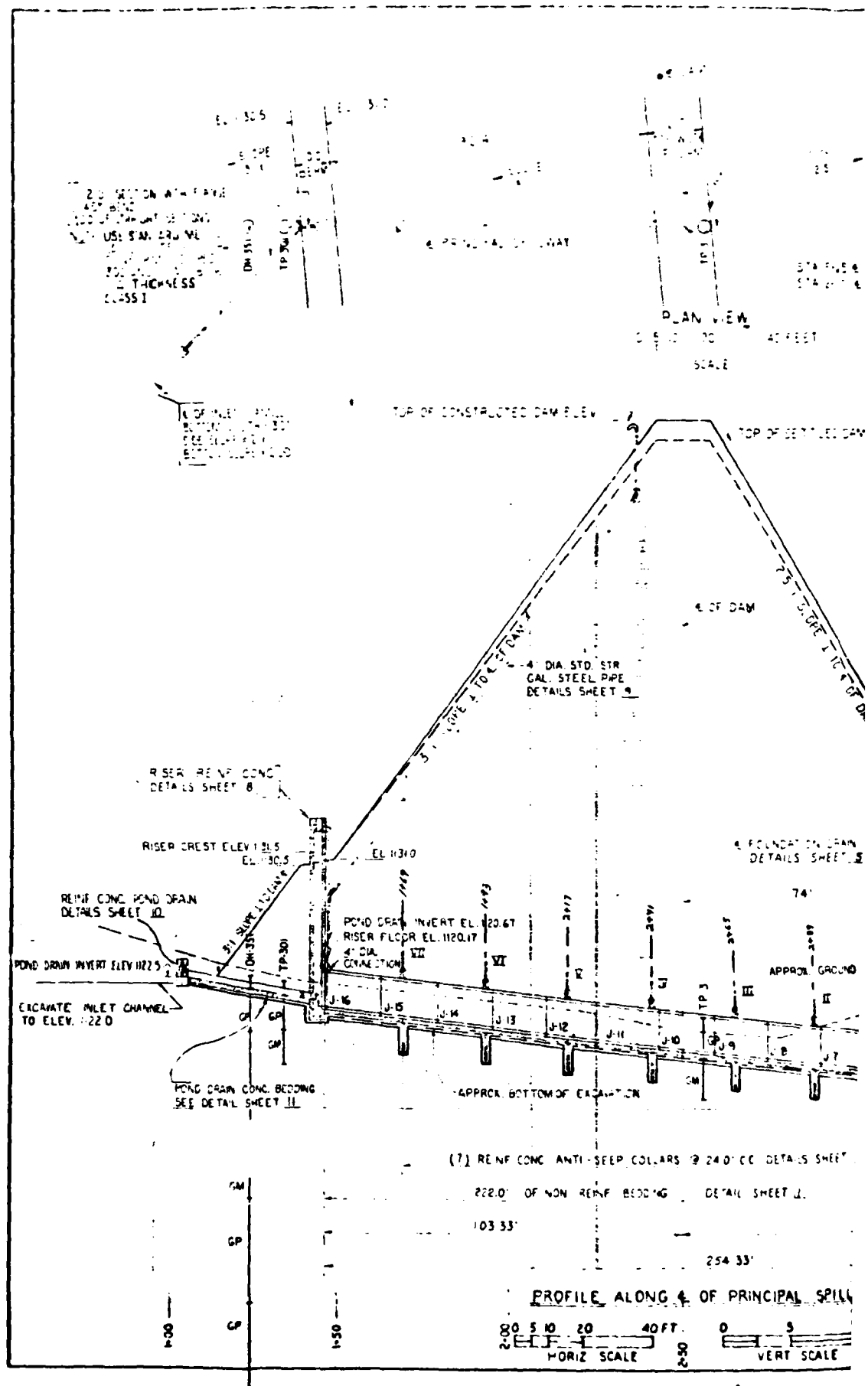
AS BUILT

12/13/68

FROTHOLLOW, LITTLE CHOCOMUT & TROUT BROOK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO. 2-E
LITTLE CHOCOMUT CREEK
DRAINAGE SYSTEM DETAILS

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

JH HARRINGTON 7/66
W GRAJCO JR 7/66
L B 8/66
NY 209-P



STA 5+54 OF DAM
STA 2+17.6 OF PRINCIPAL SPILLWAY

FEET

SETTLED DAM ELEV 101.8

23:7 SLOPE 1 TO 6 OF DAM

FOUNDATION DRAIN FRENCH
TAILS SHEET 5

74'

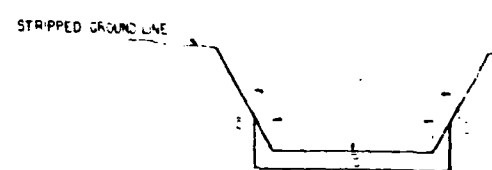
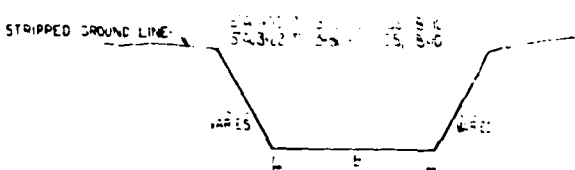
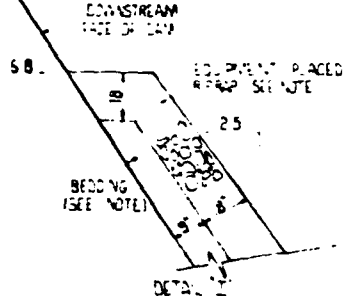
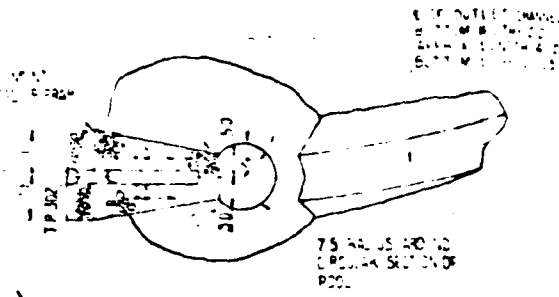
PROPOSED GROUND LINE

DETAILS SHEET 11

DETAIL 11

PRINCIPAL SPILLWAY

SCALE



NOTE EXCAVATE SLOTS 11.5' x 4'
PRINCIPAL SPILLWAY EXCAVATION AT ANTI-SEEP COLLARS

12" D REINFORCED WATER PIPE
5 2-0' SECTIONS
4-0' SECTION
SPOT RING WALL FITTING FOR 12" WALL
TOTAL LENGTH = 253.33'
PRESSURE HEAD = 45.0'
LOAD = 360 LB PER LIN FT BASED ON OD OF 31"
MIN 3 EDGE BEARING STRENGTH FOR 6000 CRACK
3340 LB PER LIN FT FOR PRESTRESSED PIPE
(A.A.W.A. C-50)

PIPE SUPPLIERS NOTES
1. CAST OUTSIDE OF SPOT RING WITH CONCRETE ON ONE 18-2" SECTION
2. FABRICATE A 4" DIAMETER CONNECTION INTO ONE 4-0' SECTION. SEE NOTES SHEET 10-01

PREP NOTES
ALL REPAIRING FACE OF DAM SHALL BE SHAPED FROM A MINIMUM SIZE OF 8" TO A MINIMUM OF 3" AND SHALL BE LAD ON 9" OF BEDDING. BEDDING SHALL MEET CRIPPLE ON REPAIRMENT FOR DRAINAGE AS SHOWN ON SHEET 5.

AS BUILT

12/12/60

USE THIS SHEET FOR PIPE CONDUITS
FURNISHED IN 16.0 SECTIONS

FINCH HOLLOW, LITTLE CHOCONUT &
TROUT BROOK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO 2-E
LITTLE CHOCONUT CREEK
PLAN PROFILE OF PRINCIPAL SPILLWAY
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

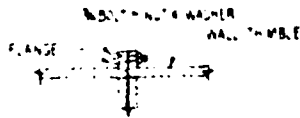
D. ZOGRAFOS 6/66
D. ANSELDO 7/66
D. ZOGRAFOS 6/66
L.B. 6/66
NY-2019-P

COLLAR	DIST FROM OUTLET	INVERT OF 30" DIA PIPE
I	88	150.5
II	116	149.88
III	144	149.27
IV	172	148.54
V	200	147.78
VI	228	147.05
VII	256	146.22

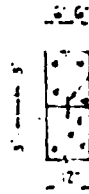
NOTE: ABOVE DIMENSIONS FOR LENGTHS
OF PIPE ARE BASED ON NOMINAL LENGTHS
AND DO NOT INCLUDE JOINTS

COLLAR	DIST FROM OUTLET	INVERT OF 30" DIA PIPE
I	88	150.5
II	116	149.88
III	144	149.27
IV	172	148.54
V	200	147.78
VI	228	147.05
VII	256	146.22

VARIOUS
SLOPE



DETAIL I



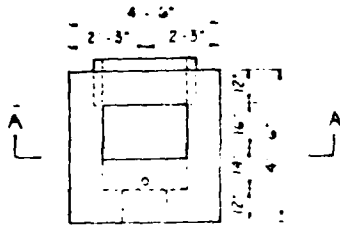
1/4" X 6" STRUCTURAL CARBON STEEL PLATE
GRADE 50. THE PLATE IN WALLS TO BE
CONTAINED WITHIN RISER JOINT TO BE
WELDED TO SOLID

- MANHOLE ASSEMBLY**
- 1 19-25 OPENING MANHOLE COVER
 - MODEL A 5655-14 SERIES NEURAL
 - FLUENCY COMPANY, IRVING, TEXAS 75039
 - 2 EXPOSED 4 1/2" HEAD BOLTS
 - 3 TYPE-D LIFT HANDLE
 - 4 BRASS BOLTS

**RISER CONSTRUCTION
JOINT DETAIL**

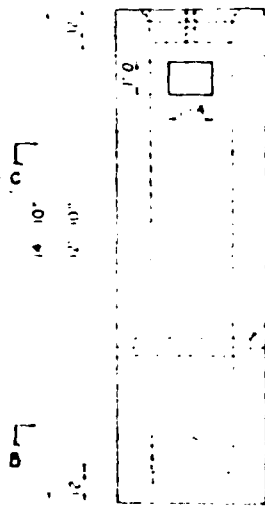
SLIDE GATE NOTES

- 1 6" DIA FLAT FRAME SLIDE GATE (SELF CONTAINED JNT)
- 2 CLASS 150
- 3 SLIDE GATE SHALL CONFORM TO SPEC 301
AND SHALL BE TYPE MWS-1
- 4 10" TYPE WALL THIMBLE 8" DEEP
- 5 PIPE SLEEVE, STEM & STEM SIZES SIZED AND SPACED
ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
REMOVABLE T HANDLE WRENCH SOCKET AND
TOP OF STEM LOCATED WITHIN PIPE SLEEVE
- 6 PAINT IN ACCORDANCE WITH SPEC 22
- 7 HOLES DRILLED IN BACK FLANGE OF WALL THIMBLE BY GATE
MANUFACTURER
DIA OF BOLT CIRCLE: 9 1/2"
NO. OF BOLT HOLES: 8
DIA OF BOLT HOLES: 7/8"

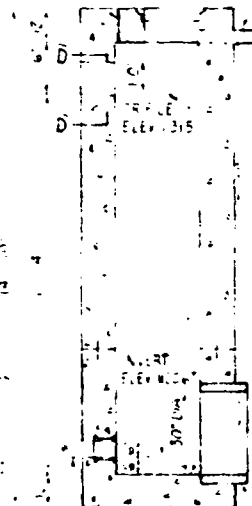


PLAN VIEW

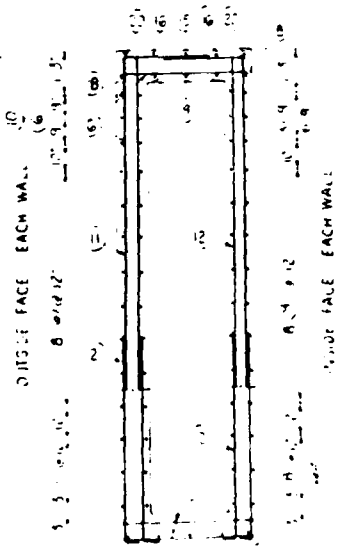
PIPE SLEEVE SIZE AND
LOCATION ACCORDING
TO MFR'S RECOMM.



UPSTREAM ELEVATION



SECTION ALONG CENTERLINE



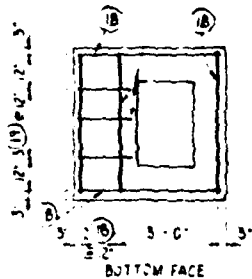
SECTION A-A

BOTT

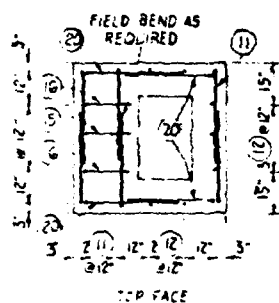
OUTSIDE FACE

USE 1/4" G. STEEL PLATE CARBON STEEL PLATE
GRADE 70 STEEL PLATE IN WALLS TO BE
CONTINUOUS AND AS RISE TO BE
WELDED OR BOLTED

FIELD BEND AS REQUIRED



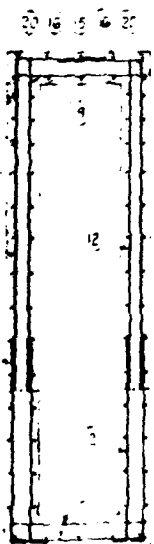
BOTTOM FACE



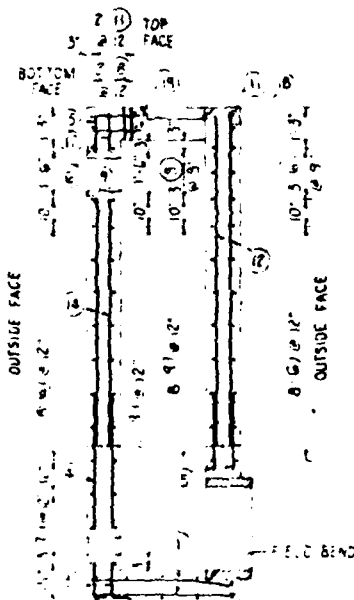
PLAN VIEWS

EACH FACE

2 12'

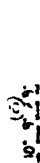


SECTION A-A



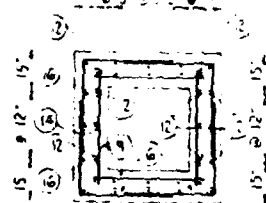
SECTION B-B

OUTSIDE FACE - EACH WALL



SECTION D-D

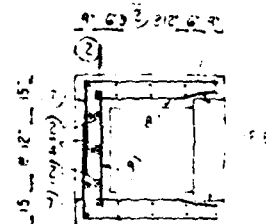
INSIDE FACE - EACH WALL



OUTSIDE FACE - EACH WALL

SECTION C-C

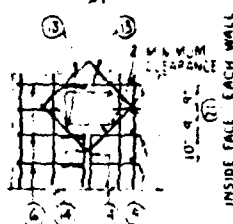
INSIDE FACE - EACH WALL



OUTSIDE FACE - EACH WALL

SECTION E-E

SYMMETRICAL ABOUT A



STEEL SCHEDULE

MARK	SIZE	QUANTITY	LENGTH	TYPE	NO.	C	TOTAL
1	5	20	4.0	1			80.0
2	5	22	6.8	2	6.1	0.7	150.0
3	5	2	1.7	2	1.0	0.7	3.2
4	5	2	4.0	2			8.0
5	5	6	2.3	1			13.8
6	5	42	5.10	2	2.1	2.1	245.0
7	5	6	7.0	2	2.1	4.1	42.0
8	5	6	3.4	1			20.4
9	5	4	3.6	1			14.4
10	5	2	4.1	2	2.1	1.2	8.2
11	5	6	12.8	2	4.0	2.10	76.0
12	5	22	4.4	1			96.8
13	5	8	2.6	1			20.8
14	5	2	7.6	1			15.2
15	5	1	2.5	2	1.4	1.1	2.5
16	5	2	11.2	2	4.0	1.4	26.4
17	5	1	1.0	1			2.0
18	5	5	4.0	1			20.0
19	5	3	1.5	1			4.5
20	5	4	4.5	2	2.10	1.7	7.8
21	5	2	1.0	1			2.0

BAR TYPES



RISER QUANTITIES

STEEL	14.76	1.76
NO. 5 BAR	14.76	1.76
CONCRETE	7.9	0.105
REINFORCED	7.9	0.105

CONSTRUCTION DETAILS

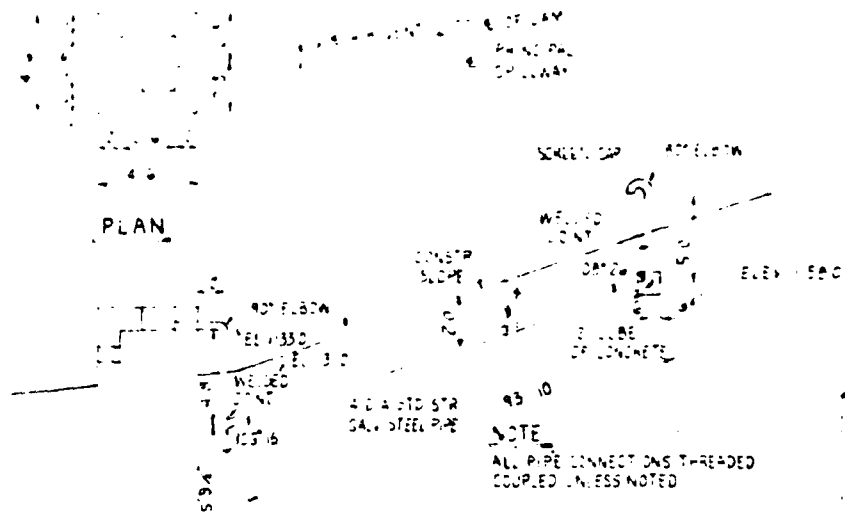
- SPECIFIED BAR DIMENSIONS ARE MEASURED TO THE OUTSIDE EDGE OF ALL BENDS.
- RADIUS OF BENDS SHALL BE 2 BAR DIAMETERS.
- ALL REINFORCING STEEL PLACEMENT IN CONCRETE SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE A.C.I. CODE. ALL REINFORCING STEEL SHALL BE IN CONCRETE FOR A MINIMUM OF 2' CLEAR COVER.
- ALL EXPOSED EDGES OF CONCRETE SHALL HAVE A 1/2" MINIMUM UNLESS OTHERWISE NOTED.

SCALE IN FEET
AS BUILT

FINCH HOLLOW, LITTLE CHOCUNUT &
TROUT BROOK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO. 2 E
LITTLE CHOCUNUT CREEK
RISER STRUCTURAL DETAILS
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

D. ZOGRAFOS
D. ZOGRAFOS 6/56
N. BEAMER 8/56 NY-2019-P

PLAN



SECTION ON E

AIR VENT DETAILS

0 1 2 4 6

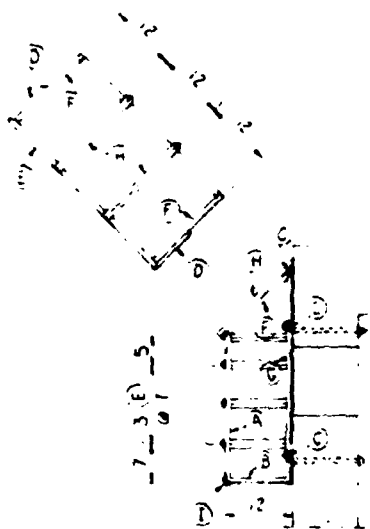
SCALE IN FEET

WELDING DETAIL

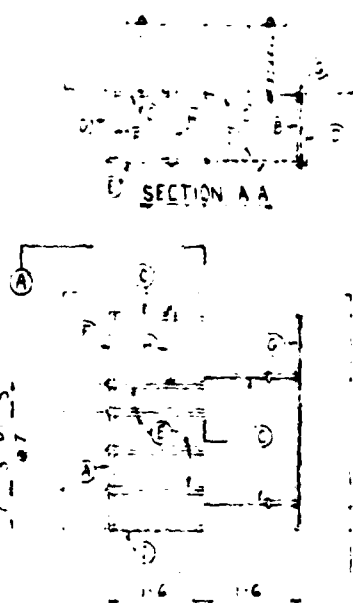
NOTE:
ALL JOINTS OF CON-
CRETE WATER PIPE SHALL BE WELDED
IN ACCORDANCE WITH

ISOMETRIC

ALL POINTS OF CONTACT BETWEEN ANGLE
IRONS TO BE WELDED
ENTIRE TRAIL-PACK TO BE GALVANIZED
IN ACCORDANCE WITH SPEC 1.9

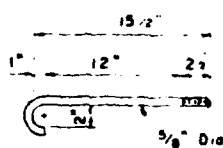


SECTION ON E



ELEVATION

ISOMETRIC



"HOOK" BOLT

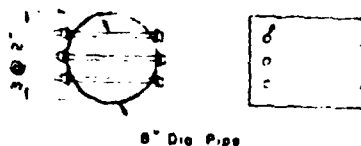
Supply With Hex Nut And Washer

BILL OF MATERIAL

ITEM	SIZE	LENGTH	QUANTITY
ANGLE IRON	2" x 2"	2'	2
	1" x 1"	2'	3
	1" x 1"	10'	8
	3" x 2"	4'	4
	1" x 1"	5'	2
	3" x 2"	2'	2
	1" x 1"	10'	2
	3" x 2"	1'	1
2" PIPE SLEEVE	2" DIA	10'	4
2" x 3" WASHERS	2" DIA	10'	4
2" STD. PIPE	4" DIA	10'	1
40# ELBOW, GALV	4" DIA	1	1
40# ELBOW, GALV	4" DIA	1	1
CAP-SCREEN, GALV	4" DIA	1	1

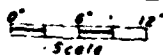
3/8" Dia Bolts
w/ Hex Nut And Washers
9" Long .

1 1/2" Drill 1/2" Dia
Holes



6. Die P,pg

SMALL ANIMAL GUARD DETAILS



AS BUILT

12/12/68

FINCH HOLLOW, LITTLE CHOCONUT &
TROUT BROOK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO 2-E
TRASH PAK, VENTING TUBE AND ANIMAL GUARD

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

. D ZOGRAFOS 6/66
 . D ZOGRAFOS 6/66

N BEAVER 8/66 12 NY-2019-P

POND DRAIN TRASH RACK BILL OF MATERIALS

ITEM	SIZE	LENGTH	QUANTITY
Angle Iron	2" x 2" x 1/4"	1'-3"	2 ✓
	2" x 2" x 1/4"	1'-2"	4 ✓
Steel Riv	7/16"	2'-4"	6 ✓
	7/16"	1'-5"	2 ✓
	7/16"	2'-0"	5 ✓
Anchor Bar	7/8"	2'-4"	6 ✓

POND DRAIN STEEL SCHEDULE

MINIMUM SIZE	LENGTH	TYPE	TOTAL LENGTH

BAR TYPES

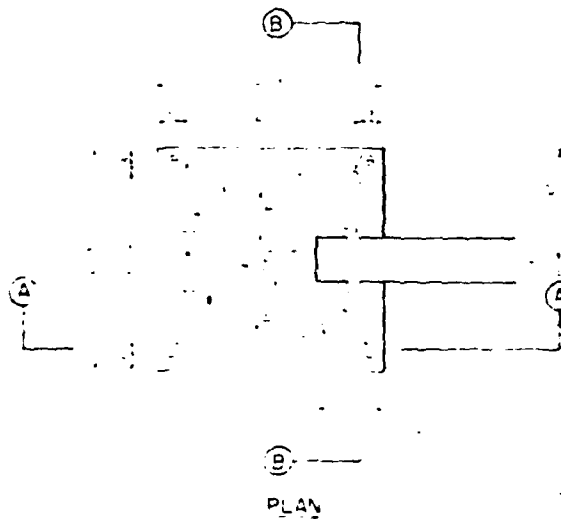
① _____

POND DRAIN INLET QUANTITIES

STEEL
No. 4 Bar 16.2' Lin Ft. 10.2' Lin
CONCRETE
Reinforced 0.7' C. Yds

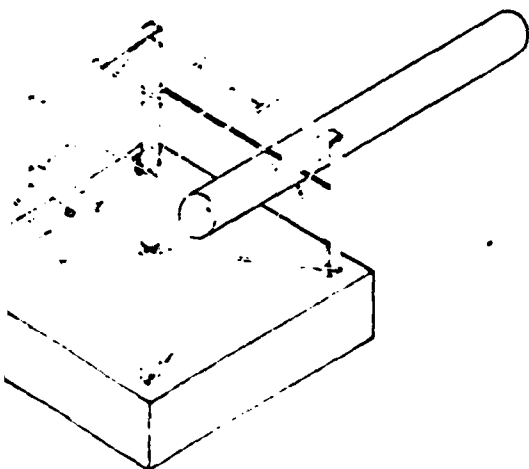
CONSTRUCTION DETAILS

1. All points of contact between angles and between reinforcing bars and angles to be welded.
2. Materials in pond drain trash rack shall conform to Spec. 2 for structural carbon steel plates, shapes and bars.
3. Trash rack shall be painted in accordance with Spec. 22.

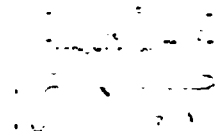


SECTION A-A

ANCH

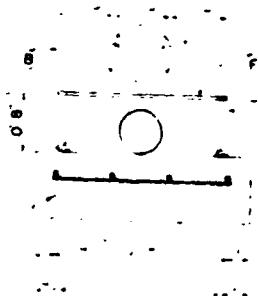


ISOMETRIC
NOT TO SCALE

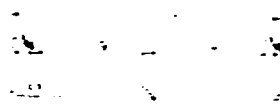


ANCHOR BOLT DETAIL
NOT TO SCALE

SEE PLAN FOR ANCHOR BOLT DETAIL
SEE PLAN FOR ANCHOR BOLT DETAIL



SECTION B-B



ANGLE IRON (A)
NOT TO SCALE

AS BUILT

12/19/68

FINCH HOLLOW, LITTLE CHOCONUT B
TROUT BROOK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO 2-E
LITTLE CHOCONUT CREEK
POND DRAIN INLET DETAILS

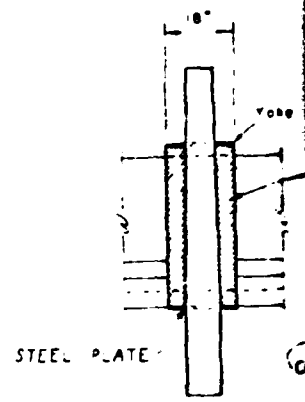
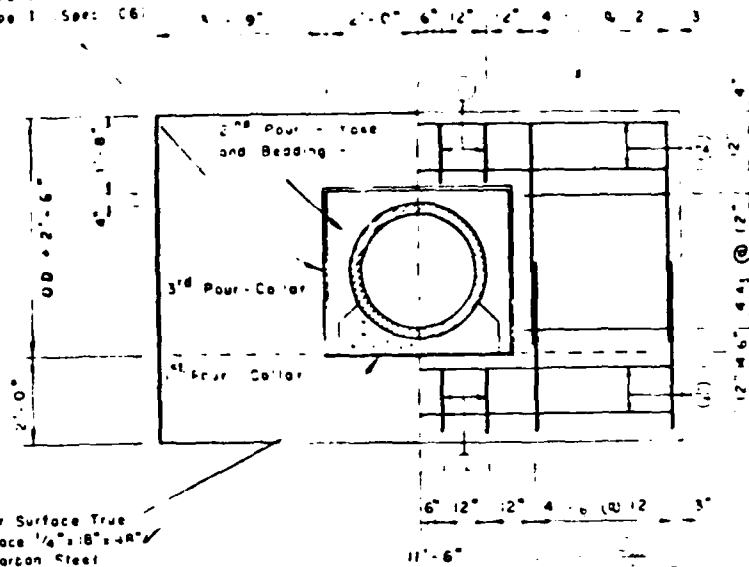
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

NY 1256

10 NY-209-P
12

1/2" Preformed Joint Filler
 18" W. do. Type 1 Spc. C6

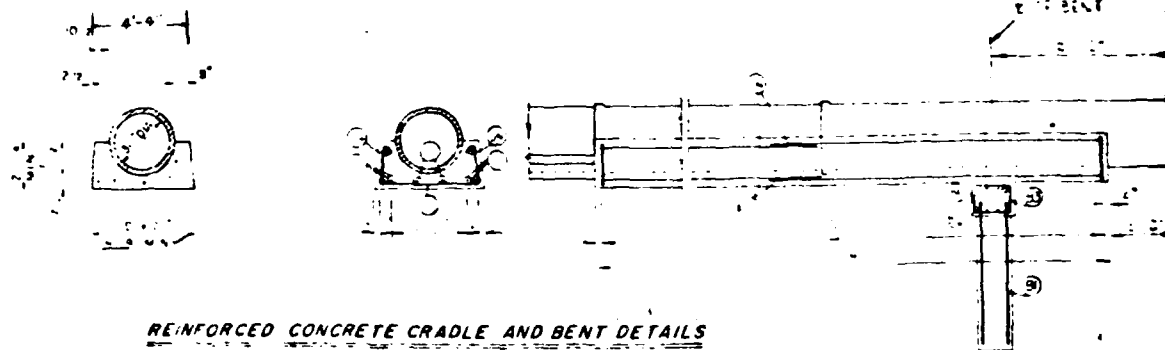
Symmetrical About C



REINFORCED CONCRETE ANTI-SEEP COLLAR

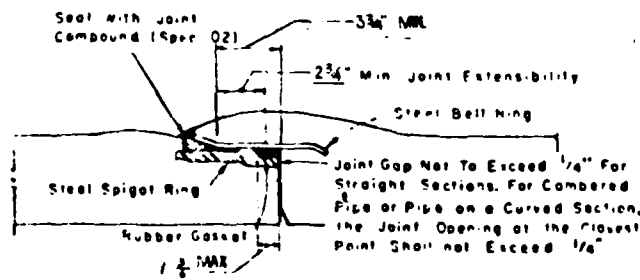
1/4" = 1'-0"
 SCALE

① - Req'd.

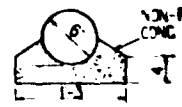


REINFORCED CONCRETE CRADLE AND BENT DETAILS

0 1 2 3 4 5 6 FT
 1/4" = 1'-0"
 SCALE

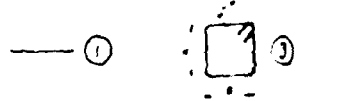


REINFORCED CONCRETE WATER PIPE JOINT



POND DRAIN CONCRETE B

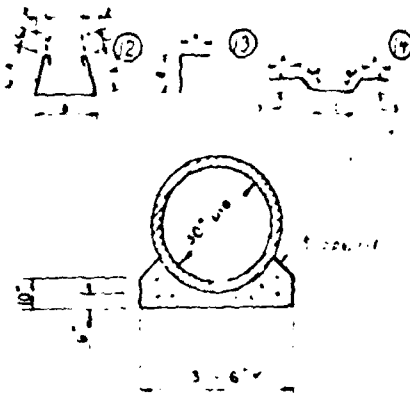
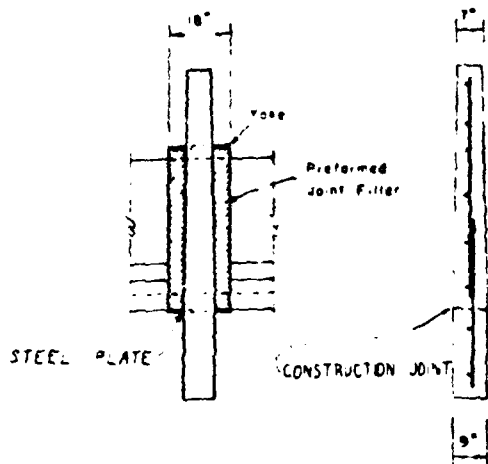
BAR TYPES



ANTI-SEEP COLLAR STEEL SCHEDULE

Weld Size	Length	Type	Quan	Collar	Total	Quan	Total	Length
A-1	4	1	4	28	112	4	112	112
A-2	4	11	4	56	224	4	224	224
A-3	4	3-3	8	56	224	8	224	224
A-4	4	11-0	4	28	112	4	112	112
A-5	4	1-6	4	28	112	4	112	112
A-6	4	3-2	8	56	224	8	224	224

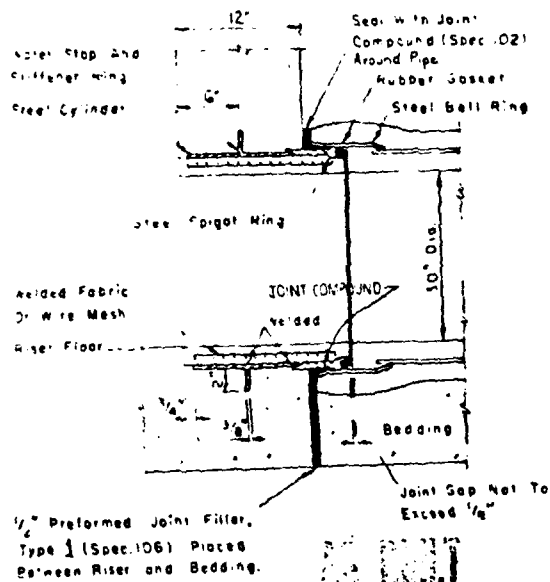
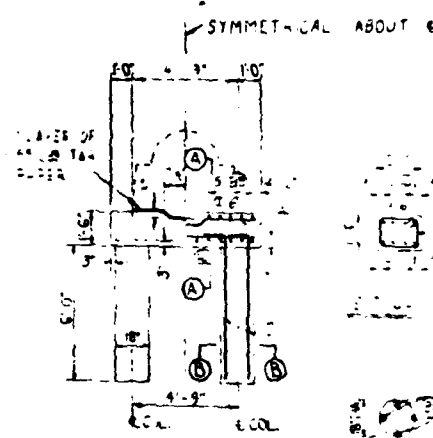
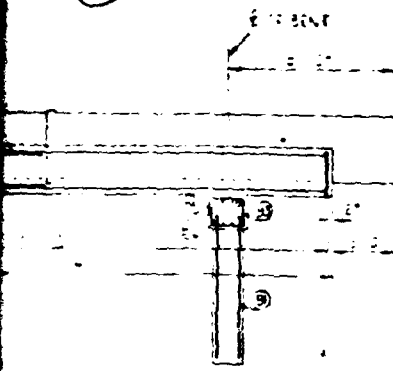
Weld Location	Weld Size	Length	Type	A	B	C	Total Length		
B-1 BENT	8	5	7-7	3	10	6-0	56	✓	
B-2	4	8	6-3	1	8	0	28	✓	
B-3	10	4	6-4	3	0	6-0	84	✓	
B-4	4	5	8-8	4	2-5	0-3	56	✓	
D-1 CRADLE	30	4	8-7	12	8	4-5	0-3	25	✓
D-2	8	9	4-0	1	8	0	28	✓	
D-3	4	4	0-1	1	4	0	16	✓	
D-4	4	7	1-5	1	7	0	28	✓	



CONSTRUCTION NOTES SEE SHEET B

SEEP COLLAR

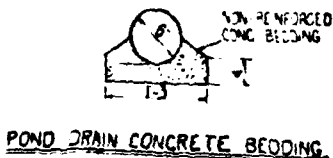
① - Req'd.



TOTAL QUANTITIES COLLAR, YOKE, CRADLE, BEDDING, & BENT

	STEEL	
#4 BARS	470.67 LIN. FT.	935.6 LBS.
#5 BARS	82.67 LIN. FT.	86.2 LBS.
#7 BARS	62.70 LIN. FT.	26.7 LBS.
#8 BARS	25.00 LIN. FT.	66.8 LBS.
#9 BARS	28.20 LIN. FT.	435.2 LBS.

CONCRETE
REINFORCED 22.70 CU. YDS.
NOT REINFORCED 22.39 CU. YDS.



SPIGOT RING WALL FITTING

12/13/68

FINCH HOLLOW, LITTLE CHOCONUT & TROUT BROOK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO. 2-E
LITTLE CHOCONUT CREEK
COLLAR, CRADLE, YOKE, BEDDING, BENT
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

DATE 5/66
DRAWN BY D. IOGRAPOS
CHECKED BY M. BEAMER
DATE 8/66
DRAWING NO. NY-2019-P

