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NATIONAL DAM SAFETY PROGRAM. NANTICOKE CREEK WATERSHED PROJECT --ETC(U)
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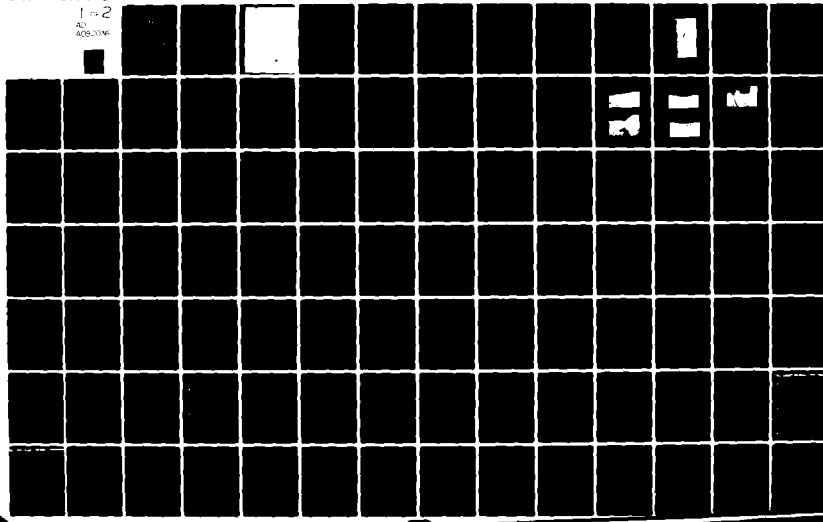

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Susquehanna River Basin, Broome County, New York
Inventory No. 713

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Visual Inspection
Hydrology, Structural Stability
Nanticoke Creek
Broome County
Susquehanna River

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

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

The examination of documents and visual inspection of the Site 10 dam and appurtenant structures did not reveal conditions which constitute a hazard to human life or property.

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The total discharge capacity of the spillways is adequate for the Probable Maximum Flood (PMF).

The following remedial actions are required during this construction season:

1. Repair the eroded areas on the right cut slope of the right auxiliary spillway, at the downstream end of the left auxiliary spillway, and at the left upstream abutment contact. Reseed as required.

2. Reseed the grass vegetation of the auxiliary spillways (slopes and bottoms) where the previous seeding has not been completely established.

3. Remove the debris on the upstream slope of the earth embankment, and the debris in the downstream channel near the outlet of the right auxiliary spillway.

4. Remove the tree and brush growth observed in both auxiliary spillways at the entrances and exits. Provide a program of periodic cutting and mowing of the embankment and auxiliary spillways.

5. Provide a program of periodic inspection and maintenance of the dam and appurtenances, including yearly operation and lubrication of the reservoir drain system. Document this information for future reference. Also, develop an emergency action plan.

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PREFACE

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

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

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

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
NANTICOKE CREEK WATERSHED PROJECT
SITE 10 DAM
I.D. NO. NY 713
(DEC. 85D-3946)
SUSQUEHANNA RIVER BASIN
BROOME COUNTY, NEW YORK

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Nanticoke Creek Watershed Project, Site 10 I.D. No. NY 713
State Located:	New York
County Located:	Broome
Stream:	East Branch of Nanticoke Creek (tributary of Susquehanna River)
Date of Inspection:	July 24, 1980

ASSESSMENT

The examination of documents and visual inspection of the Site 10 dam and appurtenant structures did not reveal conditions which constitute a hazard to human life or property.

The total discharge capacity of the spillways is adequate for the Probable Maximum Flood (PMF).

The following remedial actions are required during this construction season:

1. Repair the eroded areas on the right cut slope of the right auxiliary spillway, at the downstream end of the left auxiliary spillway, and at the left upstream abutment contact. Reseed as required.

2. Reseed the grass vegetation of the auxiliary spillways (slopes and bottoms) where the previous seeding has not been completely established.

3. Remove the debris on the upstream slope of the earth embankment, and the debris in the downstream channel near the outlet of the right auxiliary spillway.

4. Remove the tree and brush growth observed in both auxiliary spillways at the entrances and exits. Provide a program of periodic cutting and mowing of the embankment and auxiliary spillways.

5. Provide a program of periodic inspection and maintenance of the dam and appurtenances, including yearly operation and lubrication of the reservoir drain system. Document this information for future reference. Also, develop an emergency action plan.

George Koch

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

Approved By:

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

Date: 30 Sep 83

Photo #1
Overview of Nanticoke Site 10

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
NANTICOKE CREEK WATERSHED PROJECT - SITE 10
I.D. No. NY 713
D.E.C. #85D-3946
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.

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 the Dam and Appurtenant Structures

The Site 10 dam consists of a 540-foot long zoned earth embankment with auxiliary spillways at both ends of the embankment, located in cut sections beyond the abutments of the embankment. The maximum height of the dam is 58 feet. The embankment has a crest width of 19 feet and an upstream slope of 1 vertical on 3 horizontal. The downstream slope is 1 on 2.5. A 10-foot wide bench was constructed in the upstream slope in the vicinity of the principal spillway.

The auxiliary spillways are vegetated earth channels. The left channel has a bottom width of 125 feet, and the right channel is 45 feet wide. Side slopes are 1 on 2.5.

The principal spillway is a rectangular concrete riser which extends above the upstream slope near its toe. The riser is topped by a triangular trash rack, the sides of which form a drop inlet, which is utilized during high reservoir levels. Under low flow conditions, a 12 inch by 2 feet 7 inch rectangular low stage inlet in the upstream side of the riser controls the reservoir level.

A 42-inch diameter reinforced concrete pipe controls the flow between the riser and the impact basin located at the toe of the dam. A 16-inch diameter cast-iron pipe, with a manually operated slide gate, the controls of which are located atop the riser, serve as the reservoir drain system.

b. Location
The dam is located on the East Branch of Nanticoke Creek a tributary of the Susquehanna River, approximately 2.5 miles northeast of the Village of Nanticoke.

c. Size Classification
The dam is 58 feet high and is classified as "intermediate" in size (40 to 100 feet in height).

d. Hazard Classification
The dam is classified as high hazard, because of its location above the homes along County Route #26.

e. Ownership
The dam is owned and operated by the County of Broome, New York.

f. Purpose of the Dam
The dam is a flood water retarding structure.

g. Design and Construction History
The dam was designed by the U.S. Department of Agriculture, Soil Conservatio Service (SCS). Construction of the dam was completed in 1979. The SCS office for Broome County, located at the Broome County Airport, has all design and construction information.

h. Normal Operating Procedures
Normal flows are discharged through the principal spillway. This structure has sufficient capacity to store and discharge a 100-year flood without use of the auxiliary spillways. Flow in excess of the 100-year storm will be discharged through the auxiliary spillways.

1.3 PERTINENT DATA

a. Drainage Area (sq. mi.)	4.5
b. Discharging at Dam (cfs)	
Principal spillway at maximum high water	320
Principal spillway at auxiliary spillway crest elev.	300
Reservoir drain to principal spillway crest elev.	25
Total spillway capacity at maximum high water	11,546
c. Elevation (USGS Datum)	
Top of dam	1134.6
Auxiliary spillway crest	1127.0
Principal spillway crest	1112.9
Low stage inlet, invert elev.	1092.6
Reservoir drain, invert elev.	1081.0

d. Reservoir (Acres)

Surface area at top of dam	42
Surface area at crest of auxiliary spillway	33
Surface area at crest of principal spillway	20

e. Storage Capacity (Acre-Feet)

Top of dam	899
Auxiliary spillway crest	618
Principal spillway crest	242

f. Dam

Embankment type: homogeneous with keyed earth cutoff trench and drain parallel to axis of dam.

Embankment length (ft.)	520

Slopes	upstream	1 vertical on 3 horizontal
	downstream	1 vertical on 2.5 horizontal

Crest width (ft.)	19

g. Principal Spillway

Type: Uncontrolled, reinforced concrete 2 stage drop inlet (3.5 x 10.5 ft.) rising 35.0 feet above the 42-inch diameter reinforced concrete pipe invert; length of pipe 298. feet; rip rapped plunge pool.

Weir length (ft.)	21

h. Auxiliary Spillway (Emergency)

Type: Two grass-lined channels having trapezoidal cross sections.

Bottom width (ft.)	
Eastern channel	210
Western channel	100
Side slopes (vert.:horiz.)	1:2.5
Length of level section (in profile) (ft.)	50
Exit slope (ft/ft)	0.025

i. Reservoir Drain

Type: 16-inch diameter cast-iron pipe with reinforced concrete inlet.

Control: Manually operated vertical slide gate mounted along the inside of the principal spillway riser.

SECTION 2: ENGINEERING DATA

2.1 GEOLOGY

The Nanticoke Creek Watershed Project Dam No. 10 is located in the glaciated portion of the "Appalachian Uplands" (northern extreme of the Appalachian Plateau) physiographic province of New York State. These uplands were formed by dissection of the uplifted but flat lying sandstones and shales of the middle and upper Devonian Catskill Delta. The plateau surface is represented by flat-topped divides with drainage generally southwest toward the Susquehanna River system.

Glacial cover is generally thin, although some north-south valleys are so thick that they are completely buried. The present surficial deposits have resulted primarily from glaciations during the Cenozoic Era, the last of which was the Wisconsin glaciation, approximately 11,000 years ago.

2.2 SUBSURFACE INVESTIGATION

A subsurface investigation was conducted by the Soil Conservation Service in 1970. This program consisted of 21 drill holes and 20 test pits at locations along the dam, auxiliary spillways, structural elements, and borrow area. Applicable subsurface information is included in Appendix F.

In general, the soils in the vicinity of the dam are of glacial till or glacial lacustrine origin, and are silty gravel, clayey gravels, and sandy silts over shale bedrock. The permeability of these soils is low.

2.3 EMBANKMENT AND APPURTENANT STRUCTURES

The dam was designed and constructed under the supervision of the Soil Conservation Service. "As-Built" drawings of this dam are on file at the SCS office in Broome County. Selected drawings of the dam and appurtenances are included in Appendix F. The dam is composed of zoned earth fill, the maximum height of which is 58 feet, a 22 foot wide cut-off trench having side slopes of 1 on 2, and a foundation drain parallel to the axis of the dam approximately 100 feet downstream from the centerline. A reinforced concrete riser serves as the principal spillway and 2 vegetated channels serve as auxiliary spillways.

2.4 CONSTRUCTION RECORDS

Complete construction records are available from the SCS office in Broome County. No major construction changes were instituted.

2.5 OPERATION RECORD

Since the dam is an ungated floodwater retarding structure, no operating records are maintained regarding water levels. During periods of extreme rainfall, SCS personnel do monitor the reservoir.

2.6 EVALUATION OF DATA

The data presented in this report has been compiled from information obtained from Mr. Gary Page, Project Engineer for SCS in Broome County, and Mr. Donald Lake, Head of the SCS Design Section in Syracuse, New York. This information appears to be adequate and reliable for Phase I Inspection purposes.

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection of Dam 10 was conducted on July 24, 1980. The weather was cloudy and the temperature ranged in the 80's. The water surface was approximating the invert of the low stage inlet on the principal spillway riser.

b. Embankment

No signs of distress were observed in the earth embankment, and no evidence of seepage, misalignment, sloughing, subsidence, depressions, surface cracking, or undesirable growth were noted in connection with the embankment. While no riprap was in use on the upstream slope for wave protection, little erosion was apparent. Slight erosion was observed at the left upstream abutment contact. The maximum depth of erosion was 6 inches and extended from the waterline approximately 50 feet up the abutment contact. Some debris was observed on the upstream slope approximately one-third up the slope and appeared to result from a previous storm.

An internal drainage system composed of 2-10 inch diameter pipes surrounded by "drain fill" and extending parallel to the axis of the dam provide drainage at the embankment-subgrade contact. These pipes exit through the concrete walls of the impact basin. No discharge was apparent from these pipes.

c. Principal Spillway

The principal spillway consists of a vertical drop inlet structure, a reinforced concrete pipe through the embankment, a plunge pool at the toe of the embankment, and an outlet channel. These components appear to be in satisfactory condition.

d. Auxiliary Spillways

The two vegetated auxiliary spillways in earth cut sections are located near the abutments of the embankment. The following problem areas were observed:

1. Both channels require mowing of vegetative growth and removal of the trees at the entrance and exit of both auxiliary spillways.

2. The side slopes of the auxiliary spillway channels have not completely established vegetation. Erosion of the left cut slope was noted above a rock cut near the entrance of the right auxiliary spillway. In addition, a zone of seepage (from the adjacent hillside) has caused sloughing and erosion at the downstream end of the right slope of the right auxiliary spillway. Runoff from the left hillside has eroded the outlet end of the left auxiliary spillway.

e. Reservoir Drain

The 12-inch diameter reservoir drain and manually operated slide gate may be used to lower the reservoir. The slide gate control mechanism is located at the top of the riser. This system is reported to be operational.

f. Downstream Channel

The downstream channel below the plunge pool is riprapped and joins the original Nanticoke Creek channel near the outlet. The channel appears to be stable in the near vicinity of the dam. Some debris was noted in the channel resulting from erosion of a side channel stream near the outlet of the right auxiliary spillway.

g. Reservoir

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

3.2 EVALUATION

The problem areas observed during the inspection are considered minor in nature, requiring only limited remedial action. The required remedial action is as follows:

1. Erosion observed at the downstream end of the left auxiliary spillway, and on the right side of the right auxiliary spillway (above the rock cut, and at the outlet end) requires repair and reseeding.

2. The grass vegetation has not established itself properly in many areas (particularly on the slopes and bottoms of the auxiliary spillways) and requires reseeding.

3. Slight erosion was noted at the left upstream abutment contact. This area requires repair and reseeding.

4. Debris on the upstream slope of the embankment should be removed.

5. Debris in the downstream channel, from a side channel stream, requires removal.

6. Extensive vegetation was observed in both auxiliary spillways at each end. This vegetation must be removed. Provide a program of periodic cutting and mowing of the embankment and auxiliary spillway surfaces.

7. Provide a program of periodic inspection and maintenance of the dam and appurtenances, including yearly operation and lubrication of the reservoir drain system. Document this information for future reference. Also develop an emergency action plan.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The normal water surface elevation is approximated by the low stage inlet elevation. Downstream flows are limited by the 42-inch diameter principal spillway pipe, except during extremely heavy runoff when the auxiliary spillways are in service. The dam provides 590 acre feet of flood storage between normal water level and the crest of the auxiliary spillways.

4.2 MAINTENANCE OF THE DAM

The dam is maintained by the County of Broome, New York. Maintenance is considered satisfactory.

4.3 WARNING SYSTEM IN EFFECT

There is no warning system in effect or in preparation.

4.4 EVALUATION

The dam and appurtenant structures have been maintained in a satisfactory condition.

SECTION 5: HYDRAULIC/HYDROLOGIC

5.1 DRAINAGE AREA CHARACTERISTICS

The Nanticoke Creek Dam Site 10 is located on an unamed tributary of the East Branch of the Nanticoke, Susquehanna River Basin. The drainage area contributing to the site is 4.53 square miles. The watershed consists of woodlands and fields in a rural location. Relief ranges from moderate to steep.

5.2 ANALYSIS CRITERIA

The analysis of the spillway capacity of the dam and storage of the reservoir was performed using the Corps of Engineers HEC-1 computer model. The unit hydrograph was defined by the Snyder Synthetic Unit Hydrograph method and the Modified Puls routing procedure was incorporated. The Probable Maximum Precipitation (PMP) used was 21.0 inches (24 hrs., 200 sq. mi.) from Hydrometeorological Report No. 33. Several floods were selected (%'s PMF) for analysis in accordance with recommended guidelines of the Corps of Engineers. The PMF inflow of 7404. cfs, was routed through the reservoir and the peak outflow was determined to be 7367 cfs.

5.3 SPILLWAY CAPACITY

The service spillway consists of a 3.5 x 10.5 feet drop inlet structure (21' weir length) emptying into a 42 inch diameter reinforced concrete pipe. A riprap lined plunge pool is located at the toe of the dam for energy dissipation. The capacities at emergency spillway crest and top of dam are 300. cfs and 520 cfs respectively. The emergency spillway consists of two grass lined trapezoidal channels, one on either abutment. The left channel has a bottom width of 125 feet and the right has a bottom width of 45 feet. At top of dam they bring the total discharge capacity to 11,546 cfs.

5.4 RESERVOIR CAPACITY

The reservoir capacities at the crest of the spillway, and at the top of dam are 242 and 399 acre feet respectively. Surcharge storage, spillway crest to top of dam, is 657 acre feet or an equivalent runoff of 2.72 inches.

5.5 FLOODS OF RECORD

At the time of inspection the water surface elevation had not yet reached the crest of the riser.

5.6 OVERTOPPING POTENTIAL

The maximum capacity of the spillways is 11,546 cfs before overtopping of the dam would occur. This capacity results in the ability to pass the full PMF of 7404 cfs, and greatly attenuate storms of lesser magnitude.

5.7 EVALUATION

The spillway is adequate to pass the full PMF, with approximately 2 feet of freeboard.

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

No signs of distress were observed in connection with the earth embankment.

b. Design and Construction Data

A stability analysis was conducted by SCS during the design of the dam. The analyses were performed using the modified swedish circle method. The soil parameters assumed were γ = 119 & 132, γsub = 56.5 & 69.5, ϕ = 24° & 25°, c = 850 and 825. The results of the stability analyses area as follows:

Condition	Minimum Factor of Safety
1. Upstream slope = 1:3, full drawdown no berm	1.63
2. Downstream slope = 1:2.5, steady state condition, no berm	1.92

The calculated factors of safety for this dam are in excess of the minimum factors recommended by the Corps of Engineers. The dam is, therefore, considered to have adequate factors of safety for stability.

A summary of the analysis is included in Appendix E.

c. Post Construction Changes

No post construction changes were instituted.

d. Seismic Stability

The dam is located in Seismic Zone 1. Therefore, a seismic analysis is not warrented.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

The Phase I Inspection of the Nanticoke Creek Dam Site 10 did not reveal conditions which constitute a hazard to human life or property. The earth embankment is not considered to be unstable and appears capable of retarding floodwaters resulting from the PMF.

b. Adequacy of Information

Information reviewed for Phase I Inspection purposes is considered adequate.

c. Need for Additional Investigations

No additional investigations are required at this time.

7.2 RECOMMENDED MEASURES

1. Repair the eroded areas on the right cut slope of the right auxiliary spillway, at the downstream end of the left auxiliary spillway, and at the left upstream abutment contact. Reseed as required.

2. Reseed the grass vegetation of the auxiliary spillways (slopes and bottoms) where the previous seeding has not been completely established.

3. Remove the debris on the upstream slope of the earth embankment, and the debris in the downstream channel near the outlet of the right auxiliary spillway.

4. Remove the tree and brush growth observed in both auxiliary spillways at the entrances and exits. Provide a program of periodic cutting and mowing of the embankment and auxiliary spillways.

5. Provide a program of periodic inspection and maintenance of the dam and appurtenances, including yearly operation and lubrication of the reservoir drain system. Document this information for future reference. Also, develop an emergency action plan for notification of residents and proper authorities in the event of hazardous conditions.

APPENDIX A

PHOTOGRAPHS

Photo #2
Upstream Face

Photo #3
Plunge Pool & Downstream Channel

Photo #4
Right Auxiliary Spillway

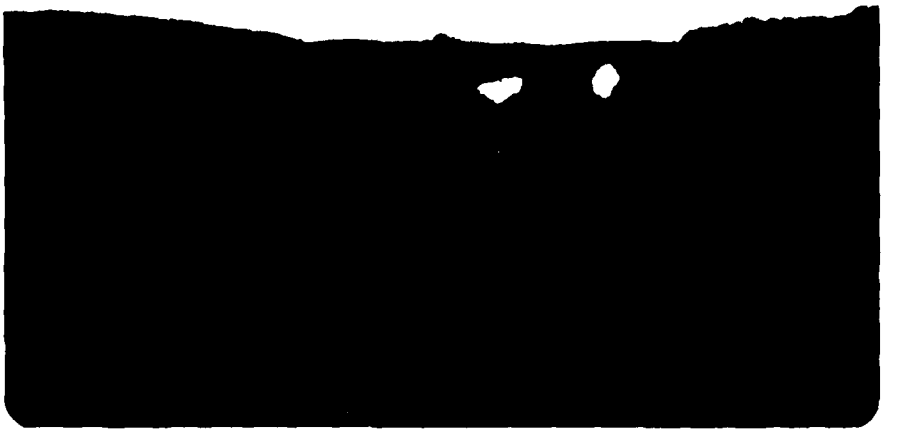


Photo #5
Left Auxiliary Spillway

Photo #6
Erosion at Outlet of Left
Auxiliary Spillway

APPENDIX B

VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam Nanticoke S. de 10

Fed. I.D. # NY 713 DEC Dam No. 85 D - 3946

River Basin Susquehanna

Location: Town Nanticoke County Broome

Stream Name t.b. of E. Branch Nanticoke Ck

Tributary of Susquehanna

Latitude (N) 42° 17.7' Longitude (W) 76° 0.8'

Type of Dam Zoned earth

Hazard Category "C"

Date(s) of Inspection July 24, 1980

Weather Conditions Cloudy 80's

Reservoir Level at Time of Inspection approx at low stage elev.

b. Inspection Personnel J.C. Veitch, R.P. McCarty

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

Gary Page - SCS Broome County Airport

Donald Lake - SCS Syracuse

d. History:

Date Constructed 1979 Date(s) Reconstructed —

Designer SCS

Constructed By Bestway Construction Inc. Endicott N.Y.
Earth work: Howard Jones Construction Co. Appalachin N.Y.

Owner
Broome County, N.Y.

2) Embankment

a. Characteristics

(1) Embankment Material Glacial till

(2) Cutoff Type Earth

(3) Impervious Core Zoned embankment

(4) Internal Drainage System standard SCS design w/ perforated pipes surrounded by drain fill material

(5) Miscellaneous

b. Crest

(1) Vertical Alignment good

(2) Horizontal Alignment good

(3) Surface Cracks none

(4) Miscellaneous

c. Upstream Slope

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

(2) Undesirable Growth or Debris, Animal Burrows

some debris & stone on slope from past storm

(3) Sloughing, Subsidence or Depressions

none

(4) Slope Protection none

(5) Surface Cracks or Movement at Toe unobservable

d. Downstream Slope

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

(2) Undesirable Growth or Debris, Animal Burrows

none

(3) Sloughing, Subsidence or Depressions

none

(4) Surface Cracks or Movement at Toe

none

(5) Seepage none

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

riprapped at abutm't contacts

(7) Condition Around Outlet Structure

good

(8) Seepage Beyond Toe none evident

e. Abutments - Embankment Contact

(1) Erosion at Contact left upstream contact is max. 6" erosion depth from water line ≈ 50' up slope

(2) Seepage Along Contact

none

3) Drainage System

a. Description of System 2 - 10" diam pipes surrounded by dam fill material line parallel to axis of dam & outlets along service (spillway) pipe

b. Condition of System appears good

c. Discharge from Drainage System none

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

none

5) Reservoir

a. Slopes good

b. Sedimentation none reported

c. Unusual Conditions Which Affect Dam

6) Area Downstream of Dam

a. Downstream Hazard (No. of Homes, Highways, etc.)

homes along co rt # 26

b. Seepage, Unusual Growth

none

c. Evidence of Movement Beyond Toe of Dam

none

d. Condition of Downstream Channel some debris (stone) in channel right side from stream at outlet of rt. auxiliary

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

a. General service spillway under dam - riser, 42" concrete pipe & inport basin
2 vegetated earth channels at abutments

b. Condition of Service Spillway

good

c. Condition of Auxiliary Spillway trees in both ends of both auxiliaries vegetation not established at all locations downstream end eroded of left aux from hillside runoff right cut slope of rt. aux. sloughed & eroded at outlet from nearby springs on hillside - also above rock cut.

d. Condition of Discharge Conveyance Channel

generally good

8) Reservoir Drain/Outlet

Type: Pipe ✓ Conduit _____ Other _____

Material: Concrete _____ Metal ✓ Other _____

Size: 16" Length _____

Invert Elevations: Entrance _____ Exit _____

Physical Condition (Describe): Unobservable ✓

Material: _____

Joints: _____ Alignment _____

Structural Integrity: _____

Hydraulic Capability: _____

Means of Control: Gate ✓ Valve _____ Uncontrolled _____

Operation: Operable ✓ Inoperable _____ Other _____

Present Condition (Describe): good condition

9) Structural

a. Concrete Surfaces good condition

b. Structural Cracking none evident

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

d. Junctions with Abutments or Embankments
good condition

e. Drains - Foundation, Joint, Face
foundation drains functional

f. Water Passages, Conduits, Sluices
good condition

g. Seepage or Leakage none evident

h. Joints - Construction, etc. _____

good condition

i. Foundation unobservable

j. Abutments N/A

k. Control Gates operable

l. Approach & Outlet Channels N/A

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

plunge pool riprapped - good condition

n. Intake Structures good condition

o. Stability appears adequate

p. Miscellaneous _____

APPENDIX C

HYDROLOGIC / HYDRAULIC

ENGINEERING DATA AND COMPUTATIONS

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

AREA-CAPACITY DATA:

	Elevation (ft.)	Surface Area (acres)	Storage Capacity (acre-ft.)
1) Top of Dam	1134.6	41.8	816.5
2) Design High Water (Max. Design Pool)	1130.4	36.9	734.5
3) Auxiliary Spillway Crest	1127.0	33.3	618.0
4) Pool Level with Flashboards	—	—	—
5) Service Spillway Crest	1112.9	19.8	241.8

DISCHARGES

	Volume (cfs)
1) Average Daily	5.
2) Spillway @ Maximum High Water [illegible] (Tot [illegible])	14,546.
3) Spillway @ Design High Water [illegible]	2,967.
4) Spillway @ Auxiliary Spillway Crest Elevation	301.
5) Low Level Outlet	50
6) Total (of all facilities) @ Maximum High Water	11,000
7) Maximum Known Flood	— Not to second stage.
8) At Time of Inspection	1.

CREST: ELEVATION: 1134.6

Type: Zoned Compacted Earth Fill

Width: 15 Length: 520'

Spillover [illegible] Service / [illegible] (2)

Location [illegible] / left & right · ABUT

SPILLWAY:

SERVICE		AUXILIARY
1115.9	Elevation	1127.0
[illegible] (R.C.)	Type	Grass lined channel (2)
21' with [illegible]	Width	170' [illegible]
	Type of Control	
✓	Uncontrolled	✓
	Controlled:	
—	Type (Flashboards; gate)	—
	Number	
	Size/Length	
	Invert Material	Grass lined
	Anticipated Length of operating service	[illegible]
200' conduit	Chute Length	
[illegible]' V	Height Between Spillway Crest & Approach Channel Invert (Weir Flow)	2.1 [illegible]

HYDROMETEROLOGICAL GAGES:

Type : _____

Location: _____

Records:

Date - _____

Max. Reading - _____

FLOOD WATER CONTROL SYSTEM:

Warning System: NONE

Method of Controlled Releases (mechanisms):

MOTION RESERVOIR DRAIN

DRAINAGE AREA: 4.53 mi^2.

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: RURAL [illegible]

Terrain - Relief: [illegible]

Surface - Soil: [illegible]

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

[illegible] control - Slope [illegible]

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

NONE

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

NONE

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

Location: NONE

Elevation:

Reservoir:

Length @ Maximum Pool [illegible]' ~~(Miles)~~

Length of Shoreline (@ Spillway Crest) [illegible]' ~~(Miles)~~

[illegible]

[illegible]

[illegible] = 4.53 mi^2 [illegible]

[illegible] = 8.1" [illegible] .15 mi

[illegible] = 4.9 [illegible] 1.78 mi

t_p = C_t ([illegible]) [illegible] .45 hr

t_r = 0.63 *

T_p = t_p + .5t_r [illegible] 3.75 hs.

[illegible]	[illegible] (acre)	[illegible]
[illegible]	0	0
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

[illegible]

```
*********************************                                                  *********************************
FLOOD HYDROGRAPH PACKAGE (HEC-1)                                                   NEW YORK STATE
DAM SAFETY VERSION      JULY 1978                                                  DEPT OF ENVIRONMENTAL CONSERVATION
  LAST MODIFICATION  26 FEB 79                                                     FLOOD PROTECTION BUREAU
  MODIFIED FOR HONEYWELL APR 79                                                    *********************************
*********************************
    1          A1   NANTICOKE CREEK  SITE 10
    2          A2  PHASE I
    3          A3  PMF
    4          B    200       0      15       0       0       0       0       0       0       0
    5          B1     5
    6          J      1       6       1
    7          J1    .2      .4      .5      .6      .8       1
    8          K      0       1                       2               1
    9          K1   INFLOW FROM BASIN
   10          M      1       1    4.53
   11          P           21.0     111     123     133     142
   12          T                                                       1      .1
   13          W   3.75    .625
   14          X   -2.0    -.05       1
   15          K      1       1                       2               1
   16          K1   ROUTE THROUGH RESERVOIR
   17          Y                               1       1
   18          Y1     1                                          -1112.9      -1
   19          Y41092.6  1112.9  1127.0  1130.4  1134.6
   20          Y5            55     301    2967   11546
   21          $S            28     242     618     735     899
   22          $E  1077  1092.6  1112.9  1127.0  1130.4  1134.6
   23          $$1112.9
   24          $D1134.6     2.7     1.5     520
   25          K     99
   26          A
   27          A
   28          A
   29          A
   30          A
```

```
PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS
        RUNOFF HYDROGRAPH AT          1
        ROUTE HYDROGRAPH TO           1
        END OF NETWORK
```

```
*********************************                                    *********************************
FLOOD HYDROGRAPH PACKAGE (HEC-1)                                    NEW YORK STATE
DAM SAFETY VERSION      JULY 1978                                   DEPT OF ENVIRONMENTAL CONSERVATION
  LAST MODIFICATION  26 FEB 79                                      FLOOD PROTECTION BUREAU
  MODIFIED FOR HONEYWELL APR 79
*********************************                                    *********************************

RUN  DATE 06/08/80
                    NANTICOKE CREEK  SITE 10
                   PHASE I
                   PMF

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

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


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

                                  SUB-AREA RUNOFF COMPUTATION

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

                                        HYDROGRAPH DATA
          IHYDG     IUHG    TAREA     SNAP    TRSDA    TRSPC    RATIO    ISNOW    ISAME    LOCAL
              1        1     4.53     0.       4.53     0.       0.        0        0        0

                                          PRECIP DATA
                   SPFE      PMS       R6      R12      R24      R48      R72      R96
                   0.      21.00   111.00   123.00   133.00   142.00     0.       0.
TRSPC COMPUTED BY THE PROGRAM IS 0.600

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

                                      UNIT HYDROGRAPH DATA
                                 TP=  3.75    CP=0.63    NTA=  0

                                        RECESSION DATA
                          STRTQ=   -2.00    QRCSN=   -0.05    RTIOR= 1.00
APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC=16.37 AND R=14.06 INTERVALS

          UNIT HYDROGRAPH 84 END-OF-PERIOD ORDINATES, LAG=   3.73 HOURS, CP= 0.62  VOL= 1.00
          9.       32.       66.      106.      150.      197.      246.      297.      348.      394.
        432.      461.      483.      497.      502.      497.      477.      446.      415.      387.
        360.      335.      312.      291.      271.      252.      235.      219.      204.      190.
        177.      165.      153.      143.      133.      124.      115.      107.      100.       93.
         87.       81.       75.       70.       65.       61.       57.       53.       49.       46.
         43.       40.       37.       34.       32.       30.       28.       26.       24.       22.
         21.       19.       18.       17.       16.       15.       14.       13.       12.       11.
         10.       10.        9.        8.        3.        7.        7.        6.        6.        5.
```

C

END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1.01	0.15	1	0.00	0.	0.00	9.	1.02	1.15	101	0.03	0.00	0.03	37.
1.01	0.30	2	0.00	0.	0.00	9.	1.02	1.30	102	0.03	0.00	0.03	36.
1.01	0.45	3	0.00	0.	0.00	9.	1.02	1.45	103	0.03	0.00	0.03	35.
1.01	1.00	4	0.00	0.	0.00	9.	1.02	2.00	104	0.03	0.00	0.03	34.
1.01	1.15	5	0.00	0.	0.00	9.	1.02	2.15	105	0.03	0.00	0.03	33.
1.01	1.30	6	0.00	0.	0.00	9.	1.02	2.30	106	0.03	0.00	0.03	33.
1.01	1.45	7	0.00	0.	0.00	9.	1.02	2.45	107	0.03	0.00	0.03	33.
1.01	2.00	8	0.00	0.	0.00	9.	1.02	3.00	108	0.03	0.00	0.03	33.
1.01	2.15	9	0.00	0.	0.00	9.	1.02	3.15	109	0.03	0.00	0.03	34.
1.01	2.30	10	0.00	0.	0.00	9.	1.02	3.30	110	0.03	0.00	0.03	34.
1.01	2.45	11	0.00	0.	0.00	9.	1.02	3.45	111	0.03	0.00	0.03	35.
1.01	3.00	12	0.00	0.	0.00	9.	1.02	4.00	112	0.03	0.00	0.03	35.
1.01	3.15	13	0.00	0.	0.00	9.	1.02	4.15	113	0.03	0.00	0.03	36.
1.01	3.30	14	0.00	0.	0.00	9.	1.02	4.30	114	0.03	0.00	0.03	37.
1.01	3.45	15	0.00	0.	0.00	9.	1.02	4.45	115	0.03	0.00	0.03	37.
1.01	4.00	16	0.00	0.	0.00	9.	1.02	5.00	116	0.03	0.00	0.03	38.
1.01	4.15	17	0.00	0.	0.00	9.	1.02	5.15	117	0.03	0.00	0.03	38.
1.01	4.30	18	0.00	0.	0.00	9.	1.02	5.30	118	0.03	0.00	0.03	38.
1.01	4.45	19	0.00	0.	0.00	9.	1.02	5.45	119	0.03	0.00	0.03	39.
1.01	5.00	20	0.00	0.	0.00	9.	1.02	6.00	120	0.03	0.00	0.03	39.
1.01	5.15	21	0.00	0.	0.00	9.	1.02	6.15	121	0.03	0.06	0.03	40.
1.01	5.30	22	0.00	0.	0.00	9.	1.02	6.30	122	0.03	0.06	0.03	42.
1.01	5.45	23	0.00	0.	0.00	9.	1.02	6.45	123	0.08	0.06	0.03	46.
1.01	6.00	24	0.00	0.	0.00	9.	1.02	7.00	124	0.08	0.06	0.03	52.
1.01	6.15	25	0.01	0.	0.01	9.	1.02	7.15	125	0.08	0.06	0.03	61.
1.01	6.30	26	0.01	0.	0.01	9.	1.02	7.30	126	0.08	0.06	0.03	72.
1.01	6.45	27	0.01	0.	0.01	9.	1.02	7.45	127	0.08	0.06	0.03	86.
1.01	7.00	28	0.01	0.	0.01	9.	1.02	8.00	128	0.08	0.06	0.03	103.
1.01	7.15	29	0.01	0.	0.01	9.	1.02	8.15	129	0.08	0.06	0.03	123.
1.01	7.30	30	0.01	0.	0.01	9.	1.02	8.30	130	0.08	0.06	0.03	145.
1.01	7.45	31	0.01	0.	0.01	9.	1.02	8.45	131	0.08	0.06	0.03	169.
1.01	8.00	32	0.01	0.	0.01	9.	1.02	9.00	132	0.03	0.06	0.03	195.
1.01	8.15	33	0.01	0.	0.01	9.	1.02	9.15	133	0.08	0.06	0.03	223.
1.01	8.30	34	0.01	0.	0.01	9.	1.02	9.30	134	0.08	0.06	0.03	251.
1.01	8.45	35	0.01	0.	0.01	9.	1.02	9.45	135	0.08	0.06	0.03	279.
1.01	9.00	36	0.01	0.	0.01	9.	1.02	10.00	136	0.08	0.06	0.03	307.
1.01	9.15	37	0.01	0.	0.01	9.	1.02	10.15	137	0.08	0.06	0.03	334.
1.01	9.30	38	0.01	0.	0.01	9.	1.02	10.30	138	0.08	0.06	0.03	359.
1.01	9.45	39	0.01	0.	0.01	9.	1.02	10.45	139	0.08	0.06	0.03	382.
1.01	10.00	40	0.01	0.	0.01	9.	1.02	11.00	140	0.08	0.06	0.03	404.
1.01	10.15	41	0.01	0.	0.01	9.	1.02	11.15	141	0.08	0.06	0.03	424.
1.01	10.30	42	0.01	0.	0.01	9.	1.02	11.30	142	0.08	0.06	0.03	443.
1.01	10.45	43	0.01	0.	0.01	9.	1.02	11.45	143	0.08	0.06	0.03	460.
1.01	11.00	44	0.01	0.	0.01	9.	1.02	12.00	144	0.08	0.06	0.03	477.
1.01	11.15	45	0.01	0.	0.01	9.	1.02	12.15	145	0.47	0.44	0.02	495.
1.01	11.30	46	0.01	0.	0.01	9.	1.02	12.30	146	0.47	0.44	0.02	522.
1.01	11.45	47	0.01	0.	0.01	9.	1.02	12.45	147	0.47	0.44	0.02	560.
1.01	12.00	48	0.01	0.	0.01	9.	1.02	13.00	148	0.47	0.44	0.02	613.
1.01	12.15	49	0.03	0.	0.03	9.	1.02	13.15	149	0.56	0.53	0.02	682.
1.01	12.30	50	0.03	0.	0.03	9.	1.02	13.30	150	0.56	0.53	0.02	771.
1.01	12.45	51	0.03	0.	0.03	9.	1.02	13.45	151	0.56	0.53	0.02	881.
1.01	13.00	52	0.03	0.	0.03	9.	1.02	14.00	152	0.56	0.53	0.02	1014.
1.01	13.15	53	0.04	0.	0.04	9.	1.02	14.15	153	0.70	0.67	0.02	1171.
1.01	13.30	54	0.04	0.	0.04	9.	1.02	14.30	154	0.70	0.67	0.02	1352.
1.01	13.45	55	0.04	0.	0.04	9.	1.02	14.45	155	0.70	0.67	0.02	1557.
1.01	14.00	56	0.04	0.	0.04	9.	1.02	15.00	156	0.70	0.67	0.02	1783.
1.01	14.15	57	0.05	0.	0.05	9.	1.02	15.15	157	0.71	0.68	0.02	2027.
1.01	14.30	58	0.05	0.	0.05	9.	1.02	15.30	158	1.42	1.39	0.03	2294.
1.01	14.45	59	0.05	0.	0.05	9.	1.02	15.45	159	3.97	3.94	0.03	2612.
1.01	15.00	60	0.05	0.	0.05	9.	1.02	16.00	160	0.99	0.97	0.02	2996.
1.01	15.15	61	0.05	0.	0.05	9.	1.02	16.15	161	0.65	0.63	0.02	3423.
1.01	15.30	62	0.10	0.	0.10	9.	1.02	16.30	162	0.65	0.63	0.02	3670.

1.01	16.15	65	0.04	0.02	0.03	14.
1.01	16.30	66	0.04	0.02	0.03	18.
1.01	16.45	67	0.04	0.02	0.03	24.
1.01	17.00	68	0.04	0.02	0.03	30.
1.01	17.15	69	0.03	0.01	0.03	38.
1.01	17.30	70	0.03	0.01	0.03	46.
1.01	17.45	71	0.03	0.01	0.03	55.
1.01	18.00	72	0.03	0.01	0.03	65.
1.01	18.15	73	0.00	0.	0.00	74.
1.01	18.30	74	0.00	0.	0.00	83.
1.01	18.45	75	0.00	0.	0.00	90.
1.01	19.00	76	0.00	0.	0.00	97.
1.01	19.15	77	0.00	0.	0.00	102.
1.01	19.30	78	0.00	0.	0.00	106.
1.01	19.45	79	0.00	0.	0.00	108.
1.01	20.00	80	0.00	0.	0.00	108.
1.01	20.15	81	0.00	0.	0.00	106.
1.01	20.30	82	0.00	0.	0.00	103.
1.01	20.45	83	0.00	0.	0.00	99.
1.01	21.00	84	0.00	0.	0.00	95.
1.01	21.15	85	0.00	0.	0.00	90.
1.01	21.30	86	0.00	0.	0.00	86.
1.01	21.45	87	0.00	0.	0.00	81.
1.01	22.00	88	0.00	0.	0.00	76.
1.01	22.15	89	0.00	0.	0.00	72.
1.01	22.30	90	0.00	0.	0.00	67.
1.01	22.45	91	0.00	0.	0.00	63.
1.01	23.00	92	0.00	0.	0.00	60.
1.01	23.15	93	0.00	0.	0.00	56.
1.01	23.30	94	0.00	0.	0.00	53.
1.01	23.45	95	0.00	0.	0.00	50.
1.02	0.	96	0.00	0.	0.00	47.
1.02	0.15	97	0.03	0.00	0.03	44.
1.02	0.30	98	0.03	0.00	0.03	42.
1.02	0.45	99	0.03	0.00	0.03	40.
1.02	1.00	100	0.03	0.00	0.03	38.

1.02	17.15	165	0.51	0.49	0.02	5245.
1.02	17.30	166	0.51	0.49	0.02	5692.
1.02	17.45	167	0.51	0.49	0.02	6117.
1.02	18.00	168	0.51	0.49	0.02	6500.
1.02	18.15	169	0.04	0.02	0.03	6824.
1.02	18.30	170	0.04	0.02	0.03	7080.
1.02	18.45	171	0.04	0.02	0.03	7264.
1.02	19.00	172	0.04	0.02	0.03	7373.
1.02	19.15	173	0.04	0.02	0.03	7404.
1.02	19.30	174	0.04	0.02	0.03	7348.
1.02	19.45	175	0.04	0.02	0.03	7192.
1.02	20.00	176	0.04	0.02	0.03	6961.
1.02	20.15	177	0.04	0.02	0.03	6695.
1.02	20.30	178	0.04	0.02	0.03	6406.
1.02	20.45	179	0.04	0.02	0.03	6102.
1.02	21.00	180	0.04	0.02	0.03	5787.
1.02	21.15	181	0.04	0.02	0.03	5465.
1.02	21.30	182	0.04	0.02	0.03	5144.
1.02	21.45	183	0.04	0.02	0.03	4828.
1.02	22.00	184	0.04	0.02	0.03	4516.
1.02	22.15	185	0.04	0.02	0.03	4221.
1.02	22.30	186	0.04	0.02	0.03	3946.
1.02	22.45	187	0.04	0.02	0.03	3689.
1.02	23.00	188	0.04	0.02	0.03	3450.
1.02	23.15	189	0.04	0.02	0.03	3227.
1.02	23.30	190	0.04	0.02	0.03	3020.
1.02	23.45	191	0.04	0.02	0.03	2827.
1.03	0.	192	0.04	0.02	0.03	2647.
1.03	0.15	193	0.	0.	0.	2479.
1.03	0.30	194	0.	0.	0.	2323.
1.03	0.45	195	0.	0.	0.	2176.
1.03	1.00	196	0.	0.	0.	2039.
1.03	1.15	197	0.	0.	0.	1911.
1.03	1.30	198	0.	0.	0.	1790.
1.03	1.45	199	0.	0.	0.	1677.
1.03	2.00	200	0.	0.	0.	1570.
		SUM	23.66	20.16	3.70	215866.
			(606.)	(512.)	(94.)	(6112.64)

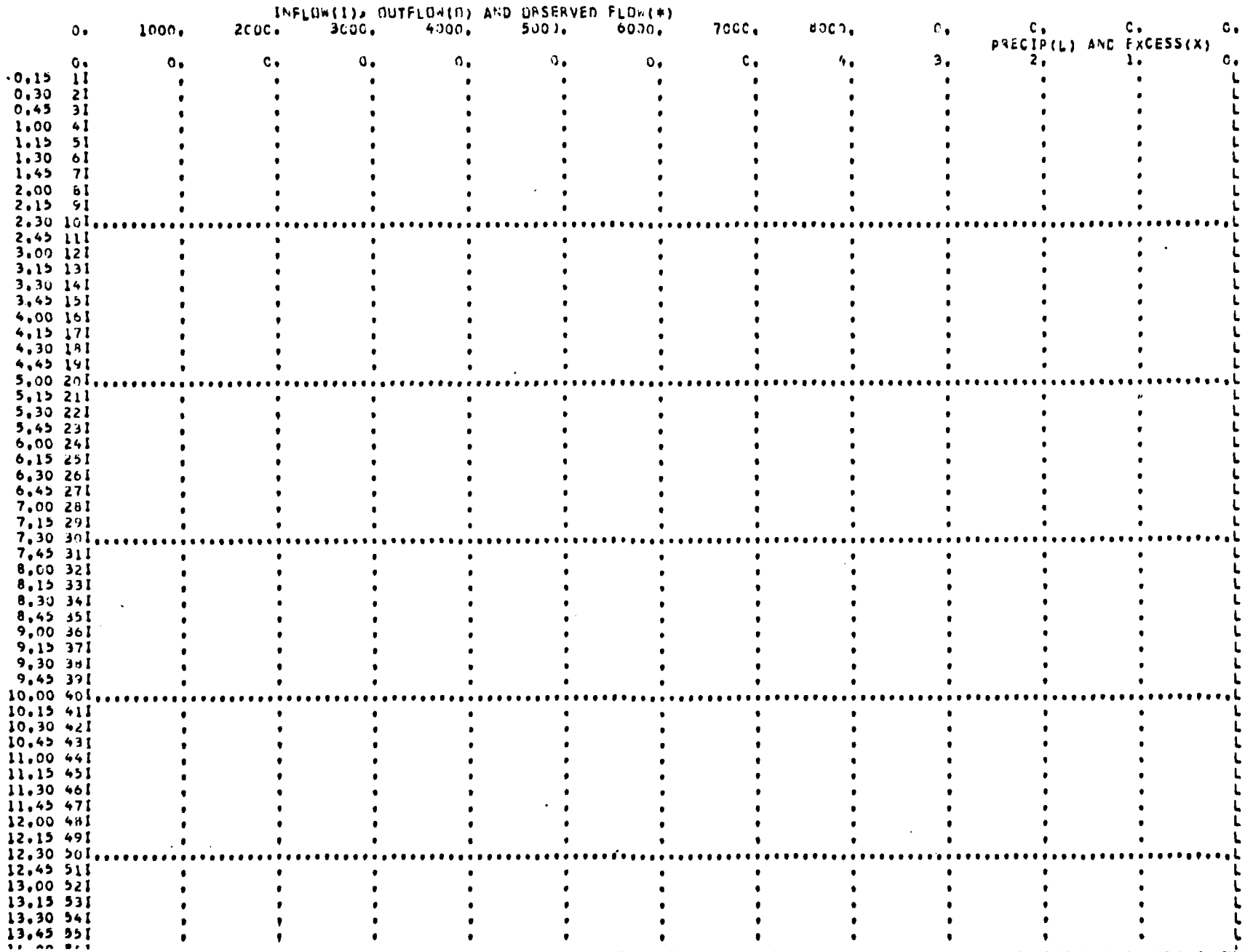
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	7404.	5966.	2208.	1075.	215079.
CMS	210.	169.	63.	30.	6090.
INCHES		12.25	18.13	18.40	18.40
MM		311.18	460.63	467.43	467.43
AC-FT		2958.	4379.	4444.	4444.
THOUS CU M		3649.	5402.	5481.	5481.

OVF

STATION 1

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

PRECIP(L) AND EXCESS(X)



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16.45 67I
17.00 68I
17.15 69I
17.30 70I
17.45 71.I
18.00 72.I
18.15 73.I
18.30 74.I
18.45 75.I
19.00 76.I
19.15 77.I
19.30 78.I
19.45 79.I
20.00 80.I
20.15 81.I
20.30 82.I
20.45 83.I
21.00 84.I
21.15 85.I
21.30 86.I
21.45 87.I
22.00 88.I
22.15 89.I
22.30 90.I
22.45 91.I
23.00 92.I
23.15 93.I
23.30 94.I
23.45 95I
0. 96I
0.15 97I
0.30 98I
0.45 99I
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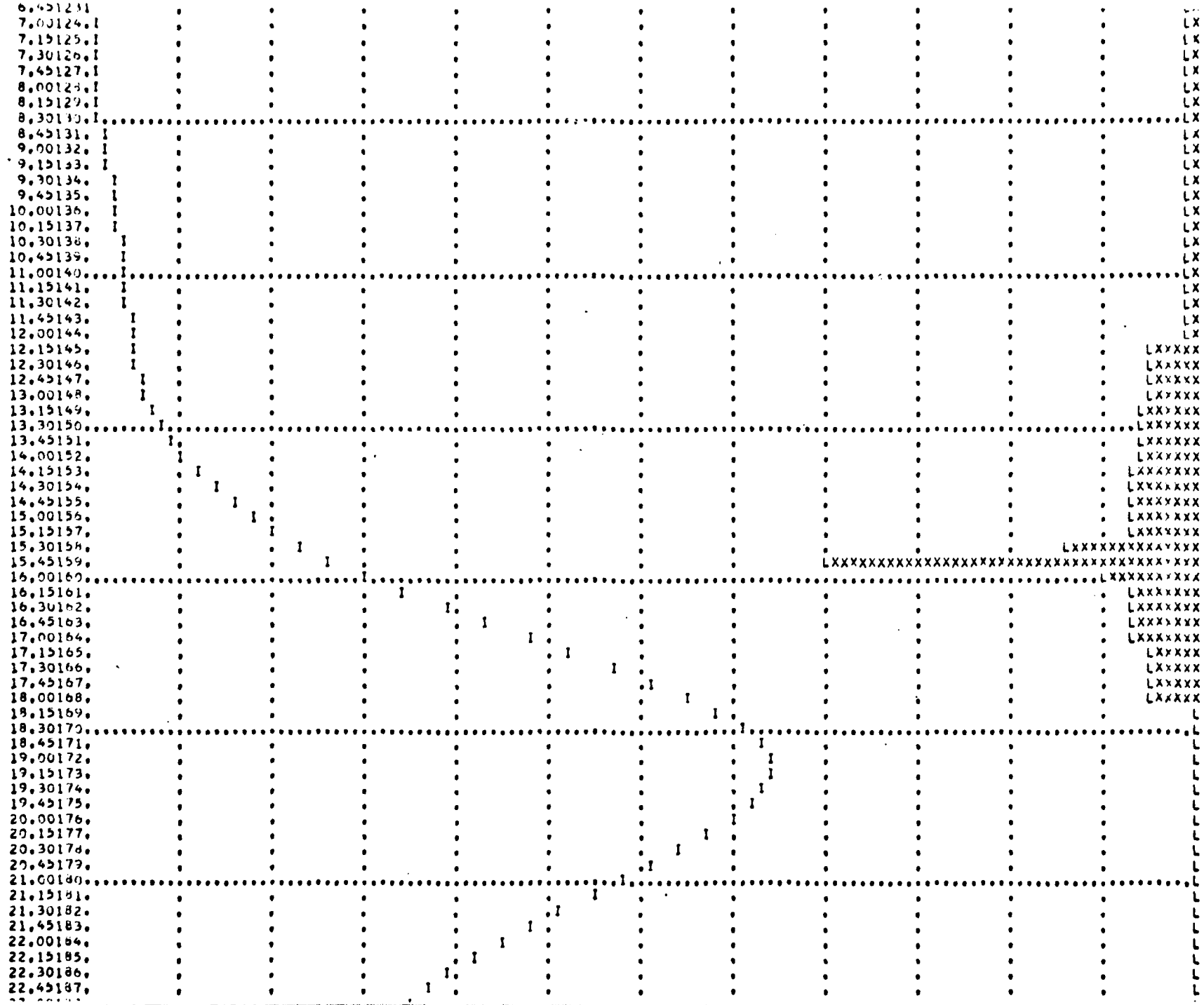

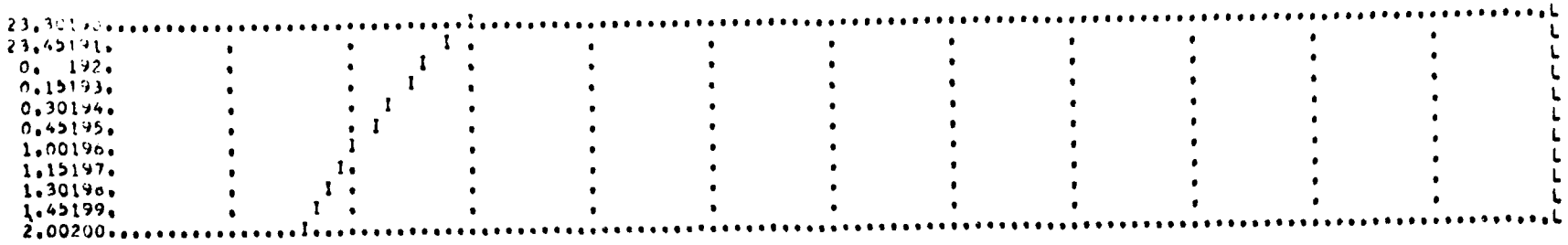
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1.15197.
1.30198.
1.45199.
2.00200

DVN

STATION 1, PLAN 1, RATIO 3

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

55.	54.	54.	54.	54.	53.	53.	53.	53.	52.
52.	52.	52.	51.	51.	51.	51.	50.	50.	50.
50.	49.	49.	49.	49.	48.	48.	48.	48.	48.
47.	47.	47.	47.	46.	46.	46.	46.	46.	45.
45.	45.	45.	44.	44.	44.	44.	44.	43.	43.
43.	43.	43.	42.	42.	42.	42.	42.	41.	41.
41.	41.	41.	40.	40.	40.	40.	40.	40.	40.
40.	39.	39.	39.	39.	40.	40.	40.	40.	40.
40.	40.	40.	40.	40.	40.	40.	40.	40.	40.
40.	40.	40.	40.	40.	40.	40.	39.	39.	39.
39.	39.	39.	39.	39.	39.	38.	38.	38.	38.
38.	38.	38.	38.	38.	37.	37.	37.	37.	37.
37.	37.	37.	37.	37.	37.	37.	37.	37.	37.
37.	38.	38.	38.	39.	39.	40.	41.	42.	42.
43.	44.	45.	46.	47.	48.	49.	51.	52.	54.
57.	62.	69.	76.	85.	95.	107.	120.	135.	152.
171.	193.	218.	246.	275.	537.	1457.	2104.	2572.	2916.
3343.	3565.	3656.	3678.	3648.	3571.	3461.	3331.	3180.	3037.
2920.	2818.	2694.	2557.	2415.	2273.	2134.	2001.	1875.	1755.
1644.	1539.	1441.	1349.	1264.	1184.	1109.	1039.	973.	912.

STORAGE

241.	240.	239.	230.	237.	236.	235.	234.	233.	232.
231.	230.	229.	228.	227.	226.	225.	224.	223.	222.
221.	220.	219.	219.	213.	217.	216.	215.	214.	213.
212.	211.	210.	210.	209.	208.	207.	206.	205.	204.
204.	203.	202.	201.	200.	199.	199.	198.	197.	196.
195.	195.	194.	193.	192.	191.	191.	190.	189.	188.
188.	187.	186.	185.	185.	184.	183.	183.	182.	182.
182.	182.	181.	181.	182.	182.	182.	182.	182.	183.
183.	183.	184.	184.	184.	184.	184.	184.	184.	184.
184.	183.	183.	183.	183.	182.	182.	182.	181.	181.
180.	180.	179.	179.	179.	178.	178.	177.	177.	176.
176.	175.	175.	175.	174.	174.	174.	173.	173.	172.
172.	172.	171.	171.	171.	171.	171.	171.	172.	172.
173.	174.	176.	177.	179.	181.	184.	187.	190.	193.
194.	200.	203.	207.	211.	216.	220.	225.	231.	237.
245.	253.	263.	275.	288.	303.	321.	341.	364.	390.
420.	453.	492.	534.	580.	628.	665.	697.	718.	733.
742.	746.	748.	749.	748.	747.	744.	742.	739.	736.
733.	728.	723.	717.	711.	705.	698.	690.	687.	682.
677.	672.	668.	664.	660.	657.	653.	650.	648.	645.

STAGE

1112.8	1112.7	1112.6	1112.5	1112.4	1112.3	1112.2	1112.1	1112.0	1111.9
1111.8	1111.8	1111.7	1111.6	1111.5	1111.4	1111.3	1111.2	1111.1	1111.0
1110.9	1110.8	1110.8	1110.7	1110.6	1110.5	1110.4	1110.3	1110.2	1110.2
1110.1	1110.0	1109.9	1109.8	1109.7	1109.7	1109.6	1109.5	1109.4	1109.3
1109.3	1109.2	1109.1	1109.0	1108.9	1108.9	1108.8	1108.7	1108.6	1108.6
1108.5	1108.4	1108.3	1108.3	1108.2	1108.1	1108.0	1108.0	1107.9	1107.8
1107.7	1107.7	1107.6	1107.5	1107.5	1107.4	1107.3	1107.3	1107.3	1107.2
1107.2	1107.2	1107.2	1107.2	1107.2	1107.2	1107.2	1107.2	1107.3	1107.3
1107.3	1107.3	1107.4	1107.4	1107.4	1107.4	1107.4	1107.4	1107.4	1107.4
1107.4	1107.3	1107.3	1107.3	1107.3	1107.2	1107.2	1107.2	1107.1	1107.1
1107.1	1107.0	1107.0	1106.9	1106.9	1106.8	1106.8	1106.8	1106.7	1106.7

1106.4	1106.5	1106.6	1106.8	1106.9	1107.1	1107.4	[illegible]	[illegible]	[illegible]
1108.5	1108.9	1109.2	1109.6	1110.0	1110.4	1110.8	1111.3	1111.8	1112.5
1113.0	1113.3	1113.7	1114.1	1114.6	1115.2	1115.9	1116.6	1117.5	1118.4
1119.6	1120.8	1122.3	1123.[illegible]	1125.6	1127.3	1128.5	1129.3	1129.9	1130.3
1130.6	1130.7	1130.7	1130.7	1130.7	1130.7	1130.6	1130.6	1130.5	1130.4
1130.3	1130.2	1130.1	1129.9	1129.7	1129.5	1129.3	1129.2	1129.0	1128.9
1128.7	1128.6	1128.5	1128.3	1128.2	1128.1	1128.0	1127.9	1127.9	1127.8

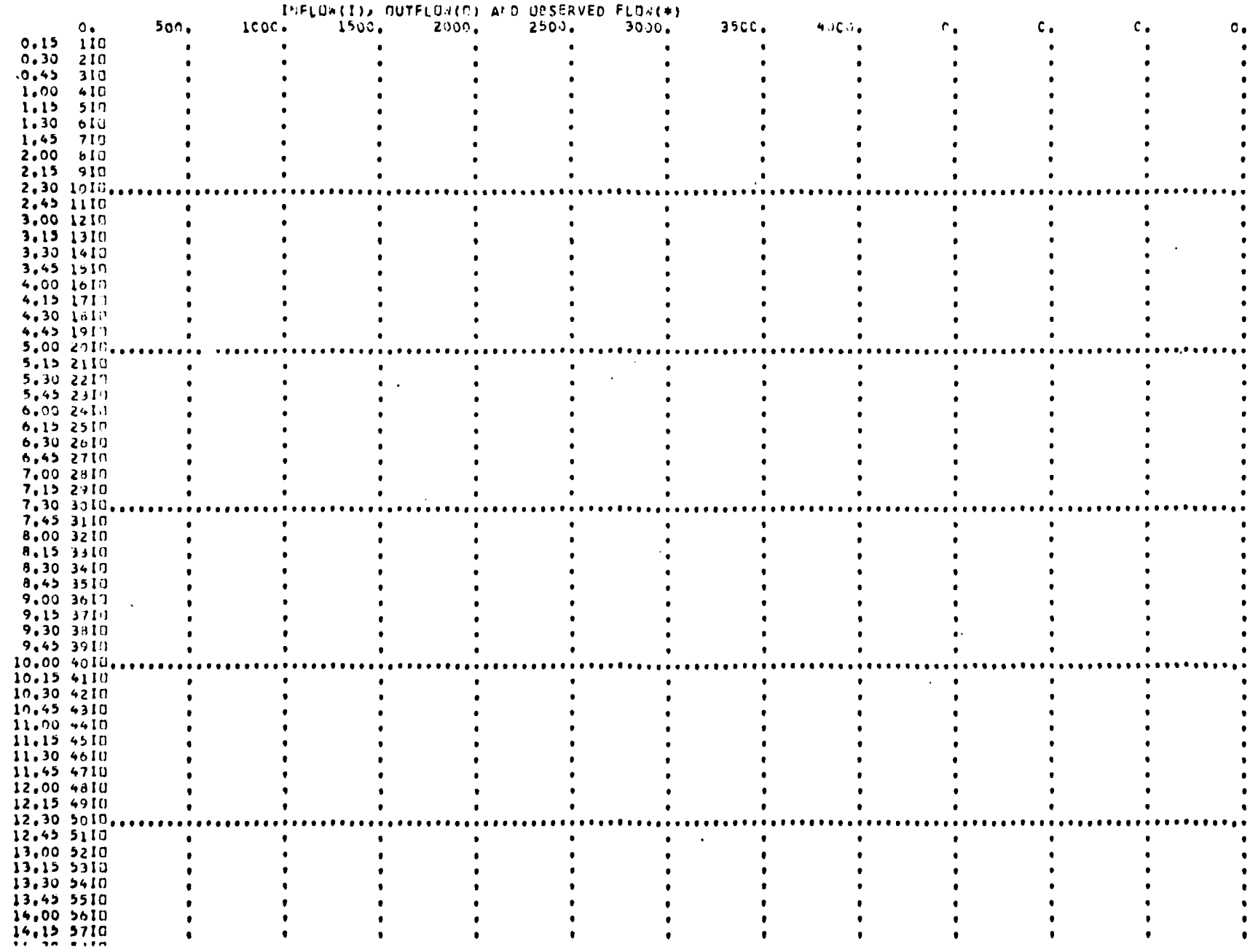
PEAK OUTFLOW IS 3678. AT TIME 43.50 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3678.	2794.	869.	440.	87994.
CMS	104.	79.	25.	12.	2492.
INCHES		5.74	7.14	7.53	7.53
MM		145.74	181.32	191.24	191.24
AC-FT		1386.	1724.	1818.	1813.
THOUS CU M		1709.	2126.	2243.	2243.

OVF

STATION 1

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



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17.00 68I0
17.15 69I0
17.30 70I0
17.45 71.I
18.00 72.I
18.15 73.I
18.30 74.I
18.45 75.I
19.00 76.I
19.15 77.I
19.30 78.I
19.45 79.I
20.00 80.I
20.15 81.I
20.30 82.I
20.45 83.I
21.00 84.I
21.15 85.I
21.30 86.I
21.45 87.I
22.00 88.I
22.15 89.I
22.30 90.I
22.45 91.I
23.00 92.I
23.15 93.I
23.30 94.I
23.45 95I0
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0.30 98I0
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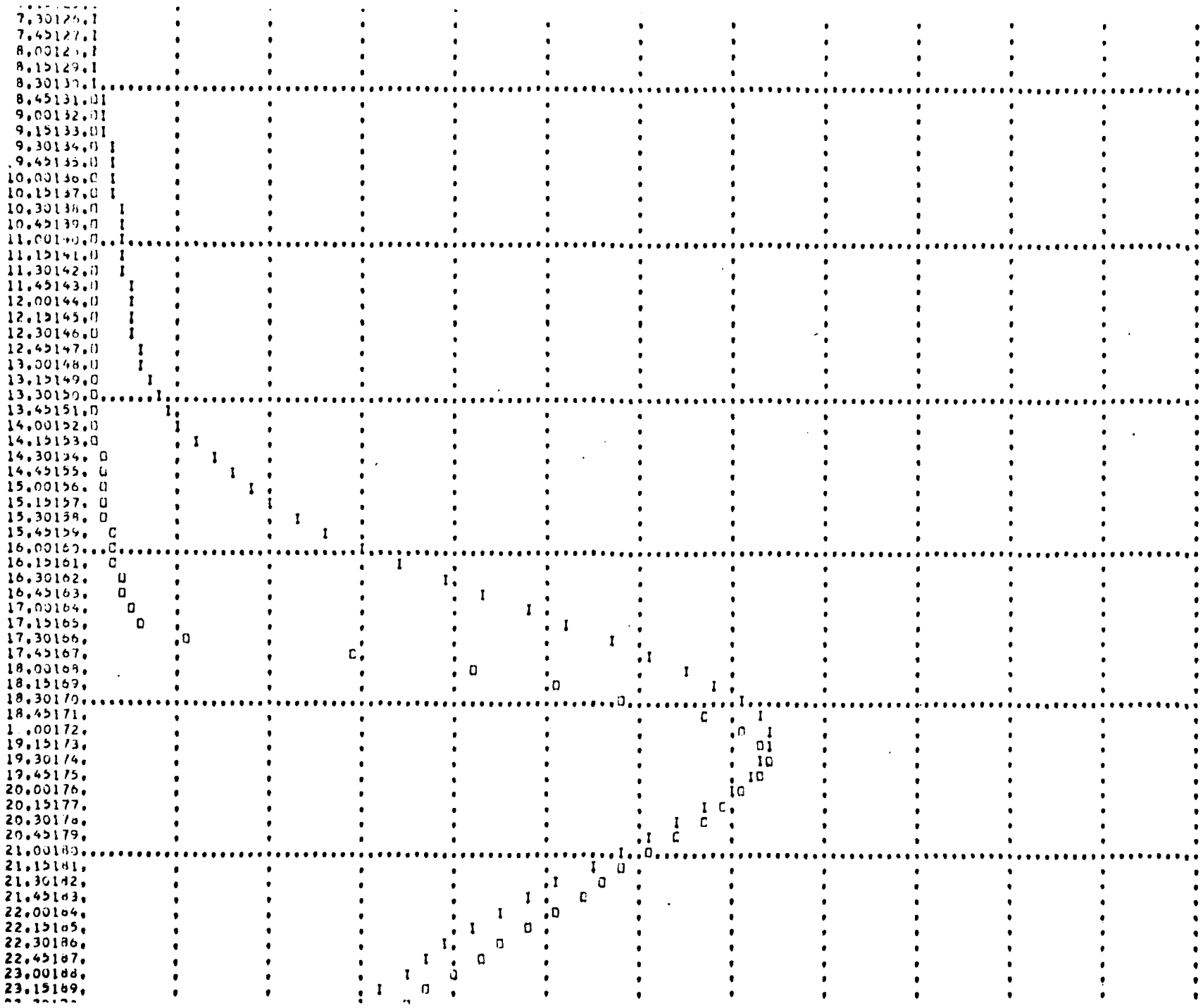
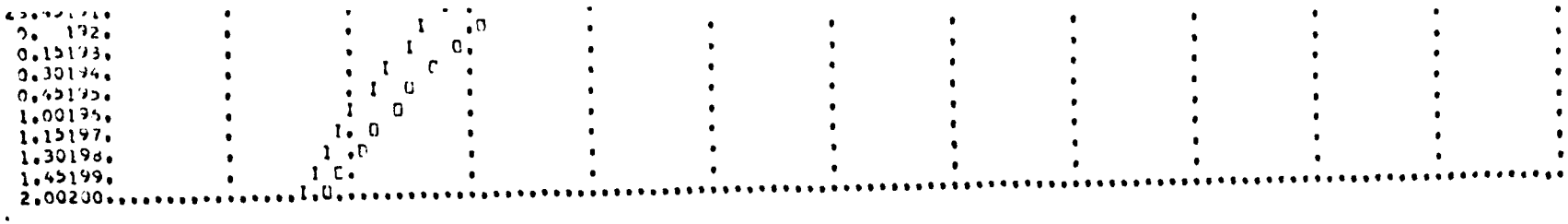
6.45123I0

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0.15193.
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1.45199.
2.00200.

DVN

STATION 1, PLAN 1, RATIO 6

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

55.	55.	54.	54.	54.	54.	53.	53.	53.	53.
52.	52.	52.	52.	51.	51.	51.	51.	51.	50.
50.	50.	50.	50.	49.	49.	49.	49.	48.	48.
48.	48.	48.	47.	47.	47.	47.	47.	46.	46.
46.	46.	46.	45.	45.	45.	45.	45.	44.	44.
44.	44.	44.	44.	43.	43.	43.	43.	43.	42.
42.	42.	42.	42.	42.	41.	41.	41.	41.	41.
41.	41.	42.	42.	42.	42.	43.	43.	43.	44.
44.	44.	45.	45.	45.	45.	46.	46.	46.	46.
46.	46.	46.	46.	46.	46.	46.	46.	46.	46.
46.	46.	46.	46.	46.	46.	46.	46.	46.	46.
46.	45.	45.	45.	45.	45.	45.	45.	45.	45.
45.	45.	45.	45.	45.	45.	45.	46.	46.	47.
47.	48.	49.	50.	51.	52.	54.	55.	59.	64.
69.	74.	79.	84.	89.	95.	101.	107.	115.	123.
132.	143.	156.	171.	189.	208.	231.	257.	286.	838.
1742.	2467.	3191.	4149.	4757.	5256.	5711.	6130.	6503.	6818.
7066.	7243.	7345.	7367.	7299.	7143.	6922.	6661.	6376.	6073.
5759.	5440.	5121.	4805.	4497.	4208.	3934.	3679.	3440.	3218.
3011.	2837.	2763.	2625.	2482.	2340.	2201.	2067.	1940.	1819.

STORAGE

241.	240.	239.	238.	237.	236.	235.	235.	234.	233.
232.	231.	230.	229.	228.	227.	227.	224.	225.	224.
223.	222.	221.	221.	220.	219.	218.	217.	216.	216.
215.	214.	213.	212.	212.	211.	210.	209.	209.	208.
207.	206.	206.	205.	204.	203.	203.	202.	201.	200.
200.	199.	198.	197.	197.	196.	195.	195.	194.	193.
193.	192.	191.	191.	190.	189.	189.	189.	189.	189.
189.	189.	190.	190.	191.	192.	194.	195.	196.	198.
199.	200.	201.	202.	203.	204.	205.	206.	206.	207.
207.	208.	208.	208.	208.	208.	208.	208.	208.	208.
208.	207.	207.	207.	207.	206.	206.	206.	206.	205.
205.	205.	205.	205.	204.	204.	204.	204.	204.	204.
204.	203.	203.	203.	204.	204.	205.	206.	207.	209.
211.	214.	217.	221.	225.	231.	236.	242.	249.	256.
263.	270.	278.	286.	294.	303.	312.	322.	333.	346.
360.	377.	396.	419.	445.	476.	511.	550.	595.	642.
681.	713.	739.	758.	769.	779.	787.	795.	803.	809.
813.	817.	819.	819.	818.	815.	811.	806.	800.	794.
786.	782.	776.	770.	764.	759.	753.	749.	744.	740.
736.	731.	726.	720.	714.	707.	701.	696.	690.	685.

STAGE

1112.8	1112.7	1112.6	1112.5	1112.5	1112.4	1112.3	1112.2	1112.1	1112.0
1111.9	1111.9	1111.8	1111.7	1111.6	1111.5	1111.4	1111.4	1111.3	1111.2
1111.1	1111.0	1111.0	1110.9	1110.8	1110.7	1110.6	1110.6	1110.5	1110.4
1110.3	1110.3	1110.2	1110.1	1110.0	1109.9	1109.9	1109.8	1109.7	1109.7
1109.6	1109.5	1109.4	1109.4	1109.3	1109.2	1109.2	1109.1	1109.0	1108.9
1108.9	1108.8	1108.7	1108.7	1108.6	1108.5	1108.5	1108.4	1108.3	1108.3
1108.2	1108.1	1108.1	1108.0	1108.0	1107.9	1107.9	1107.8	1107.8	1107.8
1107.9	1107.9	1107.9	1108.0	1108.1	1108.2	1108.3	1108.4	1108.6	1108.7
1108.8	1108.9	1109.0	1109.1	1109.2	1109.3	1109.4	1109.5	1109.5	1109.6
1109.6	1109.6	1109.7	1109.7	1109.7	1109.7	1109.7	1109.7	1109.7	1109.6
1109.6	1109.6	1109.6	1109.6	1109.5	1109.5	1109.5	1109.5	1109.4	1109.4

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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1113.7	1114.0	1114.3	1114.6	1114.9	1115.2	1115.5	1115.9	1116.3	1116.8
1117.3	1117.0	1116.7	1119.5	1120.5	1121.7	1123.0	1124.5	1126.1	1127.7
1128.8	1129.8	1130.5	1131.0	1131.3	1131.5	1131.7	1131.9	1132.1	1132.3
1132.4	1132.5	1132.5	1132.6	1132.5	1132.4	1132.3	1132.2	1132.1	1131.9
1131.8	1131.6	1131.5	1131.3	1131.2	1131.0	1130.9	1130.7	1130.6	1130.5
1130.4	1130.3	1130.1	1130.0	1129.8	1129.6	1129.4	1129.3	1129.1	1128.9

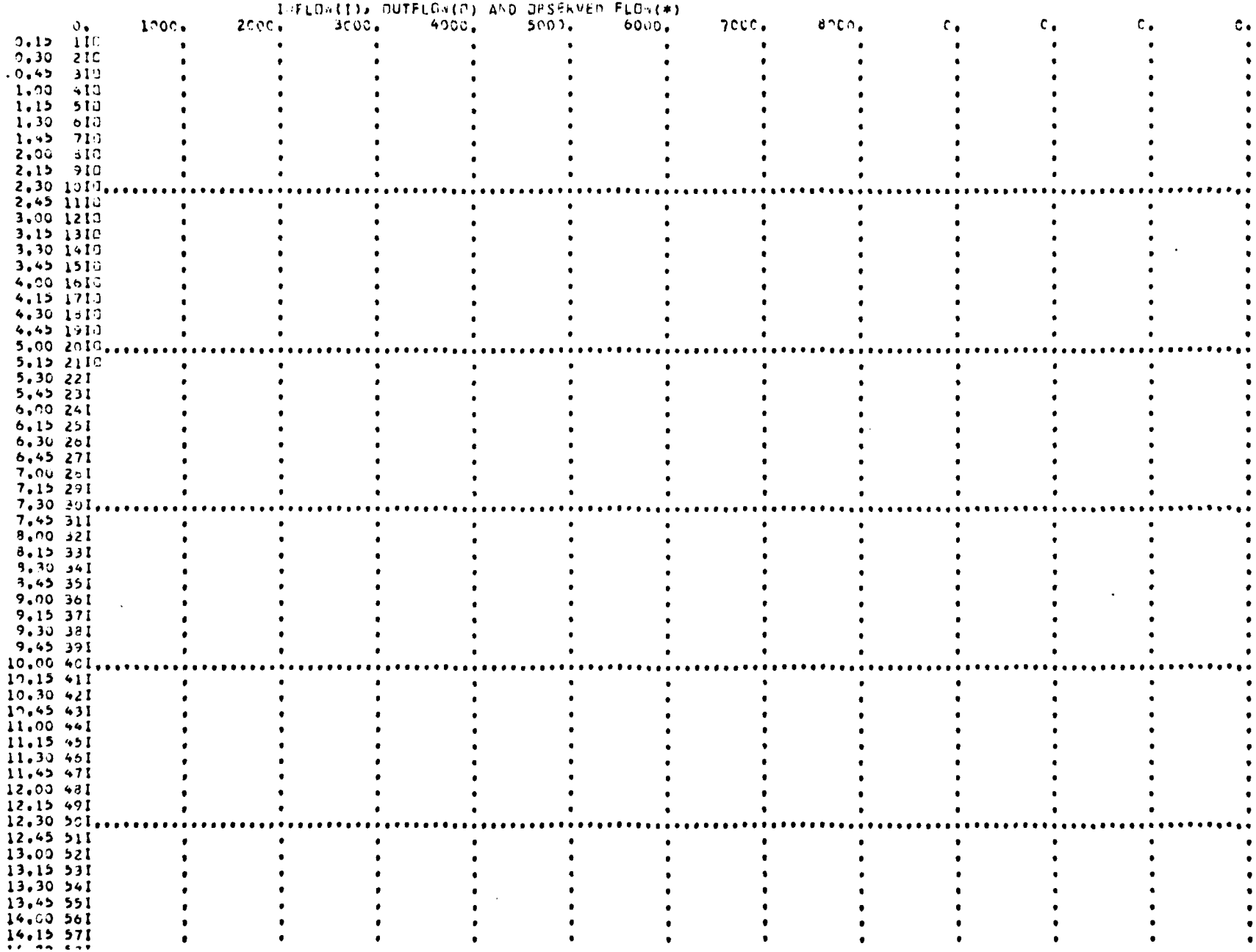
PEAK OUTFLOW IS 7367. AT TIME 43.50 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	7367.	5931.	1967.	968.	193611.
CMS	209.	168.	56.	27.	5482.
INCHES		12.18	16.16	16.57	16.57
MM		309.37	410.37	420.77	420.77
AC-FT		2941.	3901.	4000.	4000.
THOUS CU M		3628.	4812.	4934.	4934.

OVF

STATION 1

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



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17.15 69I
17.30 70I
17.45 71OI
18.00 72OI
18.15 73OI
18.30 74OI
18.45 75OI
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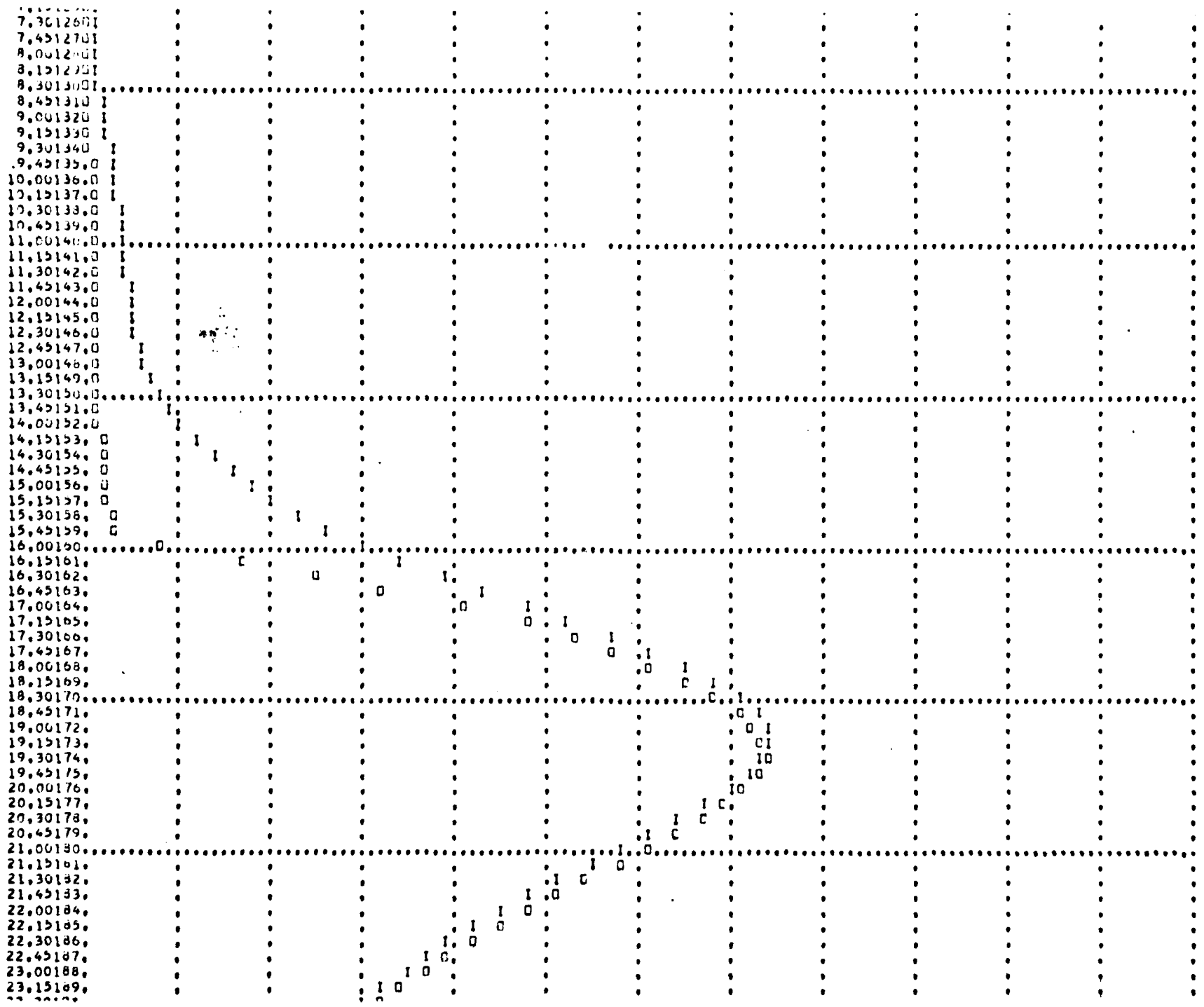
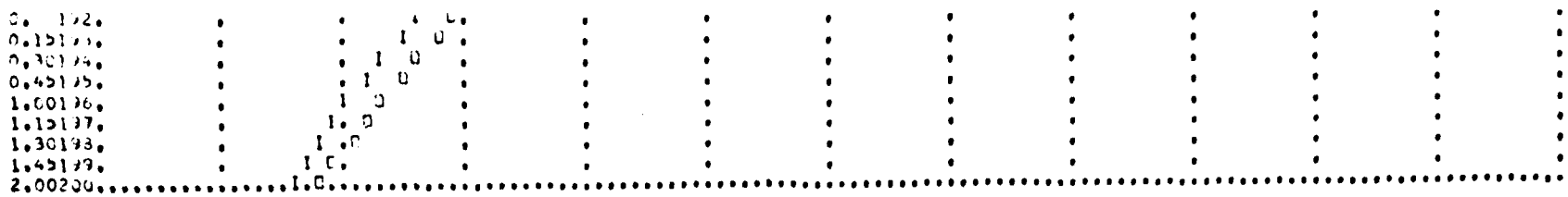
5.30118I
5.45119I
6.00120I
6.15121I
6.30122I
6.45123I




0.15193.
0.30194.
0.45195.
1.00196.
1.15197.
1.30198.
1.45199.
2.00200.

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

				RATIOS APPLIED TO FLOWS					
OPERATION	STATION	AREA	PLAN	RATIO 1 0.20	RATIO 2 0.40	RATIO 3 0.50	RATIO 4 0.60	RATIO 5 0.80	RATIO 6 1.00
HYDROGRAPH AT	1	4.53 (19079.77)	1	1481. (41.93)(	2962. 83.86)(	3702. 104.83)(	4442. 125.80)(	5923. 167.73)(	7404. 209.66)(
ROUTED TO	1	4.53 (19079.77)	1	1001. (28.35)(	2827. 80.05)(	3678. 104.16)(	4420. 125.15)(	5893. 166.88)(	7367. 208.60)(

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1112.90	1112.90	1134.60
STORAGE	242.	242.	699.
OUTFLOW	55.	55.	11546.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
0.20	1127.89	0.	649.	1001.	0.	45.50	0.
0.40	1130.22	0.	729.	2827.	0.	44.00	0.
0.50	1130.75	0.	749.	3678.	0.	43.50	0.
0.60	1131.11	0.	763.	4420.	0.	43.50	0.
0.80	1131.83	0.	791.	5893.	0.	43.50	0.
1.00	1132.55	0.	819.	7367.	0.	43.50	0.

APPENDIX D

REFERENCES

APPENDIX D

REFERENCES

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

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

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

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

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

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

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

APPENDIX E

STABILITY ANALYSIS

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE - Soil Mechanics Laboratory
800 "J" Street, Lincoln, Nebraska 68508

SUBJECT: ENG 22-5, New York WP-08, Nanticoke Creek Site No. 10 (Broome County)

DATE: January 29, 1970

TO: Richard J. Phillips, State Conservation Engineer
SCS, Syracuse, New York

ATTACHMENTS

1. Form SCS-354, Soil Mechanics Laboratory Data, 1 sheet.
2. Form SCS-355A, Triaxial Shear Test Data, 2 sheets.
3. Form SCS-352, Compaction and Penetration Resistance Report, 4 sheets.
4. Form SCS-130, Drain Materials, 1 sheet.
5. Form SCS-357, Summary - Slope Stability Analysis, 2 sheets.

DISCUSSION OF DATA

FOUNDATION MATERIALS

A. Classification. Bedrock at the site is shale and siltstone of the Upper Devonian Group. In both abutments glacial till overlies the bedrock, except in the steep right abutment where the bedrock outcrops and is covered by a thin, loose mantle of colluvium classifying as ML, which contains rock.

In the left abutment the till is 28 to 30 feet deep over bedrock in the area of the emergency spillway. Between here and the channel, investigational drilling did not reach bedrock. This till, based on samples, is coarse with 48 to 52 percent finer than the No. 200, and 70 to 65 percent passing the No. 4, classifying as CL-ML and GC. Above the emergency spillway the soil is finer grained, consisting of 8 to 11 feet of till overlying glacio-lacustrine deposits. These are field classified as ML and CL-ML.

In the right abutment, under the emergency spillway location, the bedrock slope flattens, making a bench or shelf where the till covering is up to 27 feet thick. Based on the submitted sample, this till is CL-ML with a liquid limit of 22 and a plasticity index of 4. Seventy-three percent of the sample is finer than the No. 200.

In the channel area is a stream deposit of sand and gravel with some silt up to about 12 feet deep, and lying on till or bedrock on centerline. To the left of the channel the floodplain is overlain with 2 to 3 feet of soft ML, which based on a submitted sample has a liquid limit of 33 and a plasticity index of 5.

B. Blow Count. Blow counting was done in the till on centerline in Holes 252, 51, 52, 53, and 261. The minimum counts in these holes varied from 22 to 27 per foot and the maximum counts from 68 to 175 per foot.

Blow counting in the alluvial GM-GP and the underlying till in Holes 351, 352, and 353 on the principal spillway line indicate blows from 29 to 76 per foot in the alluvium, and from 20 to 90 per foot in the till (one count of 170 per foot was probably due to a rock).

C. Consolidation. Except for the 2 to 3 feet of soft ML in the floodplain there should be very little consolidation in the foundation.

D. Permeability. Field permeability testing (Hole 352) indicates that the irregularly stratified alluvial gravels in the channel area have a permeability rate of 85.5 fpd but that the till underlying the gravels is practically impermeable. In a continuation of this same hole into the bedrock, a total pressure of 40 psi produced a water loss of 0.9 gpm over a 17-foot depth of hole.

In Hole 353, pumping at 30 psi between depths 22 and 27 feet showed a rate of 0.94 gpm, but between depths 18 and 27 feet it showed a rate up to almost 11 gpm. It is conjectured that fractured zones in the surface 5 feet of bedrock were being opened up, or washed free of clay seams.

Pump testing at 42.6 psi in Hole 53 in the right abutment shows a similar situation. In testing the entire 28 feet of bedrock hole (11 to 39 feet) a loss of 19.2 gpm occurred. In testing only the bottom 15 feet (24 to 39 feet), a loss of 8 gpm was recorded. This would indicate fracturing and weathering in the upper portion.

Water was found in the floodplain at creek level. In Holes 4 and 252 water was found at bedrock contact.

E. Shear Strength. Removal of some of the floodplain surface ML is contemplated. The alluvial gravels and glacial tills have more than enough strength to carry the proposed structure. Shear testing was not done.

EMBANKMENT MATERIALS

A. Classification and Compacted Dry Density. Four samples were submitted to represent the borrow. Following is a table showing the gradation and standard Proctor density of these soils:

Sample No.		LL	PI	Classifi-cations	Gradation		Proctor Density pcf	Optimum Moisture %
Laboratory	Field				Minus 200	Minus No. 4		
70W730	301.1	33	5	ML	77	100	98.0	22.0
70W731	202.1	24	7	CL-ML	52	70	123.5	12.0
70W732	209.2	24	9	GC	48	65	124.5	11.5
70W733	224.1	22	4	CL-ML	73	85	118.0	14.0

Of these samples 70W730 is moderately dispersed, the other three only slightly so.

Sample 70W730 represents the soft surface ML in the floodplain which may be removed from under the proposed dam. The other three samples are from the emergency spillways.

B. Permeability. Even though the borrow contains sand and gravel, it appears well graded and seepage through the dam is expected to be minimal.

C. Shear Strength. Samples 70W730 and 70W733 were tested in triaxial consolidated undrained shear on the minus No. 4 material at 95 percent of standard Proctor density. At about 91 percent of theoretical full saturation, shear parameters for the ML, 70W730, are $\phi = 24°$, $c = 850$ psf. For the CL-ML, 70W733, at about 97 percent of full saturation, parameters are $\phi = 25°$, $c = 825$ psf.

D. Consolidation. It is estimated that the maximum section of the embankment (channel section) will consolidate an average of 0.03 ft/ft. The portion of the embankment basing at permanent pool elevation will consolidate an average of 0.02 ft/ft.

STABILITY ANALYSIS

The maximum section was checked for slope stability using each embankment shear value and a foundation value of $\phi = 35°$, $c = 0$ psf. A minimum factor of safety of 1.63 was found for the upstream slope with an arc cutting about 23 feet into the foundation. The analysis is shown on Form SCS-357.

SETTLEMENT ANALYSIS

It has been stated that the right abutment where the bedrock outcrops, or nearly so, is quite steep and could be a source of differential settlements.

CONCLUSIONS AND RECOMMENDATIONS

A. Special Site Factors. We concur with the engineer's suggestion that the bedrock slopes, particularly in the right abutment, be flattened to 2:1 if the rock is not too hard. A reluctant alternative would be a wider than normal core trench cut back to a 2:1 slope in the abutment.

It is suggested that the soft surface ML be removed from under the downstream half of the embankment and be placed in the channel area upstream from the dam to make a continuous blanket over the alluvial gravels, as far upstream as is feasible.

B. Cutoff. The till soils are evidently deeper over the bedrock in the left abutment than in the right abutment. In the left abutment the cutoff trench should cut off the topsoil and bottom in firm till.

In the right abutment, because of the permeable nature of the surface bedrock, the trench should, if possible, bottom in firm bedrock.

Across the floodplain, complete cutoff of the alluvial gravels would be most desirable. It is suggested that an attempt be made to provide cutoff to the till. If this should fail, then cutoff to whatever depth is attainable should be accomplished.

Backfill with the till borrow. Suggested placement density is 95 percent of standard Proctor, at near optimum moisture with the control based on the minus No. 4 fraction.

C. Principal Spillway. Both settlement under and elongation in the pipe will be minimum values.

Backfill with till borrow to a suggested 95 percent of standard Proctor density, at near optimum moisture.

Use a ϕ-angle of 30° for conduit loading computations.

D. Drainage. Drainage is recommended below approximate emergency spillway elevation. A trench drain is suggested at the c/b = 0.7 point.

In the left abutment this should bottom in the till, about the same depth as the cutoff trench. In the upper right abutment the drain should contact the bedrock, which is pervious. On the steep rock right abutment a blanket drain may better serve the purpose. Suggested location is between the c/b points 0.6 and 0.8.

Across the floodplain, depth of the trench will depend on the degree of cutoff attained. If it is felt that the cutoff is good, then suggested trench depth is half the depths of the gravels. However, if only partial cutoff has been obtained, then the drain trench should penetrate to near full depth of the gravels.

A coarse gradation similar to ASTM No. 78 Road Gravel, shown on Form SCS-130, is suggested as drain material. It is suggested that the coarsest gradation of till available be laid as a base for the downstream section of the dam where the ML has been removed in order to provide a transition zone between the fill and the coarse-grained alluvium.

E. Embankment Design. If the floodplain ML under the downstream portion of the dam is not all used in upstream blanketing the remainder may be placed in the center portion of the dam. The till borrow may be placed without selection.

Suggested placement density is 95 percent of standard Proctor at near optimum moisture, with control on the minus No. 4 material.

The suggested 3:1 upstream slope with a 10-foot berm, and 2 1/2:1 downstream slope with drainage provide good factors of safety.

Overbuild the dam by about one foot to compensate for settlement in the embankment.

Prepared by:

Carl G. Nygren

Reviewed and Approved by:

Lorn P. Dunnigan

Attachments

cc:
Richard J. Phillips (1)
Bernard S. Ellis, Syracuse, New York
D. W. Shanklin, Binghamton, New York
Neil F. Bogner, Upper Darby, Pa.

Rev. 3.59
10/21/60

Ht. = 58'
79,000 cy

Class "C"
Floodwater Retarding

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

NEW YORK

LABORATORY SAMPLE NUMBER	FIELD NUMBER	LOCATION AND DESCRIPTION	DEPTH	FIELD CLASSIFICATION	MECHANICAL ANALYSIS GRAIN SIZE DISTRIBUTION EXPRESSED AS PERCENT FINER BY DRY WEIGHT: FINES					SAND						GRAVEL				
70W		Nanticoke, Creek Site: 10																		
730	301.1	Prin. Spwy (D) L. Bag	0-1.1	ML	15	25	45	67	77	23	33	37	39	100						
	303.1	" " (D)	0-2'	ML																
		Alluvial																		
731	202.1	L. Em. Spwy. (B) L. Bag	6-16'	GM	15	23	49	48	52	50	55	54	59	63	70	77	34	15	37	97
		Coarsest Till																		
		23,200 cy Est 5% >6", 10% 3-6"																		
732	209.2	L. Em. Spwy (C) L. Bag	13-18'	CL-ML	15	22	36	46	48	49	51	52	54	59	65	71	73	73	79	97
		Medium Till																		
		18,800 cy Est 2% >6", 5% 3-6"																		
733	224.1	R. Em. Spwy (C) L. Bag	.5-13.5'	ML	14	25	47	65	73	75	77	78	79	82	85	88	90	93	94	97
		Finest Till																		
		32,200 cy																		

"C"

water Retarding

U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL MECH
LABORATORY
1

DEPTH	FIELD CLASSIFICATION	MECHANICAL ANALYSIS GRAIN SIZE DISTRIBUTION EXPRESSED AS PERCENT FINER BY DRY WEIGHT — FINES					SAND						GRAVEL						ATTERBERG LIMITS		UNIFIED CLASSIFICATION	SOLUBLE SALTS %	DISPERSION %	MOISTURE - DENSITY RELATIONSHIPS ☒ STANDARD ☐ MODIFIED			UNDISTURBED SAMPLE DATA		G_s	SPECIAL TESTS			
		[illegible]	[illegible]	[illegible]	[illegible]	#200 0.074	#40 [illegible]	#[illegible]	#40 [illegible]	#20 0.84	#10 [illegible]	#4 4.76	3/8" 9.525	1/2" [illegible]	[illegible]	1" 25.4	1 1/2" [illegible]	[illegible]	LL	PI				TRIAL NO.	MAX γ_d pcf	w_o %	γ_d g/cc	w_n %					
0-1.1	ML	[illegible]	25	45	[illegible]	77	83	93	97	99	100								33	5	ML		20	1	98.0	12.0			2.70				[illegible]
0-2'	ML																																
6-16'	GM	15	23	40	48	52	53	55	5[illegible]	59	63	70	77	8[illegible]	[illegible]	89	92	100	24	7	CL-ML		5						2.8[illegible]	MINUS NO. [illegible]			
																			DRY DENSITY < NO. 4					2	1[illegible]3.5	1[illegible].0				GRAVEL FRACTION			
																													2.[illegible]	APPARENT			
																													[illegible]	BULK, DRY	[illegible]	[illegible]	
																													1.6	% ABSORPTION			
13-18'	CL-ML	15	22	36	46	48	49	51	52	54	59	65	71	73	76	79	83	100 75	24	9	GC		5						[illegible]	MINUS NO. 4			
																			DRY DENSITY < NO. 4					3	124.5	11.5				GRAVEL FRACTION			
																													[illegible]	APPARENT			
																													[illegible]	BULK, DRY	[illegible]	[illegible]	
																													[illegible]	% ABSORPTION			
.5-13.5'	ML	[illegible]	25	47	65	[illegible]	[illegible]	[illegible]	73	79	82	85	88	90	93	94	96	100	22	4	CL-ML		8						2.69	MINUS NO. 4			[illegible]
																			DRY DENSITY < NO. 4					4	[illegible]	14.0				GRAVEL FRACTION			
																													[illegible]	APPARENT			
																													2.5[illegible]	BULK, DRY	15[illegible]	[illegible]	
																													[illegible].4	% ABSORPTION			

2

Form [illegible] USDA
Rev. [illegible]

LABORATORY NO. [illegible]

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

PROJECT and STATE [illegible] 10 NEBRASKA			SAMPLE LOCATION [illegible]
FIELD SAMPLE NO. [illegible]	DEPTH [illegible]	GEOLOGIC ORIGIN	
TYPE OF SAMPLE [illegible]	TESTED AT [illegible] LINCOLN	APPROVED BY	DATE

INDEX TEST DATA

USCS ML ; LL 33 ; PI 5

% FINER (mm): 0.002 15 ; 0.005 25 ; 0.074 (# 200) 77

G_s (-#4) 2.70 ; G_s (+#4) _____

STANDARD: γ_d MAX. 93.0 pcf; w_o 22.0 %

MODIFIED: γ_d MAX. _____ pcf; w_o _____ %

SPECIMEN DATA

HEIGHT 3.0 "; DIAMETER 1.4 "

MATERIALS TESTED PASSED #4 SIEVE

METHOD OF PREPARATION STATIC 3 LAYER COMPACTION & SOAKED

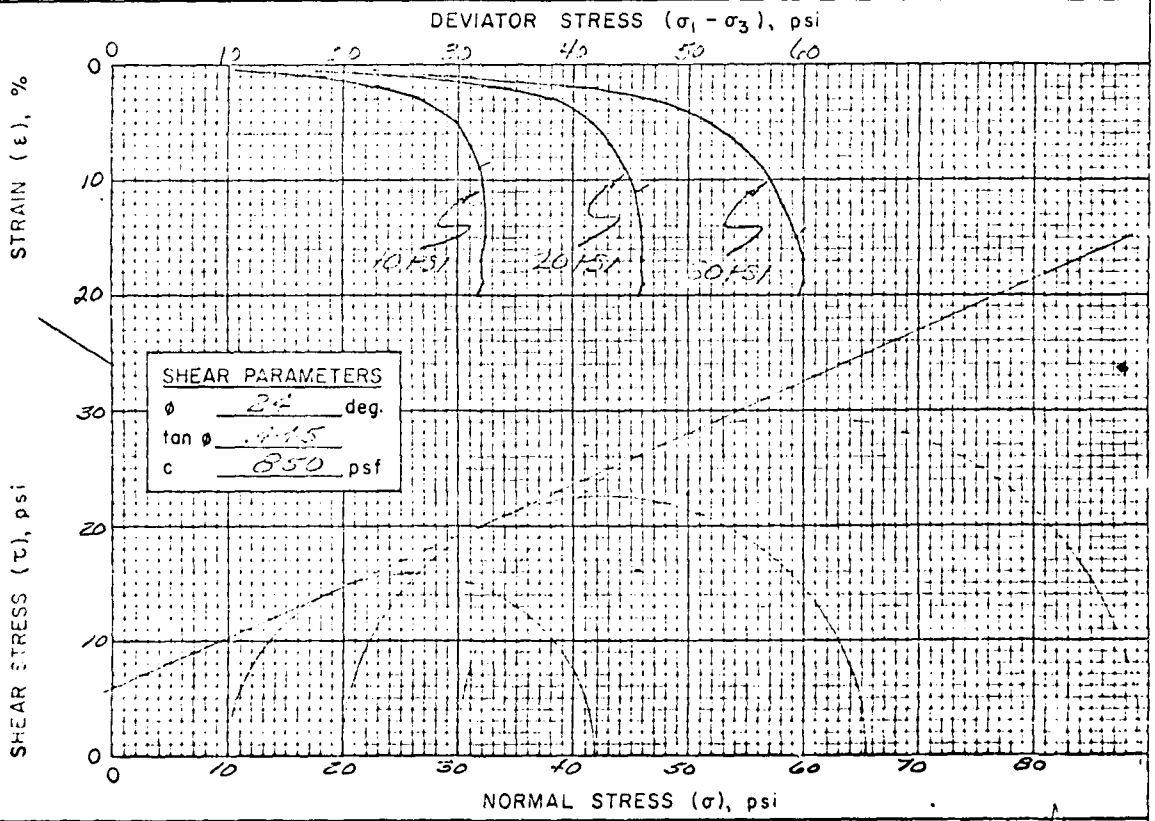
MOLDING MOISTURE 24.4 %

MOLDED AT 95.1 % OF γ_d MAXIMUM

TYPE OF TEST

UU ☐
CU ☑
$\overline{CU}$ ☐
CD ☐

DRY DENSITY INITIAL pcf ☒ g/cc ☐	DRY DENSITY CONSOLIDATED pcf ☒ g/cc ☐		MOISTURE CONTENT, % START OF TEST	MOISTURE CONTENT, % DEG. OF SAT. AT START OF TEST	MOISTURE CONTENT, % END OF TEST	TIME OF CONSOLIDATION (hrs)	MINOR PRINCIPAL STRESS σ_3 (psi)	DEVIATOR STRESS $\sigma_1 - \sigma_3$ (psi)	AXIAL STRAIN AT FAILURE, ε (%)
93.7	93.7		26.8	90.5	26.8	6.48	10	31.9	9.0
93.5	94.7		26.9	90.9	26.3	6.78	20	45.3	11.0
94.2	95.5		26.3	91.8	25.9	6.43	30	59.3	15.0



REMARKS AVERAGE TEST γ_d = 95.8% STD.

[illegible]

USDA SCS-HYATTSVILLE, MD. 1966

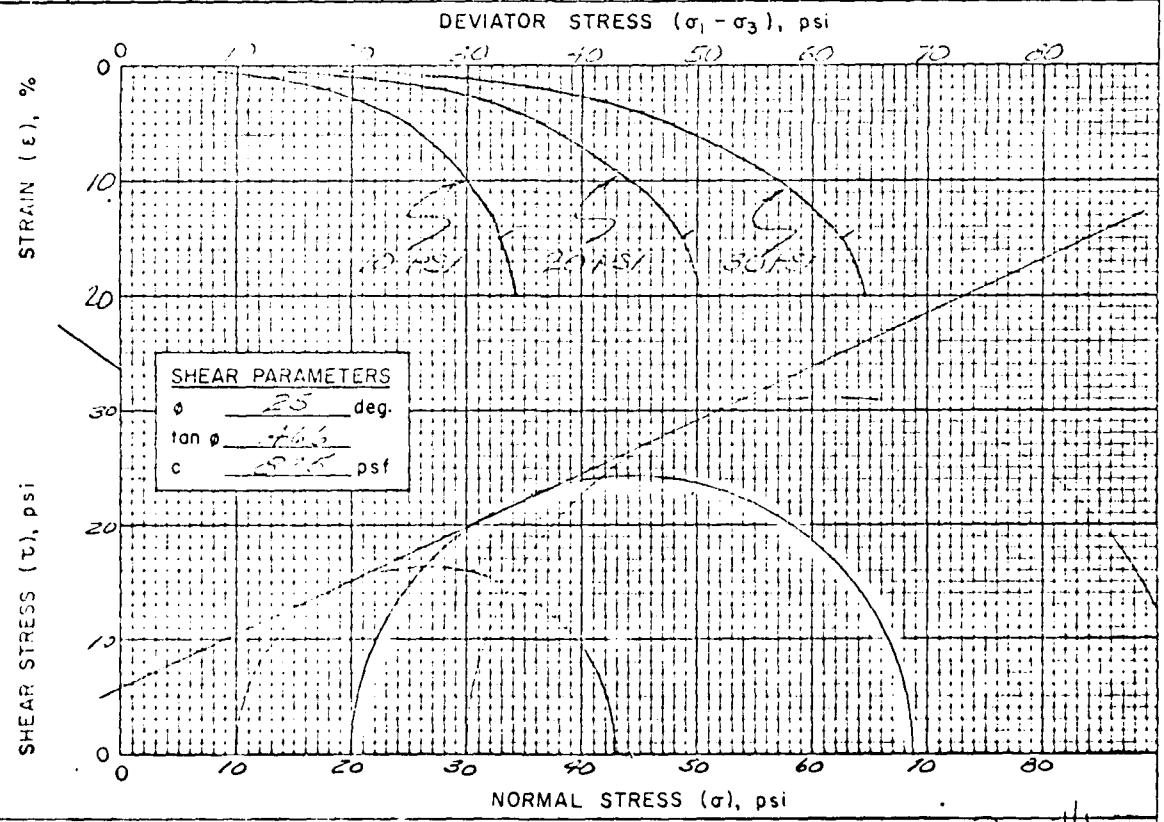
LABORATORY NO [illegible]

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

PROJECT and STATE [illegible]			SAMPLE LOCATION [illegible]
FIELD SAMPLE NO [illegible]	DEPTH [illegible]	GEOLOGIC ORIGIN	
TYPE OF SAMPLE [illegible]	TESTED AT [illegible]	APPROVED BY	DATE

INDEX TEST DATA	SPECIMEN DATA	TYPE OF TEST
USCS [illegible]; LL 22; PI 4	HEIGHT 5.0"; DIAMETER 1.4"	
% FINER (mm): 0.002 [illegible]; 0.005 [illegible]; 0.074 (#200) [illegible]	MATERIALS TESTED PASSED [illegible] SIEVE	UU ☐
G_s (-#4) 2.69; G_s (+#4) 2.71	METHOD OF PREPARATION STATIC 3 LAYER COMPACTION & SOAKED	CU ☑
STANDARD: γ_d MAX. 112.0 pcf; w_o 14.0 %	MOLDING MOISTURE 16.4 %	$\overline{CU}$ ☐
MODIFIED: γ_d MAX. _____ pcf; w_o _____ %	MOLDED AT 94.4% OF γ_d MAXIMUM	CD ☐

DRY DENSITY INITIAL pcf ☐ g/cc ☐	DRY DENSITY CONSOLIDATED pcf ☐ g/cc ☐		MOISTURE CONTENT, % START OF TEST	MOISTURE CONTENT, % DEG. OF SAT. AT START OF TEST	MOISTURE CONTENT, % END OF TEST	TIME OF CONSOLIDATION (hrs)	MINOR PRINCIPAL STRESS σ_3 (psi)	DEVIATOR STRESS $\sigma_1 - \sigma_3$ (psi)	AXIAL STRAIN AT FAILURE, ε (%)
112.0	112.8		17.7	94.6	17.4	6.83	10	32.8	15.0
112.1	114.3		18.1	98.4	17.0	5.93	20	48.8	15.0
112.2	115.0		17.9	97.3	16.5	5.77	30	62.5	15.0



REMARKS AVERAGE TEST γ_d = 95.0% STD.

USDA SCS HYATTSVILLE, MD. 1966

7001730

[illegible]	U.S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE	COMPACTION AND PENETRATION RESISTANCE

[illegible] Cooks Creek, Site 10, New York.

FIELD SAMPLE NO.	LOCATION	DEPTH
301.1	Prin. SPWY D	0-1.1'
303.1	" " D	0-2'

GEOLOGIC ORIGIN	TESTED AT	APPROVED BY	DATE
	SML-LINCOLN		

CLASSIFICATION ML LL 33 PI 5

MAX. PARTICLE SIZE INCLUDED IN TEST <#4 "

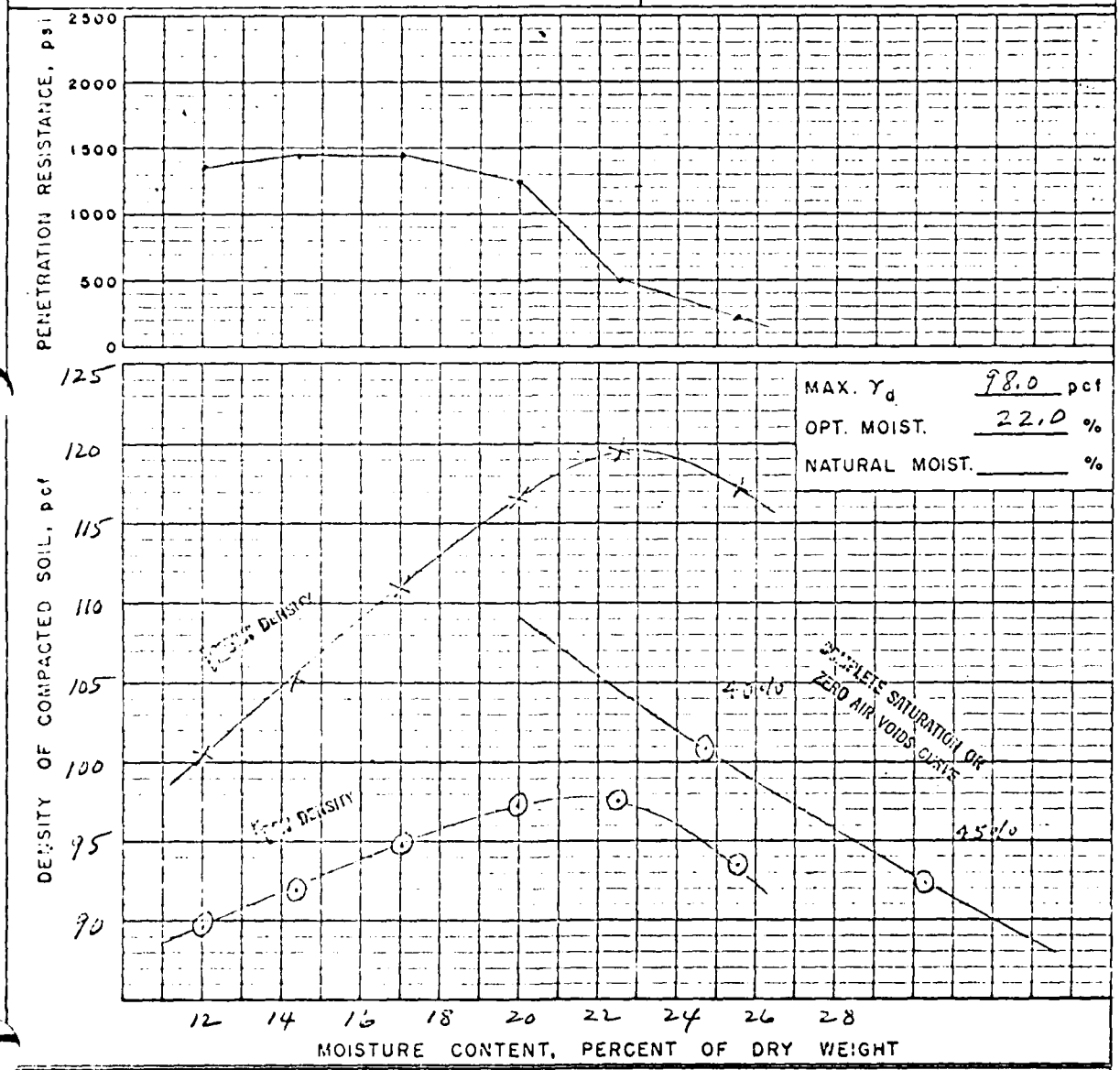
SPECIFIC GRAVITY (G_s) { MINUS NO. 4 2.70 ; PLUS NO. 4 }

CURVE NO. 1 OF 4

STD (ASTM D-698) ☒; METHOD A

MOD. (ASTM D-1557) ☐; METHOD

OTHER TEST ☐ (SEE REMARKS)



MAX. γ_d 98.0 pcf

OPT. MOIST. 22.0 %

NATURAL MOIST. ____ %

REMARKS

LABORATORY NO. 7002731

MATERIALS TESTING REPORT	U.S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE	COMPACTION AND PENETRATION RESISTANCE

PROJECT OR SITE: Yandaska Creek, Site 10, New York.

FIELD SAMPLE NO	LOCATION	DEPTH
202.1	L. Emer. Spwy. (B) Coarsest Till.	6-16'.

GEOLOGIC ORIGIN	TESTED AT	APPROVED BY	DATE
	SML-LINCOLN		

CLASSIFICATION CL-ML. LL 24 PI 7

MAX. PARTICLE SIZE INCLUDED IN TEST < #4 "

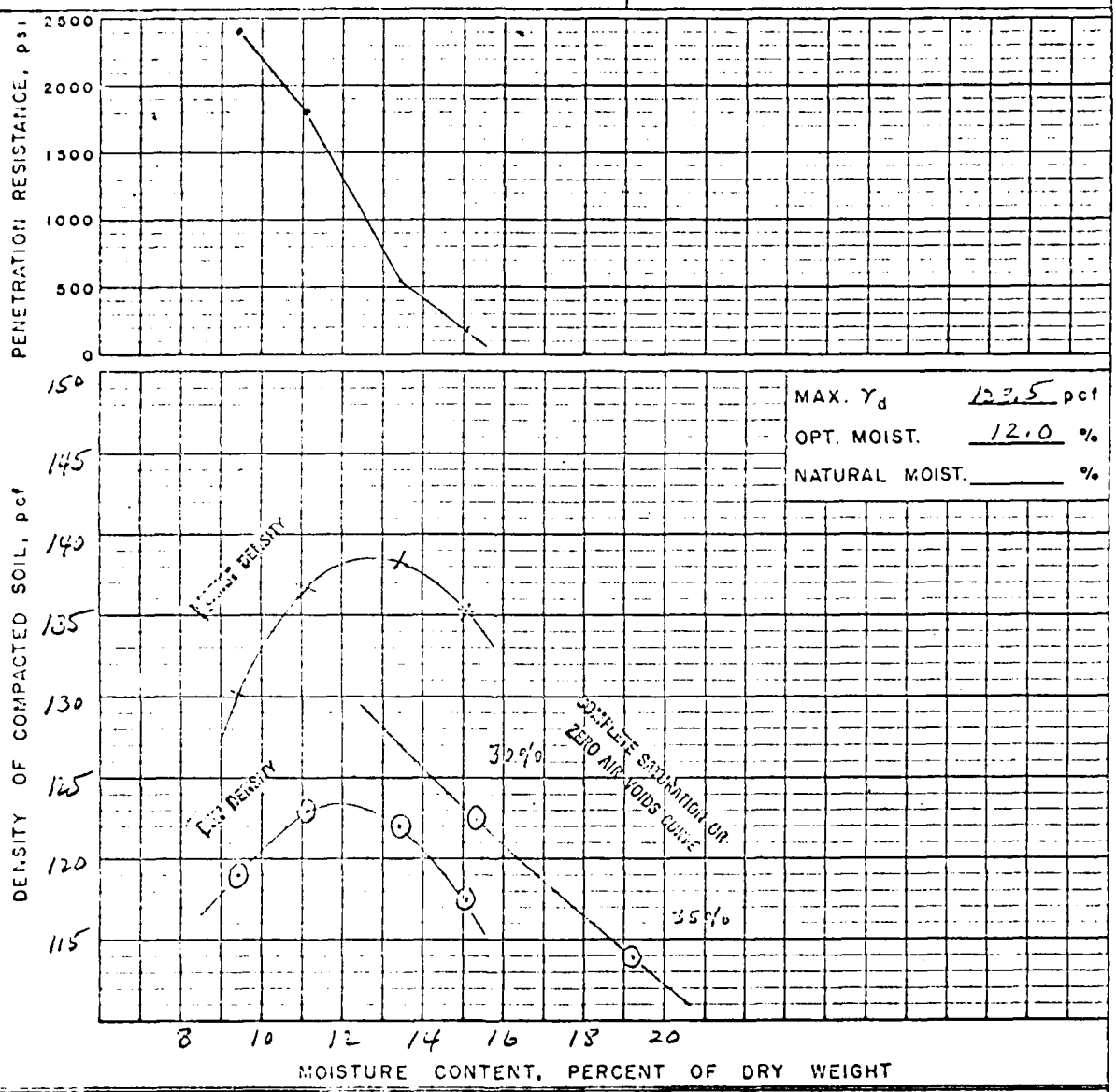
SPECIFIC GRAVITY (G_s) { MINUS NO. 4 2.80 ; PLUS NO. 4 2.73

CURVE NO. 2 OF 4

STD. (ASTM D-698) ☒; METHOD A

MOD. (ASTM D-1557) ☐; METHOD

OTHER TEST ☐ (SEE REMARKS)



MAX. γ_d 123.5 pcf

OPT. MOIST. 12.0 %

NATURAL MOIST. ____ %

REMARKS

CURVE IS FOR THE MINUS NO. 4 FRACTION

GRADATION OF TOTAL SAMPLE

< NO. 200 52 %, < NO. 4 70 %, < 6 IN. 100 %

LABORATORY NO. 7SW 7[illegible]

[illegible] REPORT	U.S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE	COMPACTION AND PENETRATION RESISTANCE

PROJECT OR SITE: [illegible] Creek, Site 10, New York,

FIELD SAMPLE NO.	LOCATION	DEPTH
209.2	L. Em. Spwy. (C) Medium Till	13-18'

GEOLOGIC ORIGIN	TESTED AT	APPROVED BY	DATE
	SML-LINCOLN		

CLASSIFICATION GC LL 24 PI 9

MAX. PARTICLE SIZE INCLUDED IN TEST <#4 "

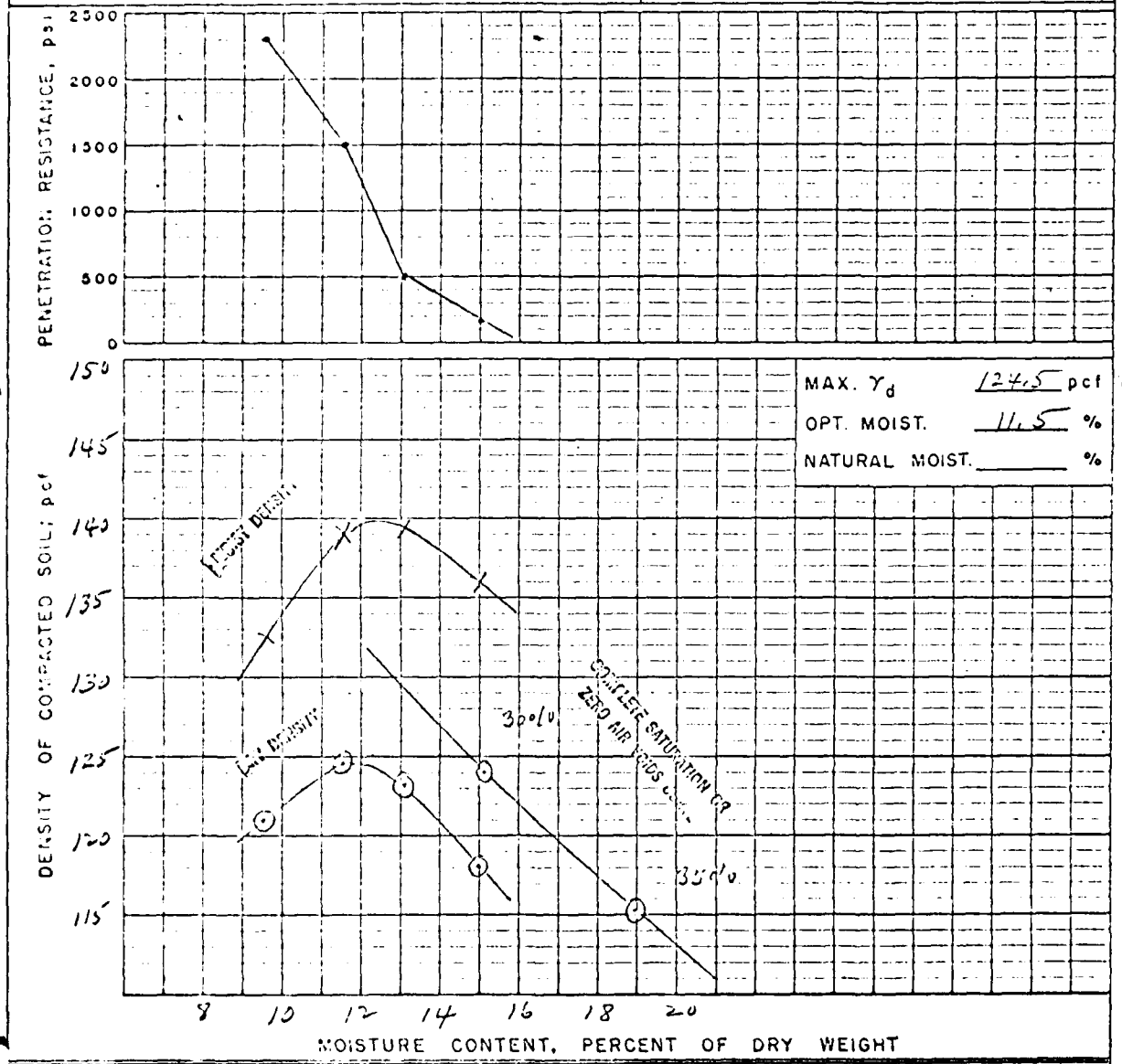
SPECIFIC GRAVITY (G_s) { MINUS NO. 4 2.84 ; PLUS NO. 4 2.73

CURVE NO. 3 OF 4

STD (ASTM D-698) ☒; METHOD A

MOD (ASTM D-1557) ☐; METHOD

OTHER TEST ☐ (SEE REMARKS)



MAX. γ_d 124.5 pcf

OPT. MOIST. 11.5 %

NATURAL MOIST. ____ %

REMARKS

CURVE IS FOR THE MINUS NO. 4 FRACTION

GRADATION OF TOTAL SAMPLE

< NO. 200 48 %; < NO. 4 65 %; < 6 IN. 100 %

LABORATORY No. 70 W 732

LABORATORY TESTING REPORT	U.S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE	COMPACTION AND PENETRATION RESISTANCE

PROJECT OR LOCATION: Nanticoke Creek, Site 10, New York.

FIELD SAMPLE NO.	LOCATION	DEPTH
224-1	R. Em. Spwy. (C) Finest Till.	0.5 – 13.5'

GEOLOGIC ORIGIN	TESTED AT	APPROVED BY	DATE
	SML-LINCOLN		

CLASSIFICATION CL-ML LL 22 PI 4

MAX. PARTICLE SIZE INCLUDED IN TEST < #4 "

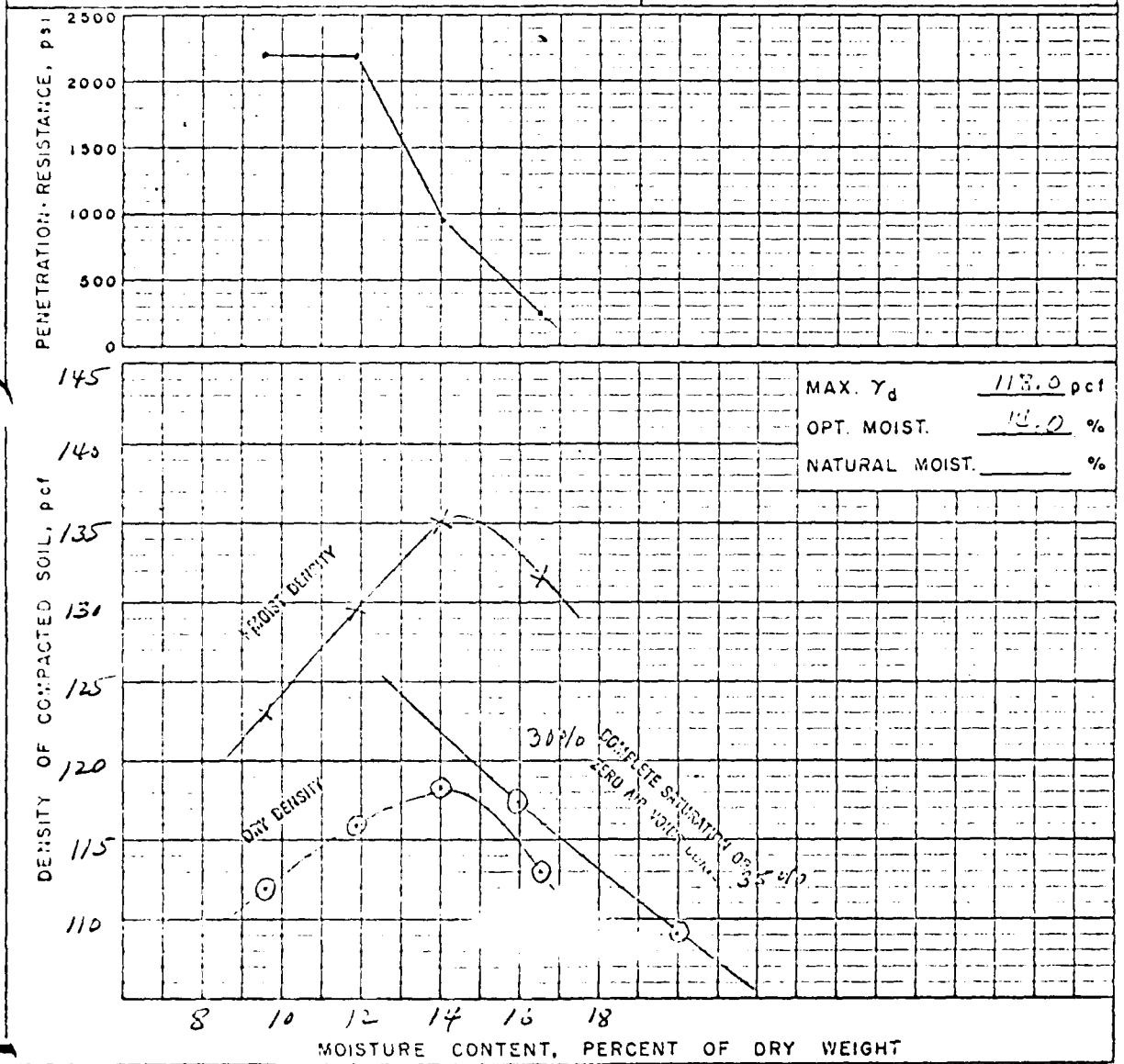
SPECIFIC GRAVITY (G_s) { MINUS NO. 4 2.69 ; PLUS NO. 4 2.71

CURVE NO. 4 OF 4

STD (ASTM D-698) ☒; METHOD A

MOD. (ASTM D-1557) ☐; METHOD _____

OTHER TEST ☐ (SEE REMARKS)



MAX. γ_d 113.0 pcf

OPT. MOIST. 13.0 %

NATURAL MOIST. _____ %

REMARKS

CURVE IS FOR THE MINUS NO. 4 FRACTION

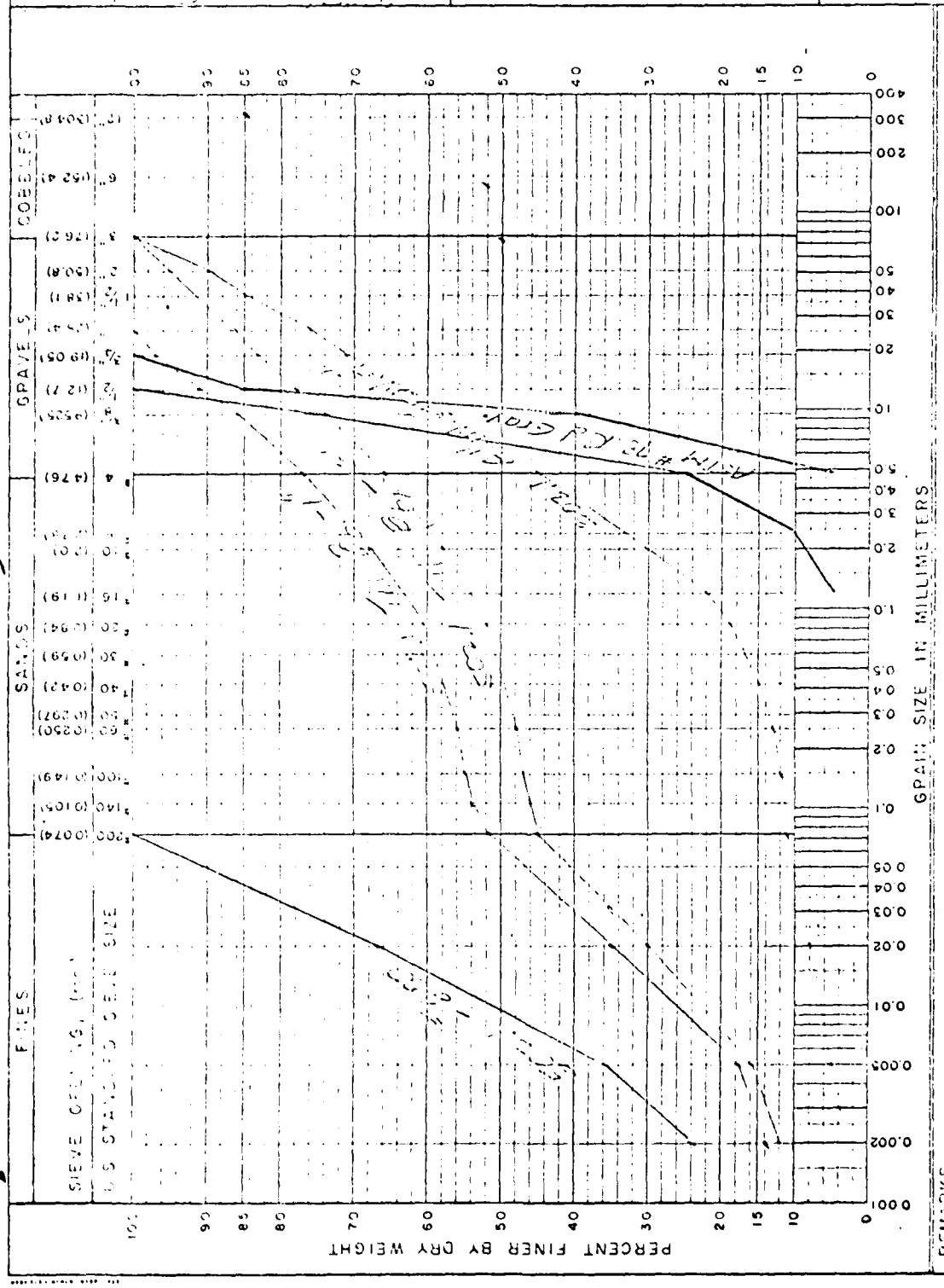
GRADATION OF TOTAL SAMPLE

< NO. 200 73 %; < NO. 4 85 %; < 3 IN. 100 %

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

PROJECT OR STATE

DESIGNED AT | BY | DATE



REMARKS

U.S. DEPARTMENT of AGRICULTURE
SOIL CONSERVATION SERVICE

SUMMARY - SLOPE STABILITY ANALYSIS

PROJECT OR STATE: NEW MEXICO
DATE: 12-1[illegible]-[illegible]

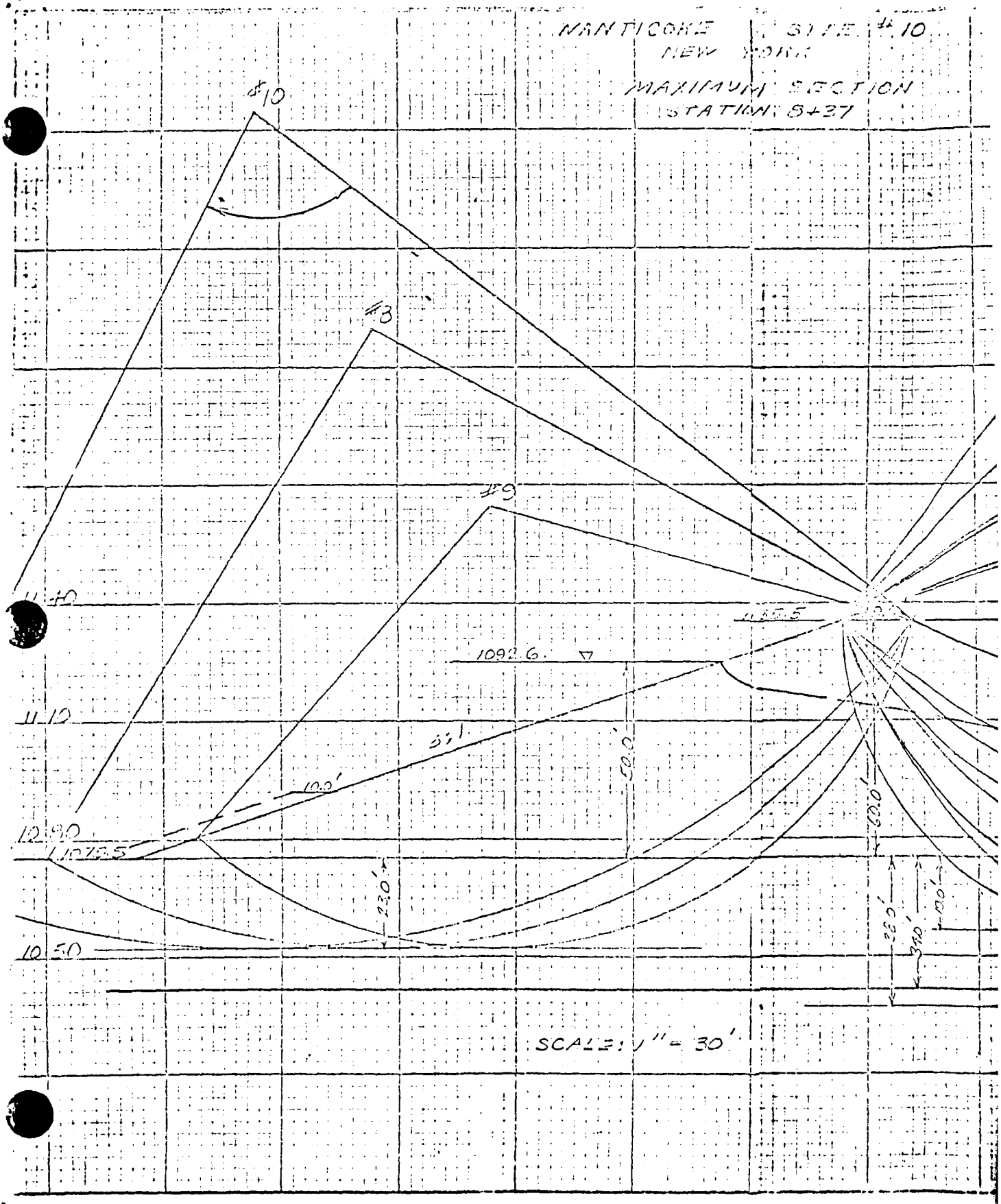
METHOD OF ANALYSIS: STANDARD
ANALYZED AT: SANTA LINCOLN NM
APPROVED BY:

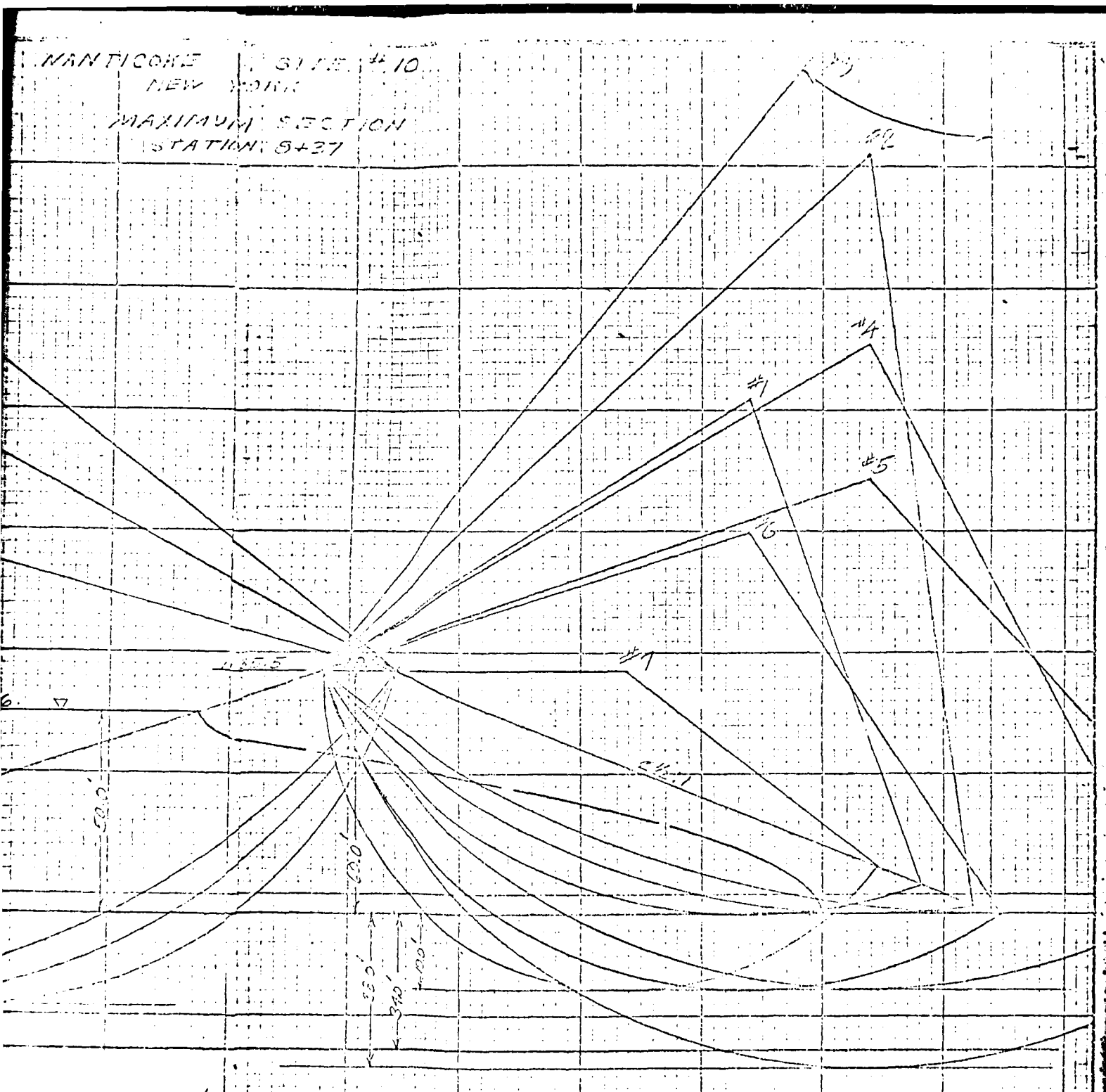
SOURCE AND USE OF MATERIALS	CLASSIFICATION	ADOPTED DESIGN DATA γd (pcf)	γm (pcf)	γsat (pcf)	γsub (pcf)	φ (deg)	tan φ	c (psf)	REMARKS
(1) FOUNDATION		110.5		132.0	70.5	35.0	.700	0	ASSUMED VALUES
(2) EMBANKMENT	ML	93.9	114.5	130.0	76.5	24.0	.445	850	
(3) EMBANKMENT	CL-ML	112.1	128.0	132.0	82.5	25.0	.466	825	
(4)									
(5)									
(6)									
(7)									
(8)									

CIRCLE

TRIAL NO.		SLOPE	MAXIMUM SECTION — CONDITIONS @ STATION 8+37	F_s
1	DN	2½:1	DRAIN @ % = 0.7 - NO BERM - ARC CUT FROM OPPOSITE SHOULDER	
			THRU EMB. (24°-850) ONLY	2.41
1A	DN	2½:1	DRAIN @ % = 0.7 - NO BERM - ARC CUT FROM OPPOSITE SHOULDER	
			THRU EMB. (25°-825) ONLY	2.36
2	DN	2½:1	SAME CONDITIONS AS TRIAL #1A	2.3
3	DN	2½:1	SAME CONDITIONS AS TRIAL #1A	2.6
4	DN	2½:1	DRAIN @ % = 0.7 - NO BERM - ARC CUT FROM OPPOSITE SHOULDER THRU	
			EMB. (25°-825) & 19' FOUND (35°-0)	1.92
5	DN	2½:1	DRAIN @ % = 0.7 - NO BERM - ARC CUT FROM OPPOSITE SHOULDER	
			THRU EMB. (25°-825) & 38' FOUND (35°-0)	1.96
6	DN	2½:1	SAME CONDITIONS AS TRIAL #4	1.90
7	DN	2½:1	SAME CONDITIONS AS TRIAL #4	2.3
8	UP	3:1	FULL DRAWDOWN - NO BERM - ARC CUT FROM OPPOSITE	
			SHOULDER THRU EMB. (25°-825) & 23' FOUND (35°-0)	1.65
9	UP	3:1	SAME CONDITIONS AS TRIAL #8	1.77
10	UP	3:1	SAME CONDITIONS AS TRIAL #8	1.73

Sheet 1 of 2


NANTICOKE SITE #10
NEW YORK
MAXIMUM SECTION
STATION: 8+37
#10
#8
#9
1092.6
1075.5
10.0'
50.0'
60.0'
23.0'
SCALE: 1" = 30'

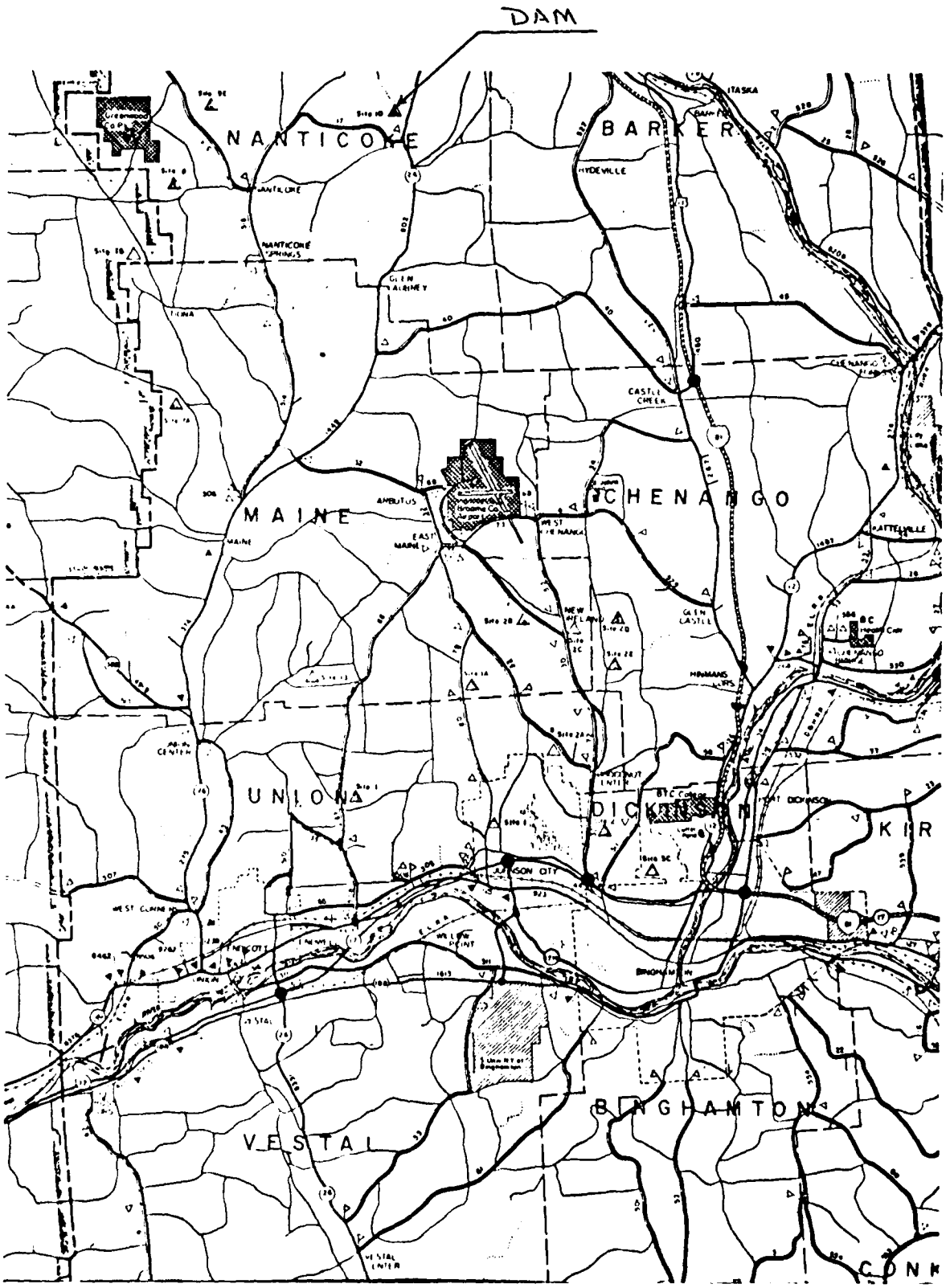


U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

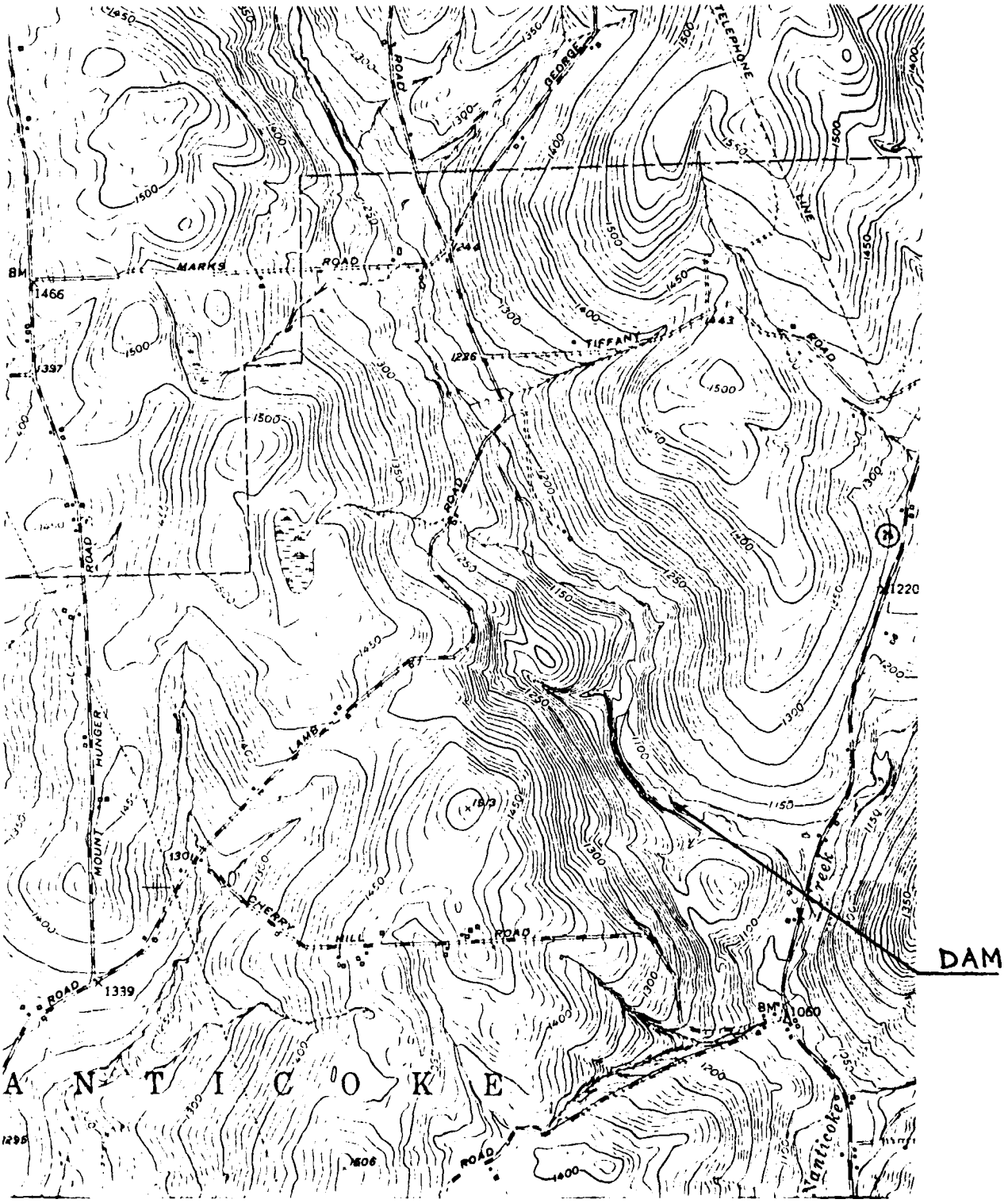
DESIGNED BY R D L	APPROVED BY
CHECKED BY G.N.G.	DRAWING NO. (FORM SCS 357)
DATE: 12-15-69	SHEET 2 OF 2

APPENDIX F

DRAWINGS



VICINITY MAP



TOPOGRAPHIC MAP

NANTICOKE CREEK WATERSHED PROJECT

FLOODWATER RETARDING DAM SITE 10

DRAINAGE AREA	2902 Acres
FLOOD STORAGE TO EMERGENCY SPILLWAY CREST	618 Ac.Ft.
WATER SURFACE AREA AT SEDIMENT POOL	4.8 Acres
HEIGHT OF DAM	58 Feet
VOLUME OF FILL	108,380 ~~101,400~~ Cu.Yds.

BUILT UNDER THE WATERSHED PROTECTION AND 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 - ACCESS ROAD DETAILS
SHEET 3 - PLAN OF STORAGE AREA
SHEET 4 - PLAN OF STRUCTURAL WORKS
SHEET 4A LOCATION OF DIVERSIONS, TILE LINES, + ROCK LINED DITCHES
SHEET 5 - LAYOUT DATA
SHEET 6 - CUTOFF TRENCH EXCAVATION
SHEET 7 - EAST EMERGENCY SPILLWAY
SHEET 8 - WEST EMERGENCY SPILLWAY
SHEET 9 - FILL PLACEMENT & PRINCIPAL SPILLWAY EXCAVATION
SHEET 10 - DRAINAGE SYSTEM
SHEET 11 - DRAINAGE SYSTEM
SHEET 12 - PLAN PROFILE OF PRINCIPAL SPILLWAY
SHEET 13 - RISER STRUCTURAL DETAILS
SHEET 13A RISER STRUCTURAL DETAILS
SHEET 14 - RISER STRUCTURAL DETAILS
SHEET 15 - RISER STRUCTURAL DETAILS
SHEET 16 - RISER STRUCTURAL DETAILS
SHEET 17 - RISER TRASH RACKS
SHEET 18 - CONDUIT DETAILS
SHEET 19 - CRADLE AND BENT DETAILS
SHEET 20 - RESERVIOR DRAIN INLET DETAILS
SHEET 21 - FENCING DETAILS
SHEET 22 - LOGS OF TEST HOLES
SHEET 23 - LOGS OF TEST HOLES
DRAWING NO. NY-2010-P-A ADDENDUM TO RISER STRUCTURAL DETAILS

CONTRACTOR
GOV'T. REP. —
INSPECTOR —

CONTRACT NO. #
TOTAL COST

RSHED PROJECT
DAM SITE 10

AS BUILT
9-13-79

2902 Acres
618 Ac.Ft.

4.8 Acres

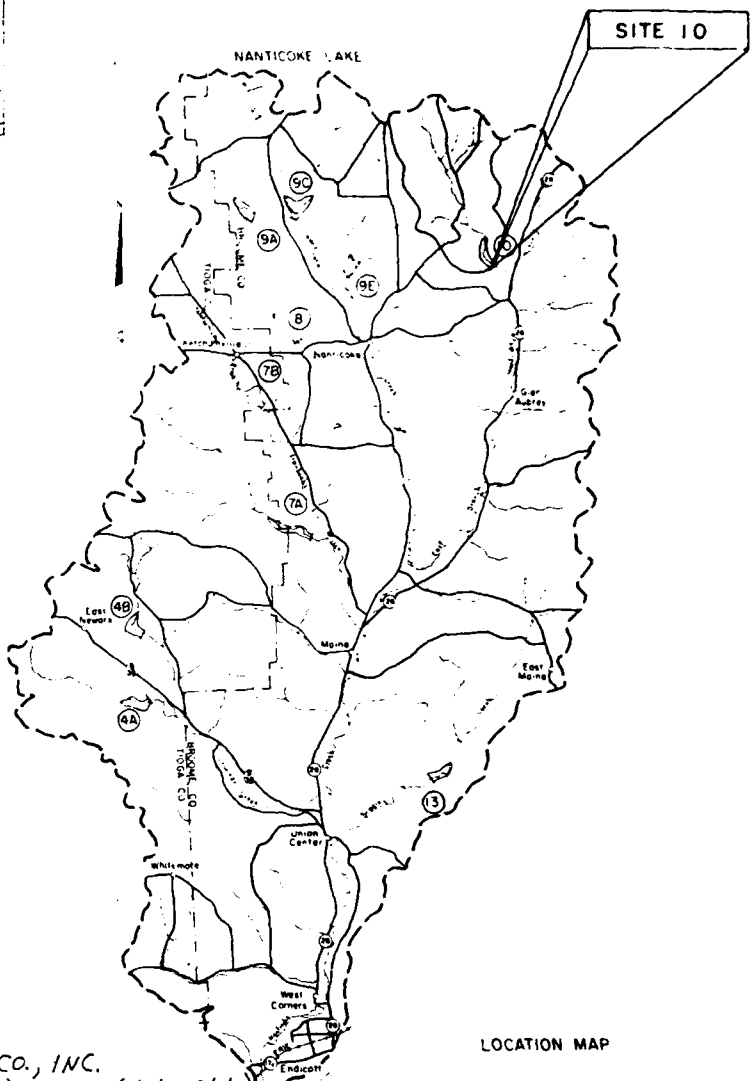
58 Feet
108,380 ~~101,400~~ Cu.Yds.

PROTECTION AND
N ACT

OME
OF THE
SERVICE

GRICULTURE

LOCATION MAP



LOCATION MAP

OCATION OF DIVERSIONS, TILE LINES, + ROCK LINED DITCHES

EXCAVATION

SER STRUCTURAL DETAILS

CONTRACTOR - BESTWAY CONSTR. CO., INC.
GOV'T. REP. — D. LAKE (10/6/77 - 6/25/78) + G. PAGE (6/26/78 - 9/13/79)
INSPECTOR — J. MOTT (10/18/77 - 1/8/78), J. BARLOW (1/9/78 - 5/30/79)
R. GEMMEL (5/31/79 - 9/13/79)
CONTRACT NO. + DATE - NAN-10-T1 10/31/77
TOTAL COST - $453,752.92

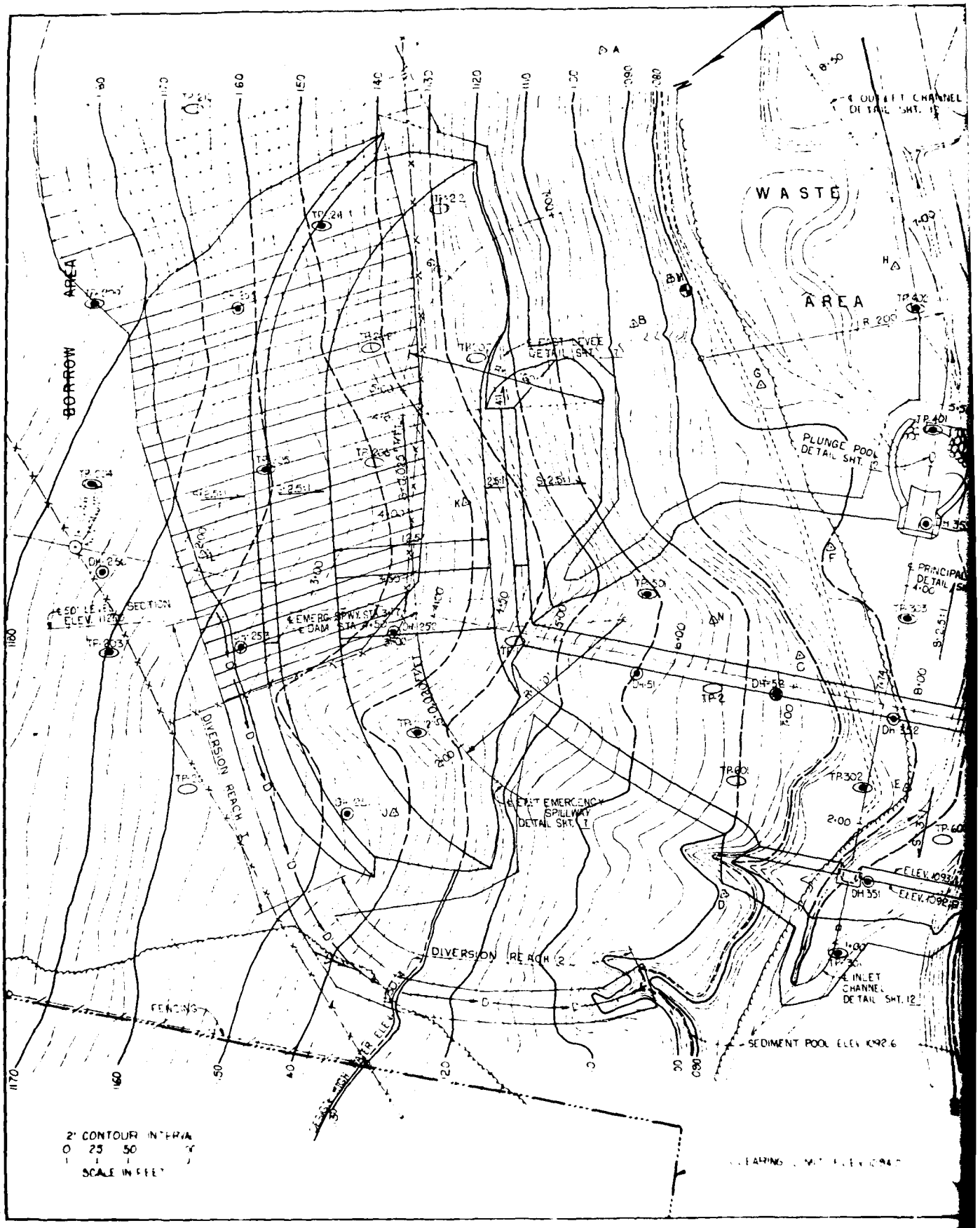
SCALE 0 1 2 3 Miles

85D-3946
NY-713

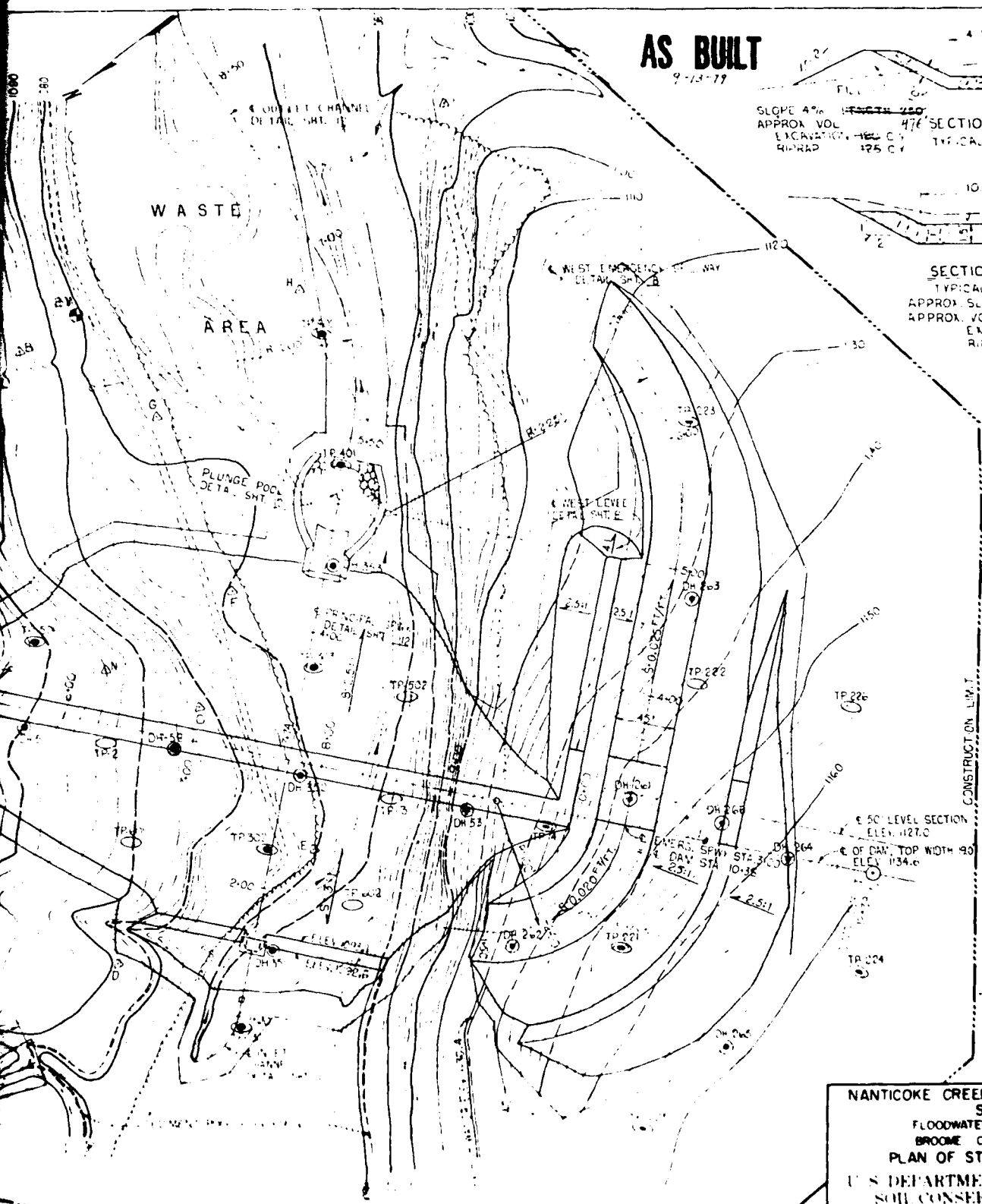
A STRUCTURAL DETAILS

NANTICOKE CREEK WATERSHED PROJE
SITE 10
FLOODWATER RETARDING DAM
BROOME COUNTY, NEW YORK
COVER SHEET
U.S. DEPARTMENT OF AGRICULTU
SOIL CONSERVATION SERVICE

DEW 1-77 NY-2010-P



WASTE
AREA
BORROW AREA
PLUNGE POOL DETAIL SHT. 13
EAST LEVEE DETAIL SHT. 7
EAST EMERGENCY SPILLWAY DETAIL SHT. 7
DIVERSION REACH 1
DIVERSION REACH 2
INLET CHANNEL DETAIL SHT. 12
SEDIMENT POOL ELEV. 1092.6
FENCING
2' CONTOUR INTERVAL
0 25 50
SCALE IN FEET



ABUTMENT EXCAVATION

~~SLOPE THE RIGHT ABUTMENT TO 2:1 SLOPE. SEE SHT. 6 FOR SLOPE EXCAVATION LIMITS 140' UPSTREAM TO 160' DOWN STREAM FROM ℄ OF DAM.~~

ALL EXPOSED ROCK SHALL BE CLEANED OF LOOSE MATERIAL PRIOR TO PLACEMENT OF EARTH FILL.

SEE MODIFICATION NO. 4 FOR DETAILS

FOUNDATION EXCAVATION

EXCAVATE THE SANDY SILT WITH ORGANIC MATERIAL (AS REPRESENTED BY TP 303 FROM 0 TO 2.0') FROM THE BASE WIDTH OF DAM IN THE FLOOD PLAIN. SEE SHEET 6

SOILS DETAILS

SEE SHEETS 22 & 23 FOR DESCRIPTIONS OF TEST PITS AND DRILL HOLES SHOWN ON SHEETS 4, 6, 7, 8, 9, 10 & 12

BENCH MARK DESCRIPTION

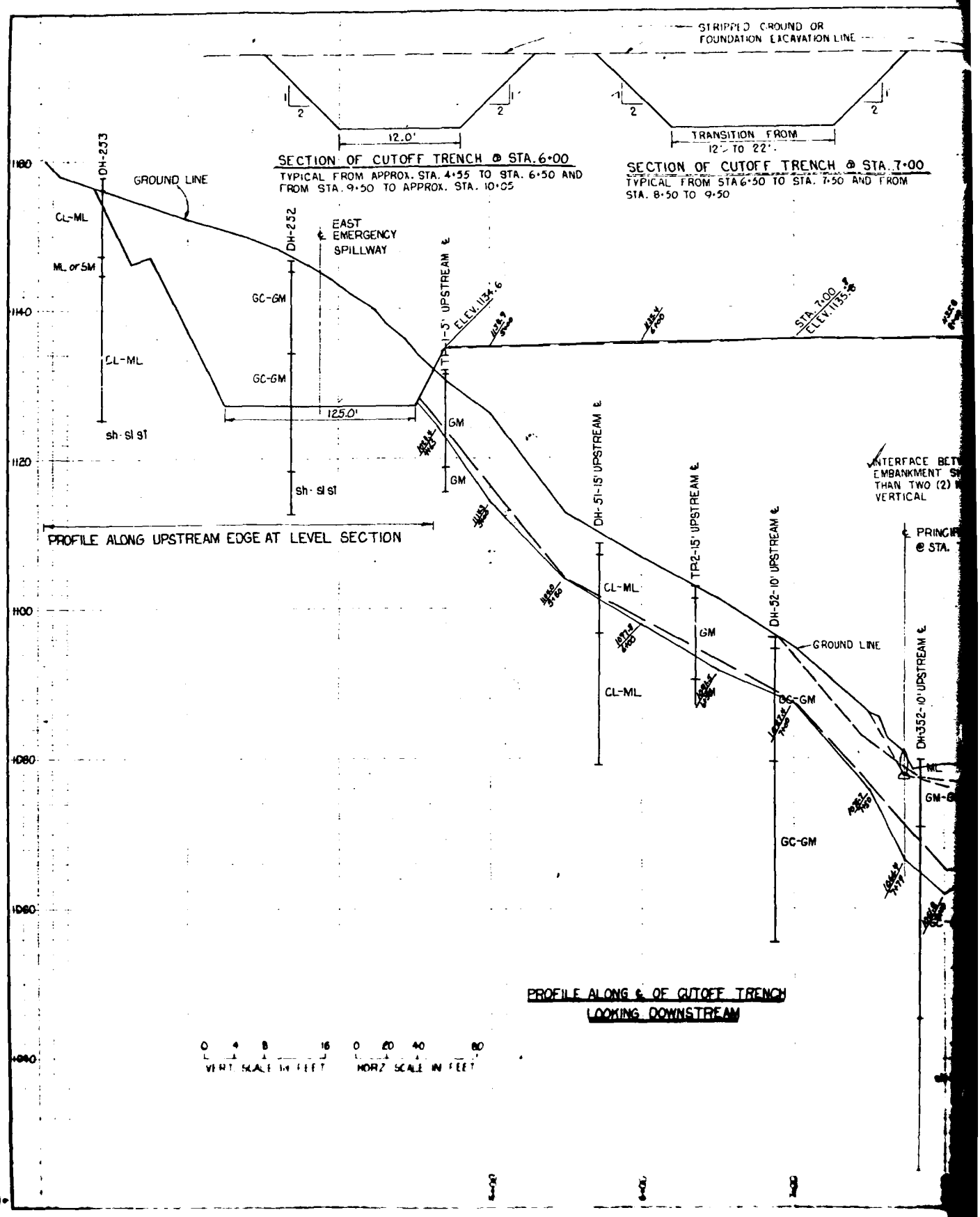
BM ELEV. 1080.52
S.C.S. STANDARD DISK TOP OF BENT NAIL IN ROOT OF 40" MAPLE TREE WITH TREEHOUSE

NANTICOKE CREEK WATERSHED PROJECT
SITE 10
FLOODWATER RETARDING DAM
BROOME COUNTY, NEW YORK
PLAN OF STRUCTURAL WORKS

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

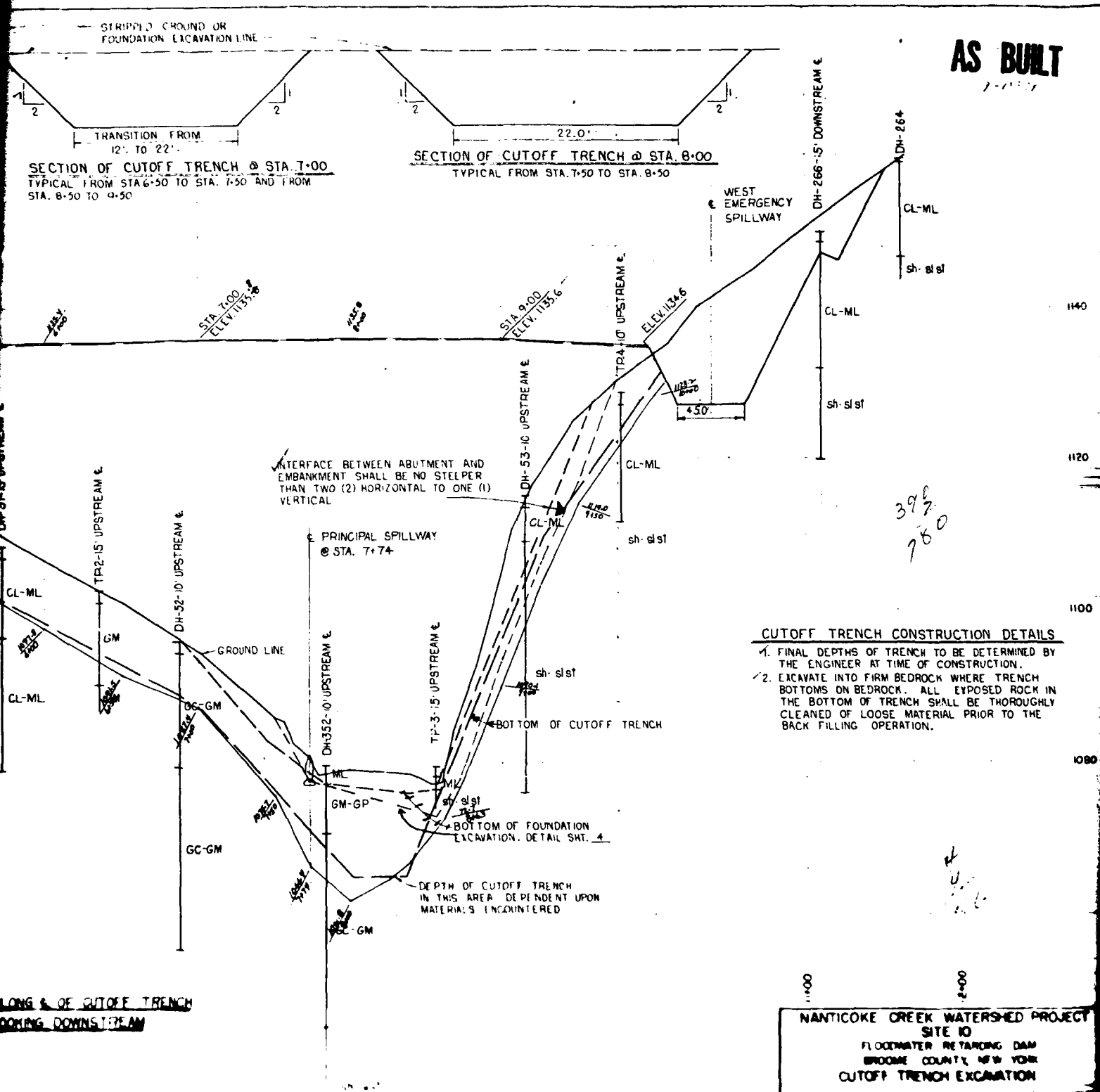
D. L. CHAPMAN 10/89
D. ANGELO 10/89
C. BURECH 10/89

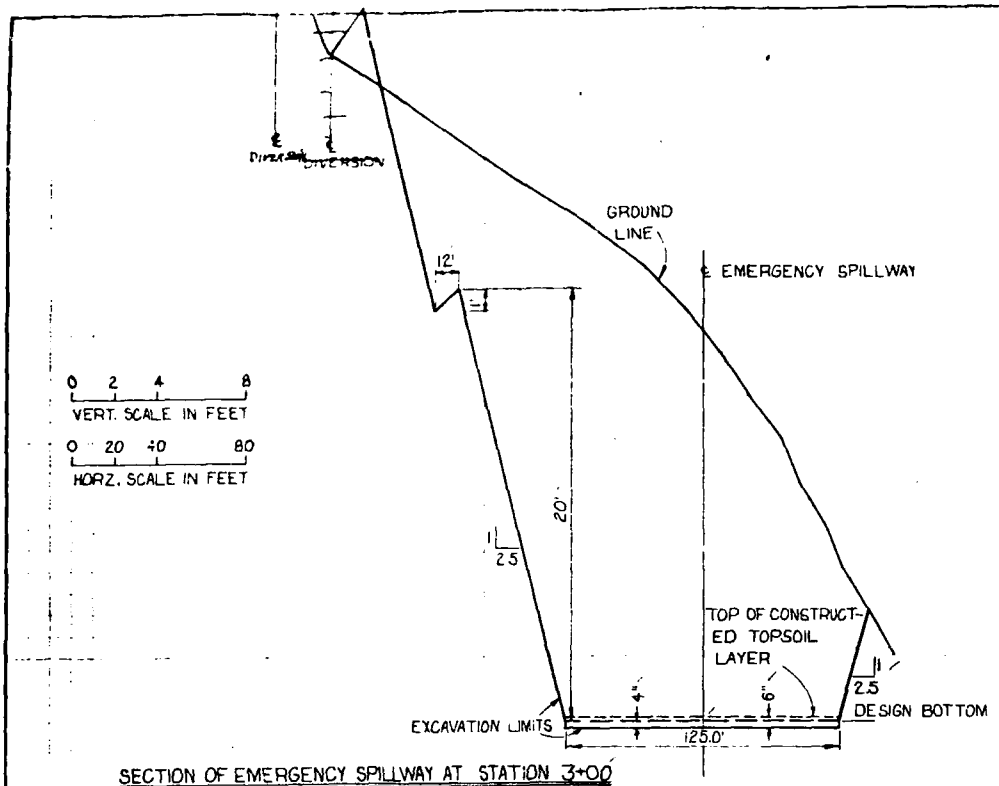
NY-2010-P



PROFILE ALONG ℄ OF CUTOFF TRENCH
LOOKING DOWNSTREAM

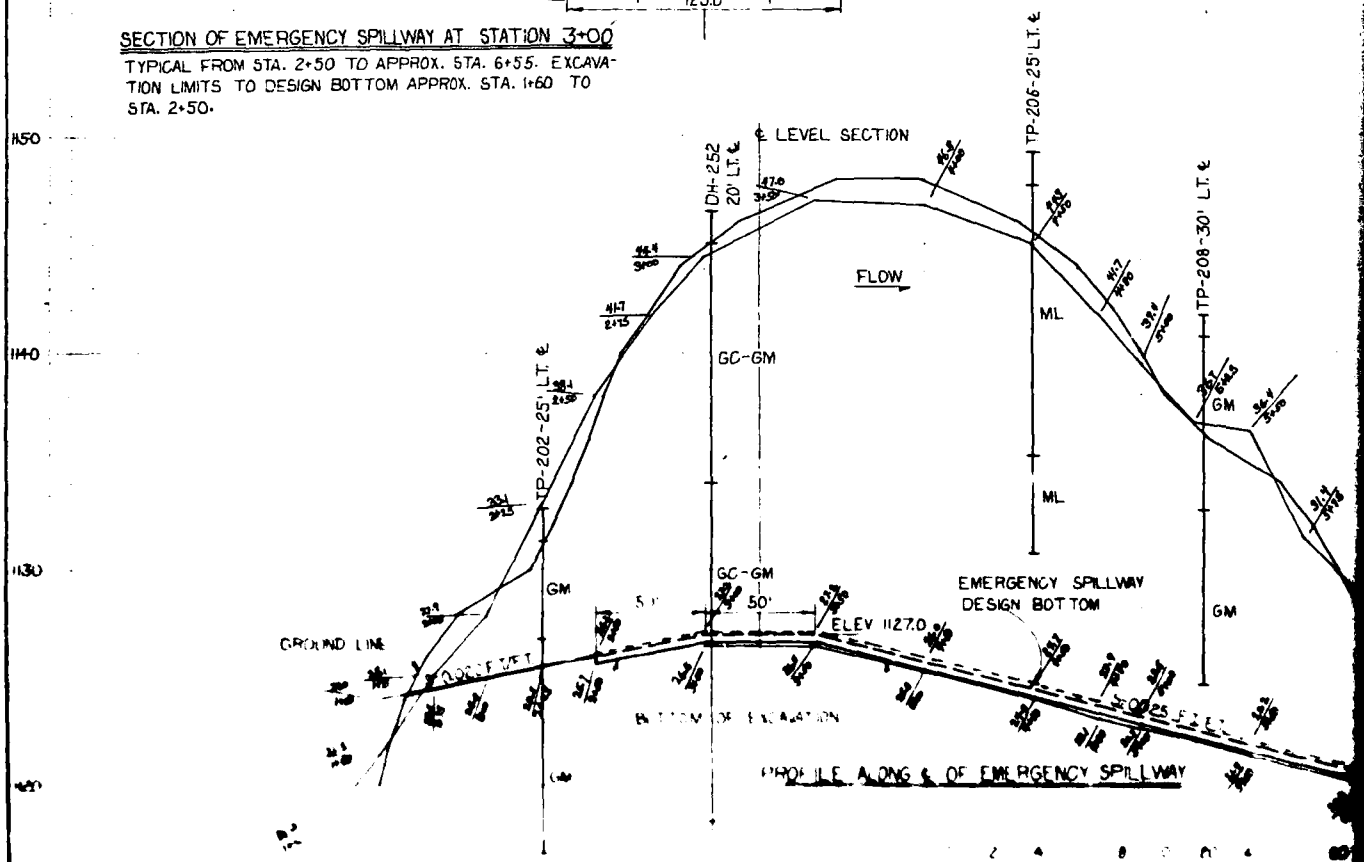
AS BUILT


STRIPPED GROUND OR FOUNDATION EXCAVATION LINE
TRANSITION FROM 12'- TO 22'-
SECTION OF CUTOFF TRENCH @ STA. 7+00
TYPICAL FROM STA. 6+50 TO STA. 7+50 AND FROM STA. 8+50 TO 9+50
22.0'
SECTION OF CUTOFF TRENCH @ STA. 8+00
TYPICAL FROM STA. 7+50 TO STA. 8+50
WEST EMERGENCY SPILLWAY
DH-266-15' DOWNSTREAM ℄
DH-264
CL-ML
sh-slst
STA. 7+00 ELEV. 1135.6
STA. 9+00 ELEV. 1135.6
TP4-10' UPSTREAM ℄
ELEV. 1134.6
4.50'
1140
1120
1100
1080
DH-53-10' UPSTREAM ℄
INTERFACE BETWEEN ABUTMENT AND EMBANKMENT SHALL BE NO STEEPER THAN TWO (2) HORIZONTAL TO ONE (1) VERTICAL
PRINCIPAL SPILLWAY @ STA. 7+74
TP2-15' UPSTREAM ℄
DH-52-10' UPSTREAM ℄
GM
GROUND LINE
GC-GM
DH-352-10' UPSTREAM ℄
TP-3-15' UPSTREAM ℄
ML
GM-GP
BOTTOM OF CUTOFF TRENCH
BOTTOM OF FOUNDATION EXCAVATION. DETAIL SHT. 4
DEPTH OF CUTOFF TRENCH IN THIS AREA DEPENDENT UPON MATERIALS ENCOUNTERED
ALONG ℄ OF CUTOFF TRENCH
LOOKING DOWNSTREAM
CUTOFF TRENCH CONSTRUCTION DETAILS
1. FINAL DEPTHS OF TRENCH TO BE DETERMINED BY THE ENGINEER AT TIME OF CONSTRUCTION.
2. EXCAVATE INTO FIRM BEDROCK WHERE TRENCH BOTTOMS ON BEDROCK. ALL EXPOSED ROCK IN THE BOTTOM OF TRENCH SHALL BE THOROUGHLY CLEANED OF LOOSE MATERIAL PRIOR TO THE BACK FILLING OPERATION.
NANTICOKE CREEK WATERSHED PROJECT
SITE 10
FLOODWATER RETARDING DAM
BROOME COUNTY, NEW YORK
CUTOFF TRENCH EXCAVATION
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE



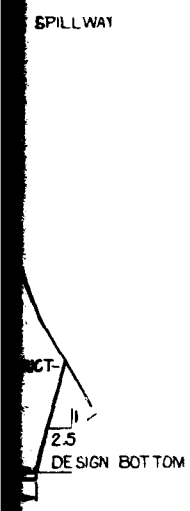
SECTION OF EMERGENCY SPILLWAY AT STATION 3+00

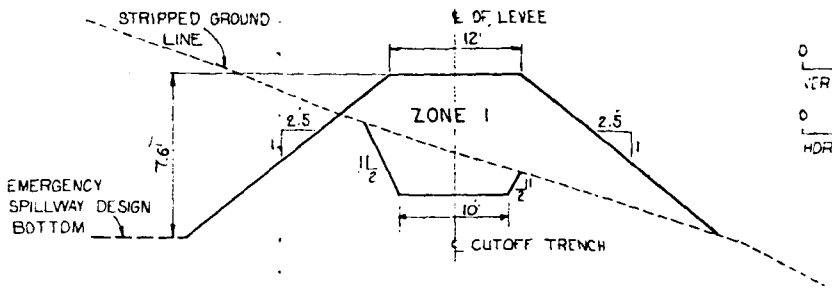
TYPICAL FROM STA. 2+50 TO APPROX. STA. 6+55. EXCAVATION LIMITS TO DESIGN BOTTOM APPROX. STA. 1+60 TO STA. 2+50.



AS BUILT

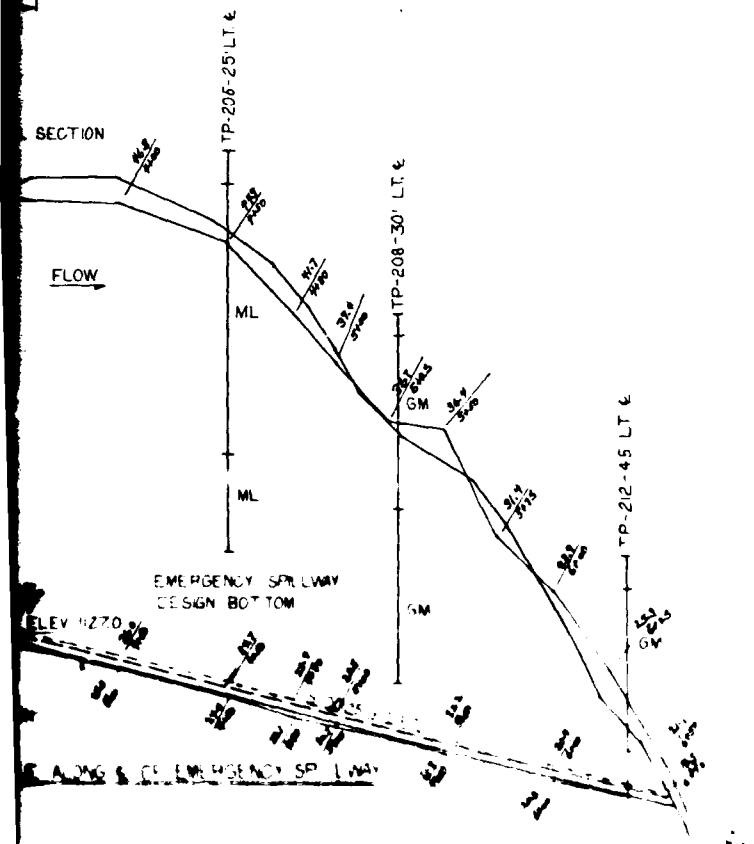
9-13-79

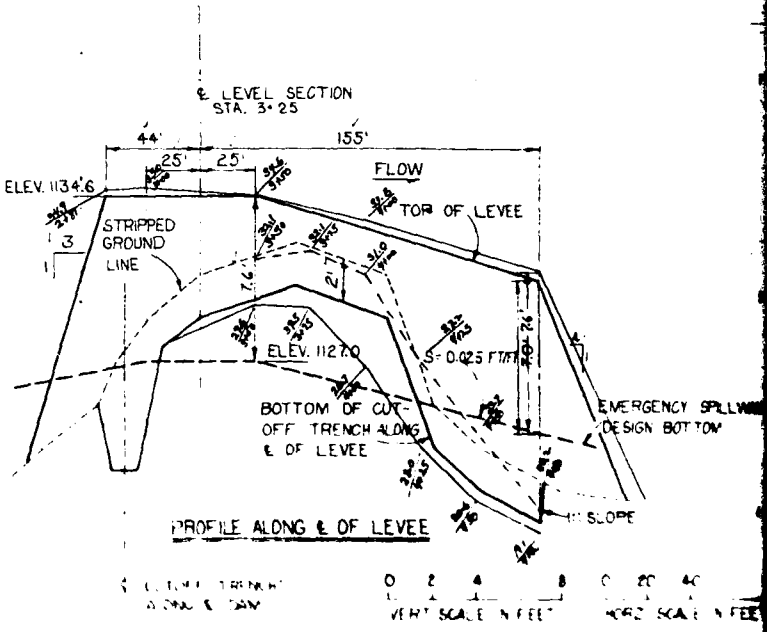




SECTION OF LEVEE AT ℄ OF LEVEL SECTION

TYPICAL FROM STA 3+00 TO STA. 4+80 EMERGENCY SPWY.

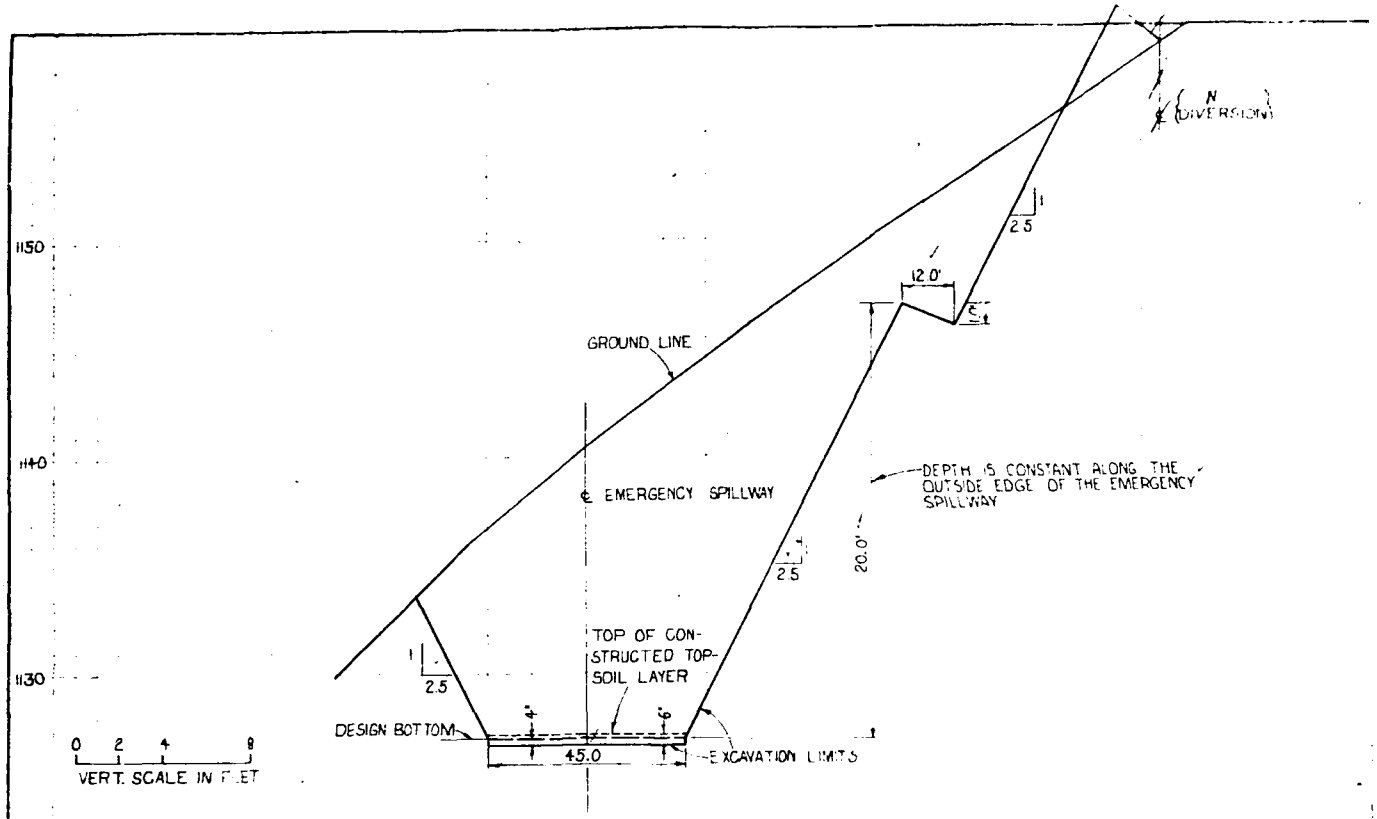




PROFILE ALONG ℄ OF LEVEE

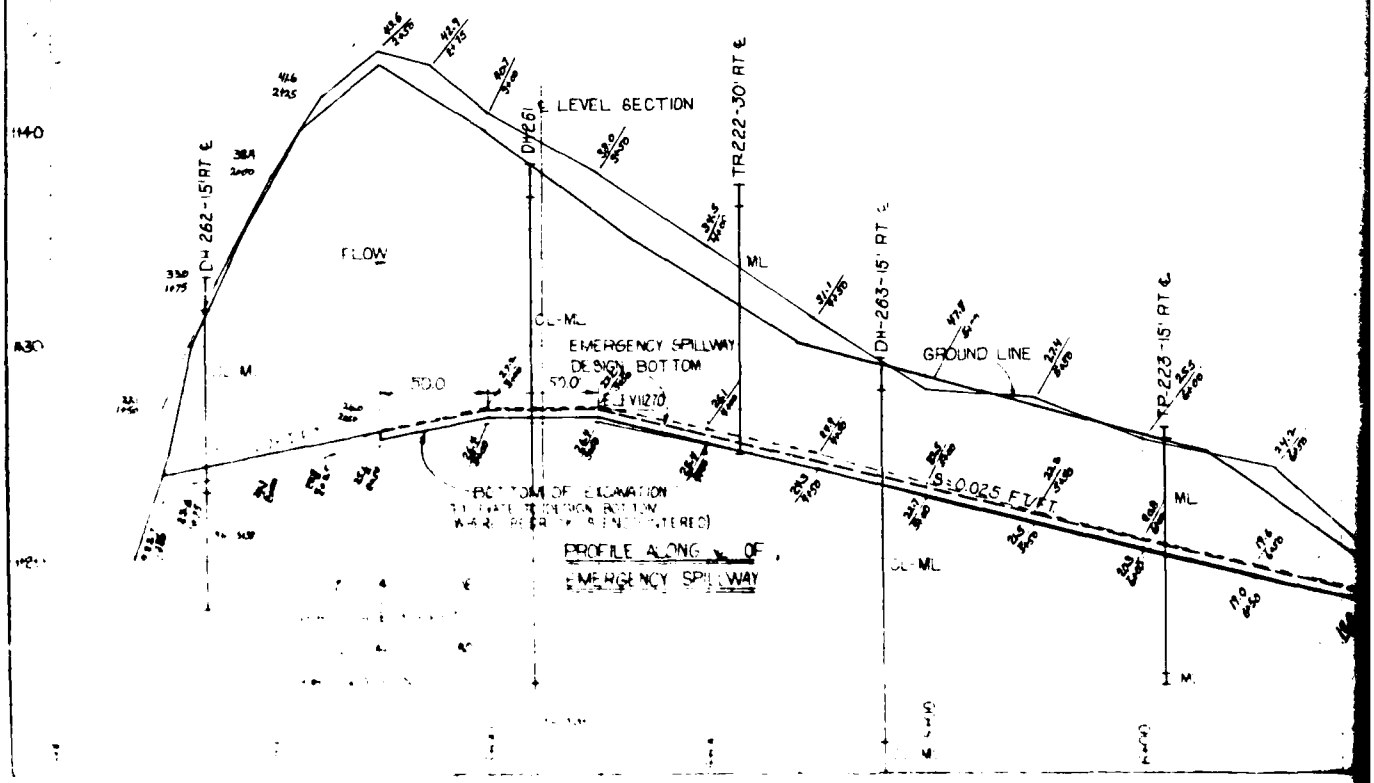
NANTICOKE CREEK WATERSHED PROJECT
SITE 10
FLOODWATER RETARDING DAM
BROOME COUNTY, NEW YORK
EAST EMERGENCY SPILLWAY

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

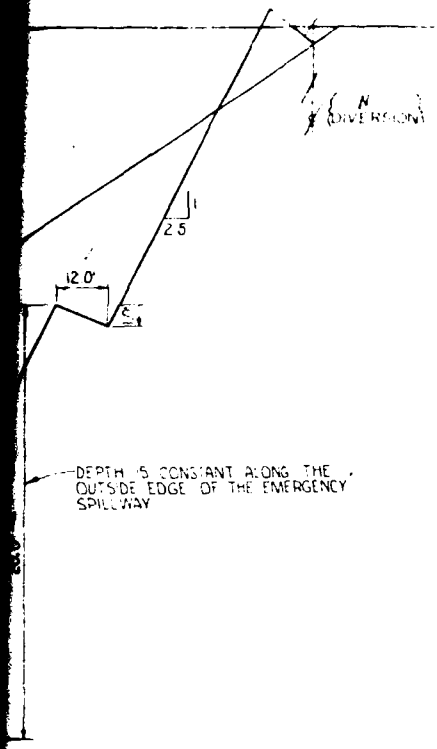


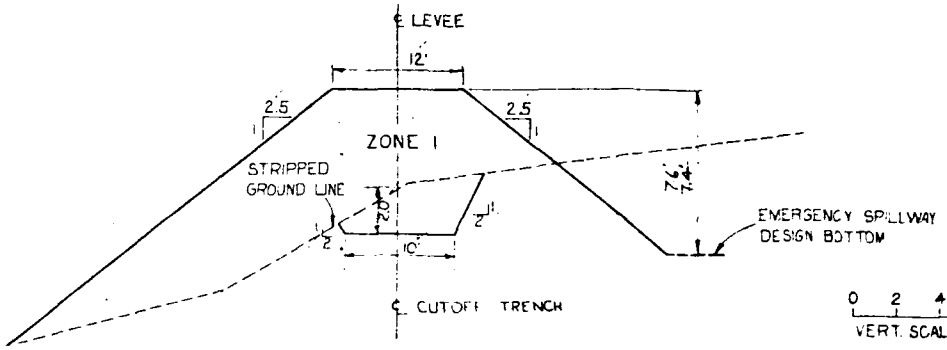
SECTION OF EMERGENCY SPILLWAY AT STA. 3+50

TYPICAL FROM STA. 2+50 TO APPROX. STA. 7+15. EXCAVATION LIMITS TO DESIGN BOTTOM IN SECTION WHERE BED ROCK IS ENCOUNTERED AT DESIGN GRADE AND FROM APPROX. STA. 1+50 TO STA. 2+50



AS BUILT



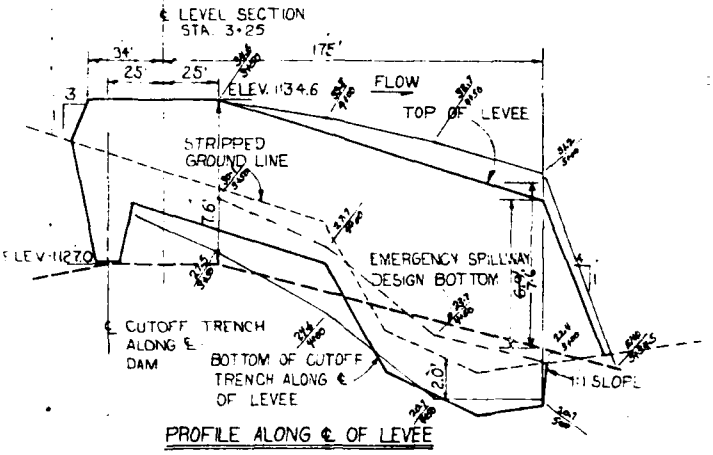


SECTION OF LEVEE AT EMERGENCY SPILLWAY STA. 4+00

TYPICAL FROM ℄ OF LEVEL SECTION @ STA 3+00 TO STA. 5+00 EMERGENCY SPILLWAY

0 2 4
VERT. SCALE IN FEET

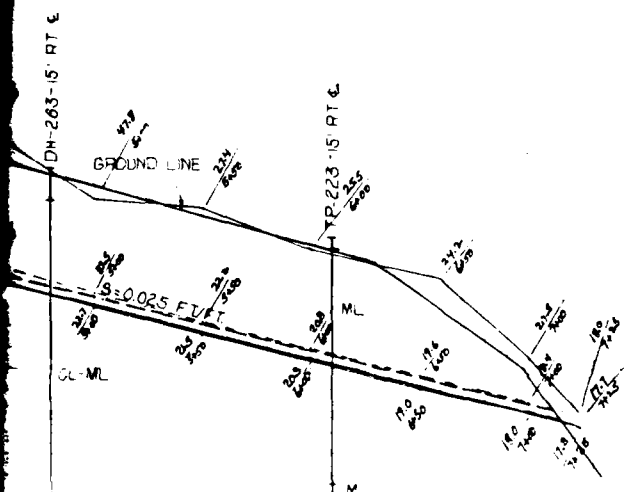
0 4 8
HORZ. SCALE IN FEET



PROFILE ALONG ℄ OF LEVEE

0 2 4 6
VERT. SCALE IN FEET

0 20 40 80
HORZ. SCALE IN FEET



NANTICOKE CREEK WATERSHED PROJECT
SITE 10
FLOODWATER RETARDING DAM
BROOME COUNTY NEW YORK
WEST EMERGENCY SPILLWAY

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

D. C. CHAPMAN
D. BURDICK

AD-A092 036 NEW YORK STATE DEPT OF ENVIRONMENTAL CONSERVATION ALBANY F/G 13/13
NATIONAL DAM SAFETY PROGRAM. NANTICOKE CREEK WATERSHED PROJECT --ETC(U)
SEP 80 G KOCH DACW51-79-C-0001

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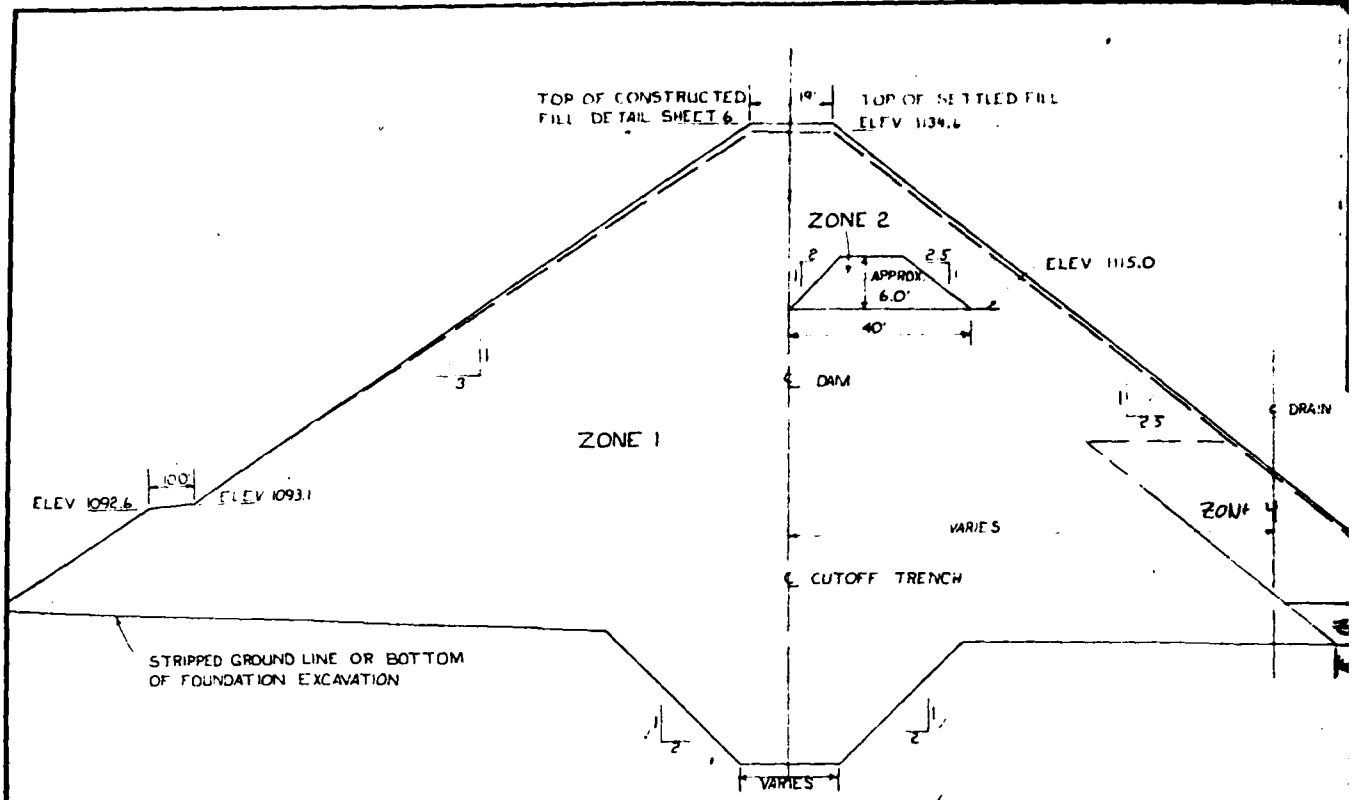
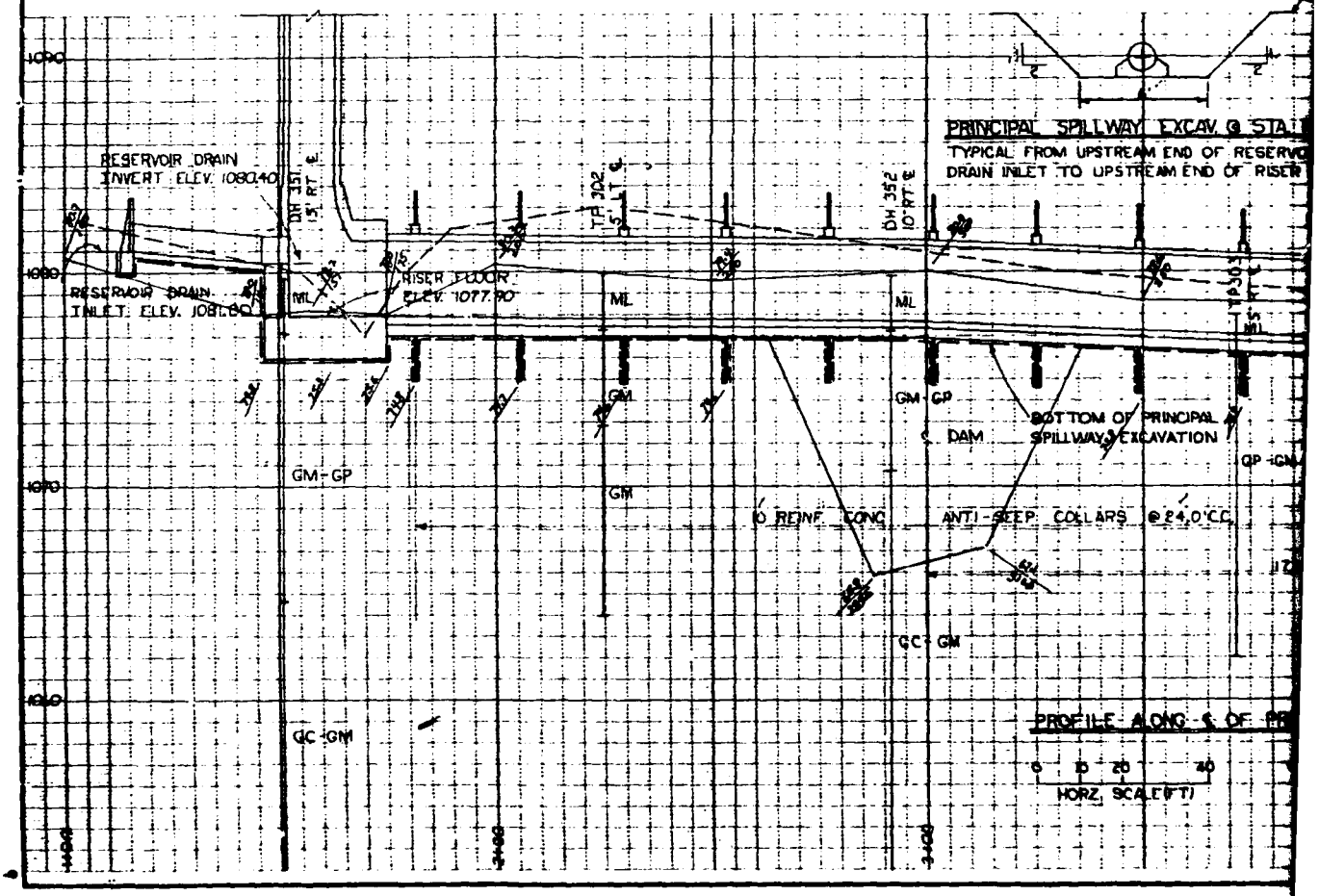
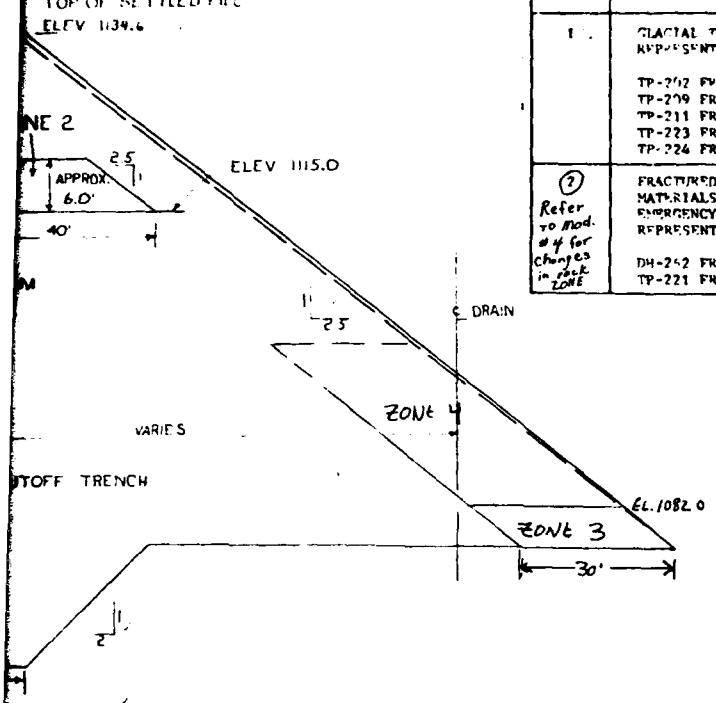


SECTION OF DAM AT STATION 8+25 (NOT TO SCALE)
TYPICAL FROM APPROX. STA 4+75 TO APPROX. STA. 9+90





EARTH FILL REQUIREMENTS

ZONE	MATERIAL 1/	MAX. ROCK SIZE 2/	MAX. LIFT THICKNESS 3/	REQUIRED WATER CONTENT 4/	COMPACTION CLASS	COMPACTION DEFINITION
1	GLACIAL TILL MATERIALS REPRESENTED BY TP-202 FROM 1.5' TO 16.0' TP-209 FROM 1.5' TO 18.0' TP-211 FROM 1.5' TO 17.0' TP-223 FROM 0.5' TO 12.0' TP-224 FROM 0.5' TO 13.5'	6"	9"	2 PERCENTAGE POINTS BELOW OPTIMUM TO 2 PERCENTAGE POINTS ABOVE OPTIMUM	A	95% OF MAXIMUM DENSITY BY A[illegible] D
2 Refer to mod. # 4 for changes in rock ZONE	FRACTURED SHALE AND SILTSTONE MATERIALS FROM THE WEST EMERGENCY SPILLWAY AS REPRESENTED BY: DH-242 FROM 10.0' TO 15.5' TP-221 FROM 9.5' TO 10.0'	18"	18"	WET 5/	C	THREE PASSES PER LAYER OF A SHEE FOOT ROLLER EXERTING A MINIMU CONTACT PRESSURE OF 450 psi NOWI AT A SPEED NO GREATER THAN 3 MPH

1/ THE PLACEMENT TABLE INDICATES ESTIMATED USE OF MATERIAL.

2/ a. MAXIMUM ROCK SIZE PLACED IN BACKFILL COMPACTED BY MEANS OF MANUALLY DIRECTED POWER TAMPERS OR PLATE VIBRATORS SHALL BE 3".

b. OVERSIZE MATERIAL (6" TO 18" INCLUSIVE), FROM ZONE 1, SHALL BE UTILIZED IN THE OUTSIDE 10 FEET OF THE UPSTREAM SLOPE BELOW ELEVATION 1093.1'. OVERSIZE MATERIAL SHALL BE PLACED IN THIS SECTION SO THERE IS ROCK TO ROCK CONTACT. COMPACTION FOR THIS SECTION SHALL BE THE SAME AS [illegible]

3/ MAXIMUM LIFT THICKNESS PRIOR TO COMPACTION.

4/ WATER CONTENT AT TIME OF COMPACTION.

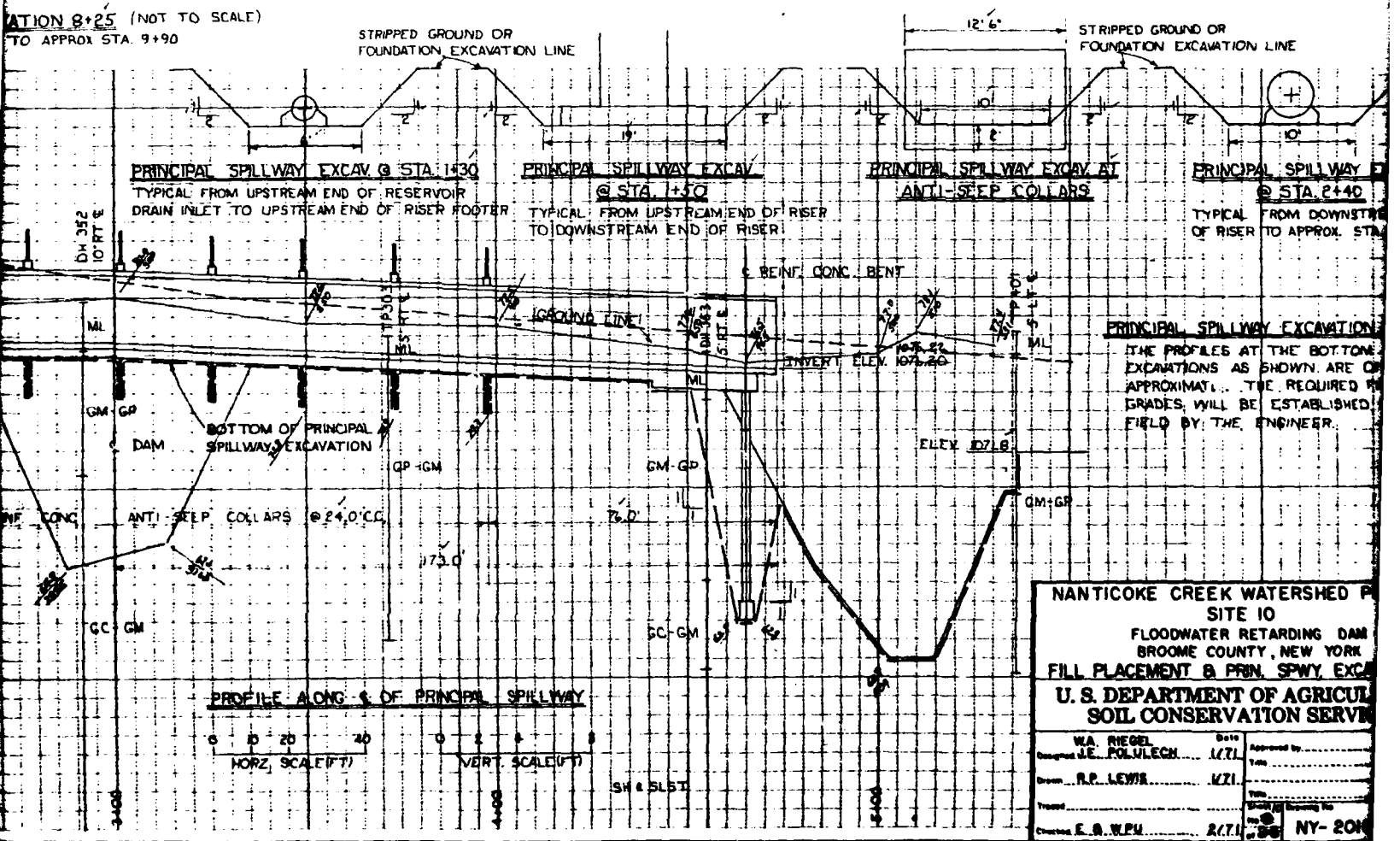
5/ THE MOISTURE CONTENT OF THE FILL MATERIAL SHALL BE MAINTAINED WITHIN THE LIMITS REQUIRED TO: (a) PREVENT THE ADHERENCE OF THE SOIL TO THE WHEELS OR TRACKS OF EQUIPMENT AND PREVENT BOGGING DOWN OF EQUIPMENT AND (b) INSURE THE CRUSHING OF THE SHALE PARTICLES INTO A REASONABLY HOMOGENEOUS MASS.

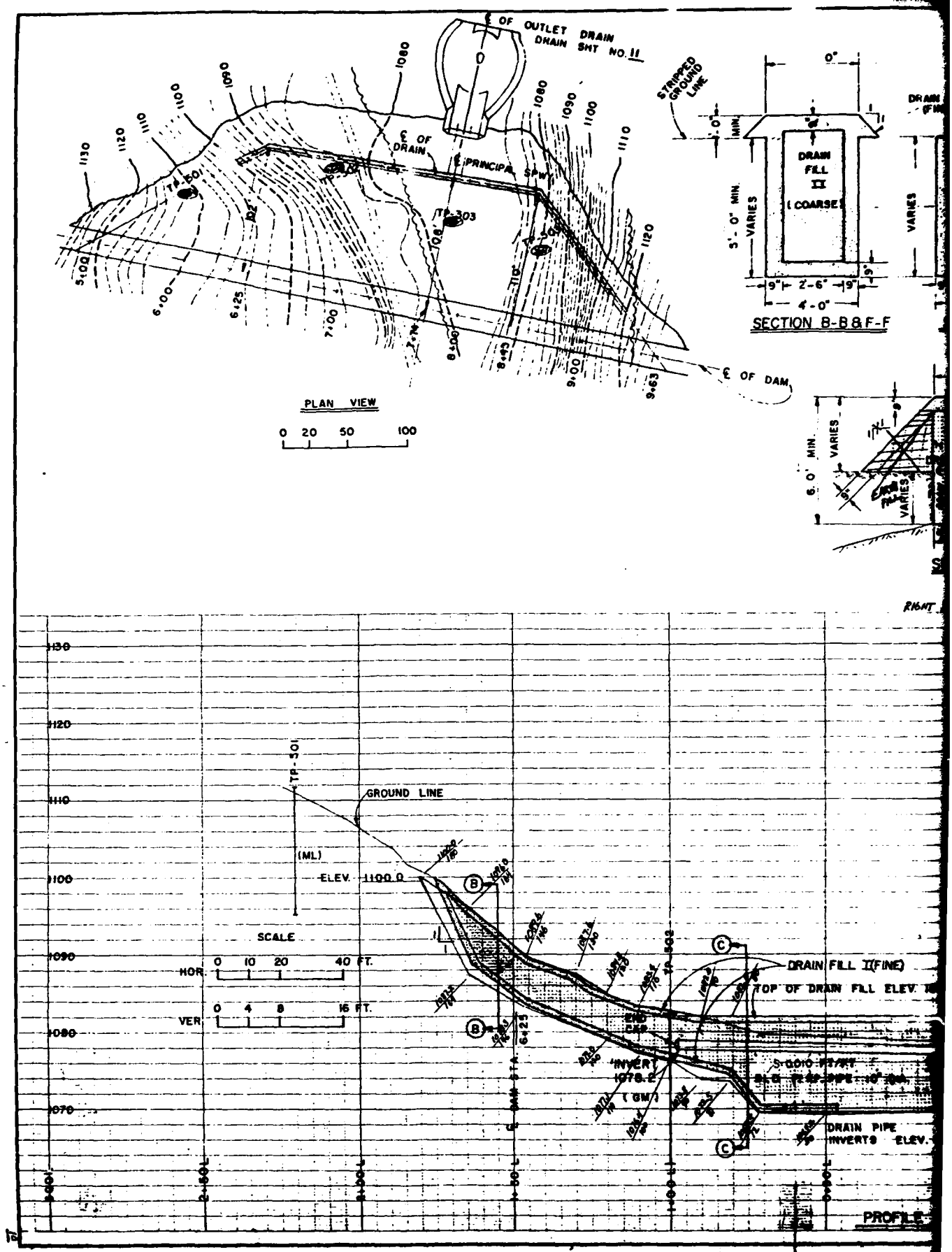
6/ FOR TYPICAL COMPACTION CURVES SEE SHEET 22.

CONSTRUCTION DETAILS

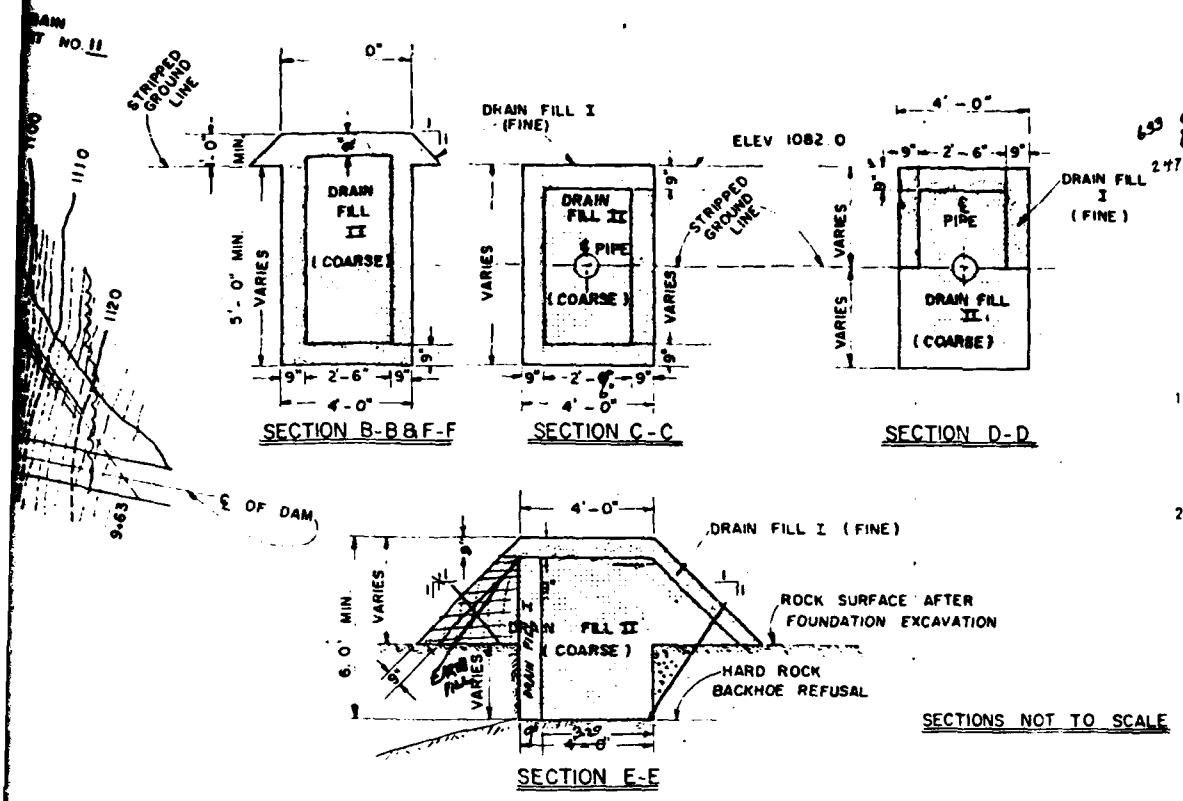
1. ZONE 2 BOUNDARIES INDICATED ARE APPROXIMATE. ADJUSTMENTS WILL BE MADE BY THE ENGINEER TO PERMIT THE CONTRACTOR TO UTILIZE ALL FRACTURED SHALE AND SILTSTONE MATERIALS FROM THE WEST EMERGENCY SPILLWAY WITHIN THE NEAT LINES OF THE EMBANKMENT.

2. TOPSOIL THAT IS SUITABLE FOR USE AND AND NOT USED ON THE SPECIFIED AREAS OF THE EMERGENCY SPILLWAYS SHALL BE INCORPORATED WITHIN THE SLOPES OF THE EARTH FILL AS DIRECTED BY THE ENGI[illegible]




℄ OF OUTLET DRAIN
DRAIN SHT NO. 11
STRIPPED GROUND LINE
℄ OF DRAIN
℄ PRINCIPAL SPWY
℄ OF DAM
TP-501
TP-503
PLAN VIEW
0 20 50 100
DRAIN FILL II (COARSE)
5'-0" MIN.
VARIES
9" 2'-6" 9"
4'-0"
SECTION B-B & F-F
6.0' MIN.
GROUND LINE
(ML)
ELEV. 1100.0
SCALE
HOR. 0 10 20 40 FT.
VER. 0 4 8 16 FT.
DRAIN FILL II(FINE)
TOP OF DRAIN FILL ELEV.
END CAP
INVERT 1078.2
(GM)
DRAIN PIPE INVERTS ELEV.
PROFILE

AS BUILT 9-12-79



QUANTITY SUMMARY

- 635 {~~200~~ CU. YDS DRAIN FILL I (FINE)
- {~~460~~ CU. YDS. DRAIN FILL II (COARSE)
- 247 ~~262~~ LIN. FT. STRAIGHT SECTION OF 10" DIA PERFORATED ASBESTOS - CEMENT PIPE
- 26 LIN. FT. STRAIGHT SECTION OF 10" DIA NON-PERFORATED ASBESTOS - CEMENT PIPE
- 2 END CAPS.
- 1 45° BEND - 10" DIA. CAST IRON
- 2 90° BENDS 10" DIA. CAST IRON

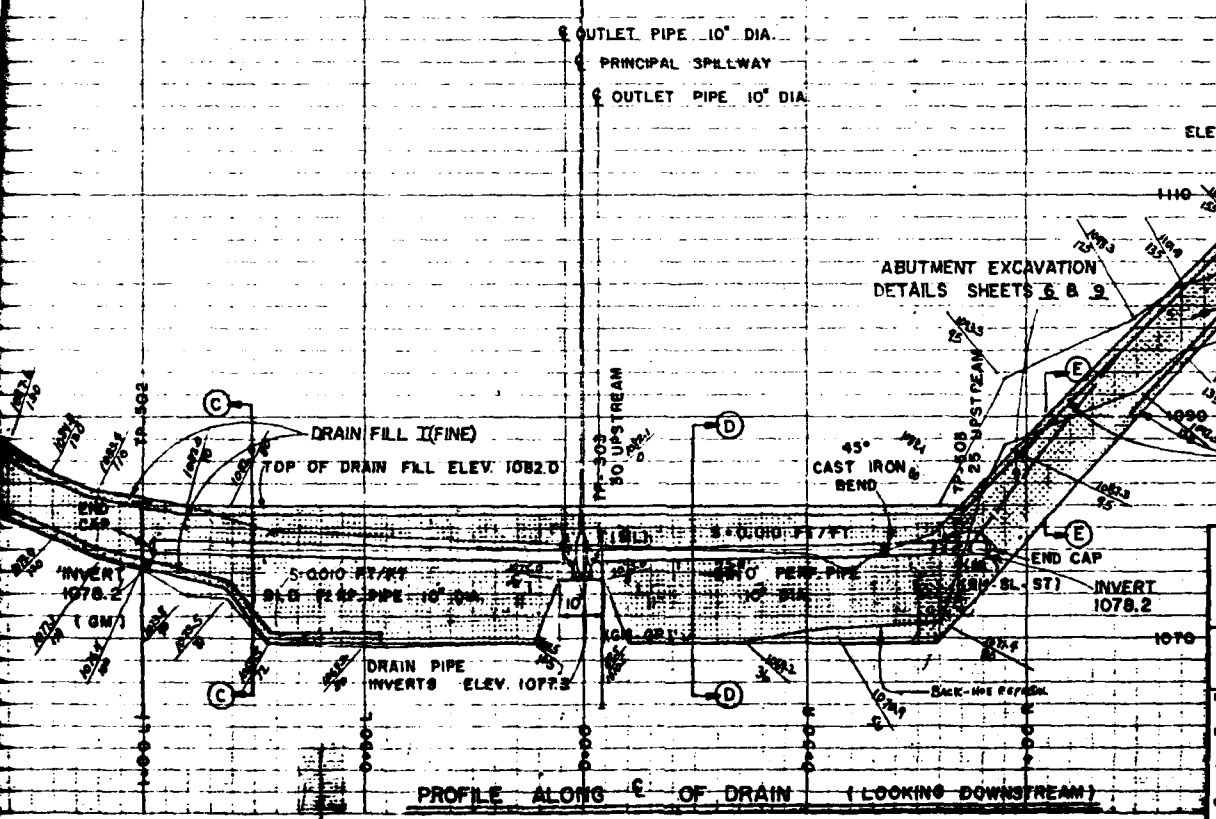
GRAIN SIZE DESCRIPTION FOR DRAIN FILL

1. DRAIN FILL I (FINE) SHALL MEET THE GRADAT ASTM C33-67 FOR FINE AGGERGATE. IN ADDIT THE PERCENTAGE OF MATERIAL IN DRAIN FILL FINER THAN A #200 SIEVE SHALL NOT BE MORE 3 PERCENT
2. DRAIN FILL II (COARSE) SHALL MEET THE GRA OF SIZE DESIGNATION 1 AS SHOWN IN TABLE 1 OF THE JANUARY 2, 1973 STANDARD SPECIFICA OF THE NEW YORK STATE DEPARTMENT OF TRANS PORTATION. IN ADDITION, THE PERCENTAGE OF MATERIAL IN DRAIN FILL II FINER THAN A #2 SIEVE SHALL NOT BE MORE THAN THREE (3) PE

DRAINAGE SYSTEM DETAILS

1. ASBESTOS CEMENT DRAIN PIPE SHALL CONFOR TO SPECIFICATION 545 AND SHALL BE 10" DIA PRESSURE PIPE CLASS 200.
2. THE PROFILES AT THE BOTTOM OF ALL EXCAVATIONS AS SHOWN ARE ONLY APPROX THE REQUIRED FINISHED GRADES WILL BE ESTABLISHED IN THE FIELD BY THE ENGI AT THE TIME OF CONSTRUCTION.

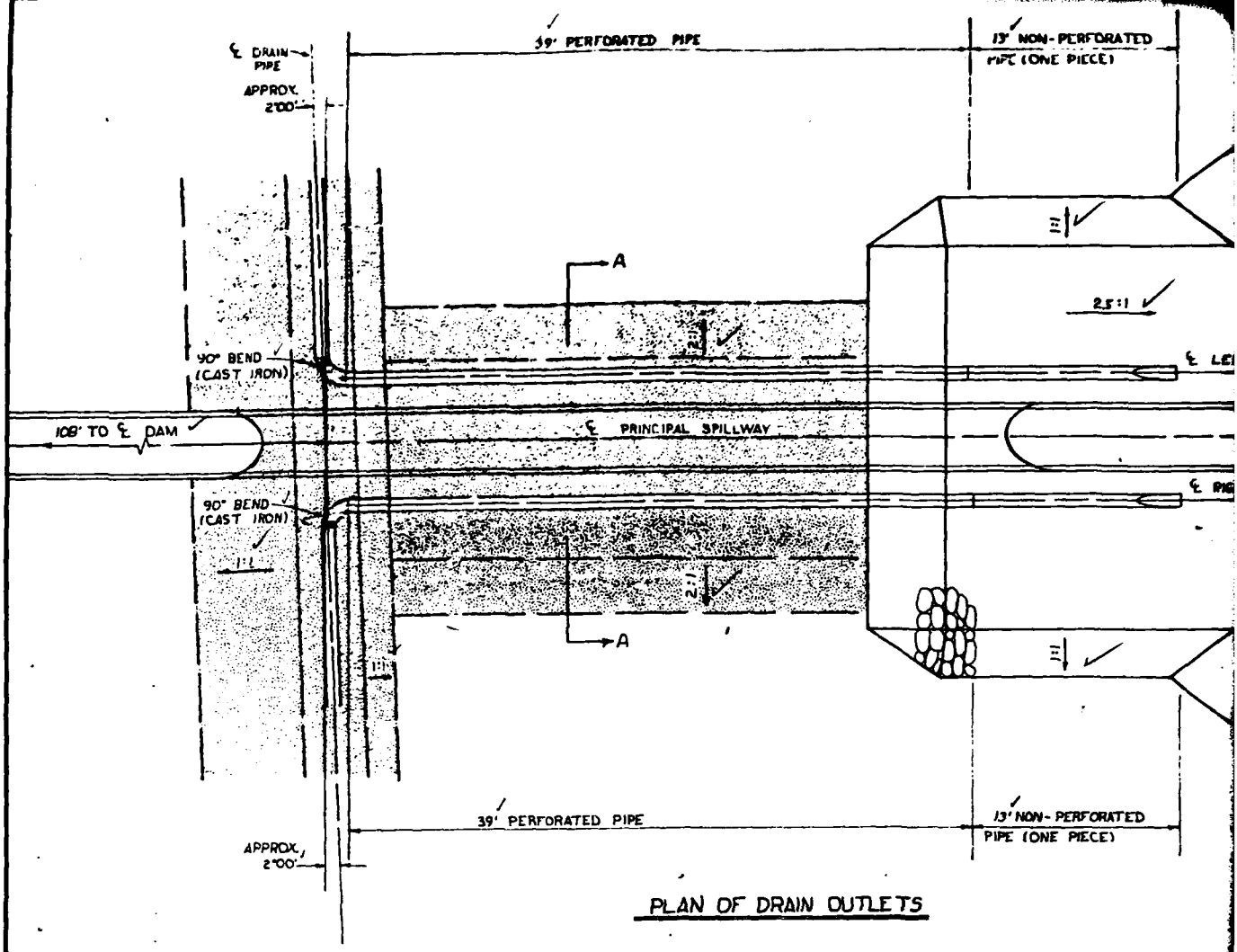
RIGHT ABUTMENT ALTERED DUE TO ROCK FOUNDATION VARIATIONS



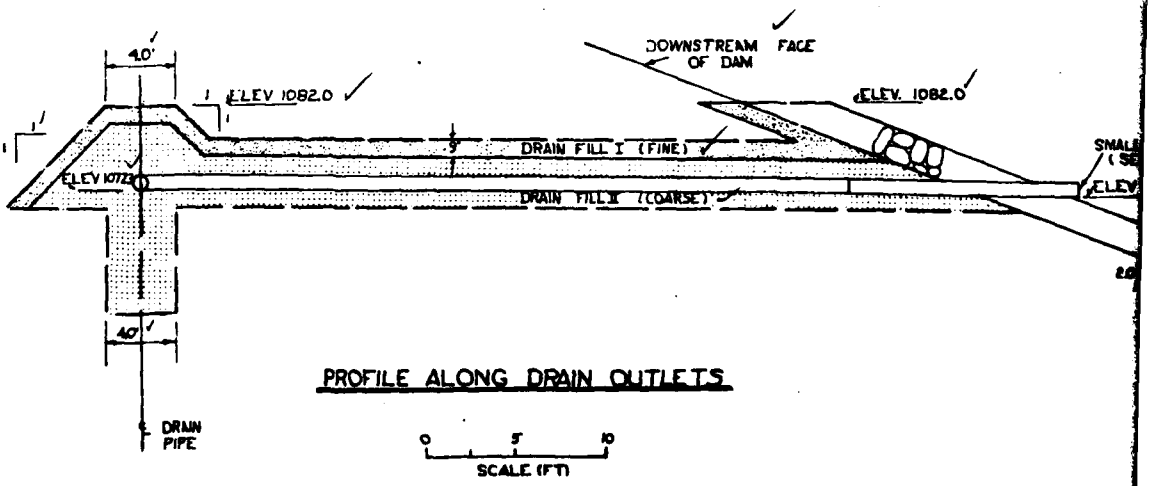
NANTICOKE CREEK WATERSHED P
SITE 10
FLOODWATER RETARDING DAM
BROOME COUNTY, NEW YORK
DRAINAGE SYSTEM

U.S. DEPARTMENT OF AGRICUL
SOIL CONSERVATION SERVIC

Designed W. A. REGEL	Date 12/70	Approved by	Title
Drawn W. HAYNS	12/70		
Traced			
Checked		Sheet / Drawing No.	NY-20

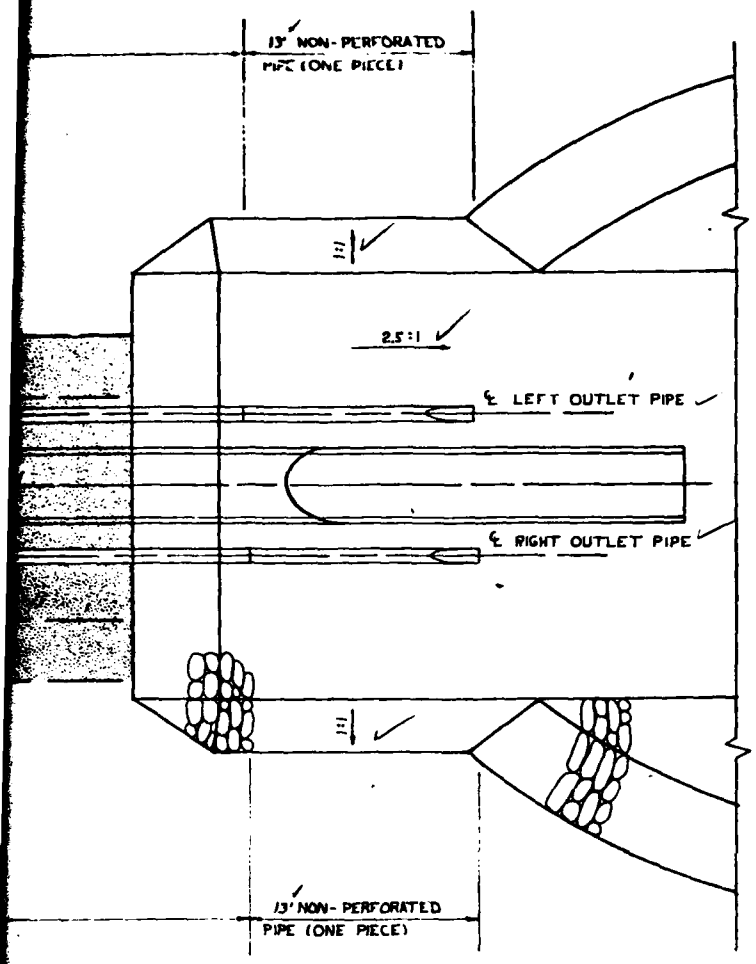


PLAN OF DRAIN OUTLETS

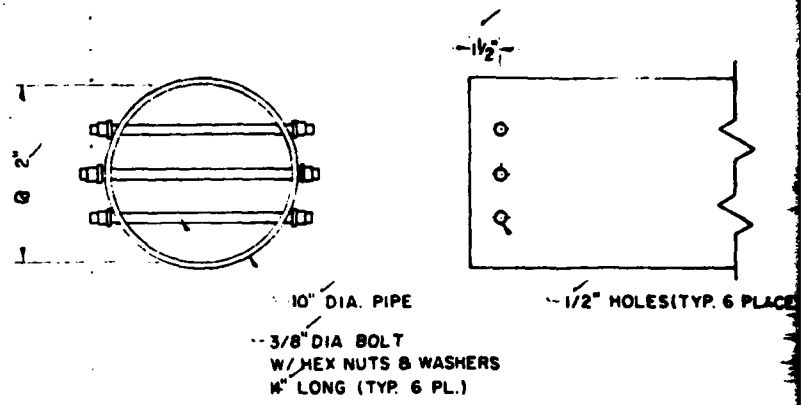


PROFILE ALONG DRAIN OUTLETS

AS BUILT
9-13-79

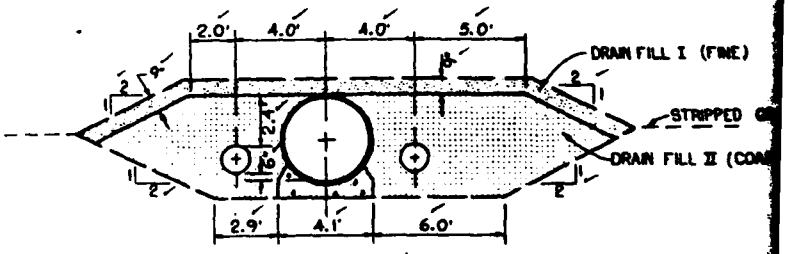


DRAIN OUTLETS



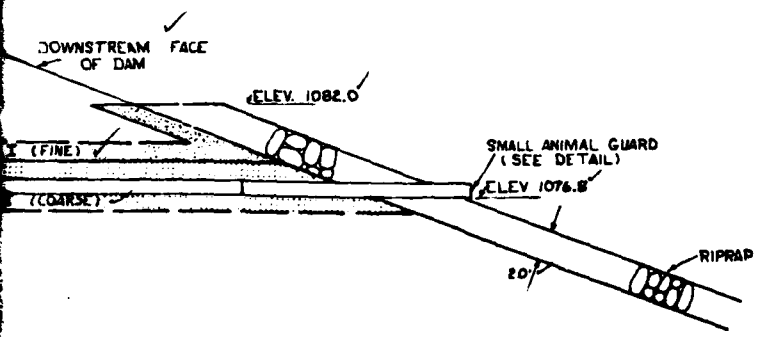
SMALL ANIMAL GUARD DETAILS

(2 REQUIRED)



SECTION A-A

0 1 2 4 8
SCALE IN FEET

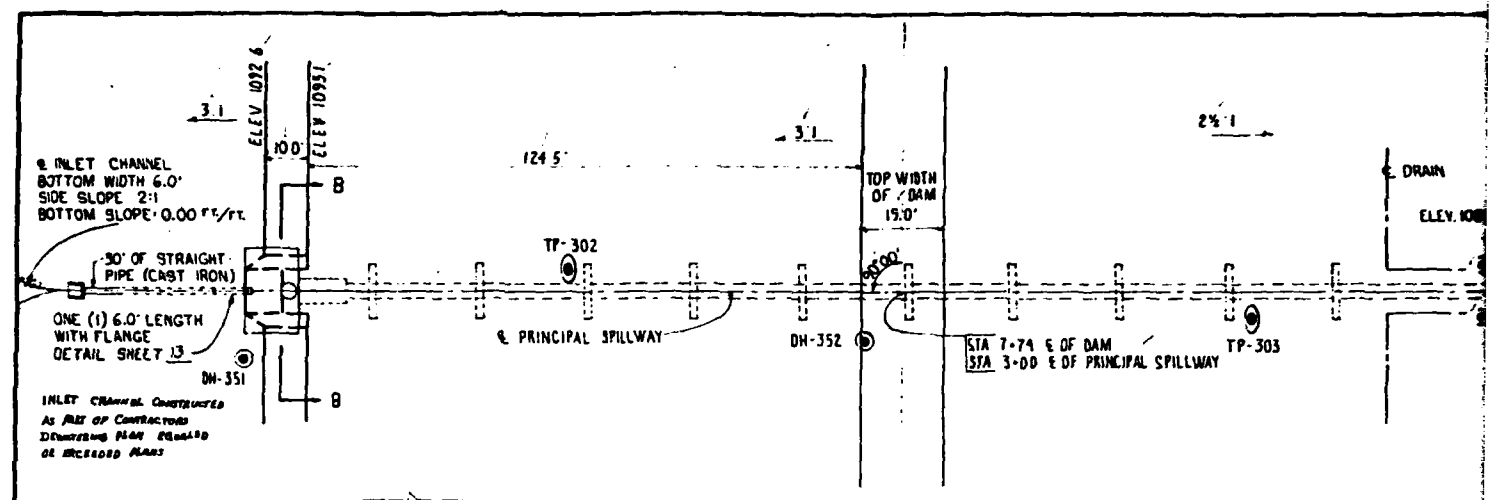


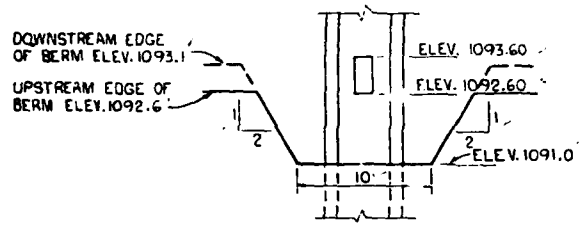
OUTLETS

NANTICOKE CREEK WATERSHED PROJ
SITE 10
FLOODWATER RETARDING DAM
BROOME COUNTY, NEW YORK
DRAINAGE SYSTEM

U. S. DEPARTMENT OF AGRICULTU
SOIL CONSERVATION SERVICE

		Date	
Designed	W.A. RIEGEL	12/70	Approved by
Drawn	R.P. LEWIS	12/70	Title
Traced			Title
Checked	J.C.P.		Drawing No. NY-2010-



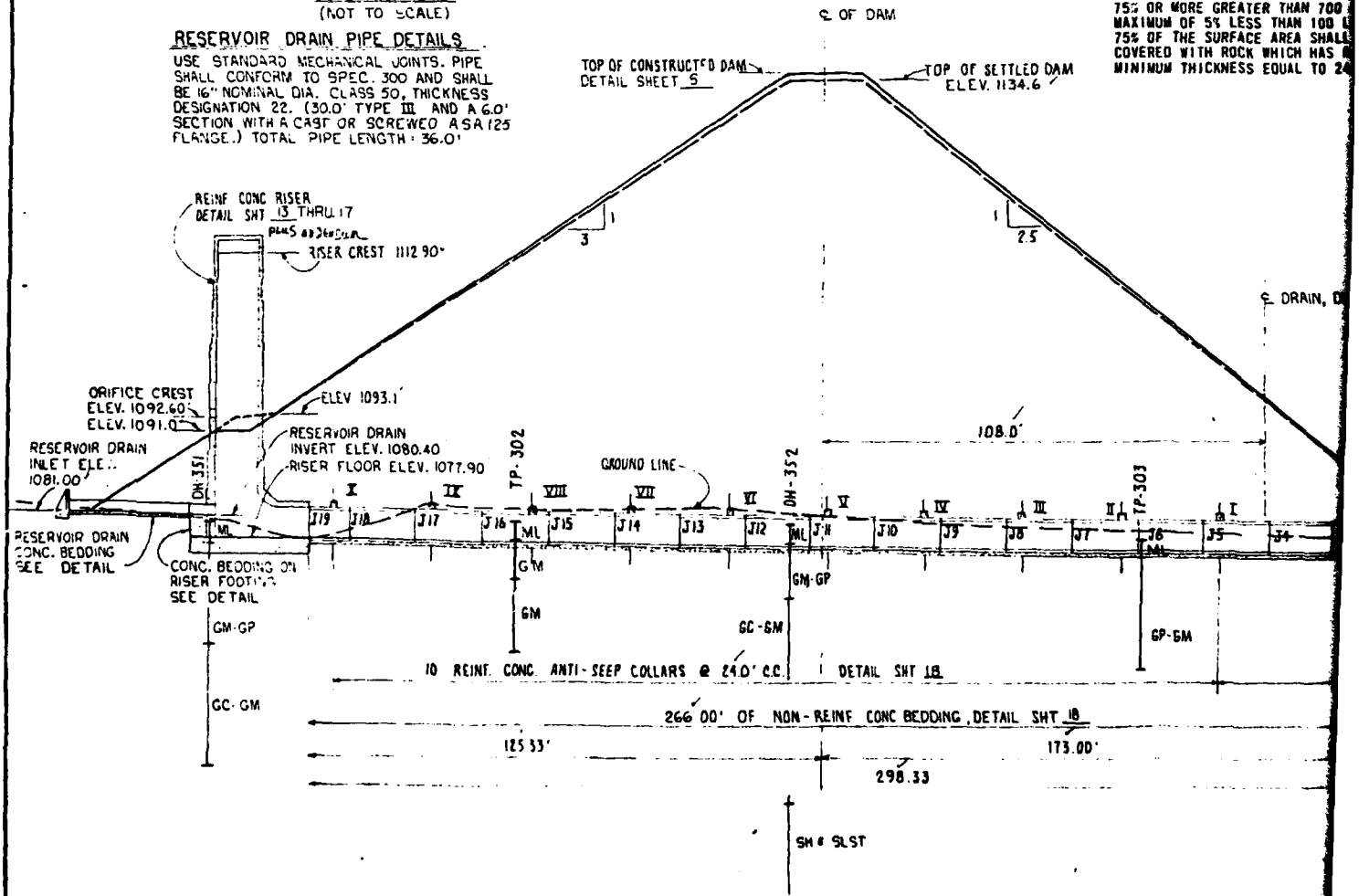


SECTION B-B
(NOT TO SCALE)

PLAN VIEW
0 10 20 40
SCALE IN FEET

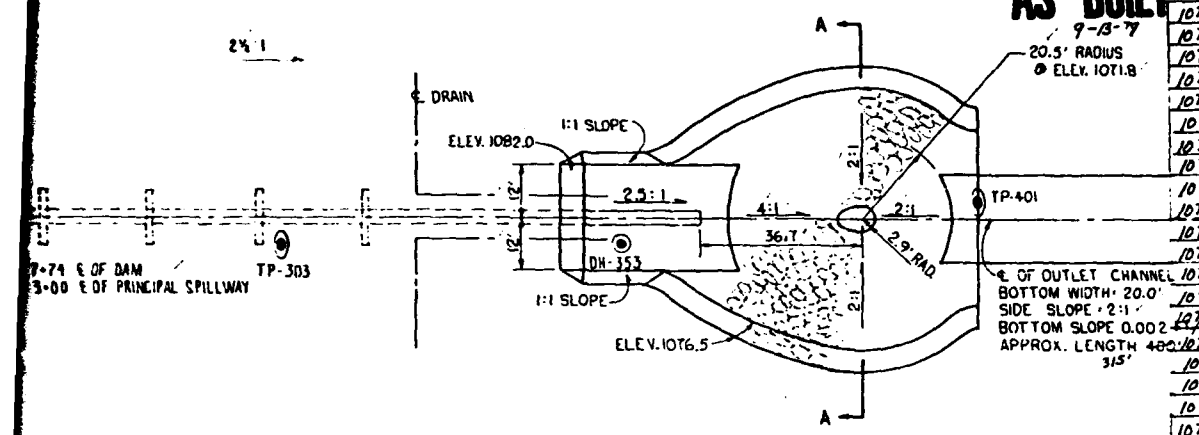
RIPRAP DETAILS
LOOSE ROCK SHALL BE PROPORTIO
WEIGHT AS FOLLOWS
MAXIMUM WEIGHT 2000 LBS.
75% OR MORE GREATER THAN 700
MAXIMUM OF 5% LESS THAN 100
75% OF THE SURFACE AREA SHALL
COVERED WITH ROCK WHICH HAS
MINIMUM THICKNESS EQUAL TO 24

RESERVOIR DRAIN PIPE DETAILS
USE STANDARD MECHANICAL JOINTS. PIPE SHALL CONFORM TO SPEC. 300 AND SHALL BE 16" NOMINAL DIA. CLASS 50, THICKNESS DESIGNATION 22. (30.0' TYPE III AND A 6.0' SECTION WITH A CAST OR SCREWED ASA 125 FLANGE.) TOTAL PIPE LENGTH = 36.0'



PROFILE ALONG ℄ OF PRINCIPAL SPILLWAY

AS BUILT 9-13-77



	JOINT	DIST FROM OUTLET	INVERT OF 42" DIA PIPE	SLOPE
1076.22	OUTLET	0	1076.20	
1076.36	J 1	16	1076.34	½"
1076.49	J 2	32	1076.47	½"
1076.63	J 3	48	1076.61	½"
1076.77	J 4	64	1076.75	½"
1076.89	J 5	80	1076.88	0
1077.04	J 6	96	1077.02	½"
1077.18	J 7	112	1077.16	½"
1077.30	J 8	128	1077.29	½"
1077.43	J 9	144	1077.43	½"
1077.59	J 10	160	1077.57	0
1077.71	J 11	176	1077.70	½"
1077.74	J 12	192	1077.73	½"
1077.76	J 13	208	1077.76	½"
1077.78	J 14	224	1077.78	0
1077.82	J 15	240	1077.81	½"
1077.85	J 16	256	1077.83	½"
1077.89	J 17	272	1077.86	½"
1077.88	J 18	288	1077.88	½"
1077.92	J 19	298	1077.90	½"

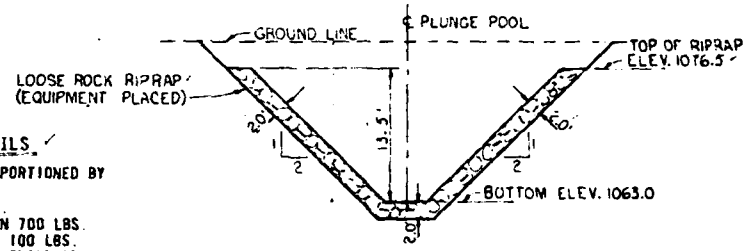
ABOVE DIMENSIONS FOR LENGTHS OF PIPE ARE BASED ON NOMINAL LENGTH AND DO NOT INCLUDE CREEP.

COLLAR	DIST. FROM OUTLET	INVERT OF 42" DIA PIPE
I	76	1076.85
II	100	1077.05
III	124	1077.26
IV	148	1077.46
V	172	1077.67
VI	196	1077.79
VII	220	1077.77
VIII	244	1077.81
IX	268	1077.85
X	292	1077.89

PLAN VIEW

0 20 40

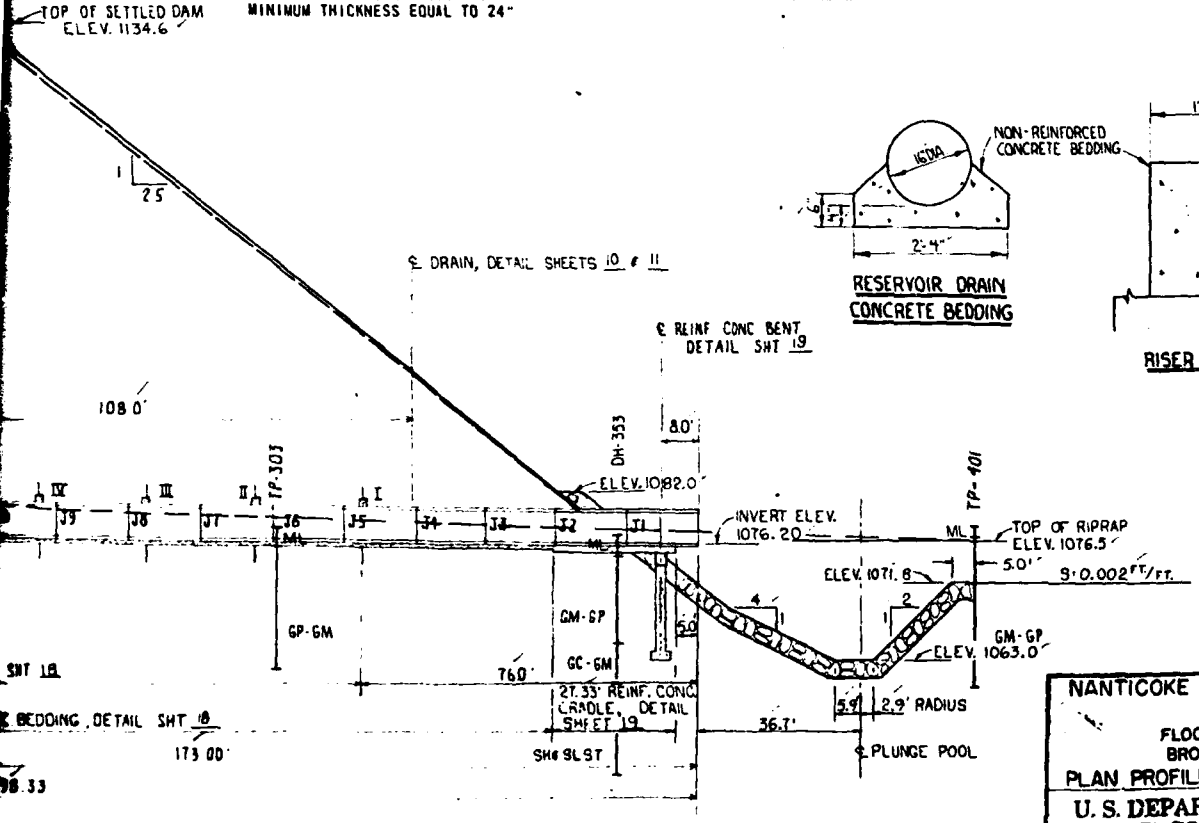
SCALE IN FEET



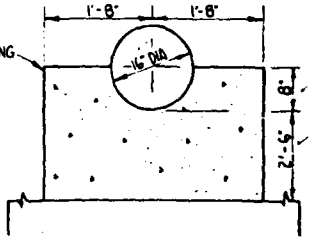
SECTION A-A (NOT TO SCALE)

RIPRAP DETAILS

LOOSE ROCK SHALL BE PROPORTIONED BY WEIGHT AS FOLLOWS:
MAXIMUM WEIGHT 2000 LBS.
75% OR MORE GREATER THAN 700 LBS.
MAXIMUM OF 5% LESS THAN 100 LBS.
75% OF THE SURFACE AREA SHALL BE COVERED WITH ROCK WHICH HAS A MINIMUM THICKNESS EQUAL TO 24"



RESERVOIR DRAIN CONCRETE BEDDING



RISER FOOTING CONCRETE BEDDING

NON-REINFORCED CONCRETE 30 C.Y.

0 10 20 40 HORIZ SCALE IN FEET

0 5 10 20 VERT. SCALE IN FEET

PRINCIPAL SPILLWAY

NANTICOKE CREEK WATERSHED PROJECT
SITE 10
FLOODWATER RETARDING DAM
BROOME COUNTY, NEW YORK
PLAN PROFILE PRINCIPAL SPILLWAY

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed D.C. CHAPMAN 3/70
Drawn D.W. LAKE 4/70
Traced E.E.W.P.U.
Checked J.E.P.
Approved by
Title
Sheet 15 of Drawing No.
NY-2010-P

NCS-313B (APRIL 1963)

DH #251, Left Emer. Spwy., Elev. 1145.5, D.B.C. 6/30-7/1/69

34	0.0 – 1.0	Material H (Topsoil)
31, 89, 41, 32, 36, 107, 40, 180/.7	1.0 – 16.0	Material Bb (GC-GM)
	▽ 17.	
	16.0 – 26.5	Material Bg (GC-GM)

Note: Auger refusal @ 26.5'. Brown gray boundary indistinct.

DH #252, Left Emer. Spwy., Elev. 1146.5, D.B.C. 6/18-19/69

10	0.0 – 1.5	Material H (Topsoil)
50, 43, 26, 26, 24, 46, 54, 45, 31, 50, 33, 53, 112, 92, 175, 73, 61, 114/.7	▽ 8.0 6/30/69; 1.5 – 28.2	Material Bb (GC-GM)
	12.5	
177, 100/R, BR, 100/R	28.2 – 34.0	Material Bg (GC-GM)
	28.2 – 34.0	Material I (sh&slst)

Note: Lots of water near rock surface. Badly weathered, 28.2-30.0'. Blind hole 31.3'-34.0'.

DH #253, Left Emer. Spwy. Elev. 1157.8, D.B.C. 6/30/69

11	0.0 – 1.5	Material H (Topsoil)
BR, 42, BR	▽ 8.5 7/1/69; 1.5 – 10.5	Material Cb (CL ML)
27	10.5 – 13.0	Material F (ML or SM)
BR, 26, 44, 45, 33, 27, 32, 35, 39, 110/1.0	13.0 – 32.5	Material E (CL-ML)
	32.5	Material I (sh&slst)

Note: Refusal @ 32.5. Blind holes 2.0'-5.0', 7.0' 10.0, 12.0'-15.0'.

DH #254 Not Drilled

DH #255, Left Emer. Spwy., Elev. 1164.3, D.B.C. 6/27/69

18	0.0 – 1.5	Material H (Topsoil)
BR, 37, BR, 44, BR, 66, 99, 120, 156, 41	1.5 – 23.0	Material Bb (GC-GM)
94, 112	23.0 – 26.0	Material Bg (GC)
441, 43	26.0 – 30.5	Material E (CL ML)
90, 100/R, BR, 100/R, BR	30.5 – 33.0	Material F (SM or ML)
	33.0 – 37.0	Material I (sh&slst)

Note: Auger refusal @ 37.0'. Blind hole 1.5'-5.0', 7.0'-9.0', 11.0-13.0', 33.0'-35.0', 35.0'-37.0'. Caved @ 9.0', no water 6/30/69.

DH #256, Left Emer. Spwy., Elev. 1172.0, D.B.C. 6/27/69

38	0.0 – 1.5	Material H (Topsoil)
BR, 33, BR, 37, BR, 27, 49, 46, 74, 57, 40, 44, 27, 37, 40, 72	1.5 – 10.1	Material Cb (CL ML)
	10.1 – 18.[illegible]	Material Cg (CL)
	18.[illegible] – 26.0	Material E (CL-ML)
	26.0 – 32.5	Material F (SM or ML)
	32.5 – 36.0	Material Cg (CL)

Note: Hole caved @ 6.0', no water. Blind hole 1.5-5.0', 6.5'-10.0', 11.5-15.0'.

DH's 257-260 - Not Drilled

DH #261, Right Emer. Spwy., Elev. 1138.4, D.B.C. 6/19-20/69

8	0.0 – 1.5	Material H (Topsoil)
40, 45, 38, 27, 27, 27, 35, 57, 100/.5, 42, 60, 56, 52, 65, 77, 100/.2, BR, 100/.5, AUG.	1.5 – 29.8	Material Cb (CL-ML)
	6/19/69; ▽ 24.2	
	29.8	Material I (sh&slst)

Note: Auger refusal @ 29.8'. Blind holes @ 24.2-25.7', 26.2'-29.8'.

DH #262, Right Emer. Spwy., Elev. 1133.2, D.B.C. 6/26/69

11	0.0 – 1.5	Material H (Topsoil)
BR, 59, BR, 70/.4, BR, 50/.1, BR	1.5 – 10.0	Material Cb (CL-ML)
	10.0 – 15.5	Material I (sh&slst)

Note: Auger refusal @ 15.5'. Hole caved @ 10.0', no water. Blind hole 1.5'-5.0', 6.5'-10.0', 10.9'-15.0', 15.1'-15.5'.

DH #263, Right Emer. Spwy., Elev. 1129.3, D.B.C. 6/20-23/69

18	0.0 – 1.5	Material H (Topsoil)
39, 20, 20, 24, 35, 47, 56, 40, 37, 54, 63	▽ 5.5' 6/30/69; 1.5 – 18.0	Material Cb (CL-ML)
35, 27, 39	18.0 – 23.5	Material E (CL-ML)

DH #264, Right Emer. Spwy., Elev. 1159.6, D.B.C. 6/25/69

27	0.0 – 0.5	Material H (Topsoil)
BR, 28, BR, 37, BR	▽ 7.5' 6/30/69; 0.5 – 13.0	Material Cb (CL-ML)
	13.0	Material I (sh&slst)

Note: Auger refusal on bedrock @ 13.0'. Blind hole 1.5'-5.0', 6.5'-10.0', 11.5-13.0'.

DH #265, Right Emer. Spwy., Elev. 1166.2

24	0.0 – 1.5	Material H (Topso
BR	1.5 – 6.0	Material Cb (CL-M
23	▽ 6.5' 6/30/69; 6.0 – 7.5	Material F (SM o
BR, 83/.8, BR	7.5 – 14.0	Material Cb (CL-M
100/R, ADB, BR, 100%, BR, 100%	14.0 – 35.0	Mater I (sh&s

Note: Run 1, 19.5-29.5, 100%; 35.0, 100%. Auger refus Blind hole 1.5'-5.0', 6. 11.5'-15.0', 15.0'-19.5'

DH #266, Right Emer. Spwy., Elev. 1169.8

36	0.0 – 1.5	Material H (Topso
BR, 32, BR, 85, BR, 115, BR	▽ 6.0 6/30/69; 1.5 – 18.0	Material Cb (CL-M
RB, BR, 100%	18.0 – 30.0	Material I (sh&s

Note: RB 18.0-20.0' to check Run 1, 20.0-30.0', 100%; holes, 1.5 5.0', 6.5'-10 13.0', 14.5'-18.0'. Bo 13.0'-18.0'.

DH #351, Centerline Prin. Spwy., Elev. 1

6, 10	0.0 – 2.5; ▽ 1.0 6/30/69	Material D (ML)
5, 35, 31, 42, 76, 76, 64, 39	2.5 – 15.0	Material A (GM-G
48, 64, 59, 170, 100/R, BR, 44, 56, 71, 55	15.0 – 30.0	Material Bb (GC-G; Boulder

Note: Blind hole 22.5-24.0'.

DH #352, Centerline Prin. Spwy., Elev.

6, 49	0.0 – 2.5; ▽ 0.8 6/30/69	Material D (ML)
39, 64, 61	2.5 – 9.0; k=85.5 fpd	Material A (GM-G
37, 74, 51, 61	9.0 – 34.5; k=0 fpd	Material Bb (GC-G
29, 52, 54, 84	k=0 fpd	
76, 80/.2, BR, 64, 84, 90, 30, 41, 38, 20, 180, 100/R, BR, 100%, BR, 100%	Boulder; PrT	
	34.5 – 35.0	Material I (sh

Note: Refusal @ 34.5'. Run Run 2, 43.0-35.0', 100%. Pr

DH #265, Right Emer. Spwy., Elev. 1166.2, D.B.C. 6/25/69

Blows	Depth	Material
	0.0	
24	1.5	Material H (Topsoil)
BH	6.0	Material Cb (CL-ML)
23	▽ 6.5' 6/30/69	Material F (SM or ML)
	7.5	
BH 83/.8 BH	14.0	Material Cb (CL-ML)
100/R ADB NX 100% NX 100%	35.0	Material I (sh&slst)

Note: Run 1, 19.5-29.5, 100%: run 2, 29.5-35.0, 100%. Auger refusal @ 19.5'. Blind hole 1.5'-5.0', 6.5-10.0', 11.3'-15.0', 15.0'-19.5'.

DH #266, Right Emer. Spwy., Elev. 1149.8, D.B.C. 6/26/69

Blows	Depth	Material
	0.0	
36	1.5	Material H (Topsoil)
BH 32 BH 85 BH 115 BH	▽ 6.0 6/30/69	Material Cb (CL-ML)
	18.0	
RB NX 100%	30.0	Material I (sh&slst)

Note: RB 18.0-20.0' to check for boulder. Run 1, 20.0-30.0', 100% Rec. Blind holes, 1.5-5.0', 6.5'-10', 11.5'-13.0', 14.5'-18.0'. Bouldery from 13.0'-18.0'.

DH #351, Centerline Prin. Spwy., Elev. 1079.7, D.B.C. 6/26/69

Blows	Depth	Material
	0.0	
6 10	▽ 1.0 6/30/69	Material D (ML)
	2.5	
3 35 31 42 76 76 64 39	15.0	Material A (GM-GP)
48 64 59 170 100/R BH 64 56 71 55	30.0	Material Bb (GC-GM) Boulder

Note: Blind hole 22.5-24.0'.

DH #352, Centerline Prin. Spwy., Elev. 1079.8, D.B.C. 6/18-25/69

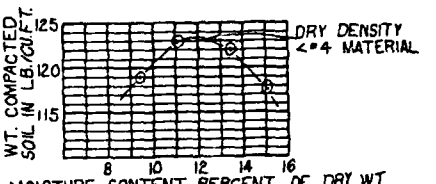
Blows	Depth	Material
	0.0	
6 49	▽ 0.8 6/30/69	Material D (ML)
	2.5	
39 64 61	h=85.5 fpd	Material A (GM-GP)
	9.0	
37 74 51 61	h=0 fpd	
29 52 54 84	h=0 fpd	
76 80/.2 BH 64 84 90 50 41 30 20 100	34.5	Material Bb (GC-GM) Boulder
100/R NX 100% NX 100%	PrT 55.0	Material I (sh&slst)

Note: Refusal @ 34.5'. Run 1, 33.0'-43.0', 100%; Run 2, 43.0-55.0', 100%. Pressure tests tabulated in narrative.

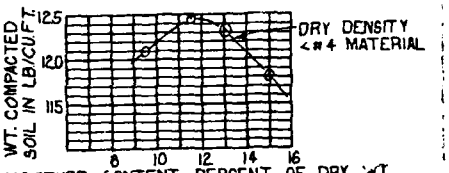
DH #353, Centerline Pr. Spwy., Elev. 1077.1, DBC 6/17/69

Blows	Depth	Material
	0.0	
5 16	▽ 2.0 6/30/69	Material D (ML)
	2.5	
29 40 44 46 66 62	12.0	Material A (GM-GP)
41 65 112 50/.2 NX 100%	PrT 16.7	Material Bb (GC-GM)
	27.0	Material I (sh&slst)

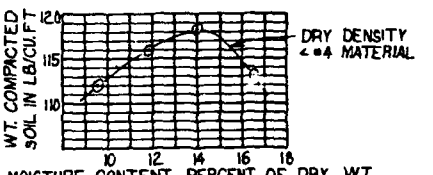
Note: Refusal @ 16.7'. Run 1, 17.0-27.0', 100%. Pressure tests tabulated in narrative.



COMPACTION CURVE
FIELD SAMPLE NO. 202.1
LABORATORY CLASSIFICATION - CL-ML



COMPACTION CURVE
FIELD SAMPLE NO. 209.2
LABORATORY CLASSIFICATION - GC



COMPACTION CURVE
FIELD SAMPLE NO. 224.1
LABORATORY CLASSIFICATION - CL-ML

LEGEND

TEST HOLE NUMBERING SYSTEM

Centerline of dam	1-99
Borrow Area	101-199
Emergency spillway	201-299
Centerline of outlet structure	301-399
Stream channel	401-499
Relief wells	501-599

UNIFIED SOIL CLASSIFICATION SYSTEM SYMBOLS

GW Well graded gravels; gravel-sand mixtures
GP Poorly graded gravels
GM Silty gravels; gravel-sand-silt mixtures
GC Clayey gravels; gravel-sand-clay mixtures
SW Well graded sands; sand-gravel mixtures
SP Poorly graded sands
SM Silty sands; sand-silt mixtures
SC Clayey sands; sand-clay mixtures
ML Silts; silty, v. fine sands; sandy or clayey silt
CL Clays of low to medium plasticity; silty, sandy or gravelly clays
CH Clays of high plasticity; fat clays
MH Elastic silts; micaceous or diatomaceous silts
OL Organic silts and organic silty clays of low plasticity
OH Organic clays or silts of medium to high plasticity

NOTE: All classification shown in the logs are based on lab tests of samples representative of the material. Significant deviations from the normal are noted in the logs.

BEDROCK SYMBOLS

B	Basalt	Sc	Schist
Gn	Gneiss	Sh	Shale
Gr	Granite	sl/st	Siltstone
Ls	Limestone	Sl	Slate
Ma	Marble	ss	Sandstone

SAMPLES

DS Disturbed
US Undisturbed
Core NX Core

KEY TO DRILL HOLE (DH) LOGS

	0.0	
22		Number of blows required for 1 ft. standard penetration, using 2.0" O.D. split barrel sampler, 140 lb. hammer and 30" drop. ASTM D 1586 (N)
	9.0	Depth in hole (ft.)
CL		Unified Soil Classification Symbol
	12.0	
DBS		Dry barrel sampler
RB		Roller bit to advance hole by wash B
ADB		Hole advanced by auger
	17.0	
NX		Rock core, 2-1/8" diameter
73%		Percent rock core recovery in each drill run
90% LS		Bedrock symbol
	24.0	

▼ WL (date) Water Level

FOR IN-SERVICE USE ONLY

NANTICOKE CREEK WATERSHED
SITE 10
FLOODWATER RETARDING DAM
BROOME COUNTY, NEW YORK
LOGS OF TEST HOLES

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Logged: Bruce Thompson Date: 7-1-69
Drawn: Diane Cole 8/69
Checked: E. I. 7/...
Approved: Robert L. S... Title: STATE CONS. ENGR.
Sheet 2 of 2 Drawing No. NY-2010-P

MATERIAL DESCRIPTIONS

A

Gravel, sandy w/silt (max. size 24": est. 15% > 6", 15% 3-6", 70% matrix; approx. 40% gravel, 25% sand, 15% silt fines): oversize material mostly sub angular, flaggy siltstones; silt fines, LL=26-27, PI= NP-3: gray to brown, depending on water table; moist above, saturated below water level; rapid permeability, k=85.5 fpd; digs easily, B= 30-75 (dense -very dense); irregularly stratified; alluvial, stream channel deposits: D.S. 303.1 (GM-GP), D.S. 401.1 (GM), D.S. 402.1 (GM-GP)

B

Gravel, silty, clayey w/sand (max. size 24": est. 5% > 6", 10% 3-6", 85% matrix: approx. 40% gravel, 20% sand, 40% fines): oversize material ranges from sub-angular flaggy siltstones to spheroidal erratics; silt or clay fines, LL= 21-25, PI= NP 6; color varies from gray (Bg) to brown (Bb), depending on moisture content; usually moist; essentially very slight permeability, k=0; B is never less than 22, usually >40 (very stiff-hard); occasionally lensed or pseudo-stratified and often shows variation of 10% either side of norm.: glacial till: D.S.'s 202.1 (GC-GM), 211.1 (GM), 211.2 (GC), 302.1 (GM).

GC GM

C

Silt and clay, gravelly w/sand (max. size 24": est. 3% > 6", 3% 3-6", 92% matrix: approx. 25% gravel, 15% sand, 60% fines): oversize material varies same as B: silt and clay fines, LL= 21-28, PI=0-7; color varies same as B: usually moist; very slight permeability; B never less than 20, usually > 40 (very stiff-hard); occasionally lensed or pseudo-stratified and often shows variation of 10% either side of norm: glacial till: D.S.'s 4.1 (CL-ML), 203.1 (CL-ML), 205.2 (ML), 209.1 (CL ML), 209.2 (CL-ML), 223.1 (CL-ML), 224.1 (ML), 225.1 (CL-ML), 225.2 (CL-ML), 301.1 (CL-ML).

D

Silt, sandy (max. size 10mm: approx. 20% sand, 80% silt fines): non-plastic: brown: moist-wet: moderate permeability: digs easily, B= 5-15 (medium to stiff): alluvial, over-bank flood plain deposits with occasional organics: D.S.'s 301.1 and 303.1 (ML).

E

Silt and clay (max. size 1": approx. 5% gravel, 5% sand, 90% fines): LL= 23-32, PI= 3-9; usually gray, sometimes brown: moist: very slight permeability: B= 26-74 (hard); sometimes occurs as rhythmically graded beds: glacio-lacustrine: D.S.'s 203.1, 204.1, 221.1, 224.2 (all CL-ML).

F

Sand, silty (est. 60% sand, 40% fines) non-plastic, dilatant fines: brown; wet: moderate permeability: B= 23-50 (very stiff-hard); found in jar samples only: possibly glacio lacustrine: not bulk sampled (SM or MLT).

G

Silt, gravelly w/sand (max. size 10": est. 30% > 3", 70% matrix: est. 25% gravel, 20% sand, 55% fines): oversize are flaggy shales and siltstones (locally derived): brown to yellow-brown: dry-moist: rapid permeability: loose medium: colluvium, found along steep right bank over bedrock: not bulk sampled (CL).

H

Topsoil: roots and organics: brown; moist: medium to rapid permeability: loose: very rocky on steep right abutment: avg. thickness 1.5'.

I

Bedrock: silty shales and siltstones w/few fine sandstone beds: usually highly weathered (augerable) for 3-5', grading through badly fractured rock and into fresh unaltered rock: gray: mod. soft to hard: mostly thin-bedded w/few 6-8" coarser beds of sandstone or fossiliferous (brachiopods) siltstone: fossils calcareous: few vertical joints in core, fractures vary w/ depth: dips slightly to south : Senecas Gp. - Chemung shale and Middlesex shale, lower Upper Devonian. (see core photos)

TEST PIT LOGS

TP #1, Centerline of Dam Elev. 1151.7, D.B.C. 4/3/69

0.0	0.6	Material H	(Topsoil)
0.6	13.0	Material Bb	(GM)
13.0	16.5 +	Material Bg	(GM)

Note: Dry pit

TP #2, Centerline of Dam Elev. 1142.9, D.B.C. 4/3/69

0.0	1.6	Material H	(Topsoil)
1.6	12.5	Material Bb	(GM)
12.5	16.5 +	Material Bg	(GM)

Note: Dry pit

TP #3, Centerline of Dam Elev. 1179.5, D.B.C. 4/3/69

0.0	1.3	Material H	(Topsoil)
1.3	3.0	Material G	(ML litter)
3.0	6.0 +	Material I	(sh & slst)

Note: Water @ creek level. Topsoil rocky. Rock digs quite easily w/backhoe.

TP #4, Centerline of Dam Elev. 1178.7, D.B.C. 4/2/69

0.0	1.5	Material H	(Topsoil)
1.5	17.0	Material Cb	(CL-ML) DS 4.1 CL-ML
17.0 +		Material I	(sh & slst)

Note: Water at top of rock.

TP #201, Left Emergency Spwy. Elev. 1161.4, D.B.C. 4/3/69

0.0	1.4	Material H	(Topsoil)
1.4	8.0	Material Cb	(ML)
8.0	16.0 +	Material Cg	(ML)

Note: Dry pit.

TP #202, Left Emergency Spwy. Elev. 1132.8, D.B.C. 4/3/69

0.0	1.5	Material H	(Topsoil)
1.5	6.0	Material Bb	(GM)
6.0	16.0 +	Material Bg	(GM) DS 202.1 GC-GM

Note: Surface drainage kept first 2.0' wet. Rest is dry.

TP #203, Left Emergency Spwy. Elev. 1170.1, D.B.C. 4/3/69

0.0	1.5	Material H	(Topsoil)
1.5	7.0	Material Cb	(ML)
7.0	10.5	Material Cg	(ML)
10.5	17.0 +	Material E	(CL) DS 203.1 CL-ML

Note: Dry pit.

TP #204, Left Emergency Spwy. Elev. 1177.8, D.B.C. 4/3/69

0.0	1.2	Material H	(Topsoil)
1.2	11.0	Material Cb	(ML)
11.0	13.0	Material Cg	(ML)
13.0	17.0 +	Material E	(CL-ML) DS 204.1 CL-ML

Note: Dry pit. Material E "varved" or rhythmically bedded.

TP #205, Left Emergency Spwy. Elev. 1161.6, D.B.C. 4/3/69

0.0	1.0	Material H	(Topsoil)
1.0	10.0	Material Cb	(ML) DS 205.1 CL-ML
10.0	18.0	Material Cg	(ML) DS 205.2 ML

Note: Dry pit. No material E as such, but occasional pods and segregations of CL and ML in 10.0' - 18.0' zone.

TP #206, Left Emergency Spwy. Elev. 1149.2, D.B.C. 4/3/69

0.0	1.5	Material H	(Topsoil)
1.5	14.0	Material Cb	(ML)
14.0	18.5 +	Material Cg	(ML)

Note: Dry pit.

TP #207, Left Emergency Spwy. Elev. 1123.6, D.B.C. 4/4/69

0.0	1.3	Material H	(Topsoil)
1.3	9.0	Material Bb	(GM)
9.0	17.7	Material Bg	(GM)
17.7 +		Material I	(sh & slst)

Note: Small amount of water on top of rock. Could not rip rock, probably because near end of backhoe reach.

TP #208, Left Emergency Spwy. Elev. 1141.7, D.B.C. 4/

0.0	1.0	Material H	(Topsoil)
1.0	9.0	Material Bb	(GM)
9.0	17.0 +	Material Bg	(GM)

Note: Dry pit.

TP #209, Left Emergency Spwy. Elev. 1183.3, D.B.C. 4/

0.0	1.5	Material H	(Topsoil)
1.5	13.0	Material Cb	(ML) D.S. 209.1 CL
13.0	18.0 +	Material Cg	(ML) D.S. 209.2 CL

Note: Dry pit.

TP #210, Left Emergency Spwy. Elev. 1164.8, D.B.C. 4/

0.0	1.5	Material H	(Topsoil)
1.5	8.0	Material Cb	(ML)
8.0	17.0 +	Material Cg	(ML)

Note: Becomes wet @ ~ 8.0'.

TP #211, Left Emergency Spwy. Elev. 1147.9, D.B.C. 4/

0.0	1.5	Material H	(Topsoil)
1.5	8.0	Material Bb	(GM) D.S. 211.1 GM
8.0	17.0 +	Material Bg	(GM) D.S. 211.2 GM

Note: Wet below 8.0'. Caved.

TP #212, Left Emergency Spwy. Elev. 1130.5, D.B.C. 4/

0.0	1.5	Material H	(Topsoil)
1.5	9.0	Material Bb	(GM)
9.0	19.0	Material Bg	(GM)
19.0 +		Material I	(sh & slst)

Note: Very wet and caved below 9.0'. Could not rip rock because of depth.

TP #213 - 220 Not dug

TP #221, Right Emergency Spwy. Elev. 1150.9, A.B.C.

0.0	1.5	Material H	(Topsoil)
1.5	9.5	Material Cb	(ML)
9.5	10.0 +	Material I	(sh & slst) D.S.

Note: Dry pit. Sandy silty lenses of Mat'l E 6.0' 6.5', D.S. 221.1, CL ML. Top 1' of is quite gray when wet.

TP #222, Right Emergency Spwy. Elev. 1137.4, A.B.C.

0.0	1.0	Material H	(Topsoil)
1.0	12.5	Material Cb	(ML)

Note: Dry pit. Top 2.5' of Cb is quite gray when wet.

TP #223, Right Emergency Spwy. Elev. 1126.1, A.B.C.

0.0	0.5	Material H	(Topsoil)
0.5	11.5	Material Cb	(ML)
11.5	12.0 +	Material Cg	(ML) D.S. 223.1

Note: Dry pit. Top 1' of Cb is quite gray when wet.

TP #224, Right Emergency Spwy. Elev. 1170.2 A.B.C.

0.0	0.5	Material H	(Topsoil)
0.5	13.5	Material Cb	(ML) D.S. 224.1
13.5	14.5 +	Material E	(ML) D.S. 224.2

Note: Dry pit. D.S. 224.1 runs about 10% fin the bulk of Material C. Top 1' of Cb gray.

TP #[illegible], Left Emergency Spwy. Elev. 1141.7, D.B.C. 6/6/69

0.0	1.0	Material H	(Topsoil)
1.0	9.0	Material Bb	(GM)
9.0	17.0 +	Material Bg	(GM)

Notes: Dry pit.

TP #209, Left Emergency Spwy. Elev. 1183.3, D.B.C. 6/7/69

0.0	1.5	Material H	(Topsoil)
1.5	13.0	Material Cb	(ML) D.S. 249.1 CL-ML
13.0	18.0 +	Material Cg	(ML) D.S. 249.2 CL-ML

Notes: Dry pit.

TP #210, Left Emergency Spwy. Elev. 1164.8, D.B.C. 6/7/69

0.0	1.5	Material H	(Topsoil)
1.5	8.0	Material Cb	(ML)
8.0	17.0 +	Material Cg	(ML)

Notes: Becomes wet @ ~ 8.0'.

TP #211, Left Emergency Spwy. Elev. 1147.9, D.B.C. 6/7/69

0.0	1.5	Material H	(Topsoil)
1.5	8.0	Material Bb	(GM) D.S. 211.1 GC-GM
8.0	17.0 +	Material Bg	(GM) D.S. 211.2 GC

Notes: Wet below 8.0'. Caved.

TP #212, Left Emergency Spwy. Elev. 1130.5, D.B.C. 6/6/69

0.0	1.5	Material H	(Topsoil)
1.5	9.0	Material Bb	(GM)
9.0	19.0	Material Bg	(GM)
19.0 +		Material I	(sh & slst)

Notes: Very wet and caved below 9.0'. Could not rip rock because of depth.

TP #213 - 220 Not dug

TP #221, Right Emergency Spwy. Elev. 1150.9, A.H.C. 7/1/69

0.0	1.5	Material H	(Topsoil)
1.5	9.5	Material Cb	(ML)
9.5	10.0 +	Material I	(sh & slst) D.S. 221.2

Notes: Dry pit. Sandy silty lenses of Mat'l H @ 6.0' 6.5', D.S. 221.1, CL ML. Top 1' of Cb is quite gray when wet.

TP #222, Right Emergency Spwy. Elev. 1137.4, A.H.C. 7/1/69

0.0	1.0	Material H	(Topsoil)
1.0	12.5	Material Cb	(ML)

Notes: Dry pit. Top 2.5' of Cb is quite gray when wet.

TP #223, Right Emergency Spwy. Elev. 1125.1, A.H.C. 7/1/69

0.0	0.5	Material H	(Topsoil)
0.5	11.5	Material Cb	(ML)
11.5	12.0 +	Material Cg	(ML) D.S. 223.1 CL-ML

Notes: Dry pit. Top 1' of Cb is quite gray when wet.

TP #224, Right Emergency Spwy. Elev. 1130.2 A.H.C. 7/1/69

0.0	0.5	Material H	(Topsoil)
0.5	13.5	Material Cb	(ML) D.S. 224.1 ML
13.5	14.5 +	Material E	(ML) D.S. 224.2 CL-ML

Notes: Dry pit. D.S. 224.1 runs about 10% finer than the bulk of Material C. Top 1' of Cb is quite gray.

TP #225, Right Emergency Spwy. Elev. 1162.5, A.H.C. 7/1/69

0.0	0.6	Material H	(Topsoil)
0.6	9.0	Material Cb	(ML) D.S. 225.1 CL-ML D.S. 225.2 CL-ML
9.0	9.5 +	Material I	(Shale)

Notes: Wet on rock surface. Cb from 1.5 - 4.0 is quite gray when wet.

TP #226, Right Emergency Spwy. Elev. 1152.2, A.H.C. 7/1/69

0.0	0.5	Material H	(Topsoil)
0.5	12.5 +	Material Cb	(ML)

Notes: Wetter with depth. Top 2' of Cb is quite gray when wet.

TP #301, Principal Spillway Elev. 1081.3, D.B.C. 6/2/69

0.0	1.1	Material D	(ML) D.S. 301.1 ML
1.1	7.0	Material A	(GM)
7.0	18.0 +	Material Bb	(GM)

Notes: Water level @ 4.0'. Alluvial sands and gravels go from brown to gray at 4.5'.

TP #302, Principal Spillway Elev. 1079.9, D.B.C. 6/2/69

0.0	2.5	Material D	(ML)
2.5	7.0	Material A	(GM) D.S. 302.1 GM-GP
7.0	16.0 +	Material Bb	(GM)

Notes: Water level at creek elev., 3.5'. Alluvial gravels and sands go from brown to gray at 3.9'.

TP #303, Principal Spillway Elev. 1078.0, D.B.C. 6/2/69

0.0	2.0	Material D	(ML) D.S. 303.1 ML
2.0	16.0 +	Material A	(GM-GP)

Notes: Water level at 2.2'. No distinct color break in gravels and sands.

TP #401, Outlet Channel Elev. 1078.1, D.B.C. 6/2/69

0.0	1.2	Material D	(ML)
1.2	18.0 +	Material A	(GM-GP) D.S. 401.1 GM

Notes: Water level @ 4.2'. Color changes from brown to gray @ 4.0'.

TP #402, Principal Spillway Elev. 1076.6, D.B.C. 6/2/69

0.0	1.2	Material D	(ML)
1.2	18.0 +	Material A	(GC-GP) D.S. 402.1 GC-GM

Notes: Water level @ 3.3'. Color changes from gray-brown to brown @ 3.3'.

TP #501, Drain Line Elev. 1112.0, D.B.C. 6/3/69

0.0	0.6	Material H	(Topsoil)
0.6	16.0 +	Material Cb	(ML) D.S. 501.1 ML

Notes: Dry pit.

TP #502, Drain Line Elev. 1083.1, D.B.C. 6/2/69

0.0	0.8	Material H	(Topsoil)
0.8	20.0	Material Bb	(GM) D.S. 502.1 GM

Notes: Dry pit.

TP #503, Drain Line Elev. 1080.1, D.B.C. 6/2/69

0.0	1.3	Material H	(Topsoil)
1.3	3.0	Material C	(ML; litter)
3.0	6.0 +	Material I	(shale)

Notes: Water @ creek level. Topsoil rocky. Rock digs quite easily with backhoe.

TP #601, Foundation, U.S. of ℄ Dam Elev. 1100.1, D.B.C. 6/2/69

0.0	1.7	Material H	(Topsoil)
1.7	9.6	Material Bb	(GM)
9.6	15.0 +	Material Bg	(GM)

Notes: Dry pit.

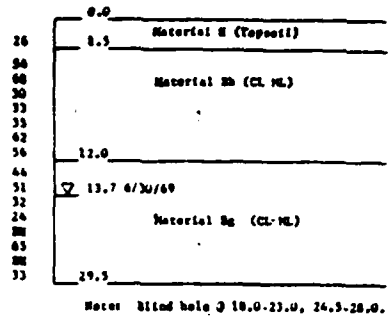
TP #602, Foundation, U.S. of ℄ Dam Elev. 1090.6, D.B.C. 6/2/69

0.0	1.3	Material D	(ML)
1.3	6.5	Material A	(GM-GP)
6.5	12.0 +	Material I	(shale)

AS BUILT 9-13-79

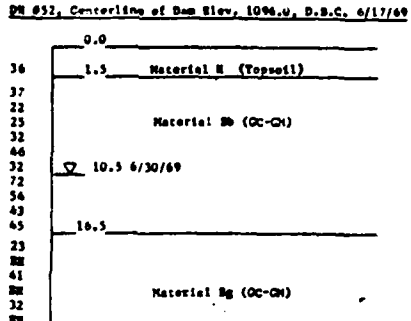
Notes: Water @ creek level. Rock slopes toward stream. Gravel extends to 12.0 + on stream side of pit.

DN #51, Centerline of Dam Elev. 1106.6, D.B.C. 6/18/69



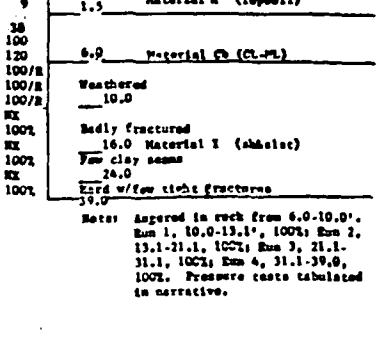
Notes: Blind hole @ 18.0-23.0, 24.5-28.0.

DN #52, Centerline of Dam Elev. 1096.0, D.B.C. 6/17/69



Notes: Blind hole @ 18.0-23.0, 24.5-29.5, 31.0-34.0, 35.5-39.0.

DN #53, Centerline of Dam Elev. 1115.1, D.B.C. 6/26/69



Notes: Augered in rock from 6.0-10.0', Run 1, 10.0-13.1', 100%; Run 2, 13.1-21.1, 100%; Run 3, 21.1-31.1, 100%; Run 4, 31.1-39.0, 100%. Pressure tests tabulated in narrative.

FOR IN-SERVICE USE ONLY

NANTICOKE CREEK WATERSHED
SITE 10
FLOODWATER RETARDING DAM
BROOME COUNTY, NEW YORK
LOGS OF TEST HOLES

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed Bruce Campbell Date 7-1-69
Approved Robert [illegible] Title STATE CONS. ENGINEER
Drawn Diane Cole
Checked
Drawing No. NY-2010-P

DAT
FILM