

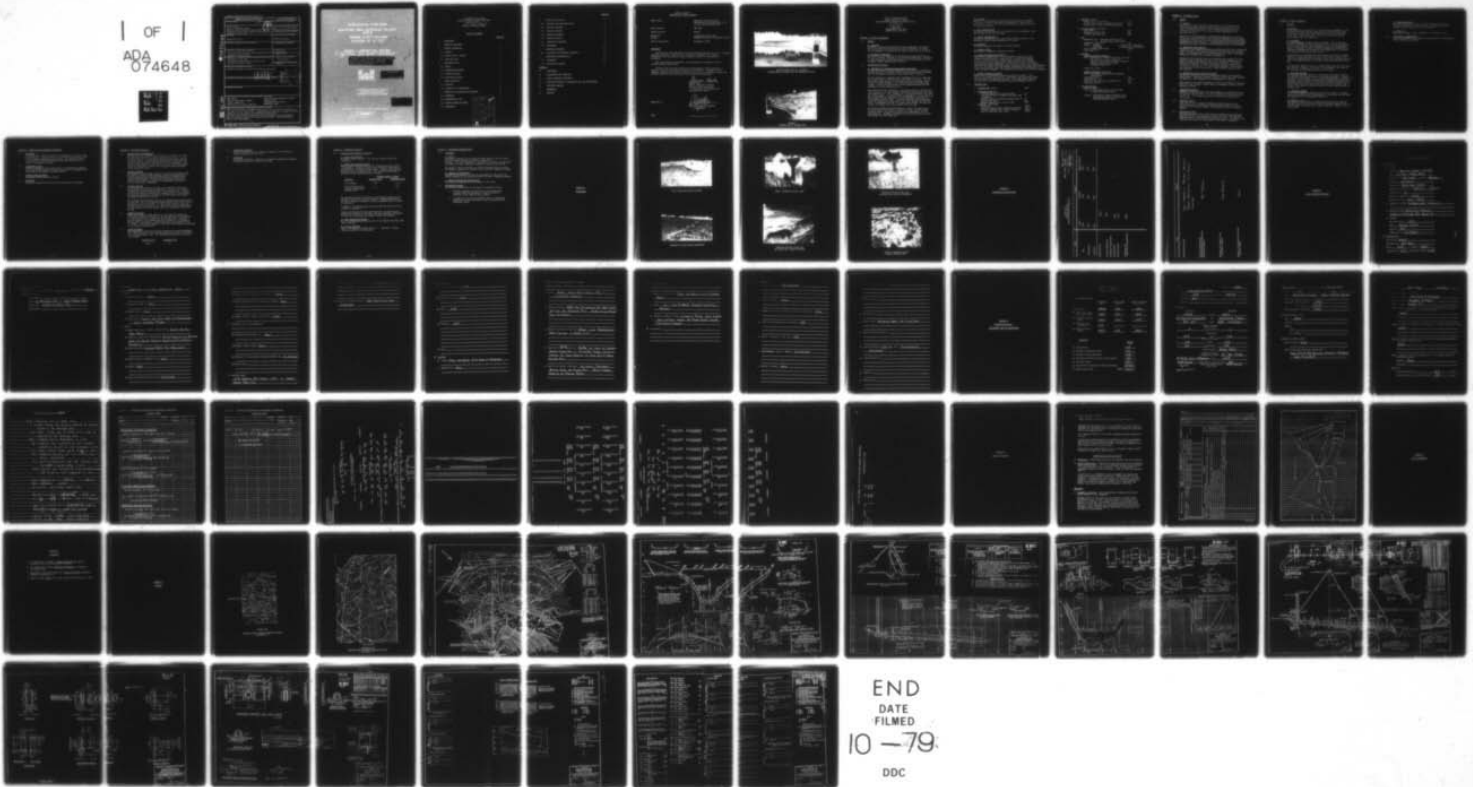
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NATIONAL DAM SAFETY PROGRAM. NANTICOKE CREEK WATERSHED PROJECT --ETC(U)  
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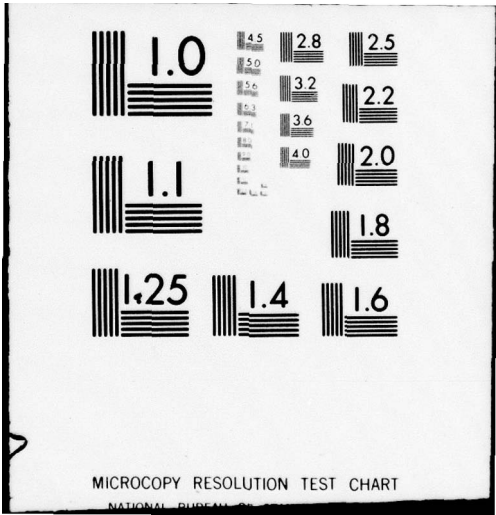
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REPORT DOCUMENTATION PAGE

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1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Phase I Inspection Report Nanticoke Creek Watershed Project Site 8 Susquehanna River Basin, Broome County, New York Inventory No. N.Y. 573		5. TYPE OF REPORT & PERIOD COVERED Phase I Inspection Report National Dam Safety Program
7. AUTHOR(s) George Koch, P.E.		6. PERFORMING ORG. REPORT NUMBER
9. PERFORMING ORGANIZATION NAME AND ADDRESS		8. CONTRACT OR GRANT NUMBER(s) DACW-51-79-C-0001
11. CONTROLLING OFFICE NAME AND ADDRESS New York State Department of Environmental Conservation/ 50 Wolf Road Albany, New York 12233		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) Department of the Army 26 Federal Plaza/ New York District, CofE New York, New York 10007		12. REPORT DATE 17 April 1979
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National Dam Safety Program	Broome County	
Visual Inspection	Susquehanna River Basin	
Hydrology, Structural Stability	Nanticoke Creek	
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. Nanticoke Creek Watershed Protection Project Dam Site No. 8 was found to have no conditions which would render the dam unsafe. Minor maintenance actions were recommended.		

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U.S. DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
BROOME COUNTY, NEW YORK  
SUSQUEHANNA RIVER BASIN, NY 573

PHASE I INSPECTION REPORT  
NATIONAL GAN SAFETY PROGRAM

Nanticoke Creek Watershed Project Site Number 8  
(Inventory Number NY-573). Susquehanna  
River Basin. Broome County, New York.  
Phase I Inspection Report.



10 George / Koch

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SUSQUEHANNA RIVER BASIN  
 NANTICOKE CREEK WATERSHED PROTECTION  
 PROJECT SITE No. 8  
 I.D. No. NY-573 (# 85D-3645)  
 PHASE 1 INSPECTION REPORT

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PHASE 1 REPORT  
NATIONAL DAM SAFETY PROGRAM

Name of Dam: Nanticoke Creek Watershed  
Protection Project Dam Site No. 8  
I.D. No. NY-573 (#85D-3645)

State Located: New York

County Located: Broome

Watershed: Susquehanna River Basin  
Stream: Unnamed tributary of Nanticoke Creek

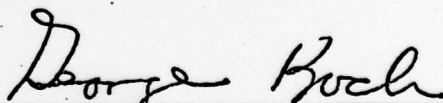
Date of Inspection: November 8, 1978

ASSESSMENT

The Nanticoke Creek Watershed Protection Project Dam Site No. 8 is a floodwater retarding structure. Examination of available documents and a visual inspection of the dam did not reveal conditions which are considered to be unsafe.

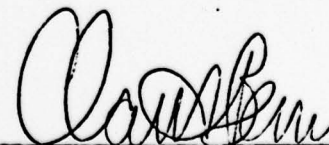
The total discharge capability of the spillways is adequate for the Probable Maximum Flood (PMF).

To assure the continued satisfactory performance of this structure, a schedule of periodic maintenance should be established. Included in this schedule should be items such as mowing the grass on the embankment slopes and periodic operation and lubrication of the slide gate mechanism.



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

Approved By:



Col. Clark H. Benn  
New York District Engineer

17 April 79

Date:

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NANTICOKE CREEK SITE No. 8 OVERVIEW  
NORTHERN END OF UPSTREAM FACE AND EMERGENCY SPILLWAY



OVERVIEW  
SOUTHERN END OF UPSTREAM FACE

PHASE 1 INSPECTION REPORT  
NATIONAL DAM SAFETY PROGRAM  
NANTICOKE CREEK WATERSHED PROTECTION PROJECT  
DAM SITE No. 8  
I.D. No. NY 573  
(#85D-3645)  
SUSQUEHANNA RIVER BASIN  
BROOME COUNTY, NEW YORK

SECTION 1: PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase 1 Inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers, to fulfill the requirements of the National Dam Inspection Act, Public Law 92-367.

b. Purpose of Inspection

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

1.2 DESCRIPTION OF PROJECT

a. Description of the Dam and Appurtenant Structures

The Nanticoke Creek Watershed Protection Project Dam No. 8 consists of an earth dam with a principle spillway pipe passing through the embankment and an emergency spillway on the northern end of the dam.

The dam consists of a compacted earth embankment which is 41 feet high, has a crest length of 460 feet and a crest width of 16 feet. The upstream slope is 1 vertical on 3 horizontal and the downstream slope is 1 vertical on 2 1/2 horizontal. The crest and exposed slopes are grass covered. An earth cutoff trench of varying depth and width keys the embankment into the foundation soils.

The principle spillway consists of a two stage reinforced concrete drop inlet structure, a 24 inch diameter reinforced concrete water pipe with anti-seepage collars, and a plunge pool to dissipate energy at the outlet end of the conduit. A reservoir drain consisting of a 12 inch cast iron pipe extends from the upstream toe of the embankment to the base of the principle spillway riser. A vertical slide gate mechanism mounted along the inside of the riser controls the flow through the reservoir drain. The emergency spillway is a grass lined channel, 180 feet wide, located in an earth cut on the northern end of the dam.

An internal drainage system consisting of a gravel and sand filter with perforated 8 inch diameter bituminous coated, corrugated metal collector pipes is located at the base of the embankment near the downstream toe. Seepage is collected and conducted through this drain and outleted into the plunge pool.

b. Location

Dam No. 8 of the Nanticoke Creek Project is located on an unnamed tributary of the Nanticoke Creek, approximately 7.5 miles north of the Village of Maine. The site is off Howland Hill Road in the Town of Nanticoke, New York.

c. Size Classification

This dam is 41 feet high and is classified as an "intermediate" size dam (between 40 and 100 feet high).

d. Hazard Classification

The dam is classified in the "high" hazard category because of the presence of several homes downstream of the dam.

e. Ownership

This dam is owned by the County of Broome, New York.

f. Purpose of Dam

This dam is a floodwater retarding structure.

g. Design and Construction History

This dam was designed by the U.S. Department of Agriculture, Soil Conservation Service (SCS). Construction of the dam was completed in 1970. The SCS Office for Broome County, located at the Broome County Airport, has a design folder containing hydrologic, hydraulic, and structural design information, and the as-built plans and documents. Since the only modification made during construction was a minor one resulting from the rock surface under the spillway being deeper than anticipated, the plans included in Appendix F are essentially the same as the as-built drawings.

h. Normal Operating Procedures

Normal flows are discharged through the principle spillway. This structure has sufficient capacity to discharge a 100 year flood without flow occurring in the emergency spillway. For storms greater than the 100 year flood, flow will discharge through the emergency spillway.

1.3

PERTINENT DATA

a. <u>Drainage Area</u> (acres)	1382
b. <u>Discharge at Dam</u> (cfs)	
Principle Spillway W.S. at top of dam	70
Principle Spillway at Emergency Spillway Crest	66
Elevation	
Reservoir Drain at Principle Spillway Crest El.	18
Maximum Known Flood	61
Emergency spillway W.S. at top of dam	8280
c. <u>Elevation</u> (USGS datum)	
Top of Dam	1258.2
Emergency Spillway Crest (Auxiliary Spillway)	1252.5
Principle Spillway Crest (Service Spillway)	1239.5
Invert of Reservoir Drain Inlet	1218.0

- d. Reservoir (acres)
- |   |      |
|---|------|
| Surface area at Top of Dam                  | 46.2 |
| Surface area at Crest of Emergency Spillway | 33.0 |
| Surface area at Crest of Principle Spillway | 13.8 |
- e. Storage Capacity (acre-feet)
- |                          |      |
|--------------------------|------|
| Top of Dam               | 608  |
| Emergency Spillway Crest | 380  |
| Principle Spillway Crest | 88.6 |
- f. Dam
- Embankment Type: Compacted earth fill with  
an earth keyed cutoff trench
- |                              |                              |
|------------------------------|------------------------------|
| Embankment length (ft.)      | 460                          |
| Slopes Upstream              | 1 vertical on 3 horizontal   |
| Downstream                   | 1 vertical on 2.5 horizontal |
| Crest elevation (USGS datum) | 1258.2                       |
| Crest Width (ft)             | 16                           |
- g. Spillway
- Principle Spillway (Service)
- Type: Uncontrolled, reinforced concrete, two stage drop inlet (2 x 6 ft.) rising 24.5 feet; 24 inch diameter reinforced concrete pressure conduit 248 feet long; riprapped plunge pool.
- |                    |    |
|--------------------|----|
| Length (ft.): Weir | 12 |
|--------------------|----|
- Emergency Spillway (Auxiliary)
- Type: Grass-lined channel having trapezoidal cross-section
- |   |        |
|---|--------|
| Bottom Width (ft.)                        | 180    |
| Side Slopes (V : H)                       | 1 on 3 |
| Length of level section (in profile)(ft.) | 50     |
| Exit Slope (ft/ft)                        | 0.29   |
- h. Low Level Outlet
- Reservoir Drain:
- Type: 12 inch diameter cast iron pipe with a reinforced concrete inlet.
- Control: Mechanically operated vertical slide gate mounted along the inside of the principle spillway riser.

## SECTION 2: ENGINEERING DATA

### 2.1 DESIGN

#### a. Geology

The Nanticoke Creek Watershed Project Dam No. 8 is located in the "Glaciated Allegheny Plateau" physiographic province of New York State. Bedrock underlying the site is mapped as Cashaqua Shale of the Upper Devonian Age. This rock was formed approximately 400 million years ago.

Glacial ice was instrumental in smoothing the topography of the area. 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. Glacial deposits such as outwash plains and eskers are major features of the landscape in parts of this region.

#### b. Subsurface Investigations

A subsurface investigation program was conducted by the Soil Conservation Service in 1966. This program consisted of 23 test pits and 13 drill holes. The maximum depth of the explorations was 34 feet. Applicable subsurface information is included in Appendix G.

In general, the surficial soils at the project site consist of a thin layer of topsoil underlain by glacial till on both abutments and by assorted alluvium and reworked till in the floodplain. A gravelly material with moderate to rapid permeability was encountered from 8 to 12 feet in Test Pit No. 1 on the northern abutment. This material was found only in this one test pit. Shale bedrock underlies these soil deposits.

#### c. Embankment and Appurtenant Structures

The dam was designed by the Soil Conservation Service who prepared a design report. Seventeen drawings, several of which have been included in Appendix G, were prepared for the construction of the dam.

Hydraulically, the dam was designed to retard the floodwaters resulting from a 100 year frequency storm, without a discharge occurring in the emergency spillway.

### 2.2 CONSTRUCTION RECORDS

Complete as-built contract plans and documents are available from the SCS Office in Broome County. No major construction changes were made on this job. The as-built plans were included in the appendix of this report.

### 2.3 OPERATION RECORD

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

### 2.4 EVALUATION OF DATA

The data presented in this report has been compiled from information obtained from the Soil Conservation Service as well as the New York State Department of Environmental Conservation files. It appears to be adequate and reliable for the purpose of the Phase 1 Inspection.

## SECTION 3: VISUAL INSPECTION

### 3.1 FINDINGS

#### a. General

Visual inspection of Dam Site No. 8 was conducted on November 8, 1978. The weather was clear and the temperature was around 50°F. The water surface was several inches above the invert of the low stage inlet on the riser. There was a small flow from the principle spillway pipe spilling into the plunge pool.

#### b. Embankment

The earth embankment showed no signs of distress. The vertical and horizontal alignment of the crest appears to be as it was constructed, with no visible surface cracks appearing on the crest or embankment slopes. There were no areas of serious sloughing or subsidence noted. Some minor sloughing was observed on the upstream slope in the range of fluctuation of the water surface level.

Inspection of the downstream face did not reveal any signs of seepage. There was a slight discharge from the 8 inch collection pipe of the internal drainage system on the southern side of the principle spillway pipe. The collection pipe to the north of the principle spillway was dry.

No undesirable vegetative growth or animal penetrations into the slopes were observed. However, on the date of the inspection, the grass on the upstream and downstream slope had not been mowed.

#### c. Principle Spillway

The principle spillway consists of the vertical drop inlet structure, a reinforced concrete pressure pipe through the embankment, a plunge pool and an outlet channel. All of these components were in satisfactory condition. The only minor deficiency noted concerned the plunge pool. The downstream toe of the dam, the bottom of the stream channel and the stream banks were lined with riprap, but there was no riprap in the center of the stream to check the velocity of water coming through the spillway pipe.

#### d. Emergency Spillway

A grass lined emergency spillway in an earth cut section is located beyond the northern end of the embankment. The spillway had been mowed and appeared to be in satisfactory condition.

#### e. Drain

The reservoir drain conduit and slide gate may be used to lower the reservoir when the pool level is below the principle spillway crest. The slide gate is located within a pipe sleeve which extends to the top of the riser.

f. Downstream Channel

The outlet channel beyond the end of the plunge pool was heavily overgrown with weeds and brush. However, no severe side-slope erosion or debris obstructions were in evidence.

g. Reservoir

There were no signs of soil instability in the reservoir area.

3.2

EVALUATION OF OBSERVATIONS

Visual observations did not reveal any problems which would adversely affect the safety of the dam.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The normal water surface elevation is approximately at the low stage inlet elevation. Downstream flows are limited by the capacity of the 24 inch diameter reinforced concrete pipe. The reservoir provides 374 acre feet of storage between the normal water level and the crest of the emergency spillway.

4.2 MAINTENANCE OF DAM

The dam is maintained by the owner and is in satisfactory condition. Normal maintenance consists of mowing the crest of the embankment and the bottom of the emergency spillway channel.

4.3 WARNING SYSTEM IN EFFECT

No apparent warning system is present.

4.4 EVALUATION

The dam and appurtenant structures are satisfactorily maintained.

## SECTION 5: HYDROLOGIC/HYDRAULIC

### 5.1 DRAINAGE AREA CHARACTERISTICS

Delineation of the watershed draining into the reservoir pool area was made using the USGS 7.5 minute quadrangle for Lisle, N.Y. The watershed consists of woodlands and lightly forested area situated in a rural section. Relief ranges from moderate to steep with the steeper slopes occurring on the western side of the watershed. The slopes on the western side range from 15 to 20%, and on the eastern side they range from 5 to 10%. The rectangularly shaped drainage area is about 1382 acres.

### 5.2 ANALYSIS CRITERIA

The analysis of the spillway capacity of the dam was performed using the Corps of Engineer's HEC-1 computer program, incorporating the "Snyder Synthetic Unit Hydrograph" method and the "Modified Puls" flood routing procedure. The spillway design flood selected for analysis was the PMF in accordance with recommended guidelines of the U.S. Army Corps of Engineers.

### 5.3 SPILLWAY CAPACITY

The principal and emergency spillways are uncontrolled structures. The principal spillway operates under weir or orifice flow conditions depending upon the floodwater inflow to the reservoir pool. During orifice flow operation, pressure flow develops in the 24 inch conduit. The emergency spillway was analyzed as a broad-crested weir having a discharge coefficient (C) of 3.087.

The spillways have sufficient capacity for discharging the peak outflow from the PMF. Due to the limited storage capacity, there will be little attenuation of the storm flows. For this storm, the peak inflow and the peak outflow are both 3640 cfs. When the spillways are discharging the peak outflow, the water surface will be 2.4 feet below the top of the dam.

### 5.4 RESERVOIR CAPACITY

Normal flood control storage capacity of the reservoir between the principal and emergency spillways is 291 acre-feet which is equivalent to a runoff depth of 2.5 inches over the drainage area. Surge storage capacity to the maximum high water elevation is an additional 228 acre-feet; equivalent to a runoff depth over the drainage area of 2.0 inches. Total storage capacity of the dam is 608 acre-feet; equivalent to 5.3 inches of direct runoff.

### 5.5 FLOODS OF RECORD

The maximum known flood occurred during Hurricane Eloise during September, 1975. The pool level at this time was reported to be about 7 feet above the principal spillway crest. The calculated discharge for this flood is as follows:

<u>Elevation (ft.)</u>	<u>Discharge (cfs)</u>
1246.4	61

5.6 OVERTOPPING POTENTIAL

Analysis indicates the total discharge capability is sufficient to prevent overtopping from the PMF.

5.7 EVALUATION

This dam has sufficient capability to impound and adequately discharge floodwaters expected to result from the PMF.

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

No signs of major distress of the dam were observed during the inspection.

b. Design and Construction Data

Design data was obtained from the Soil Conservation Service Office in Binghamton. Stability analyses were performed by SCS using a modification of the Swedish Circle Method. Various conditions were analyzed during the design process. The conditions applicable to the dam as it was constructed are as follows:

<u>CONDITION</u>	<u>MINIMUM FACTOR OF SAFETY</u>	
	<u>UPSTREAM SLOPE</u>	<u>DOWNSTREAM SLOPE</u>
Full Drawdown	1.69	—
Long Term Steady State Seepage from Emergency Spillway Crest	—	1.60

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

A summary of the analyses and sections showing the failure arcs are included in Appendix E.

Based on discussions with SCS representatives, the dam was built essentially according to the plans. The only significant difference was that the rock surface was somewhat deeper than expected.

c. Post Construction Changes

The SCS representatives were not aware of any changes which have been made on the dam.

d. Seismic Stability

This dam is located in Seismic Zone No. 1. Therefore, a seismic stability analysis is not warranted.

## SECTION 7: ASSESSMENT/RECOMMENDATIONS

### 7.1 ASSESSMENT

#### a. Safety

The Phase 1 Inspection of the Nanticoke Creek Dam No. 8 did not reveal conditions which constitute a hazard to human life or property. The earth embankment is considered to be stable, structurally, and capable of safely retarding floodwaters resulting from the PMF.

The design of this dam includes an internal drainage system to control the phreatic surface and to provide a safe outlet for foundation seepage.

#### b. Adequacy of Information

Information concerning the design and performance of this dam is considered adequate for the purposes required for Phase 1 Inspection Reports.

#### c. Need for Additional Investigations

No additional investigations are necessary at this time.

### 7.2 RECOMMENDED MEASURES

The following tasks should be undertaken by maintenance forces:

- a. Periodic operation and lubrication of the mechanically operated slide gate mechanism to insure the ease of operation of the reservoir drain conduit.
- b. A schedule for periodic maintenance should be established which would include items such as mowing the grass on the embankment slopes.

APPENDIX A

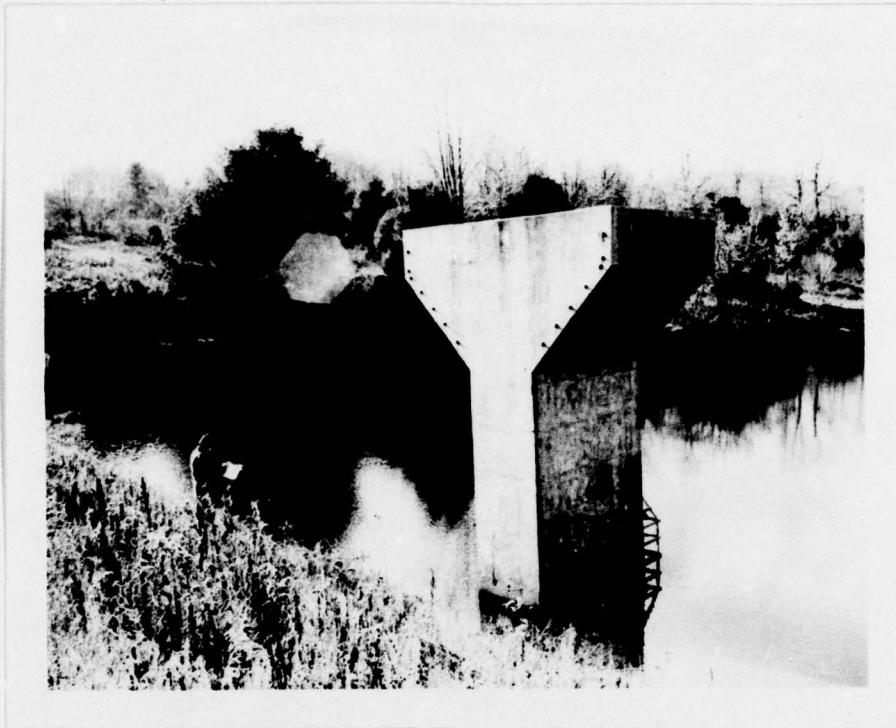
PHOTOGRAPHS



VIEW LOOKING EAST ALONG DAM CREST



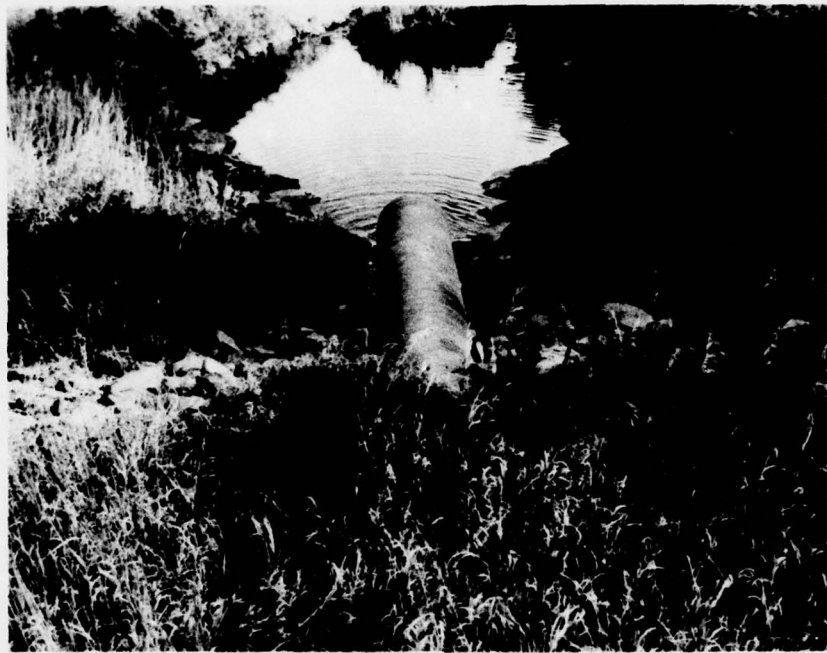
EMERGENCY SPILLWAY LOOKING DOWNSTREAM



RISER - PRINCIPAL SPILLWAY INLET



PRINCIPAL SPILLWAY OUTLET PIPE  
AND PLUNGE POOL (LOOKING UPSTREAM)



PRINCIPAL SPILLWAY OUTLET PIPE  
AND PLUNGE POOL (LOOKING DOWNSTREAM)



OUTLET OF INTERNAL DRAINAGE  
SYSTEM COLLECTION PIPE

APPENDIX B

ENGINEERING DATA CHECKLIST

Name of Dam NANTICOKE CREEK  
SITE 8

I.D. # NY-573  
(85D-3645)

Check List  
 Engineering Data  
 Design Construction Operation

Item	Remarks		
Dam	Plans YES	Details YES	Typical Sections YES
Spillway(s)	YES	YES	YES
Outlet(s)	YES	YES	YES
Design Reports	YES		
Design Computations	YES		
Discharge Rating Curves			
Dam Stability	YES		
Seepage Studies	YES		
Subsurface and Materials Investigations	YES		

Item	Remarks
------	---------

Construction History  
 ONLY INFORMATION AVAILABLE OBTAINED THROUGH DISCUSSIONS WITH PROJECT INSPECTOR

Surveys, Modifications, Post-Construction Engineering Studies and Reports

.. NONE REPORTED

Accidents or Failure of Dam Description, Reports

NONE REPORTED

Operation and Maintenance Records Operation Manual

NONE

APPENDIX C

VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam NANTICOKE CREEK SITE 8  
I.D. # N.Y. 573 (#850-3645)  
Location: Town NANTICOKE County BROOME  
Stream Name UNNAMED  
Tributary of NANTICOKE CREEK  
Longitude (W), Latitude (N) W076° 4.8' N42° 16.5'  
Hazard Category C  
Date(s) of Inspection 11/8/78  
Weather Conditions SUNNY 45°-50°

b. Inspection Personnel R. WARRENDER; W. LYNICK

c. Persons Contacted H. HIRTH, SCS SYRACUSE  
G. PAGE & D. KOLESAR, SES BROOME Co.

d. History:

Date Constructed 1970  
Owner BROOME COUNTY  
Designer SCS  
Constructed by C.D. MURRAY

2) Technical Data

Type of Dam EARTH  
Drainage Area 1382 ACRES  
Height 41 ft. Length 460 ft  
Upstream Slope 1 on 3 Downstream Slope 1 on 2.5

2) Technical Data (Cont'd.)

External Drains: on Downstream Face \_\_\_\_\_ @ Downstream Toe RIPRAP

Internal Components:

Impervious Core \_\_\_\_\_

Drains 8" CMP DRAIN PIPE IN SAND & GRAVEL DRAIN

Cutoff Type COMPACTED EARTH FILL

Grout Curtain \_\_\_\_\_

3) Embankment

EARTH FILL WITH GOOD VEGETATIVE COVER

a. Crest

(1) Vertical Alignment OKAY

(2) Horizontal Alignment OKAY

(3) Surface Cracks NONE

(4) Miscellaneous CREST WAS ONLY PART OF EMBANKMENT  
WHICH HAD BEEN MOWED.

b. Slopes

(1) Undesirable Growth or Debris, Animal Burrows SLOPES HAD NOT  
BEEN MOWED

(2) Sloughing, Subsidence or Depressions MINOR SLOUGHING ON UPSTREAM  
SLOPE AT WATER SURFACE ELEVATION (WITHIN RANGE OF  
FLUCTUATION)

(3) Slope Protection UNMOWED GRASS AND CROWN VETCH

(4) Surface Cracks or Movement at Toe NONE

(5) Seepage NONE

(6) Condition Around Outlet Structure SATISFACTORY

c. Abutments

(1) Erosion at Embankment and Abutment Contact NONE

(2) Seepage along Contact of Embankment and Abutment NONE

(3) Seepage at toe or along downstream face NONE

d. Downstream Area - below embankment

(1) Subsidence, Depressions, etc. NONE

(2) Seepage, unusual growth NONE

(3) Evidence of surface movement beyond embankment toe NO EVIDENCE

(4) Miscellaneous

e. Drainage System

2-8" DIAMETER BIT. COATED CMP IN SAND &  
GRAVEL DRAIN FILL

(1) Condition of relief wells, drains, etc. \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(2) Discharge from Drainage System VERY SLOW (LESS THAN

3 GAL/HOUR)  
\_\_\_\_\_  
\_\_\_\_\_

4) Instrumentation

(1) Documentation/Surveys N/A

\_\_\_\_\_  
\_\_\_\_\_

(2) Observation Wells N/A

\_\_\_\_\_  
\_\_\_\_\_

(3) Weirs N/A

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(4) Piezometers N/A

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(5) Other \_\_\_\_\_

\_\_\_\_\_

5) Reservoir

a. Slopes TREES AND GRASS UP TO EDGE OF RESERVOIR

\_\_\_\_\_

b. Sedimentation NONE

\_\_\_\_\_

c) Spillways (including tail race channel)

- a. General RISER, OUTLET PIPE & PLUNGE POOL IN  
SATISFACTORY CONDITION
- b. Principle Spillway 24.5' HIGH RECTANGULAR RC DROP INLET;  
24" DIA RC PRESSURE PIPE; RIP RAP LINED PLUNGE  
POOL AT OUTLET
- c. Emergency or Auxiliary Spillway GRASS LINED TRAPEZOIDAL  
OPEN CHANNEL IN EARTH CUT
- d. Condition of <sup>OUTLET</sup> Tail race channel RIP RAP ON SIDES OF CHANNEL  
FORMED PLUNGE POOL - NO RIP RAP ACROSS CENTER OF  
CHANNEL TO CHECK VELOCITY OF FLOWS EXITING FROM  
SPILLWAY PIPE.
- e. Stability of Channel side/slopes NO SPECIAL TREATMENT  
BEYOND ENDS OF PLUNGE POOL; BRUSH & WEEDS  
GROWING ON CHANNEL BANKS.

7) Downstream Channel

a. Condition (debris, etc.) TREES AND BRUSH LINING STREAM  
BANKS

b. Slopes 1 ON 1 - NOT RIP RAPPED, ALTHOUGH SOME STONE  
PRESENT.

c. Approximate number of homes VILLAGE OF MAINE PLUS 3 HOMES  
NEAR THE POINT WHERE THE STREAM PASSES UNDER  
THE COUNTY HIGHWAY

8) Miscellaneous \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

9) Structural

a. Concrete Surfaces SATISFACTORY

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b. Structural Cracking NONE

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

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d. Junctions with Abutments or Embankments N/A

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e. Drains - Foundation, Joint, Face N/A

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f. Water passages, conduits, sluices SATISFACTORY

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g. Seepage or Leakage NONE

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h. Joints - Construction, etc. \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

i. Foundation \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

j. Abutments \_\_\_\_\_

\_\_\_\_\_

k. Control Gates RESERVOIR DRAIN HAS SLIDE GATE

\_\_\_\_\_  
\_\_\_\_\_

l. Approach & Outlet Channels \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

m. Energy Dissipators (plunge pool, etc.) PIPE EXTENSION

SATISFACTORY

\_\_\_\_\_

n. Intake Structures \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

o. Stability \_\_\_\_\_

\_\_\_\_\_

p. Miscellaneous \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

APPENDIX D

HYDROLOGIC/HYDRAULIC

ENGINEERING DATA AND COMPUTATIONS

CHECK LIST FOR DAMS  
HYDROLOGIC AND HYDRAULIC  
ENGINEERING DATA

AREA-CAPACITY DATA:

	<u>Elevation</u> (ft.)	<u>Surface Area</u> (acres)	<u>Storage Capacity</u> (acre-ft.)
1) Top of Dam	<u>1258.2</u>	<u>46.2</u>	<u>608</u>
2) Design High Water (Max. Design Pool)	<u>1255.2</u>	<u>39.0</u>	<u>476</u>
3) Auxiliary Spillway Crest	<u>1252.5</u>	<u>33.0</u>	<u>380</u>
4) Pool Level with Flashboards	<u>N/A</u>	<u>      </u>	<u>      </u>
5) Service Spillway Crest	<u>1239.5</u>	<u>13.8</u>	<u>88.6</u>

DISCHARGES

	<u>Volume</u> (cfs)
1) Average Daily	<u>N/A</u>
2) Spillway @ Maximum High Water	<u>70.1</u>
3) Spillway @ Design High Water	<u>67.8</u>
4) Spillway @ Auxiliary Spillway Crest Elevation	<u>65.6</u>
5) Low Level Outlet	<u>18.7</u>
6) Total (of all facilities) @ Maximum High Water	<u>8350.2</u>
7) Maximum Known Flood	ELEV. = <u>1246.4</u>

CREST:

ELEVATION: 1258.2

Type: LEVEL; GRASSED EARTH

Width: 16 ft.

Length: 460 ft.

Spillover N/A

Location \_\_\_\_\_

SPILLWAY:

PRINCIPAL

EMERGENCY

1239.5

Elevation 1252.5

RC DROP INLET W/TRASH RACK

Type TRAPEZOIDAL CHANNEL

2ft x 6ft

Width 180ft 1 ON 3 SLOPES

Type of Control

✓

Uncontrolled

✓

Controlled:

N/A

Type

N/A

(Flashboards; gate)

N/A

Number

N/A

N/A

Size/Length

N/A

Invert Material

MOWED GRASS

Anticipated Length  
of operating service

< 1 PER 100 YRS

24" DIA RC CONDUIT - 248' LONG

Length

600ft.

SHARP CRESTED

Height Between Spillway Crest

N/A

& Approach Channel Invert

BROAD CRESTED

(Weir Flow)

L/b = 1.0

WEIR LENGTH = 12'

~~OUTLET STRUCTURES/EMERGENCY DRAINAGE FACILITIES:~~ -RESERVOIR DRAIN

Type: Gate  Sluice \_\_\_\_\_ Conduit  Penstock \_\_\_\_\_

Shape : GATE - FLAT CIRCULAR CONDUIT - ROUND CAST IRON

Size: \_\_\_\_\_

Elevations: Entrance invert 1215.5

Exit Invert 1210.5

Tailrace Channel: Elevation 1208.5

HYDROMETEROLOGICAL GAGES:

Type : NONE

Location: \_\_\_\_\_

Records:

Date - \_\_\_\_\_

Max. Reading - \_\_\_\_\_

FLOOD WATER CONTROL SYSTEM:

Warning System: NONE

Method of Controlled Releases (mechanisms):

NONE EXCEPT FOR MANUALLY OPERATED RESERVOIR  
DRAIN SLIDE GATE

WATERAGE AREA: 1382 ACRES 2.16 SQ.MI.

WATERAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: LIGHT FOREST & WOODLANDS

Terrain - Relief: MODERATE TO STEEP

Surface - Soil: GLACIAL TILL

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

NONE

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

NONE

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 N/A (Miles)

Length of Shoreline (@ Spillway Crest) N/A (Miles)

WATER FLOW DAM #8

D.A. = Drainage area in square miles

L = River mileage from the given station to the upstream limits of the drainage area

LCA = River mileage from the station to the center of gravity of the drainage area

PMP = Probable Maximum Precipitation in inches

$t_p$  = Lag time from mid-point of unit rainfall duration,  $t_r$ , to peak of unit hydrograph, in hours.

$t_r$  = Unit rainfall duration, equal to  $\frac{t_p}{5.5}$ , in hours.

$C_t$  = Coefficient depending upon units and drainage basin characteristics

$t_r$  = Unit rainfall duration other than standard unit;  $t_r$  adopted in specific study, in hours.

$t_{PR}$  = lag time from mid-point of unit rainfall duration,  $t_R$ , to peak of unit hydrograph, in hours

$$D.A. = 2.16 \text{ square miles, } L = 3.33 \text{ miles, } LCA = 1.32 \text{ miles}$$

$$PMP = 20.5 \text{ inches } C_t = 2.0$$

$$C_p = 0.625 \text{ from average } 640 C_p = 400$$

$$t_p = C_t (L \cdot LCA)^{0.3} = 2.0 [(3.33)(1.32)]^{0.3} = 3.12 \text{ hours}$$

$$t_r = \frac{t_p}{5.5} = \frac{3.12}{5.5} = .57 \text{ hours (Use 1 hr. } t_r \text{ hydrograph)}$$

$$t_{PR} = t_p + 0.25(t_r - t_r) = (3.12) + .25(1 - .57) = 3.23 \text{ hrs.}$$

From HMR 33 - Figure 2, Deple - Area - Duration  
Zone 1 Prec = 20.5"

$$6 \text{ hour } \% 111 = 22.55, \quad 12 \text{ hour } \% 133 = 27.26$$

$$24 \text{ hour } \% 122 = 25.01, \quad 48 \text{ hour } \% 142 = 29.11$$

## PROJECT GRID

JOB	NANTUCKET CREEK SITE 8	SHEET NO.	1	CHECKED BY		DATE	
SUBJECT	HYDROLOGY & HYDRAULIC COMPUTATIONS		COMPUTED BY	RLW	DATE		1/30/79
<u>PRINCIPAL SPILLWAY CAPACITY</u>							
WATER SURFACE AT AUXILIARY SPILLWAY CREST							
$q = A \sqrt{\frac{2gH}{1 + K_e + K_b + K_d L}} = 3.14 \sqrt{\frac{2(32.2)(41)}{1 + .5 + .45 + (.0165)(248)}} = 65.64 \text{ cfs}$							
WATER SURFACE AT DESIGN HIGH WATER							
$q = 3.14 \sqrt{\frac{2(32.2)(43.7)}{1 + .5 + .45 + (.0165)(248)}} = 67.77 \text{ cfs}$							
WATER SURFACE AT TOP OF DAM							
$q = 3.14 \sqrt{\frac{2(32.2)(46.7)}{1 + .5 + .45 + (.0165)(248)}} = 70.06 \text{ cfs}$							
<u>EMERGENCY SPILLWAY CAPACITY</u>							
WATER SURFACE AT TOP OF DAM							
$q = CLH^{3/2} = (3.087)(197.1)(5.7)^{3/2} = 8280.1 \text{ cfs}$							
$L = 180 + (2.95)(3)(2) = 197.1$							
<u>RESERVOIR DRAIN CAPACITY</u>							
WATER SURFACE AT PRINCIPAL SPILLWAY CREST							
$q = .78 \sqrt{\frac{2(32.2)(24.5)}{1 + .5 + 0 + .0417(30)}} = 18.68 \text{ cfs}$							

## PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
NANT COKE CREEK SITE 3	2		
SUBJECT	COMPUTED BY	DATE	
HYDROLOGY & HYDRAULIC COMPUTATIONS	RLW	2/2/77	
DEPTH OF FLOW IN EMERGENCY SPILLWAY DURING PMF			
$Q = C L H^{3/2} \Rightarrow H^{3/2} = \frac{Q}{C L} = \frac{3577}{(3.087)(189)} = 6.13 \Rightarrow H = 3.35'$			
$Q = 3643 - 66 = 3577$			
$L = 180 + (1.5)(3)(2) = 189$			

\*\*\*\*\*  
 HEC-1 VERSION DATED JAN 1973  
 UPDATED AUG 74  
 CHANGE NO. 01  
 \*\*\*\*\*

MAITICREEK CREEK WATERSHED PROJECT SITE NO 8  
 PMF WITH RATIOS  
 DATE

JOB SPECIFICATION  
 NW NHR I:MIN IDAY IHR I:MIN METRC IPLT IPRT NSTAN  
 100 1 0 0 0 0 0 0 0 0 0  
 JUPER 5 NWT 0

MULTI-PLAN ANALYSES TO BE PERFORMED  
 NPLAN= 1 NRTIM= 2 LRATIO= 1  
 RTIOS= 0.50 1.00

\*\*\*\*\*  
 \*\*\*\*\*  
 \*\*\*\*\*  
 \*\*\*\*\*

SUB-AREA RUNOFF COMPUTATION  
 ISTAQ ICOMP IFCON ITAPE JPLT JPRT INAME  
 1 0 0 0 0 0 0 0

HYDROGRAPH DATA  
 IHYDG IING TAREA SHAP TRSDA TRSFC RATIO ISNDW ISAME LOCAL  
 1 1 2.16 0. S1AP 2.16 0. 0. 0 0 0 0

PRECIP DATA  
 SPFE PMS R6 R12 R24 R48 R72 R96  
 0. 20.50 111.00 122.00 133.00 142.00 0. 0. 0.

TRSPC COMPUTED BY THE PROGRAM IS 0.738

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

UNIT HYDROGRAPH DATA  
 TP= 3.00 CP=0.63 NTA= 0

APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SHYDER CP AND TP ARE TC= 3.71 AND R= 2.44 INTERVALS  
 STATQ= 4.00 ORCSN= 4.00 RTIOM= 1.00  
 UNIT HYDROGRAPH IS END-OF-PERIOD ORDINATES, LAG= 2.98 HOURS, CP= 0.63 VOL= 1.00

47.	153.	269.	8.	283.	215.	142.	93.	62.	41.	27.
1h.	12.	8.	5.	3.	3.	3.	3.	3.	3.	3.

END-OF-PERIOD FLOW  
 TIME RAIN EXCS COMP Q  
 1 0.01 0. 4.  
 2 0.01 0. 4.  
 3 0.01 0. 4.

10	0.02	0.	4.
11	0.02	0.	4.
12	0.02	0.	4.
13	0.11	0.	4.
14	0.14	0.	4.
15	0.17	0.	4.
16	0.43	0.01	4.
17	0.15	0.06	8.
18	0.12	0.02	17.
19	0.01	0.	26.
20	0.01	0.	29.
21	0.01	0.	25.
22	0.01	0.	18.
23	0.01	0.	13.
24	0.01	0.	10.
25	0.11	0.01	9.
26	0.11	0.01	9.
27	0.11	0.01	11.
28	0.11	0.01	13.
29	0.11	0.01	15.
30	0.11	0.01	17.
31	0.23	0.18	25.
32	0.23	0.18	53.
33	0.23	0.18	98.
34	0.28	0.18	145.
35	0.28	0.18	181.
36	0.28	0.18	205.
37	1.68	1.58	286.
38	2.01	1.91	540.
39	2.52	2.42	1003.
40	6.33	6.23	1757.
41	2.35	2.25	2731.
42	1.65	1.75	3507.
43	0.17	0.07	3640.
44	0.17	0.07	3111.
45	0.17	0.07	2323.
46	0.17	0.07	1613.
47	0.17	0.07	1097.
48	0.17	0.07	756.
49	0.	0.	528.
50	0.	0.	369.
51	0.	0.	253.
52	0.	0.	167.
53	0.	0.	107.
54	0.	0.	67.
55	0.	0.	31.
56	0.	0.	17.
57	0.	0.	9.
58	0.	0.	7.
59	0.	0.	6.
60	0.	0.	5.
61	0.	0.	5.
62	0.	0.	4.
63	0.	0.	4.
64	0.	0.	4.
65	0.	0.	4.
66	0.	0.	4.
67	0.	0.	4.



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HYDROGRAPH ROUTING

ROUTED HYDROGRAPH AT DALL

ISTAQ	1	IECON	0	ITAPE	0	JPLT	0	JPRT	0	INAME	1
ICOMP	1	ROUTING DATA		AVG	1	IRES	1	ISAME	1		
QLOSS	0.	CLOSS	0.	AMSJK	0.	X	0.	YSK	STORA	89.	
NSTPS	1	NSTDL	0	LAG	0						
STORAGE=	89.	330.	608.	0:	0:	0:	0:	0:	0:	0:	0:
OUTFLW=	0:	66.	8350.	0:	0:	0:	0:	0:	0:	0:	0:

STATION	1,	PLAN 1,	RTIO 1	0.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.
0.	0.	0.	0.	0.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.
1.	0.	0.	0.	0.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.
2.	0.	0.	0.	0.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.
3.	0.	0.	0.	0.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.
4.	0.	0.	0.	0.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.
5.	1021.	1940.	1637.	1303.	64.	54.	45.	38.	32.	29.	26.	23.	20.	17.	14.	11.	8.	5.	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
6.	97.	66.	65.	64.	63.	62.	61.	60.	59.	58.	57.	56.	55.	54.	53.	52.	51.	50.	49.	48.	47.	46.	45.	44.	43.	42.	41.	40.	39.	38.	37.	36.	35.	34.
7.	57.	56.	55.	54.	53.	52.	51.	50.	49.	48.	47.	46.	45.	44.	43.	42.	41.	40.	39.	38.	37.	36.	35.	34.	33.	32.	31.	30.	29.	28.	27.	26.	25.	24.
8.	49.	47.	46.	45.	44.	43.	42.	41.	40.	39.	38.	37.	36.	35.	34.	33.	32.	31.	30.	29.	28.	27.	26.	25.	24.	23.	22.	21.	20.	19.	18.	17.	16.	15.
9.	41.	39.	38.	37.	36.	35.	34.	33.	32.	31.	30.	29.	28.	27.	26.	25.	24.	23.	22.	21.	20.	19.	18.	17.	16.	15.	14.	13.	12.	11.	10.	9.	8.	7.
10.	34.	33.	32.	31.	30.	29.	28.	27.	26.	25.	24.	23.	22.	21.	20.	19.	18.	17.	16.	15.	14.	13.	12.	11.	10.	9.	8.	7.	6.	5.	4.	3.	2.	1.

STOR	90.	91.	92.	93.	94.	95.	96.	97.	98.	99.	100.	101.	102.	103.	104.	105.	106.	107.	108.	109.	110.	111.	112.	113.	114.	115.	116.	117.	118.	119.	120.									
89.	89.	91.	96.	106.	423.	378.	333.	293.	260.	232.	89.	91.	96.	106.	423.	378.	333.	293.	260.	232.	89.	91.	96.	106.	423.	378.	333.	293.	260.	232.	89.	91.	96.	106.	423.	378.	333.	293.	260.	232.
90.	90.	91.	96.	106.	423.	378.	333.	293.	260.	232.	90.	91.	96.	106.	423.	378.	333.	293.	260.	232.	90.	91.	96.	106.	423.	378.	333.	293.	260.	232.	90.	91.	96.	106.	423.	378.	333.	293.	260.	232.
91.	91.	92.	97.	107.	432.	387.	342.	302.	269.	241.	91.	92.	97.	107.	432.	387.	342.	302.	269.	241.	91.	92.	97.	107.	432.	387.	342.	302.	269.	241.	91.	92.	97.	107.	432.	387.	342.	302.	269.	241.
92.	92.	93.	98.	108.	441.	396.	351.	311.	278.	250.	92.	93.	98.	108.	441.	396.	351.	311.	278.	250.	92.	93.	98.	108.	441.	396.	351.	311.	278.	250.	92.	93.	98.	108.	441.	396.	351.	311.	278.	250.
93.	93.	94.	99.	109.	450.	405.	360.	320.	287.	259.	93.	94.	99.	109.	450.	405.	360.	320.	287.	259.	93.	94.	99.	109.	450.	405.	360.	320.	287.	259.	93.	94.	99.	109.	450.	405.	360.	320.	287.	259.
94.	94.	95.	100.	110.	459.	414.	369.	329.	296.	268.	94.	95.	100.	110.	459.	414.	369.	329.	296.	268.	94.	95.	100.	110.	459.	414.	369.	329.	296.	268.	94.	95.	100.	110.	459.	414.	369.	329.	296.	268.
95.	95.	96.	101.	111.	468.	423.	378.	338.	305.	277.	95.	96.	101.	111.	468.	423.	378.	338.	305.	277.	95.	96.	101.	111.	468.	423.	378.	338.	305.	277.	95.	96.	101.	111.	468.	423.	378.	338.	305.	277.
96.	96.	97.	102.	112.	477.	432.	387.	347.	314.	286.	96.	97.	102.	112.	477.	432.	387.	347.	314.	286.	96.	97.	102.	112.	477.	432.	387.	347.	314.	286.	96.	97.	102.	112.	477.	432.	387.	347.	314.	286.
97.	97.	98.	103.	113.	486.	441.	396.	356.	323.	296.	97.	98.	103.	113.	486.	441.	396.	356.	323.	296.	97.	98.	103.	113.	486.	441.	396.	356.	323.	296.	97.	98.	103.	113.	486.	441.	396.	356.	323.	296.
98.	98.	99.	104.	114.	495.	450.	405.	365.	332.	305.	98.	99.	104.	114.	495.	450.	405.	365.	332.	305.	98.	99.	104.	114.	495.	450.	405.	365.	332.	305.	98.	99.	104.	114.	495.	450.	405.	365.	332.	305.
99.	99.	100.	105.	115.	504.	459.	414.	374.	341.	314.	99.	100.	105.	115.	504.	459.	414.	374.	341.	314.	99.	100.	105.	115.	504.	459.	414.	374.	341.	314.	99.	100.	105.	115.	504.	459.	414.	374.	341.	314.
100.	100.	101.	106.	116.	513.	468.	423.	383.	350.	323.	100.	101.	106.	116.	513.	468.	423.	383.	350.	323.	100.	101.	106.	116.	513.	468.	423.	383.	350.	323.	100.	101.	106.	116.	513.	468.	423.	383.	350.	323.
101.	101.	102.	107.	117.	522.	477.	432.	392.	359.	332.	101.	102.	107.	117.	522.	477.	432.	392.	359.	332.	101.	102.	107.	117.	522.	477.	432.	392.	359.	332.	101.	102.	107.	117.	522.	477.	432.	392.	359.	332.
102.	102.	103.	108.	118.	531.	486.	441.	401.	368.	341.	102.	103.	108.	118.	531.	486.	441.	401.	368.	341.	102.	103.	108.	118.	531.	486.	441.	401.	368.	341.	102.	103.	108.	118.	531.	486.	441.	401.	368.	341.
103.	103.	104.	109.	119.	540.	495.	450.	410.	377.	350.	103.	104.	109.	119.	540.	495.	450.	410.	377.	350.	103.	104.	109.	119.	540.	495.	450.	410.	377.	350.	103.	104.	109.	119.	540.	495.	450.	410.	377.	350.
104.	104.	105.	110.	120.	549.	504.	459.	419.	386.	359.	104.	105.	110.	120.	549.	504.	459.	419.	386.	359.	104.	105.	110.	120.	549.	504.	459.	419.	386.	359.	104.	105.	110.	120.	549.	504.	459.	419.	386.	359.
105.	105.	106.	111.	121.	558.	513.	468.	428.	395.	368.	105.	106.	111.	121.	558.	513.	468.	428.	395.	368.	105.	106.	111.	121.	558.	513.	468.	428.	395.	368.	105.	106.	111.	121.	558.	513.	468.	428.	395.	368.
106.	106.	107.	112.	122.	567.	522.	477.	437.	404.	377.	106.	107.	112.	122.	567.	522.	477.	437.	404.	377.	106.	107.	112.	122.	567.	522.	477.	437.	404.	377.	106.	107.	112.	122.	567.	522.	477.	437.	404.	377.
107.	107.	108.	113.	123.	576.	531.	486.	446.	413.	386.	107.	108.	113.	123.	576.	531.	486.	446.	413.	386.	107.	108.	113.	123.	576.	531.	486.	446.	413.	386.	107.	108.	113.	123.	576.	531.	486.	446.	413.	386.
108.	108.	109.	114.	124.	585.	540.	495.	455.	422.	395.	108.	109.	114.	124.	585.	540.	495.	455.	422.	395.	108.	109.	114.	124.	585.	540.	495.	455.	422.	395.	108.	109.	114.	124.	585.	540.	495.	455.	422.	395.
109.	109.	110.	115.	125.	594.	549.	504.	464.	431.	404.	109.	110.	115.	125.	594.	549.	504.	464.	431.	404.	109.	110.	115.	125.	594.	549.	504.	464.	431.	404.	109.	110.	115.	125.	594.	549.	504.	464.	431.	404.
110.	110.	111.	116.	126.	603.	558.	513.	473.	440.	413.	110.	111.	116.	126.	603.	558.	513.	473.	440.	413.	110.	111.	116.	126.	603.	558.	513.	473.	440.	413.	110.	111.	116.	126.	603.	558.	513.	473.	440.	413.
111.	111.	112.	117.	127.	612.	567.	522.	482.	449.	422.	111.	112.	117.	127.	612.	567.	522.	482.	449.	422.	111.	112.	117.	127.	612.	567.	522.	482.	449.	422.	111.	112.	117.	127.	612.	567.	522.	482.	449.	422.
112.	112.	113.	118.	128.	621.	576.	531.	491.	458.	431.	112.	113.	118.	128.	621.	576.	531.	491.	458.	431.	112.	113.	118.	128.	621.	576.	531.	491.	458.	431.	112.	113.	118.	128.	621.	576.	531.	491.	458.	431.
113.	113.	114.	119.	129.	630.	585.	540.	500.	467.	440.	113.	114.	119.	129.	630.	585.	540.	500.	467.	440.	113.	114.	119.	129.	630.	585.	540.	500.	467.	440.	113.	114.	119.	129.						

353.	344.	335.	231.	267.	283.	279.
311.	303.	296.	293.	289.	286.	250.
275.	270.	264.	261.	258.	255.	226.
247.	242.	237.	235.	232.	230.	

PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
3645.	2875.	904.	325.	23442.
	12.39	13.57	16.80	16.83
	1426.	1794.	1935.	1934.

CFS  
INCHES  
AC-FT

\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*\*

4

PEAK FLOW SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS

RATIOS APPLIED TO FLOWS

STATION	PLAN	0.50	1.00
1	1	1820.	3640.
2	2	0.	0.
1	1	1940.	3645.
2	2	0.	0.

APPENDIX E  
STABILITY ANALYSES

2 -- W. S. Atkinson -- 10/1/66

Ray S. Decker

Subj: ENG 22-5, New York WP-06, Nanticoke Creek, Site No. 8

- C. Slope Stability Analysis: The analysis is limited to the embankment assuming that soft foundation soils are removed to elevation 1211 and replaced with embankment soils. The method of analysis is a modification of the Swedish circle.

A 3:1 upstream slope with 10 ft berm is adequate assuming drawdown to the base.

In the steady seepage case with the phreatic line from the emergency spillway crest to the downstream slope, the factor of safety is 1.5 for a 2 1/2:1 slope and 10 ft wide berm. The factor of safety is 1.6 with a drain at  $c/b = 0.6$  and no berm.

Shear values from sample 66W1301, Site 13, resulted in higher factors of safety than those from sample 67W735.

#### CONCLUSIONS AND RECOMMENDATIONS

- A. Preparation: Remove deleterious and soft material from the foundation.
- B. Cutoff and Drainage: Interrupt disturbed surface soils on the abutments with a partial cutoff. Cut off the permeable alluvial gravels labeled "B" on Form SCS-35B to till or bedrock. A 30 ft bottom width is suggested through the narrow floodplain to keep the hydraulic gradient near 1.0.

A trench drain is recommended to pick up seepage that bypasses the cutoff into alluvial gravels downstream. Extend the drain up both abutments to permanent pool level taking it to bedrock in the right abutment. A transverse drain (or lateral) can be placed against the sandy silt should this material (labeled "G") be continuous downstream. Drain filter elements can be designed in the field.

#### EMBANKMENT

- A. Placement of Material: Soils represented by samples tested can be placed anywhere in the embankment.

Standard density of the minus 3/4 inch fraction of samples 67W735 and 67W736 is about 124 pcf, correcting density of the minus No. 4 fraction for 15% rock. This agrees well with similar samples from Site No. 13 which had minus 3/4 inch standard densities of 123 and 123.5 pcf. It is concluded that compaction control for this site can be based on 95% of standard density using either the minus No. 4 or the minus 3/4 inch fraction.





APPENDIX F  
LIST OF REFERENCES

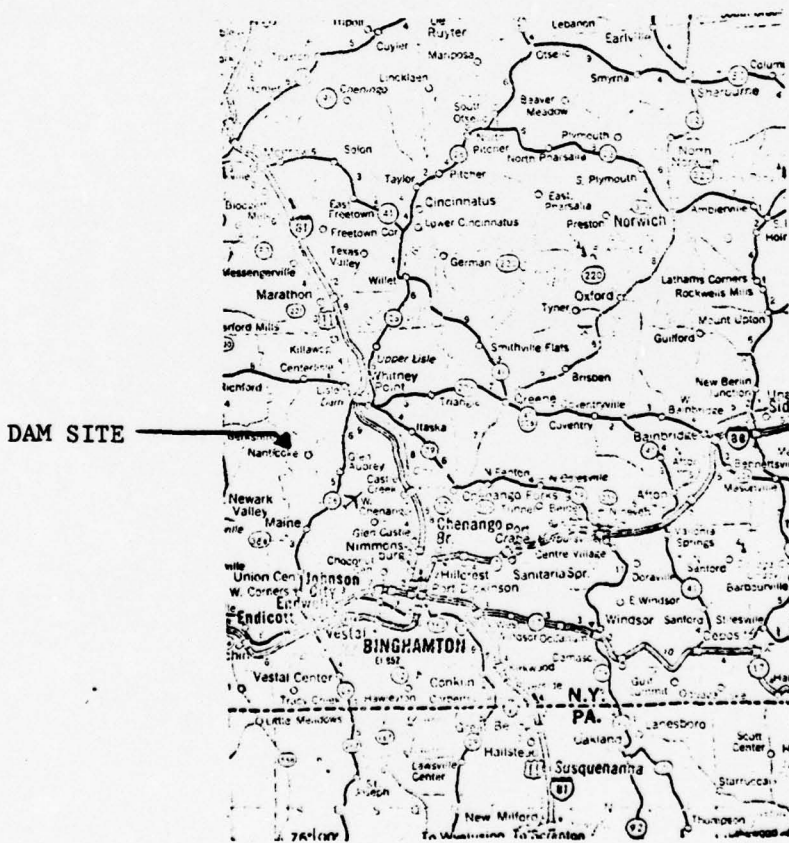
APPENDIX F

REFERENCES

- 1) U.S. Department of Commerce, Technical Paper No. 40, Rainfall Frequency Atlas of the United States, May 1961.
- 2) H.W. King and E.F. Brater, Handbook of Hydraulics, 5th edition, McGraw-Hill, 1963.
- 3) University of the State of New York, Geology of New York, Education Leaflet 20, Reprinted 1973.
- 4) Elwyn E. Seelye, Design, 3rd edition, John Wiley and Sons, Inc., 1960

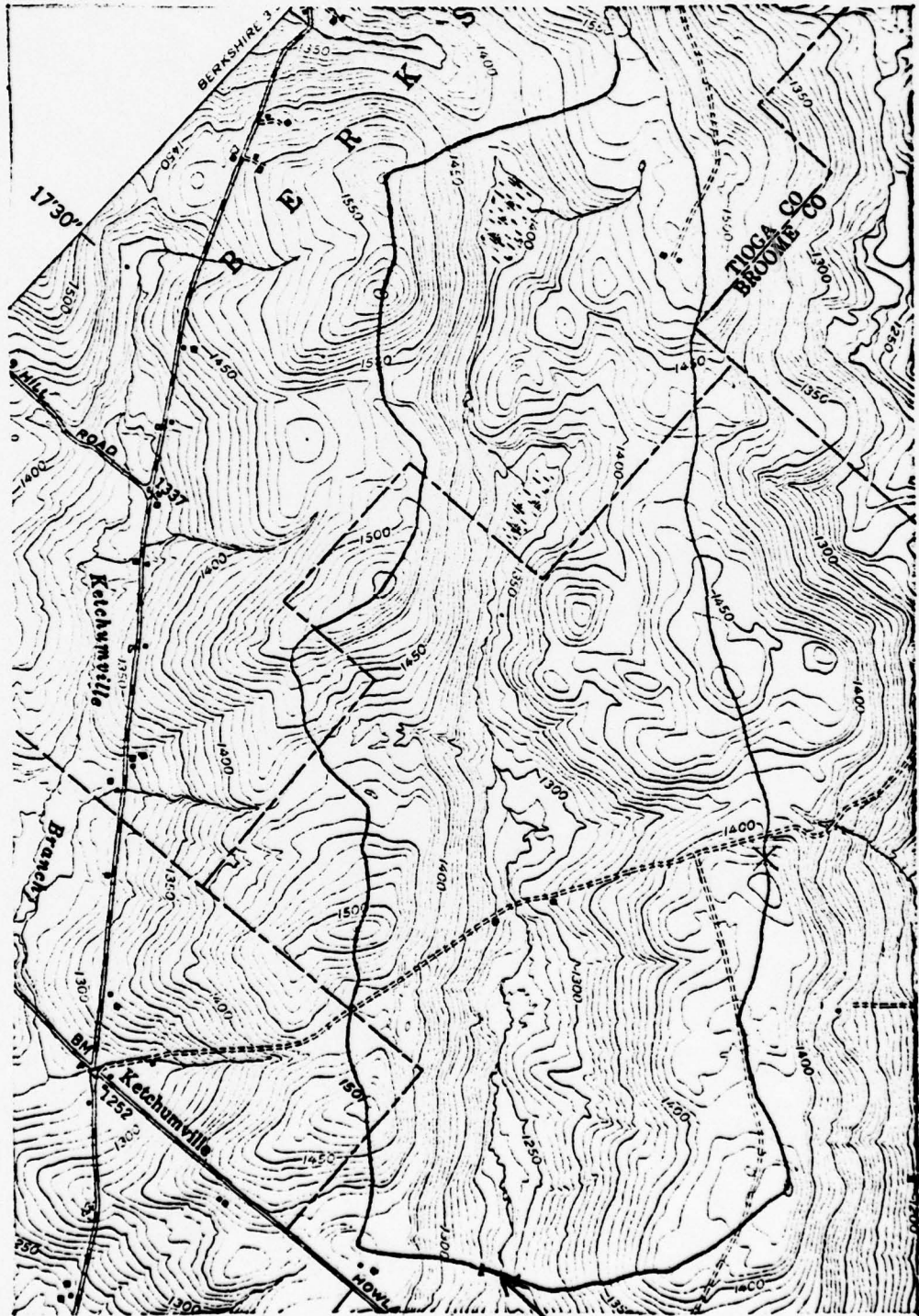
APPENDIX G

DRAWINGS



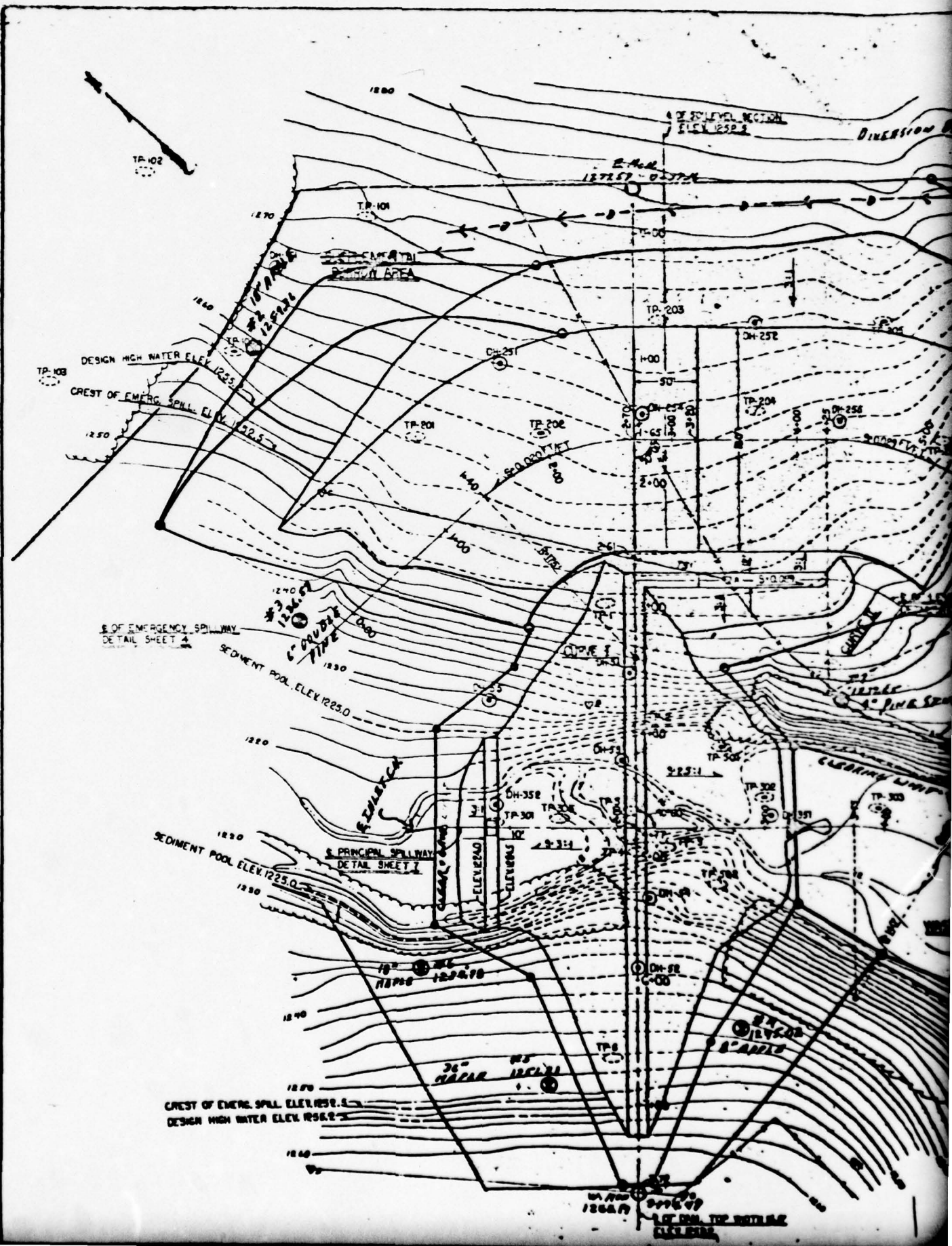
VICINITY MAP

NANTICOKE CREEK WATERSHED PROTECTION PROJECT,  
DAM SITE No. 8



DAM SITE

TOPOGRAPHIC MAP  
NANTICOKE CREEK WATERSHED PROTECTION PROJECT  
DAM SITE No. 8



TP-102

1800

TO LEVEL SECTION  
ELEV. 1252.5

DIRECTION

E.M.S.  
1272.57 - 0.37%

TP-101

1270

TP-203

CH-252

DESIGN HIGH WATER ELEV. 1235

TP-103

CREST OF EMERG. SPILL. ELEV. 1225.5

1250

TP-201

TP-202

SELO 0.00% TYP.

1400

1400

1400

S. OF EMERGENCY SPILLWAY  
DETAIL SHEET 4

240  
1240  
6" DOUBLE  
LINE

SEDIMENT POOL ELEV. 1225.0

1220

SEDIMENT POOL ELEV. 1225.0

1220

S. PRINCIPAL SPILLWAY  
DETAIL SHEET 7

ELEV. 240

ELEV. 240

1240

1240

1240

1240

CREST OF EMERG. SPILL. ELEV. 1225.5

DESIGN HIGH WATER ELEV. 1235

1240

1240

1266.79

LET CON. TOP BUTTRESS  
ELEV. 1252.5

**BENCH MARK DESCRIPTION**

\* PIN IN 3/4" STANDARD ALUMINUM DISC  
18" ABOVE GROUND IN 1 1/4" DBH WHITE  
PINE TREE 280.0' DOWNSTREAM FROM R  
OF DAM ELEV 1214.82

**AS BUILT**  
8/25/70

**LEGEND**

- DESIGN HIGH WATER
- CREST OF EMBANKMENT
- SEWER POOL
- 6" STREAM
- CONTOUR LINES
- ROCKER LINE
- BENCH MARK
- TRAP STATIONS
- CONSTRUCTION LIMITS
- SPILL WALES
- TEST PIT (LOGGED & SAMPLED)
- TEST PIT (LOGGED ONLY)
- FENCE LINE (EXIST'G)
- AS BUILT

**PLANE DATA**

**LAYOUT DATA FOR CURVE I**

$\Delta = 42^\circ 34'$        $T = 68.17'$   
 $R = 175'$            $E = 12.87'$   
 $D = 32^\circ 44'$        $M = 11.94'$   
 $L = 130.0'$

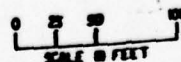
STATION	DEFLECTION	CHORD DIST
2+10	0	0.0
2+60	42	10.0
2+35	54	25.0
2+10	94	25.0
1+85	135	25.0
1+60	176	25.0
1+40	217	20.0

**LAYOUT DATA FOR CURVE II**

$\Delta = 62^\circ 53'$        $T = 125.34'$   
 $R = 205'$            $E = 35.28'$   
 $D = 27^\circ 57'$        $M = 30.10'$   
 $L = 225'$

STATION	DEFLECTION	CHORD DIST
4+25	0	0.0
4+50	31	25.0
4+75	62	25.0
5+00	94	25.0
5+25	125	25.0
5+50	157	25.0
5+75	188	25.0
6+00	219	25.0
6+25	250	25.0
6+50	281	25.0

**FOUNDATION EXCAVATION IN FLOOD PLAIN**  
 REMOVE THE SILTY, SOFT GREY TILL AND ORGANIC  
 MATTER WITHIN THE BASE OF THE DAM AS REPRESENTED  
 BY MATERIAL 'B' ON SHEET 15.



2' CONTOUR INTERVALS

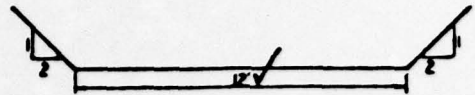
**NANTICOKE CREEK WATERSHED PROJECT**  
**SITE 8**  
**FLOODWATER RETARDING DAM**  
**BROOME COUNTY, NEW YORK**  
**PLAN OF STRUCTURAL WORKS**  
**U. S. DEPARTMENT OF AGRICULTURE**  
**SOIL CONSERVATION SERVICE**

Drawn by B. ZOGRAFOS 9-68

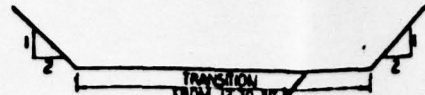
Drawn by B. ANGELD 9-68

NY-2006-P

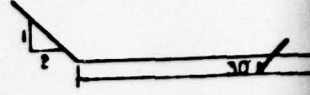
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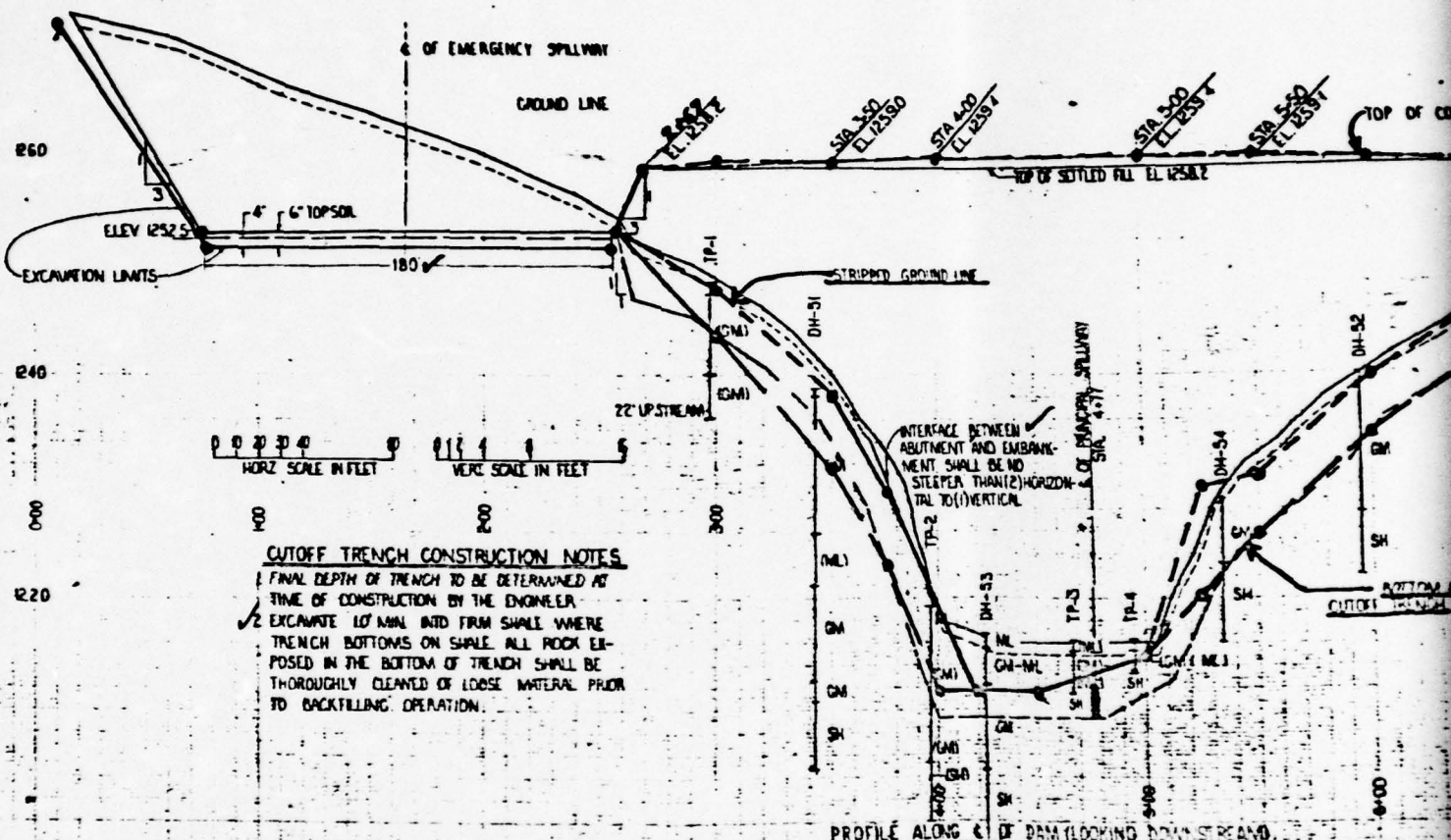
**SECTION OF CUTOFF TRENCH AT STA 3+00**  
 (TYPICAL FROM APPROX STATION 2+65 TO 4+00 AND FROM STA 5+75 TO APPROX. STA 7+20)



**SECTION OF CUTOFF TRENCH AT STA 4+25**  
 (TYPICAL FROM STATION 4+00 TO 4+50 AND 5+25 TO 5+75)

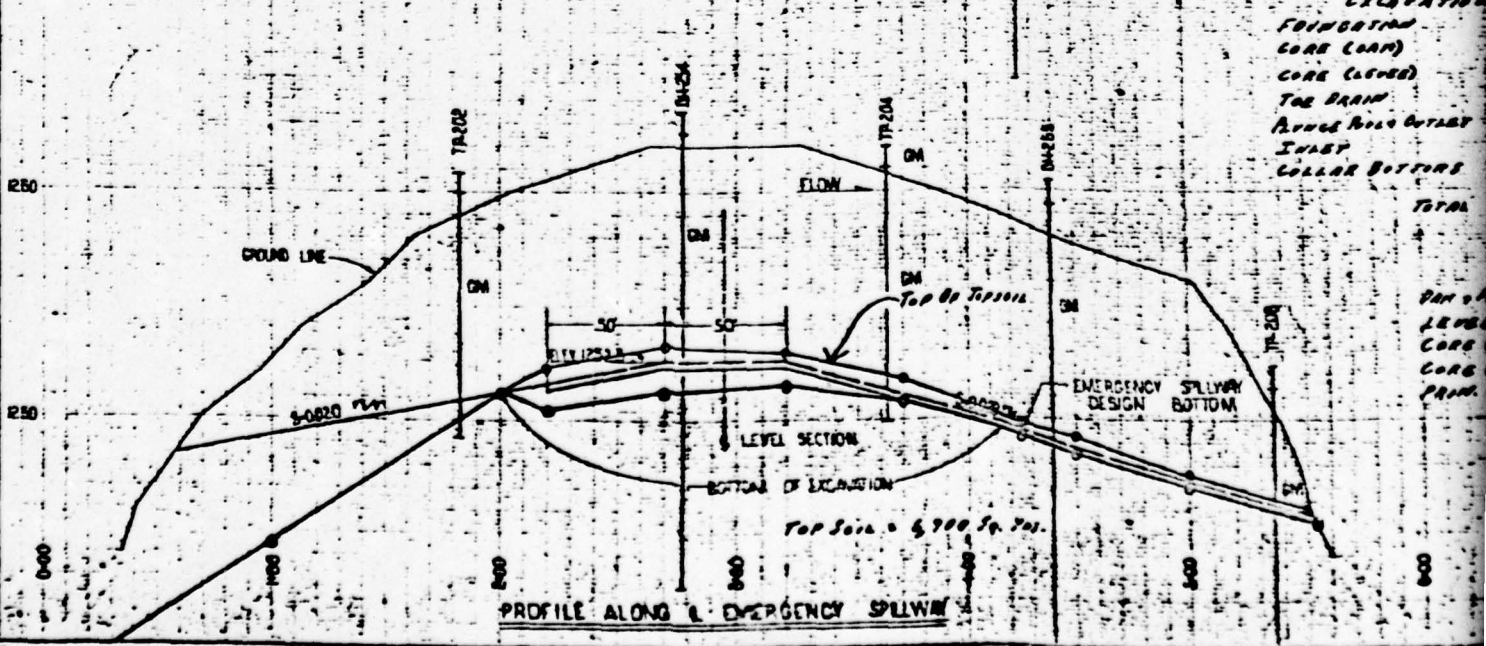


**SECTION OF CUTOFF TRENCH AT STA 4+50**  
 (TYPICAL FROM STATION 4+50 TO 5+00)

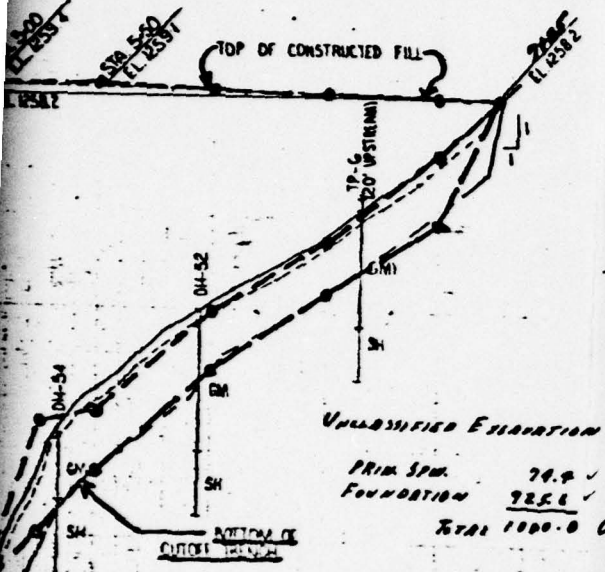
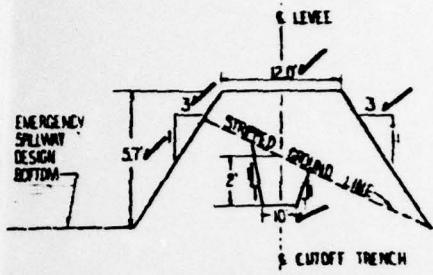
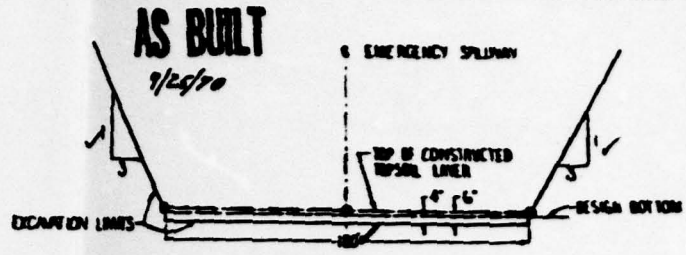
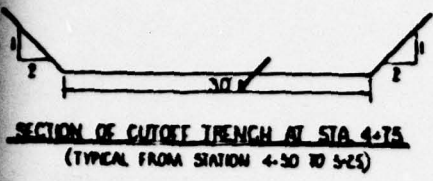


**CUTOFF TRENCH CONSTRUCTION NOTES**  
 1. FINAL DEPTH OF TRENCH TO BE DETERMINED AT TIME OF CONSTRUCTION BY THE ENGINEER.  
 2. EXCAVATE 10' MIN INTO FIRM SHALE WHERE TRENCH BOTTOMS ON SHALE ALL ROCK EXPOSED IN THE BOTTOM OF TRENCH SHALL BE THOROUGHLY CLEANED OF LOOSE MATERIAL PRIOR TO BACKFILLING OPERATION.

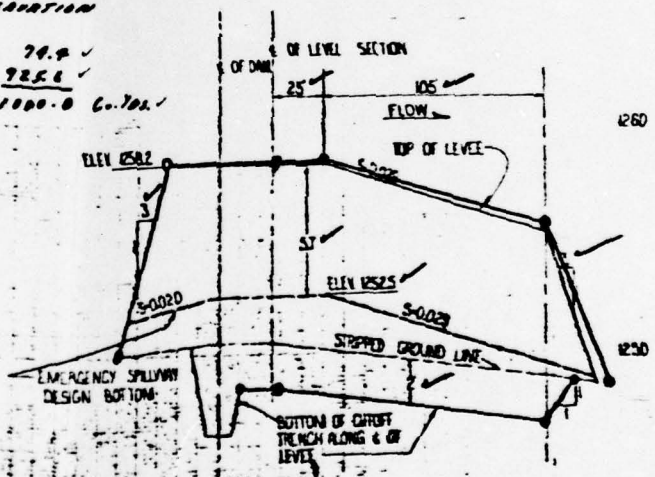
PROFILE ALONG C OF DAM (LOOKING DOWNSTREAM)



PROFILE ALONG C OF EMERGENCY SPILLWAY



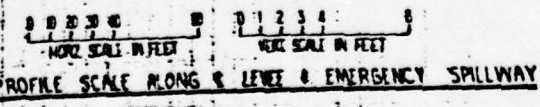
Unclassified Elevation  
Prim. Spm. 79.9'  
Foundation 92.6'  
Total 1000.0 Cu. Yds.



ELEVATION	
FOUNDATION	2892.2 ✓
CORE (C&M)	1506.8 ✓
CORE (C&M)	201.9 ✓
TOP DAM	64.6 ✓
Average Head Retard	936.9 ✓
SLAB	12.2 ✓
COLLAR BOTTOMS	1.0 ✓

TOTAL 6010.4 Cu. Yds.

EARTH FILL	
DAM & FOUNDATION	1805.0 ✓
LEVEE	1500.9 ✓
CORE (C&M)	1506.8 ✓
CORE (C&M)	201.9 ✓
Prim. Spm.	70.0 ✓
REDUCTIONS	5103.8 ✓
TOTAL	5415.9 Cu. Yds.

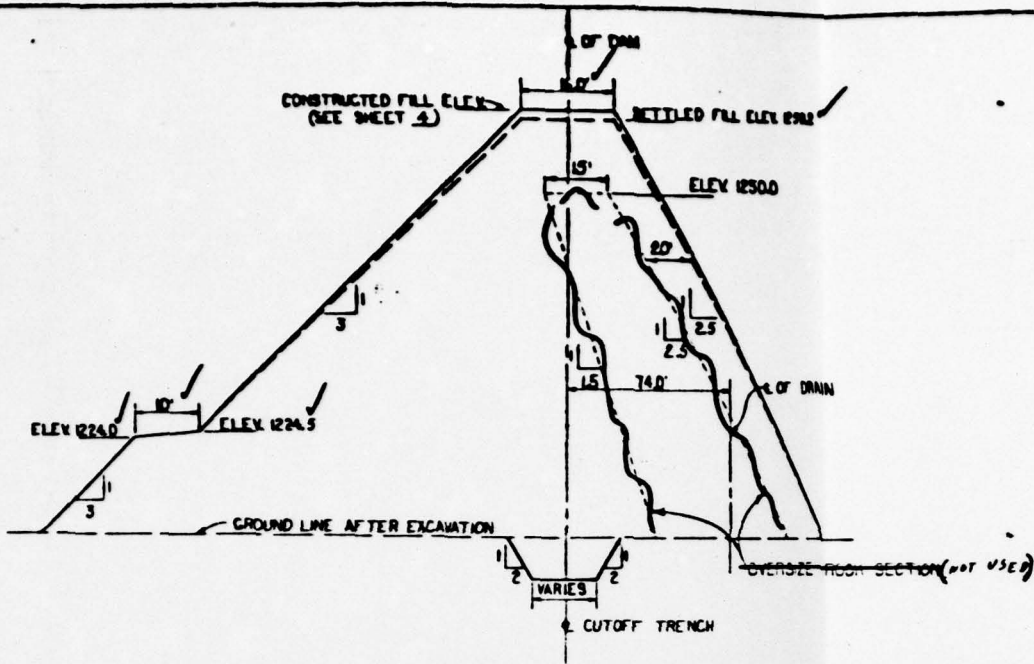


NANTICOKE CREEK WATERSHED PROJECT  
SITE 8  
FLOODWATER RETARDING DAM  
BROOME COUNTY, NEW YORK

CUTOFF TRENCH & EMERGENCY SEWY EXCAVATION  
U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

By	D. ZOGRAFOS	Date	1/67
By	B. FELTON	Date	1/67
By	B. J. B.	Date	2/67

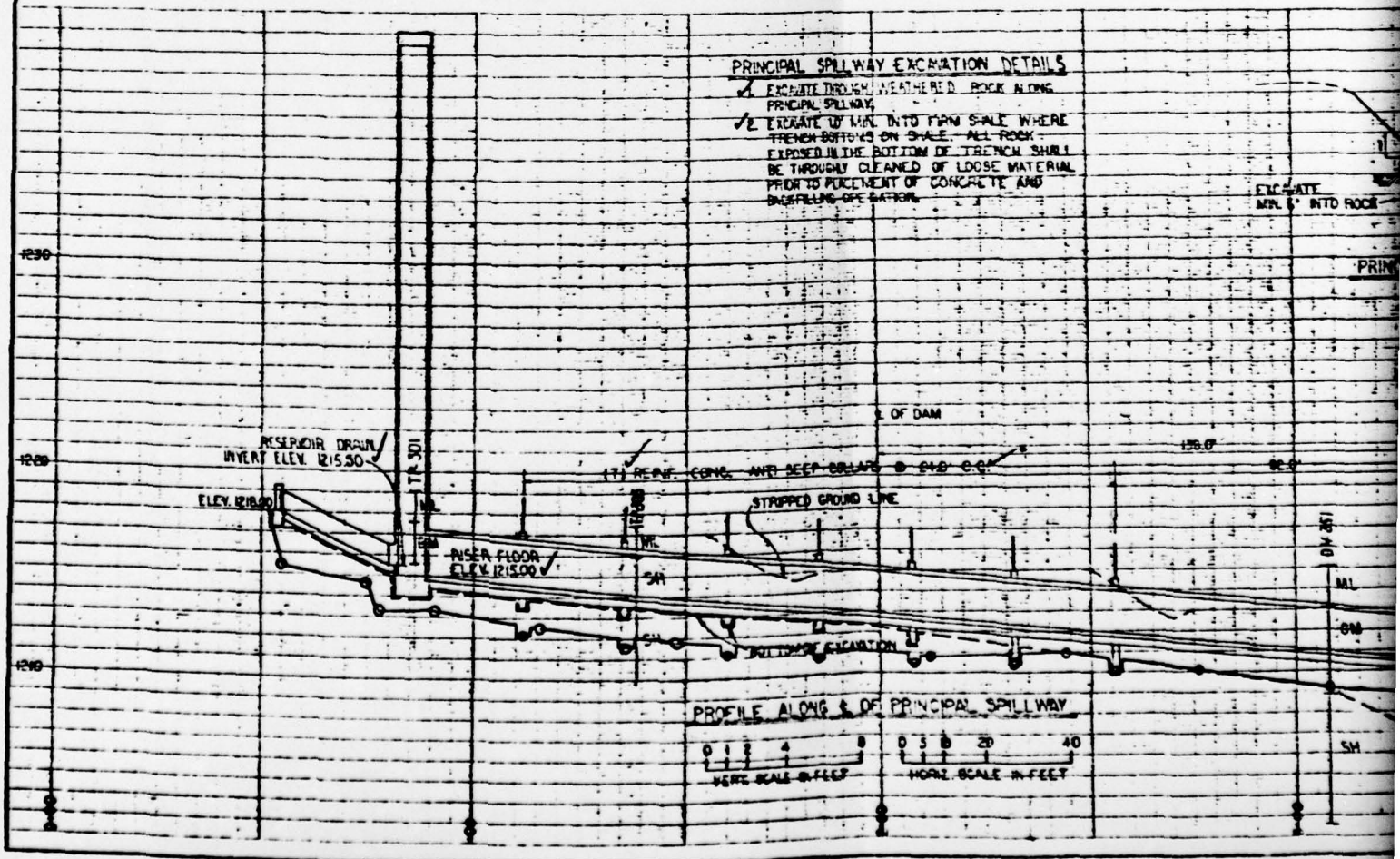
NY-2006-P



SECTION OF DAM AT STA. 4+77 (TYPICAL FROM APPROX. STA. 2+58 TO 7+30)  
(NOT TO SCALE)

MATERIAL	
✓	SILTY GRAVEL LABELLED ON SHEET 15 AND REPRESENTED
✓	TP-202 FROM 22'
✓	TP-203 FROM 24'
✓	TP-104 FROM 14'

- ✓ THE PLAN
- ✓ A. MAIN POWER
- ✓ B. MAIN OVER BE G
- ✓ A. MAIN
- ✓ B. USE
- ✓ WATER
- ✓ A. FOR
- ✓ B. USE
- ✓ CONT
  
- ✓ THE FOUR
- ✓ COMPACT
- ✓ EXCAVATE
- ✓ AND USE
- ✓ TOPSOIL
- ✓ BE INCO



**AS BUILT**  
9/25/70

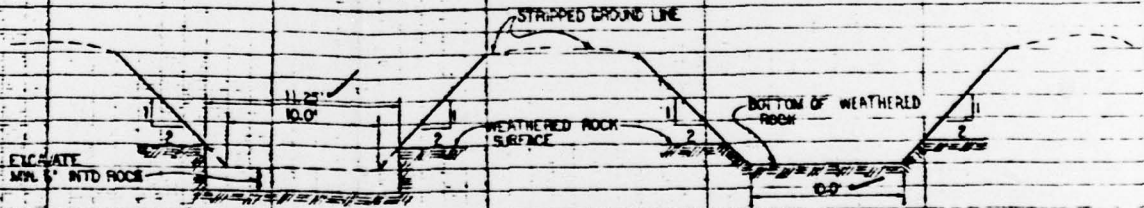
EARTH FILL REQUIREMENTS					
MATERIAL 1/	MAX. ROCK SIZE 2/	MAX. LIFT THICKNESS 3/	MINIMUM WATER CONTENT 4/	COMPACTION 5/	
				CLASS	DEFINITION
SILTY GRAVEL LABELLED MATERIAL "A" ON SHEET 15 AND REPRESENTED BY: TP-202 FROM 2.0' TO 10.0' TP-203 FROM 2.0' TO 10.0' TP-104 FROM 1.0' TO 10.0'	6"	9"	2 PERCENTAGE POINTS BELOW OPTIMUM MOISTURE	A	95% MAX. DENSITY BY ASTM D698 METHOD A

- 1/ THE PLACEMENT TABLE INDICATES ESTIMATED USE OF MATERIAL.
- 2/ A. MAXIMUM ROCK SIZE PLACED IN BACKFILL COMPACTED BY MEANS OF HAND TAMPING OR MANUALLY DIRECTED POWER TAMPERS OR PLATE VIBRATORS SHALL BE 3".  
B. MAXIMUM ROCK SIZE OF 12" DUMPED IN THE EARTH FILL CAN BE RAKED TO THE PORTION OF THE DAM LABELLED "OVERSIZE ROCK SECTION" AS SHOWN ON THIS SHEET. OVERSIZE MATERIAL (6" TO 12") IN THIS SECTION SHALL BE GRADED SO THAT THE LARGER ROCK ARE PLACED TOWARD THE DOWNSTREAM SLOPE.
- 3/ A. MAXIMUM LIFT THICKNESS PRIOR TO COMPACTION.  
B. USE 18" LIFTS IN AREAS WHERE OVERSIZE MATERIAL (6" TO 12") IS PLACED.
- 4/ WATER CONTENT AT TIME OF COMPACTION.  
A. FOR TYPICAL COMPACTION CURVES SEE SHEET 15.  
B. USE CLASS V COMPACTION (SEE CONSTRUCTION SPECIFICATION 5) IN AREAS OF THE OVERSIZE ROCK SECTION CONTAINING OVERSIZE MATERIAL (6" TO 12").

**CONSTRUCTION DETAILS**

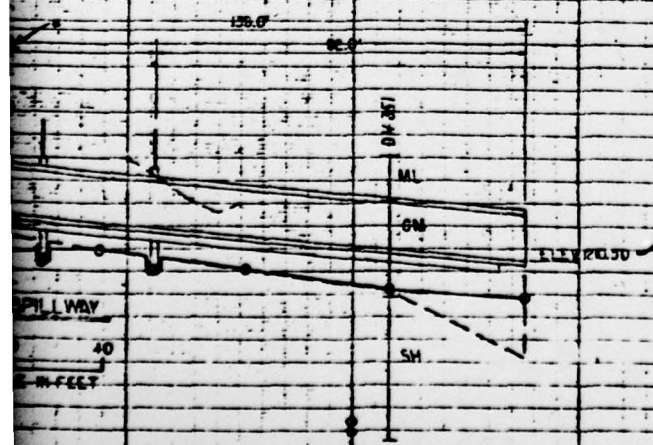
- 1. THE FOUNDATION SURFACE THROUGH THE BASE AREA OF THE DAM SHALL BE SCARIFIED TO A DEPTH OF 6" AND COMPACTED PRIOR TO PLACEMENT OF FILL MATERIAL.
- 2. EXCAVATED MATERIAL (REPRESENTED BY TP 501 FROM 2.5' TO 90') IN FOUNDATION TRENCH SHALL BE STOCKPILED AND USED AS EARTH FILL ADJACENT TO THE DRAIN FILL MATERIAL. MINIMUM COVERING OF THIS MATERIAL SHALL BE 2.0' TOPSOIL THAT IS SUITABLE FOR USE AND NOT USED ON THE SPECIFIED AREA OF THE EMERGENCY SPILLWAY SHALL BE INCORPORATED WITHIN THE SLOPES OF THE EARTH FILL AS DIRECTED BY THE ENGINEER.

ON DETAILS  
ROCK ALONG  
SLOPE WHERE  
WEATHERED  
TRENCH SHALL  
USE MATERIAL  
SITE AND



PRINCIPAL SPILLWAY EXCAVATION SECTION @ AND SEEP COLLARS

PRINCIPAL SPILLWAY EXCAVATION SECTION @ STA. 2+00  
(TYPICAL FROM UPSTREAM END OF DESIGN DAM PILE TO UPSTREAM SLOPE OF PLUNGE POOL)



NOV. 1969	EARTH FILL REQUIREMENTS	
DATE	ITEM	APP'D
REVISIONS		
NANTICOKE CREEK WATERSHED PROJECT SITE B FLOODWATER RETARDING DAM BROOME COUNTY, NEW YORK FILL PLACEMENT @ PRIN. SPILLWAY EXCAVATION		
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE		
Designed L. C. EBERTSON	Date 1/67	App'd [Signature]
Drawn D. ANGELD	Date 1/67	App'd [Signature]
Checked B. J. G.	Date 2/67	App'd [Signature]
		NY-2006-#

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

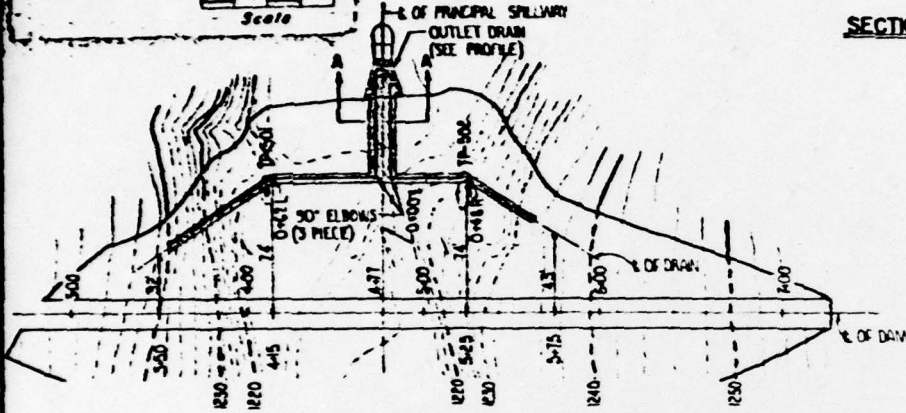


Drill 1/2" Dia  
Holes



**SMALL ANIMAL GUARD DETAILS**

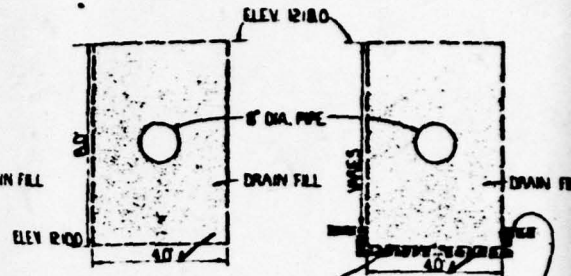
(2 REQ)



STRIPPED GROUND LINE



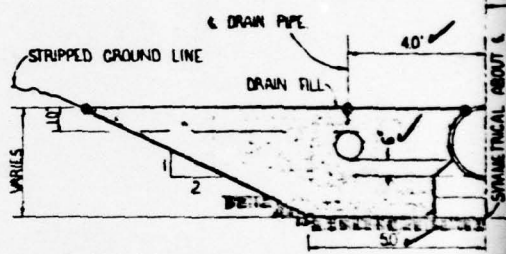
SECTION B-B



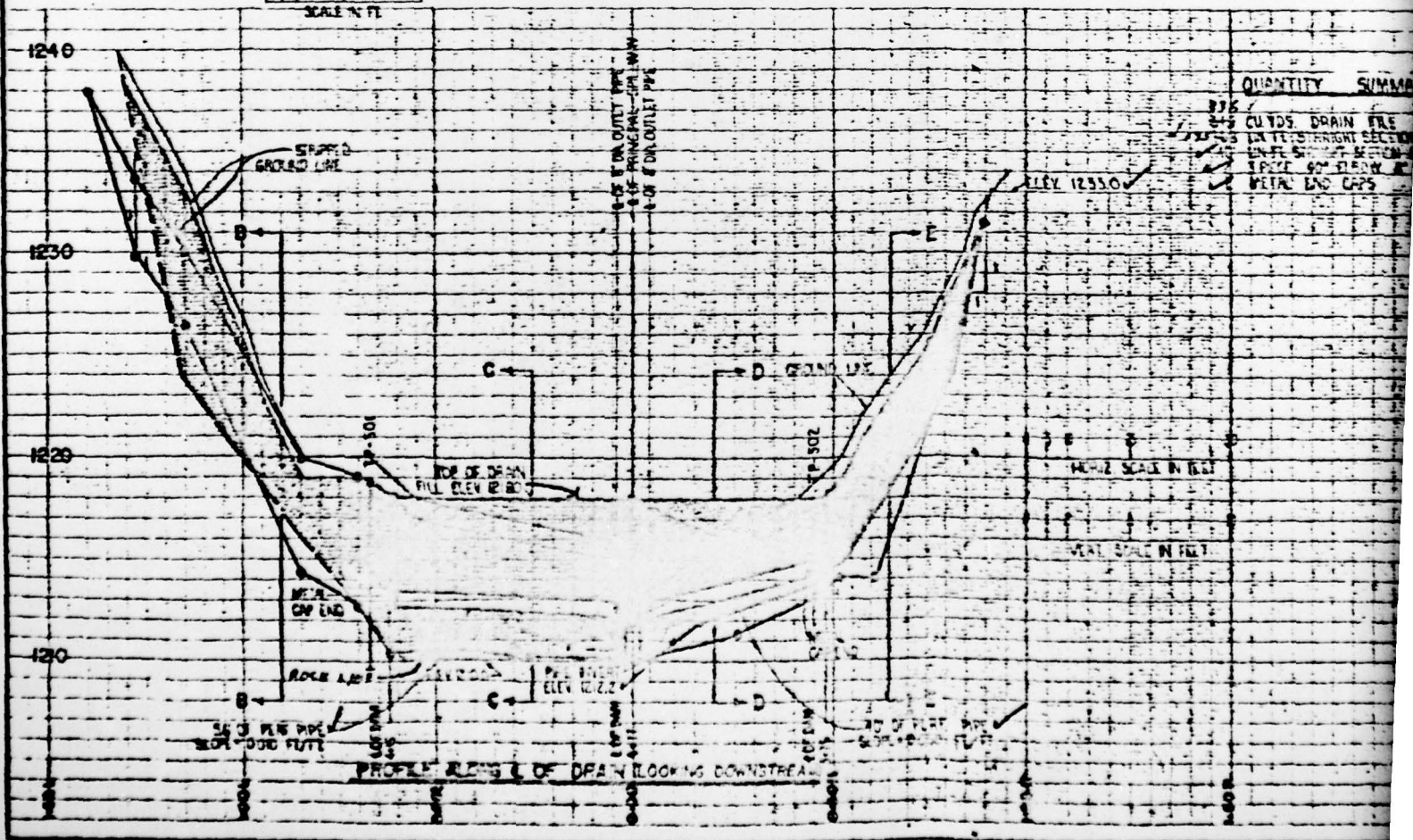
SECTION C-C

SECTION D-D

EXCAVATE INTO HARD  
ROCK (BACK HOE REFUSAL)  
WHERE TRENCH BOTTOM IS  
ON SHALE.



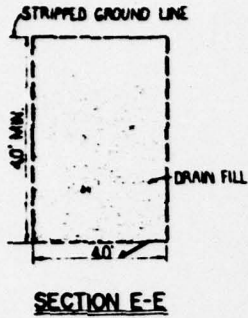
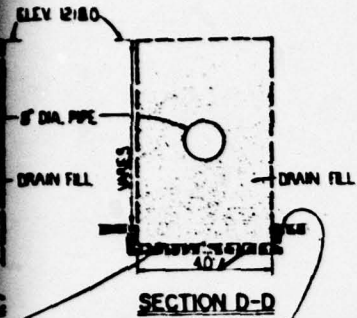
SECTION A-A



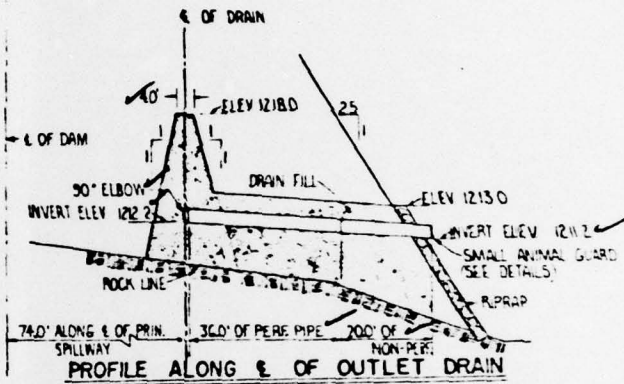
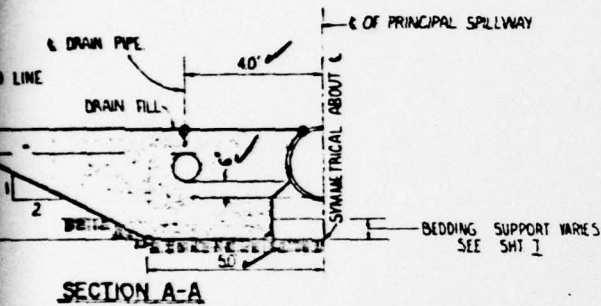
**AS BUILT** 9/25/70

**DRAINAGE SYSTEM NOTES**

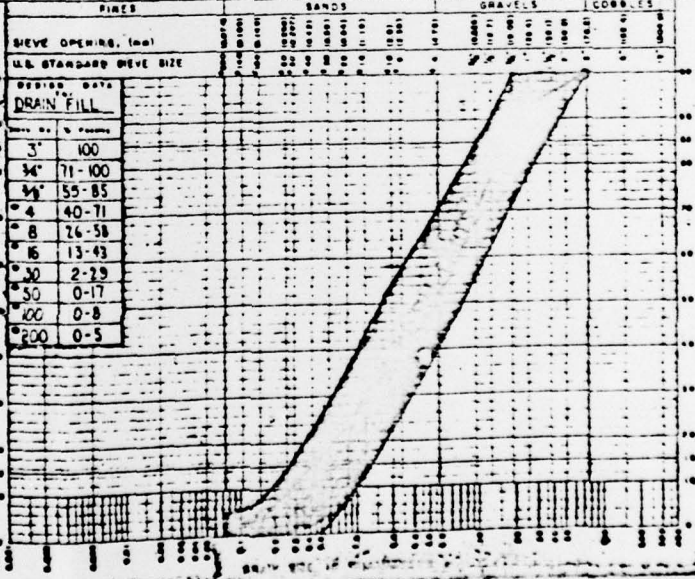
1. ALL DRAIN PIPE SHALL CONFORM TO SPECIFICATION 110 AND SHALL BE 8" DIA, SHAPE I; CLASS I (ANNULAR CORRUGATIONS) OR CLASS II (HELICAL CORRUGATIONS); TYPE-A (FULLY BITUMINOUS COATED) PIPE.
2. USE A MINIMUM OF 12" OF DRAIN FILL AROUND PIPES.
3. THE PROFILES AT THE BOTTOM OF ALL EXCAVATIONS AS SHOWN ARE ONLY APPROX THE REQUIRED FINISHED GRADES WILL BE ESTABLISHED IN THE FIELD AT THE TIME OF CONSTRUCTION BY THE ENGINEER.
4. DRAIN FILL AT AREA OF DOWN STREAM SLOPE OF DAM TO BE COVERED WITH 18" RPRAP.



ELEVATE INTO HARD ROCK (BACK HOE REFUSAL) WHERE TRENCH BOTTOM IS ON SHALE. WEATHERED ROCK SURFACE



**DRAIN SIZE DISTRIBUTION GRAPH FOR DRAIN FILL**



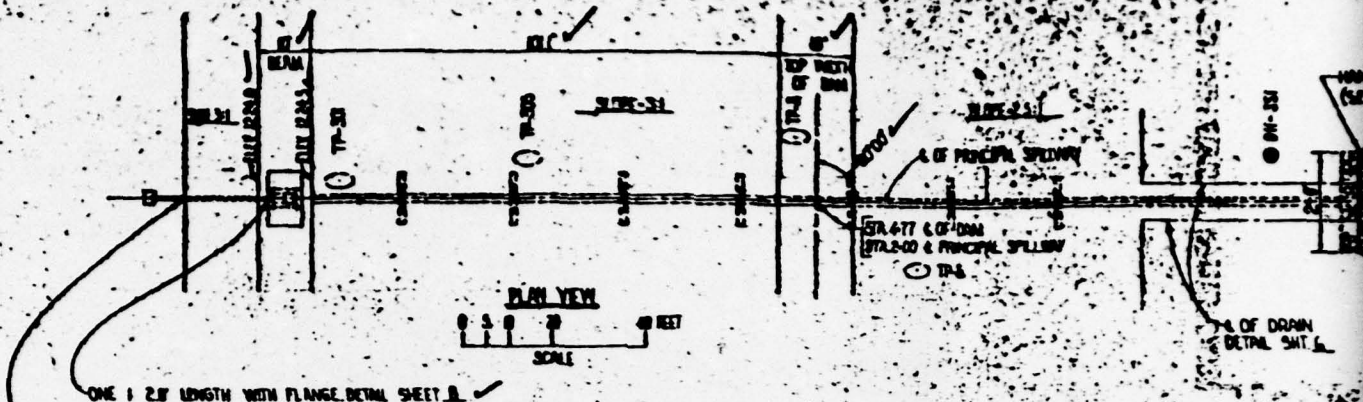
**QUANTITY SUMMARY**

376 CUBIC DRAIN FILL  
 IN THE STRAIGHT SECTION OF PERFORATED PIPE  
 IN THE STRAIGHT SECTION OF NON-PERFORATED PIPE  
 TYPE 90° ELBOW IN DRAIN UNDER DAM  
 METAL END CAPS

NANTICUKE CREEK WATERSHED PROJECT  
 SITE 8  
 FLOODWATER RETARDING DAM  
 BROOME COUNTY, NEW YORK  
 DRAINAGE SYSTEM

U.S. DEPARTMENT OF AGRICULTURE  
 SOIL CONSERVATION SERVICE

Drawn by LC BAYSON	1/67	Checked by BRUCE FELTON	1/67
Drawn by WM YOLTON	1/67	Checked by B J S	2/67
Project No. NY-2076 P	1/67	Scale 1" = 10'	



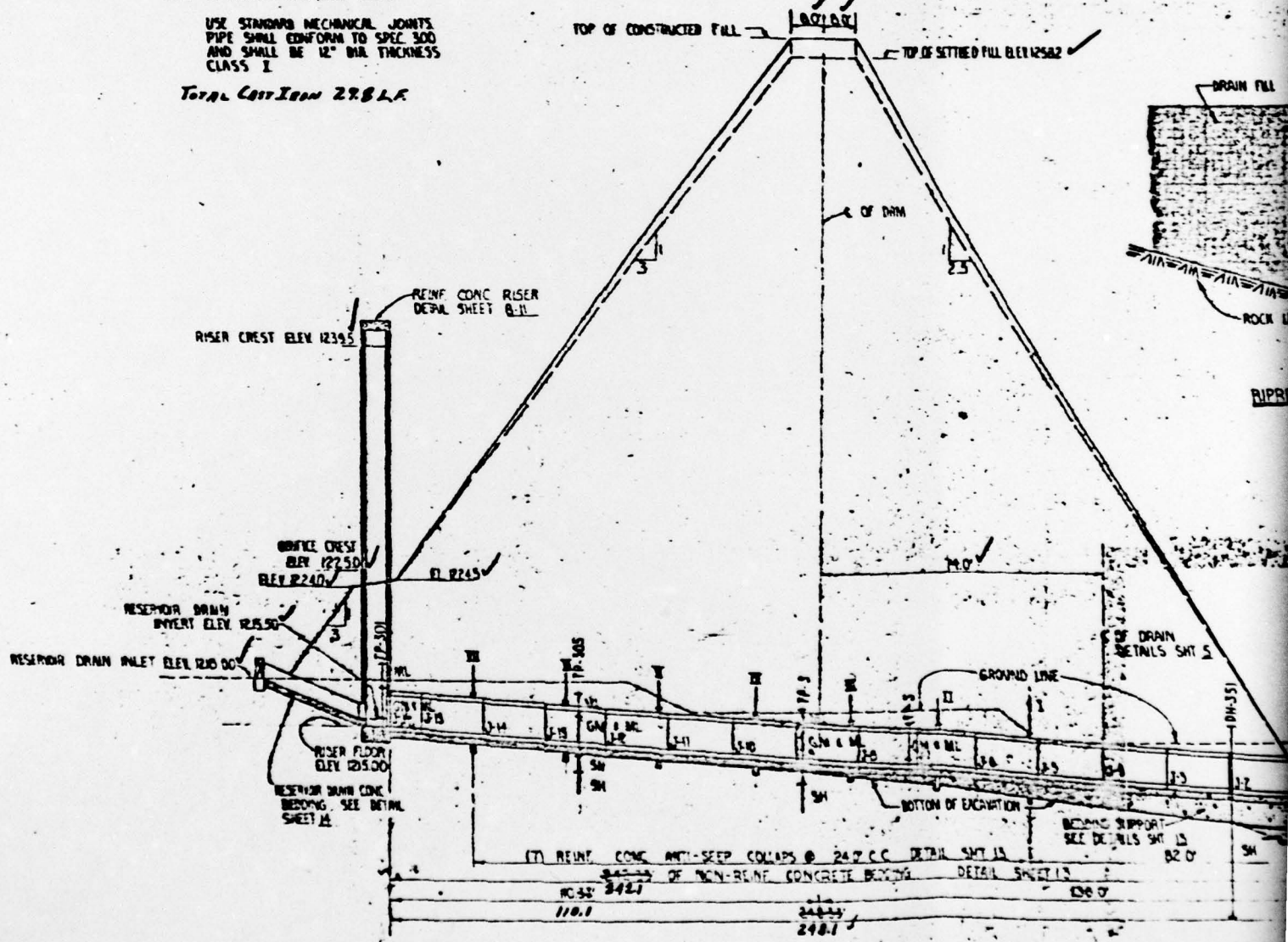
ONE 12" LENGTH WITH FLANGE DETAIL SHEET B

200' OF STRAIGHT PIPE (CAST IRON)

USE STANDARD MECHANICAL JOINTS  
PIPE SHALL CONFORM TO SPEC 300  
AND SHALL BE 12" DIA THICKNESS  
CLASS 1

**Total Cast Iron 278 L.F.**

TOP OF CONSTRUCTED FILL  
TOP OF SETTLED FILL ELEV 12582



REINF CONC RISER  
DETAIL SHEET B-11

RISER CREST ELEV 12395

ORIFICE CREST  
ELEV 12250  
ELEV 12240

RESERVOIR DAMM  
INVERT ELEV 12350

RESERVOIR DAMM INLET ELEV 12400

RISER FLOOR  
ELEV 12500

RESERVOIR DAMM CONC  
BEDDING SEE DETAIL  
SHEET A

17" REINF CONC ANTI-SEEP COLLARS @ 24.7 C.C. DETAIL SHEET 13

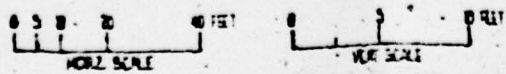
OF NON-REINF CONCRETE BEDDING DETAIL SHEETS 12

170.0

248.0

BEAM SUPPORT  
SEE DETAILS SHEET 15

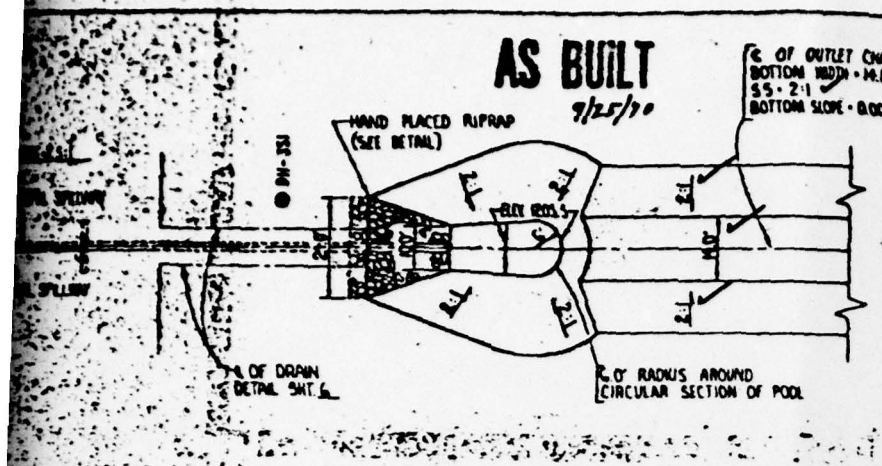
PROFILE ALONG C.C. OF PRINCIPAL SPILLWAY



ALL RIPRAP SHALL  
BE OF 18" TO 24"  
PERCENT AND  
WEIGHT OF THE  
6" AND 12" SIZES

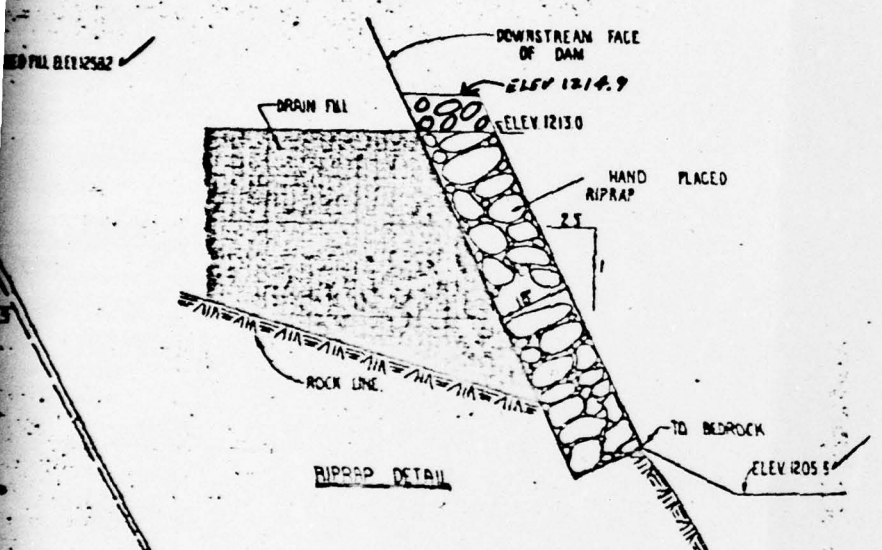
# AS BUILT

9/25/70



DATE	NO.	JOINT	DIST FROM OUTLET	ELEV. OF 24" DIA. PIPE
10.00	1/2	OUTLET	0	1203.97
10.00	1/2	J-1	16	1203.80
11.00	1/2	J-2	32	1211.07
11.00	1/2	J-3	48	1211.77
11.00	1/2	J-4	64	1214.68
11.00	1/2	J-5	80	1214.90
12.20	1/2	J-6	96	1213.20
12.25	1/2	J-7	112	1212.57
12.27	1/2	J-8	128	1213.87
12.16	1/2	J-9	144	1213.16
12.46	1/2	J-10	160	1213.46
12.25	1/2	J-11	176	1212.76
14.06	1/2	J-12	192	1214.03
14.25	1/2	J-13	208	1214.35
14.62	1/2	J-14	224	1214.04
14.92	1/2	J-15	240	1214.95
15.01	1/2	J-16	248	1215.00

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

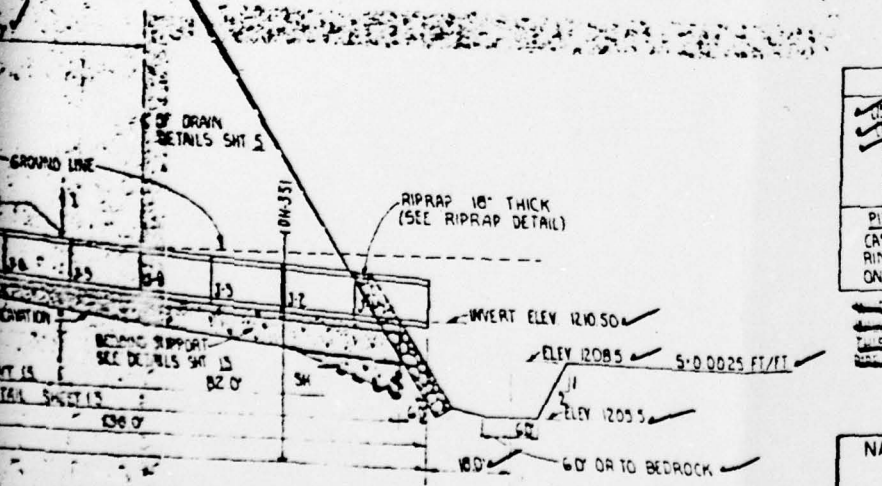


COLLAR	DISE FROM OUTLET	INVERT OF 24" DIA PIPE
I	82	1212.02
II	86	1212.46
III	90	1212.90
IV	94	1213.35
V	98	1213.79
VI	102	1214.23
VII	106	1214.68

### 24" REINFORCED CONCRETE PIPE STRENGTH REQUIREMENTS

1. PRESSURE HEAD 45
2. LOAD 33,387 LB PER LIN FT BASED ON O.D. OF 24"
3. MIN. 3 EDGE BEARING STRENGTH FOR 0.001 CRACK 12,599 LB PER LIN FT FOR PRESTRESSED PIPE (A.A. WA C-301)

WHERE THE PIPE FURNISHED HAS AN OUTSIDE DIAMETER GREATER THAN THAT CALLED FOR ON THE PLANS, THE EDGE BEARING STRENGTH OF THE PIPE FURNISHED MUST BE EQUAL TO OR GREATER THAN THE SPECIFIED THREE EDGE BEARING STRENGTH MULTIPLIED BY THE RATIO OF THE OUTSIDE DIAMETER OF THE PIPE FURNISHED TO THE OUTSIDE DIAMETER SPECIFIED.



FABRICATION INSTRUCTIONS	
<ul style="list-style-type: none"> <li>12' 4.0' SECTIONS</li> <li>1.0' SECTION</li> <li>ONE (1) SPIGOT RING</li> <li>WALL FITTING FOR 10" WALL</li> </ul>	<ul style="list-style-type: none"> <li>12' 20.0' SECTIONS</li> <li>1.0' SECTION</li> <li>ONE (1) SPIGOT RING</li> <li>WALL FITTING FOR 10" WALL</li> </ul>
<p>PIPE SUPPLIER'S NOTE: CAST OUTSIDE OF SPIGOT RING WITH CONCRETE ON ONE 6.0' SECTION</p>	<p>PIPE SUPPLIER'S NOTE: CAST OUTSIDE OF SPIGOT RING WITH CONCRETE ON ONE 20.0' SECTION</p>

**RIPRAP DETAILS**  
ALL RIPRAP SHALL BE GRADED FROM A MAX SIZE OF 18" TO A MIN SIZE OF 3" A MIN OF FORTY (40) PERCENT AND A MAX OF SIXTY (60) PERCENT (BY WEIGHT) OF THE ROCK RIPRAP SHALL BE BETWEEN 6" AND 12" IN SIZE.

13.06.70s RIPRAP

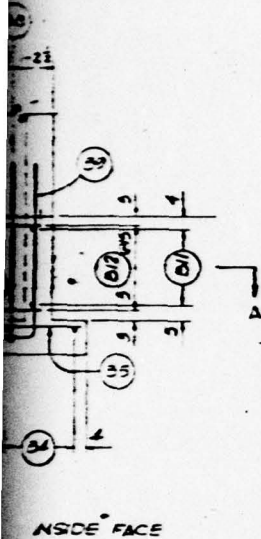
NANTICOKE CREEK WATERSHED PROJECT  
SITE E  
FLOODWATER CONTROL DAM  
BROOME COUNTY NEW YORK  
PLAN PROFILE OF SPILLWAY  
U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE  
D. ZOGHARIS 1/67  
W. E. GRAY JR 1/67  
NY-2006-P



AS BUILT

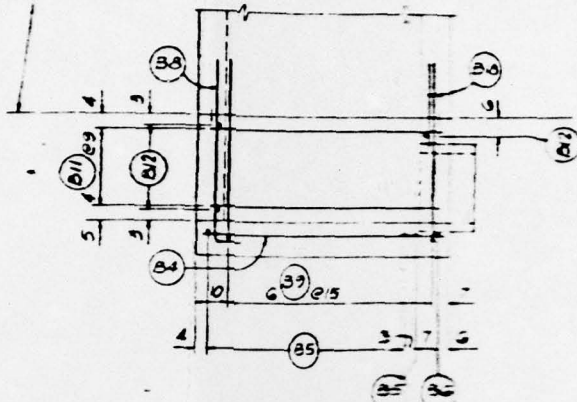
9/25/70

PLATE CONSTRUCTION  
JOINT



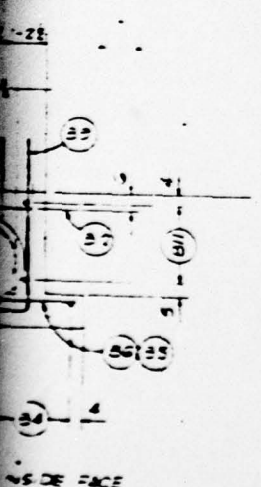
INSIDE FACE

ELEVATION



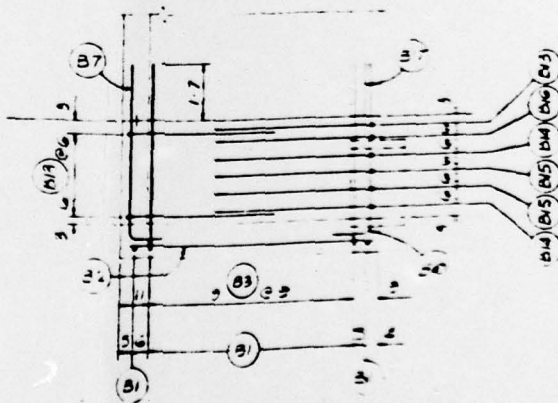
STEEL Z FROM INSIDE FACE OF RISER  
AND 2" FROM TOP OF FOOTING

SIDEWALL ELEVATION



INSIDE FACE

ELEVATION



STEEL Z FROM OUTSIDE FACE OF RISER  
AND 9" FROM BOTTOM OF FOOTING

SIDEWALL ELEVATION

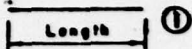
NANTICOKE CREEK WATERSHED PROJECT  
 SITE B  
 FLOODWATER RETARDING DAM  
 BROOME COUNTY, NEW YORK  
 RISER STRUCTURAL DETAILS

U. S. DEPARTMENT OF AGRICULTURE  
 SOIL CONSERVATION SERVICE

DATE: 9/25/70  
 DRAWN BY: [illegible]  
 CHECKED BY: [illegible]  
 NY 2006-P



**BAR TYPE**



**AS BUILT**  
7/25/70

**ANTI-SEEP COLLAR STEEL SCHEDULE**

Mark	Size	Length	Type	Quan. / Collar	Total Quan.	Total Length
A-1	4	1-3	1	4	28	35-0
A-2	4	4-9	1	8	36	265-0
A-3	4	3-3	1	8	36	182-0
A-4	4	10-9	1	2	14	150-6

**BEDDING SUPPORT STEEL SCHEDULE**

Mark	Size	Length	Type	Total Quan.	Total Length
D-1	5	9-3	1	4	37-0
D-2	5	2-8	1	10	26-8

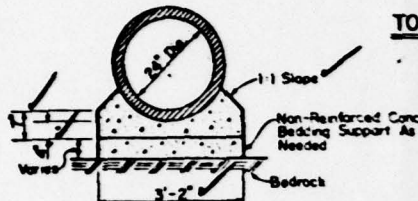
**TOTAL QUANTITIES-COLLARS, BEDDING & BEDDING SUPPORT**

**STEEL**

No. 4 Bar 630-6 = 423 Lbs. ✓  
 No. 5 Bar 63-8 = 66 Lbs. ✓

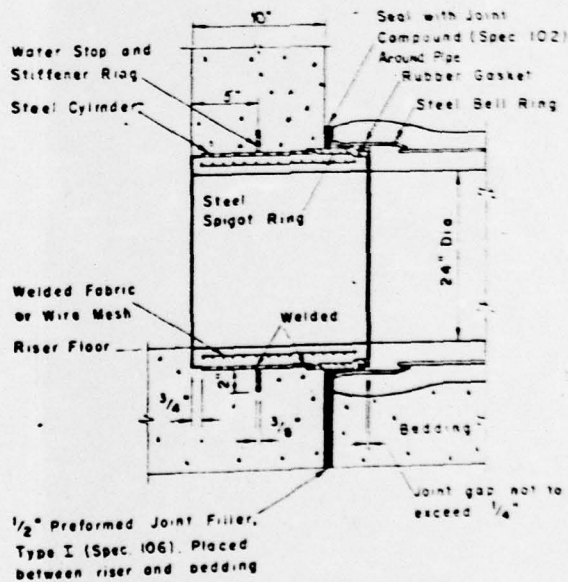
**ADDITIONAL NO. 4 BARS USED WHERE ROCK EXPOSURE IS 1 FOOT LOWER THAN DESIGN CONCRETE 157-5 = 105 LBS.**

Reinforced 449 1/2 Cu. Yds. ✓  
 Non-Reinforced 200 5/8 Cu. Yds. ✓



**CONCRETE BEDDING**  
(WITH NON-REINFORCED CONC. SECTION OF BEDDING SUPPORT)

CONSTRUCTION DETAILS SHEET B



1/2" Preformed Joint Filler, Type I (Spec 106). Placed between riser and bedding

Joint gap not to exceed 1/4"

**SPIGOT RING WALL FITTING**

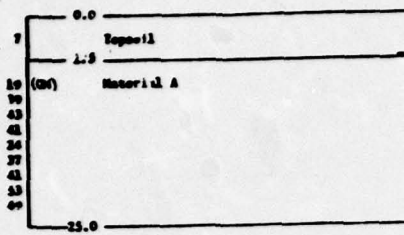
NANTICOKE CREEK WATERSHED PROJECT  
 SITE B  
 FLOODWATER RETARDING DAM  
 BROOME COUNTY, NEW YORK  
 CONDUIT DETAILS

U. S. DEPARTMENT OF AGRICULTURE  
 SOIL CONSERVATION SERVICE

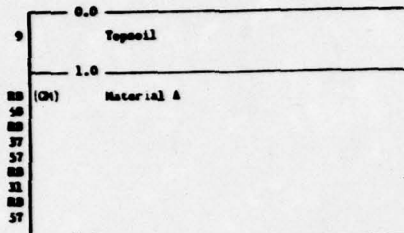
Designed by L. C. BERTSON D. BRADLEY	Checked by 2/67	Drawn by 2/67
Scale B & S	24"	NY-2006-P

**MILL HOLE LOGS**

**BH 241, Emr. Spill., Elev. 1238.4**

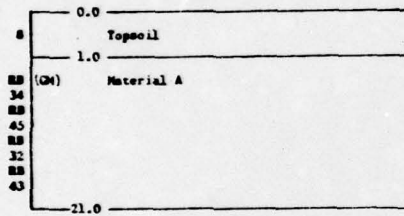


**BH 244, Emr. Spill., Elev. 1231.3**

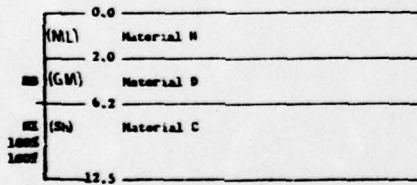


NOTE: Some indications of sand, or smaller till in the 12' sept. zone.

**BH 255, Emr. Spill., Elev. 1260.4**

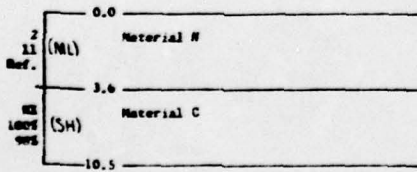


**BH 351, Prin. Spill., Elev. 1215.1**

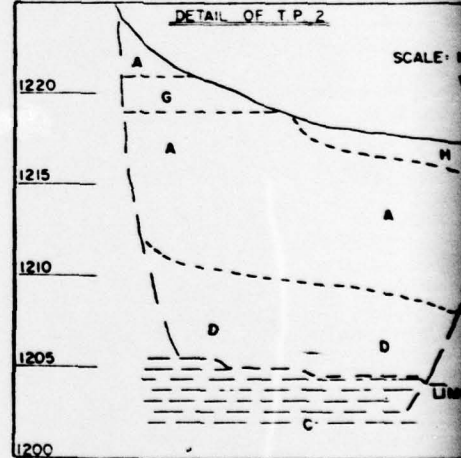
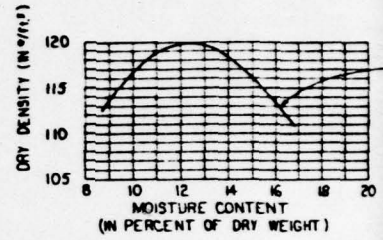
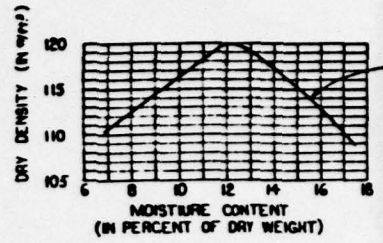


NOTE: Horizons shown from 0-6.2 inferred from log of T.F. 302.

**BH 352, Prin. Spill., Elev. 1218.3**



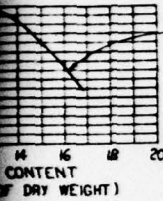
**TYPICAL COMPACTION CURVES**



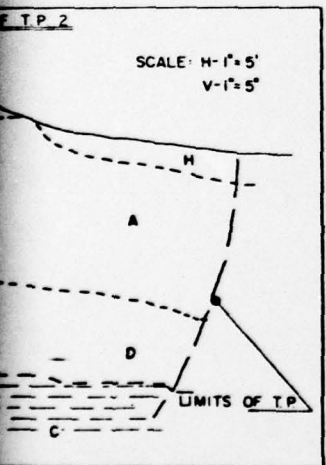
**COMPACTION CURVES**



DRY DENSITY ← MATERIAL  
 COMPACTION CURVE FOR MATERIAL FROM TP-202 2' TO 10" DEEP LABORATORY CLASSIFICATION CL



DRY DENSITY ← MATERIAL  
 COMPACTION CURVE FOR MATERIAL FROM TP-205 2' TO 10" DEEP LABORATORY CLASSIFICATION CL



**LEGEND**

**TEST HOLE NUMERICAL SYSTEM**

Number of feet	1 - 99
Surface area	100 - 199
Surrounding soil type	200 - 299
Characteristics of soil structure	300 - 399
Surface chemical	400 - 499
Soil type	500 - 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-silt mixtures
- SW Well graded sands; sand-gravel mixtures
- SP Poorly graded sands
- SM Silty sands; sand-silt mixtures
- SC Clayey sands; sand-silt mixtures
- ML Silts; silty, v. fine sands; sandy or silty silts
- CL Clays of low to medium plasticity; silty, sandy or gravelly clays
- CH Clays of high plasticity; fat clays
- MH Elastic silts; micaceous or discontinuous silts
- OL Organic silts and silty clays of low plasticity
- OH Organic silts or silts of medium to high plasticity

**MINERAL SYMBOLS**

B Basalt	Sh Shale
Gn Gneiss	Sl Slate
Gr Granite	St Sandstone
Ls Limestone	
Ms Marble	

- MS Disturbed
- MS Undisturbed
- Core KC Core

**TEST PIT DATA SHEET (CONTINUED)**

Number of blows required for 1-ft. standard penetration, using 1.0" O.D. split barrel sampler, 140 lb. hammer, and 30" drop. ASTM D 1586.

9.0 Depth to hole (ft.) \_\_\_\_\_

CL Unified Soil Classification Symbol \_\_\_\_\_

12.0 \_\_\_\_\_

D.S.L. Dry barrel sampler \_\_\_\_\_

23.0 Soller bit to advance hole by wash boring \_\_\_\_\_

17.0 Depth to hole \_\_\_\_\_

SK Rock core, 3-1/8" diameter \_\_\_\_\_

77.0 Percent rock core recovery to each drill run \_\_\_\_\_

50.0 \_\_\_\_\_

90.0 Ls Bedrock symbol \_\_\_\_\_

W.G. (feet) Water Level \_\_\_\_\_

**NANTICOKE CREEK WATERSHED PROJECT  
 SITE B  
 FLOODWATER RETARDING DAM  
 BROOKE COUNTY, NEW YORK  
 LOGS OF TEST HOLES**

**U. S. DEPARTMENT OF AGRICULTURE  
 SOIL CONSERVATION SERVICE**

Location	B. J. ELLIS	Date	
Operator		Approved by	
Tester		Date	
Checked by	B. J. E.	2/87	NY-2006-P

**GENERAL DESCRIPTION**

**A**  
Gravel, silty - approximately 40 percent fines, 20 percent sand and 40 percent + 6 - occasional 6" - 12" subangular flints - brown, sometimes grading to a slightly olive cast with depth - coarse to cut with depth - slowly permeable - glacial till - very dense. (OH)

**B**  
Gravel, or silt (typically an assumed alluvium) frequent logs and other organic remains - brown and sometimes gray - generally unconsolidated - very slowly to moderately permeable - recent alluvium and reworked till - generally soft or loose. (OH & ML)

**C**  
Shale - grading toward a siltstone - moderately thin bedded with some clay seams near the surface - weathered approximately a foot - dense and hard with depth - average water loss per 5" of H baler: 16 psi - 3 ppm, 20 psi - 1.7 ppm - gray to grayish brown - occasional minor artesian pressure. (ML)

**D**  
Gravel, silty - approximately 25 percent fines, 25 percent sand and 50 percent + 6 - some 6" - 12" flaggy cobbles - gray - unconsolidated - slowly permeable - glacial till - dense. (OH)

**E**  
Silt, some sand (10-15 percent) - brown - moist to wet - slowly permeable - glacial lacustrine - soft to medium density. (ML)

**F**  
Gravel, some sand and few fines - many 1/2" - 2" flaggy cobbles and fairly well graded ("best" of boulders?) - brown - moist - moderate to rapidly permeable - very dense (bouldery consistency). (OH)

**G**  
Silt, very sandy - brown - moist to wet - moderately permeable - glacial lacustrine - medium density. (ML)

**H**  
Silt, some sand and high in organic matter (floodplain silt and topsoil mixture) - dark brown - moist - slowly permeable - recent alluvium - soft to medium density. (ML)

**BACK-HOLE PIT LOGS**

**TP 1, C/L, Elev. 1248.2**

0	1.0	Topsoil	(OH)
1.0	8.0	Material A	(OH)
8.0	12.0	Material F	(OH)

Note: This material is essentially the same as the predominant brown till on this site, except that it has a considerable concentration of cobbles and boulders. Possibly some sort of ice-contact feature.

**TP 2, C/L, Elev. 1219.2**

NOTE: SEE PROFILE ON SHEET II

**TP 3, C/L, Elev. 1216.3**

0	1.0	Topsoil - Material H	(ML)
1.0	4.0	Material B	(OH & ML)
4.0	+	Material C	(SH)

**TP 4, C/L, Elev. 1216.4**

0	1.0	Topsoil - Material H	(ML)
1.0	3.0	Material B	(OH & ML)
3.0	+	Material C	(SH)

**TP 5, C/L, Elev. 1215.3**

0	2.3	Material B	(OH & ML)
2.3	+	Material C	(SH)

**TP 6, C/L, Elev. 1216.0**

0	1.0	Topsoil	(OH)
1.0	11.0	Material A	(OH)
11.0	+	Material C	(SH)

Note: Silt; t seepage a foot or so above this surface.

**TP 7, C/L, Elev. 1217.1**

0	1.0	Topsoil	(OH)
1.0	10.0	Material A	(OH)

**TP 8, C/L, Elev. 1217.0**

0	1.0	Topsoil	(OH)
1.0	10.0	Material A	(OH)

**TP 9, C/L, Elev. 1218.2**

0	1.0	Topsoil	(OH)
1.0	11.0	Material A	(OH)

**TP 10, C/L, Elev. 1218.1**

0	1.0	Topsoil	(OH)
1.0	11.0	Material A (D.S. 104.1)	(OH)

**TP 11, C/L, Elev. 1218.1**

0	1.0	Topsoil	(OH)
1.0	11.5	Material A	(OH)

**TP 12, C/L, Elev. 1218.0**

0	1.0	Topsoil	(OH)
1.0	11.5	Material A (D.S. 102.1)	(OH)

**TP 13, C/L, Elev. 1217.9**

0	1.0	Topsoil	(OH)
1.0	10.5	Material A	(OH)

**TP 14, C/L, Elev. 1218.0**

0	1.0	Topsoil	(OH)
1.0	12.0	Material A	(OH)

**TP 15, C/L, Elev. 1218.9**

0	1.0	Topsoil	(OH)
1.0	12.0	Material A (D.S. 105.1)	(OH)

**TP 16, C/L, Elev. 1218.4**

0	1.0	Topsoil	(OH)
1.0	12.5	Material A - very minor seepage at the 8' depth	(OH)

**TP 17, C/L, Elev. 1218.1**

0	1.5	Topsoil (Floodplain silt) - Material B	(OH & ML)
1.5	3.5	Material B	(OH)
3.5	-	Material C	(SH)

**TP 18, C/L, Elev. 1215.3**

0	2.0	Topsoil (Floodplain silt) (D.S. 102.1)	(OH)
2.0	4.7	Material B	(OH)
4.7	-	Material C	(SH)

**TP 19, C/L, Elev. 1214.0 (Drier Channel)**

0	1.5	Topsoil (Floodplain silt)	(ML)
1.5	4.0	Material B	(OH)
4.0	7.0	Material A, except drab color (D.S. 103.1)	(OH & ML)

**TP 20, C/L, Elev. 1216.7 (Drier Channel)**

0	1.0	Topsoil	(OH)
1.0	3.5	Material B, some Material B mixed	(OH & ML)
3.5	6.0	Material B (D.S. 104.1)	(OH & ML)
6.0	7.5	Material A, except drab color	(OH)

**TP 21, C/L, Elev. 1217.4**

0	1.5	Topsoil (Floodplain silt)	(ML)
1.5	4.0	Material B	(OH & ML)
4.0	5.0	Material C (weathered)	(SH)
5.0	+	Material C	(SH)

**TP 22, C/L, Elev. 1216.7**

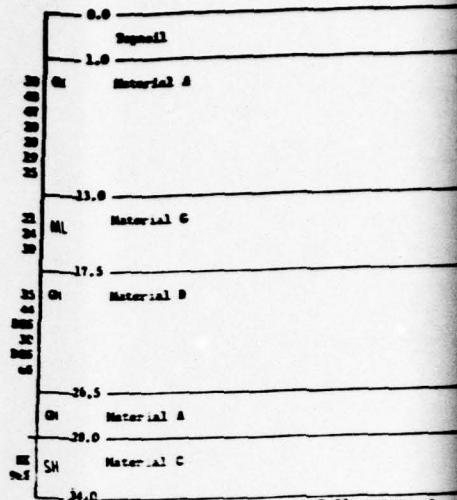
0	2.5	Material B (D.S. 101.1)	(OH & ML)
2.5	9.0	Material B (quite loose in place and unconsolidated - some seepage waters of pit showing minor coloring) (D.S. 101.2)	(OH & ML)

**TP 23, C/L, Elev. 1217.5**

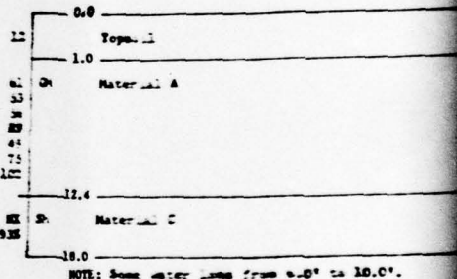
0	1.0	Topsoil	(OH)
1.0	2.0	Material A	(OH)
2.0	-	Material C	(SH)

**WELL BORE LOG**

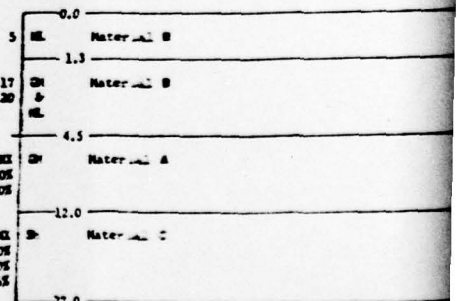
**W.B. C/L, Elev. 1218.1**



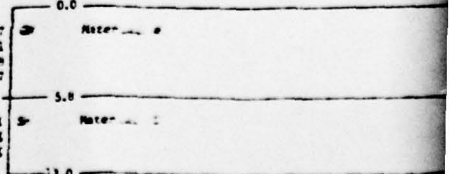
**W.B. C/L, Elev. 1241.1**



**W.B. C/L, Elev. 1217.1**

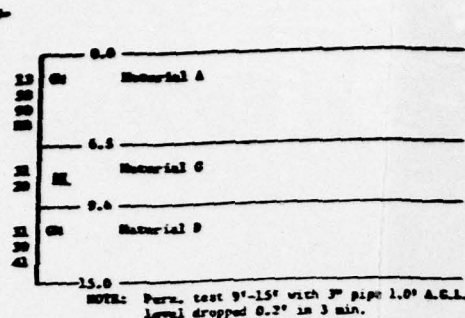


**W.B. C/L, Elev. 1217.1**

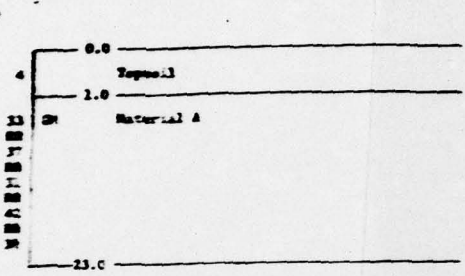


**SOIL LOG LOG**

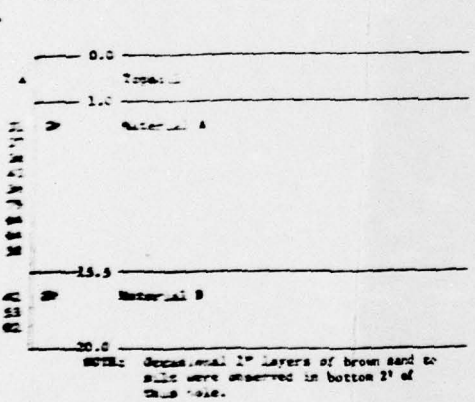
**NY 14, C.G. (Standard), Elev. 1229.7**



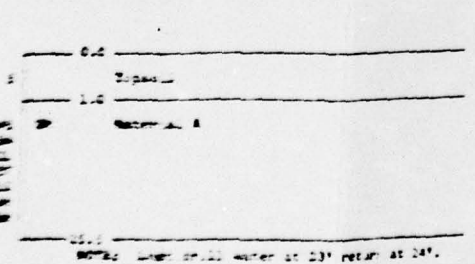
**NY 151, Barrow, Elev. 1264.1**



**NY 151, Barrow, Elev. 1264.4**



**NY 151, Barrow, Elev. 1264.2**



**SOIL TEST RESULTS**

Quantity of soil	100 - 100
Moisture content	100 - 100
Shrinkage coefficient	100 - 100
Quantity of water absorbed	100 - 100
Swollen diameter	100 - 100
Initial value	100 - 100

**SOIL TEST RESULTS**

- 10 Well graded gravel; gravel-sand mixture
- 11 Poorly graded gravel
- 12 Silty gravel; gravel-sand-silt mixture
- 13 Clayey gravel; gravel-sand-silt mixture
- 14 Well graded sand; sand-gravel mixture
- 15 Poorly graded sand
- 16 Silty sand; sand-silt mixture
- 17 Clayey sand; sand-silt mixture
- 18 Silt; silty, or fine sand; sandy or clayey silt
- 19 Clays of low to medium plasticity; silty, sandy or gravelly-clays
- 20 Clays of high plasticity; fat clays
- 21 Shale; silty, silty-sand or clayey-sand
- 22 Organic silts and organic silty clays of low plasticity
- 23 Organic clays or silts of medium to high plasticity

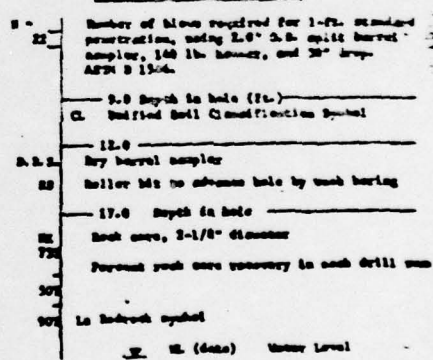
**SOIL TEST RESULTS**

1	Soil	24	Silt
2	Sand	25	Shale
3	Gravel	26	Siltstone
4	Loam	27	Shale
5	Clay	28	Siltstone

**SOIL TEST RESULTS**

- 29 Disturbed
- 30 Undisturbed
- 31 Core

**SOIL TEST RESULTS**



**NANTICOKE CREEK WATERSHED PROJECT  
SITE 8  
FLOODWATER RETARDING DAM  
BROOME COUNTY, NEW YORK  
LOGS OF TEST HOLES**

**U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE**

Log No. **B.S. ELLIS** Date **2/15/67** Approved **NY-2006-P**