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NATIONAL DAM SAFETY PROGRAM. NEWTOWN-HOFFMAN WATERSHED PROJECT---ETC(U)
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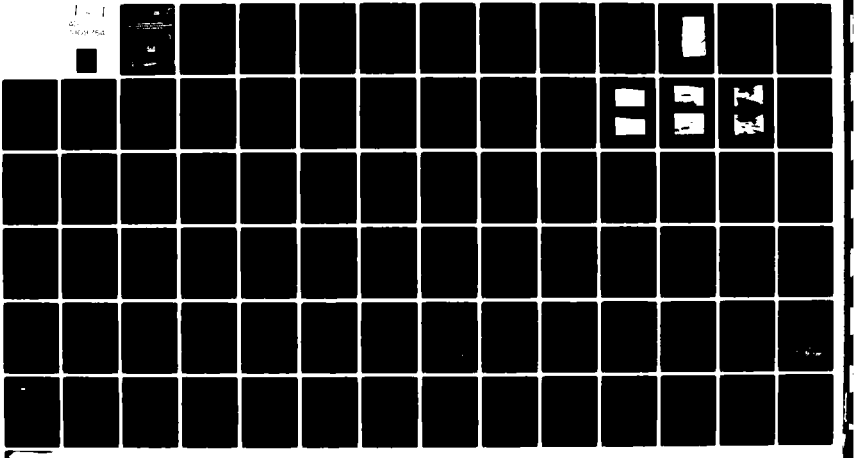

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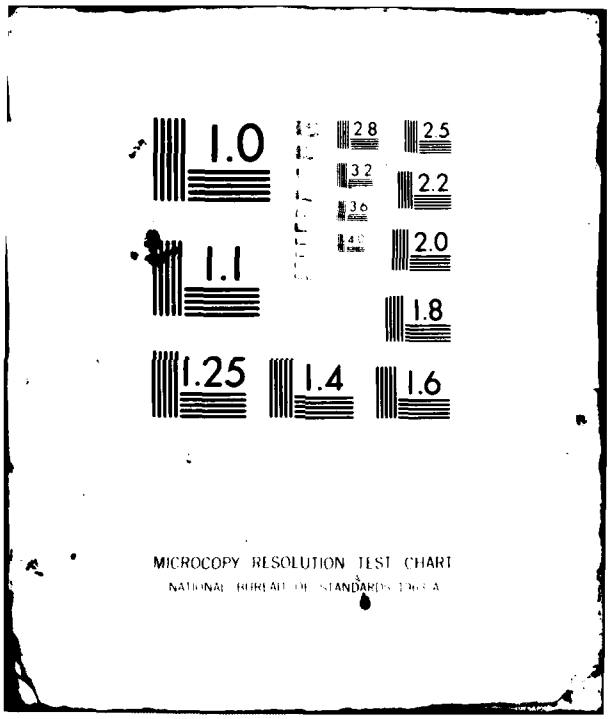
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Visual Inspection
Hydrology, Structural Stability
Newton Hoffman Creek No. 1 Dam
Chemong River Basin
Chemung County

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.

Based on the evaluation of the existing conditions, the condition of the Newtown-Hoffman Creeks Watershed Project - Floodwater Retarding Dam Site 1 is considered to be good. The examination of documents and →

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

visual observations did not reveal conditions which constitute a hazard to human life or property.

The spillway capacity was evaluated according to the recommended procedure and was found to pass the required spillway design flood of 100 percent of the Probable Maximum Flood (PMF). Therefore, the spillway capacity is rated as adequate.

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

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
NEWTOWN-HOFFMAN CREEKS WATERSHED PROJECT -
FLOODWATER RETARDING DAM SITE 1
N.Y. 547
DEC I.D. NO. 67A-3974
CHEMUNG RIVER BASIN
CHEMUNG COUNTY, NEW YORK

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Newtown-Hoffman Creeks Watershed Project - Floodwater Retarding Dam Site 1 N.Y. 547
State Located:	New York
County Located:	Chemung
Stream:	Newtown Creek (a tributary of Chemung River)
Date of Inspection:	June 24, 1981 and July 15, 1981

ASSESSMENT

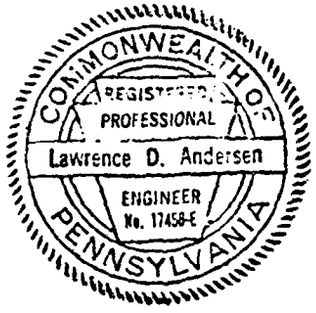
Based on the evaluation of the existing conditions, the condition of the Newtown-Hoffman Creeks Watershed Project - Floodwater Retarding Dam Site 1 is considered to be good. The examination of documents and visual observations did not reveal conditions which constitute a hazard to human life or property.

The spillway capacity was evaluated according to the recommended procedure and was found to pass the required spillway design flood of 100 percent of the Probable Maximum Flood (PMF). Therefore, the spillway capacity is rated as adequate.

The following recommendation should be implemented within three months from notification to the owner:

1. An emergency action plan should be developed, including a formal warning system to alert the downstream residents in the event of an emergency.

Assessment - Newtown-Hoffman Creeks Watershed Project - Floodwater Retarding Dam Site 1



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Approved by: for Richard E. Mayo, LTC, DEPDE
Col. W. M. Smith, Jr.
New York District Engineer

Date: 14 SEP 1981

NEWTOWN-HOFFMAN CREEKS WATERSHED PROJECT -
FLOODWATER RETARDING DAM SITE 1
N.Y. 547
DEC I.D. 67A-3974
JUNE 24, 1981

OVERVIEW

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
NEWTOWN-HOFFMAN CREEKS WATERSHED PROJECT -
FLOODWATER RETARDING DAM SITE 1
N.Y. 547
DEC I.D. NO. 67A-3974
CHEMUNG RIVER BASIN
CHEMUNG 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

The inspection was to evaluate 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. Dam and Appurtenances

Newtown-Hoffman Creeks Watershed Project - Floodwater Retarding Dam Site 1 consists of an earth embankment approximately 800 feet long with a maximum height of about 46 feet from the downstream toe. The embankment has a design crest width of 16 feet. The upstream slope of the top 10 feet is 3 horizontal to 1 vertical and is 3.5 horizontal to 1 vertical for the remaining height. A 10-foot-wide berm is located at normal pool elevation. The downstream slope is 2.5 horizontal to 1 vertical with a 20-foot-wide berm 30 feet below the dam crest.

The spillway facilities for the dam consist of a vegetated earth emergency channel located at the left abutment and a riser-type primary spillway located near the left abutment (looking downstream). The emergency spillway is a trapezoidal channel with a base width of 224 feet. The side slopes of the channel are 3 horizontal to 1 vertical. The control section of the emergency spillway is located in line with the axis of the dam, approximately nine feet below the dam crest level.

The primary spillway structures are comprised of a reinforced concrete intake riser which discharges into a 30-inch-diameter

reinforced concrete pipe, terminating at a plunge pool at the downstream toe. The discharge pipe is equipped with reinforced concrete antiseep collars.

The reservoir drain facilities consist of an 18-inch-diameter reinforced concrete pipe extending from the upstream toe to the primary spillway riser. Flow through the pipe is controlled by a manually operated sluice gate at the primary spillway riser.

b. Location

The dam is located on an unnamed tributary of Newtown Creek, which is a tributary of the Chemung River, approximately three-quarters of a mile south of Erin, in Erin Township, Chemung County, New York. Plate 1 illustrates the location of the dam.

c. Size Classification

The dam is classified to be of intermediate size based on its 46-foot height and maximum storage capacity of approximately 910 acre-feet.

d. Hazard Classification

The dam is classified to be in the high hazard category. About one mile downstream, Newtown Creek flows through a rural residential area which is considered to be within the potential floodplain of Newtown Creek.

It is estimated that failure of the dam under maximum pool level would cause loss of more than a few lives and significant property damage in this area.

e. Ownership

The dam is owned and operated by Chemung County: Mr. Stanley Benjamin, County Executive, J. H. Hazlett Building, 205 Lake Street, Elmira, New York 14901, (607) 739-3009.

f. Purpose of Dam

The dam is a floodwater retarding structure.

g. Design and Construction History

The dam was designed by the U.S. Department of Agriculture, Soil Conservation Service (SCS) in 1970. Construction of the dam was completed in January 1976.

h. Normal Operating Procedure

The reservoir is normally maintained at the crest level of the primary spillway riser at Elevation 1300.7. The emergency spillway crest is at Elevation 1321.2.

1.3 PERTINENT DATA

Elevations referred to in this section and subsequent sections of the report were obtained from design and as-built drawings.

a. Drainage Area (sq. mi.)	3.5
b. Discharge at Dam (cfs)	
Principal spillway at top of dam	145
Auxiliary spillway at top of dam	20400
Reservoir drain at top of dam	40±
Total spillway capacity at top of dam	20545
c. Elevation (USGS Datum) (feet)	
Top of dam	1330.5
Auxiliary spillway crest	1321.2
Principal spillway crest	1300.7
Reservoir drain, invert	1289.0
d. Reservoir (acres)	
Surface area at top of dam	56.0
Surface area at crest of auxiliary spillway	38.0
Surface area at crest of principal spillway	6.5
e. Storage Capacity (acre-feet)	
Top of dam	910
Auxiliary spillway crest	610
Principal spillway crest	103
f. Dam	
Type	Earth embankment
Length	800 feet
Height	46 feet
Top width	16 feet
Side slopes	Downstream: 2.5H:1V Upstream: 3H:1V and 3.5H:1V
Zoning	No
Impervious core	No
Cutoff	Yes
Grout curtain	No
g. Primary Spillway	
Type	Drop Inlet
Length	15 feet (weir length)
Crest elevation	1300.7
h. Emergency Spillway	
Type	Trapezoidal earth channel
Length	224 feet
Crest elevation	1321.2

i. Regulating Outlet

Type	18-inch reinforced concrete pipe
Length	40 feet
Access	Accessible through riser
Regulating facilities	Sluice gate

SECTION 2: ENGINEERING DATA

2.1 DATA AVAILABLE

Available information was obtained from New York State Department of Environmental Conservation, Dam Safety Division files, and from the files of the SCS in Syracuse, New York. Available information includes design, as-built drawings, and engineering reports.

2.2 GEOLOGY

The Newtown-Hoffman Creeks Watershed Project - Floodwater Retarding Dam Site 1 is located in the glaciated Allegheny Plateau section of the Appalachian Plateau Province. This section is characterized as a maturely dissected plateau with the features modified by continental glaciation. The modification consists of rounding off of high areas and deposition of glacial till in the valleys.

The dam site is near the axis of a northeast trending syncline (trending approximately north 70 degrees east). The folding is gentle with the maximum dip of the limbs one to two degrees. The dip of the strata are affected locally by the folding; however, regionally, the rock strata dip south to southwest at approximately 50 to 100 feet per mile. The most prominent fracture orientations in the region have a strike of north 30 degrees west with a vertical dip. A secondary fracture trace strikes north 80 degrees east.

The rock strata in the area consist of unconsolidated Pleistocene glacial till (Wisconsin Drift) underlain by strata of the Lower West Falls Group (Upper Devonian Age). The glacial till consists of a mixture of clay and silt with varying quantities of gravel. The glacial till is relatively thin on hilltops and slopes and thicker in the valleys, greater than 45 feet thick. The bedrock consists of a thick sequence of interbedded dark gray to black shale and siltstone which may be up to 2,000 feet thick.

The abutment slopes are relatively gentle and not susceptible to landslide slope movement, except near the base of the slope where minor sloughing of the glacial till may occur.

2.3 SUBSURFACE INVESTIGATION

A subsurface investigation was conducted by the SCS in 1970. This program consisted of 12 borings and 25 test pits. Boring and test pit logs are available in SCS files.

The subsurface conditions were described as a thick (36-foot to 45-foot) silty gravel till, overlain by lacustrine silt on the left abutment and floodplain. A thin deposit of alluvial gravel was above the silt and gravel till. Bedrock was not encountered during the investigation.

2.4 EMBANKMENT AND APPURTENANT STRUCTURES

Plates 2 and 3 show the plan and the typical cross section of the dam. As shown in Plate 3, the dam consists of a homogeneous embankment incorporating a centrally located cutoff trench and an internal drainage system consisting of a trench drain beneath the downstream slope. Plate 4 shows the layout and the details of the trench drain. Most of the embankment is reported to consist of silty gravelly glacial till. A portion of the upstream slope and a section near the downstream toe of the slope consist of oversize rock fill.

Plate 5 shows the plan and the typical cross section of the primary spillway and reservoir drain facilities. Plates 6, 7, and 8 include selected subsurface investigation boring logs.

The spillway facilities were designed based on hydrologic and hydraulic analyses conducted by the SCS. The design calculations are available in SCS files.

2.5 CONSTRUCTION RECORDS

The dam was constructed under the supervision of the SCS. Complete construction records are available in SCS files. No major post-construction changes were instituted.

2.6 OPERATING RECORDS

Because the dam is an ungaged flood-retarding structure, no operating records are maintained for the dam. During severe weather conditions, the dam is monitored by the SCS and Chemung County personnel.

2.7 EVALUATION OF DATA

The information obtained from the state and SCS files is considered to be adequate for Phase I inspection purposes.

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspections of the dam were conducted on June 24 and July 15, 1981. On both dates, the pool level was approximately at the primary spillway riser crest.

b. Embankment

No signs of distress, seepage, or misalignment were observed. While the crest of the dam is covered with grass, the upstream and downstream faces are covered with crown-vetch. There are two internal drainage pipes, both of which were dry. The top of the dam was surveyed relative to the emergency spillway crest elevation and was found to be in conformance with as-built elevations.

c. Primary Spillway

The primary spillway facilities consist of a concrete drop inlet structure discharging into a 30-inch reinforced concrete pipe terminating at a plunge pool at the downstream toe. Components of the primary spillway were in satisfactory condition.

d. Emergency Spillway

The emergency spillway is a trapezoidal vegetated earth channel located on the left abutment. The channel is in good condition. The grass cover is well established and adequately maintained. The approach and discharge channel were free of brush and trees or debris which could pose a potential for blockage of the spillway.

e. Reservoir Drain

The reservoir drain facilities consist of an 18-inch-diameter reinforced concrete pipe, extending from the upstream toe to the primary spillway riser. Flow through the pipe is controlled by a manually operated sluice gate. The gate system is reported to be operational, although operation was not observed.

f. Downstream Channel

The downstream channel below the primary spillway plunge pool is the natural stream bed. The channel appears to be stable in the near vicinity of the dam.

g. Reservoir

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

3.2 EVALUATION

The dam was found to be in good condition. At this time, no conditions were observed that would require remedial action.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The reservoir is normally maintained at the crest level of the primary spillway. The dam is a flood-retarding structure and has no formal operating procedure.

4.2 MAINTENANCE OF THE DAM

The dam is maintained by Chemung County Soil and Water Conservation District and the maintenance condition of the dam is considered to be satisfactory.

4.3 WARNING SYSTEM IN EFFECT

No formal warning system exists for the dam.

4.4 EVALUATION

The maintenance condition of the dam is considered to be good. Development of an emergency action plan is considered to be advisable. It is reported by the SCS, Broome County office, that such a plan is currently being prepared.

SECTION 5: HYDRAULIC/HYDROLOGY

5.1 DRAINAGE AREA CHARACTERISTICS

Newtown-Hoffman Creeks Watershed Project - Floodwater Retarding Dam Site 1 has a drainage area of 3.5 square miles. The watershed is comprised of woodlands and farmlands. Relief ranges from moderate to steep.

5.2 ANALYSIS CRITERIA

The PMF inflow hydrograph for the reservoir was determined using the Dam Safety Version of the HEC-1 computer program developed by the Hydrologic Engineering Center of the U.S. Army Corps of Engineers. The data used for the computer input are presented in Appendix D.

5.3 SPILLWAY CAPACITY

The spillway facilities for the dam consist of a primary and emergency spillway. The emergency spillway is a trapezoidal earth channel located on the left abutment. The base width of the channel is 224 feet. Based on the available head relative to the dam crest, the combined capacity of the primary and emergency spillways is calculated to be 20,545 cfs.

5.4 RESERVOIR CAPACITY

The dam impounds a reservoir with a storage capacity of 103 acre-feet at the primary spillway crest level (Elevation 1300.7), 468 acre-feet at the emergency spillway crest level (Elevation 1321.2), and 610 acre-feet at the top of the dam (Elevation 1330.5).

5.5 FLOODS OF RECORD

No data available.

5.6 OVERTOPPING POTENTIAL

The PMF inflow hydrograph was determined according to the recommended criterion and was found to have a peak flow of 8960 cfs. The hydrograph was routed through the dam using the capacity rating data included in the design files and the dam was found to pass full PMF with the reservoir at Elevation 1327.0, leaving 3.5 feet of freeboard to the design dam crest level.

5.7 EVALUATION

The spillway can pass the recommended spillway design flood of full PMF without overtopping the embankment; therefore, the spillway capacity is classified to be adequate according to the recommended criteria.

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

As discussed in Section 3, the field observations did not reveal any signs of distress that would significantly affect the stability of the dam at this time. However, it should be understood that because the dam is a flood control facility and was at normal low pool level at the time of inspection, it was not under maximum loading conditions which would occur only during the passage of major floods.

b. Design and Construction Data

The dam was designed based on geological and geotechnical studies, which included subsurface investigations, laboratory materials testing and engineering analyses. A SCS memorandum, dated February 4, 1971 and included in Appendix G, summarized the findings and results of the design investigation.

The stability analyses were performed using the Swedish Circle and sliding block methods. The total stress strength parameters used were: internal friction angle, 15 degrees; cohesion, 425 pounds per square foot; saturated and submerged unit weights, 137.5 and 75.0 pounds per cubic foot, respectively.

Factors of safety were reported to be 1.39 for the upstream slope under rapid drawdown conditions, and 1.52 for the downstream slope, under steady state seepage. Available information was reviewed and found to be adequate.

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

c. Postconstruction Changes

None reported.

d. Seismic Stability

The dam is located in Seismic Zone 1. Based on the recommended criteria for evaluation of seismic stability of dams, the structure is presumed to present no hazard from earthquakes.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

Visual observations indicate that Newtown-Hoffman Creeks Watershed Project - Floodwater Retarding Dam Site 1 is in good condition. No conditions were observed that would significantly affect the overall performance of the structure at this time. However, as previously noted, the dam was not inspected under its maximum loading condition which would occur when the reservoir is filled during major storms.

The spillway capacity was evaluated according to the recommended procedure and was found to pass the required spillway design flood of full PMF without overflowing the embankment; therefore, the spillway capacity is classified to be adequate.

b. Adequacy of Information

Available information, in conjunction with visual observations, is considered to be sufficient to make a Phase I evaluation.

c. Need for Additional Investigations

No additional investigation is considered to be required at this time.

d. Urgency

The action recommended below should be implemented within three months from notification to the owner.

7.2 RECOMMENDATION

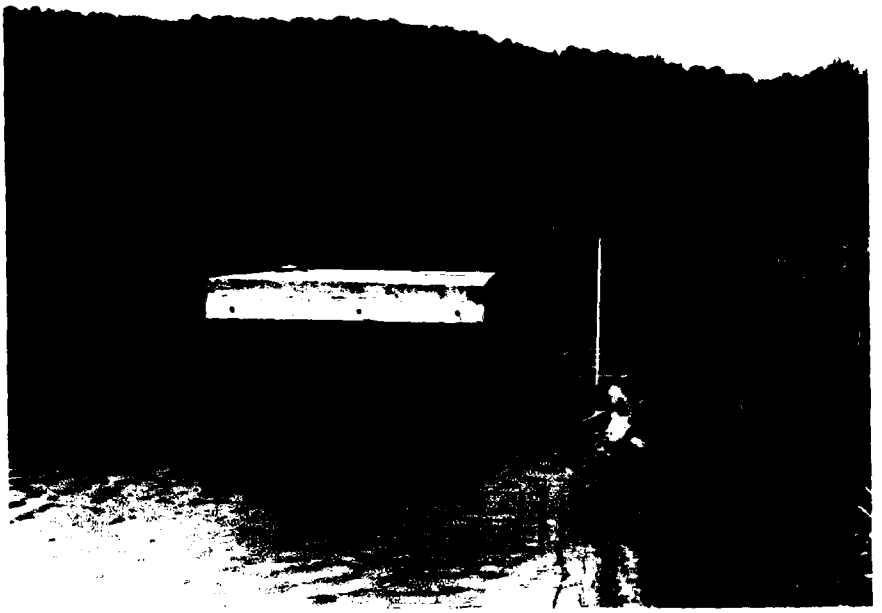
1. An emergency action plan should be developed, including a formal warning system to alert the downstream residents in the event of an emergency.

APPENDIX A

PHOTOGRAPHS

PHOTOGRAPH NO. 1
Downstream Slope (looking west)

PHOTOGRAPH NO. 2
Dam Crest (background)
Emergency Spillway (foreground)
(looking east)



PHOTOGRAPH NO. 3
Primary Spillway Riser

PHOTOGRAPH NO. 4
Primary Spillway Discharge Pipe

PHOTOGRAPH NO. 5
Rural Residential Area
(0.6 mile downstream)

PHOTOGRAPH NO. 6
Rural Residential Area
(1.0 mile downstream)

APPENDIX B

VISUAL INSPECTION CHECKLIST

APPENDIX B
VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam Newtown-Hoffman Creeks Watershed Project - Floodwater Retarding Dam Site 1

Fed. I.D. # N.Y. 547 DEC Dam No. 67A-3974

River Basin Chemung River Basin

Location: Three-quarter mile south of Erin, Chemung County

Stream Name Tributary of Newtown Creek

Tributary of Chemung River

Latitude (N) 42° 10.4' Longitude (W) 76° 40.0'

Type of Dam Earth

Hazard Category High

Date(s) of Inspection June 24, 1981 and July 15, 1981

Weather Conditions Sunny, Temp. 60 degrees

Reservoir Level at Time of Inspection El. 1301.0 ±

b. Inspection Personnel Lawrence Andersen, P.E.; James Poellot, P.E.; Bilgin Erel, P.E.; and Michael Bort

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

Mr. Stanley Benjamin, Chemung County Executive, J. H. Hazlett Building, 205 Lake Street, Elmira, New York 14901, (607) 739-3009

d. History:

Date Constructed Jan. 1976 Date(s) Reconstructed N/A

Designer USDA Soil Conservation Service

Constructed by Carl Simone, Inc.

Owner Chemung County, New York

2) Embankment

a. Characteristics

(1) Embankment Material Earth

(2) Cutoff Type Trapezoidal cutoff trench, bottom width varies from 12 feet to 20 feet, to varied depths.

(3) Impervious Core None

(4) Internal Drainage System Trench drain equipped with two 8-inch-diameter perforated drainage pipes.

(5) Miscellaneous --

b. Crest

(1) Vertical Alignment Good (0.1 to 0.7 foot above design elevation)

(2) Horizontal Alignment Good

(3) Surface Cracks None

(4) Miscellaneous --

c. Upstream Slope

(1) Slope (Estimate) Top of dam to El. 1321.2, 3H:1V; El. 1321.2 to toe, 3.5H:1V (as designed)

(2) Undesirable Growth or Debris, Animal Burrows None

(3) Sloughing, Subsidence or Depressions None

(4) Slope Protection Vegetated Slope to normal pool, riprap (oversized rock) to toe of dam.

(5) Surface Cracks or Movement at Toe None

d. Downstream Slope

(1) Slope (Estimate) 2.5H:1V (as designed and measured)

(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)

None

(7) Condition Around Outlet Structure Good

(8) Seepage Beyond Toe None

e. Abutments - Embankment Contact

No problems observed.

(1) Erosion at Contact None

(2) Seepage Along Contact None

3) Drainage System

a. Description of System A trench drain under the downstream toe of the dam equipped with two 8-inch-diameter perforated pipes, one for each side of the dam.

b. Condition of System Only the downstream end of the pipes were visible.

c. Discharge from Drainage System None

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

None

5) Reservoir

a. Slopes Moderate slopes, no problems observed.

b. Sedimentation No problems observed.

c. Unusual Conditions Which Affect Dam None observed.

6) Area Downstream of Dam

a. Downstream Hazard (No. of Homes, Highways, etc.) Rural residential area (10-15 homes) approximately one mile downstream of the dam.

b. Seepage, Unusual Growth None

c. Evidence of Movement Beyond Toe of Dam None

d. Condition of Downstream Channel Good

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

a. General Service Spillway: Concrete riser discharging into a 30-inch-diameter reinforced concrete pipe.
Auxiliary Spillways: 224-foot-wide trapezoidal vegetated earth channel on left abutment.

b. Condition of Service Spillway Good

c. Condition of Auxiliary Spillway Good

d. Condition of Discharge Conveyance Channel Good

8) Reservoir Drain/Outlet

Type: Pipe X Conduit _____ Other _____

Material: Concrete X Metal _____ Other _____

Size: 18-inch-diameter Length 40 feet

Invert Elevations: Entrance 1289.0 Exit 1288.8

Physical Condition (Describe): Not observable.

Material: --

Joints: -- Alignment --

Structural Integrity: --

Hydraulic Capability: --

Means of Control: Gate X Valve _____ Uncontrolled _____

Operation: Operable X Inoperable _____ Other _____

Present Condition (Describe): The reservoir drain system is reported operable.

9) Structural

a. Concrete Surfaces The concrete riser appears to be in good condition.

b. Structural Cracking None observed.

c. Movement - Horizontal & Vertical Alignment (Settlement)

None observed.

d. Junctions with Abutments or Embankments

Not visible.

e. Drains - Foundation, Joint, Face

No problems observed.

f. Water Passages, Conduits, Sluices

N/A

g. Seepage or Leakage None observed.

h. Joints - Construction, etc. No problems observed.

i. Foundation Not visible.

j. Abutments N/A

k. Control Gates Reported operable.

l. Approach & Outlet Channels Good

m. Energy Dissipators (Plunge Pool, etc.) Plunge pool in satisfactory condition.

n. Intake Structures Good

o. Stability N/A

p. Miscellaneous ---

10) Appurtenant Structures (Power House, Lock, Gatehouse, Other)

a. Description and Condition None

APPENDIX C

ENGINEERING DATA CHECKLIST

APPENDIX C
ENGINEERING DATA CHECKLIST
NAME OF DAM: NEWTOWN-HOFFMAN CREEKS WATERSHED
PROJECT - FLOODWATER RETARDING DAM SITE 1

AREA-CAPACITY DATA:

	Elevation (feet)	Surface Area (acres)	Storage Capacity (acre-feet)
1) Top of Dam	1330.5	56.0	910
2) Design High Water (Max. Design Pool)	1327.0	49.5	610
3) Auxiliary Spillway Crest	1321.2	38.0	468
4) Service Spillway Crest	1300.7	6.5	103

DISCHARGES

	Discharge (cfs)
1) Average Daily	6 ±
2) Auxiliary Spillway at Maximum High Water (Top of Dam)	20400
3) Auxiliary Spillway at Design High Water (El. 1327.0)	8860
4) Principal Spillway at Auxiliary Spillway Crest Elevation 1321.2	140
5) Low Level Outlet	40 ±
6) Total of All Facilities at Maximum High Water	20545
7) Maximum Known Flood	Unknown
8) At Time of Inspection	15 ±

DAM: Newtown-Hoffman Creeks Watershed Project - Floodwater Retarding Dam Site 1

CREST ELEVATION: 1330.5

Type: Earth

Width: 16 feet Length: 800 feet

Spillover: Concrete riser and vegetated earth channel.

Location: Concrete riser near the left abutment, earth channel on left abutment.

SPILLWAY:

SERVICE		AUXILIARY
1300.7	Elevation	1321.2
Concrete drop inlet	Type	3H:1V trapezoidal earth channel
15-foot weir	Width	224 feet
	Type of Control	
Uncontrolled	*Uncontrolled*	Uncontrolled
	Controlled	
N/A	Type (Flashboards; Gate)	N/A
N/A	Number	N/A
N/A	Size/Length	400± feet
	Invert Material	N/A
	Anticipated Length of Operating Service	Unknown
273± feet	Chute Length	N/A
13± feet	Height Between Spillway Crest and Approach Channel Invert (Weir Flow)	7± feet

Hydrometerological Gages:

Type: None

Location: N/A

Records:

Date - N/A

Max. Reading - N/A

FLOODWATER CONTROL SYSTEM:

Warning System: None

Method of Controlled Releases (Mechanisms):

None

DRAINAGE AREA: 3.5 square miles

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: Forest and farmland

Terrain - Relief: Moderate to steep slopes

Surface - Soil: Low permeability

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

Moderate to high runoff potential (SCS Hydrological Curve Number (CN) 75 was used in the original design calculations).

Potential Sedimentation Problem Areas (natural or man-made; present or future)

None observed.

Potential Backwater Problem Areas for Levels at Maximum Storage Capacity Including Surcharge Storage:

None observed.

Dikes - Floodwalls (overflow and nonoverflow) - Low Reaches Along the Reservoir Perimeter:

Location: None

Elevation:

Reservoir;

Length at Maximum Pool: 2,650± feet; at normal pool, 950± feet

Length of Shoreline at Normal Pool: 2,400± feet

APPENDIX D

HYDROLOGY AND HYDRAULIC ANALYSES

HYDROLOGY AND HYDRAULIC ANALYSIS
DATA BASE

NAME OF DAM: Newtown-Hoffman Creeks Watershed Project-
Floodwater Retarding Dam Site 1 (NY DEC 67A-3984)

PROBABLE MAXIMUM PRECIPITATION (PMP) = 21.1 INCHES/24 HOURS(1)

STATION	1	2	3	4	5
Station Description	Site 1 Drainage Area	Site 1 Dam			
Drainage Area (square miles)	3.5	—			
Cumulative Drainage Area (square miles)	3.5	3.5			
Adjustment of PMF for Drainage Area (%)					
6 Hours	111	—			
12 Hours	123	—			
24 Hours	132	—			
48 Hours	142	—			
72 Hours	—	—			
Snyder Hydrograph Parameters					
C_p/C_t(2)	0.72/1.7	—			
L (miles)(3)	1.99	—			
L_{ca} (miles)(3)	0.85	—			
$t_p = C_t(L \cdot L_{ca})^{0.3}$ (hours)	2.0	—			
Spillway Data					
Crest Length (ft)	—	See spillway capacity rating calculations			
Freeboard (ft)	—				
Discharge Coefficient	—				
Exponent	—				

(1) Hydrometeorological Report 33 (Figure 1), U.S. Army, Corps of Engineers, 1956.
(2) Snyder's Coefficients (see attached calculations).
(3) L = Length of longest water course from outlet to basin divide.
L_{ca} = Length of water course from outlet to point opposite the centroid of drainage area.

```
**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
  LAST MODIFICATION   11 APR 80
**********
    1                 A1       SNYDER UNIT HYDROGRAPH, SPILLWAY AND DAM OVERTOPPING ANALYSES
    2                 A2       NEWTOWN-HOFFMAN SITE-1 DAM,(NY 67A-3984)CHEMUNG CO,NY,PROJ NO. 80-775-10
    3                 A3       FOR 20%,30%,40%,50%,60%,70%,80%,90%,AND 100% PROBABLE MAXIMUM FLOOD(PMF)
    4                 B     300        0       15        0        0        0        0        0       -4        0
    5                 B1      5
    6                 J       1        9        1
    7                 J1   0.20     0.30     0.40     0.50     0.60     0.70     0.80     0.90     1.00
    8                 K       0        1                                             1
    9                 K1       CALC. OF SNYDER INFLOW HYDROGRAPH TO NEWTOWN-HOFF. S-1 DAM,(NY 67A-3984)
   10                 M       1        1     3.46              3.46                                      1
   11                 P                21.1      111      123      132      142
   12                 T                                                           1.0     0.05              0.0029
   13                 W    2.04     0.72
   14                 X    -1.5    -0.05      2.0
   15                 K       1        2                                             1
   16                 K1       ROUTING FLOW THROUGH NEWTOWN-HOFFMAN SITE-1 DAM, (N.Y. 67A-3984)
   17                 Y                                         1        1
   18                 Y1      1                                                 -1300.7       -1
   19                 Y41300.7  1308.0   1312.0   1316.0   1320.0   1321.2   1321.7   1322.2   1323.2   1324.0
   20                 Y41325.2  1326.2   1327.2   1328.0   1328.2   1331.2   1332.0
   21                 Y5    0.0   106.0    114.0    121.0    128.0    129.0    251.0    532.0   1445.0   2740.0
   22                 Y54683.0  6879.0   9434.0  11747.0  12325.0  22858.0  26091.0
   23                 $A    6.5    38.0     45.0     56.0
   24                 $E1300.7  1321.2   1324.6   1330.5
   25                 $$1300.7
   26                 $01330.5     2.65      1.5    900.0
   27                 K      99
```

NOTE: Emergency spillway rating curve per design calculations.

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

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS								
				RATIO 1 .20	RATIO 2 .30	RATIO 3 .40	RATIO 4 .50	RATIO 5 .60	RATIO 6 .70	RATIO 7 .80	RATIO 8 .90	RATIO 9 1.00
HYDROGRAPH AT	1	3.46	1	1791.	2687.	3583.	4479.	5374.	6270.	7166.	8062.	8957.
	(	8.96)	(	50.73)(	76.09)(	101.46)(	126.82)(	152.19)(	177.55)(	202.91)(	228.28)(	253.64)
ROUTED TO	2	3.46	1	1105.	2446.	3467.	4350.	5284.	6177.	7077.	7975.	8860.
	(	8.96)	(	31.29)(	69.27)(	98.17)(	123.62)(	149.63)(	174.91)(	200.39)(	225.82)(	250.89)

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1300.70	1300.70	1330.50
STORAGE	0.	0.	850.
OUTFLOW	0.	0.	20400.

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
.20	1322.83	0.00	476.	1105.	0.00	43.25	0.00
.30	1323.82	0.00	518.	2446.	0.00	42.25	0.00
.40	1324.45	0.00	546.	3467.	0.00	42.00	0.00
.50	1325.00	0.00	571.	4366.	0.00	42.00	0.00
.60	1325.47	0.00	592.	5284.	0.00	41.75	0.00
.70	1325.88	0.00	611.	6177.	0.00	41.75	0.00
.80	1326.28	0.00	630.	7077.	0.00	41.75	0.00
.90	1326.63	0.00	647.	7975.	0.00	41.75	0.00
1.00	1326.98	0.00	664.	8860.	0.00	41.75	0.00

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CONSULTING ENGINEERS, INC.

By JTC Date 2/17/81 Subject NEWTOWN-HOFFMAN CREEK SITE 1 Sheet No. 1 of 4
Chkd. By SRF Date 2/18/81 SPILLWAY RATING Proj. No. 80-773

SPILLWAY CAPACITY RATING

REFERENCE : DESIGN OF SMALL DAM, 2nd EDITION. P 553

ASSUMPTION (1) SPECIFIC ENERGY $H_E = d + \frac{V^2}{2g}$

(2) CRITICAL FLOW AT CONTROL SECTION.

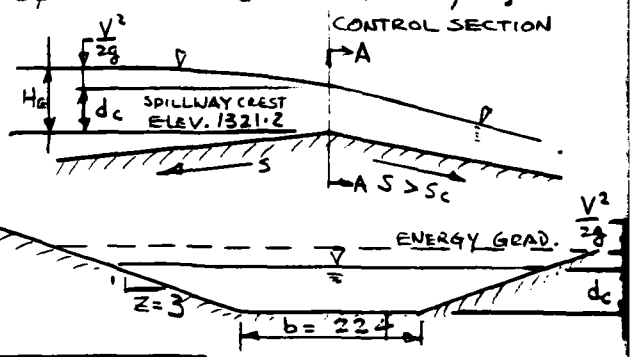
$d = d_c$; $V = V_c$ and H_E = LAKE LEVEL

NO OTHER MINOR LOSSES ARE CONSIDERED

(3) D/S SLOPE IS STEEPER THAN CRITICAL SLOPE.

FROM P553 of REF:

$$V_c = \sqrt{\frac{b + z d_c}{b + 2z d_c} d_c g} \quad \text{— EQ-1}$$



$$H_E = d_c + \frac{V_c^2}{2g} = d_c + \left(\frac{b + z d_c}{b + 2z d_c} d_c g\right)\left(\frac{1}{2g}\right)$$

$$= \frac{(3b + 5z d_c) d_c}{2b + 4z d_c}$$

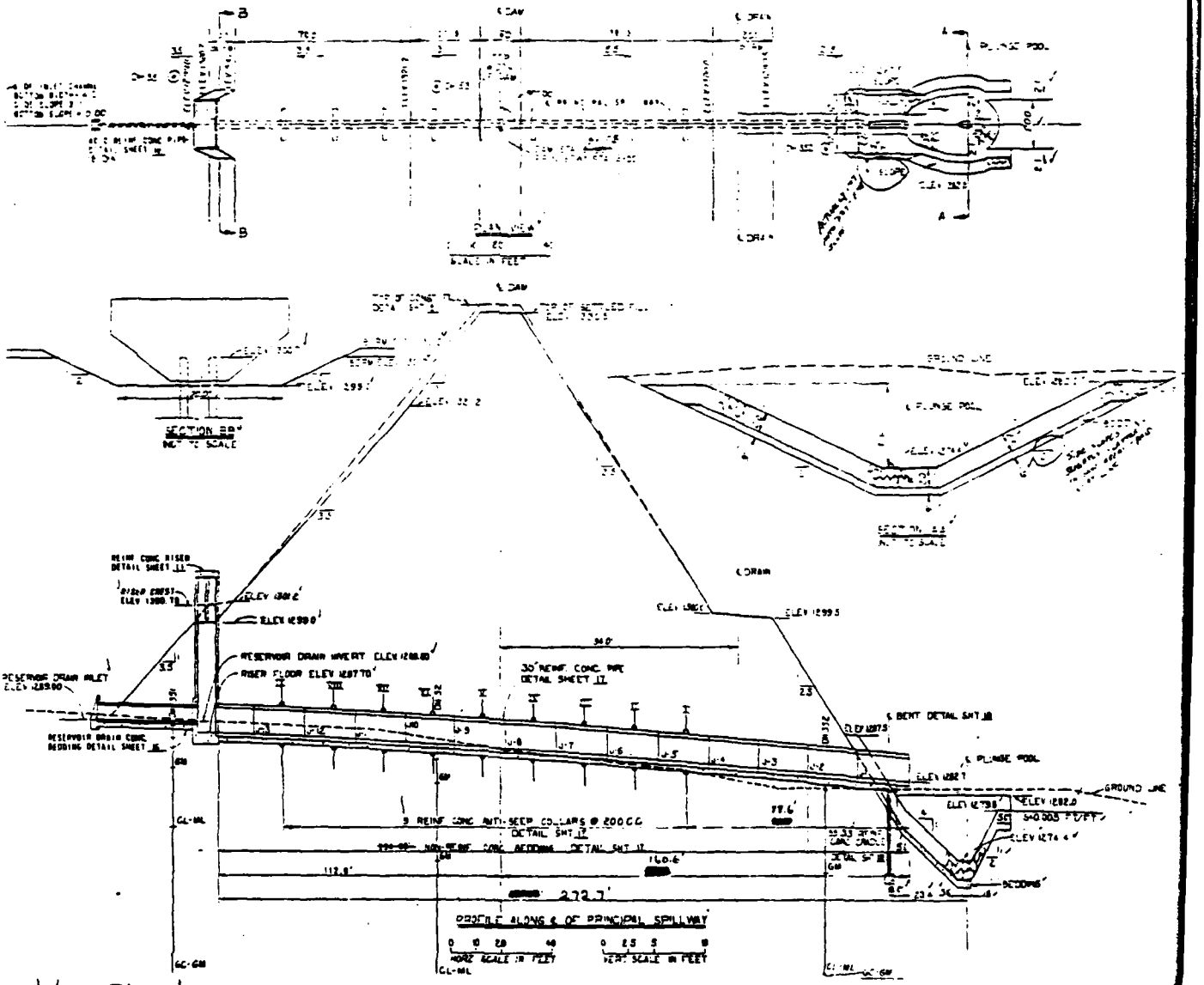
$$d_c = \frac{-(3b - 4H_E z) + \sqrt{(3b - 4H_E z)^2 + (4H_E z)(10b)}}{10z} \quad \text{— EQ-2}$$

$A_c = (z d_c + b) d_c$ — EQ 3

$Q_c = A_c V_c$ — EQ 4

LAKE ELEVATION FEET	H_E FT	d_c EQ-2 FT	A_c EQ 3 FT^2	V_c EQ. 1 FPS	Q_c EQ. 1 CFS	EMERGENCY Spillway
1321.2	0	0	0	0	0	b = 224
1321.7	0.5	0.3	75.1	3.3	246	z = 3
1322.2	1.0	0.7	151.1	4.6	698	
1323.2	2.0	1.3	305.8	6.5	1992	
1324.2	3.0	2.0	464.1	8.0	3712	
1325.2	4.0	2.7	625.9	9.2	5734	
1326.2	5.0	3.4	791.4	10.2	8083	
1327.2	6.0	4.1	960.5	11.2	10718	
1328.2	7.0	4.8	1133.3	12.0	13623	
1329.2	8.0	5.4	1309.7	12.8	16786	
1330.2	9.0	6.1	1489.7	13.6	20201	
1331.2	10.0	6.8	1673.4	14.3	23959	
1332.2	11.0	7.5	1860.8	14.9	27753	

PRIMARY SPILLWAY DISCHARGE RATING



WEIR FLOW

$$Q_1 = CL(H)^{1.5}$$
$$= (3.22)(15)(W.L.\ ELEV. - 1300.7)^{1.5}$$
$$= 48.3\,(W.L\ ELEV. - 1300.7)^{1.5} \quad - EQ-5$$

PIPE FLOW

$$H_T = \left[\frac{(2.5204)(1+K_e)}{D^4} + \frac{466.18\,n^2 L}{D^{16/3}}\right]\left(\frac{Q_2}{10}\right)^2$$ (FROM P. 567 DESIGN OF SMALL DAM, 2nd ED.)

$$(W.L\ ELEV. - 1282.7) = \left[\frac{(2.5204)(1.9)}{(2.5)^4} + \frac{(466.18)(.012)^2(272.7)}{(2.5)^{16/3}}\right]\left(\frac{Q_2}{10}\right)^2$$

$$Q_2 = 19.5848\sqrt{W.L.\ ELEV. - 1282.7} \quad - EQ-6$$

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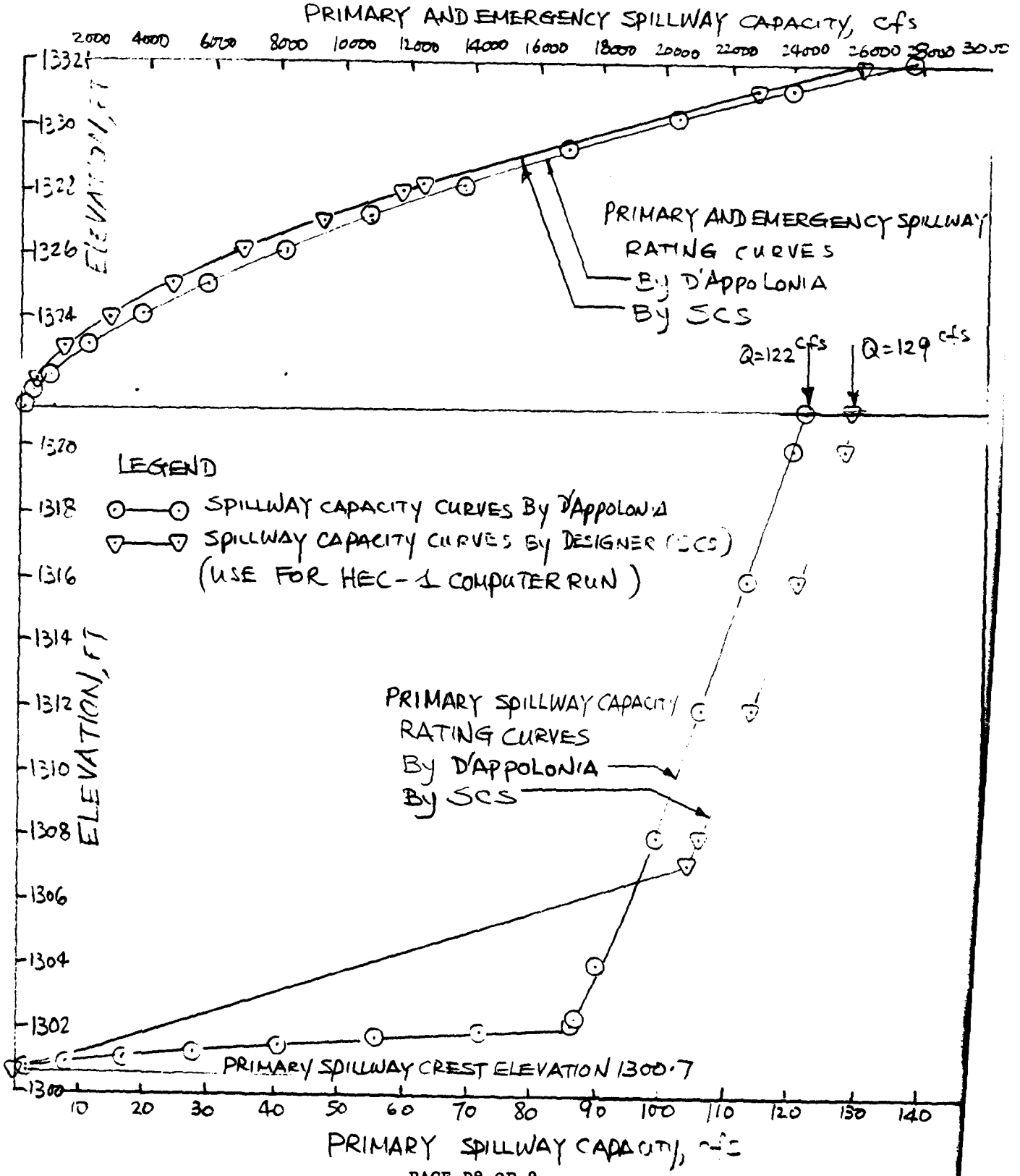
By WTC Date 8-17-81 Subject NEWTOWN-HOFFMAN SITE 1 Sheet No. 3 of 4
Chkd. By SRP Date 26AUG81 Proj. No. 80-778

LAKE LEVEL ELEVATION	PRIMARY SPILLWAY Q_1 cfs EQ-5	PRIMARY SPILLWAY Q_2 cfs EQ-6	PRIMARY SPILLWAY Q_s cfs	EMERGENCY SPILLWAY Q_c cfs EQ-4	COMBINED SPILLWAY CAPACITY cfs
1300.7	0	0	0	0	0
1300.8	1.5	~~83.3~~	1.5		2
1301.0	7.9	~~83.8~~	7.9		8
1301.2	17.1	~~84.2~~	17.1		17
1301.4	28.3	~~84.7~~	28.3		28
1301.6	41.2	~~85.1~~	41.2		41
1301.8	55.7	~~85.6~~	55.7		56
1302.0	71.6	~~86.0~~	71.6		72
1302.2	~~88.7~~	86.5	86.5		87
1302.4	~~107.1~~	86.9	86.9		87
1304		90.4	90.4		90
1308		98.5	98.5		99
1312		106.0	106.0		106
1316		113.0	113.0		113
1320		119.6	119.6		120
1321.2			121.5	0	122
1321.7			122.3	246	368
1322.2			123.1	698	821
1323.2			124.6	1992	2117
1324.2			126.2	3692	3818
1325.2			127.7	5734	5862
1326.2			129.2	2083	8212
1327.2			130.6	10718	10849
1328.2			132.1	13623	13755
1329.2			133.6	16786	16920
1330.2			135.0	20201	20336
1331.2			136.4	23859	23995
1332.2			137.8	27752	27896

D'APPOLONIA
CONSULTING ENGINEERS, INC.

By WTC Date 8/17/81 Subject NEWTOWN - HOFFMAN CREEK SITE 1 Sheet No. 4 of 4
Chkd. By SRP Date 26 AUG 81 SPILLWAY RATING Proj. No. 80-778

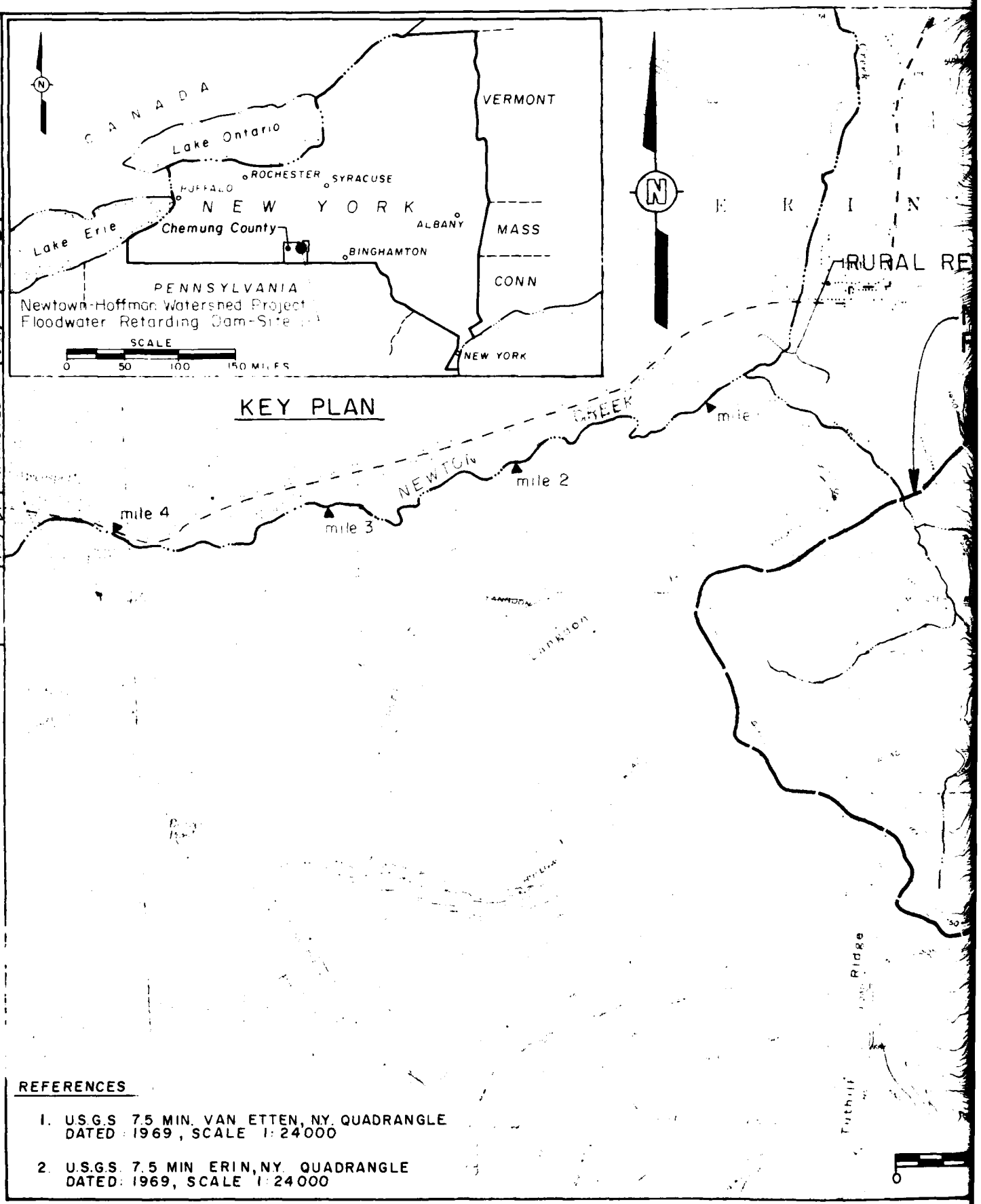


APPENDIX E

PLATES

DRAWN BY	CHECKED BY	DRAWING NUMBER
Ass 7-14-81	APPROVED BY 7-24-81	80-778-B36

KEY PLAN



REFERENCES

1. U.S.G.S 7.5 MIN. VAN ETTEN, N.Y. QUADRANGLE DATED: 1969, SCALE 1:24000
2. U.S.G.S. 7.5 MIN ERIN, N.Y. QUADRANGLE DATED: 1969, SCALE 1:24000

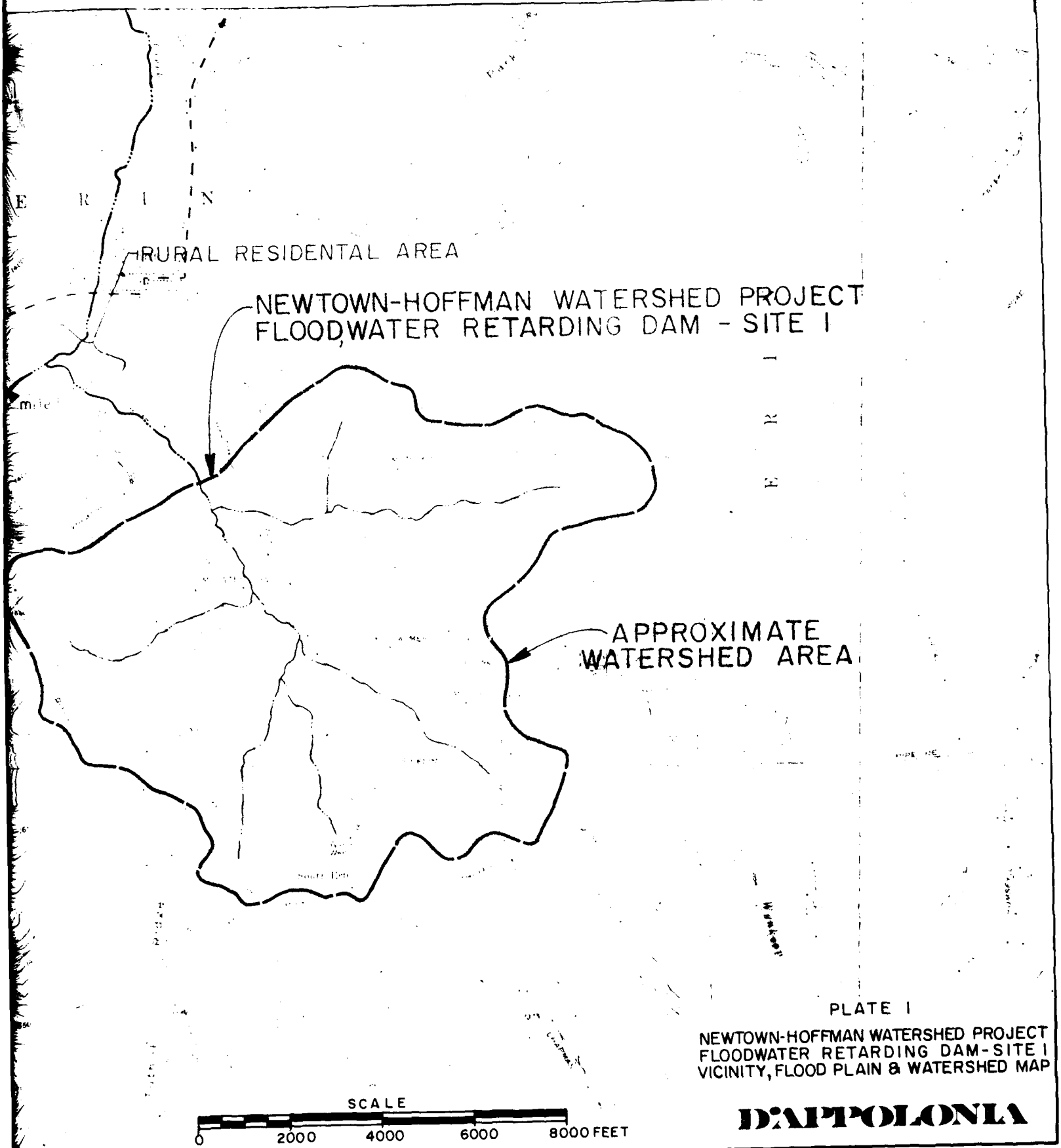
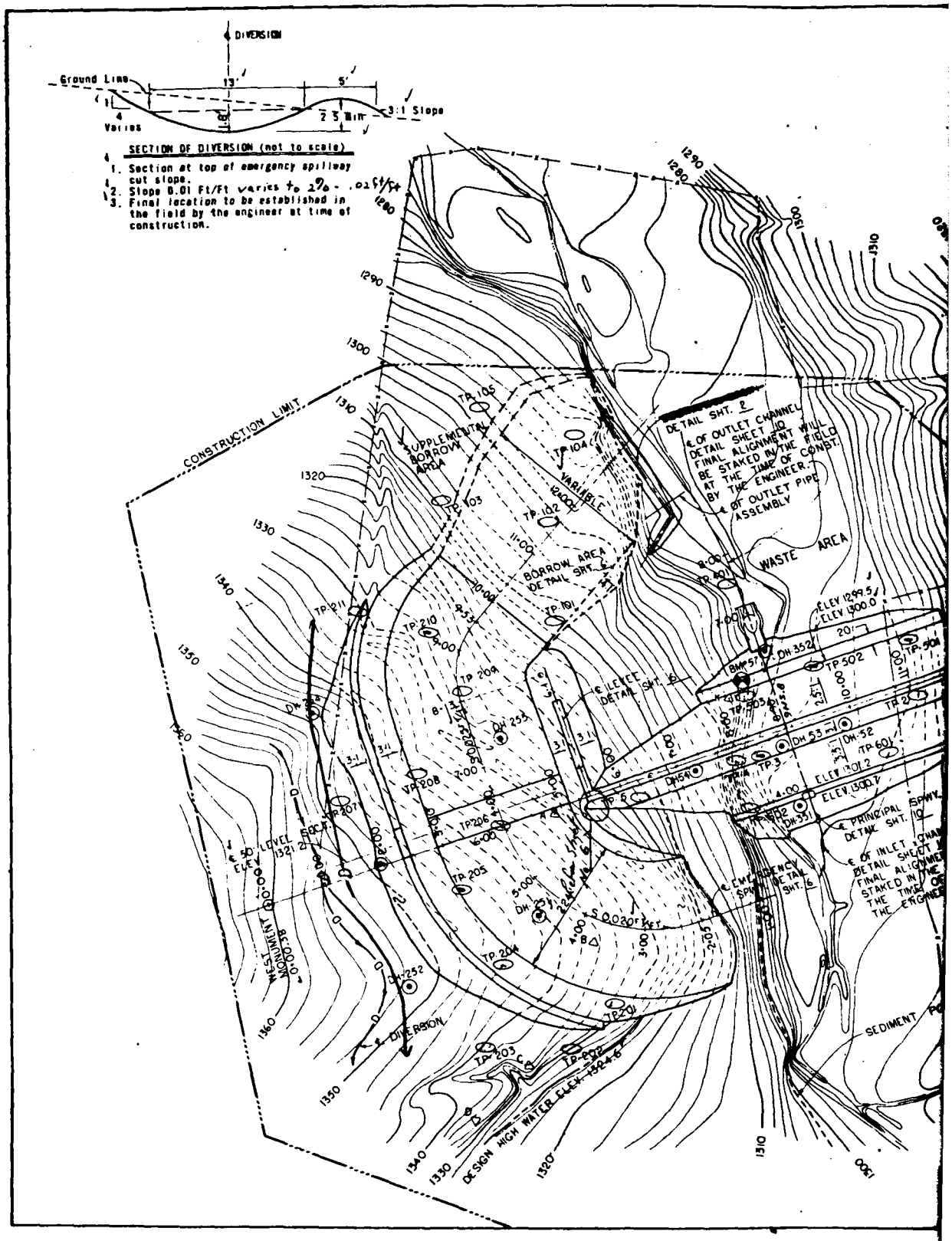


PLATE 1

NEWTOWN-HOFFMAN WATERSHED PROJECT
FLOODWATER RETARDING DAM-SITE 1
VICINITY, FLOOD PLAIN & WATERSHED MAP

DAPPOLONIA

DRAWN BY	G.J.G.	CHECKED BY	BE	7/24/81	DRAWING NUMBER 80-778-B37
	5-27-81	APPROVED BY	JHD	7-29-81	



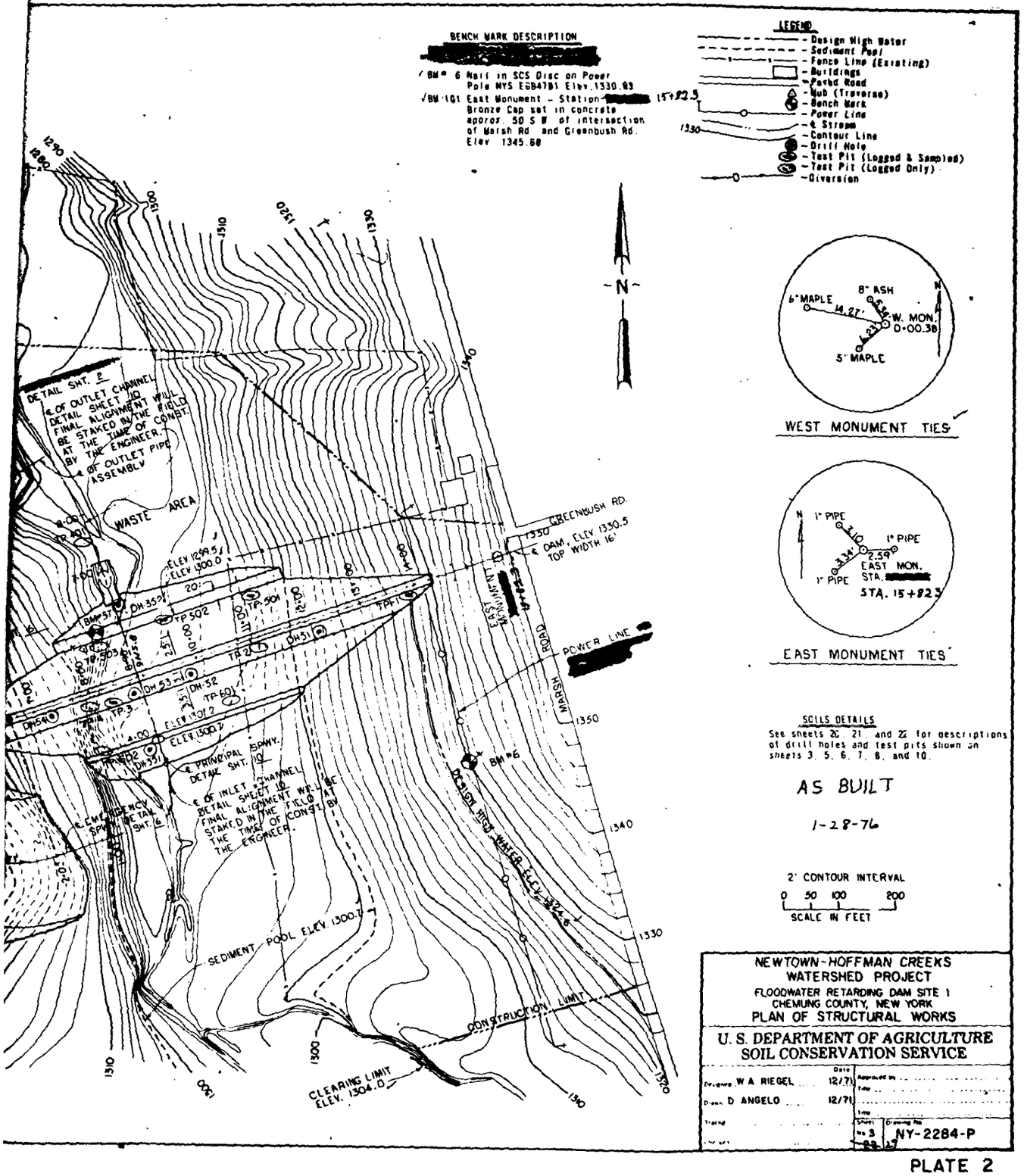
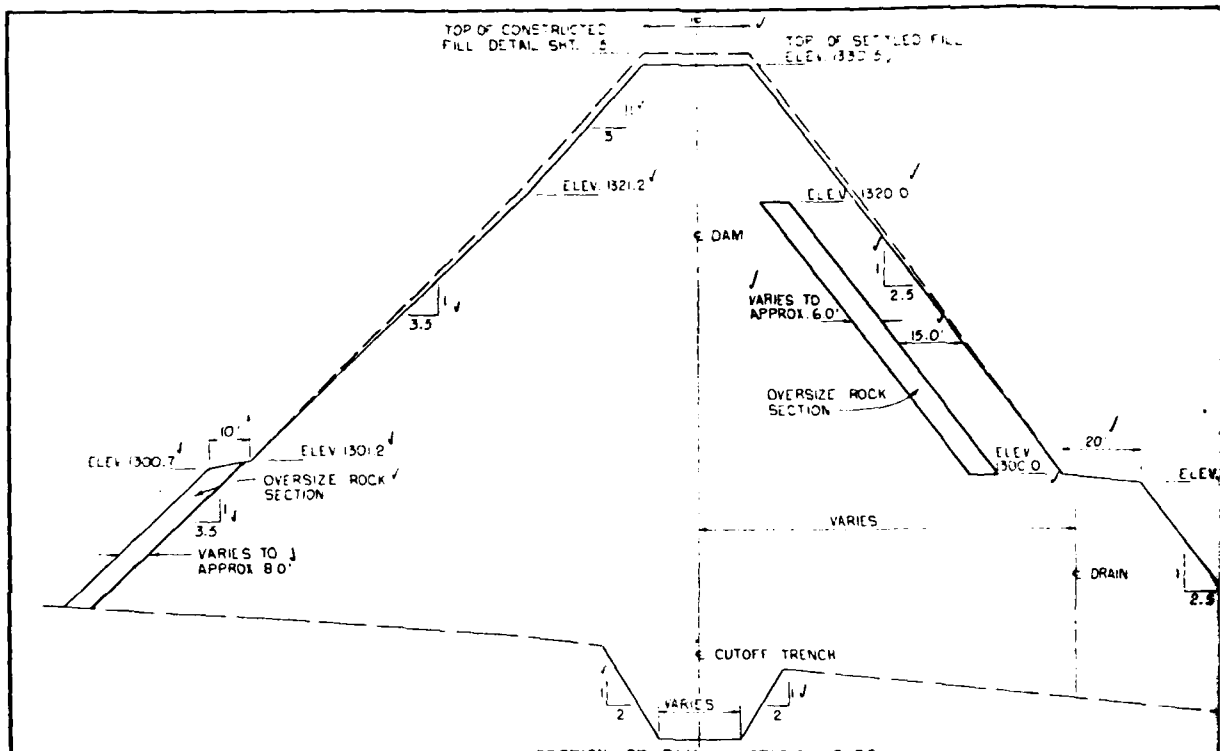


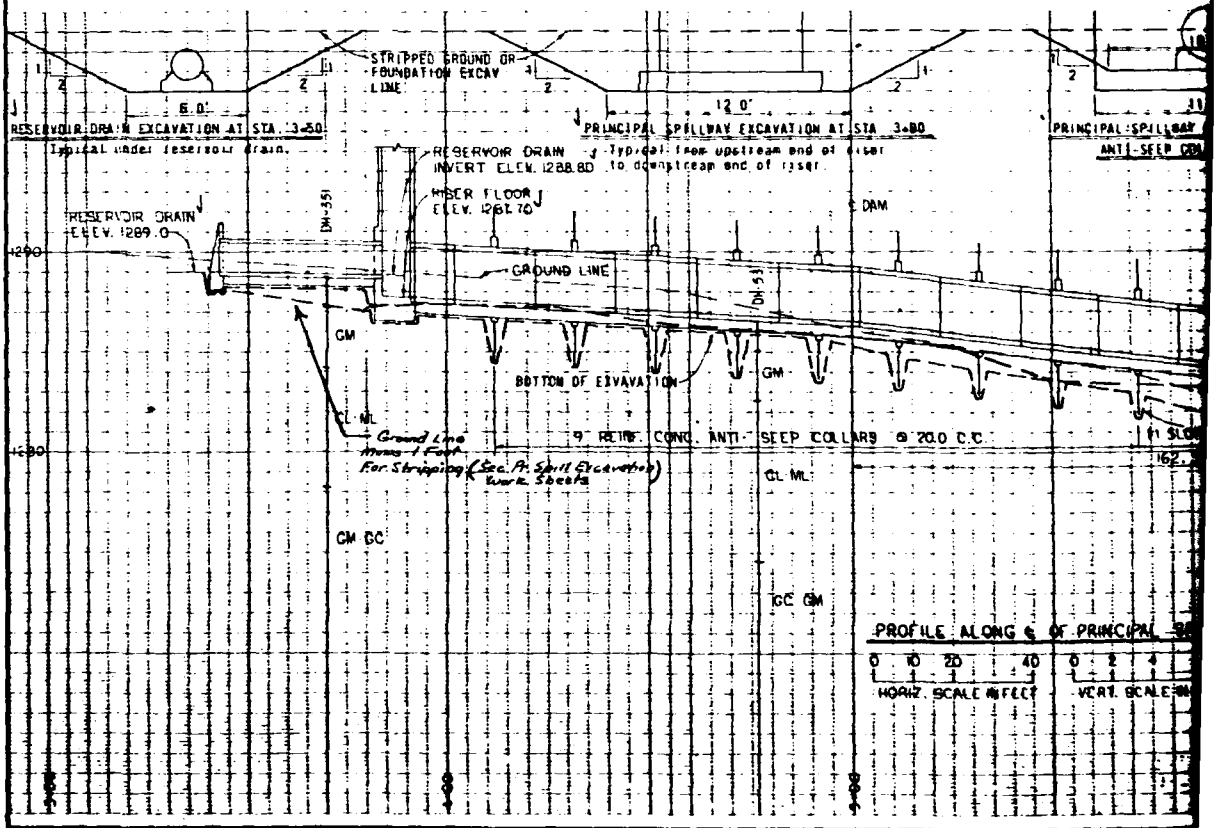
PLATE 2

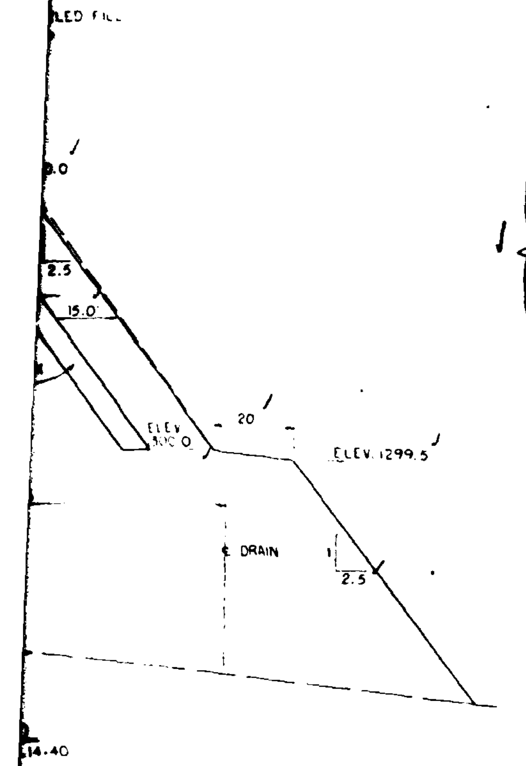
D'APPOLONIA

DRAWN BY	G. J. G.	CHECKED BY	JLE	7/24/81	DRAWING NUMBER 80-778-B38
	5-27-81	APPROVED BY	JMD	7-24-81	



SECTION OF DAM @ STATION 9+00
TYPICAL FROM APPROX. STA. 5+40 TO STA. 14+40



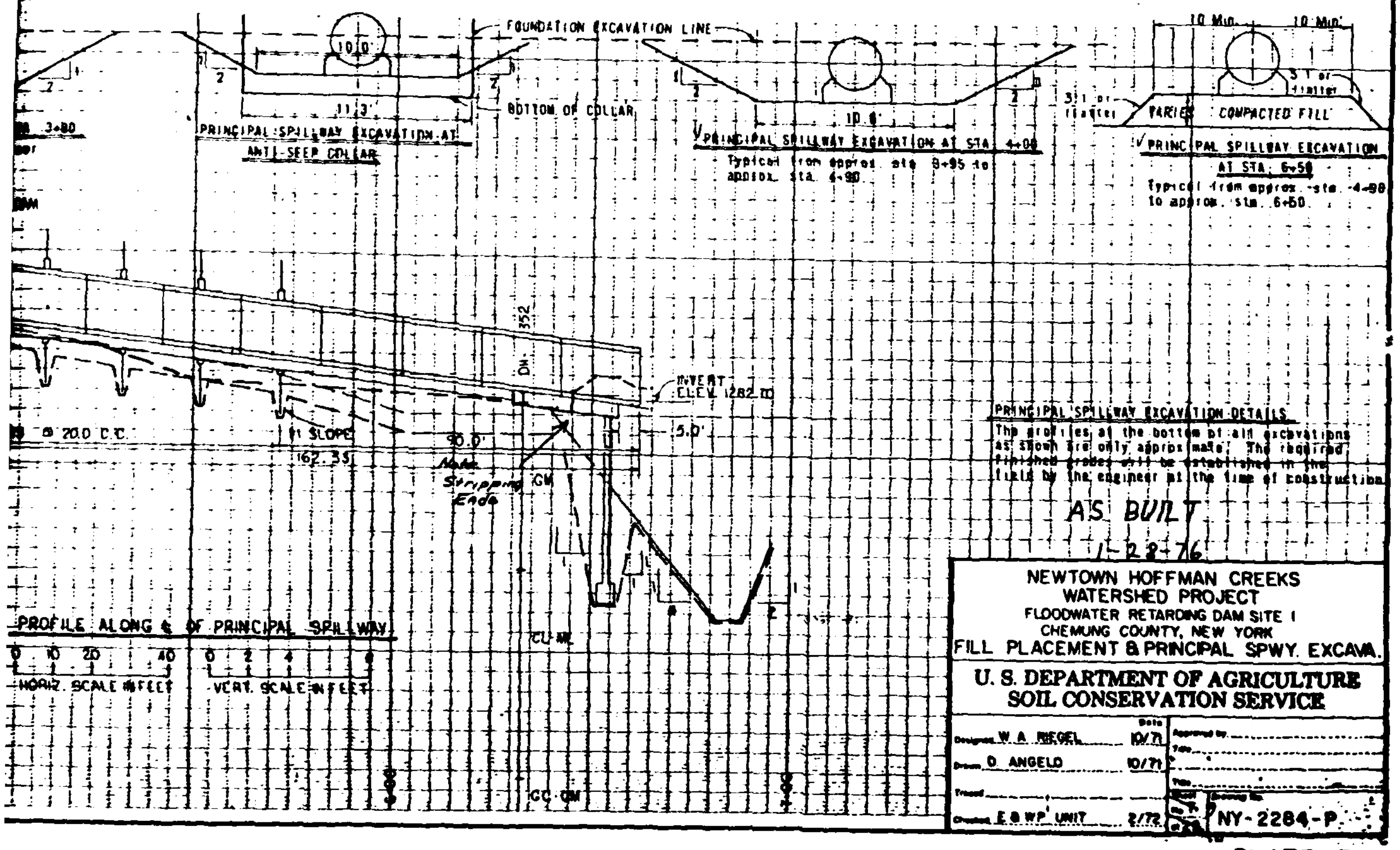


EARTH FILL REQUIREMENTS					
MATERIAL 1/	MAX ROCK SIZE 2/	MAX LIFT 3/ THICKNESS	MIN REQ'D WATER CONTENT 4/	COMPACTION 5/ CLASS	DEFINITION
GC-GM AND CL-ML GLACIAL TILL AS REPRESENTED BY TP 204 FROM 0.5 TO 11.0, TP 205 " 1.0 TO 14.4, TP 210 " 1.6 TO 14.3	6"	9"	OPTIMUM	A	100% OF MAXIMUM DENSITY BY ASTM D-698 METHOD A

1/ The placement table indicates estimated use of materials.
2/ a) Maximum rock size in backfill compacted by means of manually directed power tampers or plate vibrators shall be 3".
b) oversize material (6" to 18" inclusive) placed in the earth fill shall be raked to the portion of the dam labeled OVERSIZE ROCK SECTIONS as shown on the drawings.
3/ Maximum lift thickness prior to compaction. The maximum lift thickness of the oversize rock section shall be no greater than 18" prior to compaction.
4/ Water content at time of compaction.
5/ a) For typical compaction curve see sheet 22.
b) Use CLASS C compaction in areas of the dam containing oversize mat'l.
CLASS C compaction shall consist of a minimum of three passes per lift of fill by a tamping roller exerting a min. contact pressure of 450 PSI, or equivalent as approved by the engineer. The final number of passes required will be determined by the engineer.

CONSTRUCTION DETAILS

1. OVERSIZE ROCK SECTION boundaries are approximate. Adjustments will be made by the engineer to utilize available material.
2. Material placed in the OVERSIZE ROCK SECTIONS shall consist of oversize mat'l raked from the earthfill. These sections shall be essentially free of materials less than 3". OVERSIZE ROCK SECTION above ELEV 1300.0 may be relocated so as to be exposed at the upstream slope of the dam as determined by the engineer.
3. Topsoil that is suitable for use and not used on the specified areas of the emergency spillway shall be incorporated within the slopes of the earth fill as directed by the engineer. The source of the topsoil shall be within the required excavations.



PRINCIPAL SPILLWAY EXCAVATION DETAILS

The profiles at the bottom of all excavations as shown are only approximate. The required finished grades will be established in the field by the engineer at the time of construction.

AS BUILT
1-28-76

NEWTOWN HOFFMAN CREEKS WATERSHED PROJECT
FLOODWATER RETARDING DAM SITE 1
CHEMUNG COUNTY, NEW YORK
FILL PLACEMENT & PRINCIPAL SPWY. EXCAVA.

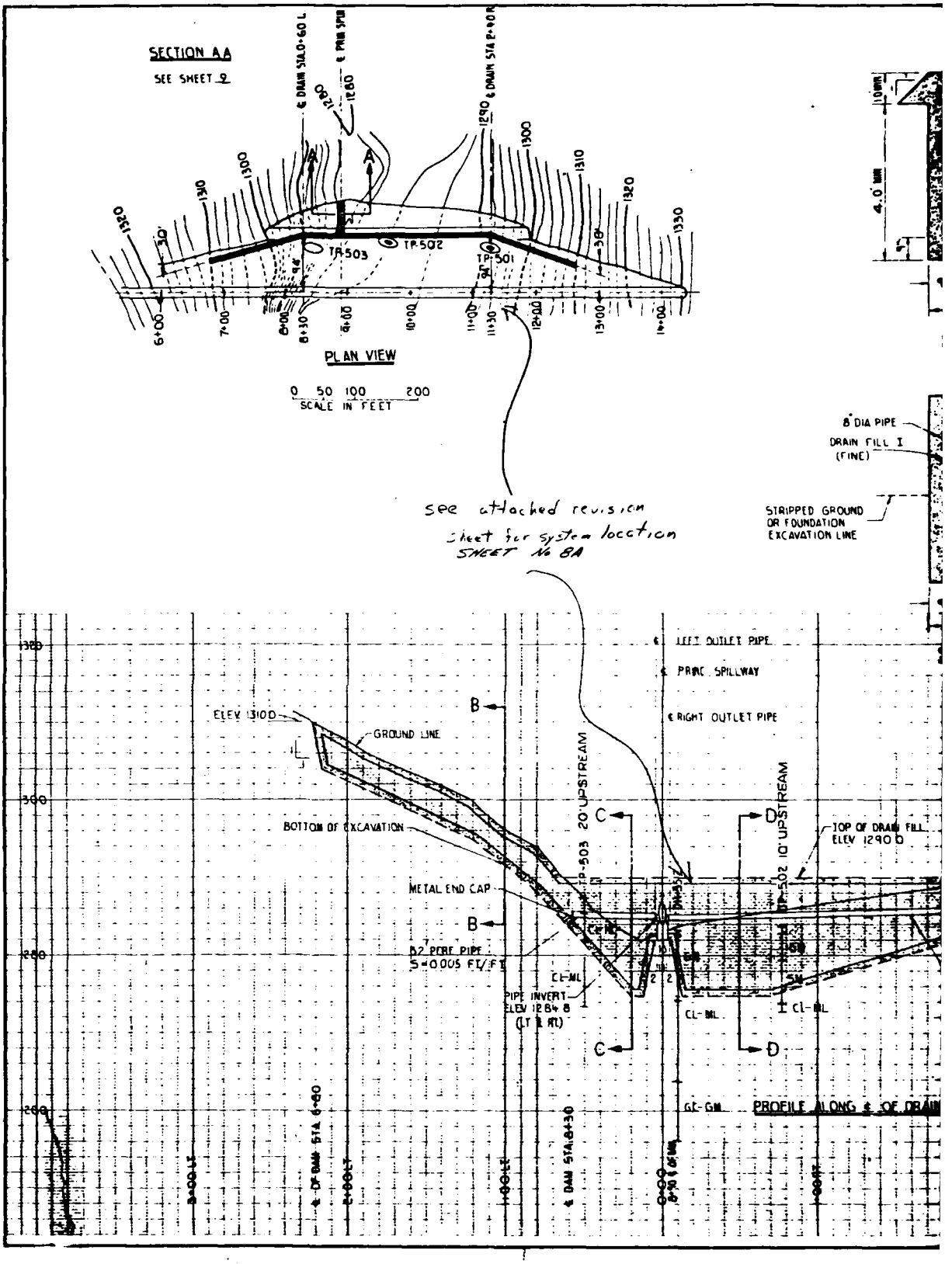
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

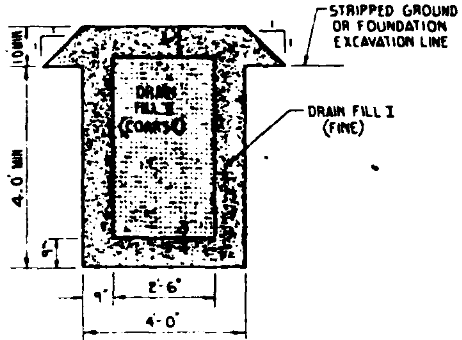
		Date	
Designed	W. A. RIEGEL	10/71	Approved by
Drawn	D. ANGELO	10/71	Title
Traced			Title
Checked	E & WP UNIT	2/72	Drawing No. NY-2284-P

PLATE 3

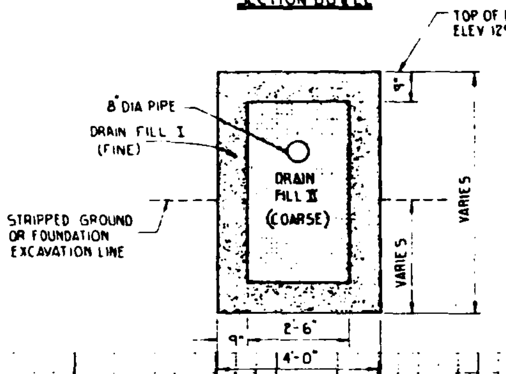
D'APPOLONIA

DRAWN BY	G.J.G.	CHECKED BY	JAE	7/2/81	DRAWING NUMBER 80-778-B39
	5-27-81	APPROVED BY	JHD	7-21-81	





SECTION BB & EE



SECTION CC & DD

DRAINAGE SYSTEM DETAILS

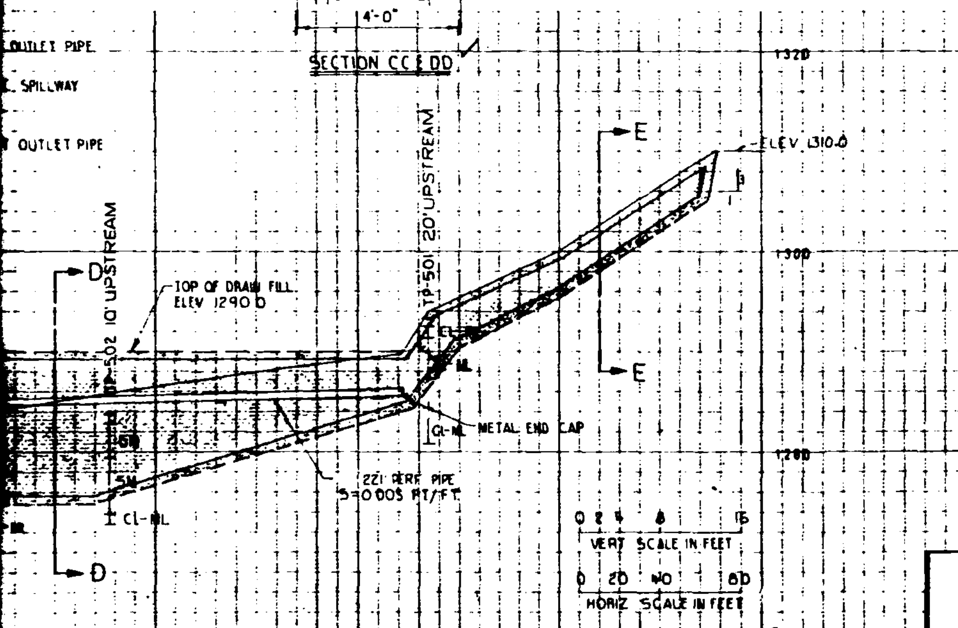
1. ASBESTOS CEMENT DRAIN PIPE SHALL CONFORM TO SPECIFICATION 545 AND SHALL BE 8" DIA PRESSURE PIPE CLASS 200.
2. THE PROFILES AT THE BOTTOM OF ALL EXCAVATIONS AS SHOWN ARE ONLY APPROXIMATE THE REQUIRED FINISHED GRADES WILL BE ESTABLISHED IN THE FIELD BY THE ENGINEER AT TIME OF CONSTRUCTION.

QUANTITY SUMMARY

417 CU YDS DRAIN FILL I (FINE)
416 CU YDS DRAIN FILL II (COARSE)
333 LIN FT STRAIGHT SECTION OF 8" DIA PERFORATED ASBESTOS CEMENT PIPE
52 LIN FT STRAIGHT SECTION OF 8" DIA NON-PERFORATED ASBESTOS CEMENT PIPE.
2 END CAPS
2 90° BEND - 8" DIA CAST IRON

GRAIN SIZE DESCRIPTION FOR DRAIN FILL

1. DRAIN FILL I FINE SHALL MEET THE GRADATION OF ASTM C33-67 FOR FINE AGGREGATE. IN ADDITION THE PERCENTAGE OF MATERIAL IN DRAIN FILL I FINER THAN A #200 SIEVE SHALL NOT BE MORE THAN (3) PERCENT.
2. DRAIN FILL II COARSE SHALL MEET THE GRADATION OF SIZE DESIGNATION 1 AS SHOWN IN TABLE 703-4 OF THE JANUARY 2, 1973 STANDARD SPECIFICATIONS OF THE NEW YORK STATE DEPARTMENT OF TRANSPORTATION. IN ADDITION THE PERCENTAGE OF MATERIAL IN DRAIN FILL II FINER THAN A #200 SIEVE SHALL NOT BE MORE THAN THREE (3) PERCENT.



PROFILE ALONG ℄ OF DRAIN (LOOKING DOWNSTREAM)

AS BUILT 1-28-76

NEWTOWN HOFFMAN CREEKS WATERSHED PROJECT
FOODWATER RETARDING DAM SITE 1
CHEMUNG COUNTY NEW YORK
DRAINAGE SYSTEM

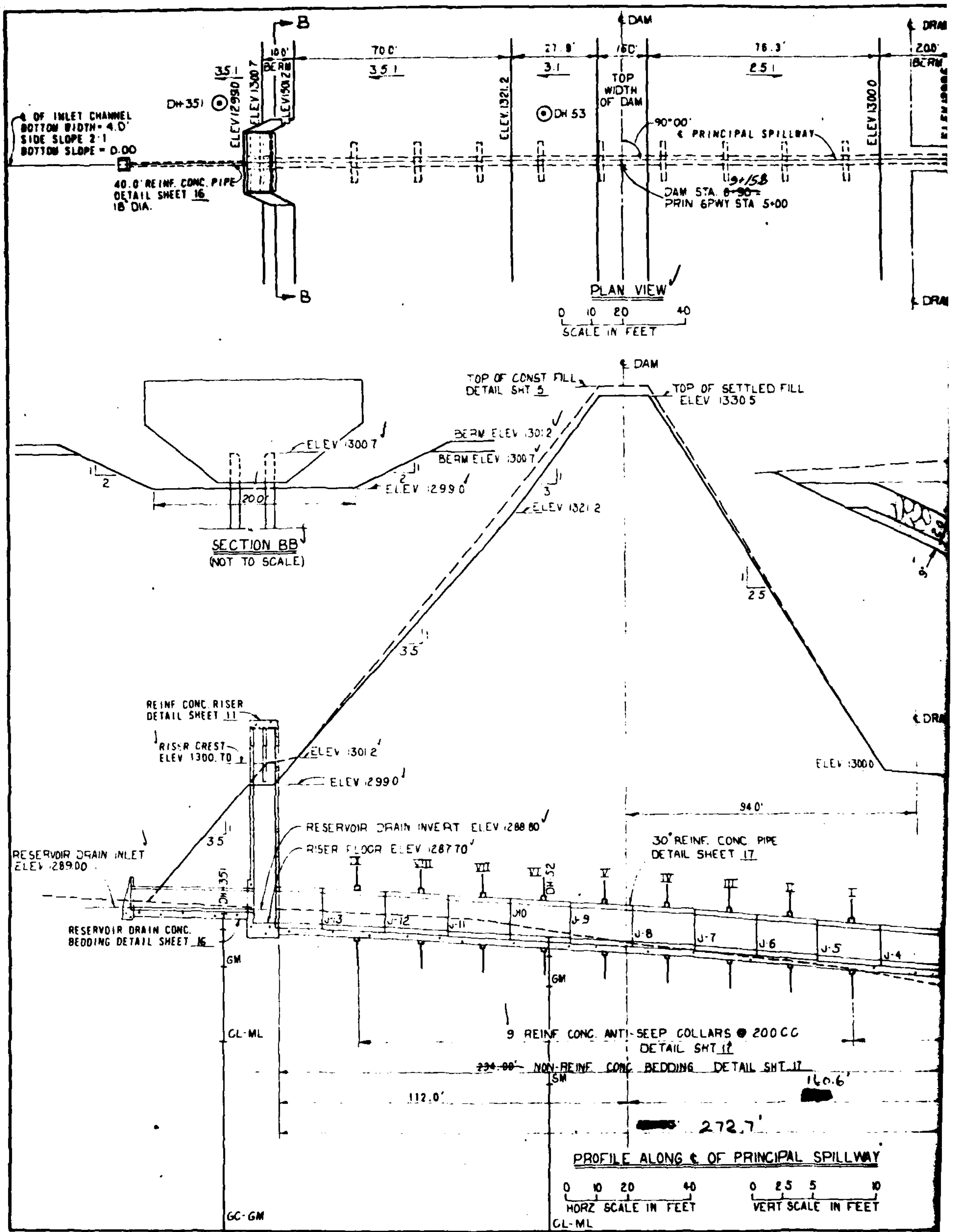
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed W. A. RIEGEL	7/71	Approved by
Drawn M. EL KORAICHI	7/71	Title
Traced		Title
Checked E SWP UNIT	2/72	Sheet 10 Drawing No. NY-2284-P

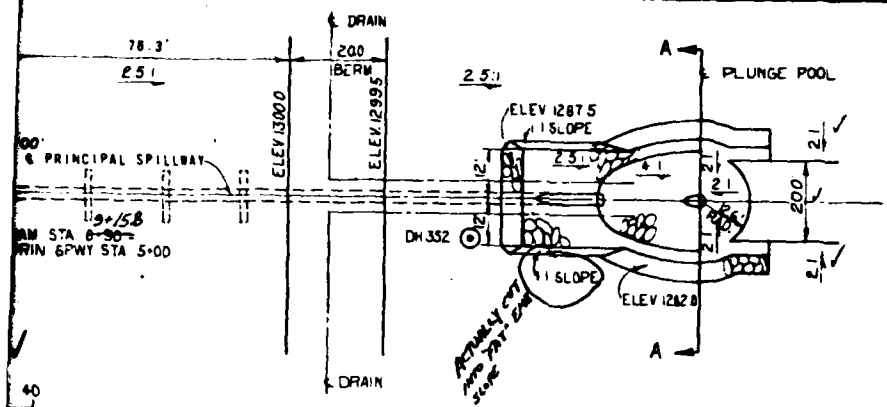
PLATE 4

D'APPOLONIA

DRAWN BY	G. J. G. 5-27-81	CHECKED BY / APPROVED BY	[initials]	7/21/81 / 7-24-81	DRAWING NUMBER 80-778-B40



19 1253 HERCULENE. A&B SMITH CO., PGH., PA LT1530-1079



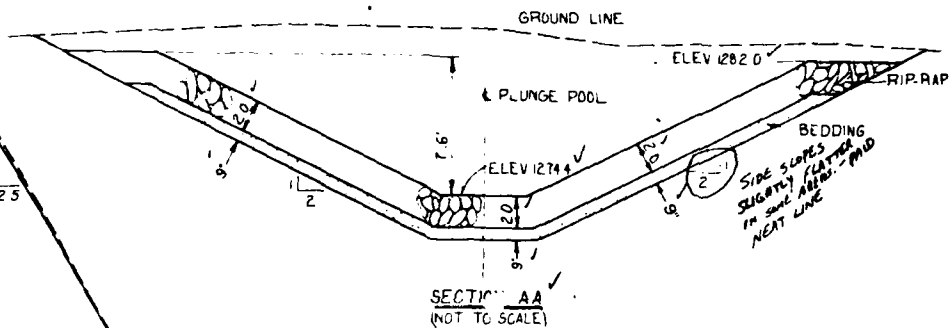
JOINT NO	DIST FROM OUTLET	INVERT OF 30 DIA PIPE	SLOPE FT./FT.	
Outlet	0	1282.78	.0E375	
J 1	20	1283.19		12.85.16
J 2	40	1283.65		12.85.66
J 3	60	1284.13		12.89.14
J 4	80	1284.59	Variable	✓
J 5	100	1285.03		✓
J 6	120	1285.43		12.85.99
J 7	140	1285.82		✓
J 8	160	1286.17		✓
J 9	180	1286.50		✓
J 10	200	1286.80		12.86.81
J 11	220	1287.08 ✓		✓
J 12	240	1287.35 ✓		✓
J 13	260	1287.55 ✓		✓
RISER	274	1287.78		12.87.68

Above dimensions for lengths of pipe are based on nominal lengths and do not include creep

Bk2 PG70

CELLAR	DIST FROM OUTLET	INVERT OF 30 DIA PIPE
I	90	1284.81
II	110	1285.23
III	130	1285.63
IV	150	1285.99
V	170	1286.34
VI	190	1286.66
VII	210	1286.95
VIII	230	1287.21
IX	250	1287.45

TOP OF SETTLED FILL
ELEV 1330.5



SECTION AA
(NOT TO SCALE)

RIPRAP DETAILS

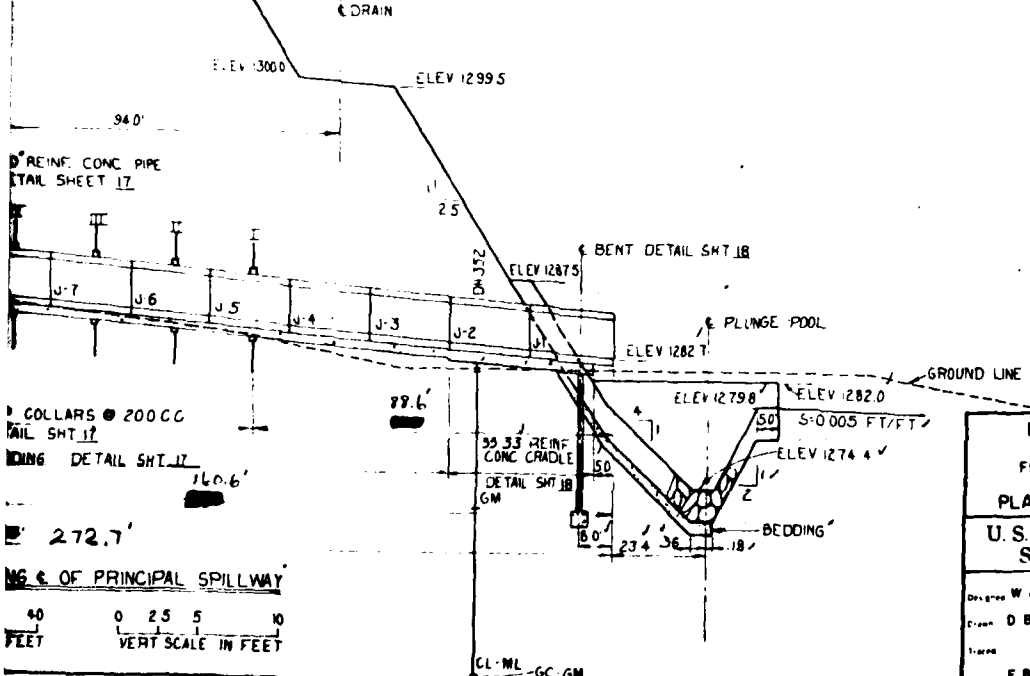
LOOSE ROCK RIPRAP SHALL BE WELL GRADED FROM A MAXIMUM OF 24" TO A MINIMUM OF 6" 35% OF THE TOTAL WEIGHT TO BE FRAGMENTS HEAVIER THAN 350 LBS AVERAGE WEIGHT OF THE FRAGMENTS SHALL BE 100-270 LBS NOT MORE THAN 10% OF THE TOTAL WEIGHT TO BE FRAGMENTS LIGHTER THAN 35 LBS

BEDDING DETAILS

Bedding shall meet the gradation requirements for drain fill II (coarse) as shown on sheet 8.

When pipe is supplied in lengths other than shown, the engineer will provide the contractor with a revision of this sheet

For further details of 30" dia reinforced concrete pressure pipe see sheet 18



AS BUILT

1-28-76

NEWTOWN-HOFFMAN CREEKS' WATERSHED PROJECT
FLOODWATER RETARDING DAM SITE-1
CHEMUNG COUNTY, NEW YORK
PLAN PROFILE OF PRINCIPAL SPILLWAY

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

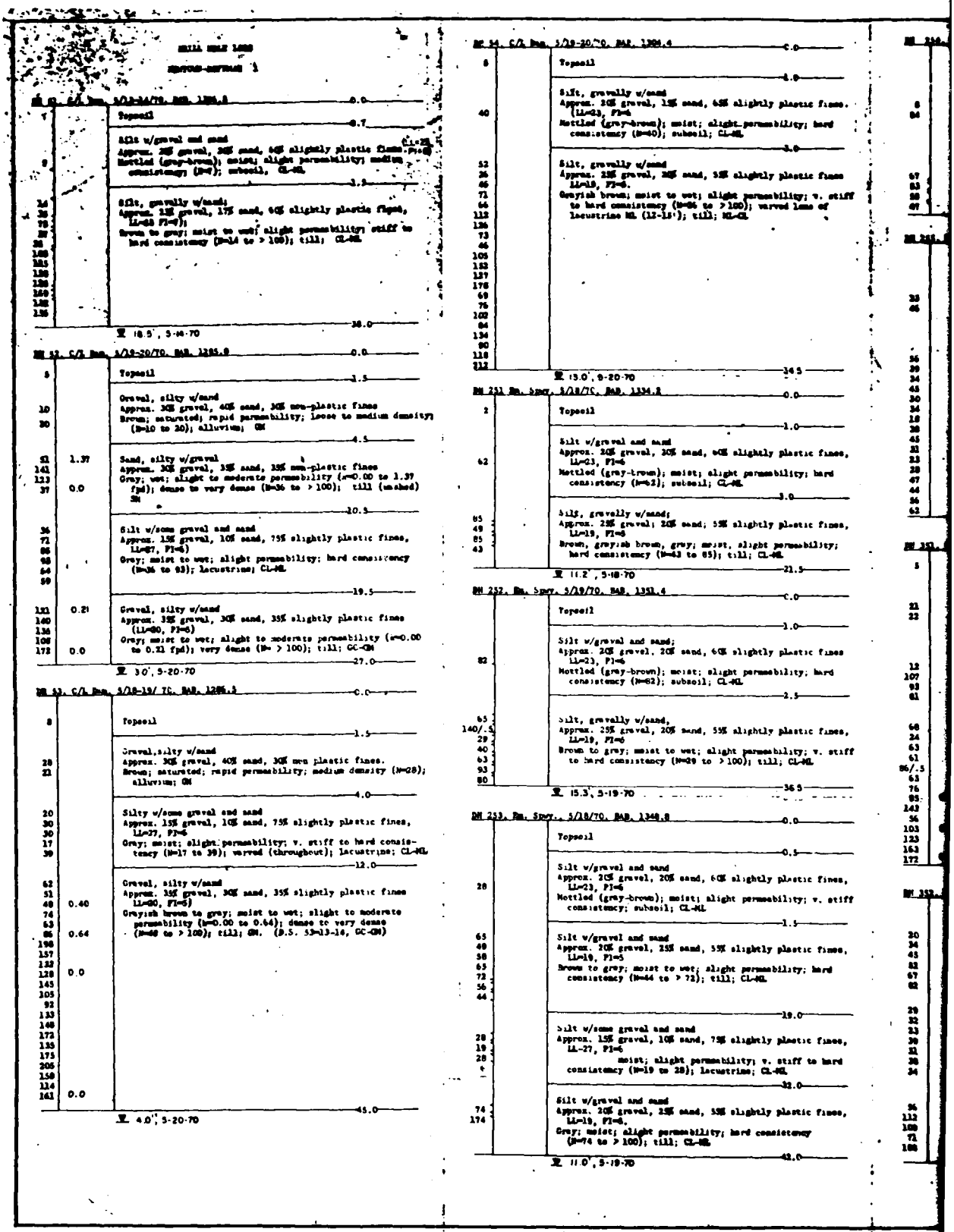
		Date	Approved by
Designed	W A RIEGEL	10/71	Title
Drawn	D BURDICK	11/71	Date
Traced			Title
Checked	E B WP UNIT	2/72	Drawing No. 13 NY-2284-P

PLATE 5

2

D'APPOLONIA

DRAWN BY	G. J. G.	CHECKED BY		DRAWING NUMBER 80-778-B41
	5-27-81	APPROVED BY		



—0.0—
—1.0—
, 64% slightly plastic fines,
slight permeability; hard
; CL-ML
—3.0—
, 54% slightly plastic fines
slight permeability; v. stiff
> 100); varved lens of
; ML-CL
—34.5—
—0.0—
—1.0—
, 60% slightly plastic fines,
; slight permeability; hard
; CL-ML
—3.0—
; 55% slightly plastic fines,
moist; slight permeability;
85); till; CL-ML
—21.5—
—0.0—
—1.0—
, 60% slightly plastic fines
; slight permeability, hard
; CL-ML
—2.5—
, 55% slightly plastic fines,
; slight permeability; v. stiff
to > 100); till; CL-ML
—36.5—
—0.0—
—0.5—
, 60% slightly plastic fines,
; slight permeability; v. stiff
—1.5—
, 55% slightly plastic fines,
; slight permeability; hard
); till; CL-ML
—19.0—
, 75% slightly plastic fines,
permeability; v. stiff to hard
; lacustrine; CL-ML
—32.0—
, 55% slightly plastic fines,
ability; hard consistency
—42.0—

DH 254, Em. Spwy., 5/28/70, BAR. 1349.2 —0.0—

N	k	Material (USCS)	Depth (ft)
		Topsoil	
			1.0
8 84		Silt, gravelly w/sand Approx. 30% gravel, 30% sand, 60% slightly plastic fines, LL=23, PI=6 Mottled (grey-brown); moist; slight permeability; hard consistency (N=84); subsoil; CL-ML	
			3.0
57 83 50 47		Silt, w/gravel and sand Approx. 20% gravel, 25% sand, 55% slightly plastic fines, LL=20, PI=6. Brown, grayish brown; grey; moist; slight permeability; hard consistency (N=47 to 83); till; CL-ML	
			21.5

DRY HOLE

DH 255, Em. Spwy., 5/20/70, BAR. 1329.8 —0.0—

N	k	Material (USCS)	Depth (ft)
		Topsoil	
			1.0
33 46		Silt, gravelly w/sand Approx. 20% gravel, 15% sand, 65% slightly plastic fines, LL=23, PI=6 Mottled (grey-brown); moist; slight permeability; hard consistency (N=46); subsoil; CL-ML	
			3.5
56 39 34 45 30 34 18 30 45 31 23 28 47 44 56 62		Silt, gravelly w/sand Approx. 25% gravel, 20% sand, 55% slightly plastic fines, LL=20, PI=6 Brown to grayish brown; moist to wet; slight permeability; v. stiff to hard (N=18 to 62); till; CL-ML	
			27.0

▼ 16.8', 5-19-70

DH 351, Prin. Spwy., 5/13-14-18/70, BAR. 1288.7 —0.0—

N	k	Material (USCS)	Depth (ft)
5		Topsoil	
			1.5
21 22		Gravel, silty w/sand Approx. 30% gravel, 40% sand, 30% non plastic fines Brown; saturated; rapid permeability; medium density (N=21 to 22); alluvium; GM	
			4.5
12 107 93 81		Silt w/some gravel and sand Approx. 15% gravel, 10% sand, 75% slightly plastic fines, LL=27, PI=6 Brown; moist; slight permeability; stiff to hard (N=12 to > 100); lacustrine; CL-ML	
			10.5
68 24 63 61 86/.5 63 76 85 143 56 103 123 163 172	 0.0 0.0 0.0	Gravel, silty w/sand Approx. 35% gravel, 30% sand, 35% slightly plastic fines, LL=20, PI=5 Brown to gray; moist to wet; slight permeability (0.00 fpd); medium to v. dense (N=24 to > 100); till; GC-GM	
			30.5

▼ 5.0', 5-18-70

DH 352, Prin. Spwy., 5/18/70, BAR. 1283.1 —0.0—

N	k	Material (USCS)	Depth (ft)
		Topsoil	
			0.5
20 34 45 82 67 82		Gravel, silty w/sand Approx. 30% gravel, 40% sand, 30% non plastic fines Brown; saturated; rapid permeability; medium to dense (N=20 to 34); alluvium; GM	
			9.0
29 32 23 39 31 38 34		Silt w/some gravel and sand Approx. 15% gravel, 10% sand, 75% slightly plastic fines, LL=27, PI=6 Gray; moist to wet; slight permeability; v. stiff to hard consistency (N=29 to 38); lacustrine; CL-ML	
			19.5
56 113 100 71 100		Gravel, silty w/sand Approx. 35% gravel, 30% sand, 35% slightly plastic fines, LL=20, PI=5 Gray; moist to wet; slight permeability; v. dense (N=56 to > 100); till; GC-GM	
			27.0

▼ 0.0', 5-18-70

LEGEND

TEST HOLE NUMBERING SYSTEM

	Test Pit (TP)	Drill Hole (DH)
Centerline of dam	1-49	50-99
Borrow Area	101-149	150-199
Emergency Spillway	201-249	250-299
Centerline of Outlet Structure	301-349	350-399
Outlet Channel	401-449	450-499
Drain Line	501-549	550-599
Other	601-649	650-699

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS) 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 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 diatomaceous silts
OL Organic silts and organic silty clays of low plasticity
OH Organic clays or silts of medium to high plasticity

XX Unified Classification by visual inspection in the field

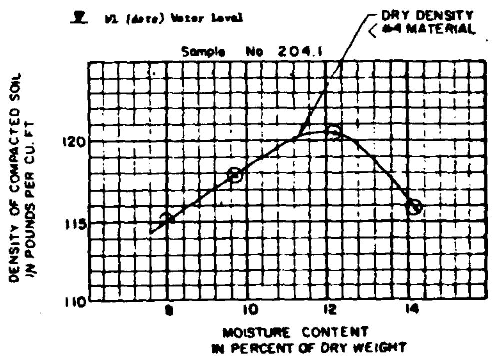
(XX) Unified Classification by laboratory analysis

Key to Drill Hole (DH) Logs

N	k	Material (USCS)	Depth (ft)
37 21 36		N= 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)	
			4.4
DBS RB 64		Dry barrel sampler Roller bit to advance hole by wash boring	
			8.2
AUG		Hole advanced by auger	
			10.4
NX 80%/40%	4.21 fpd	Rock core, 2 1/8" diameter Percent rock core recovery in each drill run / RQD Permeability test (fpd) = k	
			14.8

RQD - Rock Quality Designation = total length of pieces > 4" / length of core run

▼ WL (date) Water Level



COMPACTION CURVE
FIELD SAMPLE NO 204.1
LABORATORY CLASSIFICATION (CL-ML)

AS BUILT
1-2-8-76

NEWTOWN - HOFFMAN CREEKS
WATERSHED PROJECT
FLOODWATER RETARDING DAM SITE
CHEMUNG COUNTY, NEW YORK
LOGS OF TEST HOLES

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Logged: Bruce A. Smith	Date: 8-70	Approved by: Richard L. Gillespie
Drawn		Title
Traced		Sheet / Drawing No. NY-2284-G
Checked		[illegible]

2

PLATE 6

D'APPOLONIA

DRAWN BY G.J.G. 5-27-81 | CHECKED BY BE 7/24/81 | APPROVED BY JWP 7-24-81 | DRAWING NUMBER 80-778-B42

MATERIAL DESCRIPTIONS

A

Gravel, silty w/sand; 12-14" max. size, siltstone flags; approx. 4-8% +6", 8-18% 3-6"; 80-77% matrix (approx. 38-40% gravel, 30-35% sand, 25-30% non plastic fines); brown and grey; saturated; rapid permeability (est.); loose to dense (N= 10-34); Alluvium; GM.
(D.S. 303.1, GM)

B

Gravel or sand, silty; 12-14" max. size, subrounded to subangular siltstone w/some flags; approx. 3-8% +6", 7-13% 3-6"; 79-90% matrix (approx. 30-35% gravel, 25-40% sand, 20-40% none to slightly plastic fines, LL=20, PI=4); grey; moist to saturated; slight to moderate permeability (k= 0.00 to 1.37 fpd); medium to very dense (N= 24 to >100); till (sometimes washed); GC-GM, SC-SM, GM.
(D.S. 33-13-14, GC-GM)

C

Silt, w/gravel and sand; 8-10" max. size, subrounded to subangular siltstone w/some flags, approx. 2-5% +6", 4-7% 3-6", 88-94% matrix (approx. 16-25% gravel, 13-30% sand, 50-65% none to slightly plastic fines, LL= 16-28, PI= 3-9); Brown, greyish brown, grey, bluish grey; moist to wet; slight permeability (est.); stiff to hard consistency (N = 14 to >100); till; CL-ML.
(D.S. 208.1, GC-GM; 210.1, GC-GM; 501.1, CL-ML; 501.2,GM)

D

Silt, w/gravel and sand; 6-12" max. size, subrounded to subangular siltstone w/some flags, approx. 1-2% +6", 2-4% 3-6"; 94-97% matrix (approx. 13-20% gravel, 10-20% sand, 60-70% slightly plastic fines, LL=23, PI=6); mottled (grey-brown); moist; slight permeability (est.); medium to hard consistency (N=7 to 84); subsoil; CL-ML
(D.S. 1.1, CL-ML)

E

Silt, w/some gravel and sand; 2% 3-6", 98% matrix (approx. 8-13% gravel, 10-12% sand, 75-80% slightly plastic fines,(LL=27, PI=6); gray; moist to wet; slight permeability (est.); stiff to hard consistency (N=12 to >100), varved, lacustrine, CL-ML.
(D.S. 3.1, CL-ML)

F

Topsoil, dark brown

BACKHOE PIT LOGS

NEWTOWN HOFFMAN 1

<u>TP #1, C/L Dam, 5/7/70, BAB, 1326.7</u>

0.0 - 0.9	Topsoil - dark brown	
0.9 - 2.8	Silt, w/sand and gravel 6" max. - subrounded to subangular siltstone w/some flags Approx. 1% +6", 2% 3-6", 97% matrix (which is approx. 20% gravel, 30% sand, and 60% slightly plastic fines) Mottled (grey-brown); moist; slightly permeable; stiff; homogeneous subsoil; CL-ML. (D.S. 1.1, CL-ML) Note: Dry Pit	
2.8 - 13.0	Silt, gravelly w/sand 14" max. - subrounded to subangular siltstone w/some flags Approx. 2% +6", 4% 3-6", 94% matrix (which is approx. 23% gravel, 17% sand, and 60% slightly plastic fines) Brown; moist; slightly permeable; very stiff to hard; homogeneous till; CL-ML Note: Dry Pit	

<u>TP #2, C/L Dam, 5/5/70, BAB, 1292.4</u>

0.0 - 0.9	Topsoil - dark brown
0.9 - 4.0	Silt, w/sand and gravel 12" max. - subrounded to subangular siltstone w/some flags Approx. 2% +6", 4% 3-6", 94% matrix (which is approx. 23% gravel, 20% sand, and 63% slightly plastic fines) Brown; moist; slightly permeable; very stiff to hard; homogeneous till; CL-ML
4.0 - 13.5	Silt, sandy w/gravel 14" max. - subrounded to subangular siltstone w/some flags Approx. 3% +6", 5% 3-6", 92% matrix (which is approx. 15% gravel, 20% sand, and 65% slightly plastic fines) Grey; moist; slightly permeable, very stiff to hard; homogeneous till; CL-ML Note: Moderate seepage @ 9.4'. Caving at completion below 9.4'

<u>TP #3, C/L Dam, 5/6/70, BAB, 1286.0</u>

0.0 - 1.0	Topsoil - dark brown
1.0 - 3.2	Gravel, silty w/sand 12" max. - slst flags Approx. 4% +6", 8% 3-6", 88% matrix (which is approx. 36% gravel, 32% sand, and 32% non plastic fines) Brown; saturated, rapidly permeable; loose; mixed alluvium; GM
3.2 - 6.2	Silt, w/gravel Approx. 2% 3-6", 98% matrix (which is approx. 15% gravel, 10% sand, and 75% slightly plastic fines) Grey, wet, slightly permeable; stiff; homogeneous lacustrine; CL-ML. D.S. 3.1 (CL-ML)
6.2 - 11.0	Gravel, silty w/sand 12" max. - slst flags w/some subrounded to subangular cbls. Approx. 4% +6", 8% 3-6", 88% matrix (which is approx. 35% gravel, 30% sand, and 35% slightly plastic fines). Grey; wet; moderately permeable, dense; homogeneous till; GC-GM Note: Heavy seepage @ 1.4' and 3.0'

<u>TP #4, C/L Dam, 5/6/70, BAB, 1264.4</u>

0.0 - 2.0	Silt, w/sand and gravel 12" max. - subrounded to subangular slst w/some flags Approx. 2% +6", 4% 3-6", 94% matrix (which is approx. 20% gravel, 20% sand, and 60% slightly plastic fines). Greyish brown, moist, slightly permeable; v. stiff; homogeneous till; CL-ML
2.0 - 4.5	Silt Approx. 2% 3-6", 98% matrix (which is approx. 8% gravel, 12% sand, and 80% slightly plastic fines) Grey, moist; slightly permeable; v. stiff, homogeneous lacustrine; CL-ML.
4.5 - 10.0	Silt, w/sand and gravel 10" max. - subrounded to subangular slst w/some flags Approx. 3% +6", 5% 3-6", 92% matrix (which is approx. 17% gravel, 23% sand, and 60% slightly plastic fines) Grey, moist, slightly permeable, v. stiff, homogeneous till, CL-ML Note: Light seepage @ 2.0' or upper portion of pit in the slump area

LOGS

1

...subangular siltstone w/some flags
...97% matrix (which is approx. 20% gravel,
...ly plastic fines)
...; slightly permeable; stiff;
...ML. (B.B. 1.1, CL-ML)

...subangular siltstone w/some flags
...94% matrix (which is approx. 25% gravel,
...ly plastic fines)
...meable; very stiff to hard; homogeneous

...subangular siltstone w/some flags
...94% matrix (which is approx. 25% gravel,
...ly plastic fines)
...meable; very stiff to hard; homogeneous

...subangular siltstone w/some flags
...93% matrix (which is approx. 15% gravel,
...ly plastic fines)
...meable; very stiff to hard; homogeneous

...9.4'. Caving at completion below 9.4'

...84% matrix (which is approx. 30% gravel,
...plastic fines)
...permeable; loose; mixed alluvium; OH

...rix (which is approx. 15% gravel, 10%
...plastic fines)
...able; stiff; homogeneous lacustrine;
...)

...me subrounded to subangular cbls.
...88% matrix (which is approx. 35% gravel,
...ly plastic fines).
...meable; dense; homogeneous till; GC-GM

...4' and 3.0'

...subangular slst w/some flags
...94% matrix (which is approx. 20% gravel,
...ly plastic fines).
...ightly permeable; v. stiff; homogeneous

...rix (which is approx. 8% gravel, 12% sand,
...c fines)
...meable; v. stiff; homogeneous lacustrine;

...subangular slst w/some flags
...92% matrix (which is approx. 17% gravel,
...ly plastic fines)
...meable; v. stiff; homogeneous till;

...0" on upper portion of pit in the

TP #1, C/L Emb. 5/6/70, BAB. 1314.8

0.0 — 0.7 Topsoil - dark brown

0.7 - 2.6 Silt, w/sand and gravel
8" max. - subrounded to subangular slst w/some flags
Approx. 1% +6", 3% 3-6", 96% matrix (which is approx. 20% gravel, 15% sand, and 65% slightly plastic fines).
Mottled (grey-brown); moist; slightly permeable; stiff; homogeneous subsoil; CL-ML

2.6 - 12.8 Silt, gravelly w/sand
18" max. - subrounded to subangular slst w/some flags
Approx. 3% +6", 4% 3-6", 93% matrix (which is approx. 25% gravel, 20% sand, and 55% slightly plastic fines)
Greyish brown; moist; slightly permeable; v. stiff to hard; homogeneous till; CL-ML

12.8 - 14.5 Silt, sandy w/gravel
18" max. - subrounded to subangular slst w/some flags
Approx. 2% +6", 4% 3-6", 94% matrix (which is approx. 20% gravel, 25% sand, and 55% slightly plastic fines)
Gray; moist; slightly permeable; v. stiff to hard; homogeneous till; CL-ML

Note: Light seepage @ 1.0'. Some caving at completion.

TP #101, Borrow Area, 5/5/70, BAB. 1299.9

0.0 -.. 0.9 Topsoil - dark brown

0.9 - 2.6 Silt, gravel w/sand
6" max. - subrounded to subangular slst w/some flags
Approx. 1% + 6", 3% 3-6", 96% matrix (which is approx. 20% gravel, 15% sand, and 65% slightly plastic fines)
Mottled (grey-brown); moist; slightly permeable; stiff; homogeneous subsoil; CL-ML

2.6 - 14.4 Silt, gravel w/sand
12" max. - subrounded to subangular slst w/some flags
Approx. 2% +6", 5% 3-6", 93% matrix (which is approx. 25% gravel, 20% sand, and 55% slightly plastic fines)
Grayish brown; moist; slightly permeable; v. stiff to hard; homogeneous till; CL-ML

14.4 + Silt, sandy w/gravel
subrounded to subangular slst w/some flags
Approx. 2% +6", 5% 3-6", 93% matrix (which is approx. 20% gravel, 25% sand, and 55% slightly plastic fines)
Grey; moist; slightly permeable; v. stiff to hard; homogeneous till; CL-ML

Note: Dry Pit

TP #102, Borrow Area, 5/5/70, BAB. 1301.7

0.0 - 1.2 Topsoil - dark brown

1.2 - 2.6 Silt, gravelly w/sand
6" max. - subrounded to subangular slst w/some flags
Approx. 1% +6", 3% 3-6", 96% matrix (which is approx. 20% gravel, 15% sand, and 65% slightly plastic fines)
Mottled (grey-brown); moist; *slightly permeable; stiff;* homogeneous; subsoil CL-ML

2.6 - 15.0 Silt, gravelly w/sand
12" max. - subrounded to subangular slst w/some flags
Approx. 2% +6", 4% 3-6", 94% matrix (which is approx. 25% gravel, 20% sand, and 55% slightly plastic fines)
Greyish brown; moist; slightly permeable; v. stiff to hard; homogeneous till; CL-ML.

15.0 - 16.0 Silt, gravelly w/sand
8" max. - subrounded to subangular slst w/some flags
Approx. 2% +6", 4% 3-6", 94% matrix (which is approx. 20% gravel, 25% sand, and 55% slightly plastic fines)
Bluish grey (coloration due to water table); wet; slightly *permeable*; v. stiff to hard; homogeneous till; CL-ML

Note: Light seepage @ 7.0'

TP #103, Borrow Area, 5/5/70, BAB. 1314.2

0.0 - 0.7 Topsoil - dark brown

0.7 - 2.9 Silt, gravelly w/sand
6" max. - subrounded to subangular slst
Approx. 1% +6", 3% 3-6", 96% matrix (which is approx. 20% gravel, 15% sand, and 65% slightly plastic fines)
Mottled (grey-brown); moist; slightly permeable; *stiff*; homogeneous subsoil; CL-ML

2.9 - 13.0 Silt, gravelly w/sand
12" max. - subrounded to subangular slst
Approx. 2% +6", 4% 3-6", 94% matrix (which is approx. 25% gravel, 20% sand, and 55% slightly plastic fines)
Greyish brown; moist; slightly permeable; v. stiff to hard; homogeneous till; CL-ML

13.0 - 13.7 Silt, sandy w/gravel
14" max. - subrounded to subangular slst
Approx. 2% +6", 4% 3-6", 94% matrix (which is approx. 20% gravel, 25% sand, and 55% slightly plastic fines)
Gray; moist; slightly permeable; v. stiff to hard; homogeneous till; CL-ML.

Note: Light seepage at 1.0'.

TP #104, Borrow Area, 5/5/70, BAB. 1304.4

0.0 - 1.0 Topsoil, dark brown

1.0 - 2.3 Silt, gravelly w/sand
6" max. - subrounded to subangular slst w/some flags.
Approx. 1% +6", 3% 3-6", 96% matrix (which is approx. 20% gravel, 15% sand, and 65% slightly plastic fines)
Mottled (grey-brown); moist; slightlypermeable; stiff; homogeneous subsoil; CL-ML

2.3 - 13.0 Silt, gravelly w/sand
12" max. - subrounded to subangular slst w/some flags.
Approx. 2% +6", 5% 3-6", 93% matrix (which is approx. 25% gravel, 20% sand, and 55% slightly plastic fines)
Greyish brown; moist; slightly permeable; v. stiff to hard; homogeneous till; CL-ML

13.0 + Silt, sandy w/gravel
subrounded to subangular slst w/some flags.
Approx. 2% +6", 5% 3-6", 93% matrix (which is approx. 20% gravel, 25% sand, and 55% slightly plastic fines)
Gray; moist; slightly permeable; v. stiff to hard; homogeneous till; CL-ML

Note: Very light seepage at 2.0'.

TP #105, Borrow Area, 5/5/70, BAB. 1300.3

0.0 - 1.0 Topsoil - dark brown

1.0 - 4.6 Silt, gravelly w/sand
12" max. - subrounded to subangular slst w/some flags.
Approx. 1% +6", 3% 3-6", 96% matrix (which is approx. 20% gravel, 15% sand, and 65% slightly plastic fines)
Mottled (grey-brown); moist; slightly permeable; stiff; homogeneous subsoil; CL-ML

4.6 - 14.4 Silt, gravelly w/sand
14" max. - subrounded to subangular slst w/some flags.
Approx. 2% +6", 4% 3-6", 94% matrix (which is approx. 25% gravel, 20% sand, and 55% slightly plastic fines)
Greyish brown; moist; slightly permeable; v. stiff to hard; homogeneous till; CL-ML

14.4 - 15.2 Silt, sandy w/gravel
8" max. - subrounded to subangular slst w/some flags.
Approx. 2% +6", 4% 3-6", 94% matrix (which is approx. 20% gravel, 25% sand, and 55% slightly plastic fines)
Grey; moist; slightly permeable; v. stiff to hard; homogeneous till; CL-ML

Note: Light seepage at 7.5' and 2.4'.

TP #201, Emer. Spwy. 5/8/70, BAB. 1331.9

0.0 - 1.2 Topsoil - dark brown

1.2 - 4.0 Silt, w/sand and gravel
12" max. - subrounded to subangular slst w/some shale
Approx. 1% +6", 3% 3-6", 96% matrix (which is 20% gravel, 20% sand, and 60% slightly plastic fines)
Mottled (grey-brown); moist; slightly permeable; stiff; homogeneous subsoil CL-ML

4.0 - 14.0 Silt, sandy w/gravel
14" max. subrounded to subangular slst w/some shale
Approx. 3% +6", 5% 3-6", 92% matrix (which is approx. 20% gravel, 25% sand, and 55% slightly plastic fines)
Greyish brown; moist; slightly permeable; v. stiff to hard; homogeneous till; CL-ML

14.0 - 15.5 Silt, sandy w/gravel
10" max. - subrounded to subangular slst w/some shale
Approx. 3% +6", 5% 3-6", 92% matrix (which is approx. 20% gravel, 30% sand, and 50% slightly plastic fines)
Grey; moist; slightly permeable; v. stiff to hard; homogeneous till; CL-ML.

Note: Very light seepage at 7.2'.

AS BUILT

1-28-76

NEWTOWN-HOFFMAN CREEKS
WATERSHED PROJECT
FLOODWATER RETARDING DAM SITE 1
CHEMUNG COUNTY, NEW YORK
LOGS OF TEST HOLES

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed: Edward A. Beaton 5-70 | Approved: STATE CONS. ENGINEER
Drawn | Title
Traced | Sheet 23 of 28
Checked | Drawing No. NY-2284

PLATE 7

D'APPOLONIA

DRAWN BY	G. J. G.	CHECKED BY	BE	7/24/81	DRAWING NUMBER 80-778-B43
	5-27-81	APPROVED BY	JHD	7-24-81	

TP #202, Emer. Spwy. 5/4/70, BAB. 1330.8

0.0 - 1.4 Topsoil - dark brown

1.4 - 4.0 Silt, w/sand and gravel
10" max. - subrounded to subangular slst w/some shale
Approx. 1% +6", 3% 3-6", 94% matrix (which is approx. 20% gravel, 20% sand, and 60% slightly plastic fines)
Mottled (grey-brown); moist; slightly permeable; stiff; homogeneous subsoil; CL-ML

4.0 - 14.6 Silt, sandy w/gravel
14" max. - subrounded to subangular slst w/some shale
Approx. 3% +6", 5% 3-6", 92% matrix (which is approx. 25% gravel, 25% sand, and 50% slightly plastic fines)
Greyish brown; moist; slightly permeable; v. stiff to hard; homogeneous till; CL-ML

Note: Very light seepage at bottom of pit.

TP #203, Emer. Spwy. 5/4/70, BAB. 1340.6

0.0 - 1.5 Topsoil - dark brown

1.5 - 4.0 Silt, w/sand and gravel
6" max. - subrounded to subangular slst w/some shale
Approx. 1% +6", 3% 3-6", 96% matrix (which is approx. 20% gravel, 20% sand, and 60% slightly plastic fines)
Mottled (gray-brown); moist; slightly permeable; stiff; homogeneous subsoil; CL-ML

4.0 - 13.0 Silt, sandy w/gravel
14" max. - subrounded to subangular slst w/some shale
Approx. 3% +6", 5% 3-6", 92% matrix (which is approx. 20% gravel, 25% sand, and 55% slightly plastic fines)
Greyish brown; moist; slightly permeable; v. stiff to hard; homogeneous till; CL-ML

13.0 - 16.6 Silt, sandy w/gravel
12" max. - subrounded to subangular slst w/some shale
Approx. 3% +6", 5% 3-6", 92% matrix (which is approx. 20% gravel, 30% sand, and 50% slightly plastic fines)
Grey; moist; slightly permeable; v. stiff to hard; homogeneous till; CL-ML

Note: Light seepage at 3.0'

TP #204, Emer. Spwy. 5/4/70, BAB. 1345.7

0.0 - 0.9 Topsoil - dark brown

0.9 - 2.6 Silt, w/sand and gravel
8" max. - subrounded to subangular slst w/some shale
Approx. 1% +6", 3% 3-6", 96% matrix (which is approx. 20% gravel, 20% sand, and 60% slightly plastic fines)
Mottled (grey-brown); moist; slightly permeable; stiff; homogeneous subsoil; CL-ML

2.6 - 11.0 Silt, sandy w/gravel
14" max. - subrounded to subangular slst w/some shale
Approx. 3% +6", 5% 3-6", 92% matrix (which is approx. 20% gravel, 25% sand, and 55% slightly plastic fines)
Greyish brown, moist; slightly permeable; v. stiff to hard (extremely dense at bottom w/boulders); homogeneous till; CL-ML

Note: Light seepage at 1.0' near interface of topsoil and subsoil.

TP #205, Emer. Spwy. 5/4/70, BAB. 1346.0

0.0 - 1.0 Topsoil - dark brown

1.0 - 2.8 Silt, w/sand and gravel
8" max. - subrounded to subangular slst w/some shale
Approx. 2% +6", 4% 3-6", 94% matrix (which is approx. 20% gravel, 20% sand, and 60% slightly plastic fines)
Mottled (grey-brown); moist; slightly permeable; stiff; homogeneous subsoil; CL-ML

2.8 - 13.4 Silt, w/gravel and sand
14" max. - subrounded to subangular slst w/some shale
Approx. 3% +6", 5% 3-6", 92% matrix (which is approx. 20% gravel, 25% sand, and 55% slightly plastic fines)
Greyish brown, moist; slightly permeable; v. stiff to hard; homogeneous till; CL-ML

13.4 - 14.4 Silt, sandy w/gravel
8" max. - subrounded to subangular slst w/some shale
Approx. 2% +6", 4% 3-6", 94% matrix (which is approx. 20% gravel, 30% sand, and 50% slightly plastic fines)
Grey; moist; slightly permeable; v. stiff to hard; homogeneous till; CL-ML. D.S. 205.1 (OC-GM)

Note: Light seepage at 1.6' to 9.0'

TP #209, Emer. Spwy. 5/5/70, BAB. 1348.8

0.0 - 1.0 Topsoil - dark brown

1.0 - 2.5 Silt, w/sand and gravel
8" max. - subrounded to subangular slst w/some shale
Approx. 2% +6", 4% 3-6", 94% matrix (which is approx. 20% gravel, 20% sand, and 60% slightly plastic fines)
Mottled (gray-brown), moist, slightly permeable, stiff, homogeneous subsoil, CL-ML

2.5 - 14.5 Silt, sandy w/gravel
12" max. - subrounded to subangular slst w/some shale
Approx. 3% +6", 5% 3-6", 92% matrix (which is approx. 20% gravel, 25% shale, and 55% slightly plastic fines)
Greyish brown; moist; slightly permeable, v. stiff to hard; homogeneous till; CL-ML.

Note: Light seepage at 7.0'

TP #207, Emer. Spwy. 5/5/70, BAB. 1346.0

0.0 - 0.9 Topsoil - dark brown

0.9 - 3.5 Silt, w/sand and gravel
8" max. - subangular to subrounded slst w/some shale
Approx. 2% +6", 4% 3-6", 94% matrix (which is approx. 20% gravel, 20% sand, and 60% slightly plastic fines)
Mottled (grey-brown), moist, slightly permeable, stiff, homogeneous subsoil, CL-ML

3.5 - 15.5 Silt, w/gravel and sand
14" max - subangular to subrounded slst w/some shale
Approx. 3% +6", 4% 3-6", 94% matrix (which is approx. 20% gravel, 25% sand, and 55% slightly plastic fines)
Greyish-brown, moist; slightly permeable, v. stiff to hard; homogeneous till; CL-ML

Note: Light seepage at 1.2'.

TP #208, Emer. Spwy. 5/4/70, BAB. 1337.2

0.0 - 0.9 Topsoil - dark brown

0.9 - 2.5 Silt, w/sand and gravel
8" max. - subrounded to subangular slst w/some shale
Approx. 2% +6', 4% 3-6", 94% matrix (which is approx. 20% gravel, 20% sand, and 60% slightly plastic fines)
Mottled (grey-brown); moist; slightly permeable; stiff; homogeneous subsoil; CL-ML

2.5 - 15.0 Silt, sandy w/gravel
14" max. - subrounded to subangular slst w/some shale
Approx. 2% +6', 4% 3-6", 94% matrix (which is approx. 20% gravel, 25% sand, and 55% slightly plastic fines)
Grayish brown; moist to wet @ 6.3+', slightly permeable; v. stiff to hard, homogeneous till, CL-ML

Note: Light seepage at 6.3' and 0.9'

TP #209, Emer. Spwy. 5/5/70, BAB. 1347.4

0.0 - 1.4 Topsoil - dark brown

1.4 - 3.0 Silt, w/gravel and sand
6" max. - subangular and subrounded slst w/some flags
Approx. 1% +6", 3% 3-6", 96% matrix (which is approx. 30% gravel, 15% sand, and 65% slightly plastic fines)
Mottled (grey-brown); moist; slightly permeable; stiff; homogeneous subsoil; CL-ML

3.0 - 14.8 Silt, w/gravel and sand
14" max. - subangular and subrounded slst w/some flags
Approx. 2% +6", 4% 3-6", 94% matrix (which is approx. 25% gravel, 20% sand, and 55% slightly plastic fines)
Greyish brown; moist; slightly permeable; v. stiff to hard; homogeneous till; CL-ML

14.8 + Silt, sandy w/gravel
14" max. - subrounded to subangular slst w/some flags
Approx. 2% +6", 4% 3-6", 94% matrix (which is approx. 20% gravel, 25% sand, and 55% slightly plastic fines)
Grey; moist; slightly permeable; v. stiff to hard; homogeneous till; CL-ML

Note: V. light seepage at 6.8'

TP #210, Emer. Spwy. 5/5/70, BAB. 1334.3

0.0 - 1.6 Topsoil - dark brown

1.6 - 3.4 Silt w/sand and gravel
6" max. - subround to subangular slst w/some shale
Approx. 1% +6", 3% 3-6", 96% matrix (which is approx. 15% gravel, 15% sand, and 70% slightly plastic fines)
Mottled (gray-brown); moist; slightly permeable; stiff; homogeneous subsoil; CL-ML

3.4 - 14.3 Silt, gravelly w/sand
16" max. - subround to subangular slst w/some flags
Approx. 2% +6", 4% 3-6", 94% matrix (which is approx. 25% gravel, 20% sand, and 55% slightly plastic fines)
Greyish brown; moist; slightly permeable; v. stiff to hard; homogeneous till; CL-ML. D.S. 210.1 (OC-GM)

Note: Very light seepage at 3.4'

p slst w some shale
n (which is approx. 20% gravel,
tic fines)
ghly permeable. stiff. homogeneous

p slst w some shale
n (which is approx. 20% gravel,
stic fines)
rmeable. v. stiff to hard;

slst w/some shale
n (which is approx. 20% gravel,
ic fines)
ghly permeable, stiff. homogeneous

d slst w/some shale
n (which is approx. 20% gravel,
tic fines)
meable. v. stiff to hard;

slst w/some shale
n (which is approx. 20% gravel,
tic fines)
ghly permeable; stiff; homogeneous

r slst w/some shale
n (which is approx. 20% gravel,
tic fines)
, slightly permeable; v. stiff

0.9'

d slst w/some flags
n (which is approx. 20% gravel,
tic fines)
ghly permeable; stiff; homogeneous

ded slst w/some flags
n (which is approx. 25% gravel,
tic fines)
meable; v. stiff to hard; homogeneous

r slst w/some flags
n (which is approx. 20% gravel,
tic fines)
, stiff to hard; homogeneous till;

st w/some shale
(which is approx. 15% gravel,
fines)
ly permeable; stiff; homogeneous

st w/some flags
(which is approx. 25% gravel,
fines)
able; v. stiff to hard; homogeneous

<u>TP #211, Emer. Spwy, 5/5/70, BAB, 1320.3</u>

0.0 - 0.9 Topsoil - dark brown

0.9 - 3.2 Silt, gravelly w/sand
6" max. - subangular to subrounded slst w/some shale
Approx. 1% +6", 3% 3-6", 96% matrix (which is approx. 20% gravel, 10% sand, and 70% slightly plastic fines)
Mottled(grey-brown), moist; slightly permeable; stiff; homogeneous subsoil; CL-ML

3.2 - 14.0 Silt, sandy w/gravel
12" max. - subangular to subrounded slst w/some shale
Approx. 2% +6", 4% 3-6", 94% matrix (which is approx. 20% gravel, 25% sand,and 55% slightly plastic fines)
Greyish brown; moist: slightly permeable; v. stiff to hard; homogeneous till; CL-ML

Note: Light seepage at 2.2'

<u>TP #402, Str. Channel, 5/6/70, BAB 1282.6</u>

0.0 - 0.8 Topsoil - dark brown

0.8 - 2.2 Gravel, silty w/sand
12" max. - Slst flags
Approx. 5% +6", 10% 3-6", 85% matrix (which is approx. 40% gravel, 35% sand, and 25% non-plastic fines)
Brown; saturated; rapidly permeable; loose, homogeneous alluvium; GM

2.2 - 8.5 Gravel, silty w/sand
16" max. - Slst flags w/some subrounded to subangular cbls.
Approx. 3% +6", 18% 3-6", 79% matrix (which is approx. 40% gravel, 30% sand, and 30% non-plastic fines)
Gray; saturated; rapidly permeable; loose; homogeneous alluvium; GM

8.5 - 12.0 Gravel, silty w/sand
14" max. - subrounded to subangular slst w/some flags
Approx. 5% +6", 7% 3-6", 88% matrix (which is approx. 35% gravel, 25% sand, and 40% non-plastic fines)
Gray; wet; moderately permeable; dense; homogeneous till; GM

Note: Heavy seepage at 2.2'

<u>TP #501, Drain Line, 5/7/70, BAB, 1283.4</u>

0.0 - 0.8 Topsoil - dark brown

0.8 - 2.0 Silt, w/sand and gravel
6" max. - subrounded to subangular slst w/some flags
Approx. 1% +6", 2% 3-6", 97% matrix (which is approx. 20% gravel, 20% sand, and 60% slightly plastic fines)
Mottled (grey-brown); moist;slightly permeable; stiff, homogeneous subsoil CL-ML

2.0 - 9.0 Silt, gravelly w/sand
12" max. - subrounded to subangular slst w/some flags
Approx. 2% +6", 4% 3-6", 94% matrix (which is approx. 23% gravel, 17% sand, and 60% slightly plastic fines)
Brown; moist; slightly permeable; v. stiff to hard; homogeneous; till; CL-ML. D.S. 501.1 (CL-ML)

9.0 - 12.5 Silt, gravelly w/sand
14" max. - subrounded to subangular slst w/some flags
Approx. 2% +6", 4% 3-6", 94% matrix (which is approx. 20% gravel, 15% sand, and 65% slightly plastic fines)
Gray; moist; slightly permeable; v. stiff to hard; homogeneous till; CL-ML. D.S. 501.2 (GM)

Note: Dry Pit.

<u>TP #502, Drain Line, 5/6/70, BAB, 1283.9</u>

0.0 - 1.0 Topsoil - dark brown

1.0 - 4.5 Gravel, silty w/sand
14" max. - slst flags
Approx. 5% +6", 10% 3-6", 85% matrix (which is approx. 40% gravel, 35% sand, and 25% non-plastic fines)
Brown; saturated; rapidly permeable; loose; homogeneous alluvium; GM. D.S. 502.1 (GM)

4.5 - 10.0 Sand, silty w/gravel
14" max. - slst flags w/subround to subangular cbls
Approx. 8% +6", 13% 3-6", 79% matrix (which is approx. 35% gravel, 45% sand, and 20% non-plastic fines)
Grey; saturated; rapidly permeable; loose; homogeneous till (washed) SM

10.0 - 11.0 Silt, w/sand and gravel
12" max. - slst flags w/subrounded to subangular cbls
Approx. 5% +6", 7% 3-6", 88% matrix (which is approx. 20% gravel, 20% sand, and 60% slightly plastic fines)
Grey; wet; slightly permeable; dense; homogeneous till; CL-ML

Note: Heavy seepage at 1.0'

<u>TP #503, Drain Line, 5/6/70, BAB, 1287.2</u>

0.0 - 2.0 Topsoil - dark brown, including subsoil

2.0 - 5.5 Silt, gravelly w/sand
14" max. - subround to subangular slst w/some flags
Approx. 2% +6", 4% 3-6", 94% matrix (which is approx. 25% gravel, 20% sand, and 55% slightly plastic fines)
Mottled (grey-brown); moist; slightly permeable; v. stiff; homogeneous till; CL-ML

5.5 - 14.0 Silt, gravelly w/sand
18" max. - subround to subangular slst w/some flags
Approx. 3% +6", 5% 3-6", 92% matrix (which is approx. 25% gravel, 15% sand, and 60% slightly plastic fines)
Gray; moist; slightly permeable; v. stiff; homogeneous till; CL-ML

Note: Light seepage at 5.3'

<u>TP #601, Other, 5/6/70, BAB, 1288.4</u>

0.0 - 1.4 Topsoil - dark brown

1.4 - 5.3 Silt, gravelly w/sand
18" max. - subrounded to subangular slst w/some flags
Approx. 3% +6", 5% 3-6", 92% matrix (which is approx. 25% gravel, 20% sand, and 55% slightly plastic fines)
Brown; moist; slightly permeable; v. stiff; homogeneous till; CL-ML

5.3 - 12.5 Sand, silty w/gravel
14" max - subrounded to subangular slst w/some flags
Approx. 3% +6", 7% 3-6", 90% matrix (which is approx. 30% gravel, 35% sand, and 35% slightly plastic fines)
Gray; v. wet; moderately permeable; loose; homogeneous till (washed); SC-SM

12.5 - 14.0 Silt, sandy w/gravel
12" max. - subrounded to subangular slst w/some flags
Approx. 2% +6", 4% 3-6", 94% matrix (which is approx. 15% gravel, 20% sand, and 65% slightly plastic fines)
Gray; wet; slightly permeable; v. stiff, homogeneous till; CL-ML.

Note: Moderate seepage @ 6.4' - Caved at completion.

<u>TP #602, Other, 5/6/70, BAB, 1286.4</u>

0.0 - 1.2 Topsoil - dark brown.

1.2 - 3.5 Silt, w/sand and gravel
14" max. - subround to subangular slst w/some flags
Approx. 2% +6", 4% 3-6", 94% matrix (which is approx. 20% gravel, 20% sand, and 60% slightly plastic fines)
Greyish brown, moist; slightly permeable; v. stiff; homogeneous; till; CL-ML

3.5 - 8.8 Silt
Approx. 2% 3-6", 98% matrix (which is approx. 0% gravel, 12% sand, and 90% slightly plastic fines)
Grey; moist; slightly permeable; v. stiff; homogeneous lacustrine; CL-ML

8.8 - 13.0 Silt, w/sand and gravel
12" max. - subround to subangular slst w/some flags
Approx. 3% +6", 5% 3-6", 92% matrix (which is approx. 17% gravel, 23% sand, and 60% slightly plastic fines)
Greyish brown; moist; slightly permeable; v. stiff; homogeneous till; CL-ML

Note: Dry pit.

AS BUILT

1-28-76

NEWTOWN-HOFFMAN CREEKS
WATERSHED PROJECT
FLOODWATER RETARDING DAM SITE I
CHEMUNG COUNTY, NEW YORK
LOGS OF TEST HOLES

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

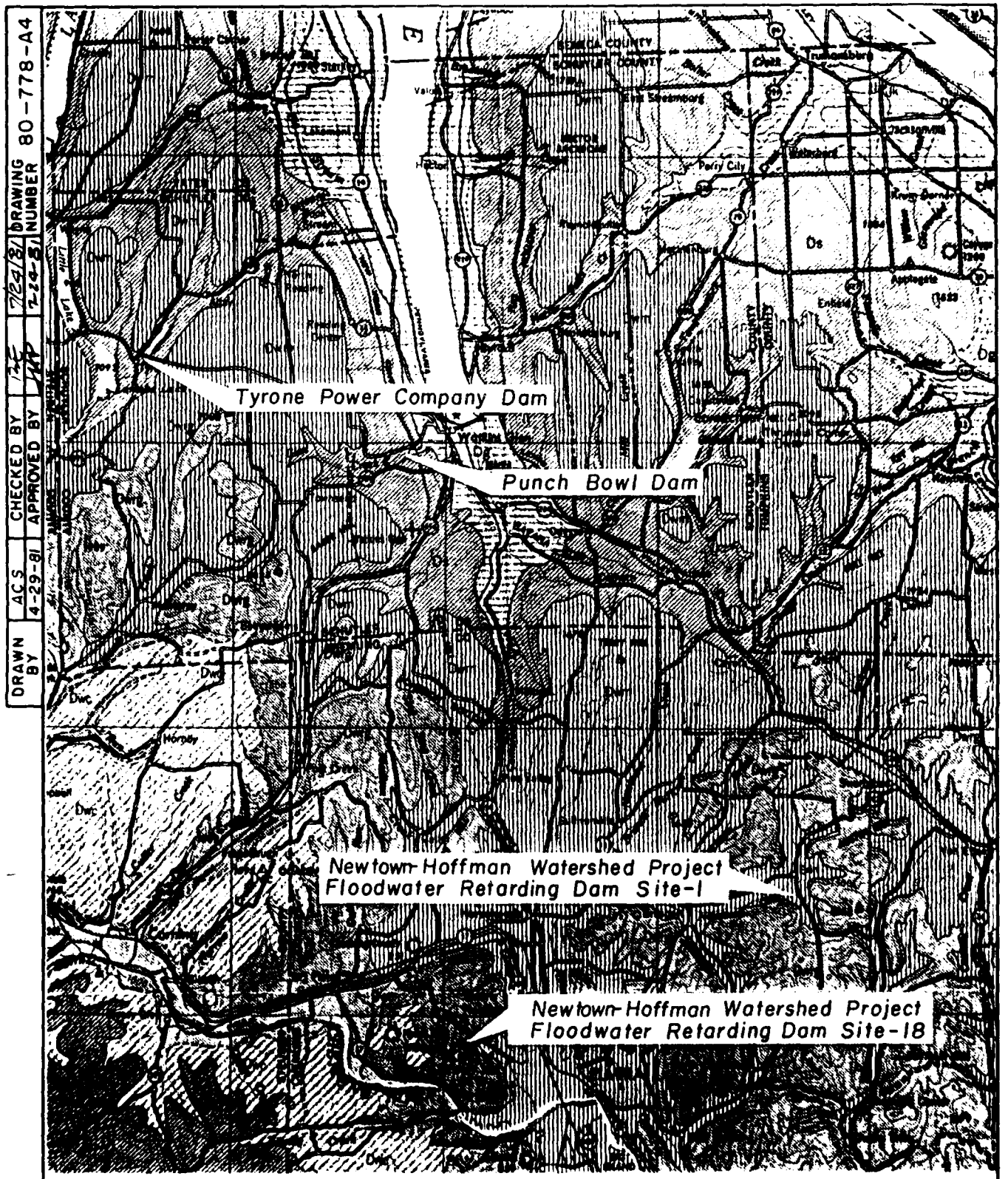
Logged Bruce A Baxter 5-70 | Date | Richard T. Phillips
Title STATE CONS. ENGINEER
Drawn
Traced
Checked
Sheet 22 | Drawing No. NY-2284-

PLATE 8

D'APPOLONIA

APPENDIX F

GEOLOGY MAP



DRAWN BY	ACS	CHECKED BY		7/24/81
	4-29-81	APPROVED BY		7-24-81

DRAWING NUMBER 80-778-A4

GEOLOGY MAP

REFERENCE

GEOLOGIC MAP OF NEW YORK, FINGER LAKES SHEET
DATED 1970, SCALE 1 250,000

DAPTOLONIA

19 1293 HERCULENE A&B SMITH CO PGH PA LT1930-1079

DRAWN BY	ACS	CHECKED BY	JE	5/7/81	DRAWING NUMBER 80-778-A6
	4-29-81	APPROVED BY	✓ HD	5-7-81	

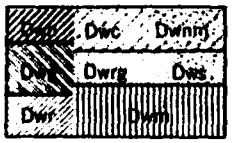
LEGEND

CANADAWAY GROUP
800-1200 ft. (240-370 m.)

Dcy — Machias Formation—shale, siltstone; Rushford Sandstone; Caneadea, Canisteo, and Hume Shales, Canaseraga Sandstone; South Wales and Dunkirk Shales; In Pennsylvania- Towanda Formation—shale, sandstone.

JAVA GROUP
300-700 ft. (90-210 m.)

Dj — Wiscoy Formation—sandstone, shale; Hanover and Pipe Creek Shales



WEST FALLS GROUP
1100-1600 ft. (340-490 m.)

Dwc — Nunda Formation—sandstone, shale.

Dwg — West Hill and Gardeau Formations—shale, siltstone; Roricks Glen Shale; upper Beers Hill Shale; Grimes Siltstone.

Dwr — lower Beers Hill Shale; Dunn Hill, Millport, and Moreland Shales

Dwc — Nunda Formation—sandstone, shale; West Hill Formation—shale, siltstone; Corning Shale.

Dwnm — "New Milford" Formation—sandstone, shale.

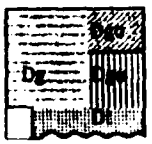
Dwrg — Gardeau Formation—shale, siltstone; Roricks Glen Shale.

Dws — Slide Mountain Formation—sandstone, shale, conglomerate.

Dwm — Beers Hill Shale; Grimes Siltstone; Dunn Hill, Millport, and Moreland Shales

SONYEA GROUP
200-1000 ft. (60-300 m.)

Ds — In west: Cashaqua and Middlesex Shales.
In east: Rye Point Shale, Rock Stream ("Enfield") Siltstone; Pulteney, Sawmill Creek, Johns Creek, and Montour Shales.



GENESEE GROUP AND TULLY LIMESTONE
200-1000 ft. (60-300 m.)

Dg — West River Shale; Genundewa Limestone; Penn Yan and Geneseo Shales; all except Geneseo replaced eastwardly by Ithaca Formation—shale, siltstone and Sherburne Siltstone.

Dgo — Oneonta Formation—shale, sandstone

Dgn — Unadilla Formation—shale, siltstone.

Dt — Tully Limestone.

LOCKPORT GROUP
80-175 ft. (25-55 m.)

Sl — Oak Orchard and Penfield Dolostones, both replaced eastwardly by Sconondoa Formation—limestone, dolostone.

GEOLOGY MAP LEGEND

REFERENCE

GEOLOGIC MAP OF NEW YORK, FINGER LAKES SHEET
DATED 1970, SCALE 1:250,000

D'APPOLONIA

APPENDIX G

STABILITY ANALYSES

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE - Soil Mechanics Laboratory

XXXXXXXXXXXXXXXXXXX 800 "J" Street, Lincoln, Nebraska 68508

SUBJECT: ENG 22-5, New York WP-08, Newton-Hoffman, Site #1 (Chemung County) DATE: February 4, 1971

TO: Richard L. 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, 1 sheet.
4. Form SCS-357, Summary - Slope Stability Analysis, 2 sheets.
5. Figure No. 1, Compactive Effort vs. Compacted Density, 1 sheet.
6. Investigational Plans and Profiles.

DISCUSSION

GENERAL.

The proposed 54-foot high damage class c flood control dam is located in the Allegheny Plateau physiographic area of Chemung County. The foundation material is principally glacial till with some lacustrine material in the floodplain section.

FOUNDATION.

A. Soil Classification. Foundation samples were not submitted to the Soil Mechanics Laboratory for testing. The field classification, along with gradation and plasticity data obtained in the field laboratory, are included in the geology report.

EMBANKMENT.

A. Soil Classification. One sample of glacial till was submitted from the borrow area. The sample contains 33 percent gravel size material and 52 percent fines. The LL is 25 and the PI is 6. It is classed as a CL-ML.

A dispersion test indicated 32 percent dispersion in the fraction finer than 0.005 mm.

B. Compacted Density. A Standard Proctor compaction test was made on the minus No. 4 fraction. The maximum dry density obtained was 120.5 pcf and the optimum moisture content is 12 percent.

In addition to the Standard Proctor test, tests were made at varying compactive efforts, and the data obtained are shown on the attached Figure No. 1.

C. Shear Strength. The till submitted from Site 3A on this watershed appear to be comparable to the till at this site. Consolidated undrained triaxial shear tests were made on the till from Site 3A at 95 percent of Proctor density and low shear strength parameters were obtained. It appeared that a higher test density was necessary, and the sample from this site was tested at 97 percent of Proctor density. Low shear strength parameters were obtained at this density also, and additional tests were made on the Site 3A samples of till at 100 percent of Proctor density. The shear test data obtained on the samples from Site 3A and the sample from this site are summarized as follows:

Site No.	Sample No.	% < No. 4	LL	PI	Class	Test Density		B Parameter	Shear Strength Parameters			
									Total Stress		Effective Stress	
						γ_d pcf	% Proctor		ϕ deg	c psf	$\bar{\phi}$ deg	$\bar{c}$ psf
1	204.1	67	25	6	CL-ML	116.8-118.5	97-98.5	0.97-0.98	18½	0	26½	0
3A	207.1	89	19	2	ML	114.9-115.7	95-95.5	0.96-1.0	19	0	26½	0
						118.7-119.4	98-98.7	0.95-0.96	21	575	32	0
3A	108.1	70	29	9	CL	111.0-111.2	94.5	0.96-0.99	12	175	22½	125
						116.7-118.2	100	0.98-1.0	15	425	25	200

The data indicates that these materials have low shear strength at 95 percent of Proctor density. The compaction study shown on Figure No. 1 indicates that 95 percent of Proctor density is obtained with a compactive effort of about 5000 ft.lbs. per cubic foot, which is in the range of 40 percent of Standard Proctor compactive effort.

The low shear strength parameters obtained at 95 percent of Proctor density may result because of the relatively small amount of energy applied to obtain this density. The laboratory data indicate that this type of material should compact quite well on the fill and that a density in the range of 100 percent of Proctor is necessary.

On the basis of the testing from this site and from Site 3A, we suggest that the shear strength parameters obtained on the till at 100 percent of Proctor density from Site 3A be used for this site also.

SLOPE STABILITY.

The stability of the proposed 3:1 upstream slope and the $2\frac{1}{2}$:1 downstream slope was checked with a Swedish circle method of analyses and with a block method of analyses. The circle analyses considered the embankment only and it was made with the computer and the SCS program. The NavDocks block method was used and it considered the embankment and 2 feet of $\phi = 35°$, $c = 0$ foundation material. The upstream slope was analyzed for the full drawdown condition and the downstream slope was analyzed for the full drawdown condition with a drain at the $c/b = 0.6$ point.

The circle analyses for the 3:1 upstream slope with planned 10-foot berm, using total stress shear strength parameters of $\phi = 15°$, $c = 425$ psf, shows a factor of safety of 1.36. The block analyses, considering the foundation, shows a factor of safety of 1.59. The circle analyses on the downstream slope shows that a 20-foot berm is required at elevation 1300 in order to obtain an acceptable factor of safety (Trial 5A, $F_s = 1.52$).

An infinite slope analysis was made for the upstream slope of Site 3A considering the effective stress shear strength parameters of $\bar{\phi} = 32°$, $\bar{c} = 0$. For the condition of parallel flow, a 3:1 slope has a factor of safety of 1.02 and a $3\frac{1}{2}$:1 slope has a factor of safety of 1.19. For the condition of horizontal flow, a 3:1 slope has a factor of safety of 0.93 and a $3\frac{1}{2}$:1 slope has a factor of safety of 1.12.

CONCLUSIONS AND RECOMMENDATIONS

A. Site Preparation. The material designated as F in the floodplain and described as floodplain silt and topsoil was not tested for strength; therefore, we suggest that it be stripped from the foundation area of the dam.

The material designated as slump on the lower part of the left abutment should be removed from the base area of the dam and we concur with the proposal to excavate the slope to 2:1.

B. Cutoff. We concur with the proposal to bottom the cutoff trench in the till and the lacustrine material underlying the GM alluvium which is designated as material A. On the abutments, the trench should bottom in till below the zone affected by surface disturbances. A minimum trench depth of 4 feet is suggested.

We suggest that the trench backfill be compacted to 100 percent of Proctor density.

C. Principal Spillway. It is reported that no unusual problems are expected.

D. Drain. We recommend that a foundation trench drain be used to provide a controlled outlet for seepage that may be expected to by-pass the cutoff. We suggest that the drain be located at about the c/b = 0.6 point, and we suggest that it be carried up the abutments to about elevation 1305. In the floodplain, the trench should extend through the GM alluvium designated as material A and we suggest that it penetrate the till on the abutments to at least a 4-foot depth.

When the cutoff trench is opened, the conditions on the left abutment should be evaluated to determine if additional drainage measures are required.

The filter requirements should be checked in order to meet the criteria outlined in Soil Mechanics Note No. 1.

E. Embankment Design.

1. Placement of Materials. We recommend that the till used for the embankment be placed at a minimum of 100 percent of Standard Proctor density. The placement moisture content should be near optimum.

2. Slopes. The following slopes are suggested:

a. Upstream: $3\frac{1}{2}$:1 in the area where the slope will be subjected to drawdown. A steeper slope can be used above this point. The test data indicate that the shear strength parameters are quite sensitive to changes in density and, since it appears possible that the effective $\bar{c}$ parameter might be 0, we are suggesting the flatter slope to reduce the possibility of shallow slides developing during drawdown. Your experience with these materials may indicate that a 3:1 slope would be satisfactory, however.

b. Downstream. $2\frac{1}{2}$:1 with a 20-foot berm at elevation 1300.

3. Settlement. An overfill allowance of 0.75-foot is suggested to compensate for residual consolidation.

Prepared by:

Lorn P. Dunnigan, Head
Soil Mechanics Laboratory

Attachments

cc: Bernard S. Ellis, Syracuse, N.Y.
Loring C. Ibbitson, Syracuse, N.Y.
D. W. Shanklin, Binghamton, N.Y.
Neil F. Bogner, Upper Darby EWPU

MATERIALS TESTING REPORT	U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE	TRIAXIAL SHEAR TEST with pore pressure measured

PROJECT and STATE: HOUSTON BASEMENT SITE 1 NEW JERSEY

SAMPLE LOCATION: ENV. EFFECTS MATERIAL C

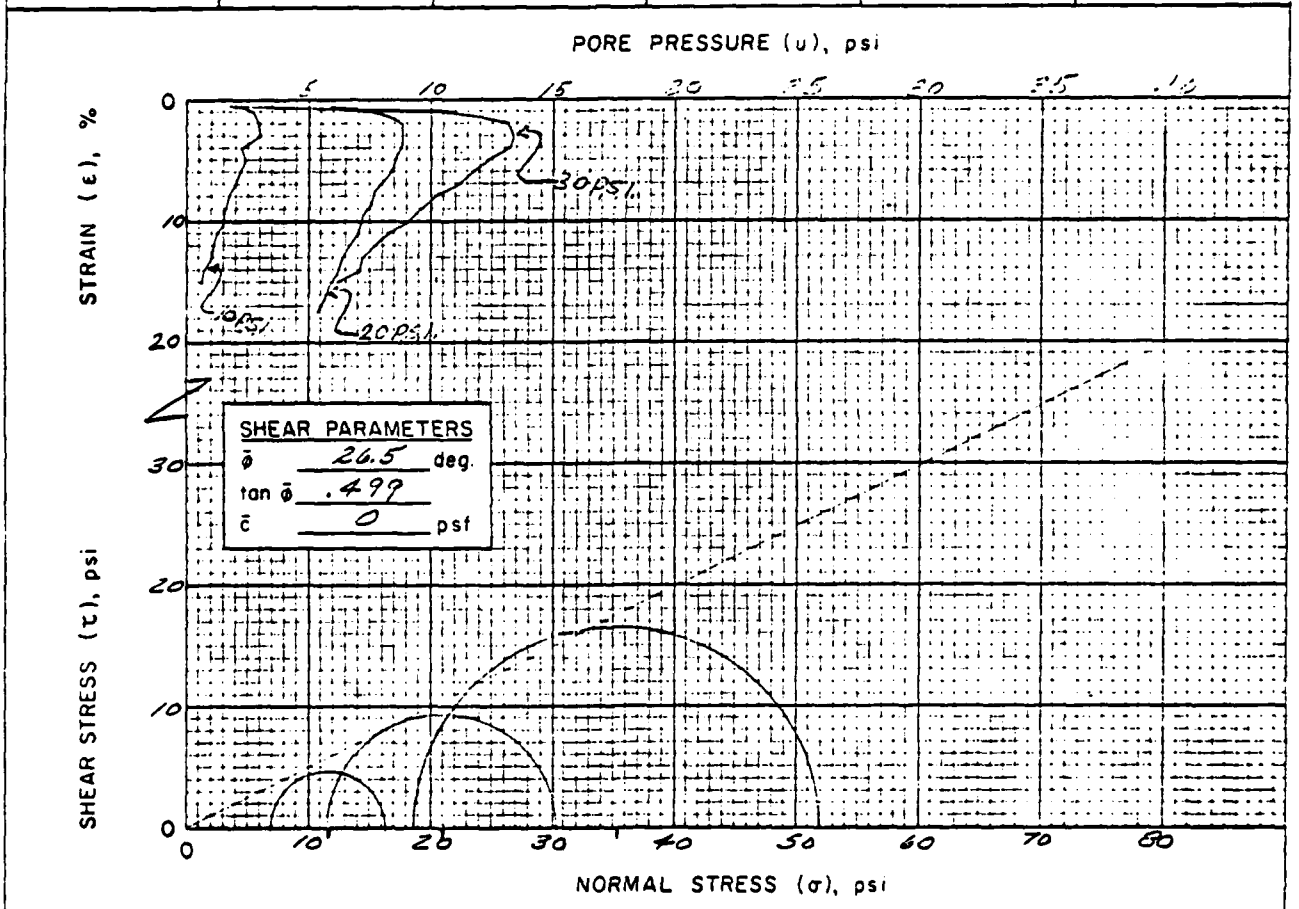
TYPE OF SAMPLE: CONSOLIDATED

TESTED AT: SOIL LABORATORY

APPROVED BY:

DATE:

MINOR PRINCIPAL STRESS, σ_3 (psi)	PORE PRESSURE, u (psi)	EFFECTIVE MINOR PRINCIPAL STRESS, $\bar{\sigma}_3$ (psi)	DEVIATOR STRESS, $\sigma_1 - \sigma_3$ (psi)	FAILURE CRITERIA	AXIAL STRAIN AT FAILURE, ϵ (%)
10	3.0	7.0	9.3		3.0
20	8.4	11.6	18.7		6.1
30	11.2	18.8	33.1		7.0



REMARKS BACKPRESSURED

G.H.G.

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

PROJECT and STATE: [illegible] - Hackensack Site 1 [illegible] | SAMPLE LOCATION: Emb. Spwy. Material C

FIELD SAMPLE NO.: 324.1 | DEPTH: 2.6 - 11.6 | GEOLOGIC ORIGIN:

TYPE OF SAMPLE: Compacted | TESTED AT: SML - Lincoln | APPROVED BY: | DATE:

INDEX TEST DATA

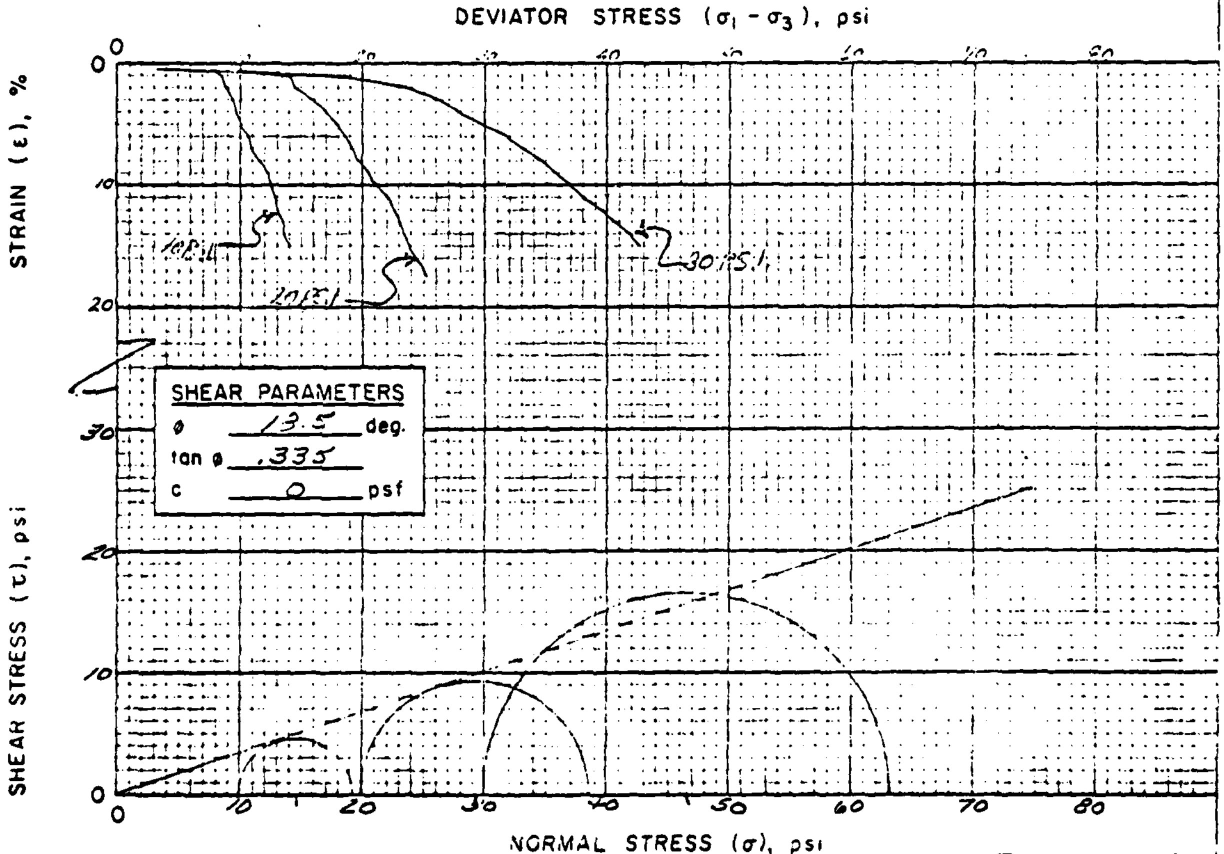
USCS CL-ML ; LL 25 ; PI 6
% FINER (mm): 0.002 10 ; 0.005 16 ; 0.074 (#200) 52
G_s (-#4) 2.75 ; G_s (+#4) ____
STANDARD: γ_d MAX. 120.5 pcf; w_o 10.5 %
MODIFIED: γ_d MAX. ____ pcf; w_o ____ %

SPECIMEN DATA

HEIGHT 3.0 "; DIAMETER 1.4 "
MATERIALS TESTED PASSED #4 SIEVE
METHOD OF PREPARATION Molded by Tamping in 5 Lifts
MOLDING MOISTURE 13.0 %
MOLDED AT 97.2 % OF γ_d MAXIMUM

TYPE OF TEST: UU ☐ Q; CU ☐ R; $\overline{CU}$ ☑ S; CD ☐ S

DRY DENSITY INITIAL pcf ☑ g/cc ☐	CONSOLIDATED pcf ☐ g/cc ☐	S Bparameter	MOISTURE CONTENT, % START OF TEST	DEG. OF SAT. AT START OF TEST	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 (%)
116.8		0.93			13.1	15.83	10	9.3	3.0
117.6		0.78			13.0	17.58	20	18.7	6.1
118.5		0.97			12.9	16.90	30	33.1	7.0



SHEAR PARAMETERS
φ 13.5 deg.
tan φ .335
c 0 psf

REMARKS Backpressured

[illegible] / J.H.J.

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

PROJECT and STATE: Newtown Hoffman #1 New York

FIELD SAMPLE NO	LOCATION	DEPTH
204.1	Em. Spwy Material C	2.6' - 11'

GEOLOGIC ORIGIN	TESTED AT	APPROVED BY	DATE
	SML-Lincoln		

CLASSIFICATION CL-ML LL 25 PI 6

MAX. PARTICLE SIZE INCLUDED IN TEST < #4 "

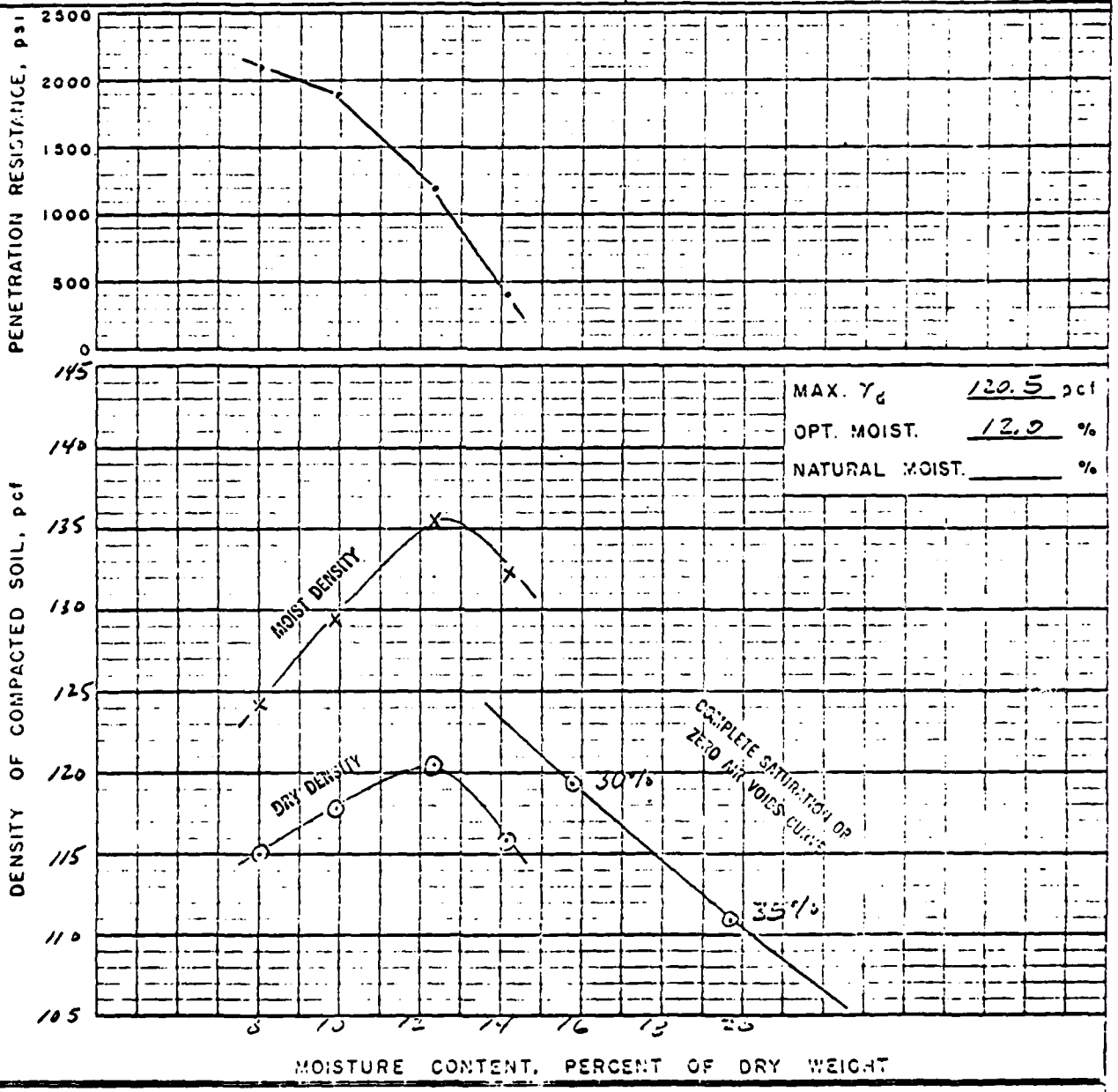
SPECIFIC GRAVITY (G_s) { MINUS NO. 4 2.73 ; PLUS NO. 4 2.73

CURVE NO. 1 OF 1

STD. (ASTM D-698) ☒; METHOD A

MOD. (ASTM D-1557) ☐; METHOD

OTHER TEST ☐ (SEE REMARKS)



REMARKS

CURVE IS FOR THE MINUS NO. 4 FRACTION

GRADATION OF TOTAL SAMPLE

< NO. 200 52 %; < NO. 4 67 %; < 3 IN. 100 %

Form SCS 357
Rev 6-65

MATERIALS TESTING REPORT	U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE	SUMMARY - SLOPE STABILITY ANALYSIS

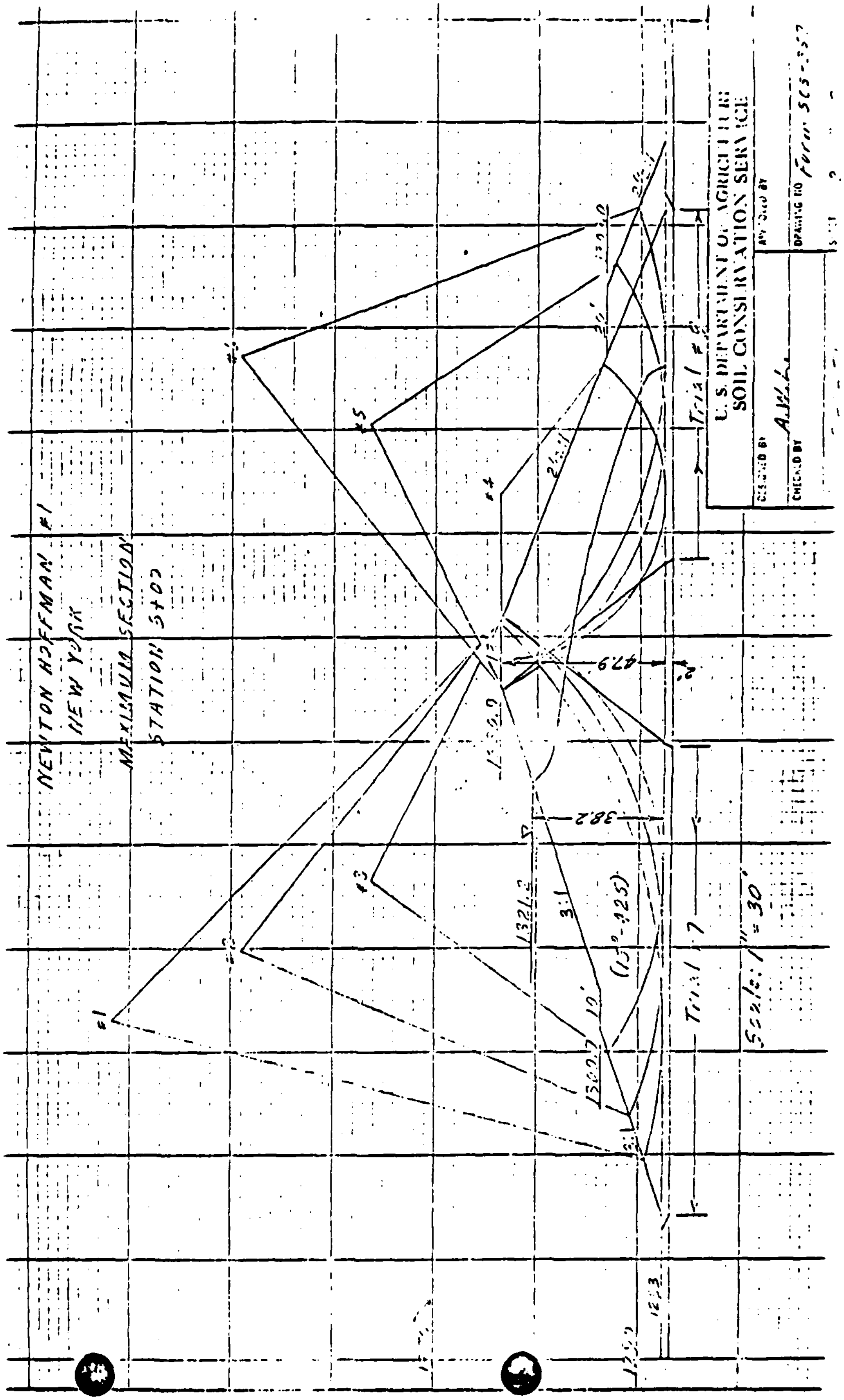
PROJECT and STATE: NEWTON HOFFMAN SITE #1 NEW YORK — DATE: 2-1-71

METHOD OF ANALYSIS: SWEDISH CIRCLE & BLOCK — ANALYZED AT: S.M.L. LINCOLN, Ne. — APPROVED BY:

	SOURCE AND USE OF MATERIALS	CLASSIFICATION	γ_d (pcf)	γ_m (pcf)	γ_{sat} (pcf)	γ_{sub} (pcf)	ϕ (deg)	tan ϕ	c (psf)	REMARKS
①	Foundation				135.0	72.5	35	.700	0	Assumed Value
②	Embankment	ML	119.0	133.0	138.0	75.5	21	.384	575	CU } From Site #3A
③							32	.625	0	$\overline{CU}$ } From Site #3A
④	Embankment	CL	117.7	135.0	137.5	75.0	15	.268	425	CU } From Site #3A
⑤							25	.466	200	$\overline{CU}$ } From Site #3A
⑥										
⑦										
⑧										

TRIAL NO.	SLOPE	CONDITIONS — Maximum Section @ Station	F_s
1Up	3:1	Fulldrawdown-10' berm @ elev. 1300.7-Arc cut thru emb. (15°-425) only.	1.39
2Up	3:1	Same conditions as trial #1.	1.36
3Up	3:1	Same conditions as trial #1.	1.40
4Dn	2½:1	Drain @ h/b=2.6-No berm-Arc cut thru emb (15°-425) only.	1.46
5Dn	2½:1	Drain @ h/b=2.6-No berm-Arc cut thru emb (15°-425) only.	1.35
5ADn	2½:1	Same conditions as trial #5 except 20' berm @ elev. 1292.	1.52
6Dn	2½:1	Same conditions as trial #5A.	1.57
7Up	3:1	Block Analysis-Fulldrawdown-10' berm @ elev. 1300.7-Emb (15°-425) & 2' found. (35°-0).	1.52
8Dn	2½:1	Block Analysis-No berm-Arc cut thru emb (15°-425) & 2' found (35°-0)	1.43

Sheet 1 of 2



NEWTON HOFFMAN #1
NEW YORK
MAXIMUM SECTION
STATION 3+02
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
Trial 7
Scale: 1" = 30'

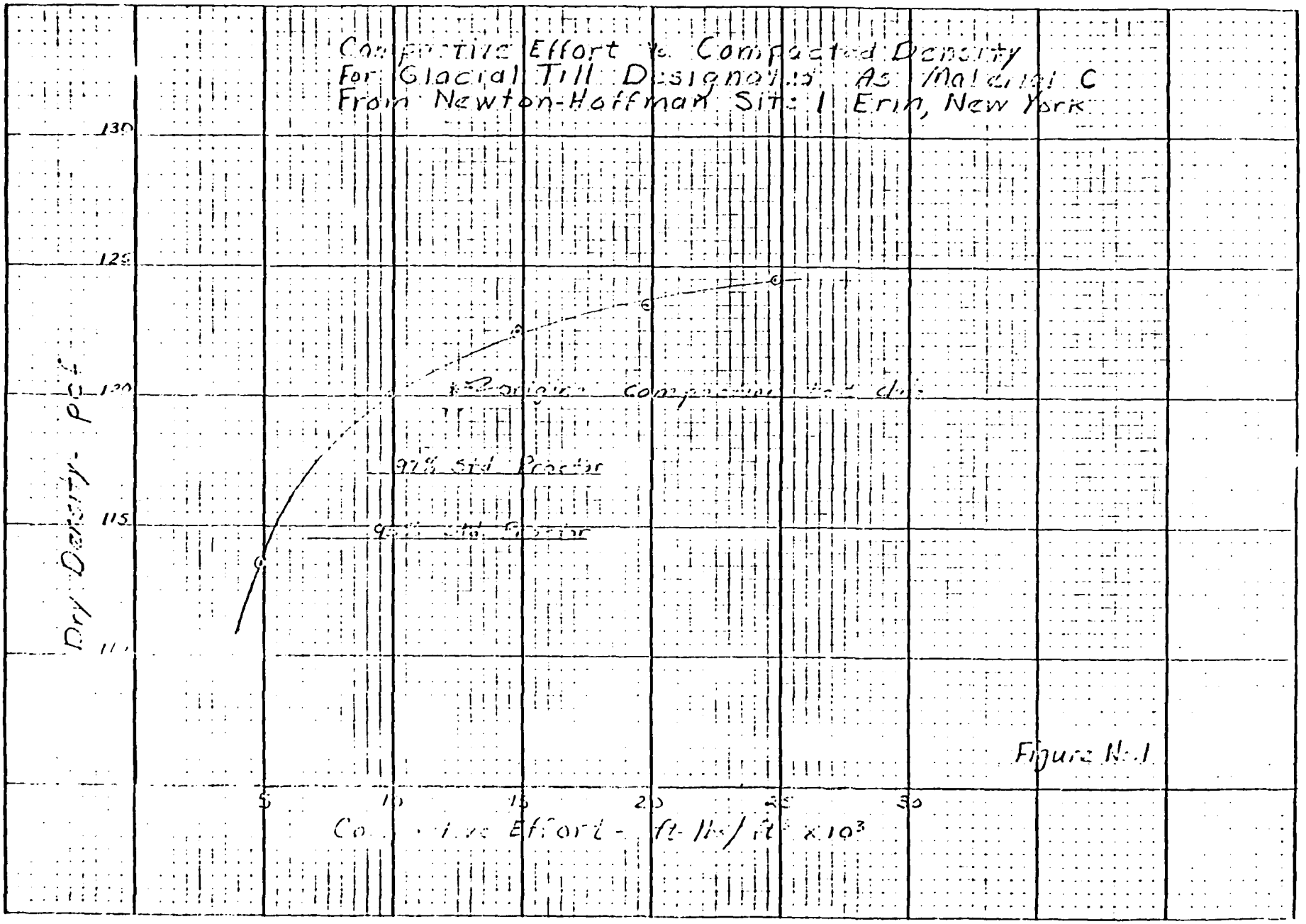

Comparative Effort vs. Compacted Density
For Glacial Till Designated As Material C
From Newton-Hoffman Site: I Erin, New York
130
125
120
115
110
97% Std Proctor
95% Std Proctor
Dry Density - pcf
5
10
15
20
25
30
Comparative Effort - ft-lbs/ft³ x10³

Figure No. 1

APPENDIX H

REFERENCES

APPENDIX H

REFERENCES

Broughton, J. G., D. W. Fisher, Y. W. Isachsen, and L. V. Rickard, 1966, "Geology of New York," New York State Museum and Science Service, Educational Leaflet 20, 50 pp.

Fisher, D. W., Y. W. Isachsen, and L. V. Rickard, 1971, "Generalized Tectonic-Metamorphic Map of New York," New York Museum and Science Service, Map and Chart Series No. 15.

Flint, R. F., 1971, Glacial and Quaternary Geology, John Wiley and Sons, Inc., 892 pp.

Rickard, L. V. and D. W. Fisher, 1970, "Geologic Map of New York, Finger Lakes Sheet," New York State Museum and Science Service, Map and Chart Series No. 15.

Thornburg, W. D., 1965, Regional Geomorphology of the United States, John Wiley & Sons, Inc., 609 pp.

U.S. Army Corps of Engineers, 1956, Hydrometeorological Report No. 33.

U.S. Department of Commerce, 1965, Weather Bureau Hydrometeorological Report No. 40.

U.S. Department of the Interior, Bureau of Reclamation, 1974, Design of Small Dams.

Wright, H. E., Jr. and D. G. Frey, 1965, The Quaternary of the United States, Princeton University Press, 922 pp.