

AD-A092 452

NEW YORK STATE DEPT OF ENVIRONMENTAL CONSERVATION ALBANY F/G 13/13
NATIONAL DAM SAFETY PROGRAM. PATTERSON BRIXIUS GREY CREEK WATER--ETC(U)
SEP 80 G KOCH DACW51-79-C-0001

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AD-A092 452



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

The following remedial actions must be completed within 1 year from notification to the owner:

1. Eliminate the pedestrian traffic on the embankment and auxiliary spillway, backfill all depressions and reseed these areas.
2. Repair the depressions on the upstream slope in the vicinity of the riser and beyond the downstream toe of the dam. Reseed as required.
3. Remove the parking area from the auxiliary spillway channel and reseed the affected area.
4. Remove the vegetation from the inlet and outlet of the auxiliary spillway, and the downstream channel. Provide a program of periodic cutting and mowing of the dam and appurtenant surfaces.
5. Investigate the conditions of the reservoir drain and restore to operational status, if required.
6. Repair the erosion on the Taft Road embankment and clean out the sediment within the 6 feet diameter highway culvert.
7. Provide a program of periodic inspection and maintenance of the dam and appurtenances, including yearly operation and lubrication of the reservoir drain system. Document this information for future reference. Also develop an emergency action plan.

DISCLAIMER NOTICE

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PREFACE

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

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

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

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

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
PATTERSON, BRIXIUS, GREY CREEK WATERSHED PROJECT
SITE 2
I.D. No. NY 725
DEC #86D-3919
SUSQUEHANNA RIVER BASIN
BROOME COUNTY, NEW YORK

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam	Patterson Brixius Grey Creek Watershed Project Site 2 I.D. No. NY 725
State Located	New York
County Located	Broome
Stream	Brixius Creek (tributary of Susquehanna River)
Date of Inspection	July 23, 1980

ASSESSMENT

➤ The examination of documents and visual inspection of the Site 2 Dam and appurtenant structures did not reveal conditions which constitute a hazard to human life or property.

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

➤ The following remedial actions must be completed within 1 year from notification to the owner:

1. Eliminate the pedestrian traffic on the embankment and auxiliary spillway, backfill all depressions and reseed these areas,
2. Repair the depressions on the upstream slope in the vicinity of the riser and beyond the downstream toe of the dam. Reseed as required.
- 3. Remove the parking area from the auxiliary spillway channel and reseed the affected area.
- 4. Remove the vegetation from the inlet and outlet of the auxiliary spillway, and the downstream channel; Provide a program of periodic cutting and mowing of the dam and appurtenant surfaces.
- 5. Investigate the conditions of the reservoir drain and restore to operational status, if required;
- 6. Repair the erosion on the Taft Road embankment and clean out the sediment within the 6 feet diameter highway culvert, AND
- 7. Provide a program of periodic inspection and maintenance of the dam and appurtenances, including yearly operation and lubrication of the reservoir drain system. Document this information for future reference. Also develop an emergency action plan.

George Koch

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

Approved By:

W. M. Smith Jr.

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

Date:

30 Sep 88



Photo #1
Overview of Patterson Brixius Grey Creek
Watershed Project - Site 2

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SITE 2
I.D. No. NY 725
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SUSQUEHANNA RIVER BASIN
BROOME COUNTY, NEW YORK

SECTION 1: PROJECT INFORMATION

1.1 GENERAL

a. Authority

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

b. Purpose of Inspection

Evaluation of the existing conditions of the subject dam to identify deficiencies and hazardous conditions, determine if they constitute hazards to human life and property and recommend measures where necessary.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam and Appurtenances

The Site 2 Dam consists of a 730 feet long homogeneous earth embankment with an auxiliary spillway beyond the right abutment of the embankment, located in a cut section. The maximum height of the dam is 30 feet. The embankment has a crest width of 14 feet, and upstream slope of 1 vertical on 3 horizontal, and a downstream slope of 1 on 2.5. A 10 feet wide berm was constructed in the upstream slope in the vicinity of the principal spillway.

The auxiliary spillway is a vegetated earth channel, having a bottom width of 500 feet. The service spillway is a drop inlet structure consisting of a single-stage reinforced concrete riser, 30 inch diameter concrete pipe and plunge pool.

An internal drainage system is located under the downstream portion of the embankment to control the phreatic surface and provide a safe outlet for foundation seepage.

b. Location

The dam is located on Brixius Creek, a tributary of the Susquehanna River, approximately 1/2 mile north of Union, NY.

c. Size Classification

The dam is 30 feet high and is classified as "small" in size (less than 40 feet in height).

d. Hazard Classification

The dam is classified as high hazard, because of its location above Union, NY.

e. Ownership

The dam is owned and operated by the County of Broome, NY.

f. Purpose of the Dam

The dam is a flood water retarding structure.

g. Design and Construction History

The dam was designed by the U.S.D.A., Soil Conservation Service (SCS) construction of the dam was completed in 1973. The SCS office for Broome County, located at the Broome County Airport, has all design and construction information.

h. Normal Operating Procedures

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

1.3 PERTINENT DATA

<u>a. Drainage Area (sq. mi.)</u>	1.34
<u>b. Discharge at Dam (cfs)</u>	
Total at Top of Dam	9682.
Principle Spillway at Auxiliary Spillway Crest El.	109.
Reservoir Drain at Principle Spillway Crest El.	12.
<u>c. Elevation (ft., USGS Datum)</u>	
Top of Dam	941.6
Auxiliary Spillway Crest	936.8
Principle Spillway Crest	922.3
Reservoir Drain Invert El.	915.6
<u>d. Reservoir (Acres)</u>	
Surface Area at Top of Dam	41.3
Surface Area at Auxiliary Spillway Crest	30.0
Surface Area at Principle Spillway Crest	3.0
<u>e. Storage Capacity (acre feet)</u>	
Top of Dam	357.1
Auxiliary Spillway Crest	187.6
Principle Spillway Crest	10.9
<u>f. Dam</u>	
Type: Homogeneous earth fill.	
Length (ft.)	730.
Slopes upstream:	3:1
downstream:	2.5:1
Crest Width (ft):	14

g. Principle Spillway

Type: Single stage, reinforced concrete drop inlet.

Weir length (ft.)

15.0

h. Auxiliary Spillway

Type: Vegetated earth channel.

Bottom Width (ft.)

400.0

Side Slopes:

3:1

Exit Slope:

0.032 ft./ft.

i. Reservoir Drain

Type: 12" cast iron conduit emptying into principle spillway.

Control: Manually operated slide valve located in drop inlet.

SECTION 2: ENGINEERING DATA

2.1 GEOLOGY

The Patterson, Brixius, Grey Creek Watershed Project Dam No. 2 is located in the glaciated portion of the "Appalachian Uplands" (northern extreme of the Appalachian Plateau) physiographic province of New York State. These uplands were formed by dissection of the uplifted but flat lying sandstones and shales of the middle and upper Devonian Catskill Delta. The plateau surface is represented by flat-topped divides with drainage generally southwest toward the Susquehanna River system.

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

2.2 SUBSURFACE INVESTIGATION

A subsurface investigation was conducted by the Soil Conservation Service in 1969. This program consisted of 12 drill holes and 24 test pits at locations along the dam, auxiliary spillways, structural elements, and borrow area. Applicable subsurface information is included in Appendix F.

In general, the foundation (in the flood plain) consists of a shallow, alluvial layer (GC-GP), over a layer approximately 25 feet thick of lacustrine silt (ML), over a layer of silty and clayey glacial till (ML-CL). The abutment areas consist of this glacial till.

2.3 EMBANKMENT AND APPURTENANT STRUCTURES

The dam was designed and constructed under the supervision of the Soil Conservation Service. "As-Built" drawings of this dam are on file at the SCS office in Broome County. Selected drawings of the dam and appurtenances are included in Appendix F. The dam is composed of homogeneous earth fill, the maximum height of which is 30 feet, a cut-off trench having side slopes of 1 on 2, and a foundation drain parallel to the axis of the dam near the downstream toe. A reinforced concrete riser serves as the principal spillway and a vegetated channel serves as the auxiliary spillway.

2.4 CONSTRUCTION RECORDS

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

2.5 OPERATION RECORD

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

2.6 EVALUATION OF DATA

The data presented in this report has been compiled from information obtained from Mr. Gary Page, Project Engineer for SCS in Broome County, and Mr. Donald Lake, Head of the SCS Design Section in Syracuse, New York. This information appears to be adequate and reliable for Phase 1 Inspection purposes.

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection of the Site #2 Dam was conducted on July 23, 1980. The weather was cloudy and the temperature ranged in the 70's. The reservoir level at the time of the inspection approximated the crest elevation of the service spillway riser (El. 922.3).

b. Embankment

No signs of distress were observed in connection with the earth embankment and no signs of misalignment sloughing, seepage, subsidence, surface cracking, or undesirable growth were noted. While no riprap was in use on the upstream slope for wave protection, no erosion was apparent. (See Photo #1)

Pedestrian paths were noted on the crest and slopes of the embankment, below the embankment and on the slopes of the auxiliary spillway. (See Photos #1 thru 4)

An area approximately 10 feet long on the upstream slope, adjacent to the service spillway riser, was depressed and a small surface crack was noted. This appears to have been caused by pedestrian traffic.

An internal drainage system composed of 2 - 8 inch diameter pipes surrounded by "drain fill" and extending parallel to the axis of the dam, provides drainage at the embankment-subgrade contact. These pipes exit through the embankment adjacent to the service spillway conduit. No discharge was apparent from these pipes.

c. Spillways

The service spillway is in good condition. The maximum joint extension of the pipe is 1.0 inches.

The grass lined auxiliary spillway beyond the right abutment is generally in good condition. Two ball fields were noted in the channel, and on adjacent parking area had been extended into the channel. Pedestrian paths were also observed on the left slope, and vegetation was evident at the inlet and outlet of the channel. (See Photo #4)

d. Reservoir Drain

The reservoir drain, the controls of which are located within the service spillway riser, was not operated because the proper key was not available.

e. Downstream Area

Approximately 20 feet below the toe of the dam on the right side of the service spillway conduit, a depression was noted. This depression was a maximum of 2 feet deep and in excess of 4 feet long. No evidence of seepage or ongoing erosion was observed, and the cause of the depression is unknown. (See Photo #6)

The downstream channel is riprapped immediately below the service spillway outlet, but the remainder of the channel is heavily vegetated and constricted. (See Photo #5) Homes were noted approximately 100 feet below the dam.

f. Reservoir

There are no signs of instability within the reservoir. Erosion of the embankment slopes on Taft Road (which traverses the reservoir) was noted. In addition, it appears that this erosion has created a sedimentation problem in which 80 to 90% of the 6 feet diameter culvert pipe beneath the embankment is plugged with sediment. (See Photo #7)

3.2 EVALUATION

The problem areas observed during the inspection and the required remedial measures are as follows:

1. Pedestrian traffic has created paths and depressions on the slopes and crest of the embankment, at the abutments, on the slope of the auxiliary spillway, and an area immediately below the toe of the dam. This traffic must be eliminated, the depressions filled, and the areas reseeded to prevent erosion.
2. The depression and surface crack noted on the upstream slope in the vicinity of the riser must be repaired and monitored to determine if movement is ongoing.
3. The parking area, which is encroaching on the auxiliary spillway channel must be relocated.
4. Trees and vegetation was observed in the inlet and outlet of the auxiliary spillway and in the downstream channel. This vegetation must be removed. Provide a program of periodic cutting and mowing of the surfaces of the dam and appurtenances.
5. Backfill the depression noted on the right side of the service spillway conduit beyond the toe of the dam. Monitor this area for signs of ongoing erosion.
6. The reservoir drain could not be operated at the time of the inspection. Investigate this condition and restore, if necessary, to operating condition.
7. The erosion and subsequent sedimentation which was noted in the highway culvert beneath Taft Road is plugging the pipe. This sediment must be removed.
8. Provide a program of periodic inspection and maintenance of the dam and appurtenances, including yearly operation and lubrication of the reservoir drain system. Document this information for future reference. Also, develop an emergency action plan.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The normal water surface elevation is approximated by the crest of the service spillway riser. Downstream flows are limited by the 30 inch diameter service spillway pipe, except during extremely heavy runoff when the auxiliary spillway is in service.

4.2 MAINTENANCE OF THE DAM

The dam is maintained by the County of Broome, New York. Maintenance of the dam is considered unsatisfactory as evidenced by the pedestrian paths, vegetation in the auxiliary spillway and downstream channels, and the depressions of the upstream slope and beyond the downstream toe.

4.3 WARNING SYSTEM

There is no warning system in effect or in preparation.

4.4 EVALUATION

The dam and appurtenant structures have not been maintained in satisfactory condition as noted in "Section 3: Visual Inspection."

SECTION 5: HYDRAULICS/HYDROLOGY

5.1 DRAINAGE AREA CHARACTERISTICS

The Patterson Brixius Site No. 2 is located on the Brixius Creek a tributary of Susquehanna River. The drainage area contributing to the site is 1.34 square miles. The watershed consists of highly populated area interspersed with woods and fields. Relief ranges from moderate to steep.

5.2 ANALYSIS CRITERIA

The analysis of the spillway capacity of the dam and storage of the reservoir was performed using the Corps of Engineers' HEC-1 computer model. The Unit Hydrograph was defined by the Snyder Synthetic Unit Hydrograph method and the Modified Puls routing procedure was incorporated. The Probable Maximum Precipitation was 21.0 inches (24 hr., 200 sq. mi.) from Hydrometeorological Report No. 33. Several floods were selected (%s PMF) for analysis in accordance with recommended guidelines of the Corps of Engineers. The PMF inflow of 2829 cfs was routed through the reservoir, and the peak outflow was determined to be 2814 cfs.

5.3 SPILLWAY CAPACITY

The service spillway consists of a 2.5 x 7.5 feet drop inlet structure (15.0 feet weir length) emptying into a 30 inch diameter reinforced concrete pipe. A riprap lined plunge pool is located at the toe of the dam for energy dissipation. The capacities at auxiliary spillway crest and top of dam are 109 cfs and 9,682 cfs respectively. The auxiliary spillway is an earth cut on the right abutment, with a bottom width of 400 feet.

5.4 RESERVOIR CAPACITY

The reservoir capacities at the crest of the service spillway and emergency spillway crest are 10.9 and 187.6 acre feet respectively. Total storage to top of dam is 357.1 acre feet. Surcharge storage available from service spillway crest and top of dam is 346.2 acre feet or 4.73 inches runoff from the basin.

5.5 FLOODS OF RECORD

The highest reported reservoir elevation was 926.5 or 4.2 feet over the crest of the service spillway. This event occurred September 1975, the estimated outflow was 100 cfs.

5.6 OVERTOPPING POTENTIAL

The maximum capacity of the spillway is 9682 cfs before overtopping of the dam would occur. This capacity results in the ability to pass the full PMF of 2929 cfs, and greatly attenuate storms of lesser magnitude.

5.7 EVALUATION

The spillway is adequate to pass the full PMF, with approximately 2.7 feet of freeboard.

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observation

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

b. Design and Construction Data

A stability analysis was conducted by SCS during the design of the dam. The analyses were performed using the modified Swedish circle method. The soil parameters assumed were:

1. Foundation: $\gamma_d = 101.1$, $\gamma_{sat} = 127.5$, $\gamma_{sub} = 65.0$, $\phi = 165^\circ$ and $c = 1300$
2. Embankment: $\gamma_d = 105.9$, $\gamma_{sat} = 129.0$, $\gamma_{sub} = 66.5$, $\phi = 26.5$ and $c = 625$

The results of these analyses are as follows:

<u>Condition</u>	<u>Minimum Factor of Safety</u>
1. Upstream Slope = 1:3, full drawdown no berm	2.8
2. Downstream Slope = 1:2.5 steady state seepage Drain @c/b=0.6 no berm	2.8

The calculated factors of safety for this dam are in excess of the minimum factors recommended by the Corps of Engineers. The dam is, therefore, considered to have adequate factors of safety for stability. Further information concerning this analysis is included in Appendix E.

c. Post Construction Changes

No post construction changes were initiated. Removable fences for sporting activities have been installed in the auxiliary spillway.

d. Seismic Stability

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

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

The Phase I Inspection of the Patterson Brixius Grey Creek Watershed Project Site 2 Dam did not reveal conditions which constitute a hazard to human life or property. The earth embankment is not considered to be unstable and appears capable of retarding floodwaters resulting from the PMF.

b. Adequacy of Information

The information reviewed appears adequate for Phase I Inspection purposes.

c. Additional Investigation

No additional investigation is required at this time.

d. Urgency

Within 1 year of notification to the owner, the following remedial measures must be completed.

7.2 RECOMMENDED MEASURES

1. Eliminate the pedestrian traffic on the embankment and auxiliary spillway, backfill all depressions and reseed these areas.
2. Repair the depressions on the upstream slope in the vicinity of the riser and beyond the downstream toe of the dam. Reseed as required.
3. Remove the parking area from the auxiliary spillway channel and reseed the affected area.
4. Remove the vegetation from the inlet and outlet of the auxiliary spillway, and the downstream channel. Provide a program of periodic cutting and mowing of the dam and appurtenant surfaces.
5. Investigate the condition of the reservoir drain and restore to operational status, if required.
6. Repair the erosion on the Taft Road embankment and clean out the sediment within the 6 feet diameter highway culvert.
7. Provide a program of periodic inspection and maintenance of the dam and appurtenances, including yearly operation and lubrication of the reservoir drain system. Document this information for future reference. Also develop an emergency action plan.

APPENDIX A

PHOTOGRAPHS



Photo #2
Crest of Embankment



Photo #3
Downstream Slope



Photo #4
Right Abutment & Auxiliary Spillway



Photo #5
Plunge Pool & Downstream Channel



Photo #6
Depression Beyond Toe of Dam



Photo #7
Reservoir Area & Taft Road

APPENDIX B

VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam Paterson Brook & Gray Cr. S. 1 & 2
Fed. I.D. # NY 725 DEC Dam No. 86 D - 3919
River Basin Susquehanna
Location: Town Union County Breanne
Stream Name Breanne Creek
Tributary of Susquehanna River
Latitude (N) 42° 7.3' Longitude (W) 76° 2.5'
Type of Dam homogeneous earth
Hazard Category "C" High
Date(s) of Inspection July 23, 1980
Weather Conditions cloudy 70's
Reservoir Level at Time of Inspection at spill. crest (El. 922.3)

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

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

Gary Page - Proj. Engr. SCS Binghamton (607) 773-2751
Breanne County Airport
Dan's Lake SCS Syracuse office (315) 423-5505

d. History:

Date Constructed 1973 Date(s) Reconstructed X

Designer SCS

Constructed By N.R. Carlselle Inc.

Owner Breanne County, NY

2) Embankment

a. Characteristics

- (1) Embankment Material Clayey Soil & Compaction
- (2) Cutoff Type earth
- (3) Impervious Core none
- (4) Internal Drainage System 2 8" pipes w/ drain fall
- (5) Miscellaneous _____

b. Crest

- (1) Vertical Alignment good
- (2) Horizontal Alignment good
- (3) Surface Cracks none
- (4) Miscellaneous heavy pedestrian traffic has destroyed vegetation

c. Upstream Slope

- (1) Slope (Estimate) (V:H) 1:3
- (2) Undesirable Growth or Debris, Animal Burrows none
- (3) Sloughing, Subsidence or Depressions expressions from rising from pedestrian traffic also surface crack - 10' long

(4) Slope Protection none

(5) Surface Cracks or Movement at Toe See 2 c. 2

d. Downstream Slope

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

(2) Undesirable Growth or Debris, Animal Burrows none

(3) Sloughing, Subsidence or Depressions depression beyond toe
see section 6 .. depression from pedestrian
traffic

(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 - depression in sanding

e. Abutments - Embankment Contact

(1) Erosion at Contact None
pedestrian traffic has caused loss of veg.

(2) Seepage Along Contact None

3) Drainage System

a. Description of System 2-8" pipes surrounded by
crushed stone parallel to dam axis

b. Condition of System good

c. Discharge from Drainage System None

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

5) Reservoir

- a. Slopes good
- b. Sedimentation in 6' diam pipe under left Road - 80-90% full of sediment
- c. Unusual Conditions Which Affect Dam impounding of water by plugged pipe will result in overtopping of road in heavy storm

6) Area Downstream of Dam

- a. Downstream Hazard (No. of Homes, Highways, etc.) houses $\approx$ 1000' below dam
- b. Seepage, Unusual Growth cattails & vegetation in channel
- c. Evidence of Movement Beyond Toe of Dam depression 2' deep & 4' long $\approx$ 20' from toe & right of service conduit cause unknown area now dry
- d. Condition of Downstream Channel constricted w/ vegetation

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

- a. General standard SCS service w/ grass auxiliary at right abut.
- b. Condition of Service Spillway good
max joint extension 1" (2 1/2 max allowable)
plying pool in good shape

c. Condition of Auxiliary Spillway vegetation in inlet & outlet
of channel, parking area extended into
channel bottom

d. Condition of Discharge Conveyance Channel ball fields in channel bottom and resemble
backstops etc.

8) Reservoir Drain/Outlet

Type: Pipe ✓ Conduit _____ Other _____

Material: Concrete _____ Metal ✓ Other _____

Size: _____ Length _____

Invert Elevations: Entrance _____ Exit _____

Physical Condition (Describe): _____ Unobservable ✓

Material: _____

Joints: _____ Alignment _____

Structural Integrity: _____

Hydraulic Capability: _____

Means of Control: Gate ✓ Valve _____ Uncontrolled _____

Operation: Operable _____ Inoperable _____ Other not operated

Present Condition (Describe): Key not available to operate

9) Structurala. Concrete Surfaces noneb. Structural Cracking nonec. Movement - Horizontal & Vertical Alignment (Settlement) noned. Junctions with Abutments or Embankments goode. Drains - Foundation, Joint, Face internal drains - good condition, no flowf. Water Passages, Conduits, Sluices good conditiong. Seepage or Leakage none

- h. Joints - Construction, etc. good condition
- i. Foundation unobservable
- j. Abutments N/A
- k. Control Gates not operated - lack of key
- l. Approach & Outlet Channels N/A
- m. Energy Dissipators (Plunge Pool, etc.) plunge pool ripraped
good condition
- n. Intake Structures standard single stage riser
good condition
- o. Stability appears adequate
- p. Miscellaneous

APPENDIX C

HYDROLOGIC / HYDRAULIC

ENGINEERING DATA AND COMPUTATIONS

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

1

AREA-CAPACITY DATA:

	<u>Elevation</u> (ft.)	<u>Surface Area</u> (acres)	<u>Storage Capacity</u> (acre-ft.)
1) Top of Dam	<u>941.6</u>	<u>41.</u>	<u>357.</u>
2) Design High Water (Max. Design Pool)	<u>938.6</u>	<u>35.</u>	<u>242.</u>
3) Auxiliary Spillway Crest	<u>936.8</u>	<u>30.</u>	<u>188.</u>
4) Pool Level with Flashboards	<u>—</u>	<u>—</u>	<u>—</u>
5) Service Spillway Crest	<u>922.3</u>	<u>3.</u>	<u>11.</u>

DISCHARGES

	<u>Volume</u> (cfs)
1) Average Daily	<u>1-2.</u>
2) Spillway @ Maximum High Water	<u>9682.</u>
3) Spillway @ Design High Water	<u>2065.</u>
4) Spillway @ Auxiliary Spillway Crest Elevation	<u>109</u>
5) Low Level Outlet @ Normal $\pm$	<u>12</u>
6) Total (of all facilities) @ Maximum High Water	<u>9700</u>
7) Maximum Known Flood	<u>100.</u>
8) At Time of Inspection	<u>0.5</u>

CREST:

ELEVATION: 941.6Type: Homogeneous earth fillWidth: 14' Length: 730'Spillover: drop inlet, emergency spillwayLocation: center embankment, right abut.

SPILLWAY:

SERVICE

AUXILIARY

922.3Elevation 936.8rein. conc. drop inlet

Type

grass lined trap. channel15' weir length

Width

400'

Type of Control

Uncontrolled

Controlled:

Type

(Flashboards; gate)

Number

Size/Length

Invert Material

vegetatedAnticipated Length
of operating service> 4.5 hrs169' concrete conduit

Chute Length

8.1'Height Between Spillway Crest
& Approach Channel Invert
(Weir Flow).02 ft/ft slope

HYDROMETEROLOGICAL GAGES:

Type : NONELocation: -

Records:

Date - -Max. Reading - -

FLOOD WATER CONTROL SYSTEM:

Warning System: NONE

Method of Controlled Releases (mechanisms):

12 INCH RESERVOIR DRAIN

DRAINAGE AREA: 1.34 mi.²

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: Residential

Terrain - Relief: moderate

Surface - Soil: low permeability, fills

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

No

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

potential sedimentation problem IN culvert passing
under TAFT AVE.

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

SOME buildings close to design high water el.

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

Location: NONE

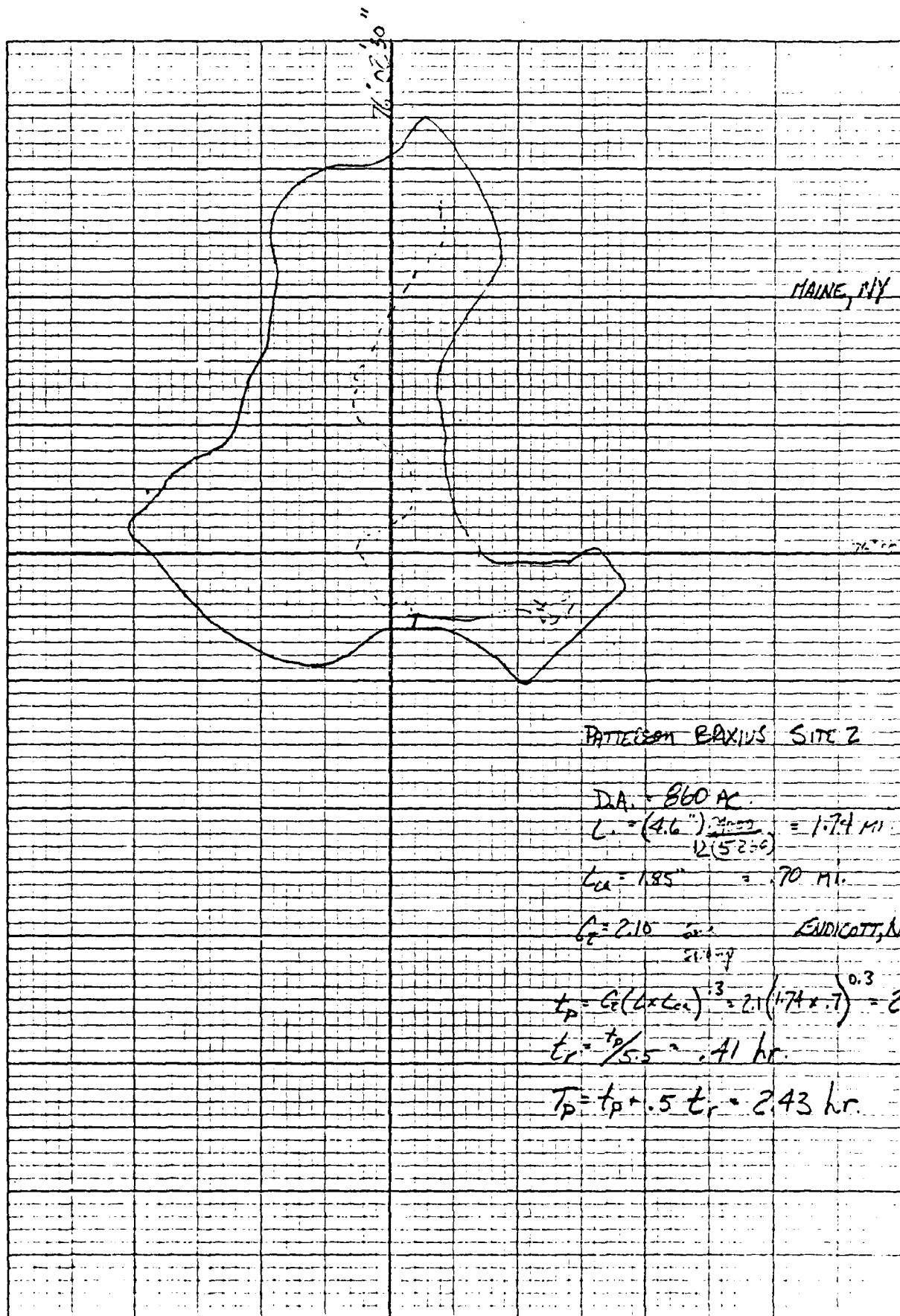
Elevation: —

Reservoir:

Length @ Maximum Pool 1200 (Miles)

Length of Shoreline (@ Spillway Crest) 300 (Miles)

(ROUNDED pond SHAPE)



PATTERSON BRAXIS SITE 2

D.A. = 860 AC.

$$L = (4.6'') \frac{2.1 \times 10^3}{2(5250)} = 1.74 \text{ MI.}$$

$$L_{CA} = 1.85'' = .70 \text{ MI.}$$

$$C_p = 2.10 \text{ sec.} \quad \text{ENDICOTT, NY}$$

$$t_p = C_p (L \times L_{CA})^{0.3} = 2.1 (1.74 \times .7)^{0.3} = 2.23 \text{ hr.}$$

$$t_r = \frac{t_p}{5.5} = .41 \text{ hr.}$$

$$T_p = t_p + .5 t_r = 2.43 \text{ hr.}$$

PATTERSON BRIDGES SITE 2

$$D.A. = 1.34 \text{ mi}^2$$

$$L = 1.74 \text{ mi.}$$

$$L_{ca} = 0.70 \text{ mi.}$$

$$C_t (\text{assumed}) = 2.10$$

$$t_p = C_t (L \times L_{ca})^{0.3} = 2.23 \text{ hr.}$$

$$t_r = t_p / 5.5 = 0.41 \text{ hr.}$$

$$T_p = t_p + 0.5 t_r = 2.43 \text{ hr.}$$

$$C_p = 0.625$$

	<u>Elev.</u>	<u>STORAGE (AC FT.)</u>	<u>SPILL. CAPACITY (CFS)</u>
	911.6	0.	-
crest	922.3	~~188~~ ~~11.~~	0
- ES.	936.8	~~242~~ 188.	109
P.H.W.	938.6	242.	2065
To.D.	941.6	357.	9682

$$L_{dam} = 700' \quad C = 2.8$$

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS
BUILDING HYDROGRAPH AT
ROUTE HYDROGRAPH TO
END OF NETWORK

 FLOOD HYDROGRAPH PACKAGE (HFC-1)
 (A) SAFETY DESIGN JULY 1973
 LAST MODIFICATION 20 FEB 74
 ROUTED FOR MC EVYELL APP 79

 NEW YORK STATE
 DEPT OF ENVIRONMENTAL CONSERVATION
 FLOOD PROTECTION BUREAU

DATE 07/11/80

PATTERSON BRIDGES SITE 2
 PHASE I
 DRP

NO HR MIN IDAY JUPER JUPER LADPT TRACP IPLT IPRT INSTAN
 ZUC 0 15 C 5 C 0 C 0 C 0 C 0

JOB SPECIFICATION

MULTI-PLAN ANALYSES TO BE PERFORMED
 JPLAN= 1 NPLAN= 6 IPLAN= 1
 RTIES= 0.20 0.40 0.60 0.80 1.00

SUB-AREA RUNOFF COMPUTATION

INFLOW FROM BASIN
 ISTAQ 1 ICOMP 0 IFCUN 0 ITAPE 0 JPLT 2 JPRI 0 INAME 1 ISTAGE 0 IAUO 0

HYDROGRAPH DATA
 IPRDC 1 IUNG 1 TAREA 1.34 TRSDA 1.34 TRSPC 0 PATIO 0 ISACK 0 ISAME 0 LOCAL 0

PRECIP DATA
 SPEE PMS P6 R12 R24 R48 R72 R96
 C. 21.00 111.00 123.00 133.00 142.00 C. 0. 0. 0. 0. 0. 0.

LOSS DATA
 LADPT 0 STARR 0 DLTKR 0 RTIOL 1.00 ERAIN 0 STARR 0 RTIOL 1.00 STATL 1.00 CNSTL 0.10 ALSMK 0 RTIMP 0

UNIT HYDROGRAPH DATA
 TP= 2.43 CP=0.63 NTA= C

APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC=10.82 AND R= 9.13 INTERVALS
 STARTQ= -2.00 QRCEN= -0.05 RTICK= 1.00

UNIT HYDROGRAPH 55 END-OF-PERIOD ORDINATES, LAG= 2.41 PLURS, CP= 0.62 VOL= 1.00
 7. 27. 35. 113. 154. 164. 221. 227.
 220. 203. 163. 145. 131. 117. 103. 94.
 78. 68. 61. 54. 49. 44. 39. 31.
 25. 23. 20. 18. 15. 13. 11. 8.
 4. 3. 2. 2. 2. 4. 4. 3.

MO.DA H4.M4 PERIOD RAIN EXCS LOSS COMP 3 MO.DA H4.M4 PERIOD RAIN EXCS LOSS COMP C
 1.01 0.15 1 0.00 C. 0.00 3. 1.02 1.13 101 0.03 0.00 7.

1.01	17.15	0.11	0.01	0.01	2.0	1.02	18.15	1.5	0.04	0.02	0.03	2410.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	2720.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	2614.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	2485.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	2545.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	2194.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	2034.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	1670.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	1706.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	1394.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	1255.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	1121.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	1020.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	920.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	831.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	751.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	679.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	615.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	557.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	506.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	418.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	381.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	348.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	317.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	290.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	264.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	241.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	219.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	199.
1.01	17.15	0.04	0.01	0.01	3.	1.02	18.15	1.7	0.04	0.02	0.03	179.

PEAK	2829.	83.	67.0	20.16	3.70	68675.
CFS	2045.	58.	14.19	19.24	503.74	1417.
CHS	14.19	58.	14.19	19.24	503.74	1417.
HM	360.50	1014.	1251.	1722.	1747.	
AC-FT	1014.	1251.	1722.	1747.		
T-DLS CU M	1251.	1722.	1747.			
72-HOUR	704.	20.	19.24	496.41	1396.	1722.
24-HOUR	704.	20.	19.24	496.41	1396.	1722.
TOTAL VOLUME	58565.	1542.	19.24	503.74	1417.	1747.
SLIP	23.86	20.16	3.70	68675.		
(606.)	(512.)	(54.)	(1544.66)			

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[illegible]

23.5171.
0. 122.
0.15173.
0.36174.
0.45195.
1.00176.
1.15197.
1.30178.
1.45199.
2.00200..

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# HYDROGRAPH "T STA

[illegible]

# HYDROGRAPH AT STA

[illegible]





STATION 1, PLIN 1, NATIF 3  
END-OF-PERIOD HYDROGRAPH TERMINATES

[illegible]



# STATUS

(\*) 079 0304554, 0.9 V (0.1014100)  $\phi$  (1)  $\phi$  374.1

[illegible]



[illegible]

| Year    | 1900    | 1901    | 1902    | 1903    | 1904    | 1905    | 1906    | 1907    | 1908    | 1909    | 1910    | 1911    | 1912    | 1913    | 1914    | 1915    | 1916    | 1917    | 1918    | 1919    | 1920    | 1921    | 1922    | 1923    | 1924    | 1925    | 1926    | 1927    | 1928    | 1929    | 1930    | 1931    | 1932    | 1933    | 1934    | 1935    | 1936    | 1937    | 1938    | 1939    | 1940    | 1941    | 1942    | 1943    | 1944    | 1945    | 1946    | 1947    | 1948    | 1949    | 1950    | 1951    | 1952    | 1953    | 1954    | 1955    | 1956    | 1957    | 1958    | 1959    | 1960    | 1961    | 1962    | 1963    | 1964    | 1965    | 1966    | 1967    | 1968    | 1969    | 1970    | 1971    | 1972    | 1973    | 1974    | 1975    | 1976    | 1977    | 1978    | 1979    | 1980    | 1981    | 1982    | 1983    | 1984    | 1985    | 1986    | 1987    | 1988    | 1989    | 1990    | 1991    | 1992    | 1993    | 1994    | 1995    | 1996    | 1997    | 1998    | 1999    | 2000    | 2001    | 2002    | 2003    | 2004    | 2005    | 2006    | 2007    | 2008    | 2009    | 2010    | 2011    | 2012    | 2013    | 2014    | 2015    | 2016    | 2017    | 2018    | 2019    | 2020    | 2021    | 2022    | 2023    | 2024    | 2025    | 2026    | 2027    | 2028    | 2029    | 2030    | 2031    | 2032    | 2033    | 2034    | 2035    | 2036    | 2037    | 2038    | 2039    | 2040    | 2041    | 2042    | 2043    | 2044    | 2045    | 2046    | 2047    | 2048    | 2049    | 2050    | 2051    | 2052    | 2053    | 2054    | 2055    | 2056    | 2057 | 2058 | 2059 | 2060 | 2061 | 2062 | 2063 | 2064 | 2065 | 2066 | 2067 | 2068 | 2069 | 2070 | 2071 | 2072 | 2073 | 2074 | 2075 | 2076 | 2077 | 2078 | 2079 | 2080 | 2081 | 2082 | 2083 | 2084 | 2085 | 2086 | 2087 | 2088 | 2089 | 2090 | 2091 | 2092 | 2093 | 2094 | 2095 | 2096 | 2097 | 2098 | 2099 | 2100 |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 0.30144 | 0.30145 | 0.30146 | 0.30147 | 0.30148 | 0.30149 | 0.30150 | 0.30151 | 0.30152 | 0.30153 | 0.30154 | 0.30155 | 0.30156 | 0.30157 | 0.30158 | 0.30159 | 0.30160 | 0.30161 | 0.30162 | 0.30163 | 0.30164 | 0.30165 | 0.30166 | 0.30167 | 0.30168 | 0.30169 | 0.30170 | 0.30171 | 0.30172 | 0.30173 | 0.30174 | 0.30175 | 0.30176 | 0.30177 | 0.30178 | 0.30179 | 0.30180 | 0.30181 | 0.30182 | 0.30183 | 0.30184 | 0.30185 | 0.30186 | 0.30187 | 0.30188 | 0.30189 | 0.30190 | 0.30191 | 0.30192 | 0.30193 | 0.30194 | 0.30195 | 0.30196 | 0.30197 | 0.30198 | 0.30199 | 0.30200 | 0.30201 | 0.30202 | 0.30203 | 0.30204 | 0.30205 | 0.30206 | 0.30207 | 0.30208 | 0.30209 | 0.30210 | 0.30211 | 0.30212 | 0.30213 | 0.30214 | 0.30215 | 0.30216 | 0.30217 | 0.30218 | 0.30219 | 0.30220 | 0.30221 | 0.30222 | 0.30223 | 0.30224 | 0.30225 | 0.30226 | 0.30227 | 0.30228 | 0.30229 | 0.30230 | 0.30231 | 0.30232 | 0.30233 | 0.30234 | 0.30235 | 0.30236 | 0.30237 | 0.30238 | 0.30239 | 0.30240 | 0.30241 | 0.30242 | 0.30243 | 0.30244 | 0.30245 | 0.30246 | 0.30247 | 0.30248 | 0.30249 | 0.30250 | 0.30251 | 0.30252 | 0.30253 | 0.30254 | 0.30255 | 0.30256 | 0.30257 | 0.30258 | 0.30259 | 0.30260 | 0.30261 | 0.30262 | 0.30263 | 0.30264 | 0.30265 | 0.30266 | 0.30267 | 0.30268 | 0.30269 | 0.30270 | 0.30271 | 0.30272 | 0.30273 | 0.30274 | 0.30275 | 0.30276 | 0.30277 | 0.30278 | 0.30279 | 0.30280 | 0.30281 | 0.30282 | 0.30283 | 0.30284 | 0.30285 | 0.30286 | 0.30287 | 0.30288 | 0.30289 | 0.30290 | 0.30291 | 0.30292 | 0.30293 | 0.30294 | 0.30295 | 0.30296 | 0.30297 | 0.30298 | 0.30299 | 0.30300 | 0.30301 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

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920.1 920.2 920.3 920.4 920.5 920.6 920.7 920.8 920.9 921.0 921.1 921.2 921.3 921.4 921.5 921.6 921.7 921.8 921.9 922.0  
 929.4 930.2 930.3 930.4 930.5 930.6 930.7 930.8 930.9 931.0 931.1 931.2 931.3 931.4 931.5 931.6 931.7 931.8 931.9 932.0  
 936.0 936.2 936.3 936.4 936.5 936.6 936.7 936.8 936.9 937.0 937.1 937.2 937.3 937.4 937.5 937.6 937.7 937.8 937.9 938.0  
 938.0 938.2 938.3 938.4 938.5 938.6 938.7 938.8 938.9 939.0 939.1 939.2 939.3 939.4 939.5 939.6 939.7 939.8 939.9 940.0  
 937.0 937.1 937.2 937.3 937.4 937.5 937.6 937.7 937.8 937.9 938.0 938.1 938.2 938.3 938.4 938.5 938.6 938.7 938.8 938.9  
 937.1 937.2 937.3 937.4 937.5 937.6 937.7 937.8 937.9 938.0 938.1 938.2 938.3 938.4 938.5 938.6 938.7 938.8 938.9 939.0

PEAK OUTFLOW IS 2014, AT TIME 42.25 HOURS

CFS  
 1-CULS  
 AC-FT  
 T+JULS CU M  
 PEAK 2814.80  
 0-HOUR 2021.57  
 24-HOUR 620.18  
 72-HOUR 259.8  
 TOTAL VOLUME 5951.14  
 14.03  
 356.44  
 1072.12  
 1276.1518

STATISTICS 1

IF FLOW (1), OUTFLOW (0) AND OBSERVED FLOW (0)  
 . 1200. 1000. 200. 2420.

[illegible]

[illegible]

[illegible]

|          |         |
|----------|---------|
| 0.13193. | .....   |
| 0.30194. | 01..... |
| 0.51195. | 01..... |
| 1.00196. | 01..... |
| 1.13197. | 01..... |
| 1.33198. | 01..... |
| 1.63199. | 01..... |
| 2.00200. | 01..... |

0.13193.  
0.30194.  
0.45195.  
1.00196.  
1.15197.  
1.30198.  
1.45199.  
0.00200.

PLAN FOR AND STORAGE (FOOT OF PER) ) SURVEY FORMULATED PLAN-RATIO TOLL-OMIC COMPUTATIONS  
 FLEDS IN CUBIC (FEET PER BLOCK) (CUBIC FEET PER BLOCK)  
 AREA IN SQUARE FEET (SQUARE METER)

| OPERATION   | STATION     | AREA      | PLAN      | RATIO     | 1         | RATIO     | 2         | RATIO     | 3         | RATIO | 4 | RATIO | 5 | RATIO | 6 |
|-------------|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------|---|-------|---|-------|---|
|             |             |           |           |           |           |           |           |           |           |       |   |       |   |       |   |
| MULTIPLY BY | 1           | 1.34      | 1         | 0.20      | 0.40      | 0.50      | 0.60      | 0.80      | 1.00      |       |   |       |   |       |   |
|             | ( 7277.73 ) | ( 16.02 ) | ( 113.1 ) | ( 32.04 ) | ( 141.5 ) | ( 169.7 ) | ( 226.1 ) | ( 282.9 ) | ( 349.7 ) |       |   |       |   |       |   |
| ROUTED TO   | 1           | 1.34      | 1         | 0.20      | 0.40      | 0.50      | 0.60      | 0.80      | 1.00      |       |   |       |   |       |   |
|             | ( 7277.73 ) | ( 16.02 ) | ( 113.1 ) | ( 32.04 ) | ( 141.5 ) | ( 169.7 ) | ( 226.1 ) | ( 282.9 ) | ( 349.7 ) |       |   |       |   |       |   |

# SUMMARY OF DAM SAFETY ANALYSIS

PLA 1 .....

| RATIO<br>OF<br>P/F | ELEVATION<br>STORAGE<br>OUTFLOW | INITIAL VALUE<br>922.30<br>11.<br>0. | SPILLWAY CREST<br>922.30<br>11.<br>0. | TOP OF DAM<br>941.61<br>957.<br>962. | DURATION<br>OVER TOP<br>HOURS | MAXIMUM<br>OUTFLOW<br>CFS | MAXIMUM<br>STORAGE<br>AC-FT | MAXIMUM<br>DEPTH<br>OVER DAM | MAXIMUM<br>RESERVOIR<br>ELEV | TIME OF<br>MAX OUTFLOW<br>HOURS | TIME OF<br>FAILURE<br>HOURS |
|--------------------|---------------------------------|--------------------------------------|---------------------------------------|--------------------------------------|-------------------------------|---------------------------|-----------------------------|------------------------------|------------------------------|---------------------------------|-----------------------------|
|                    |                                 |                                      |                                       |                                      |                               |                           |                             |                              |                              |                                 |                             |
| 0.20               |                                 |                                      |                                       |                                      | 0.                            | 311.                      | 194.                        | 0.                           | 936.99                       | 44.50                           | 0.                          |
| 0.40               |                                 |                                      |                                       |                                      | 0.                            | 1087.                     | 215.                        | 0.                           | 937.70                       | 42.50                           | 0.                          |
| 0.50               |                                 |                                      |                                       |                                      | 0.                            | 1380.                     | 223.                        | 0.                           | 937.97                       | 42.50                           | 0.                          |
| 0.60               |                                 |                                      |                                       |                                      | 0.                            | 1662.                     | 231.                        | 0.                           | 938.23                       | 42.50                           | 0.                          |
| 0.80               |                                 |                                      |                                       |                                      | 0.                            | 2249.                     | 245.                        | 0.                           | 939.67                       | 42.25                           | 0.                          |
| 1.00               |                                 |                                      |                                       |                                      | 0.                            | 2814.                     | 253.                        | 0.                           | 940.69                       | 42.25                           | 0.                          |

## APPENDIX D

## REFERENCES

#### APPENDIX D

#### REFERENCES

- 1) U.S. Department of Commerce, Technical Paper No. 40, Rainfall Frequency Atlas of the United States, May 1961.
- 2) Soil Conservation Service, National Engineering Handbook, Section 4, Hydrology, August 1972 (U.S. Department of Agriculture).
- 3) H.W. King and E.F. Brater, Handbook of Hydraulics, 5th edition, McGraw-Hill, 1963.
- 4) T.W. Lambe and R.V. Whitman, Soil Mechanics, John Wiley and Sons, 1965.
- 5) W.D. Thornbury, Principles of Geomorphology, John Wiley and Sons, 1969.
- 6) University of the State of New York, Geology of New York, Education Leaflet 20, Reprinted 1973.
- 7) Cornell University Agriculture Experiment Station (compiled by M.G. Cline and R.L. Marshall), General Soil Map of New York State and Soils of New York Landscapes, Information Bulletin 119, 1977.

APPENDIX E

STABILITY ANALYSIS

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

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

DATE: October 14, 1969

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

ATTACHMENTS

1. Form SCS-354, Soil Mechanics Laboratory Data, 1 sheet.
2. Form SCS-128 and SCS-128A, Consolidation Curves, 1 test, 4 sheets.
3. Form SCS-127, Soil Permeability, 1 sheet.
4. Form SCS-355, Triaxial Shear Test Data, 2 tests, 2 sheets.
5. Form SCS-352, Compaction and Penetration Resistance, 3 sheets.
6. Form SCS-357, Summary - Slope Stability Analysis, 2 sheets.
7. Form SCS-130, Drain Materials, 1 sheet.
8. Investigational Plans and Profiles.

DISCUSSION OF DATA

FOUNDATION MATERIALS

- A. Classification. Bedrock at the site is of Devonian age, consisting of sandstones, siltstones and shales, but was not reached by the required drilling.

The area has been glaciated, and the abutments, except for a thin mantle of topsoil, consist of till which the geologist classifies as ML-CL. During this glacial period a blockage downstream caused a deposition of lacustrine silts (ML - 85% to 90% fines) in the floodplain area, 20 to 24 feet deep. This is overlain by a stratum of alluvial GM-GC, 2 to 4 feet thick, and this in turn is overlain by a lacustrine and colluvial stratum of clayey silt (ML). Topsoil overlies the floodplain as well as the abutments.

About a 2-foot layer of SM is found, at least at the right side of the floodplain, at the contact of the deep lacustrine deposits on the underlying till.

- B. Dry Unit Weight. An undisturbed foundation sample of the lacustrine ML (from Hole 352, depth 10+ feet) had densities varying from 1.56 to 1.62 g/cc (97.3 to 101.1 pcf) as determined when the core was removed from the tube and during the consolidation and shear testing. This sample was taken from a stratum where the blow counts were 9 and 10 per foot. This lacustrine deposit is logged as stiff with blow counts in Holes 51, 352, and 355 (on dam centerline) varying from 7 to 19 per foot. Blow counting upstream and downstream from the dam centerline on the two principal spillway lines showed a variation from 6 to 26 blows per foot.

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The over-all average count for the lacustrine deposit is 15 per foot. For the till in the area the over-all average is 31 blows per foot.

- C. Consolidation. A one-dimensional consolidation test on the lacustrine material (70W274) indicates that the 24-foot deep deposit under principal spillway location No. 1 will have a consolidation potential at the dam centerline of 0.04 ft/ft due to the load of the proposed dam.

It is estimated that the firmer, harder till has a consolidation potential of 0.015 ft/ft.

Under the proposed principal spillway No. 2, the 7-foot stratum of lacustrine material underlying the surface till has a consolidation potential of 0.036 ft/ft.

- D. Permeability. A falling head permeability test which was made during the consolidation test on the lacustrine material shows it to have a vertical permeability rate of about 0.001 fpd.

The geologist has stated that the till, the deep lacustrine stratum, and the shallow lacustrine-colluvial stratum below topsoil across the floodplain are all "essentially impermeable." However, the clayey gravel stratum which lies 2 to 4 feet below the ground surface across the floodplain is highly permeable.

The investigation was conducted during a rainy season, so possibly the water tables are higher than normal. Most of the measurements across the floodplain show the level at 1.5 to 2 feet below ground level, and at 4 to 5-foot depths in the abutments.

The SM stratum under the deep lacustrine deposit is permeable. During the drilling of Hole 353 an artesian flow occurred. This flow was probably from the SM stratum.

- E. Shear Strength. A consolidated undrained triaxial shear test was made on the lacustrine undisturbed sample. The test was performed on the sample as received, which was at full saturation. Resulting shear parameters are  $\phi = 16.5^\circ$ ,  $c = 1300$  psf.

#### EMBANKMENT MATERIALS

- A. Classification. Borrow from Borrow Area A in the right abutment, upstream from the dam, consists of glacial till with LL = 28 and PI = 8, a CL, and lacustrine and colluvial soil with LL = 26 and PI = 7, a CL-ML.

A sample from Borrow B in the left abutment upstream from the dam is a CL-ML with LL = 25 and PI = 7.

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- B. Compacted Dry Density. The till samples have standard Proctor densities of 122.5 and 120.5 pcf at optimum moistures of 12.5 and 13.5 percent. The sample of lacustrine and colluvial soil has a standard density of 111.0 pcf at 16.0 percent moisture.
- C. Shear Strength. Borrow sample 70W215, the lacustrine-colluvial sample from Borrow Area A, was tested in consolidated undrained triaxial shear. Test specimens were molded at 95 percent of standard Proctor density and soaked to almost full theoretical saturation. Resulting shear parameters are  $\phi = 26.5^\circ$ ,  $c = 625$  psf.

#### STABILITY ANALYSIS

The floodplain section with 27 to 28 feet of lacustrine foundation was checked for slope stability by the Swedish circle method.

Minimum factors of safety found were 2.8 for the embankment itself (upstream 3:1 slope without berm), and 2.8 for a foundation failure arc (downstream 2 1/2:1 slope with drain, depth about 19 feet into the foundation).

#### SETTLEMENT ANALYSIS

Differential settlements and deflections in both lower abutments at the boundary area between the lacustrine silts and the glacial till cannot be accurately ascertained with the information at hand. However, it appears that the "dovetailing" of the two materials will make the transition gradual from the lacustrine material to the till.

Total settlement of the foundation at principal spillway location No. 1 will be about 1.2 feet.

#### CONCLUSIONS AND RECOMMENDATIONS

- A. Cutoff. Cutoff is recommended below emergency spillway elevation. In the abutments the trench should be deep enough to cut off surface disturbances and the less dense till, possibly 4 to 5 feet. Across the floodplain the trench should cut off the permeable clayey gravel stratum and bottom in the stiff clayey silt lacustrine material.

Backfill with till borrow similar to 70W214 or 70W216. Suggested placement density is 95 percent of standard Proctor at near optimum moisture. The till is suggested as backfill because the lacustrine borrow is very highly dispersed. If the lacustrine material is used, then a transition filter is suggested with a gradation similar to that shown on Form SCS-130. This should be placed on the downstream side of the cutoff backfill to prevent the lacustrine fines from being carried into the permeable GC stratum.

The ASTM Fine Concrete Aggregate Gradation, C-33, could be used instead of the above mentioned gradation.

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- B. Principal Spillway. It is suggested that principal spillway location proposal No. 1 not be used. A 29.5-foot high dam here with a total base width of 186.2 feet, and a foundation about 30 feet deep with a consolidation potential of 0.04 ft/ft would cause a horizontal elongation in the pipe of about 0.012 ft/ft.

At proposed location No. 2, settlement at the dam centerline will be about 0.6 foot (with the estimated consolidation potential of 0.015 ft/ft in the till) and the maximum unit horizontal elongation will be on the order of 0.0055 ft/ft.

Backfill with borrow similar to 70W215 (103.1). Suggested placement density is 95 percent of standard Proctor at near optimum moisture. Spillway backfill should be tied in well with that of the cutoff.

Use a  $\phi$ -angle of 30° for conduit loading computations.

- C. Drainage. Drainage is recommended at the  $c/b = 0.6$  point below permanent pool elevation. A trench 4 to 5 feet deep is suggested in the abutments, and deep enough in the floodplain to intercept the full depth of the permeable GC stratum.

To prevent piping out of the lacustrine materials a double filter is suggested. The ASTM Fine Concrete Aggregate C-33 together with ASTM No. 78 Road Gravel would be satisfactory gradations.

- D. Embankment Design. Selectively place the highly dispersed, erodible lacustrine soils in the interior of the dam, with the less erodible till soils as outside cover.

It is suggested the borrow be placed at 95 percent of standard Proctor density at near optimum moisture, with control on the minus No. 4 fraction.

Satisfactory factors of safety are provided with the suggested 3:1 upstream slope with a 10-foot berm, and the 2 1/2:1 downstream slope.

An overbuild of 1.3 feet is suggested to compensate for residual settlement of the embankment and foundation.

Prepared by:

Carl G. Nygren  
Carl G. Nygren

Reviewed and Approved by:

Lorn P. Dunnigan  
Lorn P. Dunnigan, Head,  
Soil Mechanics Laboratory

cc:

Richard J. Phillips (1)  
Bernard S. Ellis, Syracuse, N.Y.  
Donald Shanklin, Binghamton, N.Y.  
Neil F. Bogner, Upper Darby, Pa.

Attachments

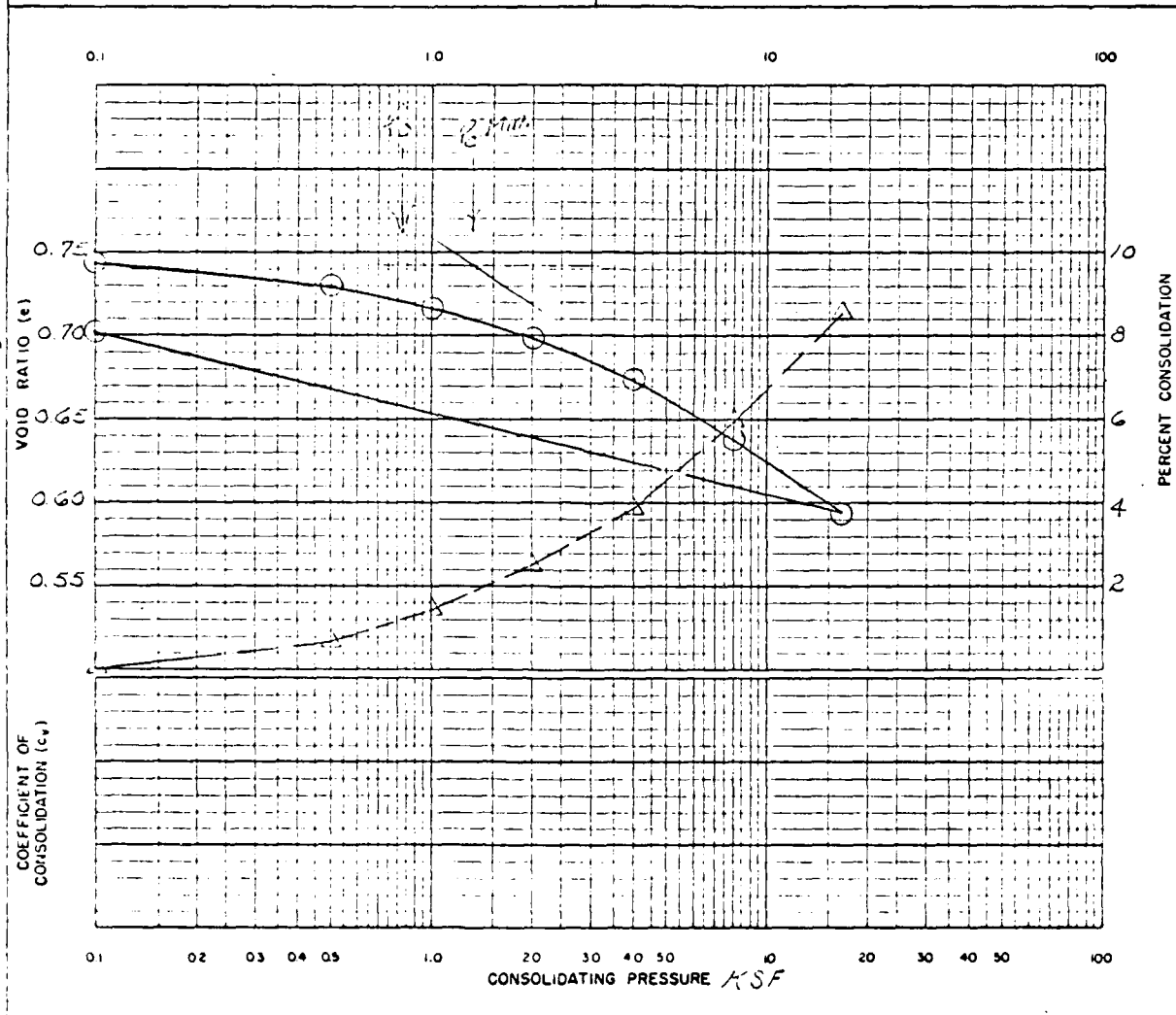


|                                     |                                                                     |                           |
|-------------------------------------|---------------------------------------------------------------------|---------------------------|
| <b>MATERIALS<br/>TESTING REPORT</b> | U. S. DEPARTMENT of AGRICULTURE<br><b>SOIL CONSERVATION SERVICE</b> | <b>CONSOLIDATION TEST</b> |
|-------------------------------------|---------------------------------------------------------------------|---------------------------|

|                                                            |                                   |
|------------------------------------------------------------|-----------------------------------|
| PROJECT and STATE<br><u>FAIRFAX CO. VA. 22030 NEW YORK</u> | SAMPLE LOCATION<br><u>BRILLUS</u> |
|------------------------------------------------------------|-----------------------------------|

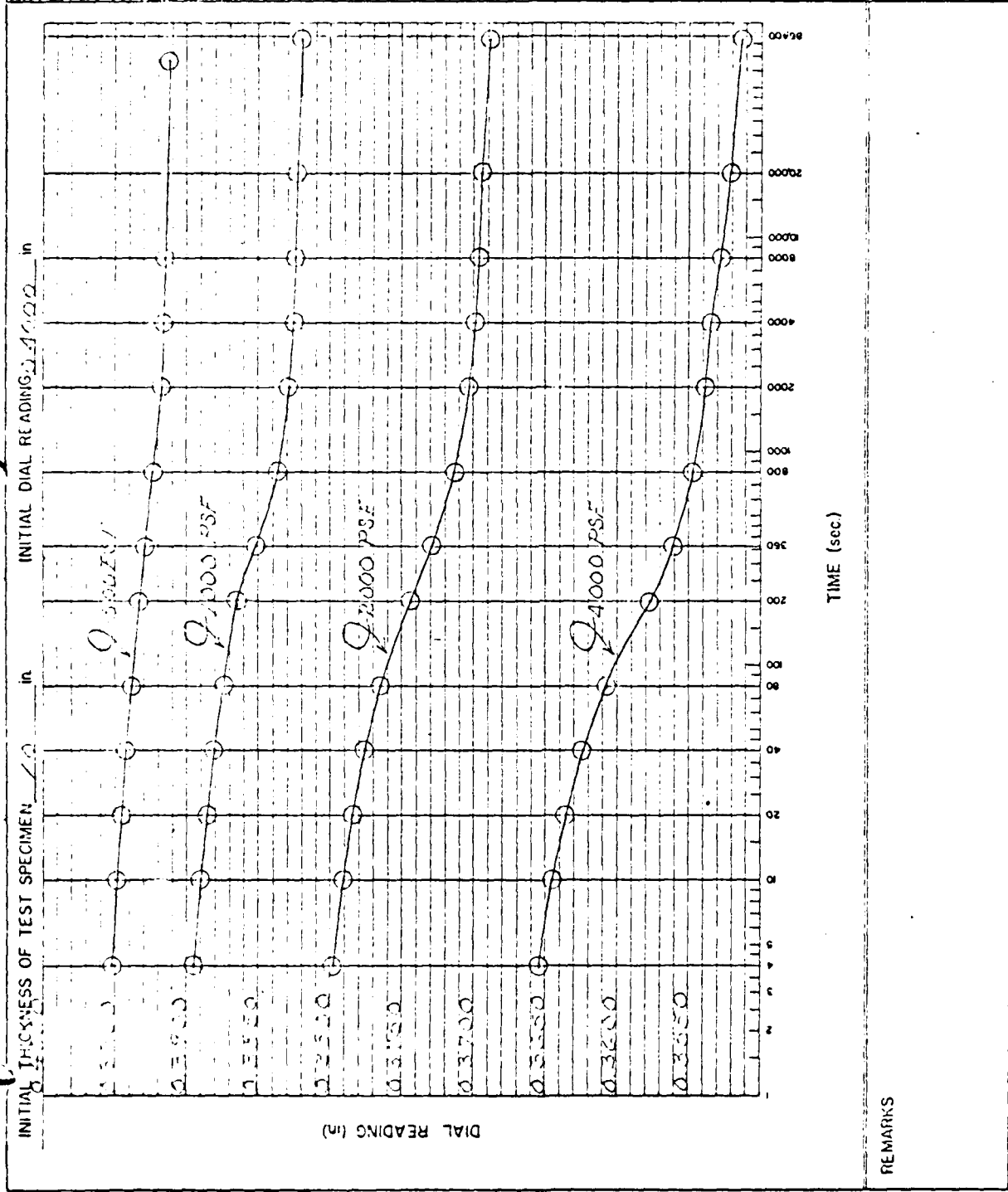
|                                      |                                               |                                     |                 |
|--------------------------------------|-----------------------------------------------|-------------------------------------|-----------------|
| FIELD SAMPLE NO.<br><u>2501-1</u>    | DEPTH<br><u>10'-5"</u>                        | GEOLOGIC ORIGIN<br><u>SUBSTRATE</u> |                 |
| TYPE OF SAMPLE<br><u>UNDISTURBED</u> | TESTED AT<br><u>SOIL CONSERVATION SERVICE</u> | APPROVED BY<br><u></u>              | DATE<br><u></u> |

|                                                                                                                                                                                                         |                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| CLASSIFICATION <u>CL-ML</u><br>$G_s$ <u>2.65</u> $LL$ <u>42</u> $PI$ <u>5</u><br>INITIAL DENSITY $\gamma_d$ <u>120.4</u><br>INITIAL VOID RATIO, $e_0$ <u>0.7200</u><br>COMPRESSION INDEX, $C_c$ <u></u> | TEST SPECIFICATIONS:<br><i>Saturated at Start</i> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|



REMARKS

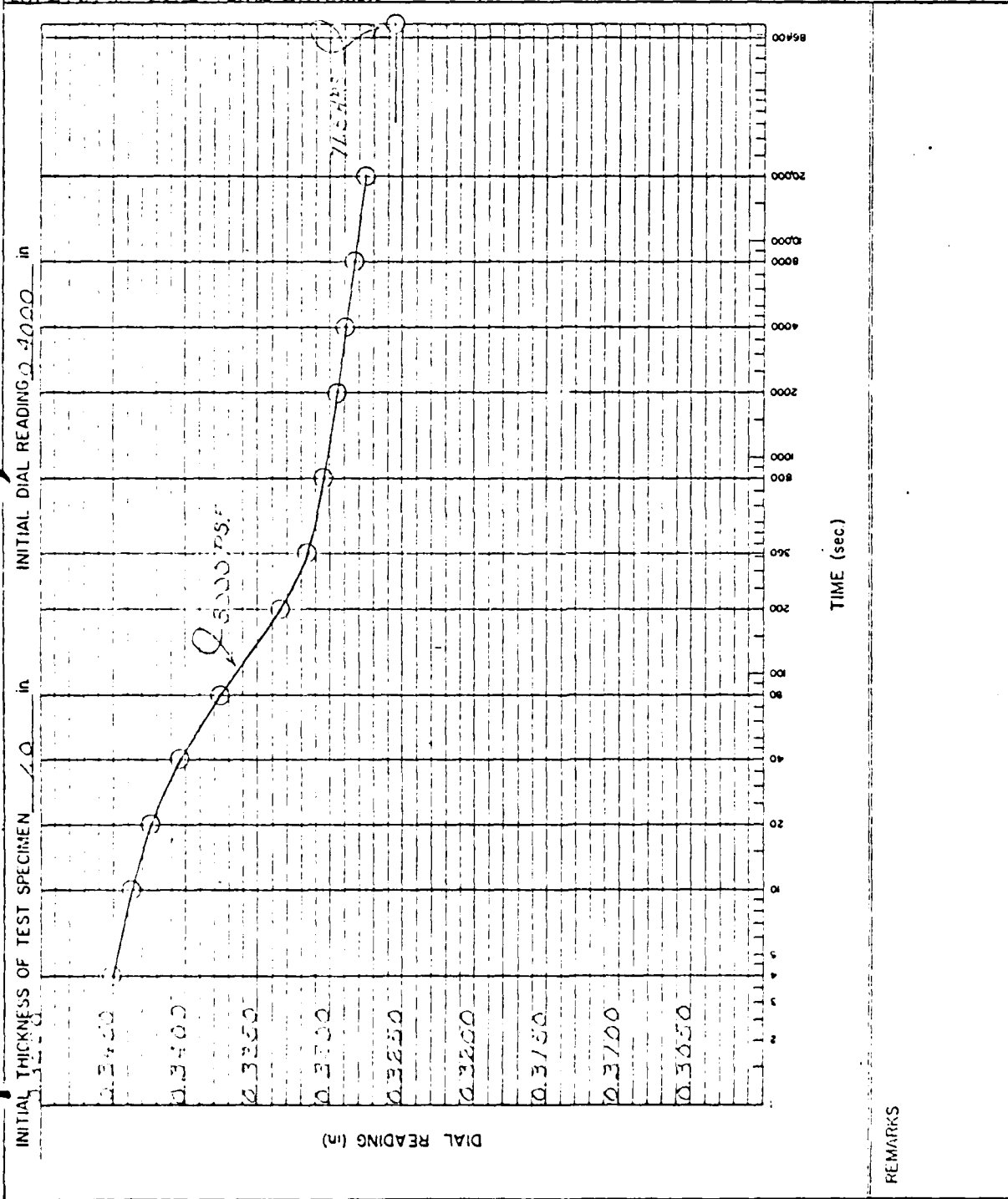
|                                                           |                          |                                                              |  |                                |  |
|-----------------------------------------------------------|--------------------------|--------------------------------------------------------------|--|--------------------------------|--|
| MATERIALS<br>TESTING REPORT                               |                          | U. S. DEPARTMENT OF AGRICULTURE<br>SOIL CONSERVATION SERVICE |  | LOG TIME<br>CONSOLIDATION      |  |
| PROJECT and STATE<br>FEDERAL HIGHWAY COMMISSION, NEW YORK |                          |                                                              |  | SAMPLE LOCATION<br>BRONX, N.Y. |  |
| FIELD SAMPLE NO.<br>3-2-1                                 | DEPTH<br>20.0'-5"        | GEOLOGIC ORIGIN                                              |  |                                |  |
| TYPE OF SAMPLE<br>UNDISTURBED                             | TESTED AT<br>SUNY-ALBANY | APPROVED BY                                                  |  | DATE                           |  |



REMARKS

|                                           |                                                                           |                                         |
|-------------------------------------------|---------------------------------------------------------------------------|-----------------------------------------|
| <b>MATERIALS</b><br><b>TESTING REPORT</b> | <b>U.S. DEPARTMENT OF AGRICULTURE</b><br><b>SOIL CONSERVATION SERVICE</b> | <b>LOG TIME</b><br><b>CONSOLIDATION</b> |
|-------------------------------------------|---------------------------------------------------------------------------|-----------------------------------------|

|                                                                  |                                 |                                   |                 |
|------------------------------------------------------------------|---------------------------------|-----------------------------------|-----------------|
| PROJECT AND STATE<br><i>SATISFACTION CRITERIA NO. 3 NEW YORK</i> |                                 | SAMPLE LOCATION<br><i>SP1X115</i> |                 |
| FIELD SAMPLE NO.<br><i>3000-1</i>                                | DEPTH<br><i>10.0' - 4</i>       | GEOLOGIC ORIGIN<br><i></i>        |                 |
| TYPE OF SAMPLE<br><i>1/4" TEST SPECIMEN</i>                      | TESTED AT<br><i>SMA-6671044</i> | APPROVED BY<br><i></i>            | DATE<br><i></i> |



|                                                           |                                |                                                                     |  |                                   |  |
|-----------------------------------------------------------|--------------------------------|---------------------------------------------------------------------|--|-----------------------------------|--|
| <b>MATERIALS<br/>TESTING REPORT</b>                       |                                | <b>U.S. DEPARTMENT OF AGRICULTURE<br/>SOIL CONSERVATION SERVICE</b> |  | <b>LOG TIME<br/>CONSOLIDATION</b> |  |
| PROJECT and STATE<br><i>STATION ON GREEN RD. NEW YORK</i> |                                |                                                                     |  | SAMPLE LOCATION<br><i>BRILLUS</i> |  |
| FIELD SAMPLE NO.<br><i>5003-1</i>                         | DEPTH<br><i>100'-1</i>         | GEOLOGIC ORIGIN                                                     |  |                                   |  |
| TYPE OF SAMPLE<br><i>UNDISTURBED</i>                      | TESTED AT<br><i>SM-1116017</i> | APPROVED BY                                                         |  | DATE                              |  |

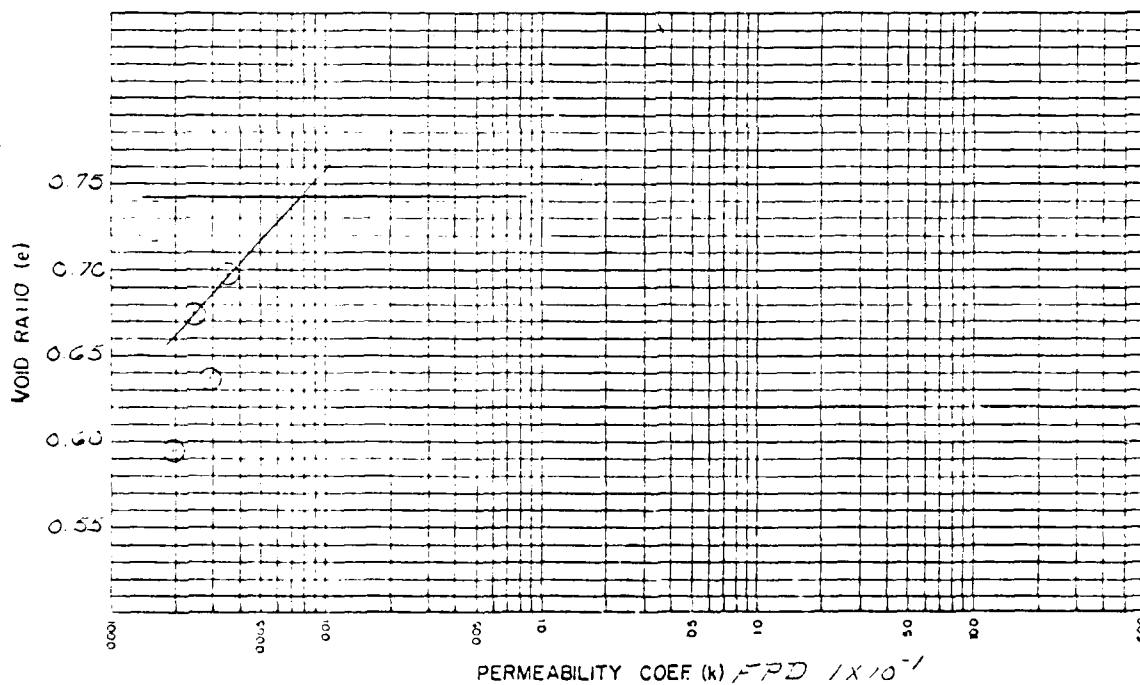
  

INITIAL THICKNESS OF TEST SPECIMEN 1.0 in

INITIAL DIAL READING 22500 in

REMARKS

|                                                                                  |                                  |                                                                      |               |                                   |             |
|----------------------------------------------------------------------------------|----------------------------------|----------------------------------------------------------------------|---------------|-----------------------------------|-------------|
| <b>MATERIALS TESTING REPORT</b>                                                  |                                  | <b>U. S. DEPARTMENT of AGRICULTURE<br/>SOIL CONSERVATION SERVICE</b> |               | <b>SOIL PERMEABILITY</b>          |             |
| PROJECT and STATE<br><i>SALESLEY BRIDGE RD. NEW YORK</i>                         |                                  |                                                                      |               | SAMPLE LOCATION<br><i>EXHIBIT</i> |             |
| FIELD SAMPLE NO.<br><i>1000-1</i>                                                | DEPTH<br><i>100-1</i>            | GEOLOGIC ORIGIN                                                      |               |                                   |             |
| TYPE OF SAMPLE<br><i>HYDROTHERMAL</i>                                            | TESTED AT<br><i>OML-LINGOLLY</i> | APPROVED BY                                                          |               |                                   | DATE        |
| CLASSIFICATION <i>CL-ML</i>                                                      |                                  |                                                                      |               | SPECIFIC GRAVITY                  |             |
| LL <i>24</i> PI <i>5</i>                                                         |                                  |                                                                      |               |                                   |             |
| TEST NO.                                                                         | <i>1000</i>                      | <i>1030</i>                                                          | <i>1030</i>   | <i>1030</i>                       | <i>1030</i> |
| INITIAL MOISTURE %                                                               |                                  |                                                                      |               |                                   | <i>2.77</i> |
| DRY DENSITY $\frac{g}{cc}$<br>$\frac{pcf}{pcf}$                                  | <i>1.59</i>                      | <i>1.59</i>                                                          | <i>1.59</i>   | <i>1.74</i>                       |             |
| VOID RATIO                                                                       | <i>0.6568</i>                    | <i>0.6763</i>                                                        | <i>0.6383</i> | <i>0.6943</i>                     |             |
| PERMEABILITY COEF. <i>FPD</i>                                                    | <i>0.0004</i>                    | <i>0.0002</i>                                                        | <i>0.0003</i> | <i>0.00019</i>                    |             |
| PERCOLATION COEF                                                                 |                                  |                                                                      |               |                                   |             |
| $H/L$ DURING TEST                                                                |                                  |                                                                      |               |                                   |             |
| TEST SPECIFICATIONS<br><i>Falling Head Perm Test on The Consolidation Sample</i> |                                  |                                                                      |               |                                   |             |



REMARKS *e = approx 0.001 fpd*

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

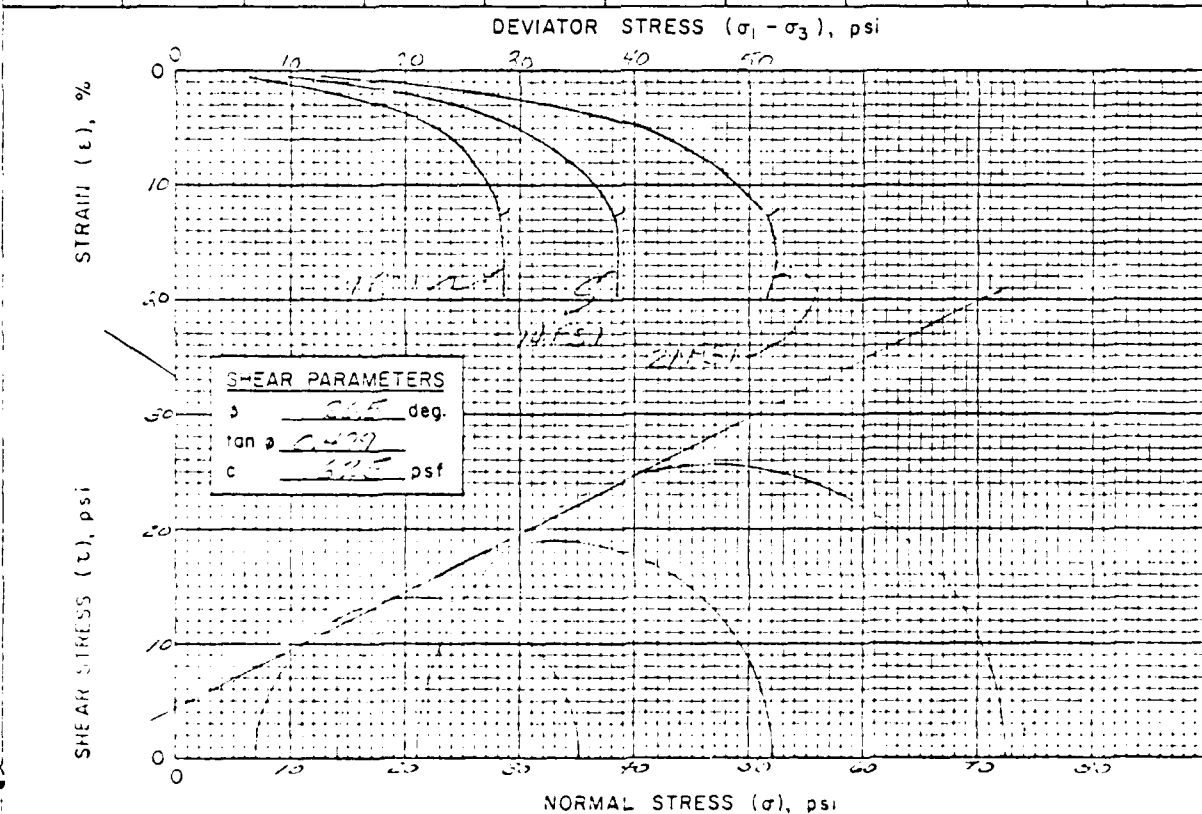
PROJECT and STATE Highway 100, New York SAMPLE LOCATION Right of Way

FIELD SAMPLE NO. 100-1 DEPTH 2.5 GEOLOGIC ORIGIN

TYPE OF SAMPLE Consolidation TESTED AT  APPROVED BY  DATE

| INDEX TEST DATA                            |                              |             |  | SPECIMEN DATA                                 |                       | TYPE OF TEST                           |
|--------------------------------------------|------------------------------|-------------|--|-----------------------------------------------|-----------------------|----------------------------------------|
| USCS <u>CL-ML</u>                          | LL <u>34</u>                 | PI <u>7</u> |  | HEIGHT <u>3.0</u> "                           | DIAMETER <u>1.4</u> " | UU <input type="checkbox"/>            |
| % FINER (mm): 0.002 <u>32</u>              | 0.005 <u>41</u>              |             |  | MATERIALS TESTED PASSED <u>5</u> SIEVE        |                       | CU <input checked="" type="checkbox"/> |
|                                            | 0.074 (#200) <u>25</u>       |             |  | METHOD OF PREPARATION <u>MOLDED</u>           |                       | CU <input type="checkbox"/>            |
| G <sub>s</sub> (-#4) <u>2.7</u>            | G <sub>s</sub> (+#4) <u></u> |             |  | <u>By Tamping in 5 Lifts (Soaked)</u>         |                       | CD <input type="checkbox"/>            |
| STANDARD: $\gamma_d$ MAX. <u>111.0</u> pcf | $w_0$ <u>16.0</u> %          |             |  | MOLDING MOISTURE <u>17.5</u> %                |                       |                                        |
| MODIFIED: $\gamma_d$ MAX. <u></u> pcf      | $w_0$ <u></u> %              |             |  | MOLDED AT <u>25.0</u> % OF $\gamma_d$ MAXIMUM |                       |                                        |

| DRY DENSITY |                  | MOISTURE CONTENT, % |                               |             | TIME OF CONSOLIDATION (hrs.) | MINOR PRINCIPAL STRESS $\sigma_3$ (psi) | DEVIATOR STRESS $\sigma_1 - \sigma_3$ (psi) | AXIAL STRAIN AT FAILURE, $\epsilon$ (%) |
|-------------|------------------|---------------------|-------------------------------|-------------|------------------------------|-----------------------------------------|---------------------------------------------|-----------------------------------------|
| INITIAL pcf | CONSOLIDATED pcf | START OF TEST       | DEG. OF SAT. AT START OF TEST | END OF TEST |                              |                                         |                                             |                                         |
| 106.4       | 106.4            | 21.8                | 99.5                          | 21.6        | 5.62                         | 7                                       | 28.1                                        | 12.8                                    |
| 105.2       | 106.7            | 22.2                | 99.6                          | 21.4        | 5.53                         | 14                                      | 38.1                                        | 12.7                                    |
| 106.4       | 108.5            | 21.8                | 99.5                          | 20.7        | 5.88                         | 21                                      | 51.5                                        | 12.8                                    |

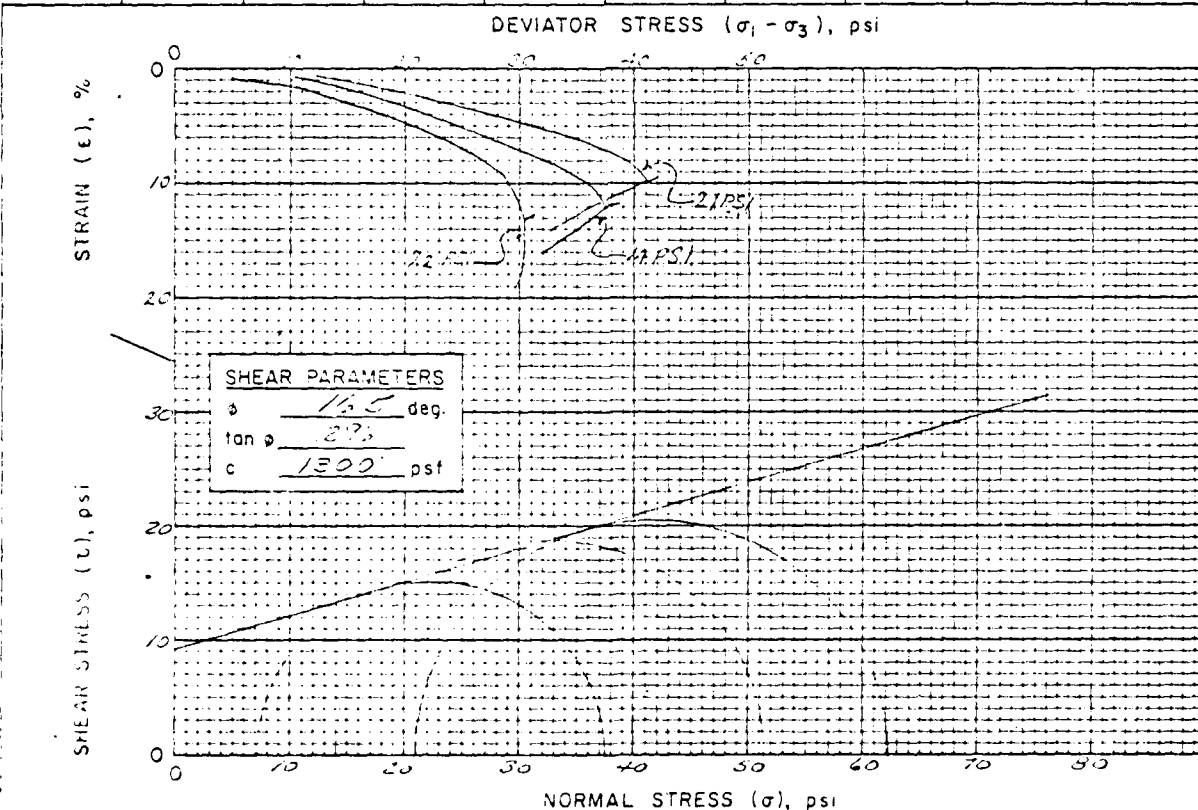


REMARKS TESTED @ 95.4% STD 7-1115-1

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

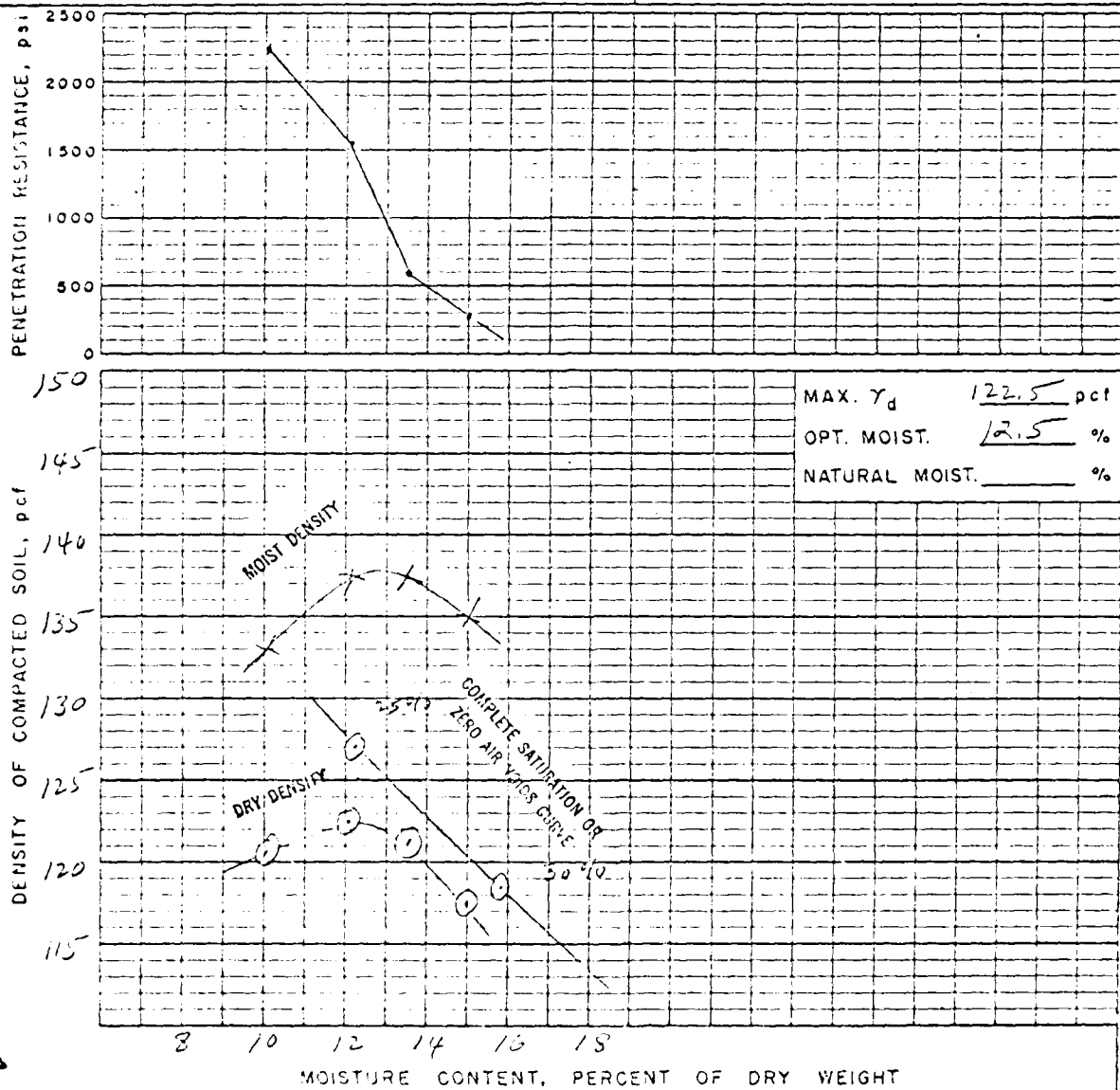
|                                                                           |                                   |                                            |      |
|---------------------------------------------------------------------------|-----------------------------------|--------------------------------------------|------|
| PROJECT AND STATE<br><i>Clinton Co. Road Site 2, New York</i>             |                                   | SAMPLE LOCATION<br><i>PC111US</i>          |      |
| FIELD SAMPLE NO.<br><i>5000-1</i>                                         | DEPTH<br><i>10 1/2'</i>           | GEOLOGIC ORIGIN                            |      |
| TYPE OF SAMPLE<br><i>undisturbed</i>                                      | TESTED AT<br><i>NYC - Lincoln</i> | APPROVED BY                                | DATE |
| INDEX TEST DATA                                                           |                                   | SPECIMEN DATA                              |      |
| USCS <i>CL-ML</i> ; LL <i>34</i> ; PI <i>5</i>                            |                                   | HEIGHT <i>2.0</i> "; DIAMETER <i>1.4</i> " |      |
| % FINER (mm): 0.002 <i>22</i> ; 0.005 <i>37</i> ; 0.074 (#200) <i>100</i> |                                   | MATERIALS TESTED PASSED <i>#4</i> SIEVE    |      |
| G <sub>s</sub> (-#4) <i>2.70</i> ; G <sub>s</sub> (+#4)                   |                                   | METHOD OF PREPARATION <i>TRIMMED</i>       |      |
| STANDARD: $\gamma_d$ MAX. _____ pcf; w <sub>0</sub> _____ %               |                                   | MOLDING MOISTURE _____ %                   |      |
| MODIFIED: $\gamma_d$ MAX. _____ pcf; w <sub>0</sub> _____ %               |                                   | MOLDED AT _____ % OF $\gamma_d$ MAXIMUM    |      |
|                                                                           |                                   | TYPE OF TEST                               |      |
|                                                                           |                                   | UU <input type="checkbox"/>                |      |
|                                                                           |                                   | CU <input checked="" type="checkbox"/>     |      |
|                                                                           |                                   | CD <input type="checkbox"/>                |      |

| DRY DENSITY |                  | MOISTURE CONTENT, % |                               |             | TIME OF CONSOLIDATION (hrs.) | MINOR PRINCIPAL STRESS $\sigma_3$ (psi) | DEVIATOR STRESS $\sigma_1 - \sigma_3$ (psi) | AXIAL STRAIN AT FAILURE, $\epsilon$ (%) |
|-------------|------------------|---------------------|-------------------------------|-------------|------------------------------|-----------------------------------------|---------------------------------------------|-----------------------------------------|
| INITIAL pcf | CONSOLIDATED pcf | START OF TEST       | DEG. OF SAT. AT START OF TEST | END OF TEST |                              |                                         |                                             |                                         |
| 1.62        | 1.62             | 26.3                | 100.0                         | 26.3        | 16.85                        | 7.2                                     | 30.3                                        | 13.2                                    |
| 1.65        | 1.65             | 25.5                | 100.0                         | 25.2        | 17.37                        | 14                                      | 37.4                                        | 12.0                                    |
| 1.61        | 1.61             | 26.1                | 100.0                         | 25.6        | 17.63                        | 21                                      | 41.1                                        | 9.9                                     |
|             |                  |                     |                               |             |                              |                                         |                                             |                                         |
|             |                  |                     |                               |             |                              |                                         |                                             |                                         |



REMARKS *TESTED @ NATURAL MOISTURE* *GFH/32A*

|                                                              |  |                                                                       |  |                                                    |  |
|--------------------------------------------------------------|--|-----------------------------------------------------------------------|--|----------------------------------------------------|--|
| MATERIALS TESTING REPORT                                     |  | U.S. DEPARTMENT OF AGRICULTURE<br>SOIL CONSERVATION SERVICE           |  | COMPACTION AND PENETRATION RESISTANCE              |  |
| PROJECT <u>Pe-Harson Creek, Site 3, New York.</u>            |  |                                                                       |  |                                                    |  |
| FIELD SAMPLE NO. <u>1021</u>                                 |  | LOCATION <u>MAT A</u>                                                 |  | DEPTH <u>1-14.5'</u>                               |  |
| GEOLOGIC ORIGIN                                              |  | TESTED AT <u>SML-LINCOLN</u>                                          |  | APPROVED BY                                        |  |
| DATE                                                         |  | DATE                                                                  |  | DATE                                               |  |
| CLASSIFICATION <u>CL</u>                                     |  | LL <u>26</u>                                                          |  | PI <u>5</u>                                        |  |
| MAX. PARTICLE SIZE INCLUDED IN TEST <u>&lt; #4 "</u>         |  | CURVE NO. <u>1</u>                                                    |  | OF <u>3</u>                                        |  |
| SPECIFIC GRAVITY (G <sub>s</sub> ) { MINUS NO. 4 <u>2.71</u> |  | STD. (ASTM D-698) <input checked="" type="checkbox"/> METHOD <u>A</u> |  | MOD. (ASTM D-1557) <input type="checkbox"/> METHOD |  |
| { PLUS NO. 4 <u>2.72</u>                                     |  | OTHER TEST <input type="checkbox"/> (SEE REMARKS)                     |  |                                                    |  |



|         |                                                                                                                               |
|---------|-------------------------------------------------------------------------------------------------------------------------------|
| REMARKS | CURVE IS FOR THE MINUS NO. 4 FRACTION<br>GRADATION OF TOTAL SAMPLE<br>< NO. 200 <u>33</u> < NO. 4 <u>33</u> < IN. <u>12.5</u> |
|---------|-------------------------------------------------------------------------------------------------------------------------------|

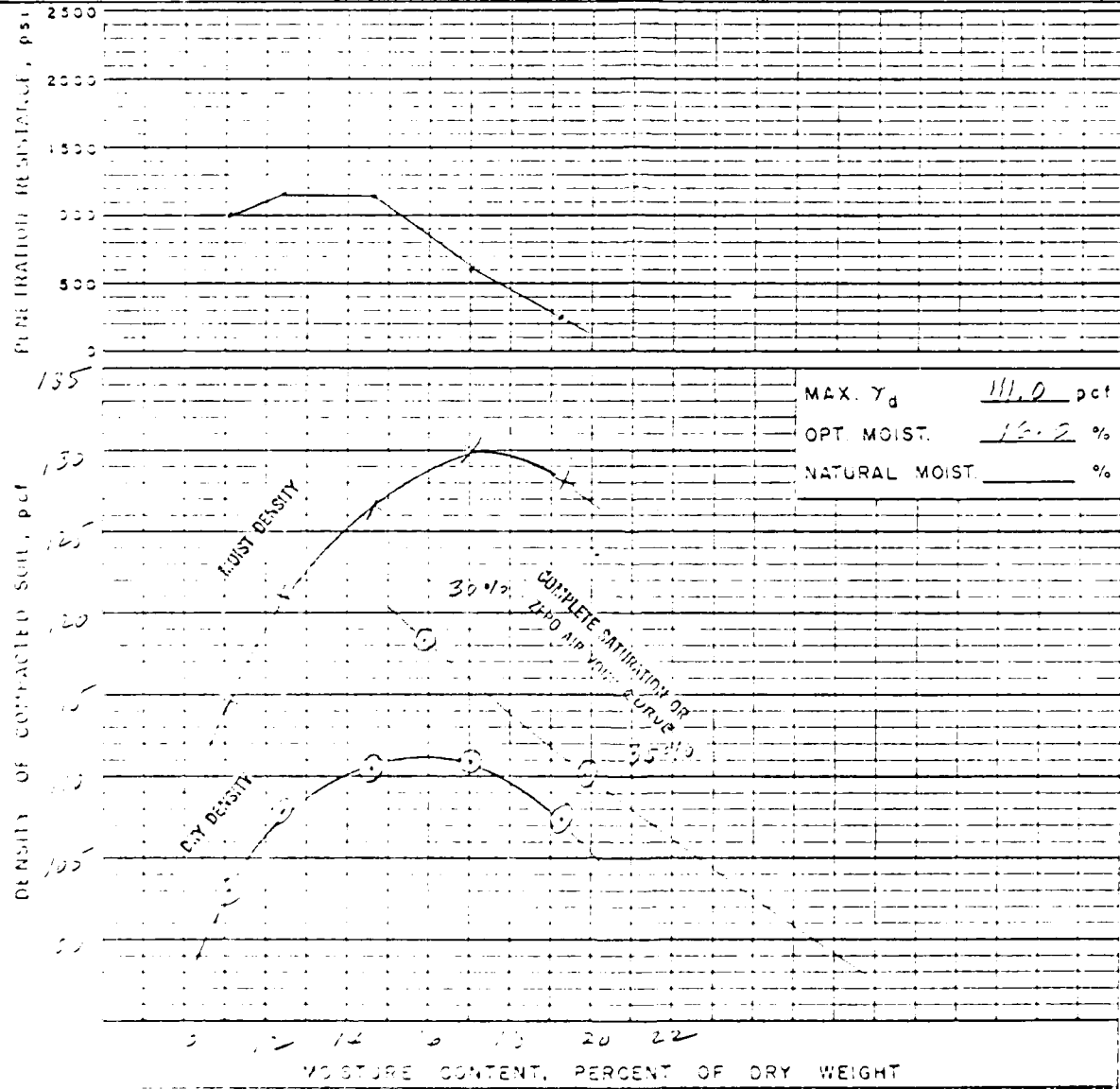
NO. 100

7.12.5

U.S. DEPARTMENT OF AGRICULTURE  
 TESTING REPORT SOIL COMPACTION BY VICE PENETRATION RESISTANCE

PROJECT: ROCKAWAY CREEK, SITE 2, NEW YORK  
 FIELD NO. 103 LOCATION BARRETT A-122 A DEPTH 0.5-2.5'  
 DESIGNED BY SM-LINCOLN APPROVED BY SM-LINCOLN DATE 7.12.5

CLASSIFICATION CL-MH LL 26 PL 7 CURVE NO. 2 OF 3  
 MAX. PARTICLE SIZE INCLUDED IN TEST < #4 STD (ASTM D-698) ☒ METHOD A  
 SPECIFIC GRAVITY  $G_s$  2.71 MINUS NO. 4 2.71 MOD (ASTM D-557) ☐ METHOD         
 PLUS NO. 4        OTHER TEST ☐ (SEE REMARKS)



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

PROJECT AND STATE Putnam Brook, Site 2, New York

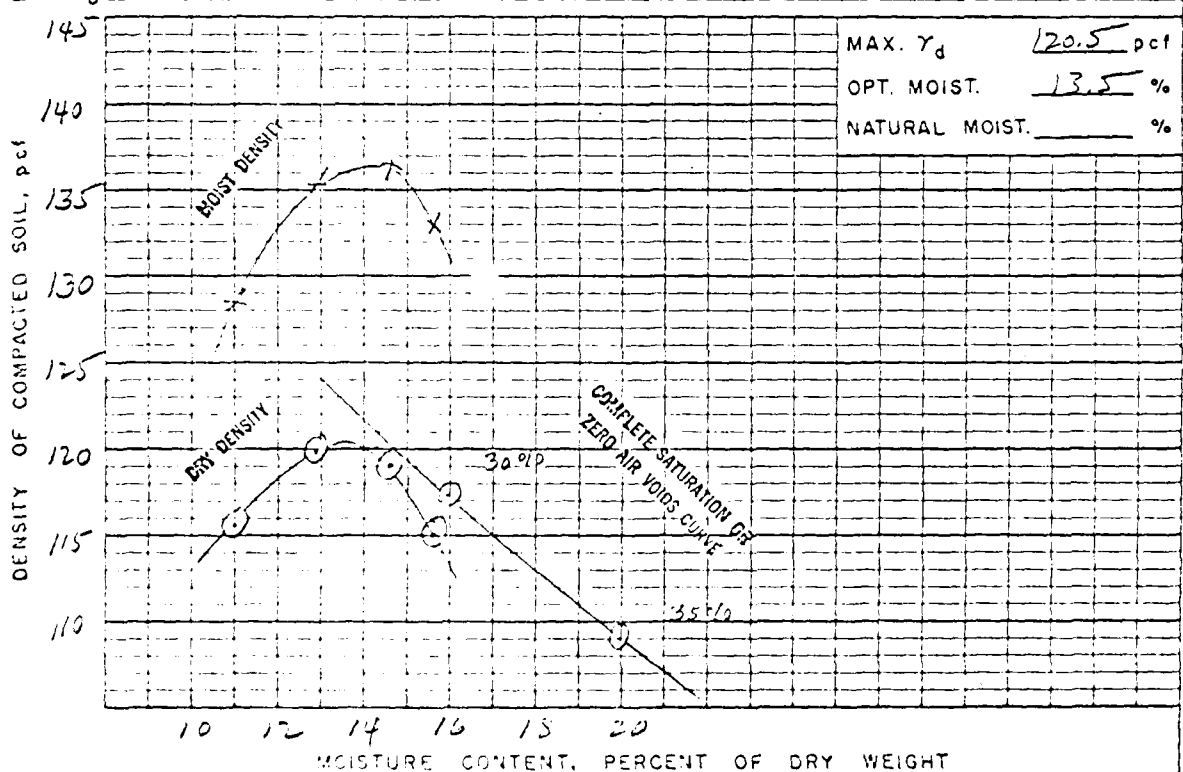
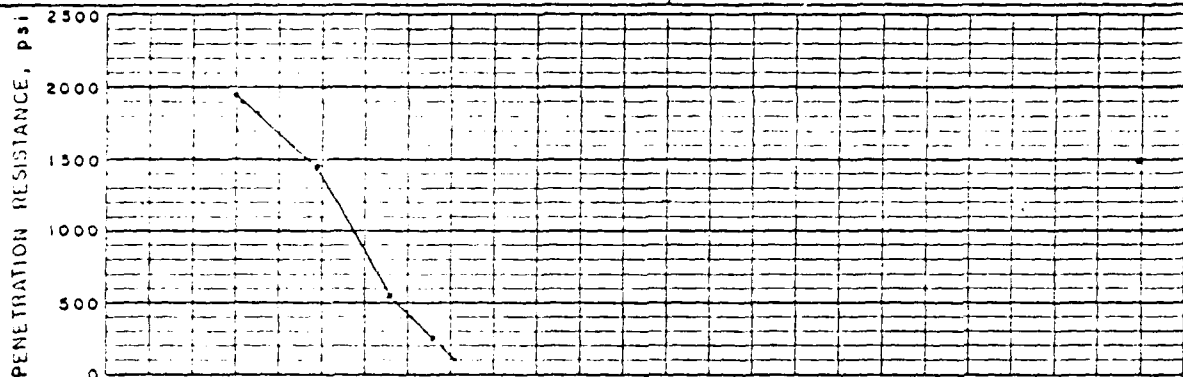
FIELD SAMPLE NO. 111.1 Plot A LOCATION Putnam Area 3 DEPTH 5' - ?

GEOLOGIC ORIGIN \_\_\_\_\_ TESTED AT SIML-LINCOLN APPROVED BY \_\_\_\_\_ DATE \_\_\_\_\_

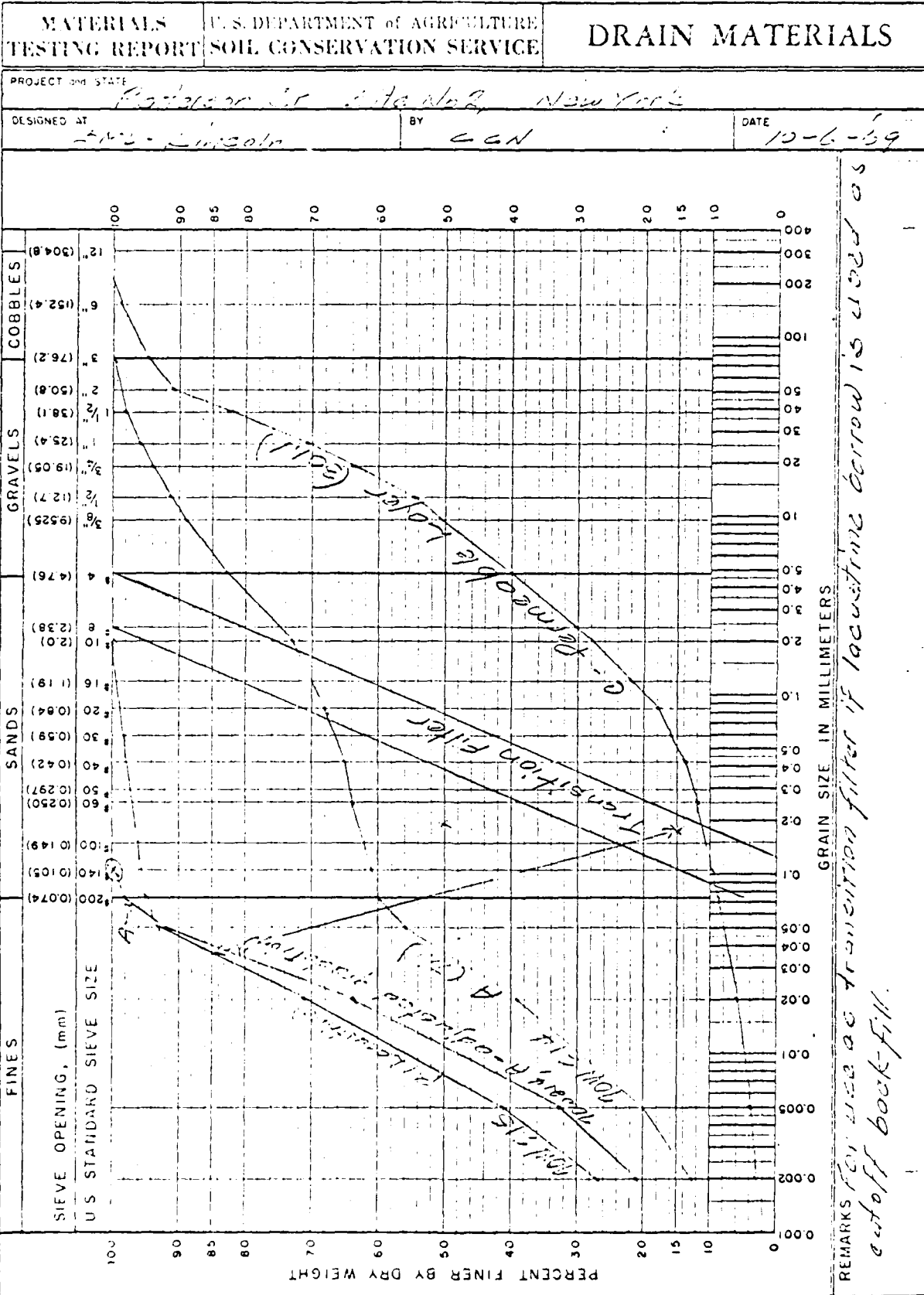
CLASSIFICATION CL-ML LL 25 PI 7 CURVE NO. 3 OF 3

MAX. PARTICLE SIZE INCLUDED IN TEST < #4 " STD. (ASTM D-698) ☒; METHOD A

SPECIFIC GRAVITY ( $G_s$ ) { MINUS NO. 4 2.69 MOD. (ASTM D-1557) ☐; METHOD \_\_\_\_\_  
PLUS NO. 4 2.71 OTHER TEST ☐ (SEE REMARKS)



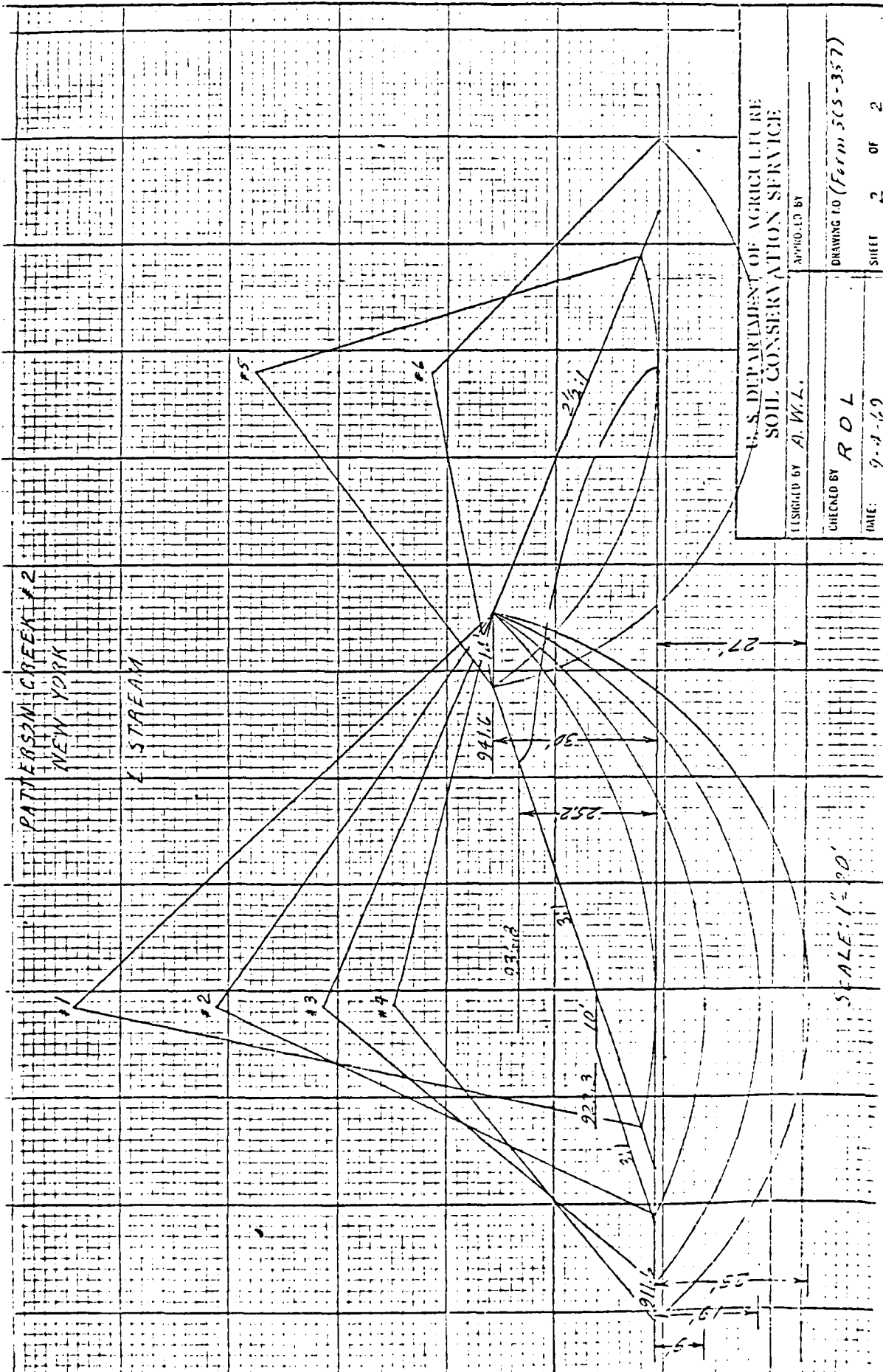
REMARKS CURVE IS FOR THE MINUS NO. 4 FRACTION  
GRADATION OF TOTAL SAMPLE  
< NO. 200 50%, < NO. 4 70%, < 3 IN. 100%



| MATERIALS TESTING REPORT                                   |  | U. S. DEPARTMENT of AGRICULTURE<br>SOIL CONSERVATION SERVICE |                                          | SUMMARY - SLOPE STABILITY ANALYSIS |             |
|------------------------------------------------------------|--|--------------------------------------------------------------|------------------------------------------|------------------------------------|-------------|
| PROJECT and STATE<br><i>PUTTICKSON CREEK SITE NEW YORK</i> |  |                                                              |                                          | DATE<br><i>9-2-69</i>              |             |
| METHOD OF ANALYSIS<br><i>SWEDISH CIRCLE</i>                |  |                                                              | ANALYZED AT<br><i>U.S. LINCOLN, N.Y.</i> |                                    | APPROVED BY |

| TRIAL NO. | SLOPE   | CLASSIFICATION                                                                      | ADAPTED DESIGN DATA |                      |                      |              |             | REMARKS |           |
|-----------|---------|-------------------------------------------------------------------------------------|---------------------|----------------------|----------------------|--------------|-------------|---------|-----------|
|           |         |                                                                                     | $\gamma_d$ (pcf)    | $\gamma_{sat}$ (pcf) | $\gamma_{sub}$ (pcf) | $\phi$ (deg) | $\tan \phi$ |         | $c$ (psi) |
| 1         | 3:1     | Full loam - No berm - Arc cut thru emb. (26.5'-62.5') only                          | 124.1               | 127.5                | 131.0                | 16.5         | 0.287       | 13.22   | 2.5       |
| 2         | 3:1     | Full loam - No berm - Arc cut thru emb. (26.5'-62.5') & 9' found (16.5'-132.2')     | 125.2               | 129.0                | 132.5                | 16.5         | 0.287       | 13.25   | 2.5       |
| 3         | 3:1     | Full loam - No berm - Arc cut thru emb. (26.5'-62.5') & 19' found (16.5'-132.2')    |                     |                      |                      |              |             |         | 2.9       |
| 4         | 3:1     | Full loam - No berm - Arc cut thru emb. (26.5'-62.5') & 19' found (16.5'-132.2')    |                     |                      |                      |              |             |         | 2.9       |
| 5         | 2 1/2:1 | Drain 2 1/2' - No berm - Arc cut thru emb. (26.5'-62.5') only                       |                     |                      |                      |              |             |         | 3.0       |
| 6         | 2 1/2:1 | Drain 2 1/2' - No berm - Arc cut thru emb. (26.5'-62.5') & 19' found (16.5'-132.2') |                     |                      |                      |              |             |         | 2.5       |

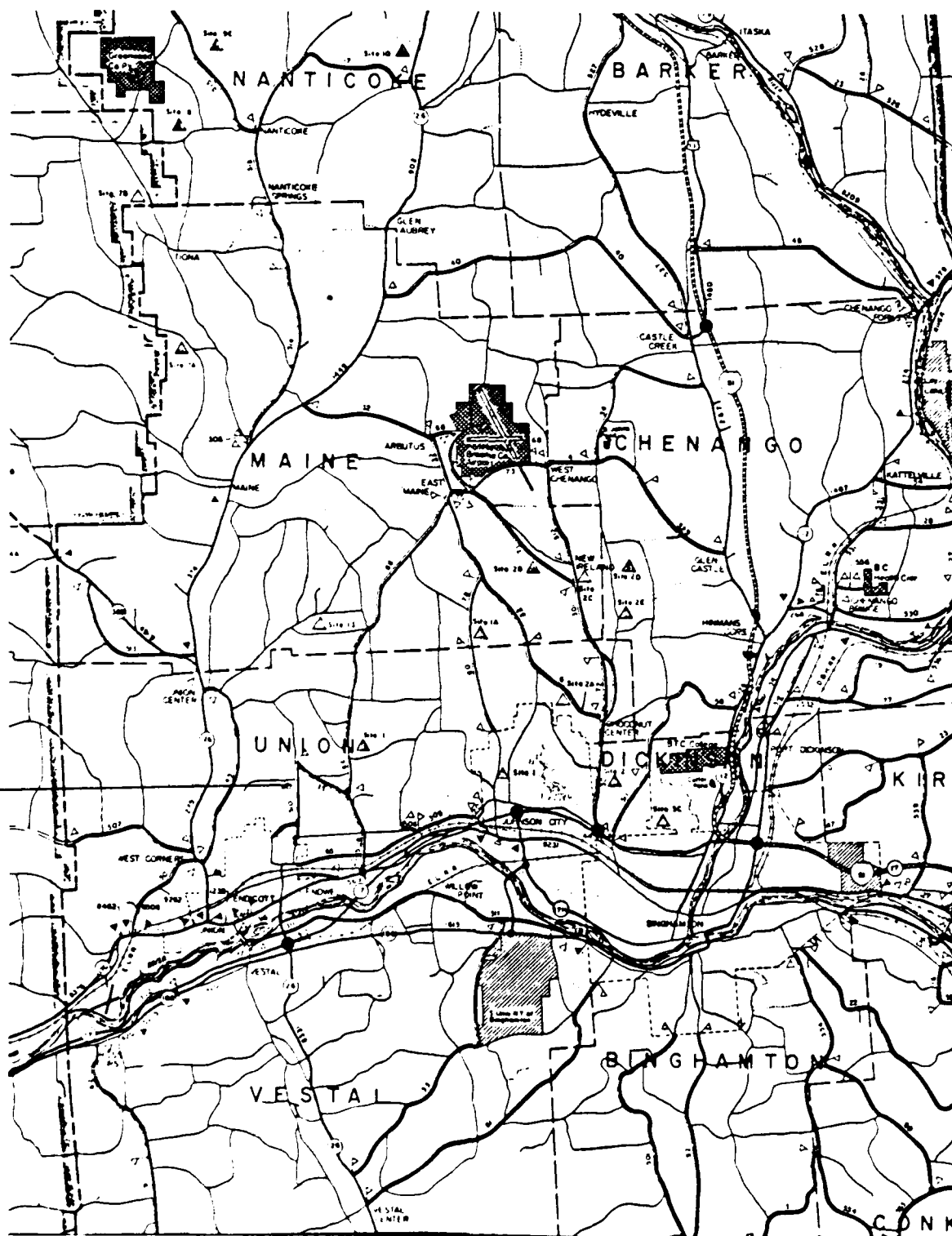


U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

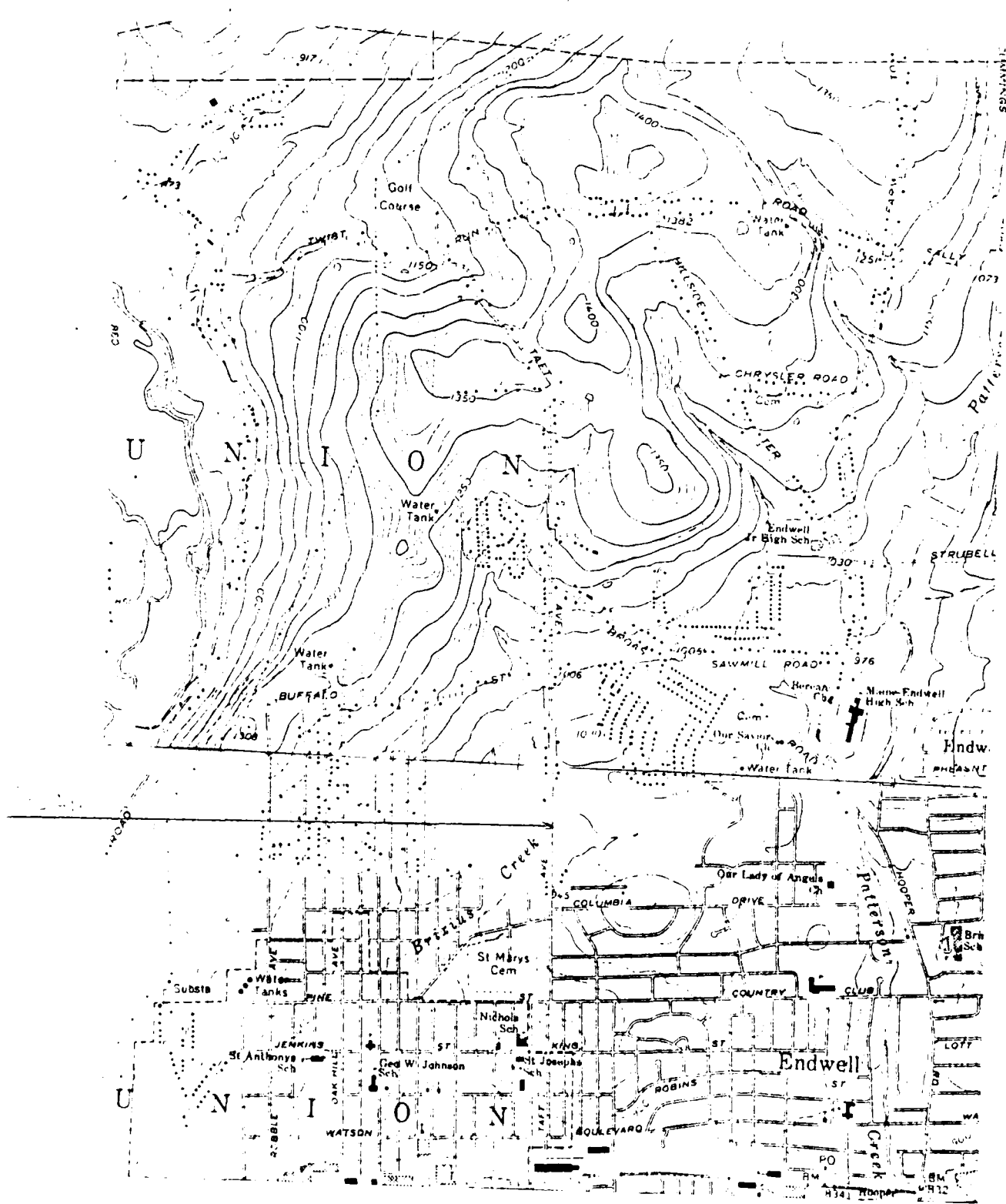
|             |                |
|-------------|----------------|
| DESIGNED BY | A. W. L.       |
| CHECKED BY  | R. D. L.       |
| DATE        | 9-1-49         |
| APPROVED BY |                |
| DRAWING NO. | (Form 505-357) |
| SHEET       | 2 OF 2         |

APPENDIX F

DRAWINGS



VICINITY MAP



TOPOGRAPHIC MAP

# PATTERSON BRIXIUS & GREY CREEK WATERSHED PROJECT

## FLOODWATER RETARDING DAM NO. 2

|                                              |                                      |
|----------------------------------------------|--------------------------------------|
| DRAINAGE AREA                                | 860 ACRES                            |
| FLOOD STORAGE<br>TO EMERGENCY SPILLWAY CREST | 188 ACRE FT                          |
| WATER SURFACE AREA<br>AT SEDIMENT POOL       | <del>58</del> ACRES                  |
| HEIGHT OF DAM                                | 30 FEET                              |
| VOLUME OF FILL                               | 56,949 <del>54,100</del> CUBIC YARDS |

BUILT UNDER THE WATERSHED PROTECTION AND  
FLOOD PREVENTION ACT

BY

COUNTY OF BROOME

WITH THE ASSISTANCE OF THE

SOIL CONSERVATION SERVICE

OF THE

U S DEPARTMENT OF AGRICULTURE

### INDEX

|          |                                                   |
|----------|---------------------------------------------------|
| SHEET 15 | RESER STRUCTURAL DETAILS                          |
| SHEET 16 | RESER TRASH RACK                                  |
| SHEET 17 | CONDUIT DETAILS                                   |
| SHEET 18 | RESERVOIR DRAIN INLET DETAILS                     |
| SHEET 19 | FENCING DETAILS                                   |
| SHEET 20 | LOGS OF TEST HOLES                                |
| SHEET 21 | LOGS OF TEST HOLES                                |
| SHEET 22 | LOGS OF TEST HOLES                                |
| SHEET 23 | RETENTION DIKE                                    |
| SHEET 24 | CATCH BASIN AND HEADWALL DETAILS                  |
| SHEET 25 | CUTOFF TRENCH EXCAVATION                          |
| SHEET 26 | EMERGENCY SPILLWAY                                |
| SHEET 27 | FILL PLACEMENT AND PRINCIPAL SPILLWAY EXCAVATION  |
| SHEET 28 | DRAINAGE SYSTEM                                   |
| SHEET 29 | DRAINAGE SYSTEM                                   |
| SHEET 30 | PLAN PROFILE OF PRINCIPAL SPILLWAY                |
| SHEET 31 | RESER STRUCTURAL DETAILS                          |
| SHEET 32 | RESER STRUCTURAL DETAILS                          |
| SHEET 33 | RESER STRUCTURAL DETAILS AND THRUST BLOCK DETAILS |

# GREY CREEK PROJECT

DAM NO. 2

860 ACRES

188 ACRE FT.

58~~8~~ ACRES

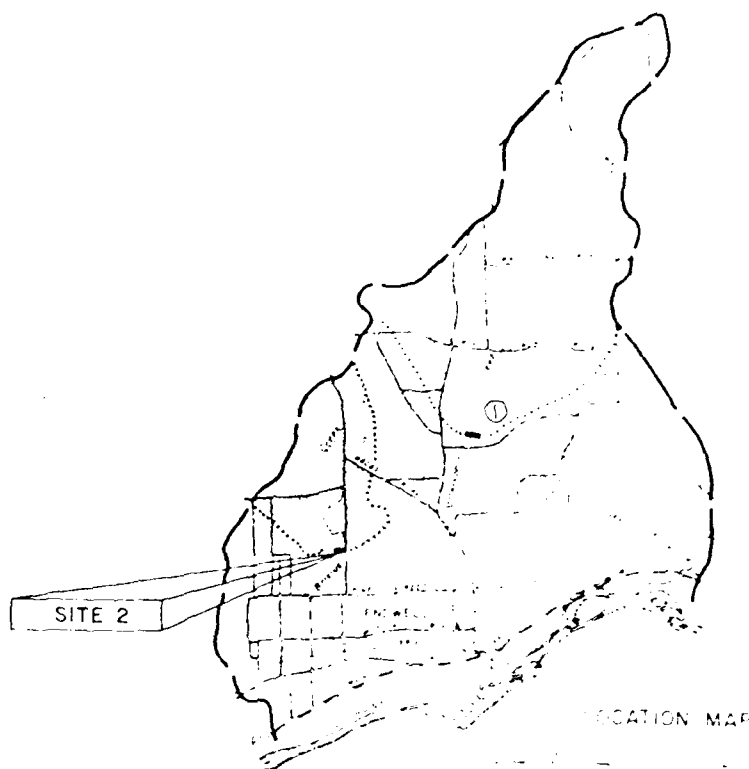
30 FEET

54,100 CUBIC YARDS

PROTECTION AND  
ACT

ME  
OF THE  
SERVICE

CULTURE



SHEET 15 - RISER STRUCTURAL DETAILS  
SHEET 16 - RISER TRASH RACK  
SHEET 17 - CONDUIT DETAILS  
SHEET 18 - RESERVOIR DRAIN INLET DETAILS  
SHEET 19 - FENCING DETAILS  
SHEET 20 - LOGS OF TEST HOLES  
SHEET 21 - LOGS OF TEST HOLES  
SHEET 22 - LOGS OF TEST HOLES

WS-12-72

6/25/73

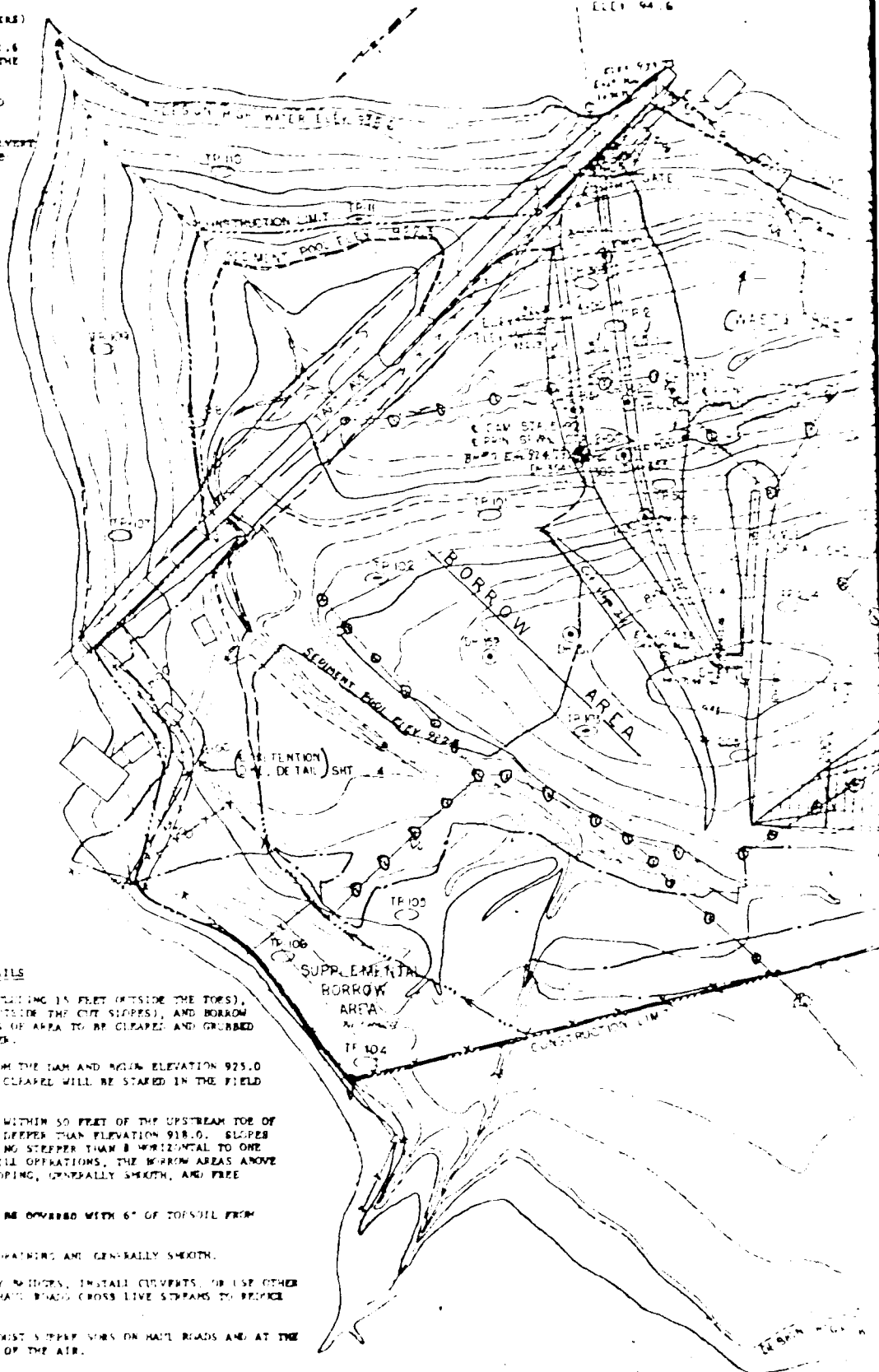
AS BUILT

WATER RESOURCES DIVISION  
WATER RESOURCES DIVISION  
WATER RESOURCES DIVISION  
WATER RESOURCES DIVISION  
U.S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

TAFT AVENUE  
CONSTRUCTION DETAILS (TO BE COMPLETED BY OTHERS)

1. TAFT AVENUE TO BE RAISED TO ELEVATION 941.6 IN THE VICINITY OF THE SOUTHEAST END OF THE DAM.
  2. THE REMAINDER OF TAFT AVENUE TO BE RAISED TO ELEVATION 938.6.
  3. DUE TO EXISTENCE OF THE ABANDONED CULVERT UNDER TAFT AVENUE, THE REMAINDER SHALL BE CONSTRUCTED PARALLEL TO THE WEST SIDE OF TAFT AVENUE IN THE AREA BETWEEN THE TWO EXISTING CULVERTS.
- NOTE: ABANDONED CULVERT NOT REMOVED.

6 DAM TO BE RAISED TO ELEVATION 941.6



#### CONSTRUCTION DETAILS

1. AREAS UNDER THE DAM, UPSTREAM AND DOWNSTREAM (WITHIN 15 FEET OUTSIDE THE TOPS), EXISTING SIDEWALKS (WITHIN 15 FEET OUTSIDE THE CUT SLOPES), AND BORROW AREAS TO BE CLEARED AND GRUBBED. LIMITS OF AREA TO BE CLEARED AND GRUBBED TO BE STATED IN THE FIELD BY THE ENGINEER.
2. THE WASTE AREA AND THE AREA DOWNSTREAM FROM THE DAM AND BELOW ELEVATION 925.0 SHALL BE CLEARED. LIMITS OF AREA TO BE CLEARED WILL BE STATED IN THE FIELD BY THE ENGINEER.
3. MINIMUM EXCAVATION SHALL BE FIVE FEET WITHIN 50 FEET OF THE UPSTREAM TOE OF THE DAM. EXCAVATION SHALL BE NO DEEPER THAN ELEVATION 918.0. SLOPES ON THE SIDE OF THE BORROW AREA SHALL BE NO STEEPER THAN 8 HORIZONTAL TO ONE VERTICAL. AT THE COMPLETION OF EARTH FILL OPERATIONS, THE BORROW AREAS ABOVE ELEVATION 925.0 SHALL BE LEFT GENTLY SLOPING, GENERALLY SMOOTH, AND FREE OF STONES.
4. BOTTOM SURFACE OF EXISTING SIDEWALK TO BE COVERED WITH 6" OF TOPSOIL FROM STATION 2+00 TO STATION 2+100.
5. WASTE AREAS SHALL BE RAISED TO BE FREE OF STONES AND GENERALLY SMOOTH.
6. TEMPORARY BRIDGES SHALL BE INSTALLED TEMPORARY BRIDGES, INSTALL CULVERTS, OR USE OTHER MEANS APPROVED BY THE ENGINEER WHERE HAUL ROADS CROSS LIVE STREAMS TO PREVENT POLLUTION OF THE STREAM.
7. TEMPORARY BRIDGES SHALL BE SPRINKLED OR APPLY DUST SUPPLY WINDS ON HAUL ROADS AND AT THE ENTRANCE AND EXIT OF THE POLLUTION OF THE AIR.
8. ALL WELLS, SPRINGS, AND OTHERS SHALL BE LOCATED, STOPPED, AND DISPOSED OF IN SUCH A MANNER AS TO PREVENT POLLUTION OF STREAMS, WELLS, OR SPRINGS.
9. ALL WELLS, SPRINGS SHALL BE LOCATED IN SUCH A MANNER AS TO PREVENT POLLUTION OF STREAMS.

| <u>QUANTITIES</u>         |         |
|---------------------------|---------|
| SEEDING & MULCHING        | 193 1/2 |
| CROWWEATCH SEED (NON FLG) | 32 1/2  |

SOILS DETAILS  
SITE SHOWN ON A-100  
FOR DETERMINATION OF SOILS  
AND TESTS TO BE MADE  
SHOWN ON A-100, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832,

WS-12-72  
6/25/73  
AS UNIT

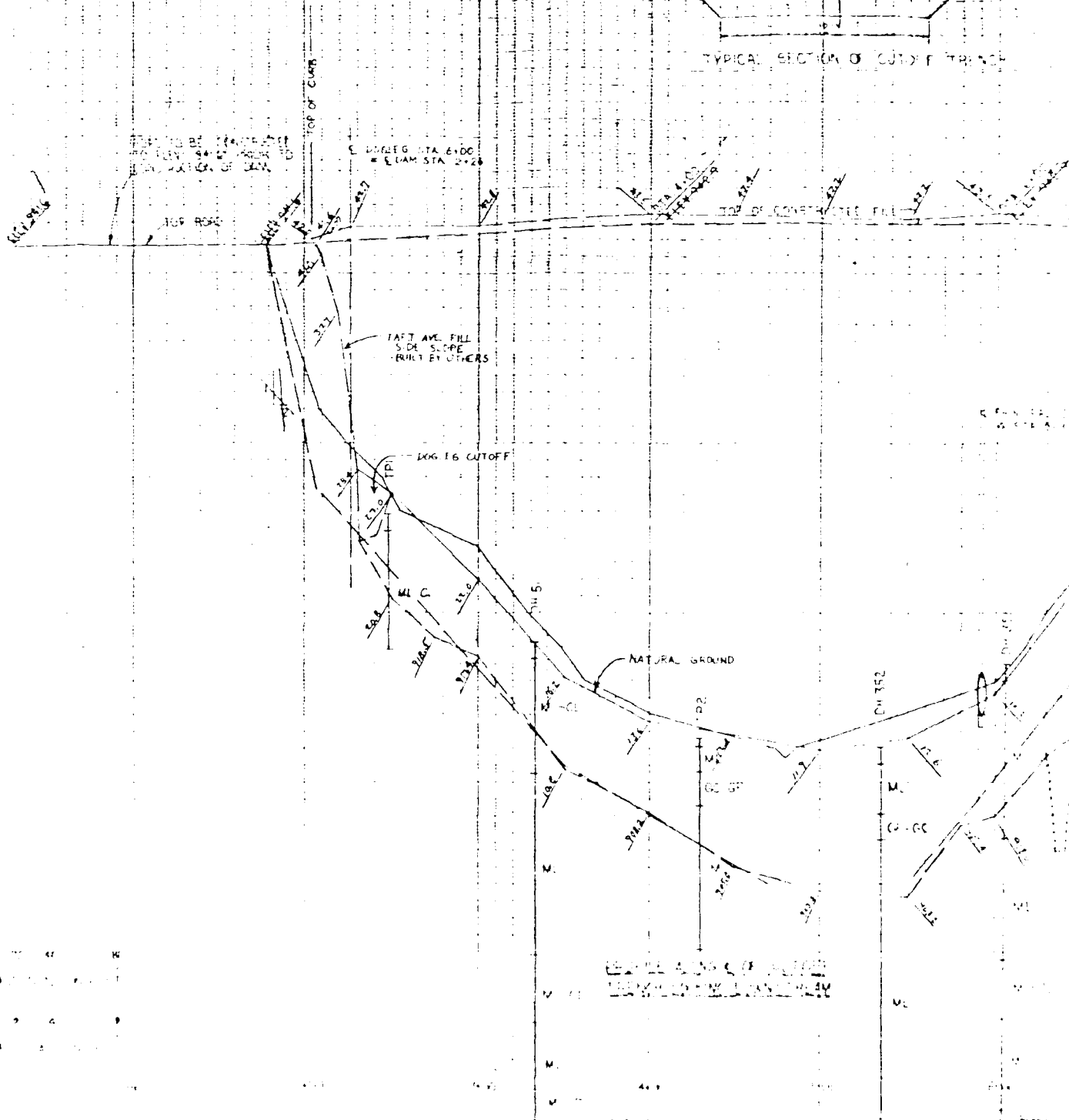
PATERSON, BRIDGES, GREY & CO.  
WATERSHED PROJECT  
1000 WATERSHED ROAD, BIRMINGHAM 1,  
ALABAMA CO., NEW YORK  
PLAN OF STRUCTURAL WORKS  
U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

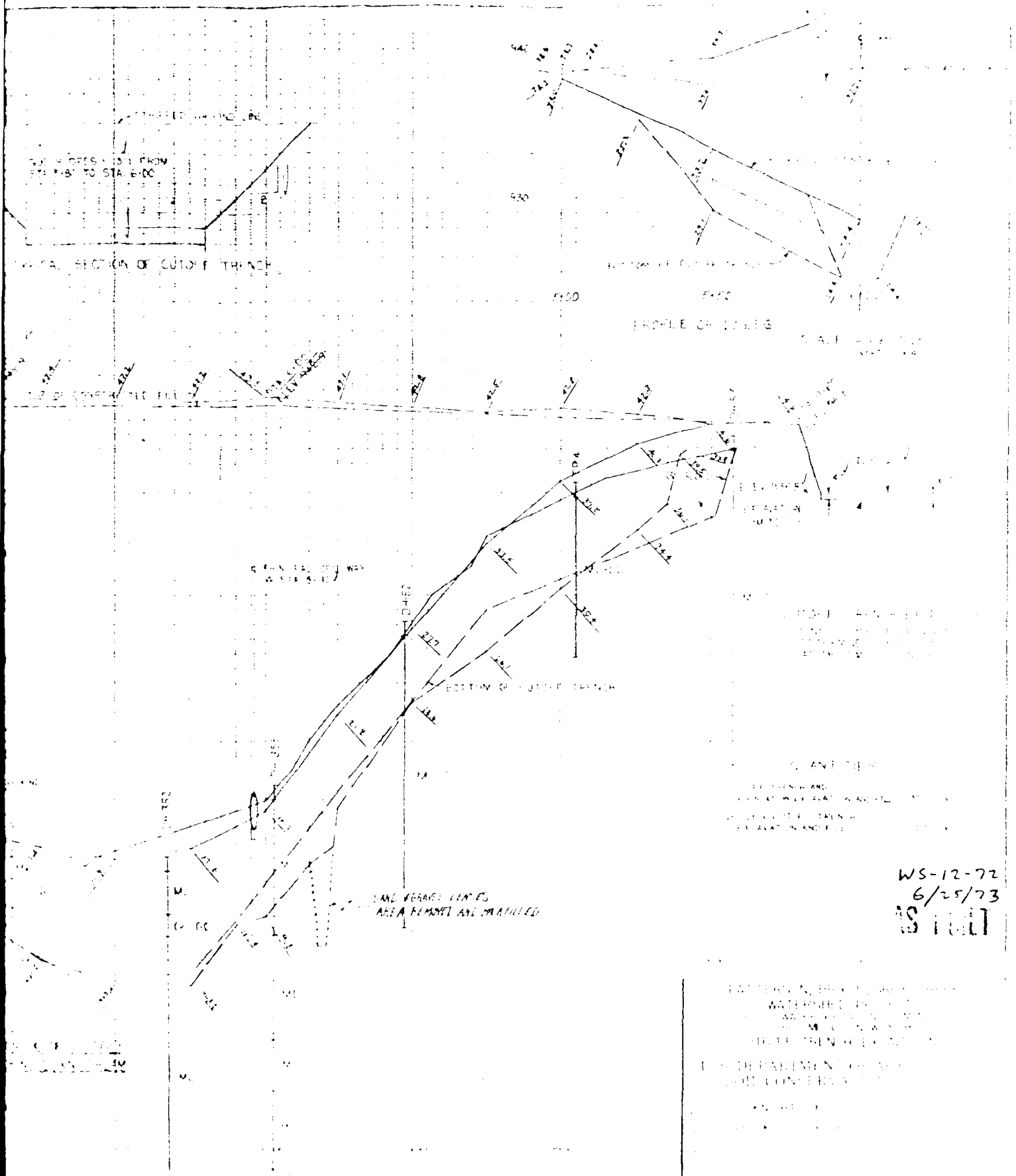
JOE POLITECH INFO.  
D. ANELLO INFO.

NOTES: ROUTE TWO E.I. 1918.6  
 D.K. WIDTH 30' 0"  
 SIDE SLOPES 2:1  
 DARTED CUTOFF  
 BOTTOM WIDTH 4' 0"  
 DEPTH 2' 0"  
 SIDE SLOPES 2:1

SIDE SLOPES 1.5:1 FROM  
 STA. 2+80 TO STA. 6+00

TYPICAL SECTION OF CUTOFF TRINCH





AD-A092 452

NEW YORK STATE DEPT OF ENVIRONMENTAL CONSERVATION ALBANY F/G 13/13  
NATIONAL DAM SAFETY PROGRAM, PATTERSON BRIXIUS GREY CREEK WATER--ETC(U)  
SEP 80 G KOCH DACW51-79-C-0001

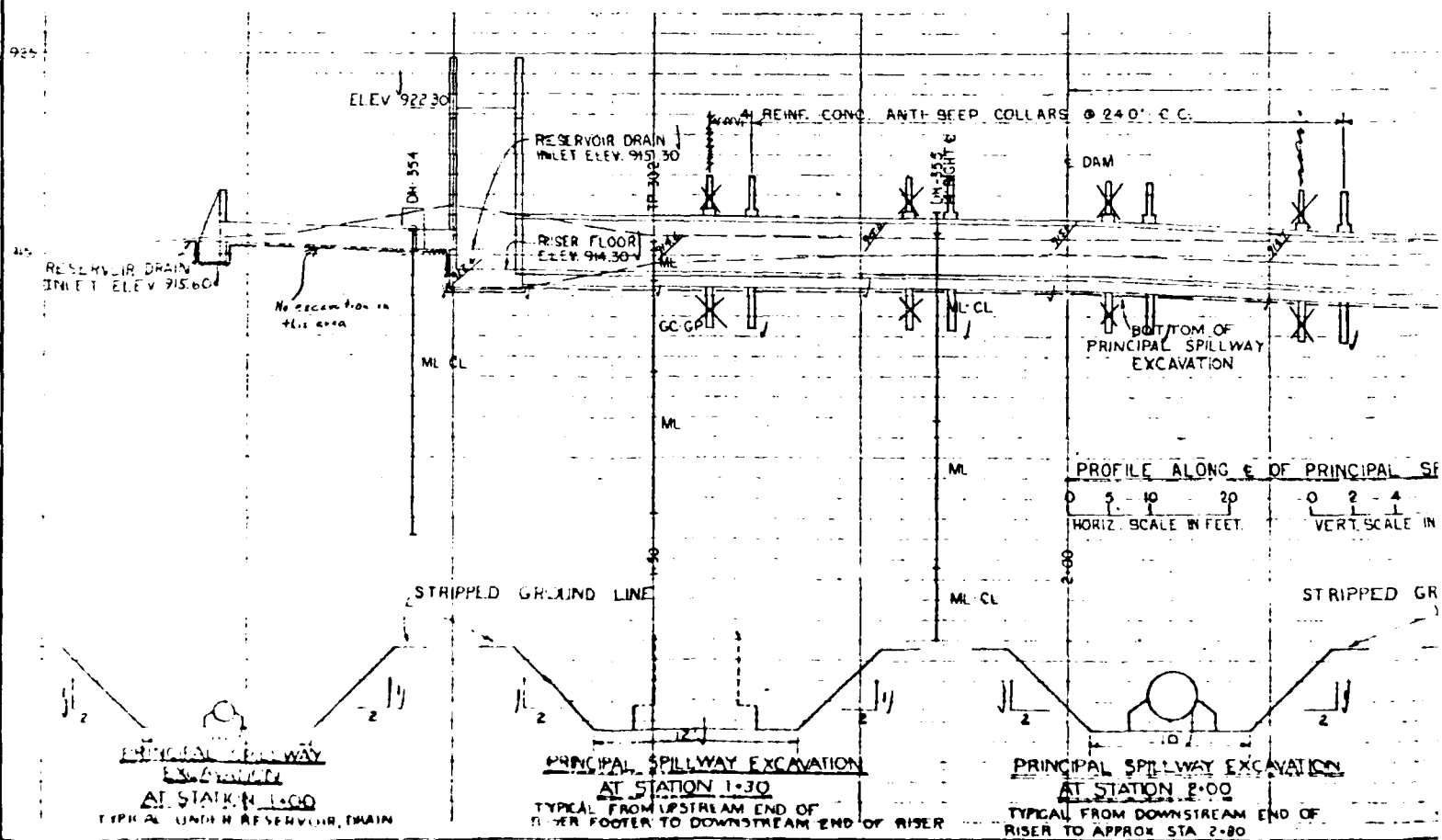
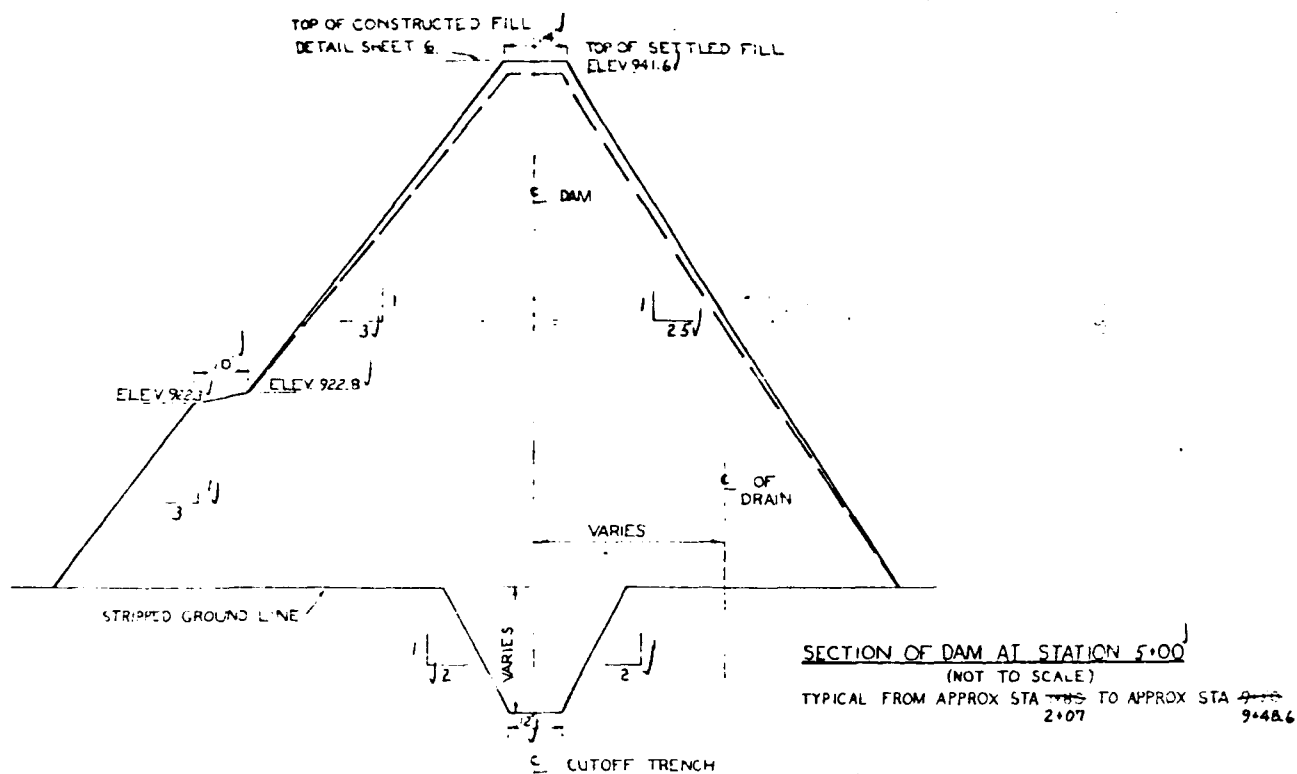
UNCLASSIFIED

NL

20-2

AD-A092 452

END  
DATE  
FILMED  
1-81  
DTIC



| MATERIAL 1/                                                                                                                                                                                   | EARTH FILL REQUIREMENTS |                        |                                   |  | COMPACTION 5/ |                                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|------------------------|-----------------------------------|--|---------------|---------------------------------------------------|
|                                                                                                                                                                                               | MAX ROCK SIZE 2/        | MAX. LIFT THICKNESS 3/ | MIN. REQ. WATER CONTENT 4/        |  | CLASS         | DEFINITION                                        |
| GLACIAL TILL, LACUSTRINE, AND COLLUVIAL MATERIALS REPRESENTED BY:<br>TP - 111 FROM 0.5' TO 10.0'<br>TP - 102 FROM 1.0' TO 14.5'<br>TP - 103 FROM 1.0' TO 11.0'<br>TP - 151 FROM 1.0' TO 19.5' | 6"                      | 9"                     | 2 PERCENTAGE POINTS BELOW OPTIMUM |  | A             | 90% OF MAXIMUM DENSITY BY A.S.T.M. D-698 METHOD A |

1/ THE PLACEMENT TABLE INDICATES ESTIMATED USE OF MATERIAL.

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

3/ MAXIMUM LIFT THICKNESS PRIOR TO COMPACTION.

4/ WATER CONTENT AT TIME OF COMPACTION.

5/ FOR TYPICAL COMPACTION CURVES SEE SHEET 20.

#### CONSTRUCTION DETAILS

TOPSOIL THAT IS SUITABLE FOR USE AND NOT USED ON THE SPECIFIED AREA OF THE EMERGENCY SPILLWAY SHALL BE INCORPORATED WITHIN THE SLOPES OF THE EARTH FILL AS DIRECTED BY THE ENGINEER.

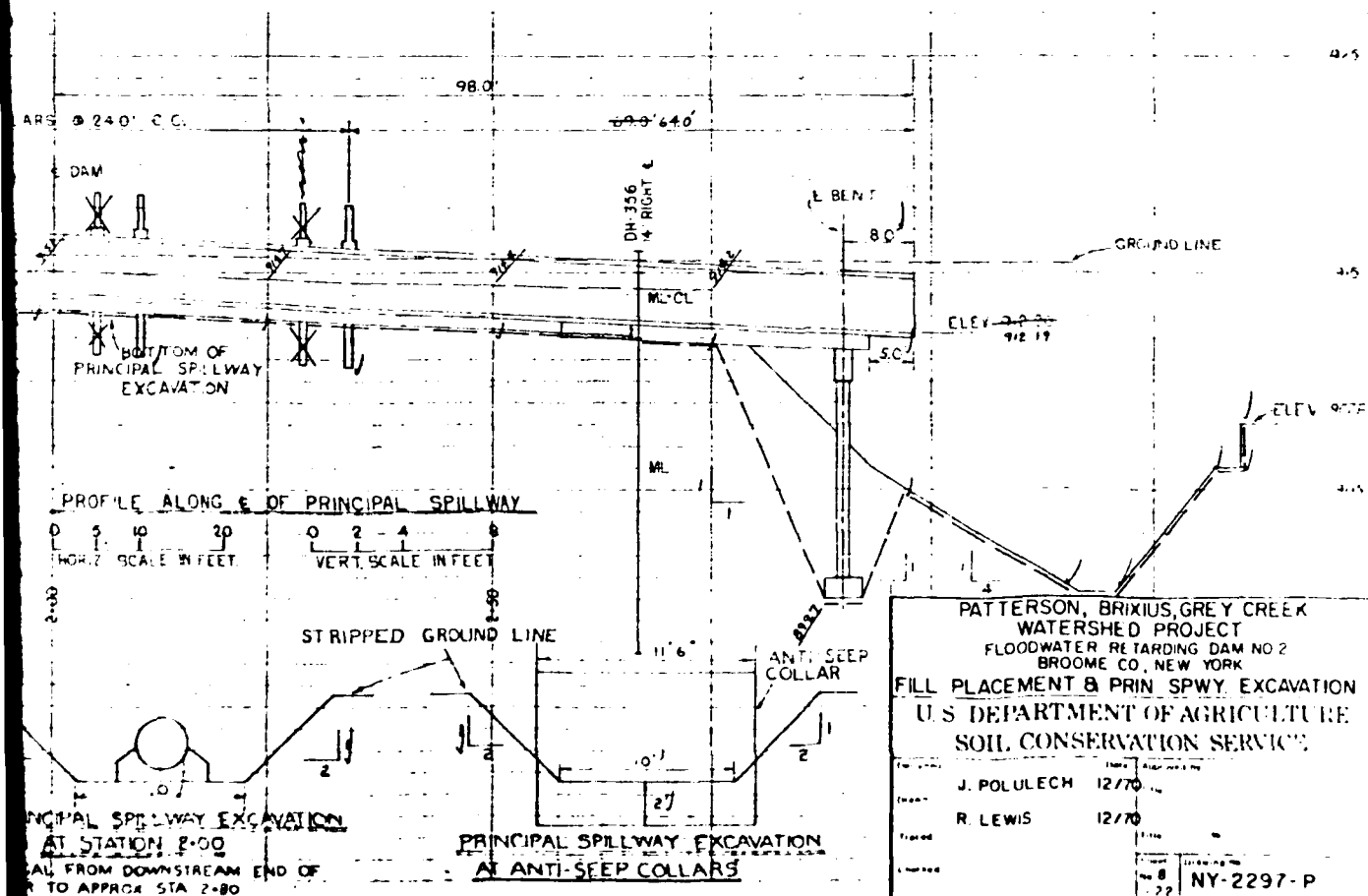
#### QUANTITIES

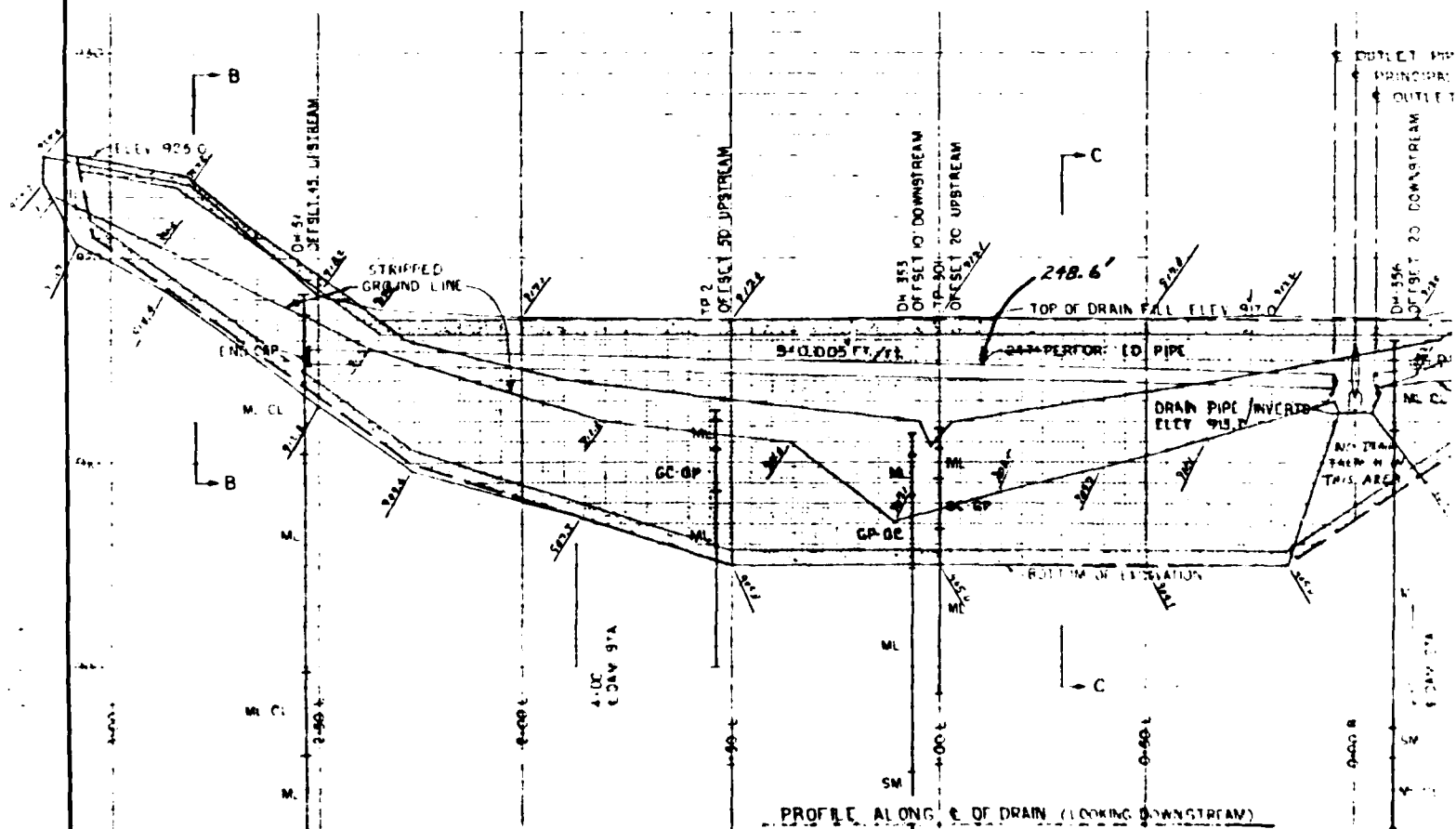
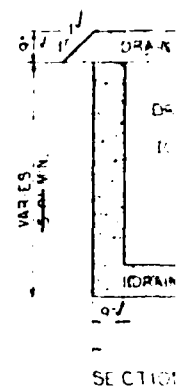
STRUCTURE AND PLUNGE POOL EXCAVATION  
STRUCTURE BACK FILL  
EARTH FILL IN DAM  
EARTH FILL IN DOGLEG

607 CY.  
119 CY.  
4,216 CY.  
131 CY.

WS-12-72  
6/25/73  
AS BUILT

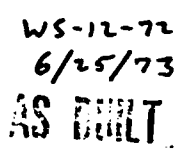
STATION 5+00  
TO APPROX STA 2+80  
9+48.6





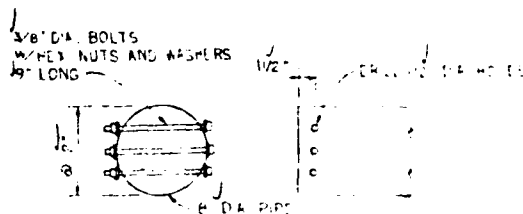
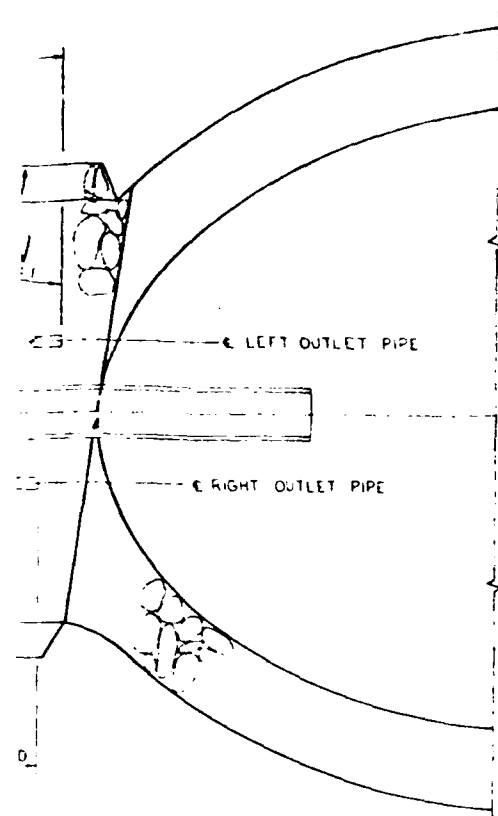
ADP COMBAT, THAT THE ONE WHO WAS  
SHOOTING WAS AN ARAB AND THAT HE  
DROPPED HIS GUN. THIS IS  
THE SCENE AT THE BOMB  
EXPLOSION AT THE AIRPORT.  
THE AIRPORT IS IN THE  
MIDDLE OF THE CITY.  
AT THE TIME OF THE BOMBING

324-  
324-  
760  
344-  
2  
2  
CROSS



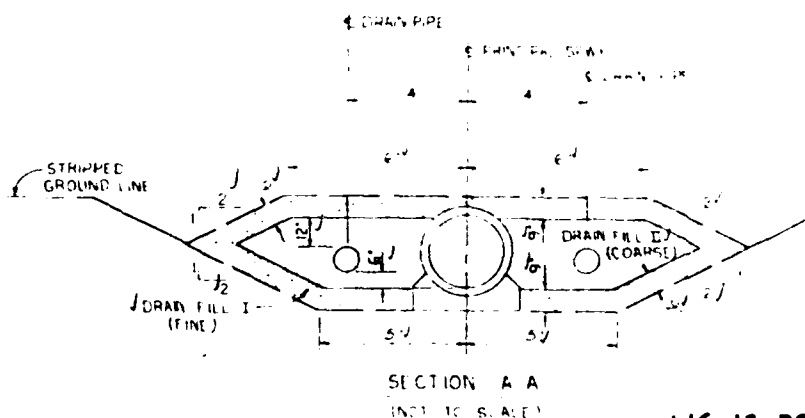
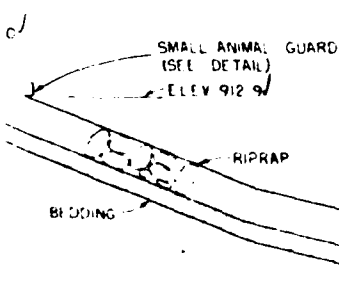
NY-2297-P





SMALL ANIMAL GUARD DETAILS (SEE DETAIL)

0' 6' 12'  
SCALE



WS-12-72  
6/25/73  
AS BUILT

PATTERSON, BRIXIUS, GREY CREEK  
WATERSHED PROJECT  
FLOODWATER RETARDING DAM NO 2  
BROOME CO, NEW YORK  
DRAINAGE SYSTEM

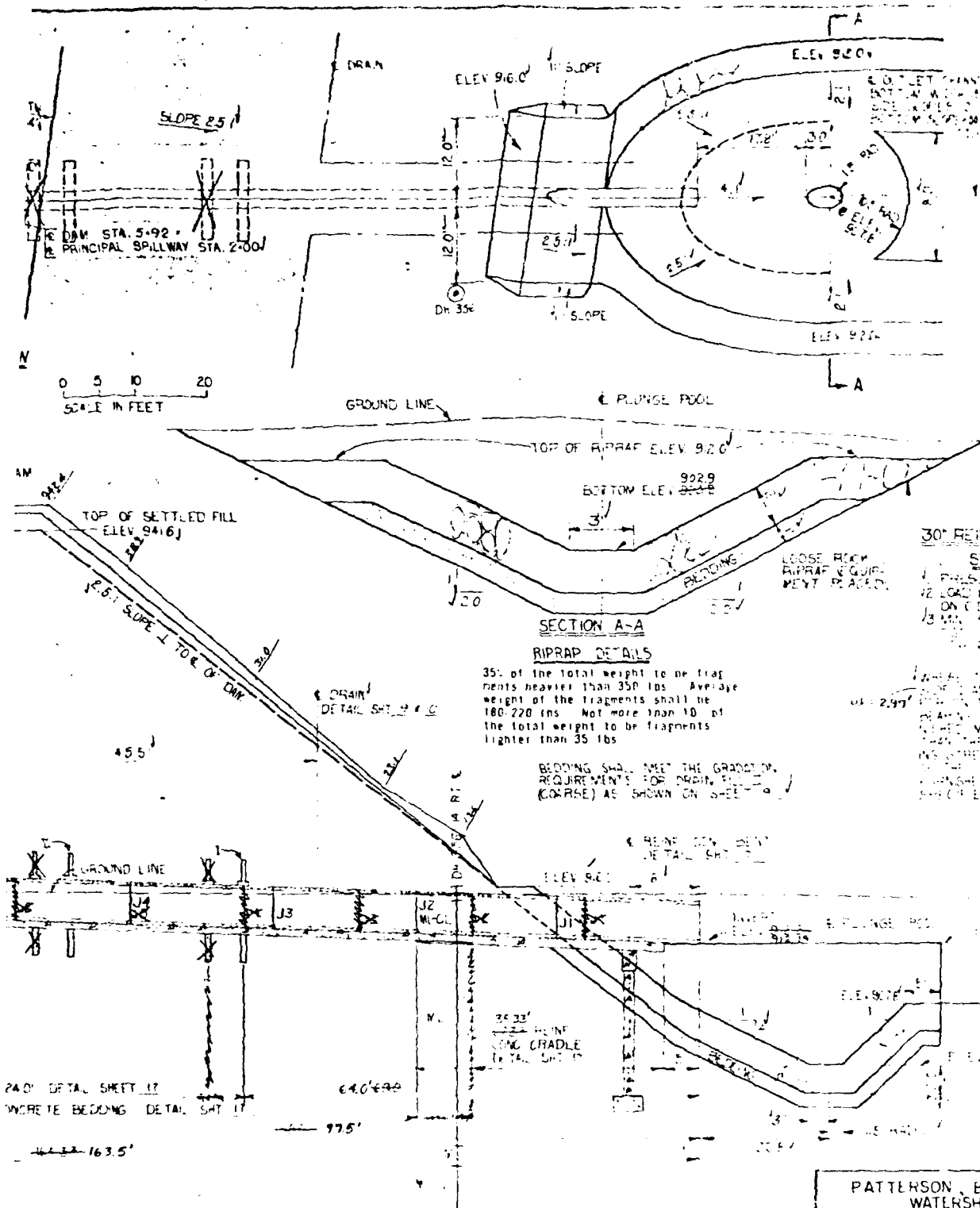
U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

|             |               |      |       |
|-------------|---------------|------|-------|
| DESIGNED BY | J. E. POLUECH | DATE | 11/70 |
| CHECKED BY  | D. J. ANGELO  | DATE | 11/70 |
| APPROVED BY | J. E. P.      | DATE | 12/70 |

NY-2297-P

5-1-11-1-64





| DATE    | BY     | REVISION |
|---------|--------|----------|
| 12/1/72 | C.S.K. | 1.0      |
| 12/1/72 | C.S.K. | 1.1      |
| 12/1/72 | C.S.K. | 1.2      |
| 12/1/72 | C.S.K. | 1.3      |
| 12/1/72 | C.S.K. | 1.4      |
| 12/1/72 | C.S.K. | 1.5      |
| 12/1/72 | C.S.K. | 1.6      |
| 12/1/72 | C.S.K. | 1.7      |
| 12/1/72 | C.S.K. | 1.8      |
| 12/1/72 | C.S.K. | 1.9      |
| 12/1/72 | C.S.K. | 2.0      |

| DATE    | BY     | REVISION |
|---------|--------|----------|
| 12/1/72 | C.S.K. | 1.0      |
| 12/1/72 | C.S.K. | 1.1      |
| 12/1/72 | C.S.K. | 1.2      |
| 12/1/72 | C.S.K. | 1.3      |
| 12/1/72 | C.S.K. | 1.4      |
| 12/1/72 | C.S.K. | 1.5      |
| 12/1/72 | C.S.K. | 1.6      |
| 12/1/72 | C.S.K. | 1.7      |
| 12/1/72 | C.S.K. | 1.8      |
| 12/1/72 | C.S.K. | 1.9      |
| 12/1/72 | C.S.K. | 2.0      |

**30" REINFORCED CONCRETE PIPE**  
**STRENGTH REQUIREMENTS**  
 1. PULL TEST SHALL BE 25,000 LBS.  
 2. LOAD 19,400 LBS. SHALL BE APPLIED ON TOP OF PIPE.  
 3. MIN. 12" RADIUS SHALL BE MAINTAINED AT ALL TIMES.

1. ALL PIPE SHALL BE 30" IN DIAMETER.  
 2. ALL PIPE SHALL BE 12' LONG.  
 3. ALL PIPE SHALL BE 12' LONG.  
 4. ALL PIPE SHALL BE 12' LONG.  
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 9. ALL PIPE SHALL BE 12' LONG.  
 10. ALL PIPE SHALL BE 12' LONG.

WS-12-72  
 6/25/73  
 AS BUILT

PATTERSON, BRIXUS, GREY CREEK  
 WATERSHED PROJECT  
 FLOODWATER RETARDING DAM NO. 2  
 BROOME COUNTY, NEW YORK  
 PLAN PROFILE OF PRINCIPAL SPILLWAY  
 U.S. DEPARTMENT OF AGRICULTURE  
 SOIL CONSERVATION SERVICE

C. S. KNIGHT 11/70  
 D. BURDICK 11/72

DATE 11/70  
 REVISION 11/72  
 NY 2297-P

NO. 1 OF PRINCIPAL SPILLWAY  
 FILL AT STA. 4+00

| DATE  | REVISION | BY     |
|-------|----------|--------|
| 11/70 | 1        | C.S.K. |
| 11/72 | 2        | D.B.   |

# SOIL DESCRIPTION

WILLIAM (10/22)

A

Silt-clayey; maximum particle size 1.0", trace to 25% gravel; 20-30% sand, 30-55% fines; slightly plastic (LL=24, PI=4); brown above 4.7, gray brown below; moist; essentially impermeable; hard, 20-30; average 31; homogeneous; glacial till; samples 111.1, 102.1.

B

Silt-clayey; maximum particle size 1.25", trace of gravel, 5-15% sand, 65-95% fines; slightly plastic (LL=24-26, PI=3-5); brown and gray with mottling; moist; essentially impermeable; very stiff, 40-42, average 27; stratified on hillside, homogeneous on floodplain; lacustrine and colluvial; samples 101.1, 101.3.

C

Gravel-clayey; maximum particle size 7", 5" x 3" x 5-10" gravel, 30-35% sand, 30-35% fines; fines are medium plastic (LL=24, PI=4); brown; saturated; highly permeable; loose to medium, 10-15; somewhat stratified; alluvium; sample 101.1. (CL-CP)

D

Silt-clayey; maximum particle size 2.0", trace of gravel, 5-10% sand, 85-95% fines; non-plastic; gray; moist to saturated; essentially impermeable; stiff, 40-42, average 15; stratified with 1/2" beds of sand; lacustrine; samples 101.2, 102.1 (undisturbed).

E

Sand-silty; maximum particle size .75", 0-5% gravel, 60-65% sand, 30-35% non-plastic fines; gray-brown; saturated; highly permeable - artesian flow in one hole; firm, 40-42, average 25; possible stratification; lacustrine; sample 101.12-13. (SM)

F

Topsoil-organic; maximum particle size 3", 10-20% coarse material; slightly plastic; moist; moderate to high permeability; soft, 10-15 average 6; homogeneous; residual.

## TEST RESULTS

TP #1, SPILLWAY, 911.1, R.P. 10/29/61

|     |     |                      |
|-----|-----|----------------------|
| 0.0 | 1.0 | Material F (Topsoil) |
| 1.0 | 4.0 | " A (ML-CL)          |

TP #2, SPILLWAY, 911.2, R.P. 10/29/61

|     |      |                      |
|-----|------|----------------------|
| 0.0 | 0.5  | Material F (Topsoil) |
| 0.5 | 2.0  | " B (ML)             |
| 2.0 | 4.0  | " C (CL-CP)          |
| 4.0 | 12.5 | " D (ML)             |

NOTE: Water running in at 4.0'.

TP #3, SPILLWAY

TP #4, SPILLWAY, 911.4, R.P. 10/29/61

|     |      |                      |
|-----|------|----------------------|
| 0.0 | 1.0  | Material F (Topsoil) |
| 1.0 | 12.0 | " A (ML-CL)          |

NOTE: Greater than usual; 1' over 1".

TP #5, SPILLWAY, 911.5, R.P. 10/29/61

|     |     |                      |
|-----|-----|----------------------|
| 0.0 | 0.5 | Material F (Topsoil) |
| 0.5 | 1.0 | " B (ML-CL)          |

NOTE: Water very slowly seeping in bottom of hole.

TP #6, SPILLWAY, 911.6, R.P. 10/29/61

|     |      |                      |
|-----|------|----------------------|
| 0.0 | 0.5  | Material F (Topsoil) |
| 0.5 | 12.0 | " (ML-CL)            |

NOTE: Hole caved badly after digging.

TP #7, SPILLWAY, 911.7, R.P. 10/29/61

|     |      |                      |
|-----|------|----------------------|
| 0.0 | 1.0  | Material F (Topsoil) |
| 1.0 | 14.5 | Material A (ML-CL)   |

TP #8, SPILLWAY, 911.8, R.P. 10/29/61

|     |      |                           |
|-----|------|---------------------------|
| 0.0 | 1.0  | Material F (Topsoil)      |
| 1.0 | 4.5  | " B (ML)                  |
| 4.5 | 11.0 | " D.S. 103.1<br>" (ML-CL) |

NOTE: Boulder at 10.0'.

TP #9, SPILLWAY, 911.9, R.P. 10/29/61

|     |     |                      |
|-----|-----|----------------------|
| 0.0 | 0.5 | Material F (Topsoil) |
| 0.5 | 8.0 | Material A (ML-CL)   |

NOTE: 2 1/2" over 1" hole remained dry during digging.

TP #10, SPILLWAY, 911.10, R.P. 10/29/61

|     |     |                      |
|-----|-----|----------------------|
| 0.0 | 0.5 | Material F (Topsoil) |
| 0.5 | 7.5 | Material A (ML-CL)   |

TP #11, SPILLWAY, 911.11, R.P. 10/29/61

|     |      |                      |
|-----|------|----------------------|
| 0.0 | 0.5  | Material F (Topsoil) |
| 0.5 | 8.0  | Material A (ML-CL)   |
| 8.0 | 10.0 | Material B (ML)      |

NOTE: Some water in the bottom of hole.

TP #12, SPILLWAY, 911.12, R.P. 10/29/61

|     |      |                      |
|-----|------|----------------------|
| 0.0 | 0.5  | Material F (Topsoil) |
| 0.5 | 10.0 | Material A (ML-CL)   |

TP #13, SPILLWAY, 911.13, R.P. 10/29/61

|     |      |                      |
|-----|------|----------------------|
| 0.0 | 0.5  | Material F (Topsoil) |
| 0.5 | 10.0 | Material A (ML-CL)   |

TP #14, SPILLWAY, 911.14, R.P. 10/29/61

|     |      |                      |
|-----|------|----------------------|
| 0.0 | 0.5  | Material F (Topsoil) |
| 0.5 | 10.0 | Material A (ML-CL)   |

TP #15, SPILLWAY, 911.15, R.P. 10/29/61

|     |      |                      |
|-----|------|----------------------|
| 0.0 | 0.5  | Material F (Topsoil) |
| 0.5 | 10.0 | Material A (ML-CL)   |

TP #16, SPILLWAY, 911.16, R.P. 10/29/61

|     |      |                      |
|-----|------|----------------------|
| 0.0 | 0.5  | Material F (Topsoil) |
| 0.5 | 10.0 | Material A (ML-CL)   |

D.S. 111.1/5.0'.

TP #17, SPILLWAY, 911.17, R.P. 10/29/61

|     |     |                      |
|-----|-----|----------------------|
| 0.0 | 0.5 | Material F (Topsoil) |
| 0.5 | 7.0 | Material A (ML-CL)   |

NOTE: Some water entering pit at 2.0'.

TP #18, SPILLWAY, 911.18, R.P. 10/29/61

|     |     |                      |
|-----|-----|----------------------|
| 0.0 | 0.5 | Material F (Topsoil) |
| 0.5 | 7.0 | Material A (ML-CL)   |

NOTE: Some water entering hole at 2.0'.

TP #19, SPILLWAY, 911.19, R.P. 10/29/61

|     |     |                      |
|-----|-----|----------------------|
| 0.0 | 0.5 | Material F (Topsoil) |
| 0.5 | 7.5 | Material A (ML-CL)   |

NOTE: Water entering hole at bottom of pit.

TP #20, SPILLWAY, 911.20, R.P. 10/29/61

|     |     |                      |
|-----|-----|----------------------|
| 0.0 | 0.5 | Material F (Topsoil) |
| 0.5 | 7.0 | Material A (ML-CL)   |

NOTE: Some water entering bottom of hole.

TP #21, SPILLWAY, 911.21, R.P. 10/29/61

|     |     |                      |
|-----|-----|----------------------|
| 0.0 | 0.5 | Material F (Topsoil) |
| 0.5 | 6.0 | Material A (ML-CL)   |

NOTE: Water bearing gravel pocket at 3.0' at E end of pit.

TP #22, SPILLWAY, 911.22, R.P. 10/29/61

|     |     |                      |
|-----|-----|----------------------|
| 0.0 | 2.0 | Material F (Topsoil) |
| 2.0 | 2.5 | Material B (ML)      |

D.S. 101.1

TP #23, SPILLWAY, 911.23, R.P. 10/29/61

|     |     |                      |
|-----|-----|----------------------|
| 0.0 | 1.0 | Material F (Topsoil) |
| 1.0 | 2.5 | Material B (ML)      |

D.S. 101.1

TP #24, SPILLWAY, 911.24, R.P. 10/29/61

|     |      |                           |
|-----|------|---------------------------|
| 0.0 | 1.0  | Material F (Topsoil)      |
| 1.0 | 4.5  | " B (ML)                  |
| 4.5 | 11.0 | " D.S. 103.1<br>" (ML-CL) |

NOTE: Water seeping in hole at 4.0'.  
Flow 2.0" in 1 hour.

TP #25, SPILLWAY, 911.25, R.P. 10/29/61

|     |     |                      |
|-----|-----|----------------------|
| 0.0 | 0.5 | Material F (Topsoil) |
| 0.5 | 2.0 | Material B (ML)      |

|     |      |                    |
|-----|------|--------------------|
| 2.0 | 4.5  | Material C (CL-CP) |
| 6.5 | 11.5 | Material F (ML)    |

NOTE: Water running in hole at 4.0'.

TP #26, SPILLWAY, 911.26, R.P. 10/29/61

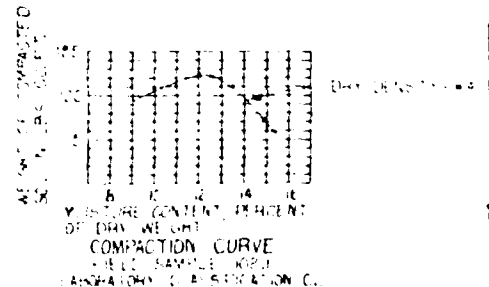
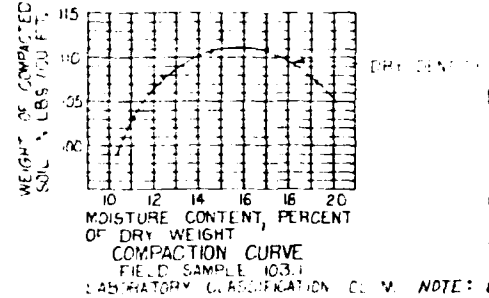
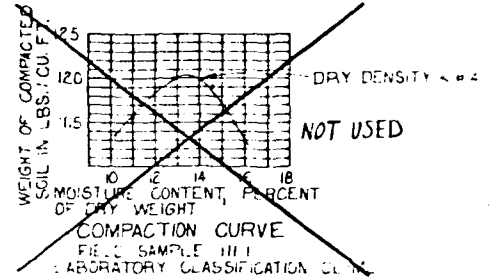
|     |     |                      |
|-----|-----|----------------------|
| 0.0 | 1.0 | Material F (Topsoil) |
| 1.0 | 2.0 | Material B (ML)      |

|     |      |                    |
|-----|------|--------------------|
| 2.0 | 5.0  | Material C (CL-CP) |
| 5.0 | 10.0 | Material F (ML)    |

TP #27, SPILLWAY, 911.27, R.P. 10/29/61

|     |      |                      |
|-----|------|----------------------|
| 0.0 | 0.5  | Material F (Topsoil) |
| 0.5 | 12.5 | Material F (ML-CL)   |

NOTE: Water entering hole at 3.0'.  
Level 6.4 after 3.5 hrs.



NOTE: DEVELOP

NY 2502. PATTERN SPILLAGE, ETC., NY, 10/24/68

0.0 0.5 Material F (Topsoil)  
0.5 2.0 Material B (ML)  
2.0 4.0 Material C (OC-CP)  
4.0 12.5 Material F (ML)

NOTE: Water running in hole at 4.0'.

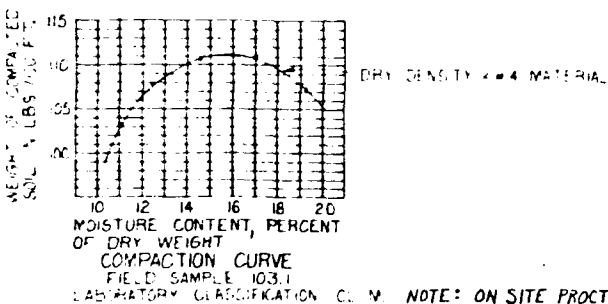
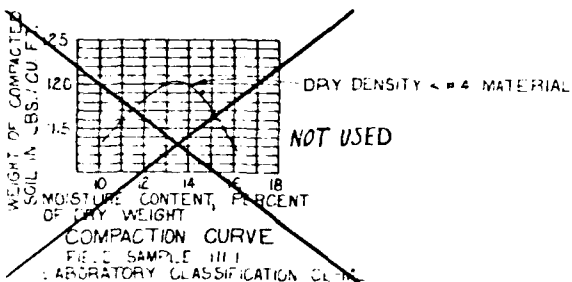
NY 2503. PATTERN SPILLAGE, ETC., NY, 10/26/68

0.0 1.0 Material F (Topsoil)  
1.0 2.0 Material B (ML)  
2.0 5.0 Material F (OC-CP)  
5.0 10.0 Material B (ML)

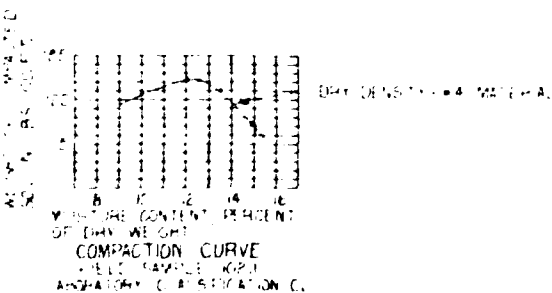
NY 2504. PATTERN SPILLAGE, ETC., NY, 10/28/68

0.0 0.5 Material F (Topsoil)  
0.5 12.5 Material B (ML-CL)

NOTE: Water entering hole at 3.0.  
Level 6.4 after 1.5 hrs.



NOTE: ON SITE PROCTOR CURVES DEVELOPED DURING CONSTRUCTION



WS-12-72  
6/25/73  
S BUILT

PATTERSON, BRIXIUS, GREY CREEK  
WATERSHED PROJECT  
FLOODWATER RETARDING DAM NO. 2  
BRUXNE CO. NEW YORK  
LOGS OF TEST HOLES

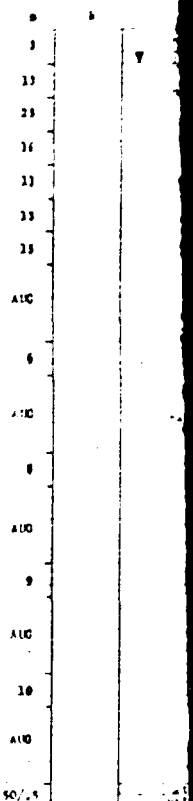
U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

STATE COMMISSIONER

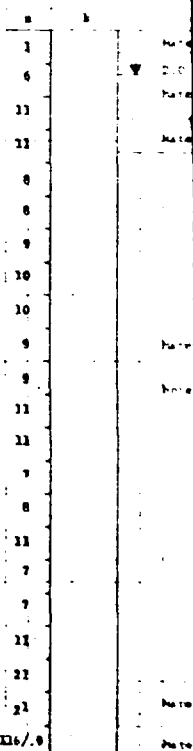
DATE

5-22-74

10



DL-352, P11W 2FA, SF140



25/12

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19.5  
10.2  
15.5  
18.0

PHILIPPA SPILLWAY, 912.1, B.P. 12/12/68

|      |                      |     |
|------|----------------------|-----|
| 0    | Material F (Topsoil) | 0.0 |
| 1    | Material F (ML)      | 1.0 |
| 11   | Material F (ML)      | 4.0 |
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PHILIPPA SPILLWAY, 912.1, B.P. 12/12/68

|      |                      |     |
|------|----------------------|-----|
| 0    | Material F (Topsoil) | 0.0 |
| 1    | Material F (ML)      | 1.0 |
| 11   | Material F (ML)      | 4.0 |
| 21   | Material C (GP-CC)   | 5.5 |
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PHILIPPA SPILLWAY, 912.1, B.P. 12/12/68

|      |                      |     |
|------|----------------------|-----|
| 0    | Material F (Topsoil) | 0.0 |
| 1    | Material F (ML)      | 1.0 |
| 11   | Material F (ML)      | 4.0 |
| 21   | Material C (GP-CC)   | 5.5 |
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PHILIPPA SPILLWAY, 912.1, B.P. 12/12/68

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|------|----------------------|-----|
| 0    | Material F (Topsoil) | 0.0 |
| 1    | Material F (ML)      | 1.0 |
| 11   | Material F (ML)      | 4.0 |
| 21   | Material C (GP-CC)   | 5.5 |
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WS-12-72  
6/25/73  
AS BUILT

PATTERSON, BRIXIUS, GREY CREEK  
WATERSHED PROJECT  
FLOODWATER RETARDING DAM NO2  
BROOME CO NEW YORK  
LOGS OF TEST HOLES  
U S DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE  
STATE COMMISSION  
NY-2297-P

71-1348-13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847

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| 0  |  |                                      |       |
| 4  |  | MATERIAL F (Topcell)                 | - 0.0 |
| 12 |  | Material A (ML-CI)                   | - 1.0 |
| 31 |  | 2.0' 12/12/64                        |       |
| 13 |  |                                      | 4.0   |
| 15 |  |                                      |       |
| 17 |  |                                      |       |
| 19 |  | Material F (ML)                      |       |
| 37 |  | Note Color change brown to gray I.C. |       |
| 39 |  |                                      |       |
| 41 |  |                                      |       |
| 43 |  |                                      |       |
| 45 |  |                                      |       |
| 36 |  |                                      | 16.0  |
| 38 |  | Material F (Sh)                      |       |
| 40 |  |                                      | 20.0  |
| 42 |  | Material A (ML-CI)                   |       |
| 44 |  |                                      | 23.5  |

23.9

1988 4-20-88 4-20-88 NY-2-2-88