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NATIONAL DAM SAFETY PROGRAM. CLARK'S CREEK WATERSHED PROJECT SI--E
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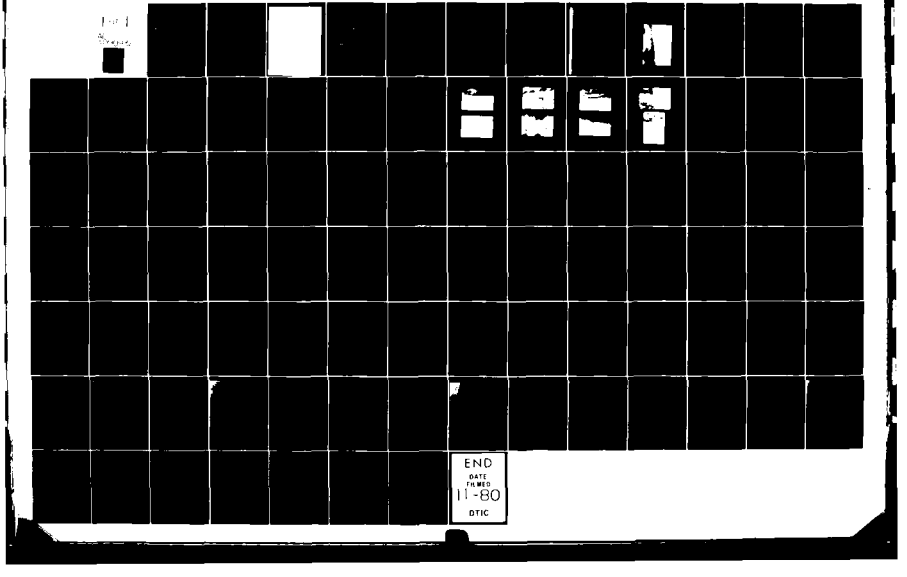

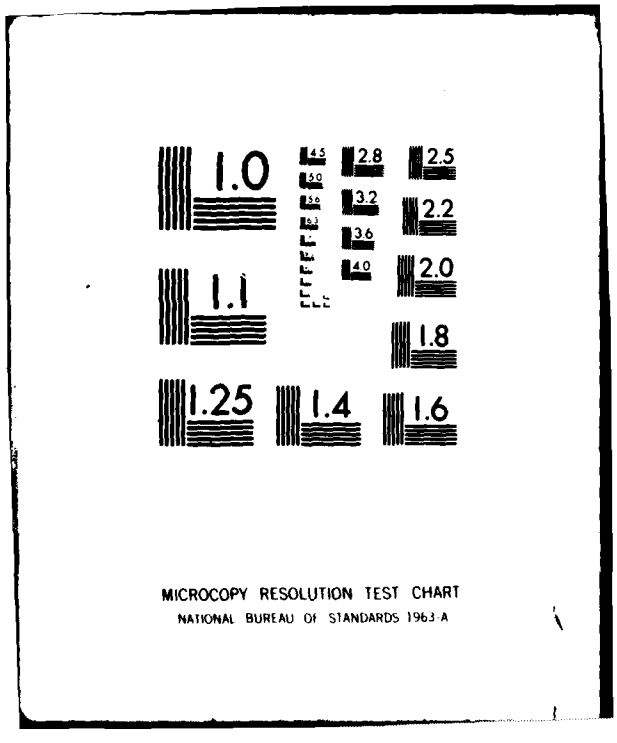
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AD A090932

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REPORT DOCUMENTATION PAGE

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1. REPORT NUMBER	2. GOVT ACCESSION NO. AD-A090932 / 3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Phase I Inspection Report ✓ Clark's Creek Watershed Project Site I Susquehanna River Basin, Chenango County, NY Inventory No. 718	5. TYPE OF REPORT & PERIOD COVERED Phase I Inspection Report National Dam Safety Program 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) George Koch	8. CONTRACT OR GRANT NUMBER(s) ✓DACW-51-79-C-0001
9. PERFORMING ORGANIZATION NAME AND ADDRESS New York State Department of Environmental ✓ Conservation 50 Wolf Road Albany, NY 12233	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS New York State Department of Environmental Conservation 50 Wolf Road Albany, NY 12233	12. REPORT DATE 30 September 1980 13. NUMBER OF PAGES
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) Department of the Army 26 Federal Plaza New York District, CofE New York, NY 10287	15. SECURITY CLASS. (of this report) UNCLASSIFIED 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

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17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

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18. SUPPLEMENTARY NOTES

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Dam Safety
National Dam Safety Program
Visual Inspection
Hydrology, Structural Stability
Clark's Creek
Chenango County
Susquehanna River

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

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

The examination of documents and visual inspection of the Clark's Creek Site 1 Dam did not reveal conditions which constitute a hazard to human life or property.

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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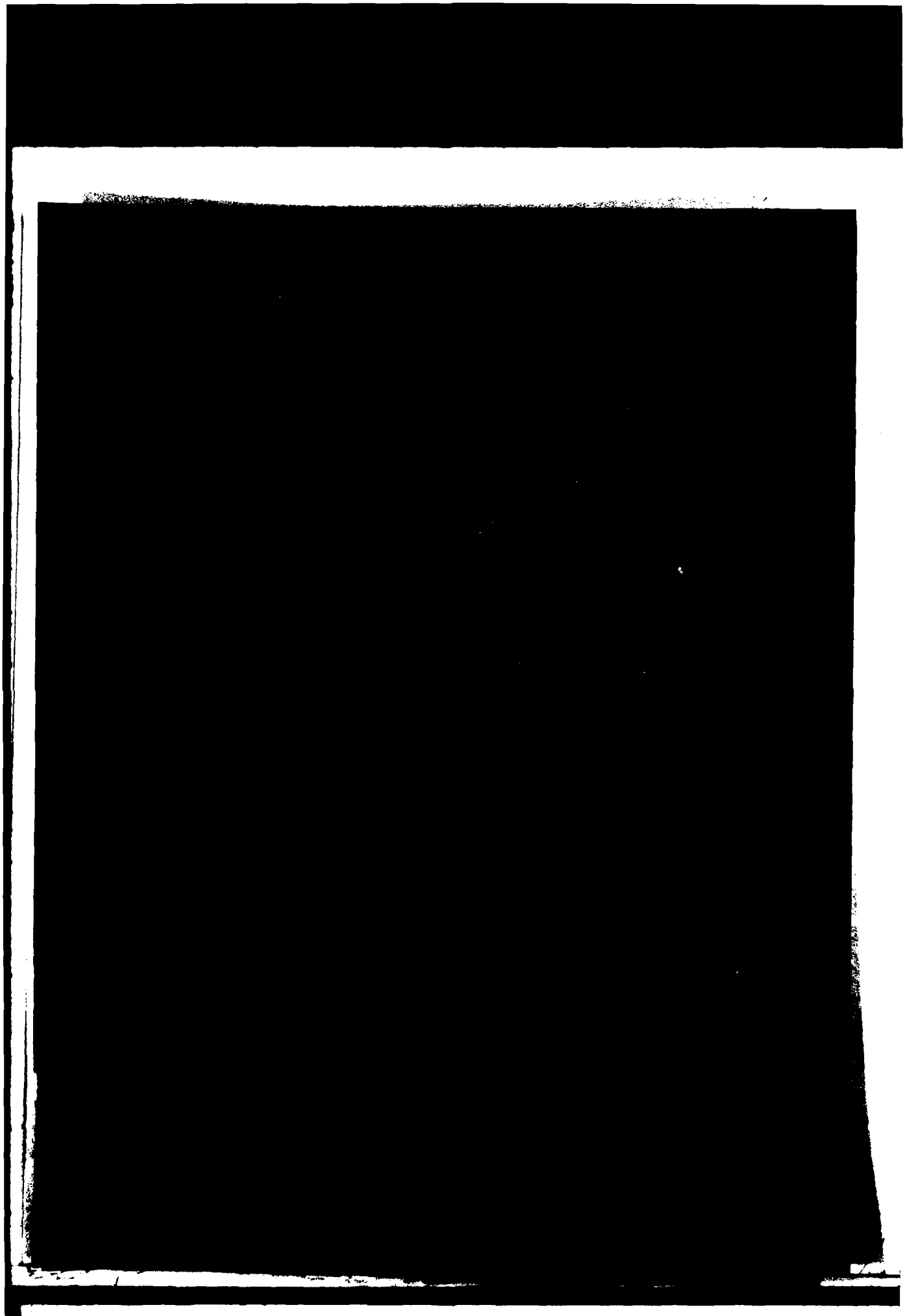
The total discharge capacity of the spillways is adequate to impound and safely discharge the floodwaters resulting from the Probable Maximum Flood (PMF).

Several minor deficiencies were noted which should be corrected within 6 months of the date of final approval of this report. The required actions are cutting brush and trees which are growing near the riser and in the vicinity of the plunge pool and investigating the wet area in the bottom of the auxiliary spillway channel. In addition, an emergency action plan for notification of downstream residents should be developed within the same time frame.



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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.

(6) PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
CLARK'S CREEK WATERSHED PROJECT SITE I (I.D. No. NY-718
(106B-4076) SUSQUEHANNA RIVER BASIN)
CHENANGO COUNTY, New York.
Phase I Inspection Report

(Number) (Number)

TABLE OF CONTENTS

(11) 30 Sep 80

(12) 88

(10) George Kraft

(15) DACW51-79-C-0001

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JCB

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Clark's Creek Watershed Project Site 1 I.D. No. NY-718
State Located:	New York
County Located:	Chenango
Watershed:	Susquehanna River Basin
Date of Inspection:	July 31, 1980

ASSESSMENT

The examination of documents and visual inspection of the Clark's Creek Site 1 Dam did not reveal conditions which constitute a hazard to human life or property.

The total discharge capacity of the spillways is adequate to impound and safely discharge the floodwaters resulting from the Probable Maximum Flood (PMF).

Several minor deficiencies were noted which should be corrected within 6 months of the date of final approval of this report. The required actions are cutting brush and trees which are growing near the riser and in the vicinity of the plunge pool and investigating the wet area in the bottom of the auxiliary spillway channel. In addition, an emergency action plan for notification of downstream residents should be developed within the same time frame.

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

Approved By:

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

Date: 30 Sep 80

OVERVIEW
CLARK'S CREEK WATERSHED PROJECT
SITE I
I.D. No. NY-718

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
CLARK'S CREEK WATERSHED PROJECT
SITE I
I.D. No. NY-718
(#106B-4076)
SUSQUEHANNA RIVER BASIN
CHENANGO 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

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

1.2 DESCRIPTION OF PROJECT

a. Description of Dam

The Clark's Creek Watershed Project Site I dam consists of an earth dam with a service spillway pipe passing through the embankment and an excavated auxiliary spillway passing around the eastern end of the dam.

The dam consists of a compacted earth embankment which is 46 feet high, has a crest length of 1250 feet and a crest width of 16 feet. The upstream slope is 1 vertical on 3 horizontal with a 10 foot wide berm near the base of the slope. The downstream slope is 1 vertical on 2.5 horizontal. The crest and exposed slopes are covered with grass and crownvetch. An earth cutoff trench of varying depth and width keys the embankment into the foundation soils.

The service spillway consists of a two-stage rectangular concrete drop inlet structure, a 30 inch diameter reinforced concrete pipe with anti-seepage collars and a riprapped plunge pool. A reservoir drain consisting of a 12 inch diameter cast iron pipe extends from the upstream toe of the embankment to the base of the spillway riser. A vertical slide gate mechanism mounted along the inside of the riser controls the flow through the reservoir drain. The auxiliary spillway is an earth cut with a bottom width of 200 feet.

An internal drainage system consisting of a gravel and stone filter is located at the base of the embankment near the downstream toe. Seepage is conducted through this drain to beyond the toe of the embankment via twin 6 inch diameter asbestos-cement pipes.

b. Location

The Clark's Creek Watershed Project Site I Dam is located off McCall Road

in the Town of Oxford. The structure is approximately one mile northwest of the Village of Oxford.

c. Size Classification
The dam is 46 feet high and has a maximum storage capacity of 200 acre feet. Therefore, the dam is in the intermediate size category as defined by the "Recommended Guidelines for Safety Inspection of Dams".

d. Hazard Classification
This dam is classified as "high" hazard due to the presence of a number of homes in the Village of Oxford located downstream of the dam.

e. Ownership
The dam is owned by Chenango County, New York and maintained by the Village of Oxford. The contracting officer is Mr. Phillip Cummings whose telephone number is (607)334-4632.

f. Purpose of Dam
The dam is a floodwater retarding structure.

g. Design and Construction History
The dam was designed by the U.S. Department of Agriculture, Soil Conservation Service (SCS). The SCS office at the Broome County Airport has a design folder containing hydrologic, hydraulic and structural design information. The dam was under construction from 1972-74 by the Jones and Mead Construction Company of Appalachin, New York.

h. Normal Operating Procedures
Normal flows are discharged through the service spillway. This structure has sufficient capacity to store and discharge a 100 year flood without discharge occuring in the auxiliary spillway. For storms in excess of the 100 year flood, discharge through the auxiliary spillway can be expected.

1.3 PERTINENT DATA

a. Drainage Area (acres)	536
b. Discharge at Dam (cfs)	
Service Spillway at maximum high water	160
Service Spillway at auxiliary spillway crest elev.	91
Auxiliary Spillway at maximum high water	4,966
Reservoir drain at service spillway crest elev.	21
c. Elevation (USGS Datum)	
Top of Dam	1361.6
Auxiliary Spillway Crest	1357.2
Service Spillway Crest - High Stage	1355.9
- Low Stage	1335.1
Reservoir Drain (invert elevation)	1319.9
d. Reservoir Surface Area (acres)	
Top of Dam	17.6
Auxiliary Spillway Crest	13.3
Service Spillway Crest	12.2

e. Storage Capacity (acre-feet)

Top of Dam	199.8
Auxiliary Spillway Crest	129.0
Service Spillway Crest	113.0

f. Dam

Embankment type - A compacted earth fill with a rock zone, a keyed earth cut-off trench, and a drain parallel to axis of dam.

Embankment length (ft)	1250
Slopes-Upstream	1 vertical on 3 horizontal
-Downstream	1 vertical on 2.5 horizontal
Crest Width (ft)	16

g. Service Spillway

Type: Two Stage, ungated, reinforced concrete drop inlet (2.5 x 7.5 ft), rising 39 feet above the invert of the 30 inch diameter concrete conduit; length of conduit 240 feet.

Weir length (ft)	15.0

h. Auxiliary Spillway

Type: An excavated trapezoidal channel.

Bottom Width (ft)	200
Side Slopes (V:H)	1:3
Exit Slope (ft/ft)	0.020

i. Reservoir Drain

Type: 12 inch diameter cast iron pipe

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

SECTION 2: ENGINEERING DATA

2.1 GEOTECHNICAL DATA

a. Geology

The Clark's Creek Watershed Project Site I Dam 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.

The present surficial deposits have resulted primarily from glaciations during the Cenozoic Era, the last of which was the Wisconsin glaciation.

b. Subsurface Investigations

A subsurface investigation program was conducted by SCS during the design process in 1971. This program consisted of 4 drill holes and 25 test pits at locations along the dam, auxiliary spillway, structural elements and borrow area. Applicable subsurface information has been included in Appendix F.

In general, the soils in the vicinity of the dam are of glacial till origin and consist of silty sand with some gravel. The soils encountered had slight permeability.

2.2 DESIGN RECORDS

The dam was designed by the Soil Conservation Service, who prepared a design report. A folder containing the design report and other design information was available at the SCS office at the Broome County Airport. Twenty-two drawings, several of which have been included in Appendix F, were prepared for the construction of this dam.

2.3 CONSTRUCTION RECORDS

Complete construction records are available from the SCS office at the Broome County Airport. As built plans have been included in Appendix F.

2.4 OPERATION RECORDS

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

2.5 EVALUATION OF DATA

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

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection of the Site I dam was conducted on July 31, 1980. The weather was clear and the temperature was in the seventies. The water surface at the time of the inspection was at the low stage orifice elevation on the principal spillway riser.

b. Embankment

No signs of distress were observed in the earth embankment and no evidence of seepage, misalignment, subsidence or surface cracking were noted on the embankment. The only deficiencies noted were of a minor nature. There was some brush growing near the toe of the upstream slope in the vicinity of the riser. There were several spots on the downstream slope where the grass was somewhat sparce.

An internal drainage system composed of 2-6 inch diameter pipes surrounded by "drain fill" material and extending parallel to the axis of the dam provides drainage at the base of the embankment. At the time of the inspection, both pipes were dry.

c. Service Spillway

The service spillway consists of a vertical drop inlet structure, a reinforced concrete pipe, a plunge pool at the outlet to the conduit, and an outlet channel. The height of the riser made it impossible to inspect the top or interior of the structure. All elements which were visible appeared to be in good condition. There was brush and small willow trees growing at the outlet to the plunge pool.

d. Auxiliary Spillway

The auxiliary spillway for this structure is located in an earth cut at the eastern end of the dam. The channel bottom has a good grass cover which had recently been mowed. A wet area extends along the upstream portion along eastern side of the spillway. This area is up to 25 feet wide and over 300 feet long. It is caused by water flowing from the outer cut slope which forms the spillway channel side.

e. Reservoir Drain

The 12 inch diameter reservoir drain and manually operated slide gate may be used to lower the reservoir. The drain was reported to be operational.

f. Reservoir

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

3.2 EVALUATION OF OBSERVATIONS

Visual inspection of this dam revealed the following deficiencies:

1. A small amount of brush growing near the riser on the lower portion of the upstream slope.

2. Brush and small trees growing immediately downstream of the plunge pool.

3. A wet area in the bottom of the auxiliary spillway channel.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The normal water surface elevation is at the low stage elevation of the principal spillway riser. Downstream flows are limited by the flow into the principal spillway riser, except during periods of extremely heavy runoff when the auxiliary spillway is in service.

4.2 MAINTENANCE OF THE DAM

The dam is maintained by the Village of Oxford through an agreement with the owner, Chenango County. While there were some minor deficiencies noted, this dam was generally well maintained.

4.3 WARNING SYSTEM IN EFFECT

There is no warning system in effect.

4.4 EVALUATION

The operation and maintenance procedures for this dam are satisfactory.

SECTION 5: HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

Delineation of the 536 acre watershed of the Site I dam was made using the USGS 7.5 minute quadrangle for Oxford, New York. The watershed consists of open grassed fields and woodlands. Relief in the drainage area ranges from moderate to steep.

5.2 ANALYSIS CRITERIA

The analysis of the floodwater retarding capability of this dam was performed using the Corps of Engineers HEC-1 computer program, Dam Safety version. This program develops an inflow hydrograph using the "Snyder Synthetic Unit Hydrograph" method and then uses the "Modified Puls" flood routing procedure. The spillway design flood selected was the Probable Maximum Flood (PMF) in accordance with the Recommended Guidelines of the U.S. Army Corps of Engineers.

5.3 SPILLWAY CAPACITY

The principal and auxiliary spillways are ungated structures. The capacities for both spillways were taken from the stage-discharge data included in the SCS design report.

The spillways have sufficient capacity for discharging the peak outflow from the PMF. For this storm, the peak inflow is 1,577 cfs and the peak outflow is 1,567 cfs. When the spillways are discharging the peak outflow the water surface will be 2.5 feet below the top of the dam. Further information concerning this analysis is included in Appendix C.

5.4 RESERVOIR CAPACITY

Normal flood control storage capacity of the reservoir between the principal and auxiliary spillway is 16 acre-feet which is equivalent to a runoff depth of 0.4 inches over the drainage area. Surcharge storage capacity to the maximum high water elevation is an additional 71 acre feet, equivalent to a runoff depth over the drainage area of 1.6 inches. Total storage capacity of the dam is 200 acre-feet.

5.5 FLOODS OF RECORD

The maximum known flood occurred on February 24, 1975. The pool level at this time was reported to be about 12.3 feet above the principal spillway crest. The calculated discharge for this flood is as follows:

Elevation (USGS)	Discharge (cfs)
1374.4	17

5.6 OVERTOPPING POTENTIAL

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

5.7 EVALUATION

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

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

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

b. Design and Construction Data

Design data was obtained from the Soil Conservation office at the Broome County airport. Stability analyses were performed using a Swedish circle method of analysis. One undrained triaxial shear test and one direct shear test was performed on compacted soil samples from the proposed borrow area. These tests were used to select soil parameters for use in the analysis. Various conditions were analyzed in the stability analysis. The conditionsapplicable to the dam as it was constructed are as follows:

	MINIMUM FACTOR OF SAFETY	
CONDITION	UPSTREAM SLOPE	DOWNSTREAM SLOPE
Full Draw Down	1.57	-
Long Term Steady State Seepage	-	1.62

The calculated factors of safety for this dam are considered to be adequate.

c. Seismic Stability

No seismic stability analysis was performed for this structure.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

The Phase I inspection of the Clark's Creek Project Site I dam did not reveal conditions which constitute a hazard to human life or property. The earth embankment is considered to be structurally stable and the spillways are capable of retarding and safely discharging floodwaters resulting from the Probable Maximum Flood (PMF).

b. Adequacy of Information

Information reviewed for Phase I inspection purposes is considered to be adequate.

c. Need for Additional Investigations

No additional investigations are necessary at this time.

7.2 RECOMMENDED MEASURES

The following actions should be taken within 6 months of the date of final approval of this report:

a. Cut the brush and small trees growing near the riser on the lower portion of the upstream slope as well as those in the vicinity of the plunge pool.

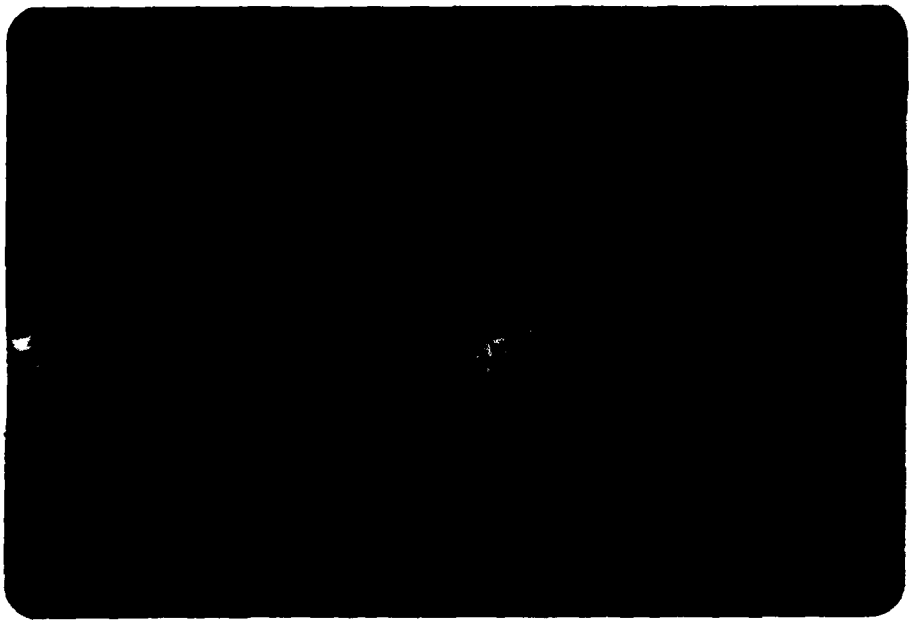
b. Investigate the wet area in the bottom of the auxiliary spillway channel to determine whether remedial work is required to drain this area.

c. Develop an emergency action plan for notification of downstream residents and the proper authorities in the event of large auxiliary spillway discharges.

APPENDIX A

PHOTOGRAPHS

Service Spillway Riser with Auxiliary Spillway
Channel at Left



Brush Growing on Slope Near the
Base of the Riser

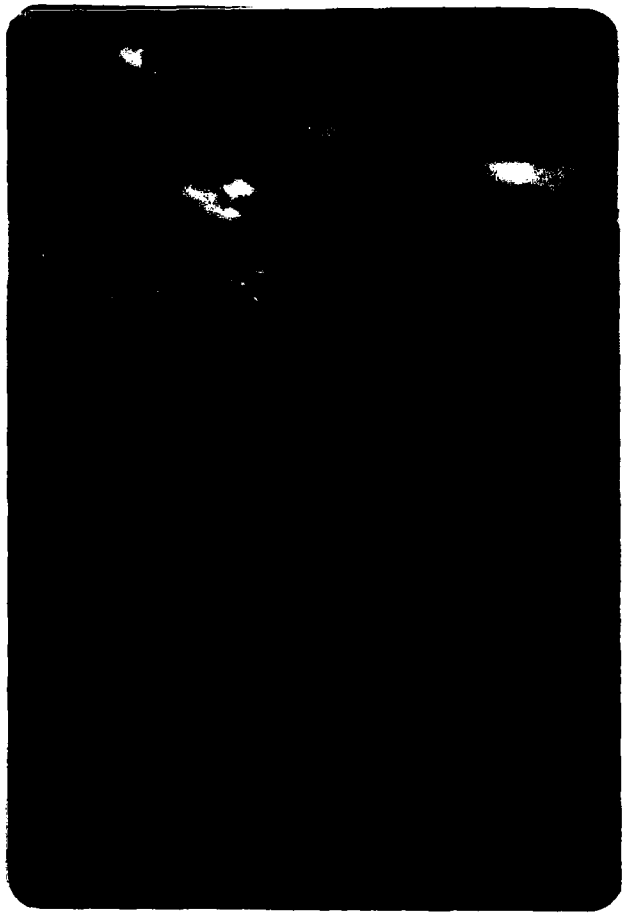
Outlet to Principal Spillway Conduit and
Plunge Pool - Note Undesireable Growth through Rock

Plunge Pool and Downstream Channel
Note Small Tree Growing at Outlet to
Plunge Pool

Entrance to Auxiliary Spillway Channel

Control Section of Auxiliary Spillway Channel

Wet Area on Cut Slope of Auxiliary Spillway



Wet Area at Base of Cut Slope on Auxiliary Spillway

APPENDIX B

VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam CLARK'S CREEK WATERSHED PROJECT SITE 1 DAM

Fed. I.D. # NY 718 DEC Dam No. #106B-4076

River Basin SUSQUEHANNA

Location: Town OXFORD County CHENANGO

Stream Name CLARK'S CREEK

Tributary of CHENANGO RIVER

Latitude (N) 42° 27.5' Longitude (W) 75° 36.1'

Type of Dam EARTH EMBANKMENT

Hazard Category C

Date(s) of Inspection 7/31/80

Weather Conditions SUNNY; CLEAR 75°

Reservoir Level at Time of Inspection AT LOW STAGE ORIFICE

b. Inspection Personnel W. LYNICH R. WARRENDER

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

GARY PAGE - SCS BROOME CO. AIRPORT OFFICE

607-773-2751

d. History:

Date Constructed 1974 Date(s) Reconstructed NONE

Designer SOIL CONSERVATION SERVICE

Constructed By JONES & MEAD CONSTRUCTION - APPALACHIN, N.Y.

Owner CHENANGO COUNTY — PHIL CUMMINGS @ NORWICH SWCD OFFICE

MAINTAINED BY VILLAGE OF OXFORD

2) Embankment

a. Characteristics

(1) Embankment Material GLACIAL TILL

(2) Cutoff Type COMPACTED EARTH

(3) Impervious Core NONE

(4) Internal Drainage System YES

(5) Miscellaneous GRASS & CROWN VETCH

b. Crest

(1) Vertical Alignment SATISFACTORY

(2) Horizontal Alignment CURVILINEAR

(3) Surface Cracks NONE

(4) Miscellaneous

c. Upstream Slope

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

(2) Undesirable Growth or Debris, Animal Burrows WELL MAINTAINED MOWED GRASS - SOME BRUSH & TREES NEAR RISER AT BOTTOM OF SLOPE

(3) Sloughing, Subsidence or Depressions NONE

(4) Slope Protection NONE

(5) Surface Cracks or Movement at Toe NONE

d. Downstream Slope

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

(2) Undesirable Growth or Debris, Animal Burrows NONE - GRASS WAS SLIGHTLY SPARSE IN SPOTS

(3) Sloughing, Subsidence or Depressions NONE

(4) Surface Cracks or Movement at Toe NONE

(5) Seepage NONE

(6) External Drainage System (Ditches, ~~Trenches~~; B~~lanket~~) ALONG ABUTMENT-EMBANKMENT CONTACT - NO SEEPAGE OR WET AREAS

(7) Condition Around Outlet Structure SATISFACTORY

(8) Seepage Beyond Toe NONE NOTED

e. Abutments - Embankment Contact

DOWNSTREAM SLOPE - RIPRAP LINED - NO SEEPAGE OR WET SPOTS

(1) Erosion at Contact No

(2) Seepage Along Contact NONE

3) Drainage System

a. Description of System TWIN 6" ASBESTOS-CEMENT PIPES WITH ANIMAL GUARDS ACROSS PIPE OUTLET

b. Condition of System APPEARED SATISFACTORY

c. Discharge from Drainage System NONE AT TIME OF INSPECTION

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

NONE

5) Reservoir

a. Slopes RELATIVELY STEEP

b. Sedimentation NONE APPARENT

c. Unusual Conditions Which Affect Dam NONE

6) Area Downstream of Dam

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

b. Seepage, Unusual Growth NONE

c. Evidence of Movement Beyond Toe of Dam NONE

d. Condition of Downstream Channel SOME BRUSH & SMALL TREES AT OUTLET OF PLUNGE POOL - BEYOND THAT TRAPEZOIDAL CHANNEL IS OKAY

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

2 STAGE RISER WITH LOW FLOW ORIFICE - AUXILIARY CHANNEL AT EAST END

a. General SATISFACTORY

b. Condition of Service Spillway

NOT POSSIBLE TO INSPECT TOP OR INTERIOR OF RISER DUE TO HEIGHT OF RISER

c. Condition of Auxiliary Spillway RECENTLY & MOWED SATISFACTORY MAINTENANCE; WET AREA WITH MINOR PONDING ALONG OUTSIDE BEND - SEEPAGE OFF CUT SLOPE EXTENDS ABOUT 25' OUT FROM TOE OF CUT AND FOR ABOUT 300 FT. - BEGINS UPSTEAM OF LEVEL SECTION & EXTENDS TO END OF CHANNEL - FLOWING INTO RESERVOIR

d. Condition of Discharge Conveyance Channel OKAY - SOME TREES SURROUND PLUNGE POOL

8) Reservoir Drain/Outlet

Type: Pipe ✓ Conduit _____ Other _____

Material: Concrete _____ Metal _____ Other CAST IRON

Size: 12 Length 50'

Invert Elevations: Entrance 1319.9 Exit 1317.9

Physical Condition (Describe): Unobservable ✓

Material: _____

Joints: _____ Alignment _____

Structural Integrity: _____

_____

Hydraulic Capability: _____

_____

Means of Control: Gate _____ Valve _____ Uncontrolled _____

Operation: Operable _____ Inoperable _____ Other _____

Present Condition (Describe): REPORTED TO BE OPERABLE - IS OPERATED ANNUALLY

9) Structural

a. Concrete Surfaces PIPE - OKAY RISER - OKAY

b. Structural Cracking NOT AT OUTLET

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

d. Junctions with Abutments or Embankments N/A

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

f. Water Passages, Conduits, Sluices SATISFACTORY

g. Seepage or Leakage NONE OBSERVED

h. Joints - Construction, etc. N/A

i. Foundation N/A

j. Abutments N/A

k. Control Gates RESERVOIR DRAIN - OPERATED ANNUALLY BUT NOT YET THIS YEAR

l. Approach & Outlet Channels

m. Energy Dissipators (Plunge Pool, etc.) SATISFACTORY - GRADED RIPRAP AROUND ENTIRE POOL & DOWNSTREAM CHANNEL SOME BRUSH & TREES IN VICINITY OF POOL

n. Intake Structures

o. Stability

p. Miscellaneous

APPENDIX C

HYDROLOGIC/HYDRAULIC ENGINEERING DATA AND COMPUTATIONS

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

AREA-CAPACITY DATA:

	Elevation (ft.)	Surface Area (acres)	Storage Capacity (acre-ft.)
1) Top of Dam	1361.6	17.6	199.8
2) Design High Water (Max. Design Pool)			
3) Auxiliary Spillway Crest	1357.2	13.3	129.0
4) Pool Level with Flashboards			
5) Service Spillway Crest	1355.9	12.2	113.0

DISCHARGES

	Volume (cfs)
1) Average Daily	
2) Spillway @ Maximum High Water	160.1
3) Spillway @ Design High Water	
4) Spillway @ Auxiliary Spillway Crest Elevation	91.4
5) Low Level Outlet	20.5
6) Total (of all facilities) @ Maximum High Water	5126
7) Maximum Known Flood	
8) At Time of Inspection	

CREST: ELEVATION: 1361.6

Type: GRASSED EARTH

Width: 16FT Length: 1250 FT

Spillover GRASSED EARTH CHANNEL

Location EASTERN END

SPILLWAY:

SERVICE		AUXILIARY
1355.9	Elevation	1357.2
R/C DROP INLET	Type	GRASSED CHANNEL
2.5 FT x 7.5 FT	Width	200 FT
	Type of Control	
✓	Uncontrolled	✓
	Controlled:	
	Type (Flashboards; gate)	
	Number	
	Size/Length	
	Invert Material	
	Anticipated Length of operating service	
	Chute Length	
	Height Between Spillway Crest & Approach Channel Invert (Weir Flow)	

HYDROMETEROLOGICAL GAGES:

Type : NONE

Location: _____

Records:

Date - _____

Max. Reading - _____

FLOOD WATER CONTROL SYSTEM:

Warning System: NONE

_____

Method of Controlled Releases (mechanisms):

OPERATION OF RESERVOIR DRAIN

_____

DRAINAGE AREA: 536 ACRES

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: FARM & FORESTS

Terrain - Relief: MODERATE

Surface - Soil: GLACIAL TILL

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

NONE

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

NONE

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

NONE

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

Location: WEST END OF DAM - DIVERSION TO GET HIGHWAY CULVERT RUNOFF AWAY FROM EMBANKMENT

Elevation: _____

Reservoir:

Length @ Maximum Pool _____ (Miles)

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

00-15-1 (3/78)
Formerly GA-17

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT GRID

JOB	SHEET NO.	CHECKED BY	DATE
CLARK'S CREEK WATERSHED PROJECT	1		
SUBJECT		**COMPUTED BY**	**DATE**
HYDROLOGIC/HYDRAULIC COMPUTATIONS		RLW	7/22/80

DRAINAGE AREA OF RESERVOIR - TAKEN FROM SCS PLANS

536 ACRES = .846 SQ. MI

SNYDER SYNTHETIC UNIT HYDROGRAPH

$L = 1.63$ mi. $\quad L_{ca} = .72$ mi.

$$t_p = C_t (L \cdot L_{ca})^{.3} = 2.0[(1.63)(.72)]^{.3} = 2.10$$

$$t_r = \frac{t_p}{5.5} = \frac{2.10}{5.5} = .38 \qquad \text{USE 20 MINUTE INCREMENTS}$$

$$t_{pr} = t_p + .25(t_R - t_r) = 2.10 + .25(.33 - .38) = 2.09$$

HR #33 PMP RAINFALL

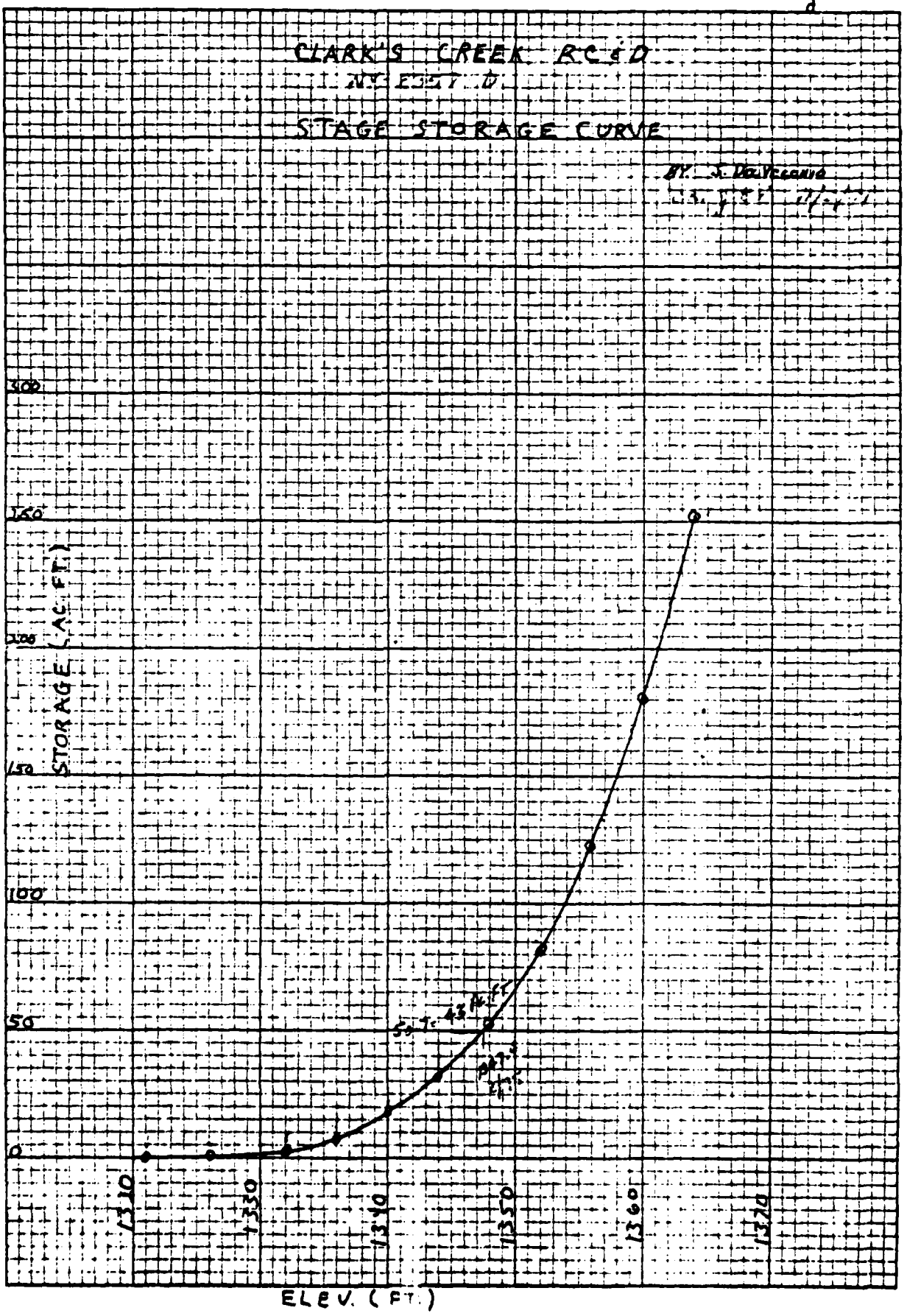
ZONE 1 PMP RAIN = 20 IN

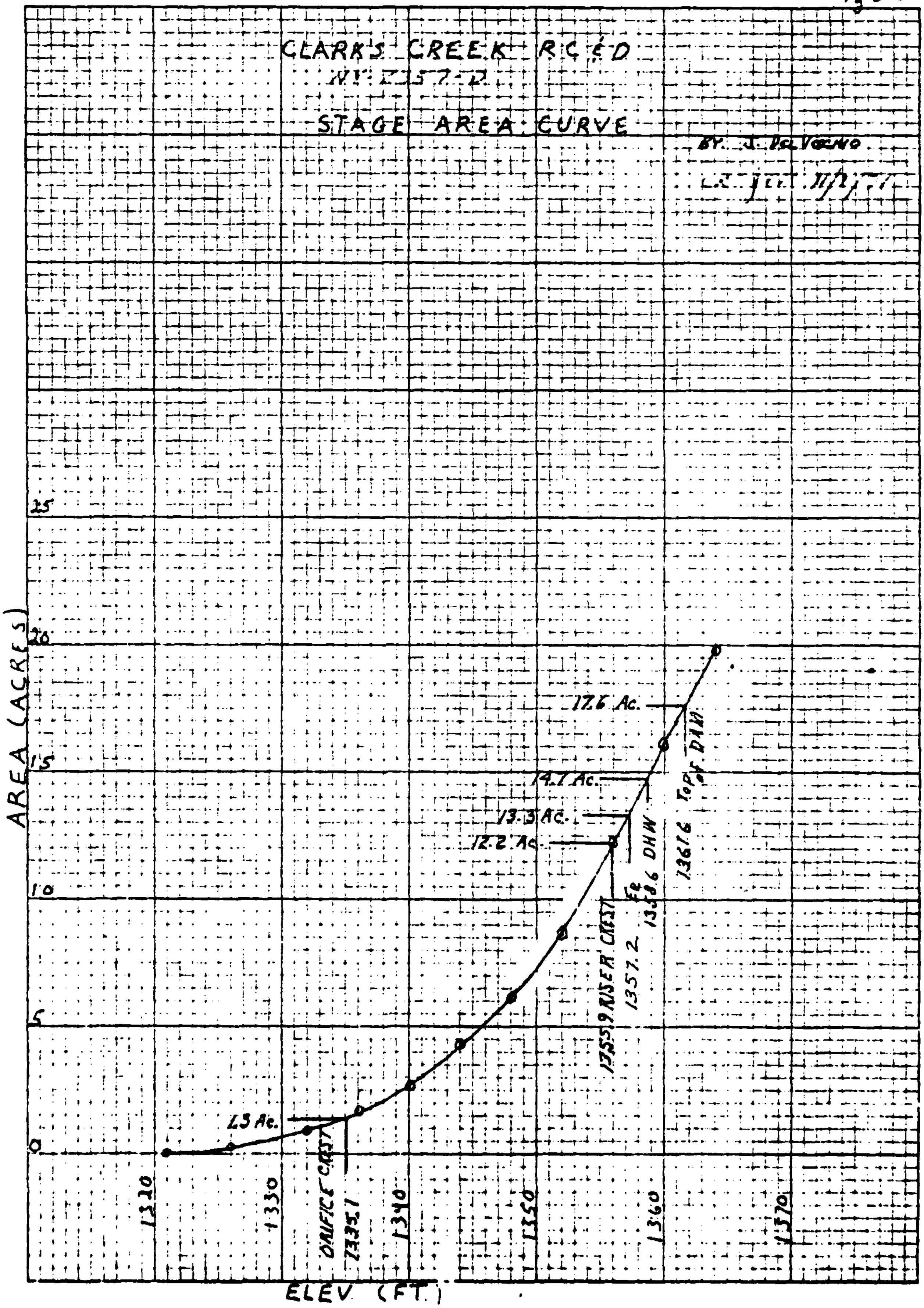
6 HR = 111% 24 HR = 132%

12 HR = 123% 48 HR = 143%

$$T \text{ SPEC} = 1 - \frac{.20 \cdot C}{(.8P) \cdot .47_R} = .689$$

BASE FLOW → USE 2 cfs


CLARK'S CREEK RCSD
NO. EAST D
STAGE STORAGE CURVE
BY: J. DeVecchio
300
250
200
150
100
50
0
STORAGE (AC. FT.)
1310
1330
1340
1350
1360
1370
ELEV. (FT.)



K&E 10 X 10 TO THE INCH 46 0703
KEUFFEL & ESSER CO.

PRINCIPAL SPILLWAY ROUT
CLARKS CRK DAM 1 EMERGENCY SPILLWAY VOLUME BY JEP NOV 3,1971
CK HWS NOV 4,1971

24 HOUR ** 10 DAY
CURVE NO. 100., RAINFALL 3.40, ** CURVE NO. 100., RAINFALL 4.30, 3.50

TC 3.90 LENGTH OF PIPE 144. MANNING'S 'N' VALUE 0.012 DRAINAGE AREA 0.64

BASE FLOW IS 3.00 CSM (5.72 CFS).

TWO STAGE WITH ORIFICE.

LOW STAGE CREST ELEV. 1335.10 OPENING IS 1.00 X 1.00 FEET.

HIGH STAGE CREST ELEV. 1355.40 WIDTH 14.00

CONDUIT DIA IS 30. INCHES.

ELEVATION	STORAGE	CFS
1335.10	7.90	0.00
1339.25	1[illegible].28	9.20
1343.41	2[illegible].76	13.45
1347.57	49.32	16.55
1351.73	78.98	19.33
1355.89	120.99	21.68
1356.10	124.01	23.94
1356.30	125.04	33.65
1356.50	129.07	43.50
1356.69	132.50	55.30
1356.90	135.33	66.71
1357.10	138.16	77.43
1357.30	140.99	87.43
1357.50	143.82	116.02
1357.69	146.65	145.90
1357.89	149.48	154.69
1359.00	165.64	155.90
1361.00	197.07	159.13
1363.00	232.82	162.30
1365.00	268.57	165.40
1367.00	304.32	168.45
1369.00	340.07	171.45
1371.00	375.82	174.39
1373.00	411.57	177.28
1375.00	447.32	180.13
1377.00	483.07	182.94
1379.00	518.82	185.70

E. S. DESIGN AND F[illegible]OARD ROUTINGS.

INPUT UNDER JEP 12/6/71

CLARKS CREEK DAM 1 CHENANGO RCSD NEW YORK BY JAH 11-23-71 CK JEP

CURVE NO. 75. TC 0.90 STORM DURATION 6.00

EMER. SPW. RAINFALL 9.10 FREEBOARD RAINFALL 23.00

CASE NO. 2. DRAINAGE AREA 0.84 EMER. SPW. CREST 1357.2

B01 150. L1 500. B02 200. L2 500. B03 250. L3 500.

ELEVATION	STORAGE	CFS	CFS	CFS
1335.60	8.	1.	1.	1.
1336.00	8.	2.	2.	2.
1340.00	16.	10.	10.	10.
1344.00	30.	13.	13.	13.
1348.00	51.	16.	16.	16.
1352.00	80.	19.	19.	19.
1355.90	121.	22.	22.	22.
1357.20	137.	91.	91.	91.
1357.70	144.	182.	208.	235.
1358.20	152.	380.	468.	557.
1358.70	159.	657.	834.	1011.
1359.20	167.	1008.	1298.	1588.
1359.70	174.	1452.	1886.	2320.
1360.00	179.	1776.	2316.	2856.
1360.20	182.	1988.	2598.	3208.
1361.20	200.	3190.	4200.	5210.
1363.20	236.	6358.	8423.	10488.
1364.00	250.	7974.	10577.	13180.
1365.20	272.	10396.	13806.	17216.
1367.99	322.	17610.	23424.	29238.

```
**********                                                    **********
FLOOD HYDROGRAPH PACKAGE (HEC-1)                              NEW YORK STATE
DAM SAFETY VERSION      JULY 1978                             DEPT OF ENVIRONMENTAL CONSERVATION
  LAST MODIFICATION  26 FEB 79                                FLOOD PROTECTION BUREAU
  MODIFIED FOR MCEVERFLL APR 79
**********                                                    **********
    1              A1 CLARKS CREEK PROJECT SITE 1
    2              A2  ANALYSIS  PMF WITH RATIOS
    3              A3  DATE
    4              R    20C       0      15       0       0       0       0       0       0       0
    5              R1     5
    6              J      1       2       1
    7              J1    .5       1
    8              K      C       1                                               1
    9              K1          INFLOW HYDROGRAPH
   10              M      1       1     .84                       .689                    1
   11              P      C      20     111     123     132     142
   12              T                                                       1      .1
   13              W    2.1    .625
   14              A      2       2       1                                        .
   15              K      1       1                                               1
   16              K1  ROUTED HYDROGRAPH AT DAM NO BREACH
   17              Y                                      1       1
   18              Y1     1                                                -1355.9      -1
   19              Y41335.1  1355.9  1357.2  1358.6  1361.6
   20              Y5     C      23      91     760    5126
   21              S5   7.7     113     129     150   199.8
   22              SF1335.1  1355.9  1357.2  1358.6  1361.6
   23              SS1355.9
   24              SD1361.6     2.6     1.5    1250
   25              K     99
   26              A
   27              A
   28              A
   29              A
   30              A
```

****
FLOOD HYDROGRAPH PACKAGE (HEC-1)
LAN SAFETY VERSION JULY 1979
LAST MODIFICATION 26 FEB 79
MODIFIED FOR HONEYWELL APR 79
****

****
NEW YORK STATE
DEPT OF ENVIRONMENTAL CONSERVATION
FLOOD PROTECTION BUREAU
****

RUN DATE 07/23/80

CLARKS CREEK PROJECT SITE 1
ANALYSIS PMF WITH RATIOS
DATE

JOB SPECIFICATION

NO	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
200	0	15	0	0	0	0	0	0	0

JOPER	NWT	LROPT	TRACE
5	0	0	0

MULTI-PLAN ANALYSES TO BE PERFORMED
NPLAN= 1 NRTIO= 2 LRTIO= 1
RTIOS= 0.50 1.00

****

SUB-AREA RUNOFF COMPUTATION

INFLOW HYDROGRAPH

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	0.84	0.	0.84	0.69	0.	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.	20.00	111.00	123.00	132.00	142.00	0.	0.

LOSS DATA

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

UNIT HYDROGRAPH DATA
TP= 2.10 CP=0.63 NTA= 0

RECESSION DATA
STRTQ= 2.00 QRCSN= 2.00 RTIOR= 1.00
APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 9.51 AND R= 7.69 INTERVALS

UNIT HYDROGRAPH 46 END-OF-PERIOD ORDINATES, LAG= 2.08 HOURS, CP= 0.63 VOL= 1.00

4.	24.	48.	75.	104.	131.	151.	162.	166.	157.
140.	123.	108.	95.	83.	73.	64.	56.	49.	43.
38.	33.	29.	26.	22.	20.	17.	15.	13.	12.
10.	9.	8.	7.	6.	5.	5.	4.	4.	3.
3.	2.	2.	2.	2.	1.				

END-OF-PERIOD FLOW

O HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1.01	0.15	1	0.00	0.	0.00	2.	1.02	1.15	101	0.02	0.	0.02	3.
1.01	0.30	2	0.00	0.	0.00	2.	1.02	1.30	102	0.02	0.	0.02	3.
1.01	0.45	3	0.00	0.	0.00	2.	1.02	1.45	103	0.02	0.	0.02	3.

1.01	1.00	4	0.00	0.	0.00	2.	1.02	2.00	104	0.02	0.	0.02	2.
1.01	1.15	5	0.00	0.	0.00	2.	1.02	2.15	105	0.02	0.	0.02	2.
1.01	1.30	6	0.00	0.	0.00	2.	1.02	2.30	106	0.02	0.	0.02	2.
1.01	1.45	7	0.00	0.	0.00	2.	1.02	2.45	107	0.02	0.	0.02	2.
1.01	2.00	8	0.00	0.	0.00	2.	1.02	3.00	108	0.02	0.	0.02	2.
1.01	2.15	9	0.00	0.	0.00	2.	1.02	3.15	109	0.02	0.	0.02	2.
1.01	2.30	10	0.00	0.	0.00	2.	1.02	3.30	110	0.02	0.	0.02	2.
1.01	2.45	11	0.00	0.	0.00	2.	1.02	3.45	111	0.02	0.	0.02	2.
1.01	3.00	12	0.00	0.	0.00	2.	1.02	4.00	112	0.02	0.	0.02	2.
1.01	3.15	13	0.00	0.	0.00	2.	1.02	4.15	113	0.02	0.	0.02	2.
1.01	3.30	14	0.00	0.	0.00	2.	1.02	4.30	114	0.02	0.	0.02	2.
1.01	3.45	15	0.00	0.	0.00	2.	1.02	4.45	115	0.02	0.	0.02	2.
1.01	4.00	16	0.00	0.	0.00	2.	1.02	5.00	116	0.02	0.	0.02	2.
1.01	4.15	17	0.00	0.	0.00	2.	1.02	5.15	117	0.02	0.	0.02	2.
1.01	4.30	18	0.00	0.	0.00	2.	1.02	5.30	118	0.02	0.	0.02	2.
1.01	4.45	19	0.00	0.	0.00	2.	1.02	5.45	119	0.02	0.	0.02	2.
1.01	5.00	20	0.00	0.	0.00	2.	1.02	6.00	120	0.02	0.	0.02	2.
1.01	5.15	21	0.00	0.	0.00	2.	1.02	6.15	121	0.07	0.04	0.03	2.
1.01	5.30	22	0.00	0.	0.00	2.	1.02	6.30	122	0.07	0.04	0.03	3.
1.01	5.45	23	0.00	0.	0.00	2.	1.02	6.45	123	0.07	0.04	0.03	5.
1.01	6.00	24	0.00	0.	0.00	2.	1.02	7.00	124	0.07	0.04	0.03	9.
1.01	6.15	25	0.01	0.	0.01	2.	1.02	7.15	125	0.07	0.04	0.03	13.
1.01	6.30	26	0.01	0.	0.01	2.	1.02	7.30	126	0.07	0.04	0.03	19.
1.01	6.45	27	0.01	0.	0.01	2.	1.02	7.45	127	0.07	0.04	0.03	26.
1.01	7.00	28	0.01	0.	0.01	2.	1.02	8.00	128	0.07	0.04	0.03	33.
1.01	7.15	29	0.01	0.	0.01	2.	1.02	8.15	129	0.07	0.04	0.03	40.
1.01	7.30	30	0.01	0.	0.01	2.	1.02	8.30	130	0.07	0.04	0.03	47.
1.01	7.45	31	0.01	0.	0.01	2.	1.02	8.45	131	0.07	0.04	0.03	53.
1.01	8.00	32	0.01	0.	0.01	2.	1.02	9.00	132	0.07	0.04	0.03	59.
1.01	8.15	33	0.01	0.	0.01	2.	1.02	9.15	133	0.07	0.04	0.03	63.
1.01	8.30	34	0.01	0.	0.01	2.	1.02	9.30	134	0.07	0.04	0.03	67.
1.01	8.45	35	0.01	0.	0.01	2.	1.02	9.45	135	0.07	0.04	0.03	71.
1.01	9.00	36	0.01	0.	0.01	2.	1.02	10.00	136	0.07	0.04	0.03	74.
1.01	9.15	37	0.01	0.	0.01	2.	1.02	10.15	137	0.07	0.04	0.03	77.
1.01	9.30	38	0.01	0.	0.01	2.	1.02	10.30	138	0.07	0.04	0.03	80.
1.01	9.45	39	0.01	0.	0.01	2.	1.02	10.45	139	0.07	0.04	0.03	82.
1.01	10.00	40	0.01	0.	0.01	2.	1.02	11.00	140	0.07	0.04	0.03	84.
1.01	10.15	41	0.01	0.	0.01	2.	1.02	11.15	141	0.07	0.04	0.03	85.
1.01	10.30	42	0.01	0.	0.01	2.	1.02	11.30	142	0.07	0.04	0.03	87.
1.01	10.45	43	0.01	0.	0.01	2.	1.02	11.45	143	0.07	0.04	0.03	88.
1.01	11.00	44	0.01	0.	0.01	2.	1.02	12.00	144	0.07	0.04	0.03	89.
1.01	11.15	45	0.01	0.	0.01	2.	1.02	12.15	145	0.38	0.36	0.02	92.
1.01	11.30	46	0.01	0.	0.01	2.	1.02	12.30	146	0.38	0.36	0.02	100.
1.01	11.45	47	0.01	0.	0.01	2.	1.02	12.45	147	0.38	0.36	0.02	110.
1.01	12.00	48	0.01	0.	0.01	2.	1.02	13.00	148	0.38	0.36	0.02	140.
1.01	12.15	49	0.03	0.	0.03	2.	1.02	13.15	149	0.46	0.43	0.02	174.
1.01	12.30	50	0.03	0.	0.03	2.	1.02	13.30	150	0.46	0.43	0.02	217.
1.01	12.45	51	0.03	0.	0.03	2.	1.02	13.45	151	0.46	0.43	0.02	269.
1.01	13.00	52	0.03	0.	0.03	2.	1.02	14.00	152	0.46	0.43	0.02	326.
1.01	13.15	53	0.03	0.	0.03	2.	1.02	14.15	153	0.57	0.55	0.02	387.
1.01	13.30	54	0.03	0.	0.03	2.	1.02	14.30	154	0.57	0.55	0.02	449.
1.01	13.45	55	0.03	0.	0.03	2.	1.02	14.45	155	0.57	0.55	0.02	510.
1.01	14.00	56	0.03	0.	0.03	2.	1.02	15.00	156	0.57	0.55	0.02	570.
1.01	14.15	57	0.04	0.	0.04	2.	1.02	15.15	157	0.58	0.56	0.02	629.
1.01	14.30	58	0.04	0.	0.04	2.	1.02	15.30	158	1.16	1.14	0.03	690.
1.01	14.45	59	0.04	0.	0.04	2.	1.02	15.45	159	3.23	3.23	0.03	772.
1.01	15.00	60	0.04	0.	0.04	2.	1.02	16.00	160	0.81	0.79	0.02	885.
1.01	15.15	61	0.04	0.	0.04	2.	1.02	16.15	161	0.54	0.51	0.02	1017.
1.01	15.30	62	0.09	0.	0.09	2.	1.02	16.30	162	0.54	0.51	0.02	1155.
1.01	15.45	63	0.25	0.	0.25	2.	1.02	16.45	163	0.54	0.51	0.02	1292.
1.01	16.00	64	0.06	0.02	0.04	2.	1.02	17.00	164	0.54	0.51	0.02	1413.
1.01	16.15	65	0.04	0.02	0.03	3.	1.02	17.15	165	0.42	0.40	0.02	1504.
1.01	16.30	66	0.04	0.02	0.03	3.	1.02	17.30	166	0.42	0.40	0.02	1560.
1.01	16.45	67	0.04	0.02	0.03	5.	1.02	17.45	167	0.42	0.40	0.02	1577.
1.01	17.00	68	0.04	0.02	0.03	6.	1.02	18.00	168	0.42	0.40	0.02	1550.
1.01	17.15	69	0.03	0.01	0.03	8.	1.02	18.15	169	0.03	0.01	0.03	1489.
									170	0.03	0.01	0.03	1415.

1.01	17.30	70	0.03	0.01	0.03	11.	1.02	18.30	170	0.03	0.01	0.03	1412.
1.01	17.45	71	0.03	0.01	0.03	13.	1.02	18.45	171	0.03	0.01	0.03	1334.
1.01	18.00	72	0.03	0.01	0.03	15.	1.02	19.00	172	0.03	0.01	0.03	1247.
1.01	18.15	73	0.00	0.	0.00	16.	1.02	19.15	173	0.03	0.01	0.03	1153.
1.01	18.30	74	0.00	0.	0.00	17.	1.02	19.30	174	0.03	0.01	0.03	1054.
1.01	18.45	75	0.00	0.	0.00	17.	1.02	19.45	175	0.03	0.01	0.03	953.
1.01	19.00	76	0.00	0.	0.00	17.	1.02	20.00	176	0.03	0.01	0.03	852.
1.01	19.15	77	0.00	0.	0.00	16.	1.02	20.15	177	0.03	0.01	0.03	755.
1.01	19.30	78	0.00	0.	0.00	15.	1.02	20.30	178	0.03	0.01	0.03	665.
1.01	19.45	79	0.00	0.	0.00	14.	1.02	20.45	179	0.03	0.01	0.03	585.
1.01	20.00	80	0.00	0.	0.00	13.	1.02	21.00	180	0.03	0.01	0.03	515.
1.01	20.15	81	0.00	0.	0.00	12.	1.02	21.15	191	0.03	0.01	0.03	454.
1.01	20.30	82	0.00	0.	0.00	10.	1.02	21.30	182	0.03	0.01	0.03	400.
1.01	20.45	83	0.00	0.	0.00	9.	1.02	21.45	183	0.03	0.01	0.03	353.
1.01	21.00	84	0.00	0.	0.00	8.	1.02	22.00	184	0.03	0.01	0.03	311.
1.01	21.15	85	0.00	0.	0.00	8.	1.02	22.15	185	0.03	0.01	0.03	275.
1.01	21.30	86	0.00	0.	0.00	7.	1.02	22.30	186	0.03	0.01	0.03	243.
1.01	21.45	87	0.00	0.	0.00	6.	1.02	22.45	187	0.03	0.01	0.03	215.
1.01	22.00	88	0.00	0.	0.00	6.	1.02	23.00	188	0.03	0.01	0.03	190.
1.01	22.15	89	0.00	0.	0.00	5.	1.02	23.15	189	0.03	0.01	0.03	169.
1.01	22.30	90	0.00	0.	0.00	5.	1.02	23.30	190	0.03	0.01	0.03	150.
1.01	22.45	91	0.00	0.	0.00	5.	1.02	23.45	191	0.03	0.01	0.03	133.
1.01	23.00	92	0.00	0.	0.00	4.	1.03	0.	192	0.03	0.01	0.03	118.
1.01	23.15	93	0.00	0.	0.00	4.	1.03	0.15	193	0.	0.	0.	105.
1.01	23.30	94	0.00	0.	0.00	4.	1.03	0.30	194	0.	0.	0.	93.
1.01	23.45	95	0.00	0.	0.00	4.	1.03	0.45	195	0.	0.	0.	83.
1.02	0.	96	0.00	0.	0.00	3.	1.03	1.00	196	0.	0.	0.	73.
1.02	0.15	97	0.02	0.	0.02	3.	1.03	1.15	197	0.	0.	0.	65.
1.02	0.30	98	0.02	0.	0.02	3.	1.03	1.30	198	0.	0.	0.	57.
1.02	0.45	99	0.02	0.	0.02	3.	1.03	1.45	199	0.	0.	0.	50.
1.02	1.00	100	0.02	0.	0.02	3.	1.03	2.00	200	0.	0.	0.	44.
									SUM	19.57	16.00	3.57	34720.
										(497.)	(406.)	(91.)	(983.16)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1577.	1087.	357.	174.	34701.
CMS	45.	31.	10.	5.	983.
INCHES		12.04	15.81	16.01	16.01
MM		305.77	401.57	406.71	406.71
AC-FT		539.	708.	717.	717.
THOUS CU M		665.	873.	884.	884.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 1

1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	2.	2.	3.	4.	5.
6.	7.	8.	9.	9.	8.	8.	8.	7.	6.
6.	5.	5.	4.	4.	3.	3.	3.	3.	2.
2.	2.	2.	2.	2.	2.	2.	2.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	2.	3.	4.	7.	10.	13.	16.	20.	23.
27.	29.	32.	34.	36.	37.	39.	40.	41.	42.
43.	43.	44.	45.	46.	50.	58.	70.	87.	109.
134.	163.	193.	225.	255.	285.	314.	345.	386.	443.
531.	579.	646.	706.	752.	780.	785.	775.	744.	707.
667.	624.	577.	527.	476.	426.	378.	333.	293.	258.
227.	200.	176.	156.	137.	121.	107.	95.	84.	75.
66.	59.	52.	47.	41.	37.	32.	29.	25.	22.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	749.	544.	178.	87.	17351.
CMS	22.	15.	5.	2.	491.
INCHES		6.02	7.90	8.01	8.01
MM		152.88	200.79	203.35	203.35
AC-FT		270.	354.	358.	358.
THOUS CU M		332.	437.	442.	442.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 2

2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	3.	3.	5.	6.	8.	11.
13.	15.	16.	17.	17.	17.	16.	15.	14.	13.
12.	10.	9.	8.	8.	7.	6.	6.	5.	5.
4.	4.	4.	4.	4.	3.	3.	3.	3.	3.
3.	3.	3.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	3.	5.	9.	13.	19.	26.	33.	40.	47.
53.	59.	63.	67.	71.	74.	77.	80.	82.	84.
89.	87.	88.	89.	92.	100.	116.	140.	174.	217.
269.	326.	387.	449.	510.	570.	629.	690.	772.	885.
1017.	1159.	1292.	1413.	1504.	1560.	1577.	1550.	1489.	1415.
1334.	1247.	1153.	1054.	953.	852.	755.	665.	585.	515.
454.	400.	353.	311.	275.	243.	215.	190.	169.	150.
134.	119.	105.	93.	83.	73.	65.	57.	50.	44.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1577.	1087.	357.	174.	34701.
CMS	45.	31.	10.	5.	983.
INCHES		12.04	15.81	16.01	16.01
MM		305.77	401.57	406.71	406.71
AC-FT		539.	708.	717.	717.
THOUS CU M		665.	873.	884.	884.

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HYDROGRAPH ROUTING

ROUTED HYDROGRAPH AT DAM NO BREACH

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.	0.	0.	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK		X	TSK	STORA	ISPRAT
1	0	0	0.	0.		0.	-1356.	-1

STAGE	1334.10	1355.90	1357.20	1358.60	1361.60
FLOW	0.	23.00	91.00	760.00	5126.00
CAPACITY=	7.	113.	129.	150.	200.
ELEVATION=	1335.	1356.	1357.	1359.	1362.

CREL	SPWID	COOW	EXPW	ELEVL	CCOL	CAREA	EXPL

DAM DATA

TOPEL	COOD	EXPD	DAMWIC
1361.0	2.0	1.5	1250.

STATION 1. PLAN 1. RATIO 1

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

23.	23.	23.	23.	23.	22.	22.	22.	22.	22.
22.	22.	22.	22.	22.	21.	21.	21.	21.	21.
21.	21.	21.	21.	21.	21.	20.	20.	20.	20.
20.	20.	20.	20.	20.	20.	20.	20.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
18.	18.	18.	18.	18.	18.	18.	18.	18.	18.
18.	18.	18.	18.	17.	17.	17.	17.	17.	17.
17.	17.	17.	17.	17.	17.	17.	17.	17.	17.
17.	17.	17.	16.	16.	16.	16.	16.	16.	16.
16.	16.	16.	16.	16.	16.	16.	16.	16.	16.
15.	15.	15.	15.	15.	15.	15.	15.	15.	15.
15.	15.	15.	15.	15.	15.	14.	14.	14.	14.
14.	14.	14.	14.	14.	14.	14.	14.	14.	14.
14.	14.	14.	14.	14.	14.	15.	15.	15.	15.
15.	15.	15.	15.	16.	16.	16.	16.	16.	17.
17.	19.	19.	19.	20.	21.	23.	44.	71.	143.
309.	424.	517.	596.	662.	713.	749.	770.	780.	783.
715.	681.	641.	597.	550.	501.	452.	404.	359.	317.
280.	247.	218.	192.	170.	150.	132.	117.	103.	92.
82.	87.	84.	92.	78.	75.	72.	69.	65.	61.

STORAGE

113.	112.	112.	111.	111.	110.	110.	109.	109.	109.
108.	108.	107.	107.	106.	106.	106.	105.	105.	104.
104.	103.	103.	103.	102.	102.	101.	101.	101.	100.
100.	99.	99.	99.	99.	98.	98.	97.	97.	96.
96.	96.	95.	95.	94.	94.	94.	93.	93.	93.
92.	92.	92.	91.	91.	90.	90.	90.	89.	89.
89.	88.	88.	88.	87.	87.	87.	86.	86.	86.
86.	85.	85.	85.	85.	85.	85.	84.	84.	84.
84.	84.	83.	83.	83.	83.	82.	82.	82.	81.
81.	81.	81.	80.	80.	80.	79.	79.	79.	79.
78.	78.	78.	77.	77.	77.	77.	76.	76.	76.
75.	75.	75.	75.	74.	74.	74.	73.	73.	73.
73.	72.	72.	72.	72.	72.	71.	72.	72.	72.
73.	73.	73.	73.	73.	74.	74.	75.	75.	76.
76.	77.	78.	78.	79.	80.	80.	81.	83.	84.
86.	89.	92.	96.	101.	106.	112.	118.	124.	131.
136.	139.	142.	145.	147.	149.	150.	150.	150.	149.
149.	148.	146.	145.	143.	142.	140.	139.	137.	136.
135.	134.	133.	132.	131.	131.	130.	130.	129.	129.
129.	128.	127.	127.	126.	125.	124.	124.	123.	122.

STAGE

1355.8	1355.7	1355.6	1355.5	1355.5	1355.4	1355.3	1355.2	1355.1	1355.0
1354.9	1354.9	1354.8	1354.7	1354.6	1354.5	1354.4	1354.4	1354.3	1354.2
1354.1	1354.0	1353.9	1353.9	1353.8	1353.7	1353.6	1353.5	1353.5	1353.4
1353.3	1353.2	1353.2	1353.1	1353.0	1352.9	1352.9	1352.8	1352.7	1352.6
1352.6	1352.5	1352.4	1352.3	1352.3	1352.2	1352.1	1352.0	1352.0	1351.9
1351.8	1351.8	1351.7	1351.6	1351.5	1351.5	1351.4	1351.3	1351.3	1351.2
1351.1	1351.1	1351.0	1350.9	1350.9	1350.8	1350.7	1350.7	1350.6	1350.6
1350.5	1350.5	1350.4	1350.4	1350.4	1350.3	1350.3	1350.3	1350.2	1350.2
1350.2	1350.1	1350.1	1350.0	1350.0	1349.9	1349.9	1349.8	1349.7	1349.7
1349.6	1349.6	1349.5	1349.5	1349.4	1349.4	1349.3	1349.2	1349.2	1349.1
1349.1	1349.0	1349.0	1348.9	1348.8	1348.8	1348.7	1348.7	1348.6	1348.6
1348.5	1348.5	1348.4	1348.3	1348.3	1348.2	1348.2	1348.1	1348.1	1348.0

1348.7	1348.8	1348.9	1349.1	1349.2	1349.3	1349.5	1349.7	[illegible]	[illegible]
1350.7	1351.2	1351.9	1352.6	1353.5	1354.5	1355.7	1356.3	1356.8	1357.3
1357.7	1357.9	1358.1	1358.3	1358.4	1358.5	1358.6	1358.6	1358.6	1358.6
1358.5	1358.4	1358.4	1358.3	1358.2	1358.1	1358.0	1357.9	1357.8	1357.7
1357.6	1357.5	1357.5	1357.4	1357.4	1357.3	1357.3	1357.3	1357.2	1357.2
1357.2	1357.1	1357.1	1357.0	1357.0	1356.9	1356.8	1356.8	1356.7	1356.6

PEAK OUTFLOW IS 770. AT TIME 42.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	770.	515.	156.	84.	10863.
CMS	22.	15.	4.	2.	478.
INCHES		5.71	6.91	7.80	7.80
MM		144.99	175.47	197.99	197.99
AC-FT		256.	309.	349.	349.
THOUS CU M		315.	382.	431.	431.

STATION 1, PLAN 1, RATIO 2

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

23.	23.	23.	23.	23.	22.	22.	22.	22.	22.
22.	22.	22.	22.	22.	22.	21.	21.	21.	21.
21.	21.	21.	21.	21.	21.	21.	21.	20.	20.
20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.
19.	19.	19.	18.	18.	18.	18.	18.	18.	18.
18.	18.	18.	18.	18.	18.	18.	18.	17.	17.
17.	17.	17.	17.	17.	17.	17.	17.	17.	17.
17.	17.	17.	17.	17.	17.	17.	17.	17.	17.
17.	17.	17.	17.	17.	17.	17.	16.	16.	16.
16.	16.	16.	16.	15.	16.	16.	16.	16.	16.
15.	16.	16.	15.	15.	15.	15.	15.	15.	15.
15.	15.	15.	15.	15.	15.	15.	15.	15.	15.
15.	16.	16.	16.	16.	16.	17.	17.	17.	18.
18.	18.	19.	19.	19.	20.	20.	20.	21.	22.
23.	42.	68.	131.	304.	421.	509.	584.	656.	742.
924.	1078.	1216.	1346.	1453.	1528.	1567.	1564.	1522.	1455.
1373.	1295.	1205.	1109.	1009.	908.	809.	737.	681.	616.
551.	490.	434.	383.	339.	299.	264.	234.	207.	183.
163.	144.	128.	114.	101.	91.	85.	87.	84.	81.

STORAGE

113.	112.	112.	111.	111.	110.	110.	110.	109.	109.
108.	108.	108.	107.	107.	106.	106.	105.	105.	105.
104.	104.	104.	103.	103.	102.	102.	102.	101.	101.
100.	100.	100.	99.	99.	99.	98.	98.	97.	97.
97.	96.	96.	96.	95.	95.	95.	94.	94.	94.
93.	93.	93.	92.	92.	92.	91.	91.	91.	90.
91.	90.	89.	89.	89.	88.	88.	88.	88.	87.
87.	87.	87.	87.	87.	87.	87.	87.	87.	87.
87.	87.	87.	86.	86.	86.	86.	86.	85.	85.
85.	85.	84.	84.	84.	83.	83.	83.	83.	82.
82.	82.	82.	81.	81.	81.	80.	80.	80.	80.
79.	79.	79.	78.	78.	78.	78.	77.	77.	77.
77.	76.	76.	76.	76.	76.	76.	76.	77.	77.
77.	79.	80.	81.	82.	83.	84.	86.	87.	88.
90.	91.	92.	94.	95.	97.	99.	101.	104.	107.
110.	117.	124.	130.	136.	139.	142.	144.	147.	149.
[illegible]	154.	155.	157.	158.	159.	159.	159.	159.	158.
				[illegible]	152.	151.	149.	148.	145.
								[illegible]	[illegible]

131.	131.	130.	130.	129.	129.	128.	128.	127.	127.
				STAGE					
1355.8	1355.7	1355.6	1355.6	1355.5	1355.4	1355.3	1355.2	1355.1	1355.1
1355.0	1354.9	1354.8	1354.7	1354.7	1354.6	1354.5	1354.4	1354.3	1354.3
1354.2	1354.1	1354.0	1354.0	1353.9	1353.8	1353.7	1353.7	1353.6	1353.5
1353.4	1353.4	1353.3	1353.2	1353.1	1353.1	1353.0	1352.9	1352.8	1352.8
1352.7	1352.6	1352.6	1352.5	1352.4	1352.4	1352.3	1352.2	1352.1	1352.1
1352.0	1351.9	1351.9	1351.8	1351.7	1351.7	1351.6	1351.5	1351.5	1351.4
1351.3	1351.3	1351.2	1351.2	1351.1	1351.0	1351.0	1350.9	1350.9	1350.9
1350.8	1350.8	1350.8	1350.8	1350.8	1350.8	1350.8	1350.8	1350.8	1350.8
1350.7	1350.7	1350.7	1350.7	1350.6	1350.6	1350.5	1350.5	1350.4	1350.4
1350.4	1350.3	1350.3	1350.2	1350.1	1350.1	1350.0	1350.0	1349.9	1349.9
1349.8	1349.8	1349.7	1349.7	1349.6	1349.5	1349.5	1349.4	1349.4	1349.3
1349.3	1349.2	1349.2	1349.1	1349.0	1349.0	1348.9	1348.9	1348.8	1348.8
1348.7	1348.7	1348.6	1348.6	1348.6	1348.6	1348.6	1348.7	1348.8	1348.9
1349.0	1349.2	1349.4	1349.6	1349.8	1350.0	1350.3	1350.5	1350.8	1351.0
1351.3	1351.6	1351.9	1352.1	1352.4	1352.7	1353.1	1353.5	1354.1	1354.8
1355.7	1356.3	1356.8	1357.3	1357.6	1357.9	1358.1	1358.2	1358.4	1358.6
1358.7	1358.8	1358.9	1359.0	1359.1	1359.1	1359.2	1359.2	1359.1	1359.1
1359.0	1359.0	1358.9	1358.8	1358.8	1358.7	1358.6	1358.6	1358.4	1358.3
1358.2	1358.0	1357.9	1357.8	1357.7	1357.6	1357.6	1357.5	1357.4	1357.4
1357.3	1357.3	1357.3	1357.2	1357.2	1357.2	1357.2	1357.1	1357.1	1357.0

PEAK OUTFLOW IS 1567. AT TIME 41.75 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1567.	1080.	334.	170.	34023.
CMS	44.	31.	9.	5.	963.
INCHES		11.96	14.80	15.70	15.70
MM		303.68	375.84	398.75	398.75
AC-FT		535.	663.	703.	703.
THOUS CU M		660.	817.	867.	867.

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

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

OPERATION	STATION	AREA	PLAN	RATIO 1	RATIO 2	RATIOS APPLIED TO FLOWS
				0.50	1.00	
HYDROGRAPH AT	1	0.04	1	739.	1577.	
	(	0.00)	(	22.33)(	44.67)(	
ROUTED TO	1	0.04	1	770.	1567.	
	(	0.00)	(	21.80)(	44.36)(	

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1355.90	1355.90	1361.60
STORAGE	113.	113.	200.
OUTFLOW	23.	23.	5126.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
0.50	1358.61	0.	150.	770.	0.	42.00	0.
1.00	1359.15	0.	159.	1567.	0.	41.75	0.

APPENDIX D

STABILITY COMPUTATIONS

A. L. Phillips

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE - Soil Mechanics Laboratory

800 "J" Street, Lincoln, Nebraska 68508

SUBJECT: ENG 22-5, New York RCD-25, Clark's Creek Dam (Chenango County) DATE: September 21, 1971

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

ATTACHMENTS

1. Form SCS-354, Soil Mechanics Laboratory Data, 1 sheet.
2. Form SCS-355A & B, Triaxial Shear Test Data, 1 test, 2 sheets.
3. Form SCS-366, Direct Shear Test, 1 sheet.
4. Form SCS-352, Compaction and Penetration Resistance, 1 sheet.
5. Form SCS-357, Summary - Slope Stability Analysis, 3 sheets.

INTRODUCTION

The proposed 47-foot high, Class C hazard dam is in the glaciated Allegheny Plateau physiographic province in Chenango County, New York. The glacial till of Wisconsin Age is very dense. Bedrock was not encountered in any of the test holes, one of which extended to a depth of 46 feet in the flood plain.

No major engineering problems are anticipated at this site with fill placed at a minimum density of 100% of Standard Proctor density (ASTM D-698, Method A).

DISCUSSION

FOUNDATION

A. Classification. Approximately 1 foot of loose, medium density top soil (ML-SM) mantles the glacial till.

The underlying glacial till is sandy with silt and gravel.

B. Dry Unit Weight. Standard penetration tests in the surface 10 feet of till yielded blow count generally in the range of 25 to 35 blows per foot. Below 10 feet, the blow count generally exceeded 100 blows/foot.

C. Permeability. Considerable seepage was encountered in some of the test pits in the flood plain in the surface 7.5 feet; however, field permeability tests at the same depths exhibited only very slight leakage.

Considerable difficulty was experienced in keeping the deeper holes open due to caving.

Springs occur at the base of the right abutment at the site. The dense underlying till causes a perched water table condition in the loose top soil layer.

D. Shear Strength and Consolidation Potential. The high blow count materials are expected to have high strength and low consolidation potential. Shear parameters of $\phi = 35°$ and c = 0 psf are assumed for the lower blow count shallow till foundation materials.

EMBANKMENT

A. Classification. Most of the borrow material will consist of glacial till. The sample submitted to the laboratory is an SC-SM material with a liquid limit of 19 and a plasticity index of 4. It contains 26% gravel, 29% sand, and 45% fines. Boulders up to 36 inches in diameter occur in the surface few feet.

B. Compacted Dry Density. A Standard Proctor compaction test (ASTM D-698, Method A) was made on the minus No. 4 fraction of the SC-SM till material. The maximum dry density was 123.0 pcf and the optimum moisture content was 11.0%.

C. Shear Strength. A consolidated undrained triaxial shear test was made on the minus No. 4 material at a compacted density of approximately 97% of Standard Proctor density. The test specimens were saturated by backpressuring, after being molded wet of optimum. The test data was interpreted to give saturated total stress shear parameters of $\phi = 13°$ and c = 425 psf. Effective stress shear parameters were $\bar{\phi} = 26°$ and $\bar{c} = 150$ psf.

A subsequent direct shear test was made on specimens compacted to 100% of Standard Proctor density. The test data was interpreted to give shear parameters of $\phi = 34°$ and c = 100 psf.

STABILITY ANALYSIS

The stability of the proposed 47-foot high embankment was analyzed using a modified Swedish circle method. The dense foundation material is expected to be sufficiently strong to limit any failure surface to the embankment; however, several circles were also cut into the upper 10 to 16 feet of the foundation material.

Shear parameters of $\phi = 35°$ and c = 0 psf were assumed for the upper 16 feet of the foundation. For the compacted embankment materials at 97% of Standard density, total stress shear parameters of $\phi = 13°$ and c = 425 psf were used.

A full drawdown analysis of the 3:1 upstream slope shows a 24-foot berm is required at elevation 1334.5 for a safety factor of 1.35. The steady seepage analysis of the 2½:1 downstream slope with a drain at c/b = 0.6 shows a 25-foot berm is needed at elevation 1338.0 to obtain a safety factor of 1.50 (see Trial #1A in the slope stability summary in the attachments).

Subsequent stability analyses using the direct shear test values of $\phi = 34°$ and c = 100 psf for the till material compacted to 100% of Standard Proctor density show a full drawdown analysis of the 3:1 upstream slope with a 10-foot berm at elevation 1334.5 gives a safety factor of 1.54 (see Trial #8 in the slope stability summary). The steady seepage analysis of the downstream 2½:1 slope with a drain at c/b = 0.6 gave a safety factor of 1.62 without any berm.

RECOMMENDATIONS

A. Site Preparation. Removal of the soft, wet top soil on the right side of the flood plain and in the right abutment is recommended.

B. Centerline Cutoff. A normal width cutoff with 1:1 side slopes extending down to a depth of 7 to 10 feet is recommended to cut off the small pockets of highly permeable material as encountered in test pit #7. Backfill with the till borrow material. Place at or wet of optimum and compact to a minimum density of 100% of Standard Proctor density.

C. Principal Spillway. The proposed location appears to be adequate. A horizontal strain of 0.002 ft/ft is suggested for pipe elongation for joint design. A ϕ angle of 34° is recommended for conduit loading calculations.

D. Drainage. A shallow foundation trench drain at c/b = 0.6 is recommended below the permanent pool elevation to prevent the phreatic line in the embankment from emerging on the downstream slope and to provide a controlled outlet for foundation seepage that by-passes the centerline cutoff.

E. Embankment Design. The following are recommended:

1. Provide a homogeneous embankment of the SC-SM till material compacted to a minimum density of 100% of Standard Proctor density.

2. Place the till borrow material at or wet of optimum.

3. Provide 3:1 upstream slopes with a 10-foot berm at elevation 1334.5 and a 2½:1 downstream slope with a drain at c/b = 0.6.

4. Provide an overfill of 0.6 foot across the flood plain to compensate for residual settlement after construction is complete.

Prepared by:

Edgar F. Steele

Edgar F. Steele
Acting Head
Soil Mechanics Laboratory

Attachments

cc:
R. L. Phillips
L. C. Ibbitson, SCS, Syracuse, N.Y.
B. S. Ellis, SCS, Syracuse, N.Y.
N. F. Bogner, Head, EWPU, SCS, Upper Darby, Pa.
Edward Blackmer, SCS, Binghamton, N.Y.

Form SCS 355 A
Rev 6-65

LABORATORY NO 72-0-1

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

PROJECT and STATE: Clocks Creek Dam, New York
SAMPLE LOCATION: Fulton
FIELD SAMPLE NO.: 105-1
DEPTH:
GEOLOGIC ORIGIN: Glacial Till (Wisconsin)
TYPE OF SAMPLE: Compacted
TESTED AT: SML-Lincoln
APPROVED BY: Edgar F Steele
DATE: 9/14/71

INDEX TEST DATA

USCS SC-SM ; LL 19 ; PI 4
% FINER (mm): 0.002 10 ; 0.005 17 ;
0.074 (#200) 45
G_s (-#4) 2.73 ; G_s (+#4) 2.73
STANDARD: γ_d MAX. 123.0 pcf; w_o 11.0 %
MODIFIED: γ_d MAX. _____ pcf; w_o _____ %

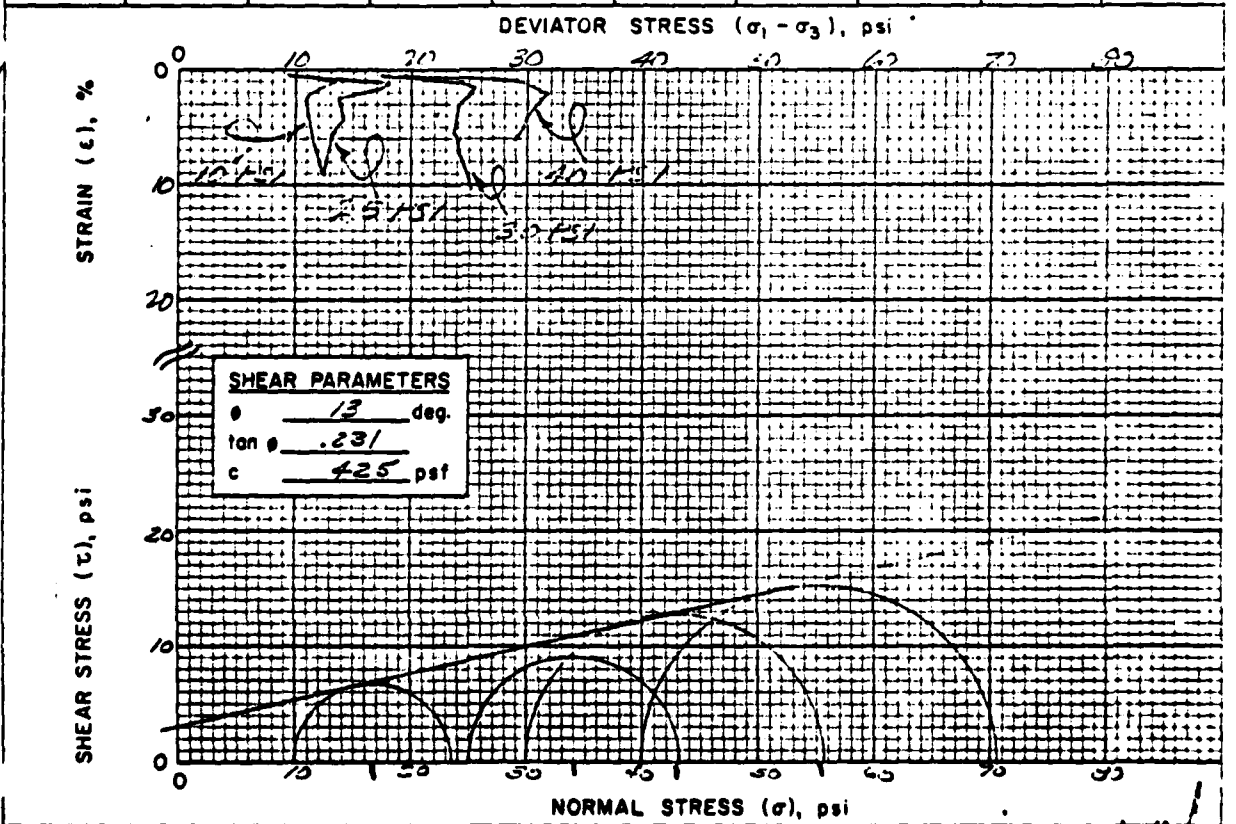
SPECIMEN DATA

HEIGHT 3.0 "; DIAMETER 1.4 "
MATERIALS TESTED PASSED #4 SIEVE
METHOD OF PREPARATION STATIC 3 LAYER COMPACTION
MOLDING MOISTURE 11.2 %
MOLDED AT 97.5 % OF γ_d MAXIMUM

TYPE OF TEST

UU ☐
CU ☐
$\overline{CU}$ ☑
CD ☐

DRY DENSITY		B,	MOISTURE CONTENT, %			TIME OF	MINOR	DEVIATOR	AXIAL
INITIAL pcf ☒ g/cc ☐	CONSOLIDATED pcf ☐ g/cc ☐	Parameter	START OF TEST	DEG. OF SAT. AT START OF TEST	END OF TEST	CONSOLIDATION (hrs.)	PRINCIPAL STRESS σ_3 (psi)	STRESS $\sigma_1 - \sigma_3$ (psi)	STRAIN AT FAILURE, ε (%)
119.7		0.99			15.4	87.68	10	15.4	1.3
119.7		0.96			15.3	15.50	25	19.0	1.1
120.0		1.00			14.8	16.00	40	30.6	1.5
120.3		0.98			14.6	15.92	30	25.6	1.5



REMARKS BACK-PRESSURED

Form SCS 359B
6-65

LABORATORY NO 720-1

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

PROJECT and STATE: Clarks Creek Dam New York

SAMPLE LOCATION:

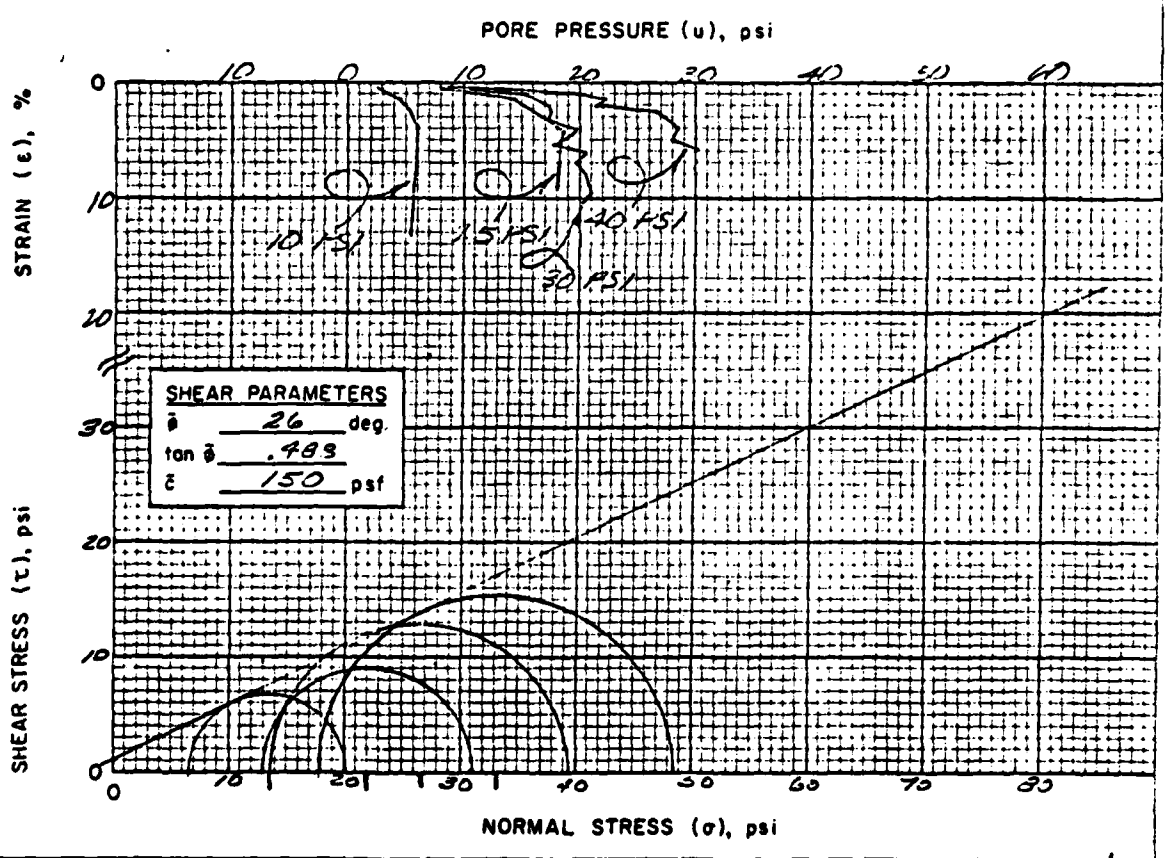
TYPE OF SAMPLE: Compacted

TESTED AT: SML-Lincoln

APPROVED BY: CPJ

DATE: 9/14/71

MINOR PRINCIPAL STRESS, σ_3 (psi)	PORE PRESSURE, u (psi)	EFFECTIVE MINOR PRINCIPAL STRESS, $\bar{\sigma}_3$ (psi)	DEVIATOR STRESS, $\sigma_1 - \sigma_3$ (psi)	FAILURE CRITERIA	AXIAL STRAIN AT FAILURE, ε (%)
10	3.4	6.6	13.4		1.0
25	12.0	13.0	18.0		1.1
40	22.1	17.9	30.6		1.5
30	16.2	13.8	25.6		1.5



REMARKS BACK-PRESSURED

CPJ/DNS.

Form SCS 366
9-64

LABORATORY NO. 7201

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

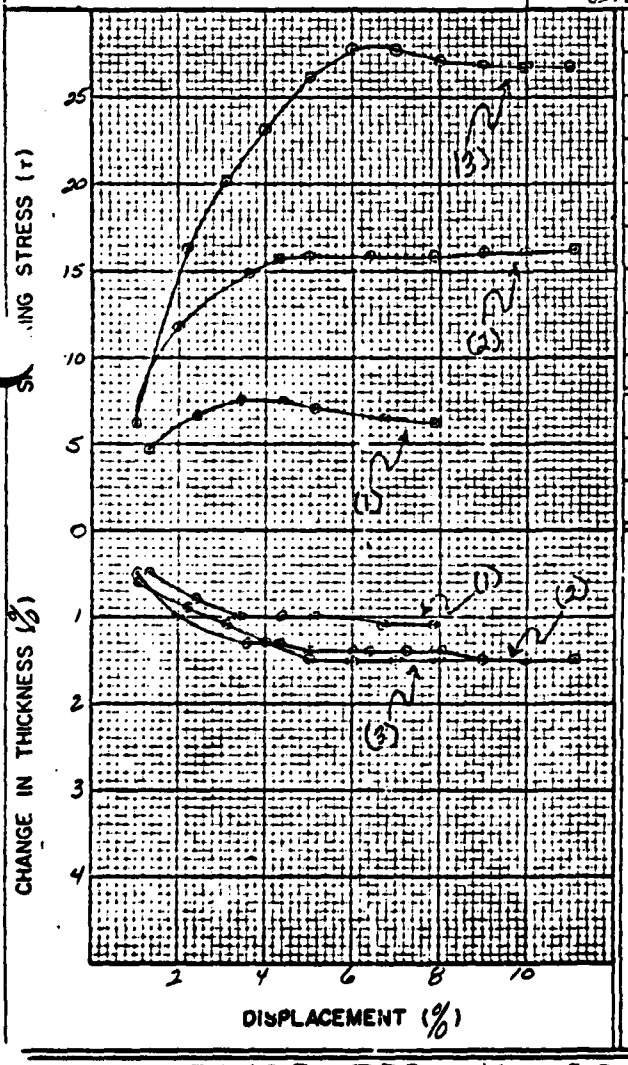
PROJECT and STATE: CLARK CREEKS DAM NEW YORK			SAMPLE LOCATION: BORROW
FIELD SAMPLE NO.: 105.1	DEPTH	GEOLOGIC ORIGIN	
TYPE OF SAMPLE: COMPACTED	TESTED AT: SML LINCOLN	APPROVED BY	DATE

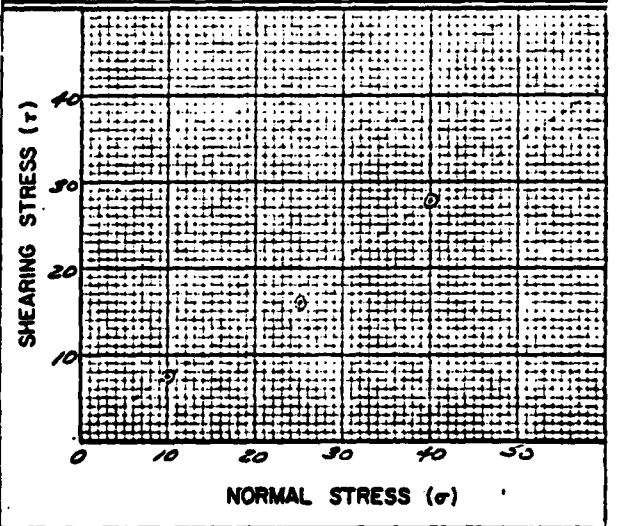
CLASSIFICATION: SC-SM LL 19 PI 4 — SPECIFIC GRAVITY

TYPE OF TEST	CONTROL: STRAIN	$G_s(-)$ #4	2.73
RATE OF LOADING (in/min.): 0.00055	MOISTURE CONDITION: FLOODED	$G_s(+)$ #4	
TYPE OF SPECIMEN	AREA (sq.in.): 6.25 / THICKNESS (in.): 1.0	G_m(bulk)(+) #4	

TEST NO.	1	2	3	4
INIT. MOISTURE, %	11.3	11.3	11.3	
DRY DENSITY, ☐ g/cc ☒ pcf	122.6	122.7	123.5	
INIT. VOID RATIO	.3900	.3886	.3801	
TEST DURATION, (min.)	288	497	501	
FINAL MOISTURE, %	12.2	12.7	12.0	
NORMAL STRESS	10	25	40	
MAX. SHEAR STRESS	7.6	15.9	27.7	

SHEAR VALUES	Ø	C
AT MAXIMUM STRESS	34°	100





REMARKS AVERAGE TEST γ_d = 99.9% STD.

Form SCS 352
Rev 5-65

LABORATORY NO 72-0-1

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

PROJECT and STATE: Clark's Creek Dam — NEW YORK

FIELD SAMPLE NO	LOCATION	DEPTH
105.1	Borrow	

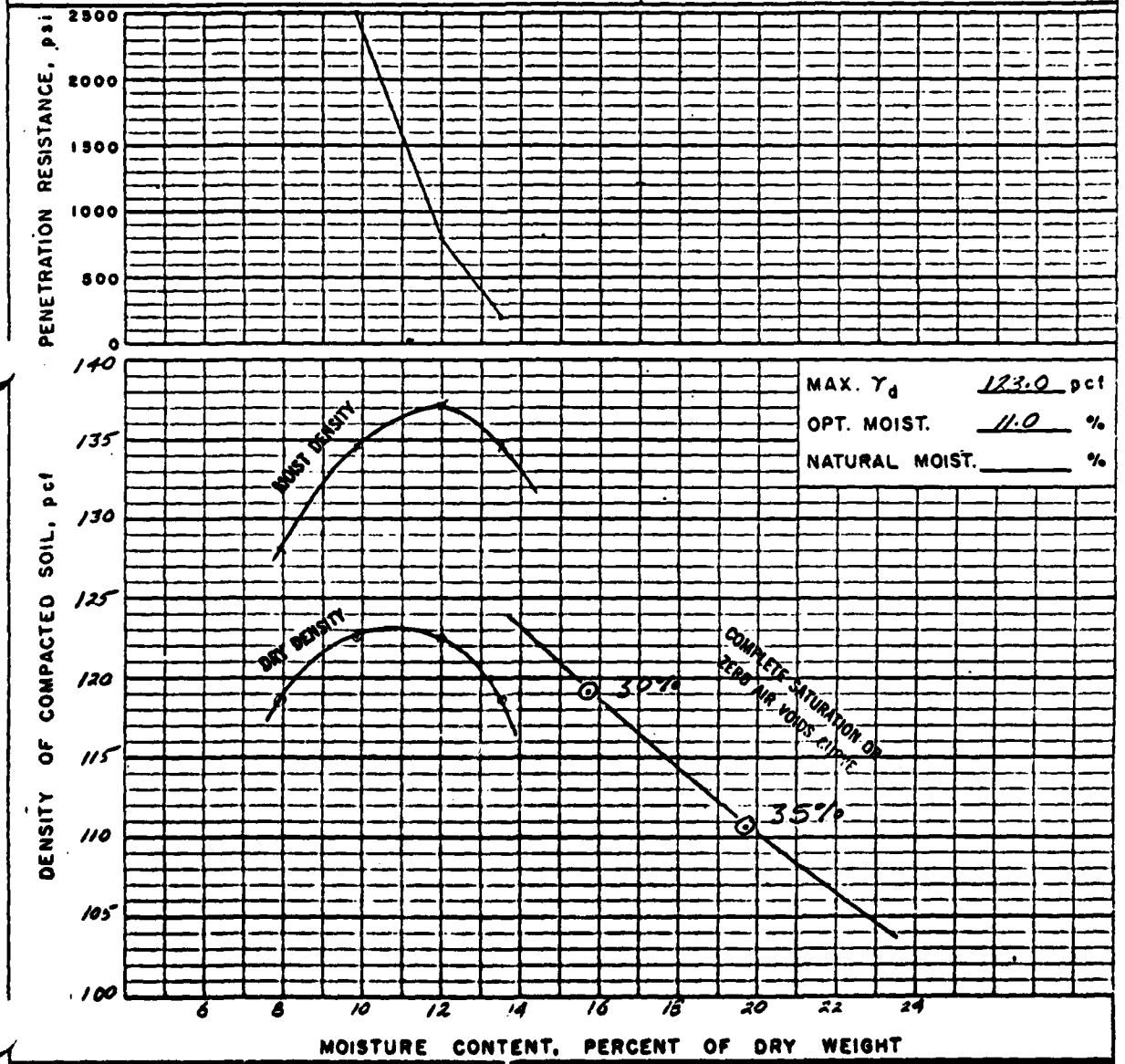
GEOLOGIC ORIGIN	TESTED AT	APPROVED BY	DATE
Wisconsin Glacial Till	SML- LINCOLN	Edgar F. Steele	9/14/71

CLASSIFICATION SC-SM LL 19 PI 4 — CURVE NO. 1 OF 1

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

SPECIFIC GRAVITY (G_s) { MINUS NO. 4 2.73 / PLUS NO. 4 2.73 } — MOD.(ASTM D-1557) ☐; METHOD ____

OTHER TEST ☐ (SEE REMARKS)



REMARKS

CURVE IS FOR THE MINUS NO. 4 FRACTION

GRADATION OF TOTAL SAMPLE

< NO. 200 45 %; < NO. 4 74 %; < 3 in. 100 %

Form SCS 357
Rev 6-65

U.S. DEPARTMENT of AGRICULTURE
SOIL CONSERVATION SERVICE

MATERIALS TESTING REPORT

SUMMARY - SLOPE STABILITY ANALYSIS

PROJECT and STATE: CLARK'S CREEK DAM — NEW YORK
METHOD OF ANALYSIS: SWEDISH CIRCLE
ANALYZED AT: SYRACUSE, N.Y.
APPROVED BY:
DATE: 9-20-71

	SOURCE AND USE OF MATERIALS	CLASSIFICATION	ADOPTED DESIGN DATA: γ_d (pcf)	γ_m (pcf)	γ_{sat} (pcf)	γ_{sub} (pcf)	ϕ (deg)	tan ϕ	c (psf)	REMARKS
①	Foundation		120.0	113.0	135.0	72.5	35	.700	0	-Est. Value.
②	Embankment	SC-SM	123.5	139.5	142.0	81.5	13	.231	425	-CU-2% rock.
③							26	.493	150	-CU
④	Embankment	SC-SM	130.9	142.0	145.5	93.0	34	.675	100	
⑤										
⑥										
⑦										
⑧										

TRIAL NO.	SLOPE	CONDITIONS	F_s
		Upstream-Fulldrawdown Onst.-Steady Seepage.	
		Maximum Section.	
1Dn	2½:1	Drain @ c/b = 0.6 - Emb (13°-425) only.	1.20
1ADn	2½:1	Drain @ c/b = 0.6 - Emb (13°-425) only - 25' berm @ elev. 1334.5	1.50
2 Dn	2½:1	Drain @ c/b = 0.6 - Emb (34°-100) only.	1.82
3 Dn	2½:1	Drain @ c/b = 0.6 - Emb (34°-100) only.	1.87
4 Dn	2½:1	Drain @ c/b = 0.6 - Emb (34°-100) only.	1.87
5 Up	3:1	Emb (34°-100) only - 10' berm @ elev. 1334.5.	1.68
6 Up	3:1	Emb (34°-100) only - 10' berm @ elev. 1334.5.	1.57
7 Up	3:1	Emb (34°-100) only - 10' berm @ elev. 1334.5.	1.72
8 Up	3:1	Emb (34°-100) & 10' found (35°-0) - 10' berm @ elev. 1334.5.	1.54
9 Up	3:1	Emb (34°-100) & 10' found (35°-0) - 10' berm @ elev. 1334.5.	1.56
10 Dn	2½:1	Emb (34°-100) & 10' found (35°-0) - Drain @ c/b = 0.6.	1.76
11 Dn	2½:1	Emb (34°-100) & 10' found (35°-0) - Drain @ c/b = 0.6.	1.62
12 Dn	2½:1	Emb (34°-100) & 10' found (35°-0) - Drain @ c/b = 0.6.	1.75
		Flood Plain Section.	
13 Up	3:1	Emb (34°-100) & 9' found (35°-0) - 10' berm @ elev. 1334.5.	1.49
14 Up	3:1	Emb (34°-100) & 16' found (35°-0) - 10' berm @ elev. 1334.5.	1.61
15 Up	3:1	Emb (34°-100) & 8' found (35°-0) - 10' berm @ elev. 1334.5.	1.71
16 Up	3:1	Emb (34°-100) & 8' found (35°-0) - 10' berm @ elev. 1334.5.	1.65
17 Dn	2½:1	Drain @ c/b = 0.6 - Emb (34°-100) & 9' found (35°-0).	1.92
18 Dn	2½:1	Drain @ c/b = 0.6 - Emb (34°-100) & 9' found (35°-0).	1.66
19 Dn	2½:1	Drain @ c/b = 0.6 - Emb (34°-100) & 9' found (35°-0).	1.92

APPENDIX E

REFERENCES

APPENDIX E

REFERENCES

1) U.S. Department of Commerce; Weather Bureau; Hydrometeorological Report No. 33 - Seasonal Variation of the Probable Maximum Precipitation East of the 105th Meridian for Areas from 10 to 1,000 Square Miles and Durations of 6, 12, 24, and 48 Hours, April 1956.

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

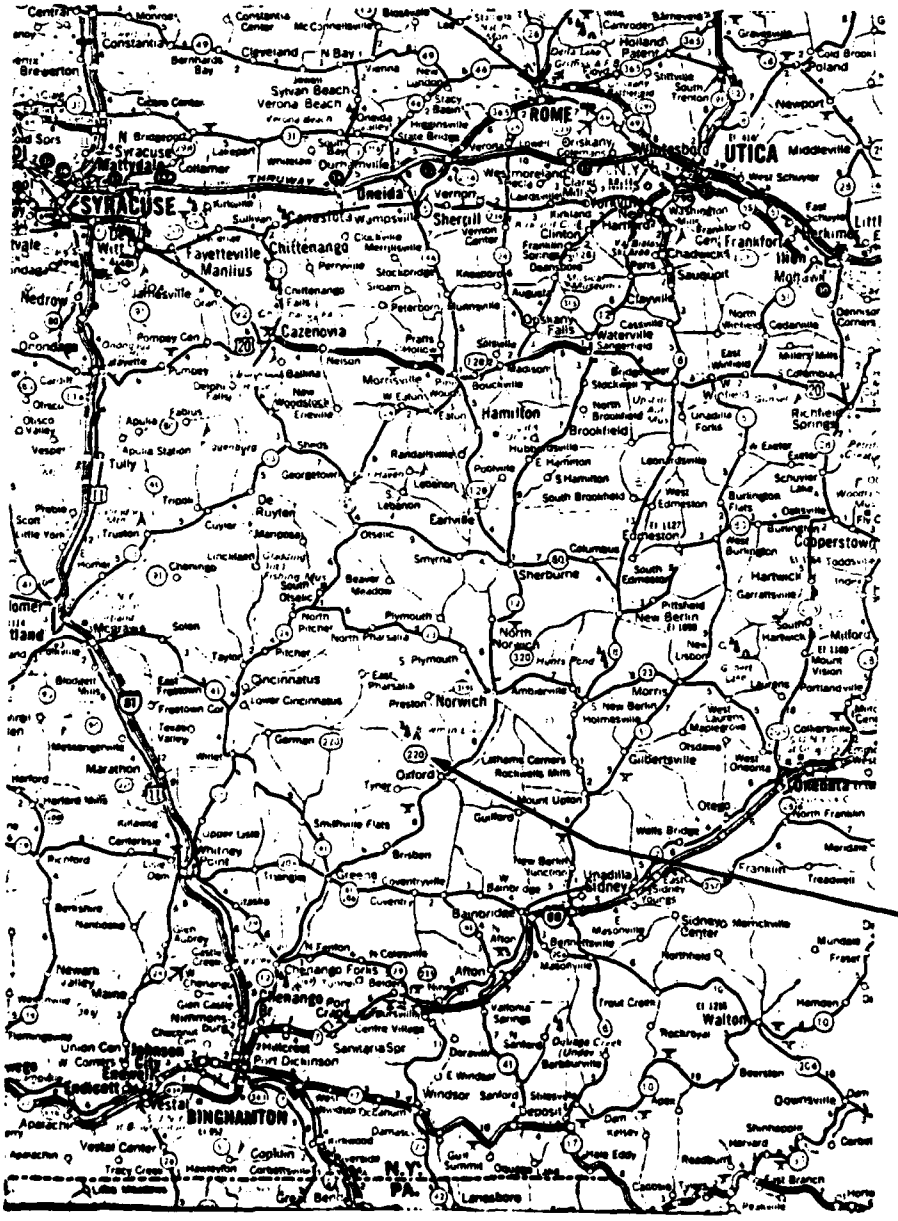
3) University of the State of New York, Geology of New York, Education Leaflet 20, Reprinted 1973.

4) Elwyn E. Seelye, Design, 3rd edition, John Wiley and Sons, Inc., 1960.

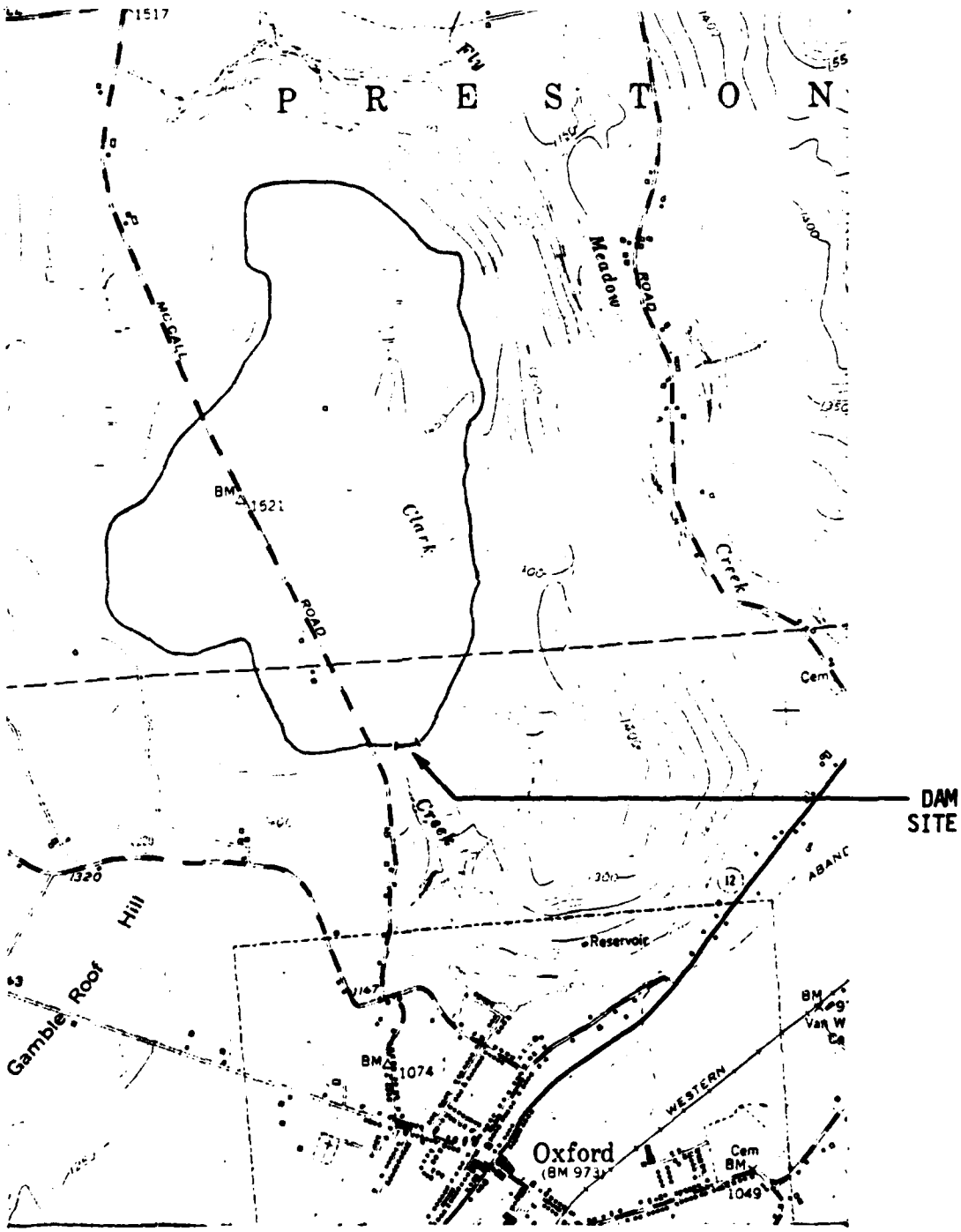
5) U.S. Department of the Interior, Bureau of Reclamations; Design of Small Dams, 2nd edition (rev. reprint), 1977.

APPENDIX F

DRAWINGS



VICINITY MAP
CLARK'S CREEK WATERSHED PROJECT
SITE I
NY-718



TOPOGRAPHIC MAP
CLARK'S CREEK WATERSHED PROJECT
SITE I
NY-718

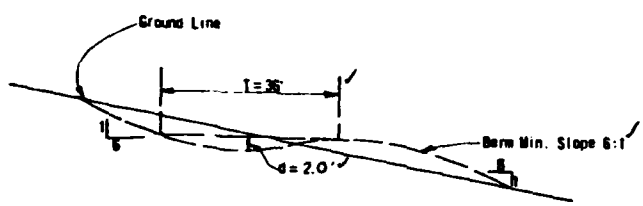
CONSTRUCTION DETAILS

1. Areas under the dam (including 15 feet outside the toes), emergency spillway (including 15 feet outside the cut slopes), and borrow areas to be cleared and grubbed limits of areas to be cleared and grubbed to be staked in the field by the engineer
2. The waste area and the area upstream from the dam and below elevation 1337.1 shall be cleared. limits of area to be cleared will be staked in the field by the engineer
3. Bottom section of emergency spillway to be covered with 6" of topsoil from STA. 6+00 to approx. STA. ~~7+25~~ 7+76.
4. Waste areas shall be graded to be free draining & generally smooth. The maximum fill height shall be 5' unless otherwise approved by the engineer.
5. BORROW AREA
   a) Limits of borrow area are approximate and final location to be determined by the engineer in the field at the time of construction.
   b) Excavation will not be any closer than 90' feet from the upstream toe slope of dam and no lower than elevation 1329.0
   c) The side slopes of borrow area will not be steeper than 1' vert. to 3' horiz. from intersection of natural ground and top of cut to ~~elevation 1335.1 a slope of 1' vert. to 2' horiz. to~~ intersection of bottom of pool.
   d) Bottom of pool slope will not be less than 1% from elevation 1329.0 to intersection of 3:1 slope
   e) At the completion of earth fill operations, the borrow areas above elevation 1335.1 shall be left gently sloping, generally smooth, and free draining

DIVERSION #1

CONSTRUCTION DETAILS

1. Minimum depth of cut ℄ of ditch to be 2' or as determined in the field by the engineer at the time of construction.
2. The grades as stated are only approx. The final location and finished grades will be established in the field by the engineer at time of construction.

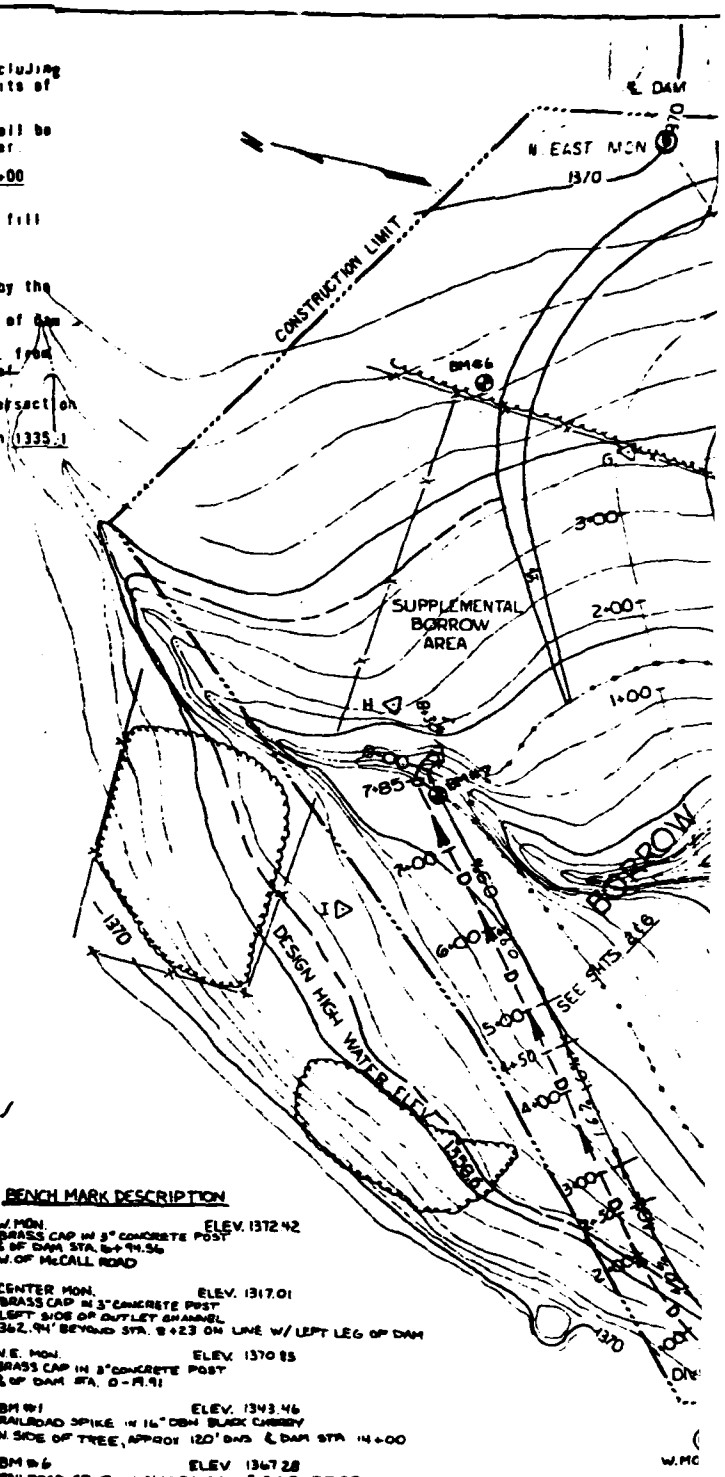


TYPICAL SECTION DIVERSION NO.1

Center Line Profile Grades Vary

0+00 thru 2+50	~~0+00 thru 3+00~~	- 4.0% Grade
2+50 thru 4+50	~~3+00 thru 5+00~~	- 1.8% Grade
4+50 thru 8+30	~~5+00 thru 8+00~~	- 0.9% Grade

DIVERSION = 830 L.F.
CLEARING = 0.6 Ac.
MOD. "1-18-79 - CLEAR + GRUB = 5.5 Ac.
SEEDING = 13.9 Ac.



BENCH MARK DESCRIPTION

W. MON. ELEV. 1372.42
BRASS CAP IN 3" CONCRETE POST
℄ OF DAM STA. 6+94.36
W. OF McCALL ROAD

CENTER MON. ELEV. 1317.01
BRASS CAP IN 3" CONCRETE POST
LEFT SIDE OF OUTLET CHANNEL
362.94' BEYOND STA. 8+23 ON LINE W/ LEFT LEG OF DAM

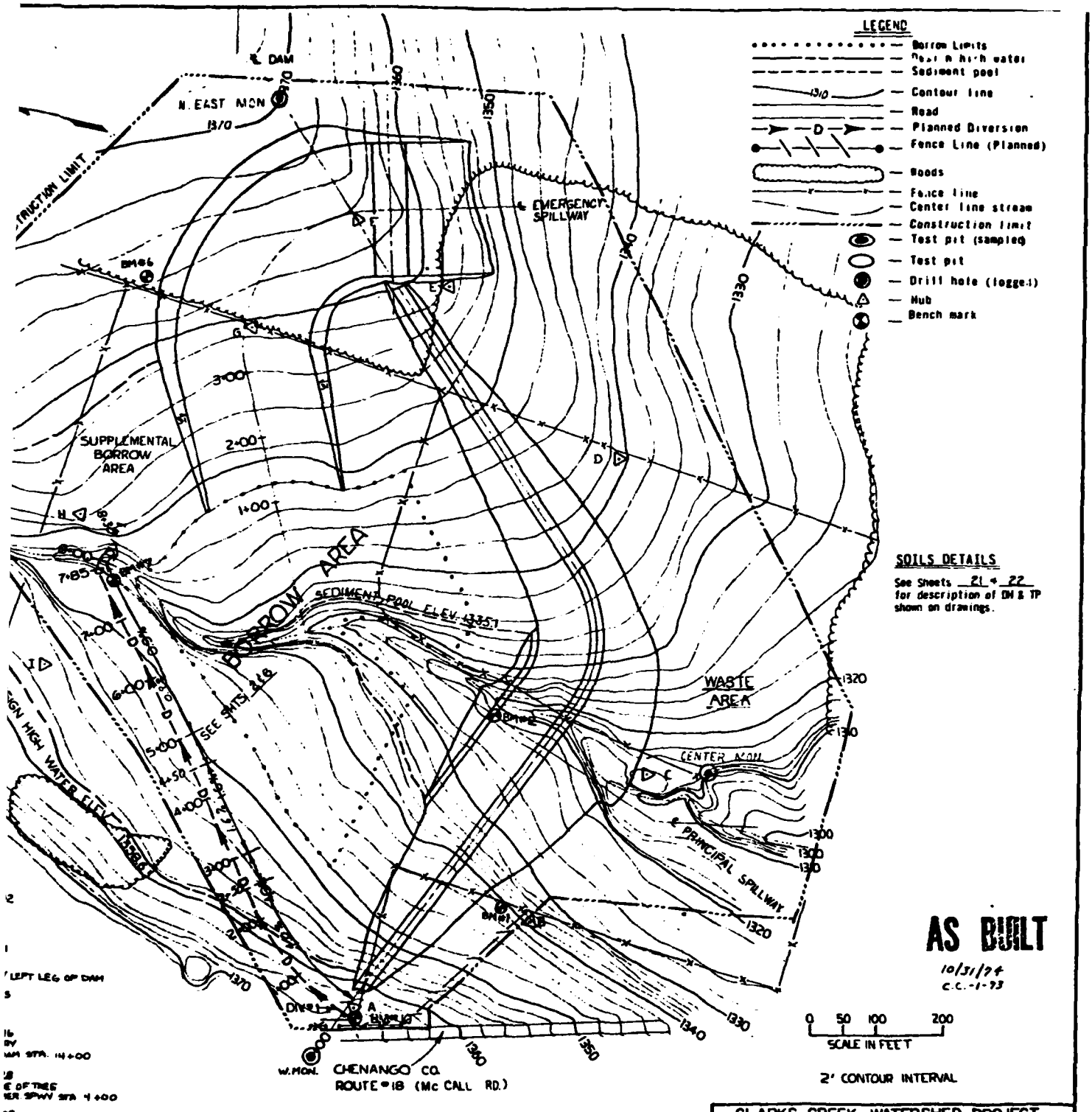
N.E. MON. ELEV. 1370.85
BRASS CAP IN 3" CONCRETE POST
℄ OF DAM STA. 0-19.91

BM #1 ELEV. 1343.46
RAILROAD SPIKE IN 16" DBH BLACK CHERRY
N. SIDE OF TREE, APPROX 120' BWS ℄ DAM STA 14+00

BM #6 ELEV. 1367.28
RAILROAD SPIKE IN 9" DBH OAK, E SIDE OF TREE
TREE IN FENCE LINE APPROX 175' UPS EMER SPWY STA 4+00

BM #7 ELEV. 1350.38
RAILROAD SPIKE IN 20" DBH ELM
UPSTREAM END OF BORROW AREA, NEAR OUTLET OF DIVERSION

BM #12 ELEV. 1357.92
BRASS CAP IN CENTER OF TOP DECK OF RISER



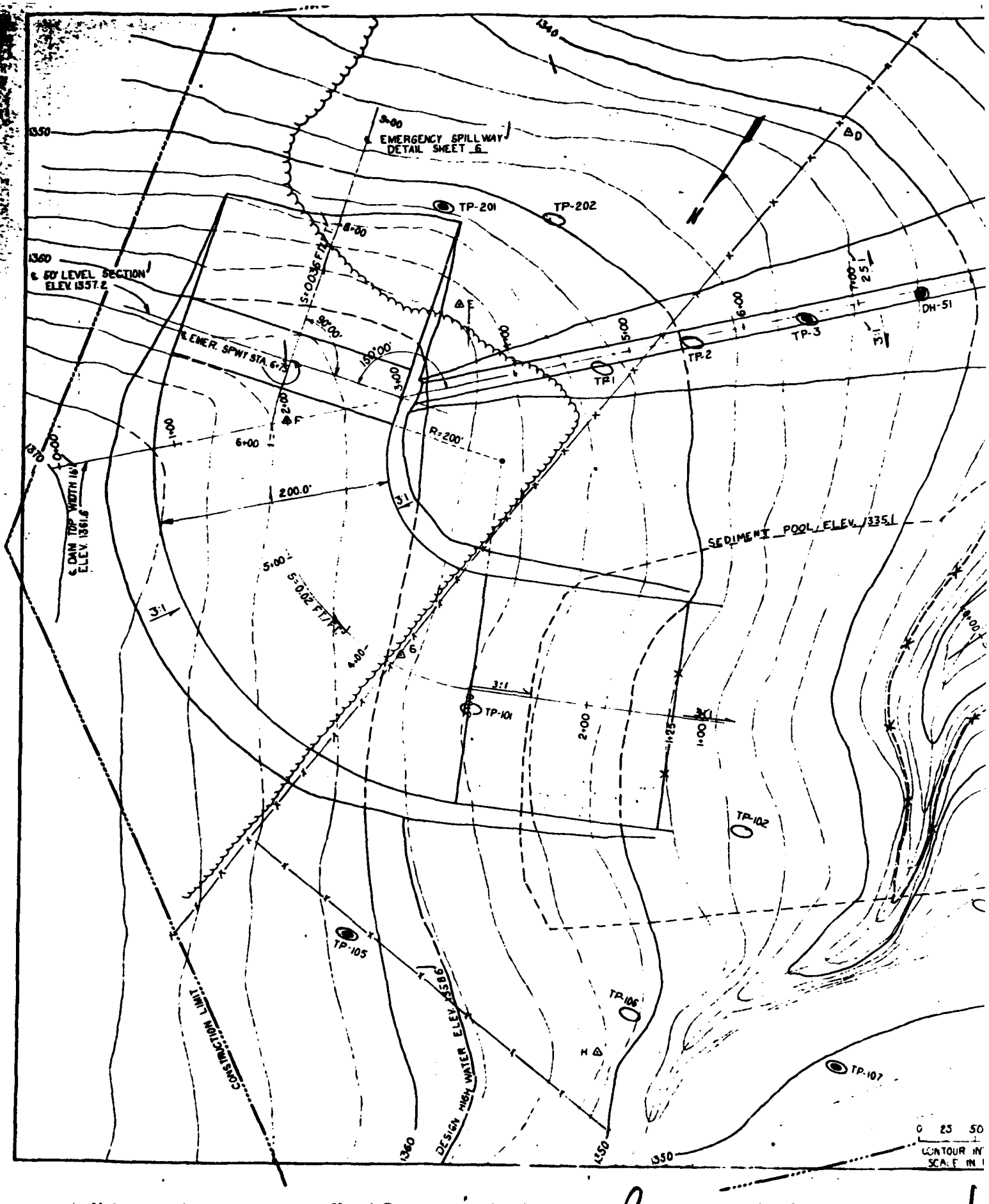
BENCH MARK DESCRIPTION

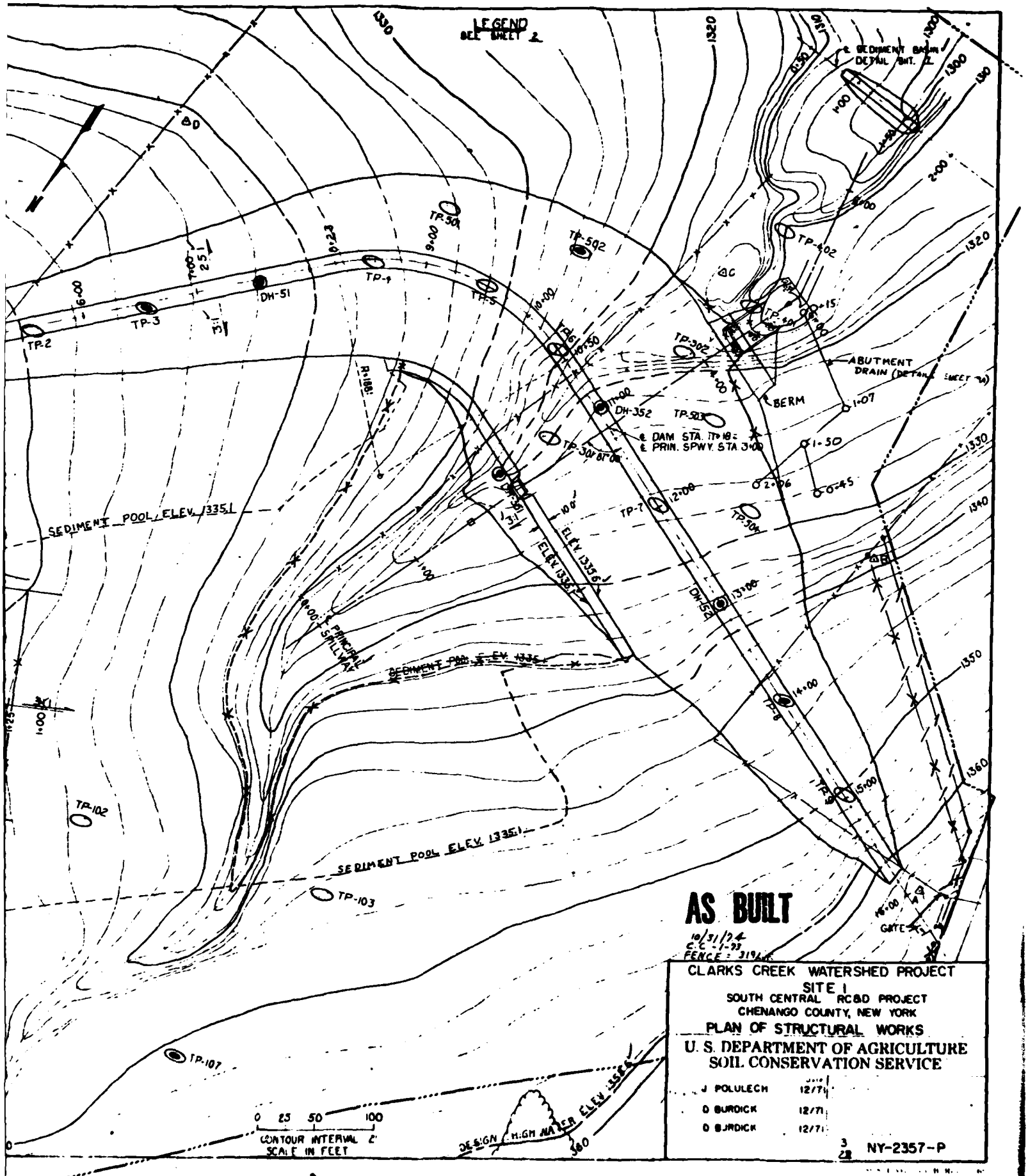
BM #10 ELEV. 1362.81
RAILROAD SPIKE IN 2' DBH. MAPLE
EAST SIDE OF TREE
EAST OF Mc CALL ROAD

CLARKS CREEK WATERSHED PROJECT
SITE 1
SOUTH CENTRAL RC&D PROJECT
CHENANGO COUNTY, NEW YORK
PLAN OF STORAGE AREA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	R. SMITH - 2/72 J. POLILECH	12/71	Approved by
Drawn	D. BURDICK	12/71	Title
Traced	R. YOLTON	11/71	Date
Checked	H. SMITH	12/71	Sheet 2 of 28 — NY-2357-P


1340
1350
1360
1370
EMERGENCY SPILLWAY
DETAIL SHEET 6
TP-201
TP-202
TP-1
TP-2
TP-3
DH-51
TP-101
TP-102
TP-105
TP-106
TP-107
60' LEVEL SECTION
ELEV 1357.2
℄ EMER. SPWY STA. 6+20
℄ DAM TOP WIDTH 16'
ELEV. 1361.6
S=0.036 FT/FT
S=0.02 FT/FT
R=200'
200.0'
90.00°
150.00°
3:1
SEDIMENT POOL ELEV. 1335.1
CONSTRUCTION LIMIT
DESIGN HIGH WATER ELEV. 1358.6
N
0 25 50
CONTOUR IN
SCALE IN



AS BUILT

10/31/74
C.C. 1-99
FENCE : 319'

CLARKS CREEK WATERSHED PROJECT
SITE 1
SOUTH CENTRAL RC&D PROJECT
CHENANGO COUNTY, NEW YORK
PLAN OF STRUCTURAL WORKS
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

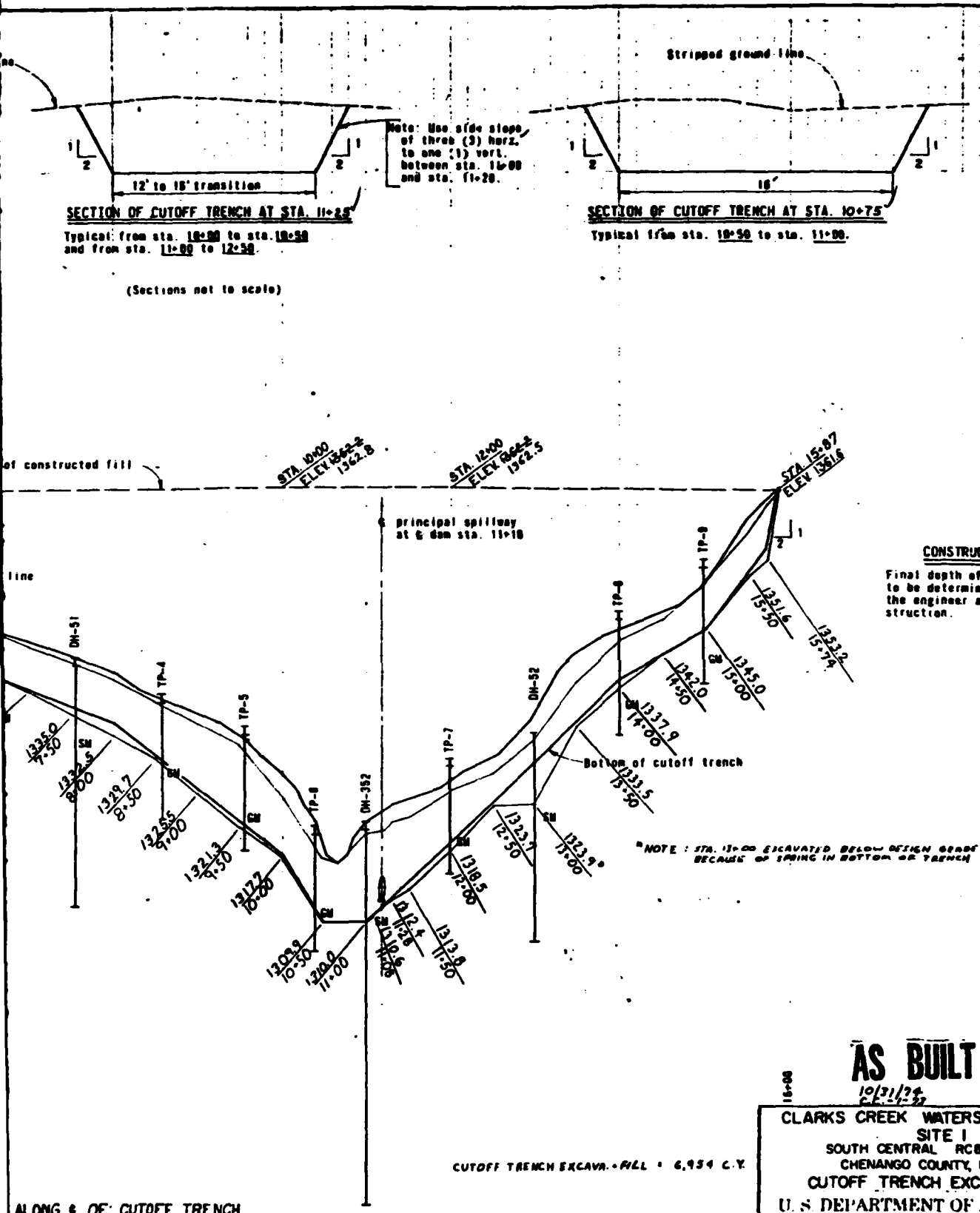
J POLULECH	12/71	
D BURDICK	12/71	
D BURDICK	12/71	

3
28 NY-2357-P

1 2

Stripped ground line
12'
12' to 16' transition
SECTION OF CUTOFF TRENCH AT STA. 5+00
Typical from approx. sta. 3+19 to sta. 10+00 and from sta. 12+50 to approx. sta. 15+07
SECTION OF CUTOFF TRENCH AT STA. 11+25
Typical from sta. 10+00 to sta. 10+50 and from sta. 11+00 to 12+50.
(Sections not to scale)
℄ Emergency spillway Detail sht. 6
STA. 3+14 ELEV. 1361.6
Top of constructed fill
STA. 10+00 ELEV. 1362.2
Elev. 1357.2
Profile along ℄ of level section
1:2 slope
Ground line
TP-1
TP-2
TP-3
DH-51
TP-4
TP-5
TP-8
1353.1 3+13
1351.9 3+50
1350.9 4+00
1347.9 4+50
1346.0 5+00
1344.0 5+50
1342.0 6+00
1340.1 6+50
1337.8 7+00
1335.0 7+50
1332.5 8+00
1329.7 8+50
1325.5 9+00
1321.3 9+50
1317.7 10+00
1309.9 10+50
1310.0 11+00
SM
GM
1360
1340
1320
1300
1280
PROFILE ALONG ℄ OF CUTOFF TRENCH
0 4 8 16
Vert. scale in feet
0 40 80 160
Horz. scale in feet
4+00
8+00
8+00
10+00

1

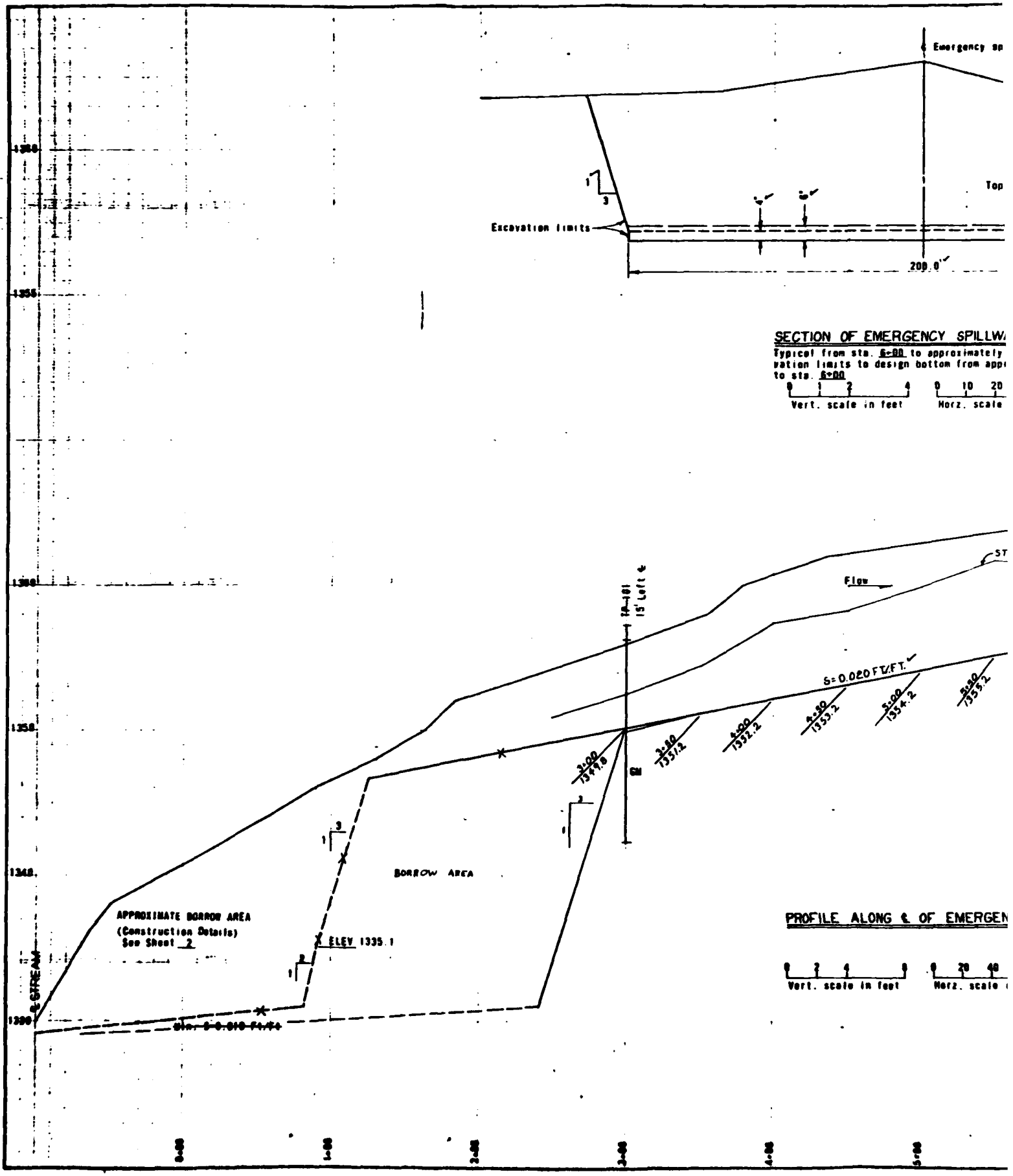


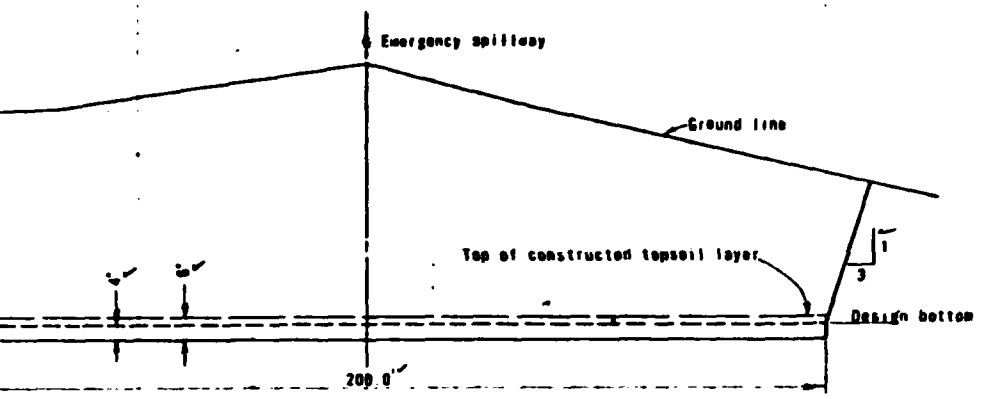
AS BUILT

10/31/74
C.E.

CLARKS CREEK WATERSHED PROJECT
SITE I
SOUTH CENTRAL RC&D PROJECT
CHENANGO COUNTY, NEW YORK
CUTOFF TRENCH EXCAVATION
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

H SMITH	1/72	
J POLULECH	12/71	
D BURDICK	12/71	
JDT	3/72	NY-2357-P


Emergency sp
Top
Excavation limits
200.0'
SECTION OF EMERGENCY SPILLW
Typical from sta. 6+00 to approximately
vation limits to design bottom from appr
to sta. 6+00
Vert. scale in feet
Horz. scale
1380
1358
1348
1338
ST
Flow
S=0.020 FT/FT.
BORROW AREA
APPROXIMATE BORROW AREA
(Construction Details)
See Sheet 2
ELEV 1335.1
PROFILE ALONG ℄ OF EMERGEN
Vert. scale in feet
Horz. scale

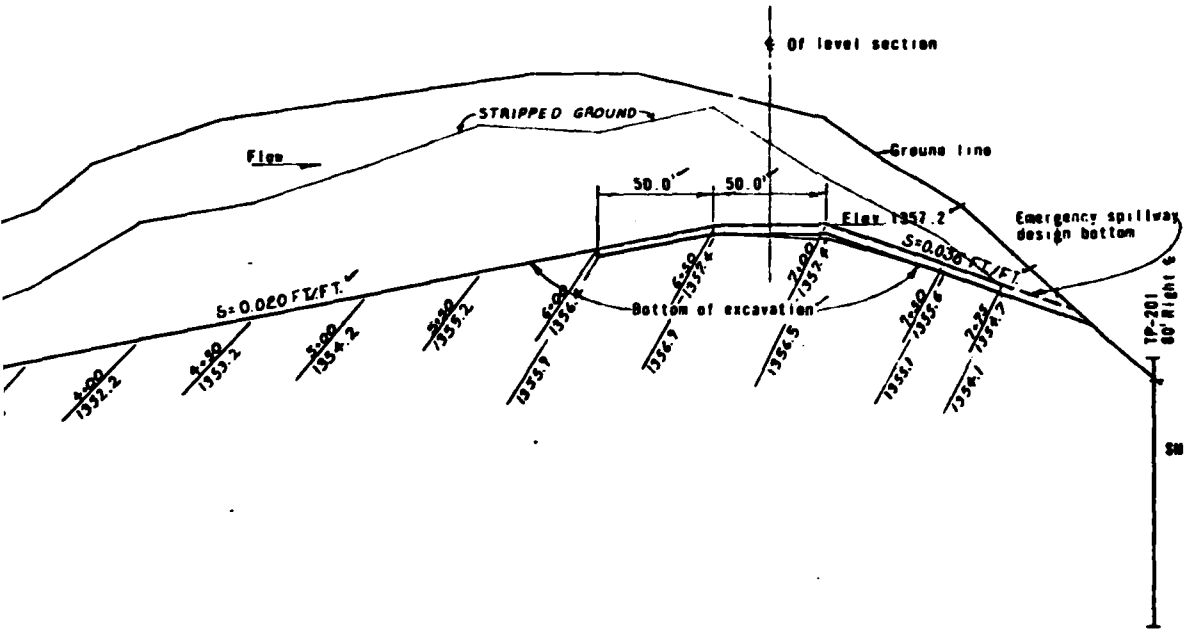


SECTION OF EMERGENCY SPILLWAY @ STA. 6+75

Typical from sta. 6+80 to approximately sta. ~~0+25+75~~ Excavation limits to design bottom from approximately sta ~~1+25~~ 3+00 to sta. 5+00

0 1 2 4 — Vert. scale in feet

0 10 20 40 — Horz. scale in feet



PROFILE ALONG ℄ OF EMERGENCY SPILLWAY

0 2 4 8 — Vert. scale in feet

0 20 40 80 — Horz. scale in feet

TOPSOIL IN EMER SPWY = 3903 S.Y.

AS BUILT

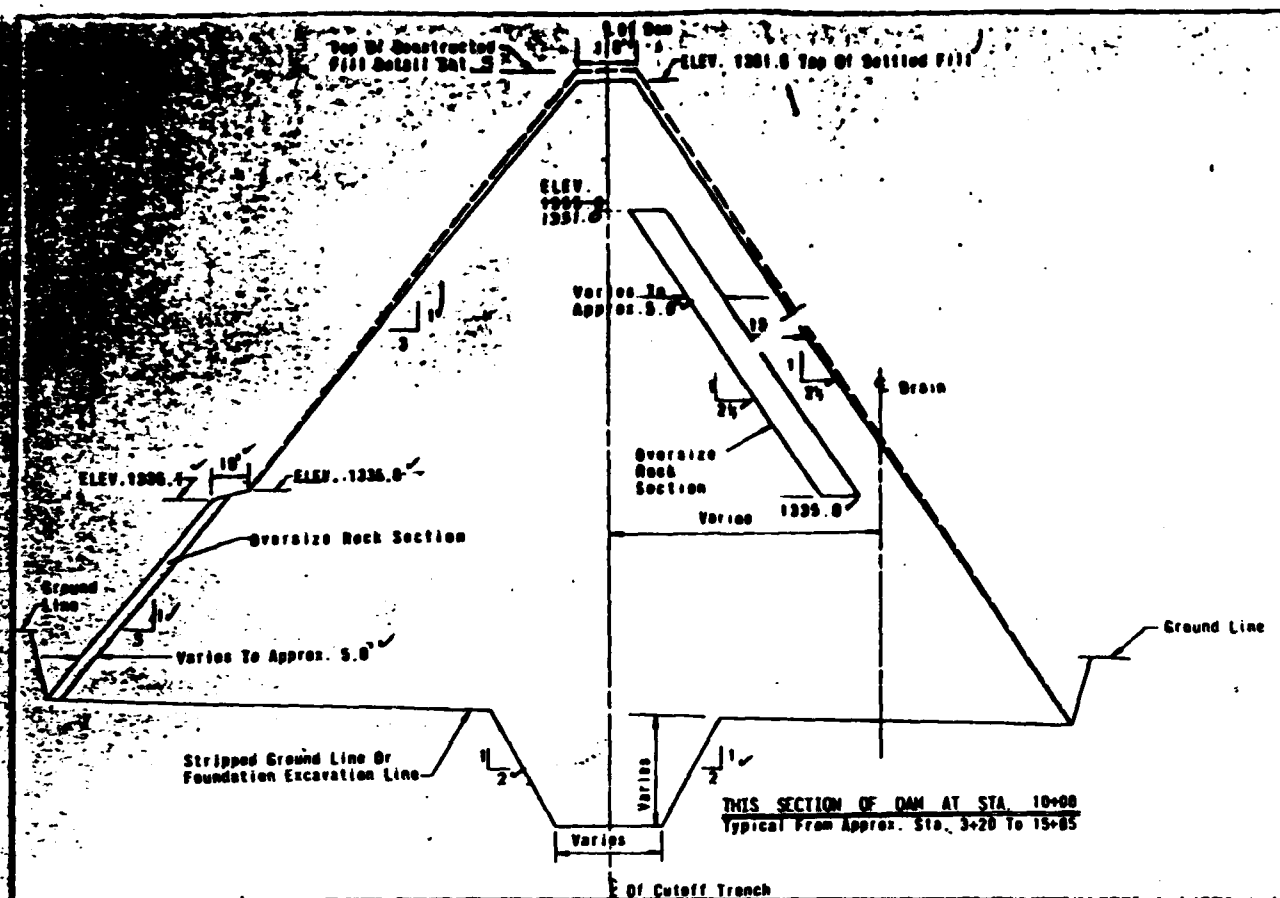
10/31/74
C.C.-1-23

CLARKS CREEK WATERSHED PROJECT
SITE I
SOUTH CENTRAL RC&D PROJECT
CHENANGO COUNTY, NEW YORK
EMERGENCY SPILLWAY
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

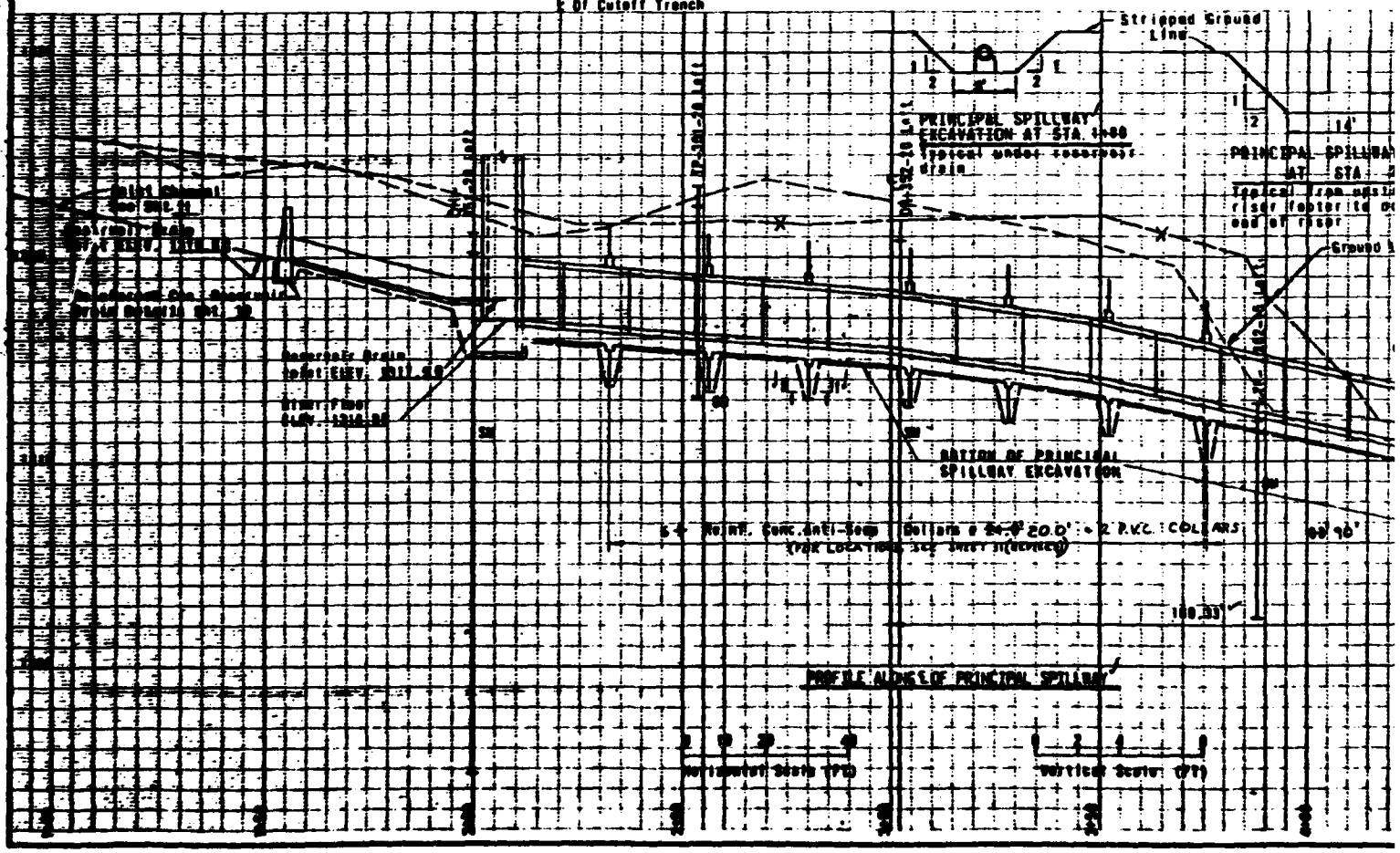
Designed	J POLULECH	12/71	Approved
Drawn	D. BURDICK	12/71	Title
Traced			Sheet 6 of 28
Checked			NY-2357-P

SCS 196-316 (Rev. 2-69)

2 1 2



THIS SECTION OF DAM AT STA. 10+00
Typical From Approx. Sta. 3+20 To 15+85



GLACIAL
TP-105
TP-201
TP-3

1/ The
2/ a.)
"sha
b.)
dam
3/ Max
sha
4/ Wate
5/ a.)
b.)
cons
pres
be c

1. Over
aval
2. Mate
fill
abov
3. Tops
inco
be w

The
The
at t

EARTH FILL REQUIREMENTS

MATERIAL 1/	Max. Rock Size 2/	Max. Lift Thickness 3/	MINIMUM REQUIRED WATER CONTENT 4/	COMPACTION 5/	
				Class	Definition
GLACIAL TILL REPRESENTED BY: TP-185 From 1.0' to 15.5' TP-201 From 1.0' to 12.0' TP-3 From 1.0' to 13.5'	8"	8"	One (1) percentage point below optimum	A	100% of maximum density by A.S.T.M. D-698 method A

1/ The placement table indicates estimated use of materials.

2/ a.) Maximum rock size in backfill compacted by means of manually directed power tampers or plate vibrators shall be 3".

b.) Oversize material (8" to 18" inclusive) placed in the earth fill shall be raked to the portion of the dam labeled oversize rock sections as shown on the drawings.

3/ Maximum lift thickness prior to compaction. The maximum lift thickness in the oversize rock sections shall be no greater than 18" prior to compaction.

4/ Water content at time of compaction.

5/ a.) For typical compaction curve see sheet 22.

b.) Use class C compaction in areas of dam containing oversize material. Class C compaction shall consist of a minimum of six passes per lift of fill by a tamping roller exerting a minimum contact pressure of 450 psi, or equivalent as approved by the engineer. The final number of passes required will be determined by the engineer in the field.

CONSTRUCTION DETAILS

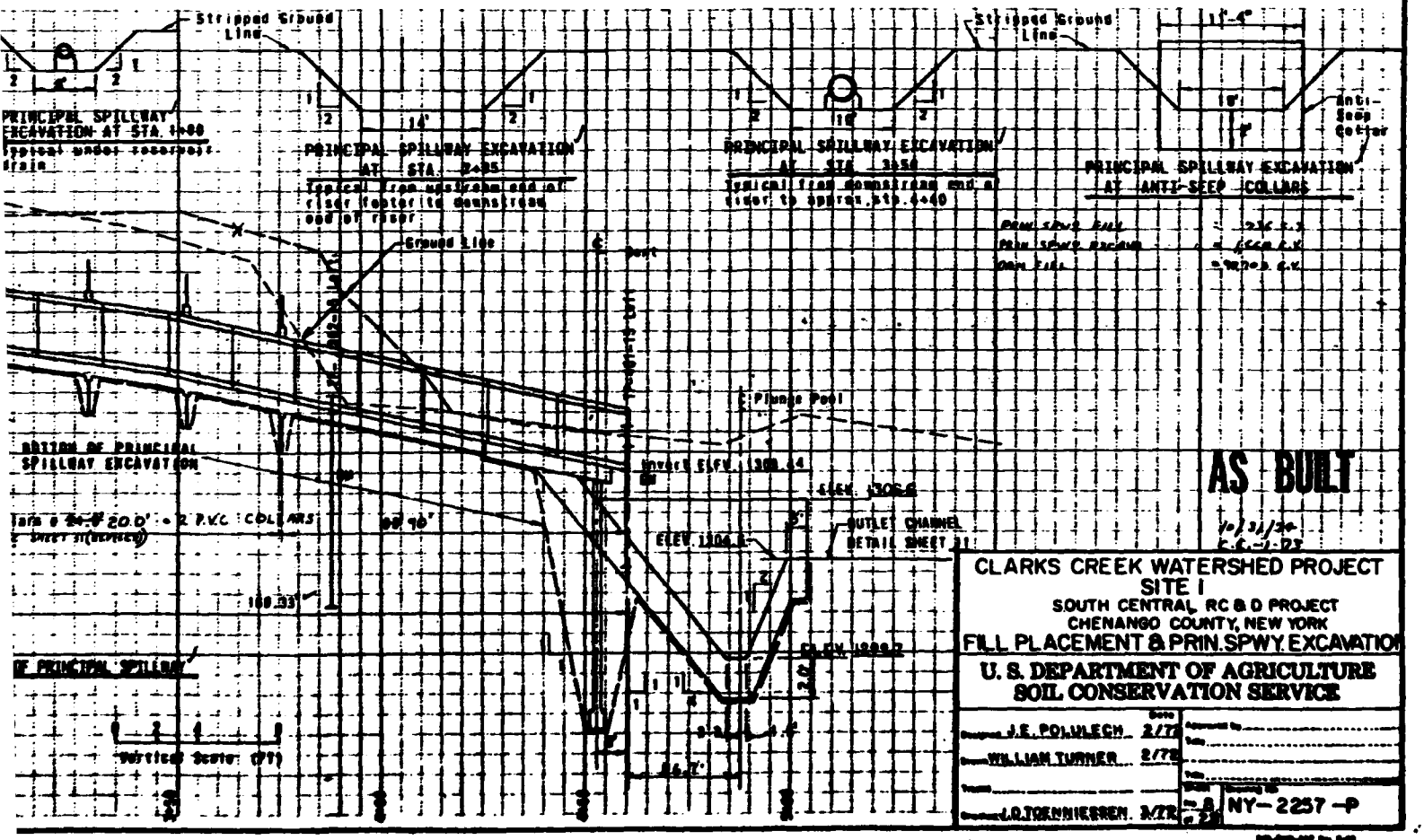
1. Oversize rock section boundaries are approximate. Adjustments will be made by the engineer to utilize available material.
2. Material placed in the oversize rock sections shall consist of oversize material raked from the earth fill. These sections shall be essentially free of materials less than 3". The oversize rock section above ELEV. 1335.0 may be relocated so as to be exposed at upstream slope of the dam as determined by the engr.
3. 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. The source of topsoil shall be within the required excavation.

PRINCIPAL SPILLWAY EXCAVATION DETAILS

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

Ground Line

10+08 To 15+85



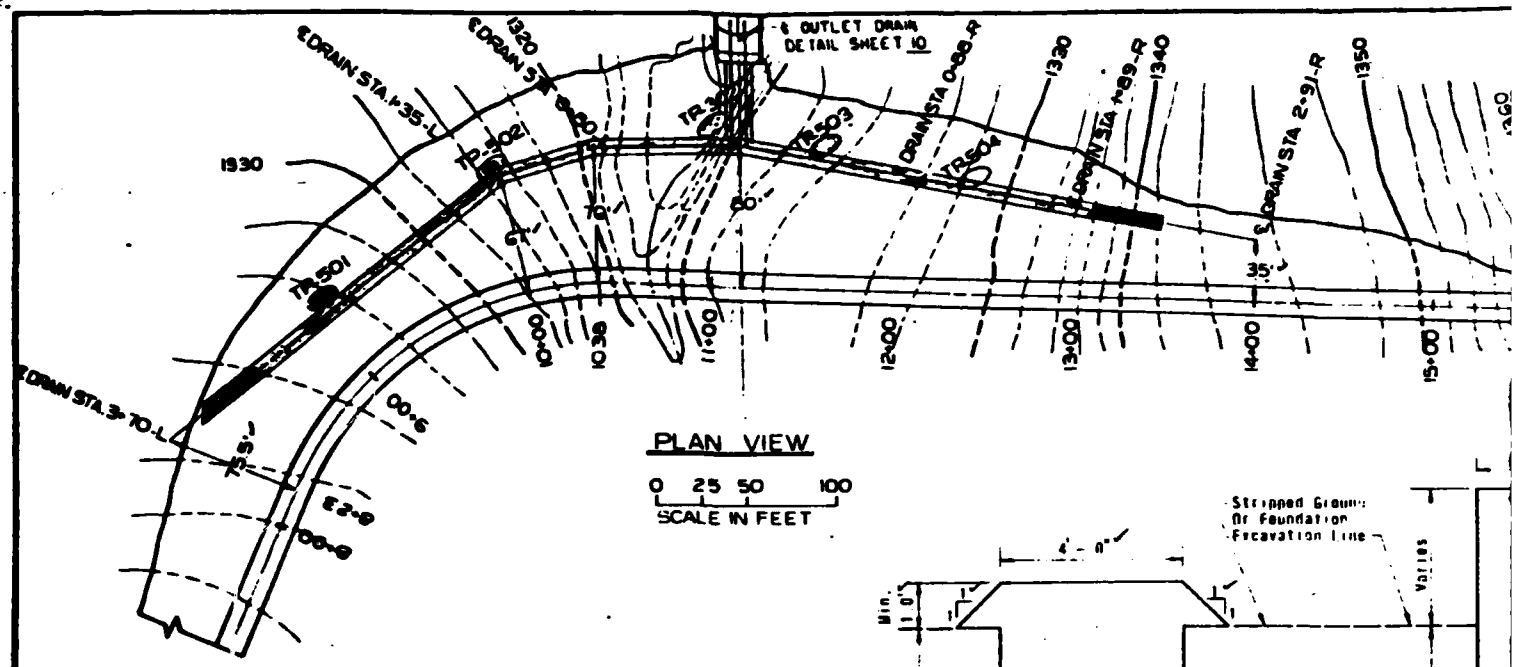
AS BUILT

10/31/80

C.C.-1-D7

CLARKS CREEK WATERSHED PROJECT
SITE I
SOUTH CENTRAL RC & D PROJECT
CHENANGO COUNTY, NEW YORK
FILL PLACEMENT & PRIN. SPWY. EXCAVATION
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

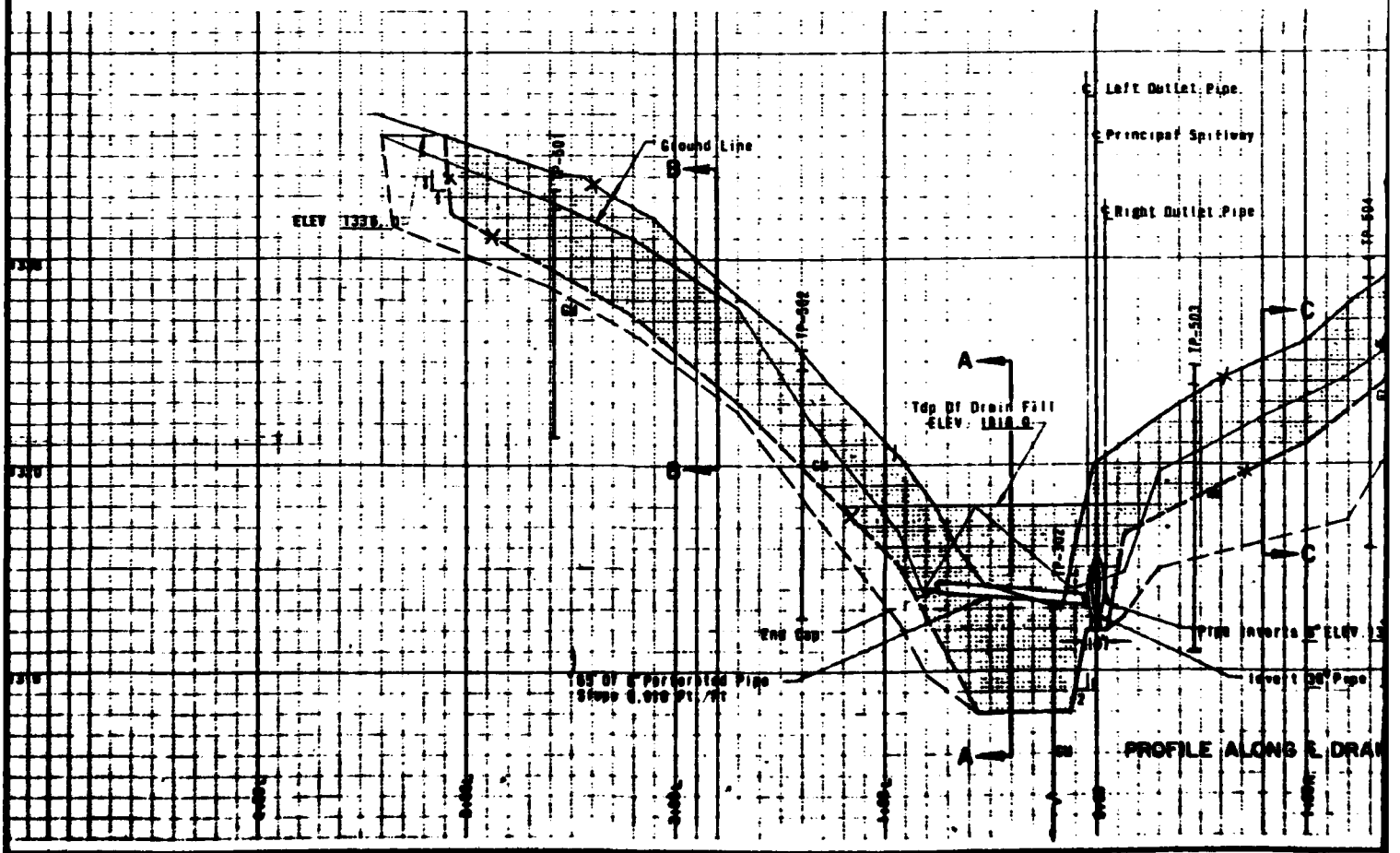
Designed	J.E. POLILECH	2/78	Approved by
Drawn	WILLIAM TURNER	2/78	Date
Traced			Title
Checked	J.D. TOENNIESSEN	2/78	Drawing No. NY-2257-P

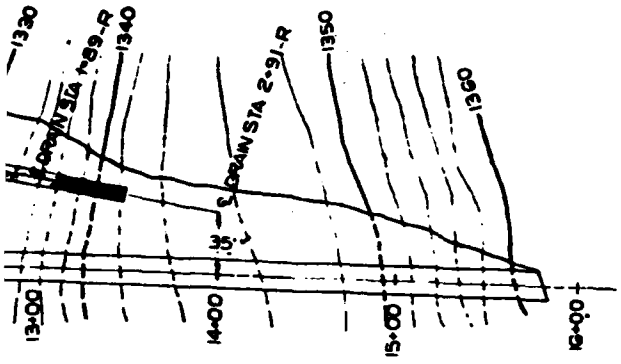


PLAN VIEW

0 25 50 100
SCALE IN FEET

SECTION B-B & C-C





DRAINAGE SYSTEM DETAILS

1. Asbestos Cement Drain Pipe Shall Conform To Material Spec 545 and Shall Be 6" Dia Pressure Pipe Class 200

2. The Bottom Profiles Elev Of All Excavation as Shown Are Only Approx The required finished Grades will Be Established in The Field At The Time Of Construction By The Engineer.

QUANTITY SUMMARY

407 / 306 Cu.Yds. Of Drain Fill

145 Lin.Ft Of Straight Section Of 6" Perforated Asbestos Cement Pipe.

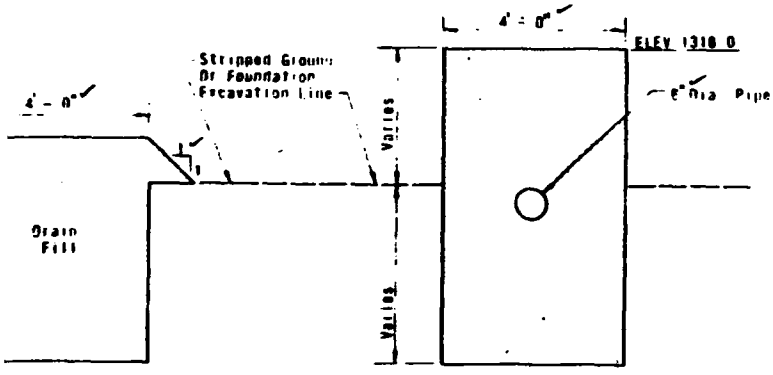
2 End Caps

1 90° 6" Cast Iron (External Angle) Elbow

49.8 / 42 Lin Ft. Of Straight Section Of 6" Non-Perforated Asbestos Cement Pipe.

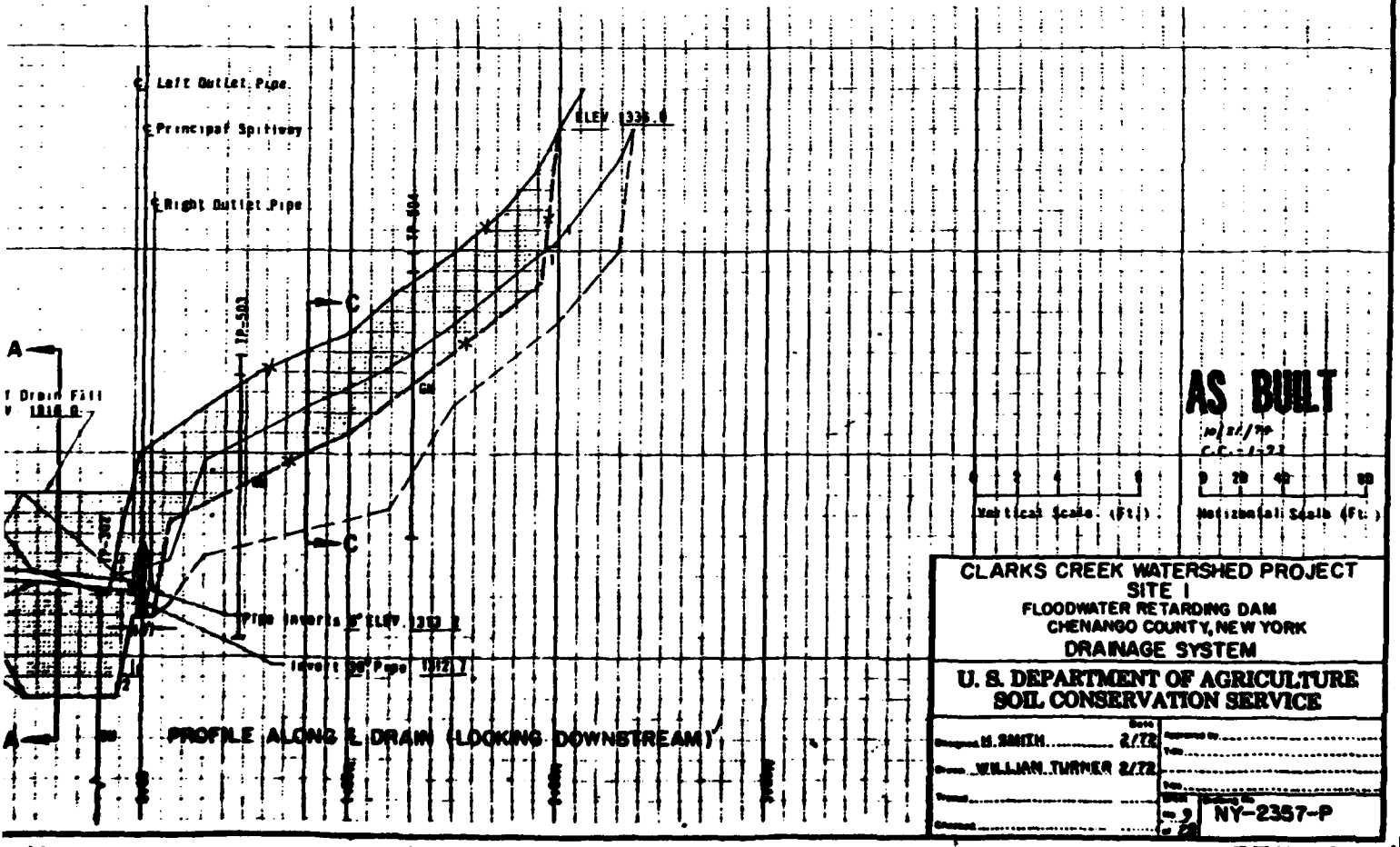
DRAIN SIZE DISTRIBUTION FOR DRAIN FILL

Drain fill shall meet the gradation of screening #1 of the standard gradations from the January 2 1967 New York Public Works Specifications In addition the percentage of material in the drain fill finer than a #200 sieve shall not be more than three (3) percent



TILN B-B

SECTION A-A

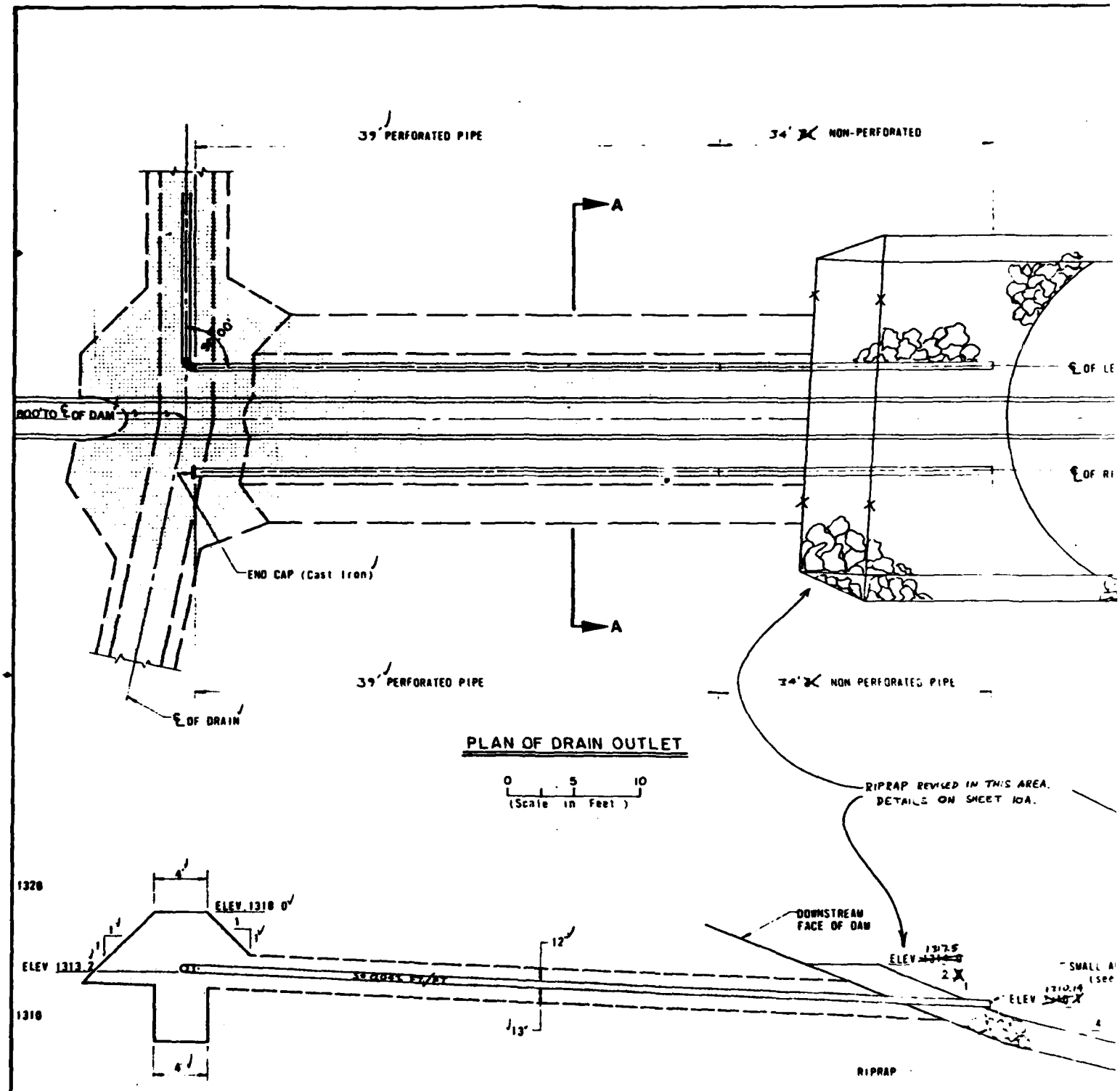


AS BUILT

CLARKS CREEK WATERSHED PROJECT
SITE I
FLOODWATER RETARDING DAM
CHENANGO COUNTY, NEW YORK
DRAINAGE SYSTEM

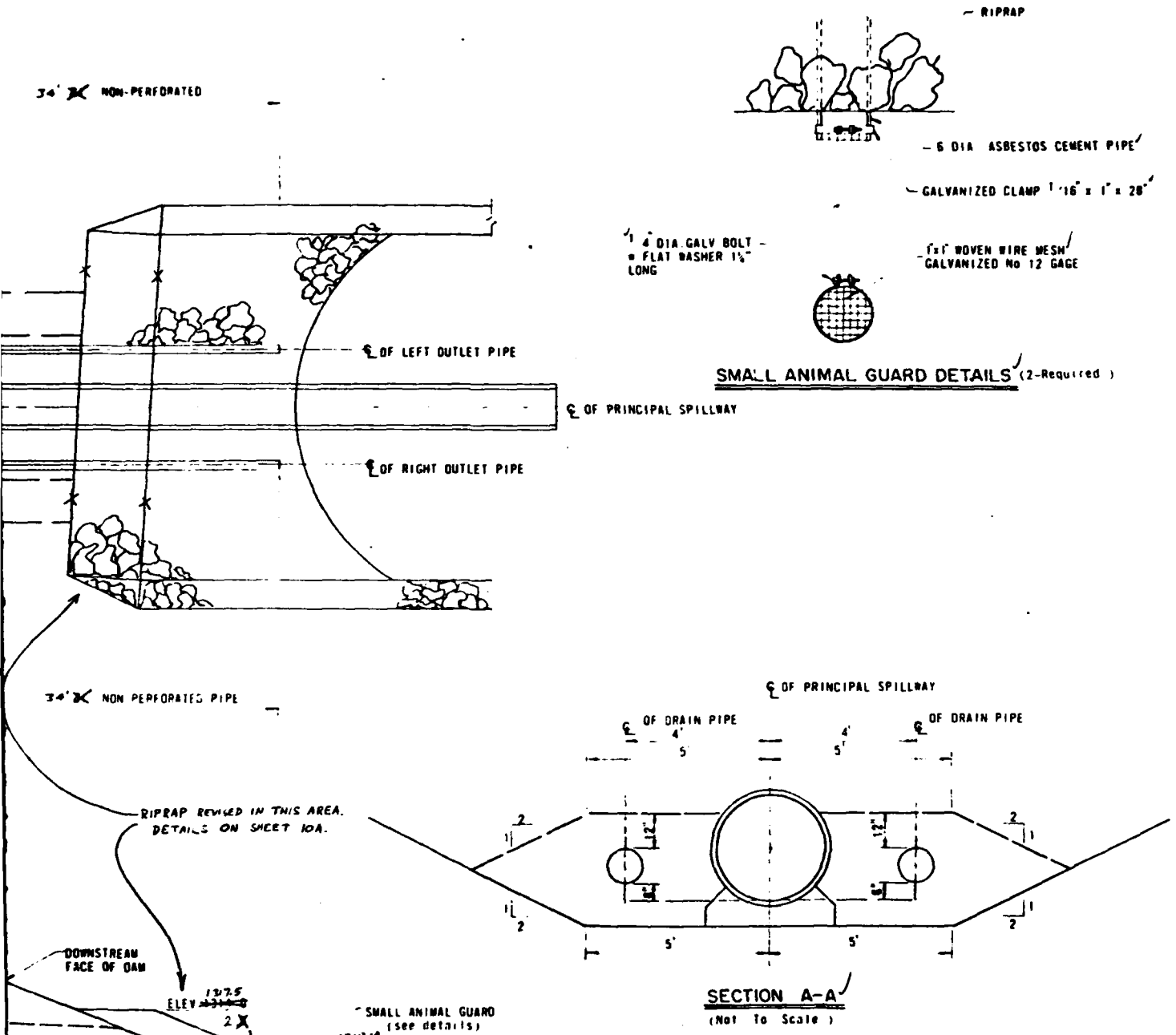
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed H. SMITH 2/72
Drawn WILLIAM TURNER 2/72
Traced
Checked
Approved by
Title
Date
Scale 1" = 5' 1" = 20'
Drawing No. NY-2357-P



PLAN OF DRAIN OUTLET

PROFILE ALONG DRAIN OUTLET



AS BUILT
10/31/74
C.C - 1 - 73

CLARKS CREEK WATERSHED PROJECT
SITE I
SOUTH CENTRAL RC&D PROJECT
CHENANGO COUNTY, NEW YORK

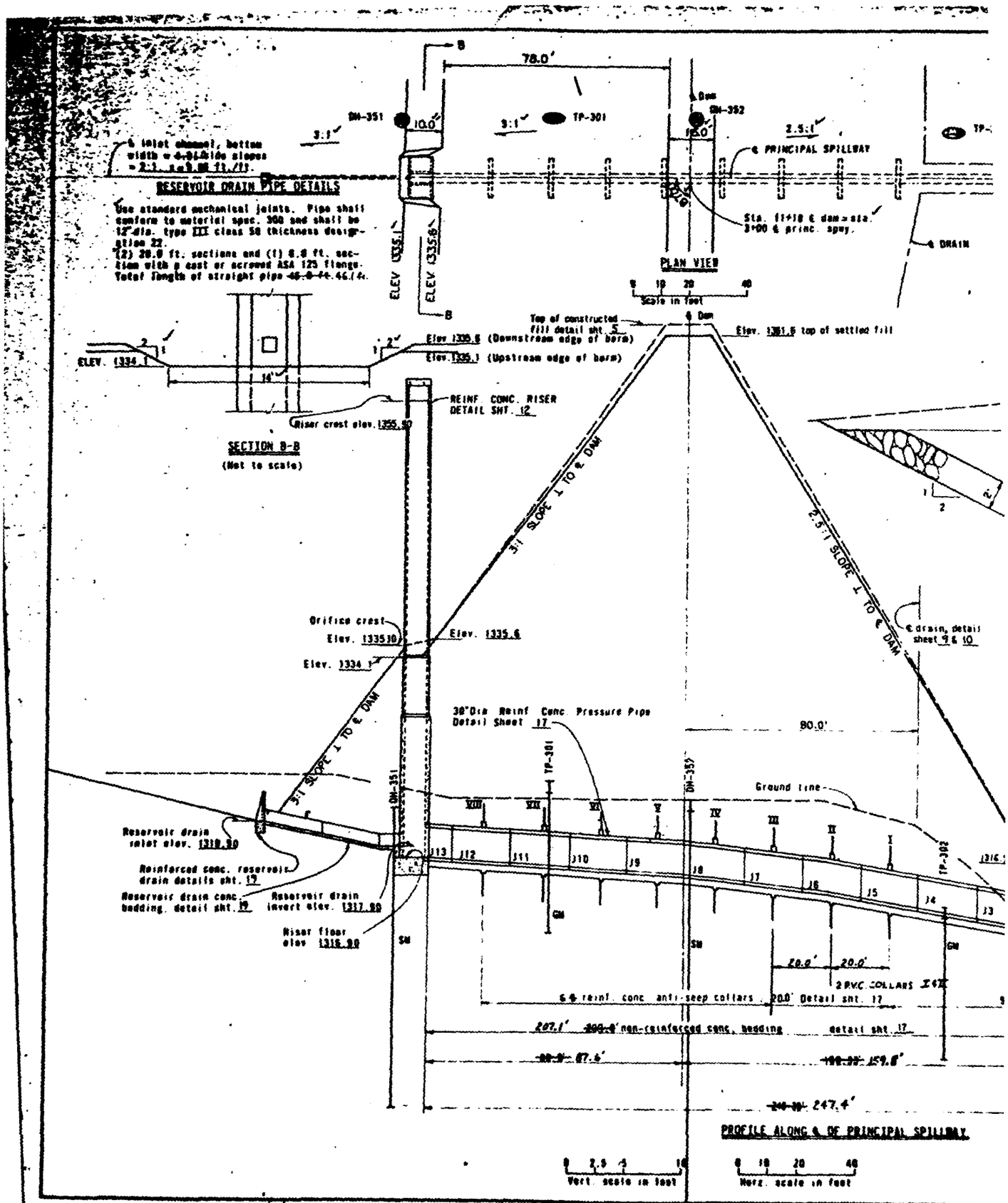
DRAINAGE SYSTEM

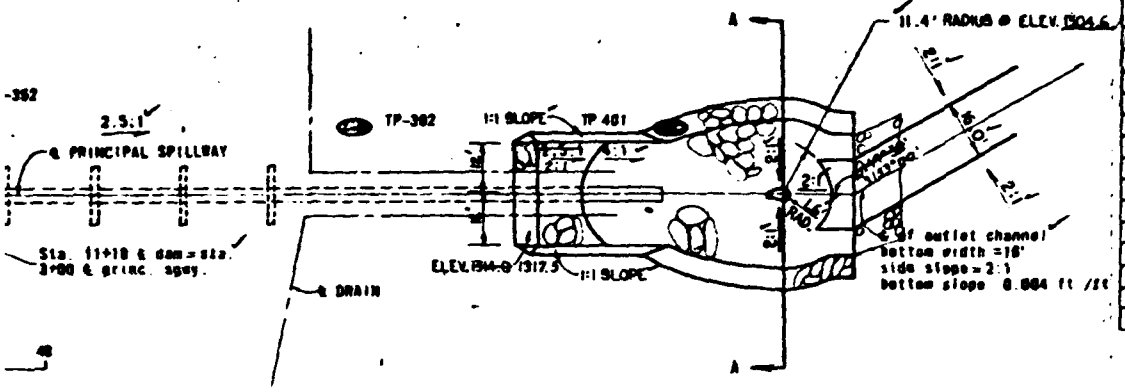
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

	Date
HOWARD SMITH	3/72
R G VOLTON	3/72
WILLIAM M TURNER	3/72

NY-2357-P

1 - 1 - 2

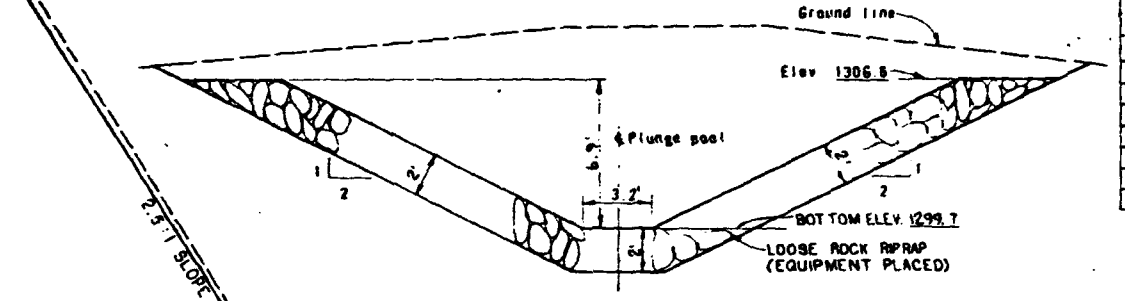

RESERVOIR DRAIN PIPE DETAILS
Use standard mechanical joints. Pipe shall conform to material spec. 308 and shall be 12" dia. type III class 50 (thickness design-ation 22.
(2) 20.0 ft. sections and (1) 8.0 ft. sec-tions with a cast or screwed ASA 125 flange.
Total length of straight pipe 46.0+44.46.(4.
PLAN VIEW
Scale in feet
SECTION B-B
(Not to scale)
Top of constructed fill detail sht. 5
Elev. 1336.6 (Downstream edge of berm)
Elev. 1335.1 (Upstream edge of berm)
Elev. 1381.6 top of settled fill
REINF. CONC. RISER DETAIL SHT. 12
Riser crest elev. 1335.60
3:1 SLOPE 1 TO ℄ DAM
2.5:1 SLOPE 1 TO ℄ DAM
Orifice crest Elev. 1335.6
Elev. 1334.1
30"Dia Reinf Conc Pressure Pipe Detail Sheet 17
Ground line
Reservoir drain inlet elev. 1318.90
Reinforced conc. reservoir drain details sht. 17
Reservoir drain conc. bedding, detail sht. 19
Reservoir drain invert elev. 1317.90
Riser floor elev 1316.90
2 PVC COLLARS
6 ℄ reinf. conc anti-seep collars
non-reinforced conc. bedding detail sht. 17
247.4'
PROFILE ALONG ℄ OF PRINCIPAL SPILLWAY
Vert. scale in feet
Horz. scale in feet



JOINT	DIST FROM OUTLET	INVERT OF 30 DIA PIPE	SLOPE FT/FT
Outlet	0	1309.44	0.0371
J-1	20	1310.189	
2	40	1310.92	
3	60	1311.97	
4	80	1312.41	
5	100	1313.196	
6	120	1313.9890	
7	140	1314.634	
8	160	1315.17	0.0270
9	180	1315.773	
10	200	1316.296	
11	220	1316.523	0.0135
12	240	1316.76	
13	240	1316.90	

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

Elev. 1301.6 top of settled fill



SECTION A-A (Not to scale)

COLLAR	DIST FROM OUTLET	INVERT OF 30 DIA PIPE
I	90	1312.78
II	110	1313.52
III	130	1314.26
IV	150	1314.98
V	170	1315.64
VI	190	1315.98
VII	210	1316.38
VIII	230	1316.65

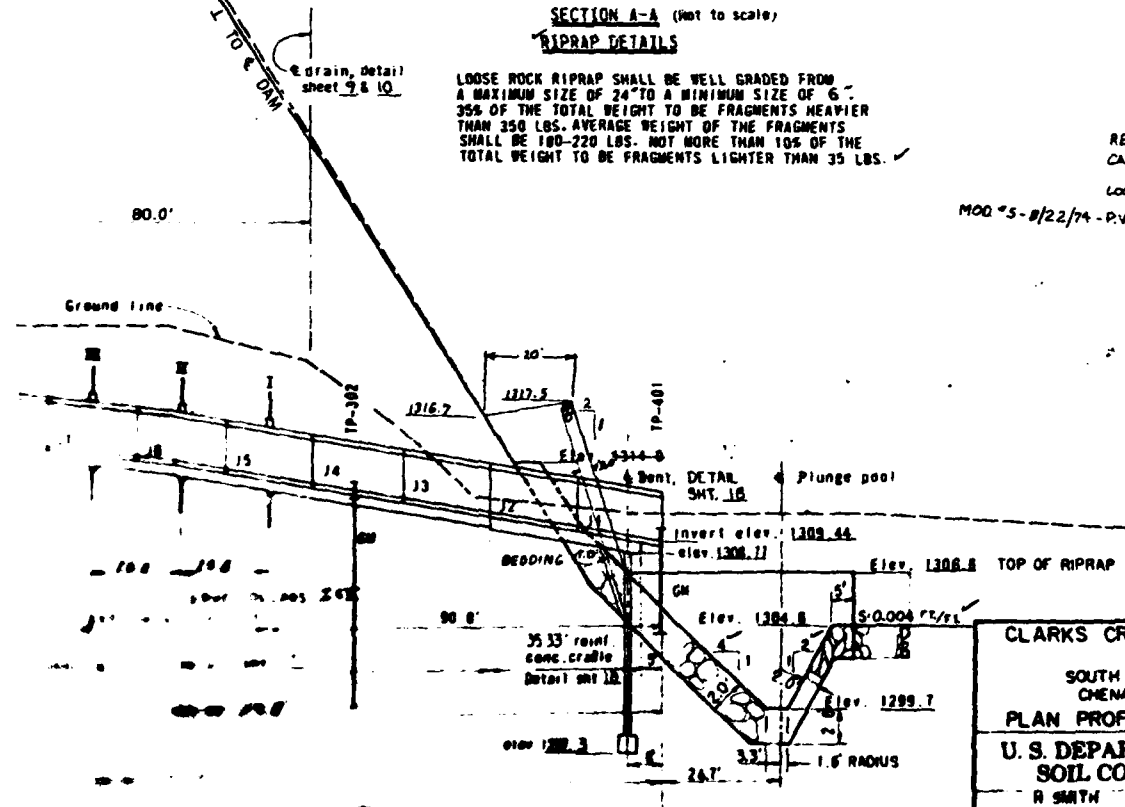
30" reinforced concrete pipe See detail sheet 17

When pipe supplied is in lengths other than shown the engineer will provide the contractor with a revision of the above tables

RIPRAP DETAILS

LOOSE ROCK RIPRAP SHALL BE WELL GRADED FROM A MAXIMUM SIZE OF 24" TO A MINIMUM SIZE OF 6". 35% OF THE TOTAL WEIGHT TO BE FRAGMENTS HEAVIER THAN 350 LBS. AVERAGE WEIGHT OF THE FRAGMENTS SHALL BE 180-220 LBS. NOT MORE THAN 10% OF THE TOTAL WEIGHT TO BE FRAGMENTS LIGHTER THAN 35 LBS.

REINF. CONC PRESSURE PIPE 30" DIA 247 LF
CAST IRON PIPE 46 LF
LOOSE ROCK RIP RAP 164 C.Y.
MOD #5-8/22/74 - P.V.C. COLLARS - 2 1 JOB



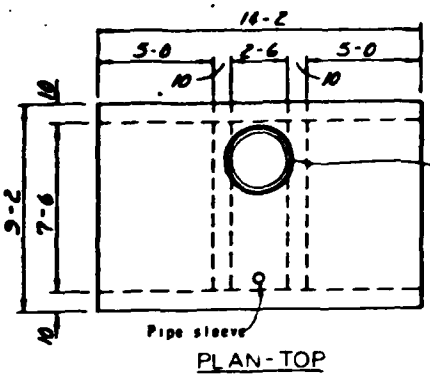
AS BUILT
10/31/74
C.C. - 1-73

CONTRACT MODIFICATION
5-8/22/74

CLARKS CREEK WATERSHED PROJECT
SITE I
SOUTH CENTRAL RC&D PROJECT
CHENANGO COUNTY, NEW YORK
PLAN PROFILE OF PRINCIPAL SPILLWAY
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	R SMITH	Date
Drawn	J POLULECH	1/73
Traced	D BURDICK	1/73
Checked		
Approved		

NY-2357-P



PLAN-TOP

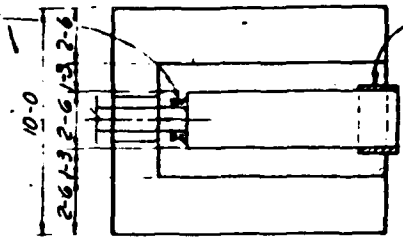
Manhole Frame

MANHOLE ASSEMBLY DETAILS

Circular manhole assembly, minimum clear opening 30" Neenah Foundry Company model R-6461-MH with stainless cap screws or approved equivalent

NOTE: MANHOLE USED WAS 8" DEEP

℄ type wall thimble 8" deep 12" dia bolted to flange See detail 1.



SECTION B-B

Spigot Wall Fitting DETAIL SHT 17

CONSTR. JOINT

1/4" x 6" Carbon steel plate to conform to Spec 581 Continuous thru constr jc. Splices Shall Be Either 1. Butt Welded 2 Lapped 3" And Bolte 3 Lapped 3" And Fille

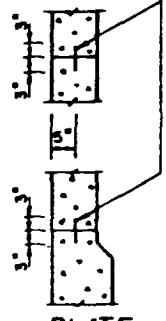


PLATE CONSTR. JOINT

High stage trash rack with pipe sleeves embedded in concrete Detail sht 16

Construction Joint

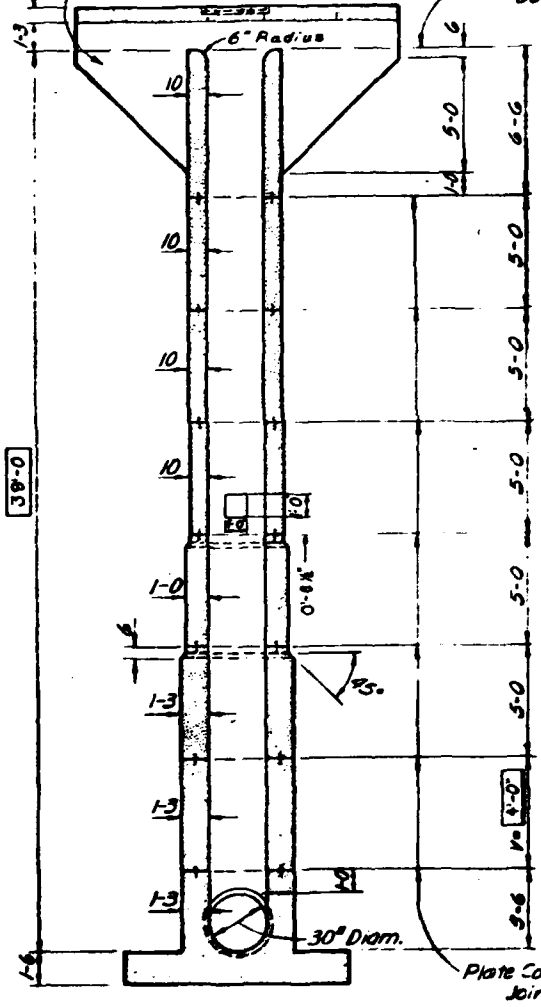
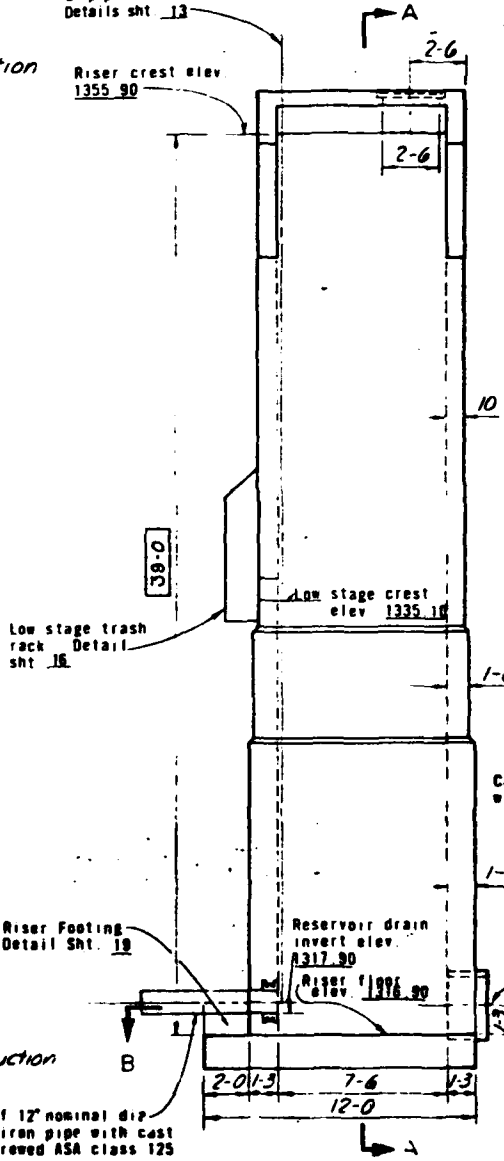


Plate Construction Joints

SECTION A-A

℄ pipe sleeve and stem Details sht 13

Riser crest elev 1355.90



Low stage crest elev 1335.16

Low stage trash rack Detail sht 16

Riser Footing Detail Sht. 19

Reservoir drain invert elev. 1317.90

Riser floor elev. 1316.90

℄ of Pipe

7/8" bolt w/ washer

Cast iron pipe with flange

DETAIL I

(Not to scale)

6'-0" of 12" nominal dia cast iron pipe with cast or screwed ASA class 125 flange

SIDE ELEVATION

QUANTITIES

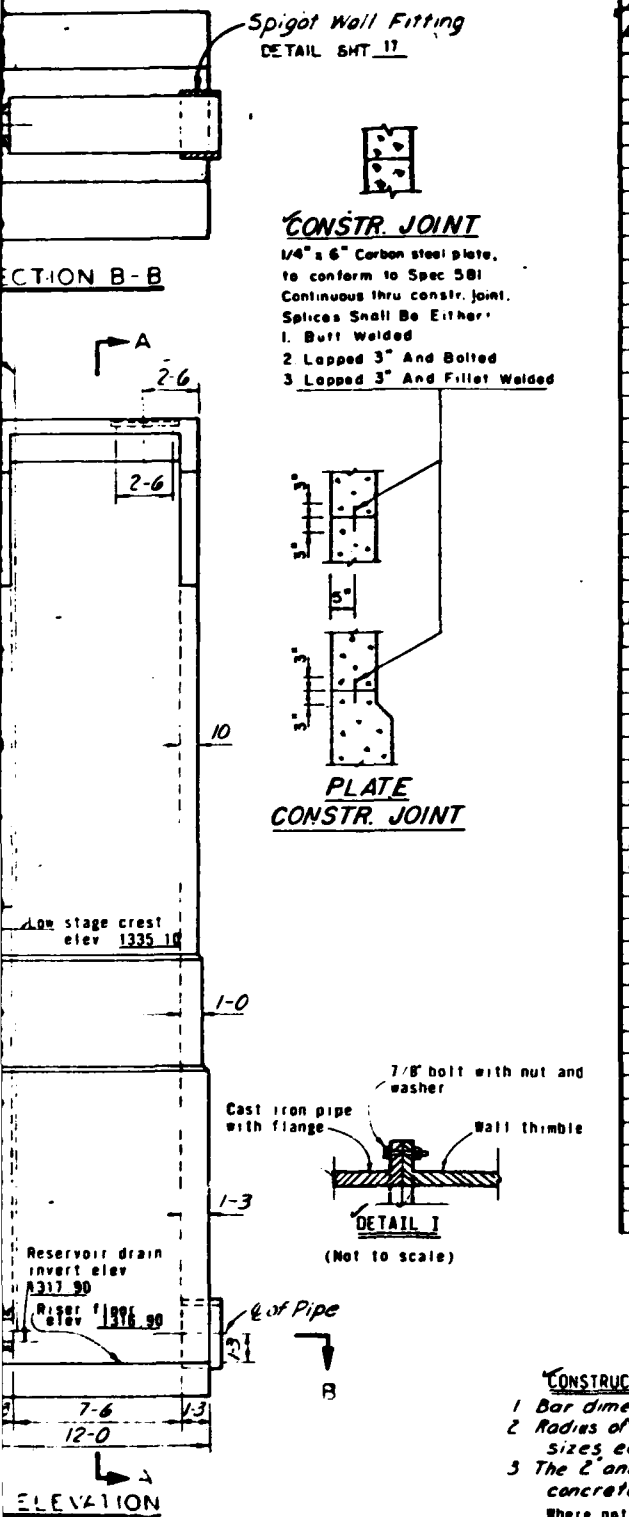
Steel:

#4 Bars	350-0	Lin. Ft.	234 Lbs.
#5 Bars	4292-10	Lin. Ft.	6611 Lbs.
#6 Bars	2100-3	Lin. Ft.	3155 Lbs.
#7 Bars	380-0	Lin. Ft.	777 Lbs.
Total			[illegible] Lbs.

Length of #5 Bars = (4186-4)+(Length of Bars R2).
Length of #6 Bars = (1292-5)+(Length of Bars R1, R3, R4 and R5)

Total Concrete = (42.32)+(1.16V) = 42.32 + 1.16(4.0) = 42.32+4.64 = 46.96 Cu. Yds

STANDARD COVERED RISER	
DESIGN CONSTANTS: f'_c = 4000 psi, f_c = 1600 psi, n = 8, f_s = 20,000 psi	
STANDARD DWG. NO. ES-3030-4020F	
DATE 6-65	SHEET 1 OF 4



CONSTR. JOINT

1/4" x 6" Carbon steel plate, to conform to Spec 581
Continuous thru constr. joint.
Splices Shall Be Either
1. Butt Welded
2 Lapped 3" And Bolted
3 Lapped 3" And Fillet Welded

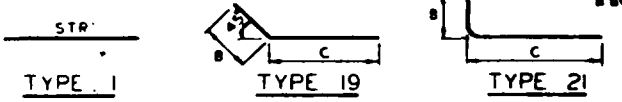
PLATE CONSTR. JOINT

DETAIL I
(Not to scale)

STEEL SCHEDULE

Mark	Size	Quantity	Length	Type	B	C	Total Length	Mark	Size	Quantity	Length	Type	B	C	Total Length
B1	#6	12	9-6	1			114-0	R30	#5	20	8-0	21	2-9	5-3	160-0
B2	#6	10	11-6	1			115-0								
B3	#7	38	10-0	21	3-5	6-7	380-0								
B4	#6	10	11-6	1			115-0								
B5	#6	12	9-6	1			114-0								
B6	#6	2	4-0	1			8-0								
B7	#6	6	7-6	21	1-0	6-6	45-0								
B8	#6	19	7-6	21	1-0	6-6	142-6								
B9	#5	14	8-6	1			119-0								
B10	#6	3	5-6	1			17-6								
B11	#6	3	2-9	1			8-3	T1	#5	18	6-0	1			108-0
B12	#6	2	2-9	1			5-6	T2	#5	6	8-0	1			48-0
B13	#6	10	6-9	21	0-10	5-11	67-6	T3	#5	4	4-9	1			19-0
B14	#6	18	9-3	21	3-4	5-11	166-6	T4	#5	4	3-6	1			14-0
								T5	#5	4	2-3	1			9-0
								T6	#5	4	9-0	19	2-0	7-0	36-0
								T7	#5	12	8-3	1			99-0
								T8	#5	2	3-3	1			6-6
								T9	#5	2	5-9	1			11-6
								T10	#5	2	10-9	1			21-6
								T11	#5	2	13-3	1			26-6
								T12	#5	14	6-3	1			87-6
								T13	#5	6	8-0	1			48-0
R1	#6	22	10-9	1			236-6	T14	#5	4	6-0	1			24-0
R2	#5	16	8-6	1			136-0	T15	#5	4	4-9	1			19-0
R3	#6	8	3-6	1			28-0	T16	#5	4	3-6	1			14-0
R4	#6	28	8-6	1			238-0	T17	#5	4	2-3	1			9-0
R5	#6	32	9-3	21	3-4	5-11	296-0	T18	#5	4	9-0	19	2-0	7-0	36-0
R6	#6	14	8-6	1			119-0	T19	#5	24	8-0	21	2-9	5-3	192-0
R7	#6	10	3-6	1			35-0	T20	#5	2	3-3	1			6-6
R8	#6	26	4-0	1			104-0	T21	#5	2	5-9	1			11-6
R9	#5	36	8-9	21	3-1½	5-7½	315-0	T22	#5	2	8-3	1			16-6
R10	#5	4	8-3	21	2-10½	5-4½	33-0	T23	#5	2	10-9	1			21-6
R11	#5	22	6-9	1			148-6	T24	#5	2	13-3	1			26-6
R12	#6	14	8-3	1			115-6	T25	#5	4	13-9	1			55-0
R13	#5	10	3-6	1			35-0	T26	#5	4	13-9	1			55-0
R14	#5	26	4-6	1			117-0	T27	#4	14	8-3	1			115-6
R15	#5	20	3-8	1			73-4	T28	#6	2	4-9	1			9-6
R16	#5	36	8-3	21	2-10½	5-4½	297-0	T29	#4	7	13-9	1			96-3
R17	#5	4	8-0	21	2-9	5-3	32-0	T30	#4	4	5-3	1			21-0
R18	#5	20	11-9	1			235-0	T31	#5	24	6-9	21	1-6	5-3	162-0
R19	#5	14	8-3	1			115-6	T32	#5	2	6-6	21	1-6	5-0	13-0
R20	#5	8	3-3	1			26-0	T33	#5	2	2-6	21	1-6	1-0	5-0
R21	#5	20	11-9	1			235-0	T34	#4	7	13-9	1			96-3
R22	#5	40	8-0	21	2-9	5-3	320-0	T35	#4	4	5-3	1			21-0
R23	#5	10	8-3	1			82-6								
R24	#5	8	3-3	1			26-0								
R25	#5	28	8-0	21	2-9	5-3	224-0								
R26	#5	20	6-9	1			135-0								
R27	#5	9	8-3	1			66-0								
R28	#5	8	3-3	1			26-0								
R29	#5	20	6-9	1			135-0								

BAR TYPES



AS BUILT
10/31/74
CC-1-73

BLOCKED IN DIMENSIONS ARE NOT TO SCALE

0 2 4 6
Scale in Feet

CONSTRUCTION DETAILS

1. Bar dimensions are out to out of bar.
2. Radius of bends equals 3 bar diameters for sizes equal to or less than #7.
3. The 2" and 3" dimensions from face of concrete to steel are clear distances.
   Where not otherwise specified all reforcing steel placed in concrete poured against the ground shall have a minimum of 3" cover All reforcing steel placed in concrete poured in forms shall have a minimum of 2" cover
4. All exposed edges of concrete to have ¾" chamfer unless otherwise noted

Ft. ___ 234 Lbs.
Ft. ___ 6477 Lbs.
Ft. ___ 3155 Lbs
Ft. ___ 777 Lbs
Total ___ 10643 Lbs ✓

Bars R2).
Bars R1, R3, R4 and R5)
= 16.0 = 42.32 + 4.64 = 61.47.0 Cu. Yds

CLARKS CREEK WATERSHED PROJECT
SITE 1
SOUTH CENTRAL RC&D PROJECT
CHENANGO COUNTY, NEW YORK
RISER STRUCTURAL DETAILS

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed J. POLULECH 1/72
Drawn D BURDICK 1/72
Traced
Checked

Approved by
Title
Date
Drawing No. NY-2357-P
Sheet No. 12
Sheet No. 28

1 2

CLARKS CREEK

TEST PIT LOGS

TP #1, ℄ of Dam, 6/22/71, HM, 1363.4

0.0 - 1.0 Topsoil

1.0 - 14.0 Sand, silty
Max. size 18", varied lithology w/sandstone boulders and shale flags;
Approx. 1% ○ 6", 2% 3-6", 97% matrix (which is approx. 20% gravel, 35% sand, 45% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous; glacial till; (SM)

NOTE: Boulders in bottom of pit.

TP #2, ℄ of Dam, 5/17/71, HM, 1349.2

0.0 - 1.0 Topsoil

1.0 - 15.0 Gravel, silty
Max. size 18", varied lithology;
Approx. 1% ○ 6", 3% 3-6", 96% matrix (which is approx. 35% gravel, 25% sand, 40% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM)

NOTE: Slight seepage just below topsoil.

TP #3, ℄ of Dam, 5/17/71, HM, 1345.8

0.0 - 1.0 Topsoil

1.0 - 13.5 Gravel, silty
Max. size 18" varied lithology;
Approx. 1% ○ 6", 2% 3-6", 97% matrix (which is approx. 35% gravel, 30% sand, 35% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM).
D. S. 31 @ 10.0', SM

NOTE: Refusal on boulders @ 13.5 ft.

TP #4, ℄ of Dam, 5/17/71, HM, 1337.5

0.0 - 1.0 Topsoil

1.0 - 15.0 Gravel, sandy
Max. size 18", varied lighology;
Approx. 2% ○ 6", 2% 3-6", 96% matrix (which is approx. 35% gravel, 35% sand, 30% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM).

NOTE: Seepage @ 7.5 ft.

TP #5, ℄ of Dam, 5/17/71, HM, 1333.6

0.0 - 1.0 Topsoil

1.0 - 15.0 Gravel, silty
Max. size 20", varied lithology w/shale flags and sandstone boulders;
Approx. 1% ○ 6", 2% 3-6", 97% matrix (which is approx. 35% gravel, 30% sand, 35% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM)

TP #6, ℄ of Dam, 5/18/71, HM, 1321.5

0.0 - 1.0 Topsoil

1.0 - 15.0 Gravel, silty
Max. size 24", varied lithology w/shale flags and sandstone boulders;
Approx. 1% ○ 6", 2% 3-6", 97% matrix (which is approx. 40% gravel, 20% sand, 40% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM).

TP #7, ℄ of Dam, 5/18/71, HM, 1329.7

0.0 - 1.0 Topsoil

1.0 - 14.0 Gravel, silty
Max. size 18", varied lithology w/shale flags and sandstone boulders;
Approx. 1% ○ 6", 2% 3-6', 97% matrix (which is approx. 35% gravel, 30% sand, 35% non-plastic fines);
Brown; moist-wet; slight permeability; dense, homogeneous, glacial till: (GM).

NOTE Heavy seepage @ 6.5 ft; banks of pit cave continuously.

TP #8, ℄ of Dam, 5/17/71, HM, 1347.2

0.0 - 1.0 Topsoil

1.0 - 15.0 Gravel, sandy
Max. size 30', varied lithology w/shale flags and sandstone boulders;
Approx. 2% ○ 6", 3% 3-6"; 95% matrix (which is approx. 40% gravel, 40% sand, 20% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous, glacial till; (GM)
D. S. 8.1 @ 10.0 ft., SM

NOTE: Seepage just below topsoil.

TP #9, ℄ of Dam, 5/17/71, H.H. 1353.4

0.0 - 1.0 Topsoil

1.0 - 15.0 Gravel, Sandy
Max. size 28", varied lithology;
Approx. 2% ○ 6", 3% 3-6", 95% matrix (which is approx. 40% gravel, 40% sand, 20% non-plastic fines;
Brown; moist-wet; slight permeability; dense, homogeneous; glacial till; (GM)

NOTE: Light seepage just below topsoil.

TP #101, Borrow, 5/17/71, HM, 1357.3

0.0 - 1.0 Topsoil

1.0 - 15.0 Gravel, Silty
Max size, 36", shale flags and sandstone boulders;
Approx. 2% ○ 6", 2% 3-6", 96% matrix (which is approx. 40% gravel, 20% sand, 40% non-plastic fines);
Brown; moist; slight permeability; dense, homogeneous; glacial till; (GM)

NOTE: Seepage just below topsoil; approx. 1% of ground surface in borrow area is covered with sandstone boulders

TP #102, Borrow, 5/18/71, HM, 1347.1

0.0 - 1.0 Topsoil

1.0 - 14.0 Gravel, Silty
Max size, 24", shale flags and sandstone boulders;
Approx. 2% ○ 6", 2% 3-6",96% matrix (which is approx. 40% gravel, 20% sand, 40% non-plastic fines;
Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM)

NOTE: Moderate seepage @ 9.0 ft., bank caves occasionally.

TP #103, Borrow, 5/18/71, HM, 1344.8

0.0 - 1.0 Topsoil

1.0 - 15.0 Gravel, silty
Max. size 24", varied w/shale flags and sandstone boulders;
Approx. 2% ○ 6", 2% 3-6", 96% matrix (which is approx. 40% gravel, 20% sand, 40% non-plastic fines;
Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM)

NOTE: TP #104 was not dug.

TP #105, Borrow, 5/15/71, HM, 1342.3

0.0 - 1.0 Topsoil

1.0 - 15.5 Gravel, silty
Max. size 30", varied lithology;
Approx. 2% ○, 2% 3-6", 96% matrix (which is approx. 40% gravel, 20% sand, 40% non-plastic fines;
Brown, moist; slight permeability; dense; homogeneous, glacial till; (GM)
D.S. 105.1 @ 10.0 ft., SM

NOTE: Seepage just below topsoil

TP #106, Borrow, 5/18/71, HM, 1352.5

0.0 - 1.0 Topsoil

1.0 - 14.5 Gravel, silty
Max. size 30", shale flags and sandstone boulders;
Approx. 2% ○ 6", 2% 3-6", 96% matrix (which is approx. 40% gravel, 25% sand, 35% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM)

TP #107, Borrow, 5/18/71, HM, 1352.1

0.0 - 1.0 Topsoil

1.0 - 13.0 Gravel, silty
Max. size 24", shale flags and sandstone boulders;
Approx. 3% ○6", 3% 3-6", 94% matrix (which is approx. 40% gravel, 20% sand, 40% non-plastic fines),
Brown; moist; slight permeability; dense; homogeneous, glacial till; (GM)
D.S. 107.1 @ 10.0 ft., SM

NOTE: Seepage @ 3.0 ft.; refusal on boulders @ 13.0 ft.

TP #201, Emer. Spwy., 6/22/71, HM, 1351.2

0.0 - 1.0 Topsoil

1.0 - 12.0 Sand, silty
Max. size 18", varied lithology w/sandstone boulders and shale flags;
Approx. 1% ○6", 2% 3-6', 97% matrix (which is approx. 25% gravel, 35% sand, 40% non-plastic fines);
Brown, moist; slight permeability, dense; homogeneous, glacial till, (SM)
D.S. 201.1 @ 8.0 ft.

NOTE Refusal on boulders @ 12.0 ft.

TP #202, B

0.0 -

1.0 - 1

TP #501, Pi

0.0 - 1

1.0 - 11

TP #502, Pi

0.0 - 1

1.0 - 11

TP #401, Ou

0.0 - 1

1.0 - 7

TP #402, Ou

0.0 - 1

1.0 - 5

TP #501, Dr

0.0 - 1

1.0 - 12

TP #502, Dr

0.0 - 1

1.0 - 13

1

TP #9, ℄ of Dam, 5/17/71, H.H. 1383.4

0.0 - 1.0 Topsoil

1.0 - 15.0 Gravel, Sandy
Max. size 30", varied lithology;
Approx. 2% + 6", 3% 3-6", 96% matrix (which is approx. 40% gravel, 40% sand, 20% non-plastic fines;
Brown; moist-wet; slight permeability; dense; homogeneous; glacial till; (GM)

NOTE: Light seepage just below topsoil.

TP #101, Borrow, 5/17/71, HH, 1357.3

0.0 - 1.0 Topsoil

1.0 - 15.0 Gravel, Silty
Max size, 36", shale flags and sandstone boulders;
Approx. 2% + 6", 2% 3-6", 96% matrix (which is approx. 40% gravel, 20% sand, 40% non-plastic fines);
Brown; moist; slight permeability; dense, homogeneous; glacial till; (GM)

NOTE: Seepage just below topsoil; approx. 1% of ground surface in borrow area is covered with sandstone boulders

TP #102, Borrow, 5/18/71, HH, 1347.1

0.0 - 1.0 Topsoil

1.0 - 14.0 Gravel, Silty
Max size, 24", shale flags and sandstone boulders;
Approx. 2% + 6", 2% 3-6",96% matrix (which is approx. 40% gravel, 20% sand, 40% non-plastic fines;
Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM)

NOTE: Moderate seepage @ 9.0 ft.; bank caves occasionally.

TP #103, Borrow, 5/18/71, HH, 1344.8

0.0 - 1.0 Topsoil

1.0 - 15.0 Gravel, silty
Max. size 24", varied w/shale flags and sandstone boulders;
Approx. 2% + 6", 2% 3-6", 96% matrix (which is approx. 40% gravel, 20% sand, 40% non-plastic fines;
Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM)

NOTE: TP #104 was not dug.

TP #105, Borrow, 5/18/71, HH, 1362.3

0.0 - 1.0 Topsoil

1.0 - 15.5 Gravel, silty
Max. size 30", varied lithology;
Approx. 2% +6", 2% 3-6", 96% matrix (which is approx. 40% gravel, 20% sand, 40% non-plastic fines;
Brown, moist; slight permeability; dense; homogeneous; glacial till; (GM)
D.S. 105.1 @ 10.0 ft., SM

NOTE: Seepage just below topsoil

TP #106, Borrow, 5/18/71, HH, 1352.5

0.0 - 1.0 Topsoil

1.0 - 14.5 Gravel, silty
Max. size 30", shale flags and sandstone boulders;
Approx. 2% + 6", 2% 3-6", 96% matrix (which is approx. 40% gravel, 25% sand, 35% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM)

TP #107, Borrow, 5/18/71, HH, 1352.1

0.0 - 1.0 Topsoil

1.0 - 15.0 Gravel, silty
Max. size 24", shale flags and sandstone boulders;
Approx. 3% +6", 3% 3-6", 94% matrix (which is approx. 40% gravel, 20% sand, 40% non-plastic fines),
Brown; moist, slight permeability; dense; homogeneous, glacial till; (GM)
D.S. 107.1 @ 10.0 ft., SM

NOTE: Seepage @ 5.0 ft.; refusal on boulders @ 15.0 ft.

TP #201, Emer. Spwy., 6/22/71, HH, 1351.2

0.0 - 1.0 Topsoil

1.0 - 12.0 Sand, silty
Max. size 18", varied lithology w/sandstone boulders and shale flags;
Approx. 1% +6", 2% 3-6", 97% matrix (which is approx. 25% gravel, 35% sand, 40% non-plastic fines);
Brown, moist; slight permeability, dense; homogeneous. glacial till, (GM)
D.S. 201.1 @ 8.0 ft.

NOTE Refusal on boulders @ 12.0 ft.

TP #202, Emer. Spwy., 6/22/71, HH, 1340.8

0.0 - 1.0 Topsoil

1.0 - 14.0 Sand, silty
Max. size 18", varied lithology w/sandstone boulders and shale flags;
Approx. 1% +6", 2% 3-6", 97% matrix (which is approx. 20% gravel, 35% sand, 45% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous; glacial till; (SM)

NOTE: Refusal on boulders @ 14.0 ft.

TP #301, Prin. Spwy., 5/18/71, HH, 1323.5

0.0 - 1.0 Topsoil

1.0 - 13.0 Gravel, silty
Max. size 24", shale flags and sandstone boulders;
Approx. 3% +6", 2% 3-6", 95% matrix (which is approx. 35% gravel, 30% sand, 35% non-plastic fines);
Brown; moist-wet; slight permeability; dense; homogeneous; glacial till; (GM)

NOTE: Heavy seepage through pocket in till @ 7.5 ft.; pit abandoned @ 13.0 ft. due to water and caving banks.

TP #302, Prin. Spwy., 5/19/71, HH, 1313.0

0.0 - 1.0 Topsoil

1.0 - 15.0 Gravel, silty
Max. size 30", varied lithology;
Approx. 3% +6", 4% 3-6", 93% matrix (which is approx. 45% gravel, 25% sand, 30% non-plastic fines);
Brown; moist-wet; slight permeability; dense; homogeneous, glacial till; (GM)

NOTE: Seepage from creek and just below topsoil material very stoney, but tight; refusal @ 13.0 ft. on boulders or bedrock; unable to determine which one due to water in pit.

TP #401, Outlet Channel, 5/19/71, HH, 1311.2

0.0 - 1.0 Topsoil

1.0 - 7.0 Gravel, silty
Max. size 30", varied lithology;
Approx 2% +6", 3% 3-6", 95% matrix (which is approx. 40% gravel, 35% sand, 25% non-plastic fines);
Brown; moist-wet; slight permeability; dense, homogeneous; glacial till; (GM)

NOTE: Seepage just below topsoil.

TP #402, Outlet Channel, 5/19/71, HH, 1309.3

0.0 - 1.0 Topsoil

1.0 - 5.0 Gravel, silty
Max. size 36', varied lithology w/shale flags and sandstone boulders;
Approx. 3% +6', 5% 3-6", 92% matrix (which is approx. 40% gravel, 35% sand, 25% non-plastic fines);
Brown; moist-wet; slight permeability; dense;homogeneous; glacial till; (GM)

NOTE: Seepage from creek.

TP #501, Drain, 5/17/71, HH, 1333.5

0.0 - 1.0 Topsoil

1.0 - 12.0 Gravel, silty
Max. size 24", varied lithology;
Approx. 1% +6", 2% 3-6", 97% matrix (which is approx. 35% gravel, 30% sand, 35% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous; glacial till: (GM)

TP #502, Drain, 5/17/71, HH, 1325.6

0.0 - 1.0 Topsoil

1.0 - 13.0 Gravel, silty
Max. size 24', varied lithology;
Approx. 5% +6", 3% 3-6", 95% matrix (which is approx. 35% gravel, 30% sand, 35% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM)
D.S. 502.1 @ 8.0 ft. SM

AS BUILT
C.C.-1-73 10/31/74

CLARKS CREEK WATERSHED PROJECT
SITE 1
SOUTH CENTRAL RC&D PROJECT
CHENANGO COUNTY, NEW YORK
LOGS OF TEST HOLES
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
Logged 5-6-71 STATE CONS ENGINEER
Typed 7-1-71
21
23
NY-2357-P

1 1 2

TP #561, Drain, 5/10/71, HH, 1324.9

0.0 - 1.0 Topsoil

1.0 - 14.0 Gravel, silty
Max. size 18", varied lithology, w/shale flags and sandstone boulders;
Approx. 1% +6", 3% 3-6", 96% matrix (which is approx. 35% gravel, 30% sand, 35% non-plastic fines);
Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM)

NOTE: Heavy seepage @ 6.0 ft.,; Bombs cave continuously'

TP #564, Drain, 5/10/71, HH, 1329.9

0.0 - 1.0 Topsoil

1.0 - 14.0 Gravel, silty
Max. size 24", varied lithology, w/shale flags and sandstone boulders;
Approx. 1% +6", 3% 3-6", 96% matrix (which is approx. 35% gravel, 30% sand, 35% non-plastic fines)
Brown; moist; slight permeability; dense; homogeneous; glacial till; (GM)

NOTE: Seepage just below topsoil; moderate seepage @ 9.0 ft.

CLARKS CREEK

DRILL HOLE LOGS

DH #51, C of Dam, 6/7 - 6/8/71, HH, 1342.0

0.0
Topsoil
8 1.0
RB
23
RB
36
RB
100/.2
RB
125/.7
RB
110/.5
RB
100/.5
RB
75/.3
RB
150/.3
30.2
BDH

Sand-silty w/gravel
Approx. 20% gravel, 45% sand, 35% non-plastic fines;
Brown; moist; slight permeability; loose-very dense; homogeneous; glacial till; (SM)

NOTE: Casing refusal @ 14.0 ft.; hole staying open; WL 9.0 ft., 6/8/71

DH #52, C of Dam, 6/8/71 - 6/9/71, HH, 1332.7

0.0
24
RB
60 0.0fpd
RB
100/.5 0.0fpd
RB
150/.5
RB
150/.4
RB
150/.2
25.2
BDH

Sand-silty w/gravel
Approx. 25% gravel, 45% sand, 30% non-plastic fines;
Brown; moist; slight permeability; medium-very dense; homogeneous; glacial till; (SM)

NOTE: Casing refusal @ 10.0 ft.; hole abandoned @ 25.2 ft. due to filling in from unknown source; casing has settled so seepage below casing may be the cause.
WL @ 2.9 ft., 6/9/71

DH #351, Prin. Spwy., 6/9 - 6/10/71, HH, 1321.2

0.0
9
36
34
75
83 0.0fpd
110
RB
50/.0
RB
70
190/.7
RB
100/.2
RB
100/.5
RB
150/.6
25.6
BDH

Sand, silty/w gravel
Approx. 25% gravel, 40% sand, 35% non-plastic fines;
Brown, moist; slight permeability; loose-very dense, homogeneous; glacial till; (SM)

NOTE: WL @ 1.0 ft., 6/10/71; loss of silt (rock flow) from 13.0 - 14.0 ft.

DH #353, Prin. Spwy., 6

0.0
14 1.0 Topso
30
19
20
75
RB
110
160/.6
RB
100/.4
RB
100/.4
RB
100/.5
RB
100/.8
RB
100/.1
RB
100/.5
RB
100/.3
RB
46.0
BDH

Sand
Approx
brown
homog

NOTE WL @ 2.0
due to ha
above. Di
mat'l.

COMPACTION CURV
Sample No 105

DENSITY OF COMPACTION SOIL IN POUNDS PER CU FT
125
120
115
110
105
100
6 8 10 12
MOISTURE CONTEN
IN PERCENT OF DRY
FIELD SAMPLE No 10
LABORATORY CLASSIFICA

2

t fines;
y dense; homogeneous;

open;

-plastic fines;
dium-very dense;

l @ 25.2 ft. due
g has settled

plastic fines;
se-very dense;

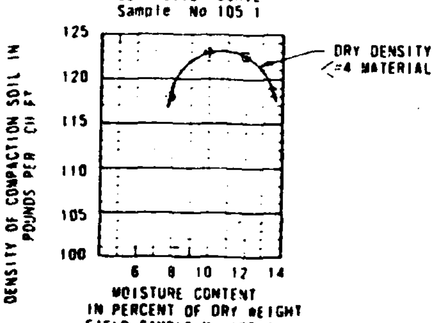
flow) from

DH #352, Prin. Spwy., 6/10 - 6/14/71, HH, 1122.0

N	Depth	Description
	0.0	
14	1.0	Topsoil
20		Sand-silty w/gravel
19		Approx. 25% gravel, 40% sand, 35% non-plastic fines
20		brown; moist; slight permeability; medium-very dense;
75		homogeneous; glacial till; (SM)
RB		
110		
100/.6		
RB		
100/.4		
RB		
100/.4		
RB		
100/.5		
RB		
100/.8		
RB		
100/.1		
RB		
100/.5		
RB		
100/.3		
BH		
	46.0 EOH	

NOTE: WL @ 2.0 ft., 6/14/71; unable to sample below 35.3 ft. due to hole continually filling in with mat'l. from above, drilled hole to 46.0 ft. to verify no change in mat'l.

COMPACTION CURVE
Sample No 105 1



MOISTURE CONTENT
IN PERCENT OF DRY WEIGHT
FIELD SAMPLE No 105 1
LABORATORY CLASSIFICATION (SC-SM)

OFFICIAL LEGEND

TEST HOLE NUMBERING SYSTEM

	Test Pit (TP)	Drill Hole (DH)
Centerline of Dam	1-49	51-99
Borrow Area	101-149	151-199
Emergency Spillway	201-249	251-299
Principal Spillway	301-349	351-399
Outlet Channel	401-449	451-499
Drain Line	501-549	551-599
Other	601-649	651-699

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS) SYMBOLS

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

(xx) Unified Classification by Visual-Manual Procedure (ASTM D2488-66T) in the field.

xx Unified Classification based on laboratory analysis of representative samples (ASTM D2487-66T).

BACKHOE PIT AND DRILL HOLE LOG TERMS AND ABBREVIATIONS

Sample types - DS - Disturbed sample (loose bagged, mixed)
- US - Undisturbed sample (sealed block or tube type)
Matrix - All material less than 3"
Atterberg limits - (ASTM D424-59 - LL - Liquid Limit
- PL - Plastic Limit
- PI - Plasticity Index

Bldr - Boulder
Cbl - Cobble
A - Angular
SA - Subangular
SR - Subrounded
R - Rounded
ss - Sandstone
sh - Shale
slst - Siltstone
ls - Limestone
sed - Sedimentary
▼ - WL - Water Level

- Seep in test hole
BH - Blind hole - no sample
WOH - Weight of Hammer
Ref - Refusal
NX - Rock core 2 1/8" diameter
RB - Roller bit - no sample
AUG - Auger - no sample
DBS - Dry barrel sample
STS - Split tube sample
Rec - Recovery - % of rock or STS recovered)
k - Permeability rate (ft/day)
EOH - End of hole

N - Blows per foot - Standard Penetration Test (ASTM D1586)
RQD - Rock Quality Designation in % = length of core pieces > 4"/length of core run

KEY TO BACKHOE PIT LOGS

TP Number, Location, Date, Logged by, Elevation

Depth Typical
Maximum size - Lithology
Approx. %6", %3-6", %matrix (which is approx. % gravel, % sand, % plasticity fines)
Odor, color, moisture, permeability; density or consistency; structure, origin; (field USCS)
Sample number and type: lab USCS

NOTE:

KEY TO DRILL HOLE LOGS

DH Number, Location, Date, Logged by, Elevation

N Description of Geologic Horizon

0.0 Depth

Typical name; gradation; Est. % gravel, % sand, % fines, plasticity; odor, color, moisture; permeability; density or consistency, structure; origin; (field (USCS). Sample number and type. lab USCS

6.0 Depth

NOTE:

AS BUILT
10/31/74
C.C.-1-73

CLARKS CREEK WATERSHED PROJECT
SITE 1
SOUTH CENTRAL RC&D PROJECT
CHENANGO COUNTY, NEW YORK
LOGS OF TEST HOLES
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

STATE CONS. ENGINEER

22
23 NY-2357-P

2

END

DATE
FILMED

11-80

DTIC