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NATIONAL DAM SAFETY PROGRAM. DAVIS BROOK DAM (SITE 1) (INVENTOR--ETC(U)
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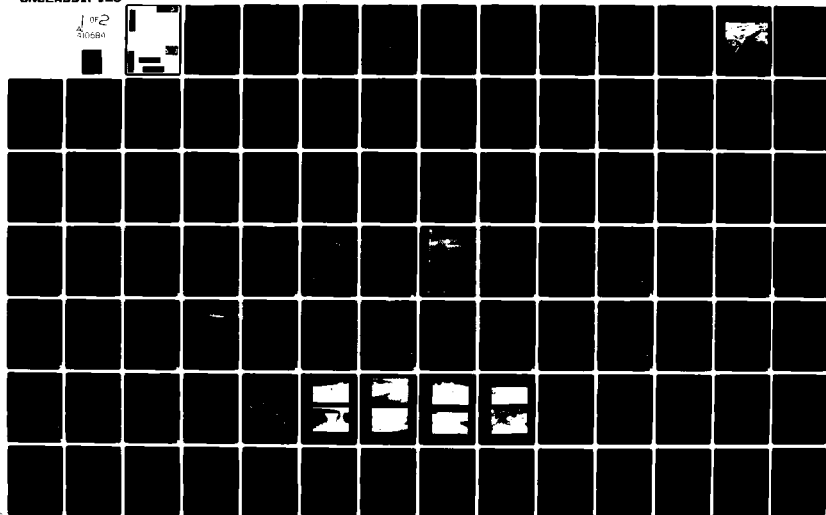
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization. Examination of available documents and visual inspection of Conewango Creek Watershed Davis Brook Dam (Site 1) and appurtenant structures did not reveal conditions which constitute a hazard to human life or property. However, the dam has some deficiencies which require further investigation and remedial action.		

A wet condition of unknown cause was observed on the lower portion of the left downstream slope. It is recommended that the services of a qualified registered professional engineer be retained to evaluate this condition.

Using the Corps of Engineers screening criteria for review of spillway adequacy, it has been determined that the dam would not be overtopped under full PMF conditions. The PMF routed through the reservoir required only 46 percent of the spillway outflow capacity. The spillway capacity is therefore judged as adequate.

The recommended investigation should be completed within 12 months of notification to owner, and remedial actions resulting from these investigations completed in the subsequent 12 months.

The following remedial measures should be performed within 1 year of notification to owner:

- Develop a formal downstream warning system.
- Develop and maintain a program of periodic technical inspections.
- Implement a program of diligent and periodic maintenance.
- Remove trees and brush from slopes.
- Regrade and fill in the erosion gullies.
- Install ladder rungs on the riser.

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ALLEGHENY RIVER BASIN

**CONEWANGO CREEK WATERSHED
DAVIS BROOK DAM (SITE 1)**

**CATTARAUGUS COUNTY, NEW YORK
INVENTORY No. N.Y. 564**

**PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM**



NEW YORK DISTRICT, CORPS OF ENGINEERS

AUGUST 1981

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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 aid 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.

TABLE OF CONTENTS

	<u>PAGE</u>
OVERVIEW PHOTO	
LOCATION MAP	
SECTION 1- PROJECT INFORMATION	
1.1 General	1-1
1.2 Description of Project	1-1
1.3 Pertinent Data	1-5
SECTION 2 ENGINEERING DATA	
2.1 Design Data	2-1
2.2 Construction Data	2-1
2.3 Operational Data	2-1
2.4 Evaluation of Data	2-1
SECTION 3 VISUAL INSPECTION	
3.1 Findings	3-1
3.2 Evaluation	3-2
SECTION 4 OPERATIONAL PROCEDURES	
4.1 Procedures	4-1
4.2 Maintenance of Dam	4-1
4.3 Description of Warning System in Effect	4-1
4.4 Evaluation	4-1

TABLE OF CONTENTS - con't.

		<u>PAGE</u>
SECTION 5	HYDRAULICS/HYDROLOGY	
5.1	Drainage Area Characteristics	5-1
5.2	Design Data	5-1
5.3	Analysis Criteria	5-1
5.4	Reservoir Capacity	5-1
5.5	Experience Data	5-2
5.6	Overtopping Potential	5-2
5.7	Analysis of Downstream Impacts	5-2
5.8	Evaluation	5-2
SECTION 6	STRUCTURAL STABILITY	
6.1	Visual Observations	6-1
6.2	Design and Construction	6-1
6.3	Post Construction Changes	6-1
6.4	Seismic Stability	6-1
SECTION 7	ASSESSMENT, RECOMMENDATIONS AND REMEDIAL MEASURES	
7.1	Dam Assessment	7-1
7.2	Recommendations	7-1
7.3	Remedial Measures	7-1
7.4	Alternatives	7-2
<u>APPENDICES</u>		
APPENDIX A	INSPECTION CHECKLIST	A-1
APPENDIX B	ENGINEERING DATA	B-1
APPENDIX C	PHOTOGRAPHS	C-1
APPENDIX D	HYDROLOGIC AND HYDRAULIC COMPUTATIONS	D-1
APPENDIX E	INFORMATION AS CONTAINED IN <u>THE NATIONAL INVENTORY OF DAMS</u>	E-1

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Conewango Creek Watershed Davis Brook Dam (Site 1)
State Located:	New York
County Located:	Cattaraugus
Stream:	Davis Brook
Basin:	Allegheny River
Date of Inspection:	April 3, 1981

ASSESSMENT

Examination of available documents and visual inspection of Conewango Creek Watershed Davis Brook Dam (Site 1) and appurtenant structures did not reveal conditions which constitute a hazard to human life or property. However, the dam has some deficiencies which require further investigation and remedial action.

A wet condition of unknown cause was observed on the lower portion of the left downstream slope. It is recommended that the services of a qualified registered professional engineer be retained to evaluate this condition.

Using the Corps of Engineers screening criteria for review of spillway adequacy, it has been determined that the dam would not be overtopped under full PMF conditions. The PMF routed through the reservoir required only 46 percent of the spillway outflow capacity. The spillway capacity is therefore judged as adequate.

The recommended investigation should be completed within 12 months of notification to owner, and remedial actions resulting from these investigations completed in the subsequent 12 months.

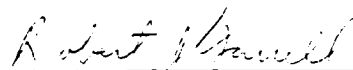
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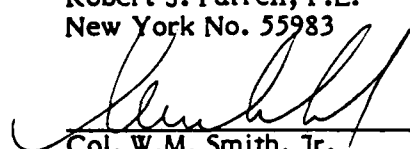
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- Develop and maintain a program of periodic technical inspections.

- Implement a program of diligent and periodic maintenance,
- Remove trees and brush from slopes,
- Regrade and fill in the erosion gullies.
- Install ladder rungs on the riser.

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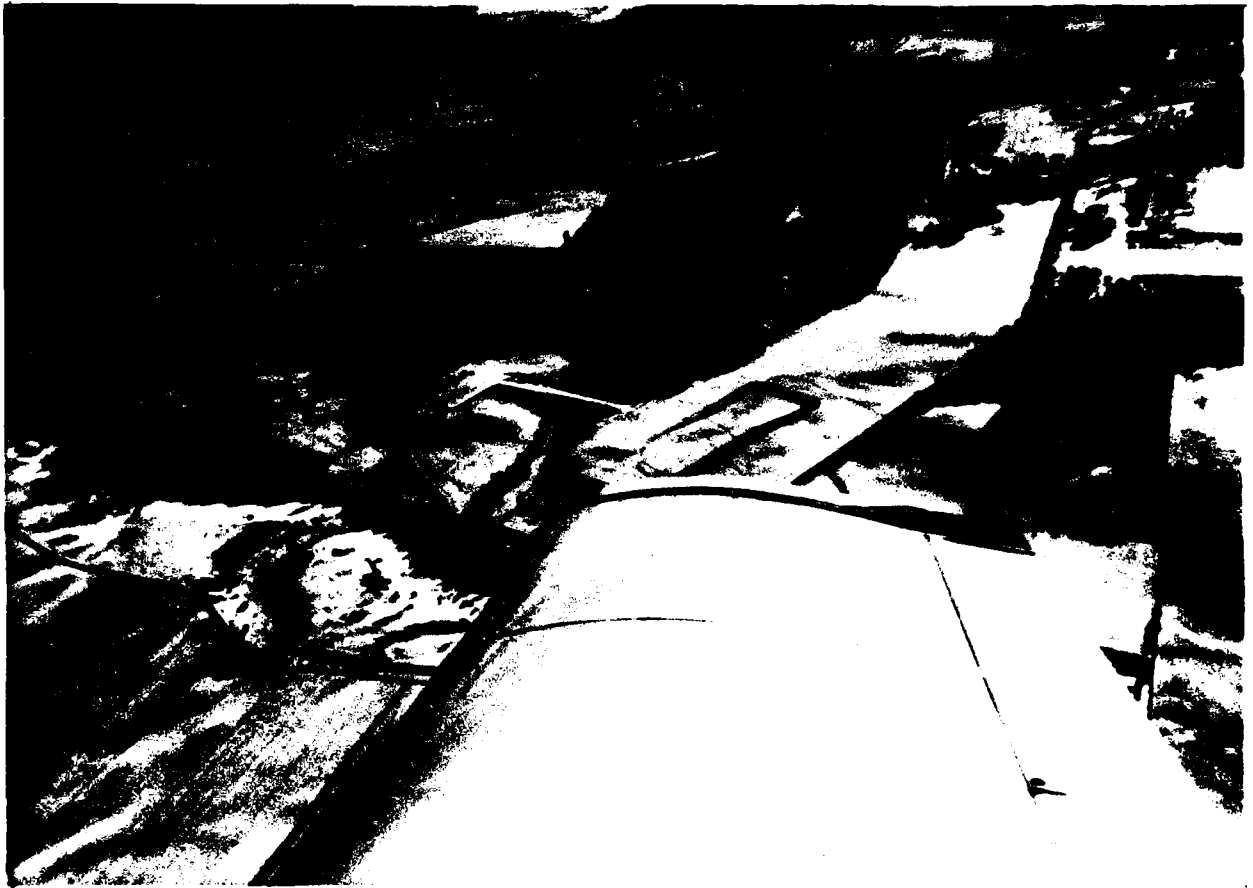
Date:


Robert J. Farrell, P.E.
New York No. 55983

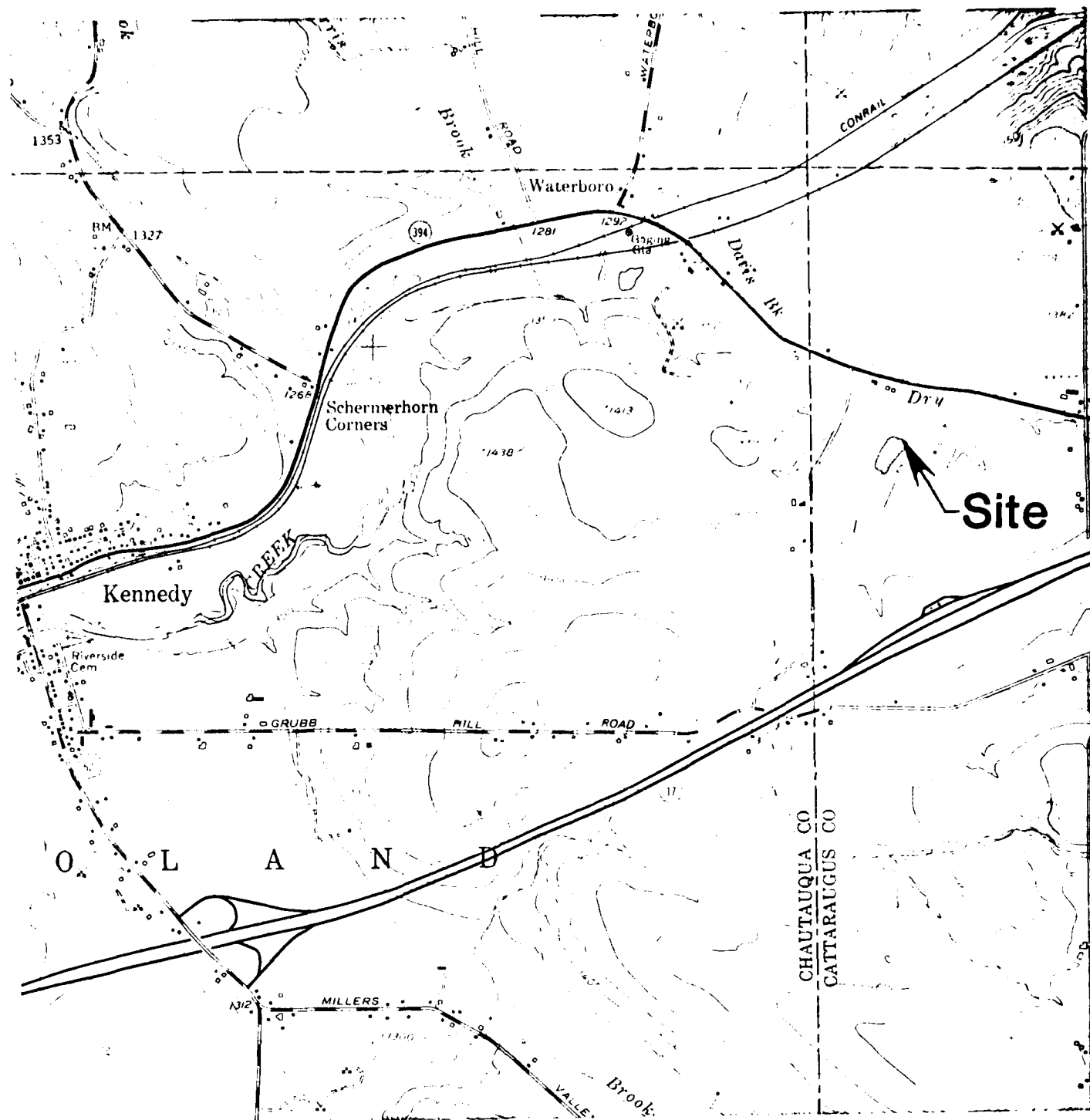

Col. W.M. Smith, Jr.
New York District Engineer

18 Aug 81

**Davis Brook Dam
(Site 1)**



AERIAL VIEW



Davis Brook Dam (Site 1)

LOCATION PLAN

Scale: 1"=2000'

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
CONEWANGO CREEK WATERSHED
DAVIS BROOK DAM (SITE 1)

SECTION I - PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I inspection reported herein was authorized by the New York District Corps of Engineers in a letter dated 24 February 1981, in fulfillment of the requirements of the National Dam Inspection Act, Public Law 92-367, dated 8 August 1972.

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 THE PROJECT

a. Location

The Davis Brook Dam is located approximately one-quarter mile east of the Chautauqua-Cattaraugus County line and approximately 800 ft. south of New York Rte 394. It can be reached from both New York Rt. 394 and Grubb Hill Road. The dam is approximately 2.5 miles east of Kennedy, New York and shown on U.S.G.S. Kennedy, New York quadrangle with coordinates approximately at N42° 09.7, W79° 03.4 (see location plan). Page B-4 of Appendix B is a site plan for this dam.

b. Description of Dam and Appurtenances

The dam consists of a zoned earthfill embankment with an earthfill cutoff trench below; a principal spillway with a reinforced concrete riser structure and outlet pipe; and a vegetated earth channel emergency spillway located at the right abutment. The length of the dam embankment is approximately 565 ft. The overall length of the dam is approximately 794 ft. including the emergency spillway which has a weir length of 200 ft.

1) Dam Embankment

The embankment consists of a zoned compacted earth structure of gravelly or silty sand and clayey silty gravelly sand. It is founded on glacial till. It is a maximum of 48 ft. high.

The upstream slope is 3 horizontal to 1 vertical and the downstream slope is 2.5 horizontal to 1 vertical. The crest width is 16 ft.

Beneath the embankment is an earthfill cutoff trench of variable width at the bottom. According to available plans it is constructed of the same material as the embankment.

2) Emergency Spillway

The emergency spillway is cut into sand and gravel in the right abutment. A diversion berm of compacted fill has been constructed on the east side with side slopes of 3 horizontal to 1 vertical. The grass covered channel curves around the east end of the dam embankment

The control section is 200 ft. wide and 30 ft. long and the downstream channel is roughly 250 ft. long.

3) Principle Spillway

The principle spillway consists of a reinforced concrete drop inlet structure with a sluice gate controlled inlet pipe, two uncontrolled orifice inlets and a 30 in. outlet pipe supported on a concrete cradle.

The inside dimensions of the riser structure are 32.25 ft. high and 7.5 ft. wide normal to the axis of the dam. It is 2.5 ft. long parallel to the embankment and flares to 14.2 ft. long at the top. The walls of the structure are 15 in. thick for the bottom 6 ft., 12 in. thick for the next 5 ft., and 10 in. thick for the top section. The top slab is 8 in. thick. The structure is founded on a 14 ft. by 15.5 ft. spread footing.

The "low stage inlet" is an uncontrolled opening approximately 16.3 ft. above the sluice gate invert. It is 16 in. wide and 12 in. high and is located in the upstream face of the riser structure. The water flows over this orifice and drops into the riser structure. It is protected by a trash rack assembly approximately 5.5 ft. high and 4.2 ft. wide. This assembly is fabricated from galvanized steel angle sections.

The "high stage inlet" consists of two openings approximately 30 ft. above the sluice gate invert. They are 7.5 ft. wide and 15 in. high and are located in the left and right sides of the flared portion of the riser structure. They are protected by a galvanized steel grating 25 in. high placed in front of each high stage opening and 5 galvanized steel angles placed in the sloping section below each opening. A 30 in. diameter manhole permits access into the riser structure.

The riser structure is drained by a 30 in. diameter reinforced concrete pressure pipe. It is approximately 224 ft. long and drops approximately 4.2 ft. over that length. The pipe penetrates the downstream side of the riser structure and is supported by a 7.5 in. thick concrete cradle within the embankment. Plans indicate 6 concrete anti-seep collars cast around the pipe within the embankment.

The downstream end of the conduit and cradle extend approximately 8 ft. downstream of the embankment. The pipe and bedding is supported by a reinforced concrete bent. The discharge conduit outlets into a stone revetted plunge pool.

4) Foundation and Embankment Drainage

A vertical seepage drain with graded filter is located in the downstream foundation at a variable distance downstream of the centerline of the dam. It extends the full length of the embankment. The drain is approximately 4 ft. wide and variable depth. For approximately 100 ft. either side of the principal spillway the drain includes a system of 8 in. diameter pipe which outlets to the left and right of the outlet conduit.

5) Reservoir Drain

The reservoir drain consists of a reinforced concrete inlet with an invert elevation of 1323.0 ft. (MSL). The inlet is drained by 42.0 ft. of 12 in. diameter cast iron pipe resting on a 4 in. thick unreinforced concrete cradle. The pipe enters the upstream side of the riser structure with an invert elevation of 1321.4 ft. (MSL), 1.0 ft. above the riser floor. The drain is regulated inside the riser structure by a 12 in. diameter slide gate, and a stem and pipe sleeve which rise to the wrench socket flush with the top slab of the riser, where a T-wrench handle may be inserted.

c) Size Classification

The dam's maximum height of 48 ft. places it in the INTERMEDIATE size category according to the Corps of Engineers' Recommended Guidelines.

d) Hazard Potential Classification

The hazard potential classification for this dam is HIGH because of the significant economic and high potential for loss of life downstream in the event of dam failure. Section 5 of this report presents more detailed discussion of the hazard potential.

e) Ownership

The dam is owned by Richard L. Shields
P.O. Box 224
Kennedy, New York 14747
Tele: (716) 267-4801

f) Operator

The dam is operated by:

Conewango Creek Watershed Commission
Donald Crowell, Chairman
RD #2
S. Dayton, New York 14138
Tele: (716) 988-3300

g) Purpose of Dam

The purpose of this dam is to reduce downstream flooding by providing temporary storage for the runoff from 1030 acres. The temporary storage is released gradually through the two-stage principal spillway system.

h) Design and Construction History

The dam was built under the Watershed Protection and Flood Prevention Act by the Conewango Creek Watershed Commission with the assistance of the Soil Conservation Service. It was completed in 1964.

i) Normal Operating Procedure

The dam is normally self-regulating.

1.3 Pertinent Data

a) Drainage Area

The drainage area for this dam covers 1.6 square miles. It is made up primarily of hilly woodland and pasture.

b) Discharge at Dam Site

1) Outlet Works

Normal discharge at the site is through the 30 in. diameter outlet pipe. In the event of severe flooding water would flow over the emergency spillway at elevation 1356.8 ft. (MSL). The invert of the low stage orifice is at elevation 1337.7 ft (MSL). The invert of the high stage orifice is at elevation 1351.4 ft. (MSL).

2) Maximum Known Flood

There is no data available for the maximum known flood at this dam site. Recent high water was observed at elevation 1347.5 ft. (MSL).

3) Ungated Spillway Capacity at Top of Dam

The capacity of the principal spillway with the reservoir at top of dam elevation 1361.6 ft. (MSL) is 165 cfs. The capacity of the emergency spillway is 6835 cfs at this level.

4) Ungated Spillway Capacity at Test Flood

The capacity of the principal spillway with the reservoir at test flood elevation (1359.7 ft. MSL) is 151 cfs. The capacity of the emergency spillway is 3103 cfs at this level.

5) Gated Spillway Capacity at Normal Pool

There are no gated spillways.

6) Gated Spillway Capacity at Test Flood

As previously mentioned, there are no gated spillways.

7) Total Spillway Capacity at Test Flood

The total spillway capacity at test flood elevation (1359.7 ft. MSL) is 3254 cfs.

c. Elevation (ft. above NGVD)

- 1) Streambed at toe of dam: 1313.4
- 2) Bottom of cutoff: variable, approximately 1312 minimum
- 3) Maximum tailwater - unknown, outlet conduit invert 1316.2
- 4) Normal pool: 1337.7
- 5) Full flood control pool: 1356.8
- 6) Spillway crest - Pond Drain Invert: 1323.0
Low level orifice: 1337.7
High level orifice: 1351.4
Emergency spillways: 1356.8
- 7) Design surcharge (original design): 1358.9
- 8) Top of dam: 1361.6
- 9) Test flood surcharge: 1359.7

- d. Reservoir (Length in feet)
 - 1) Length of maximum pool: 2100[±] ft.
 - 2) Length of normal pool: 800[±] ft.
 - 3) Length of flood control pool: 2000[±] ft.
- e. Storage (acre-feet)
 - 1) Normal pool: 23
 - 2) Flood control pool: 175
 - 3) Spillway crest pool:
 - a) Low stage inlet: 23
 - b) High stage inlet: 86
 - c) Emergency spillway: 175
 - 4) Top of dam: 273
 - 5) Test flood pool: 230
- f. Reservoir Surface (acres)
 - 1) Normal pool: 4
 - 2) Flood control pool: 18
 - 3) Spillway crest pool:
 - a) Low stage inlet: 4
 - b) High stage inlet: 14
 - c) Emergency spillway: 18
 - 4) Test flood: 21
 - 5) Top of dam: 23
- g. Dam
 - 1) Type: Earth Embankment
 - 2) Length: 565
 - 3) Height: 48 ft.
 - 4) Top Width: 16 ft.
 - 5) Side Slopes:

Upstream:	3H:1V
Downstream:	2.5H:1V
 - 6) Zoning: Embankment of clayey, silty, gravelly sand with dual graded filter at downstream embankment seepage drain under full length of embankment
 - 7) Impervious Core: Semi-pervious clayey silty gravelly sand
 - 8) Cutoff: Variable width, earthfill
 - 9) Grout Curtain: None
- h. Diversion and Regulating Tunnel

Not applicable

i. Spillways

1. Type:

- a) Principal Spillway: Reinforced concrete drop inlet
- b) Emergency Spillway: Grass covered earth channel cut in right abutment

2. Length of Weir:

- a) Low Level Orifice: 16 inches
- b) High Level Orifice: 15 feet
- c) Emergency Spillway: 200 feet

3. Crest Elevation: (feet above NGVD)

- a) Low Level Orifice: 1337.7
- b) High Level Orifice: 1351.4
- c) Emergency Spillway: 1356.8

4. Gates: None

5. Upstream Channel: Davis Brook, narrow stream to reservoir through farm and woodland

6. Downstream Channel: Davis Brook, narrow stream through farm and woodland

j. Regulating Outlet:

None

SECTION 2 - ENGINEERING DATA

2.1 GEOLOGY

Bedrock at the dam site is upper Devonian Age (345-375 million years ago) known as the Canadaway Group. These relatively underformed and flat-lying sedimentary rocks consist of interbedded shales and siltstones. Regionally, the rock forms a homocline dipping southward to southwestward at approximately 40 feet per mile. Small terraces and low folds locally modify this dip to essentially flat-lying over short distances. Only minor folding and faulting are found in the region with no major or active faults known to exist in the area.

The Davis Brook Dam is in a region classified as Zone 2 seismicity, as shown in Figure No. 1 of the Recommended Guidelines for Safety Inspection of Dams.

Pleistocene glaciation (beginning approximately 2 million years ago) modified the topography by means of both erosion and desposition. The thick continental ice sheet, moving southward from Quebec and Ontario, advanced and receded repeatedly in the area smoothing terrain by glacial scour and mantling the uplands with till deposits.

The Pleistocene geology of the dam site is that of glacial ground moraine. Generally alluvial gravels overlay dense sandy glacial till at the site. The till tends to be sparsely to moderately stony and very impermeable. In recent times, alluvium eroded from uplands has been deposited on these glacial deposits.

2.2 SUBSURFACE INVESTIGATION

Test hole logs are contained in the "As-Built" drawings; however, the copies are illegible and are not included in Appendix B.

2.3 DESIGN RECORDS

The records available for the project consists of 18 contract drawings which show the plans, sections and details for the dam, appurtenant structures, fencing details, and logs of test holes; and a design report issued by the U.S. Soil Conservation Service dated May 1969.

2.4 CONSTRUCTION RECORDS

Construction records and specifications are available at the U.S. Soil Conservation Service, Design Section, Syracuse, N.Y.

2.5 OPERATION RECORDS

No written maintenance or operation records exist for the dam.

2.6 EVALUATION OF DATA

Information obtained from the "As-Built" drawings is consistent with observations made during this inspection. The information obtained from available data was considered adequate for the Phase I inspection and evaluation.

SECTION 3 - VISUAL INSPECTION

3.1 Findings

a. General

The Davis Brook Dam is in GOOD condition at the present time.

b. Dam

1) Earth Embankment (See Photos 1, 5, 6, and 8)

The grass growth is heavy on this embankment impeding inspection of the slopes. Shrubs were noted along the right upstream abutment contact and to the right of the intake structure on the upstream slope.

Erosion gullies 1 to 2 in. wide and 1 in. deep were noted in the right downstream abutment contact.

The crest of the dam is in good condition.

There is no slope protection on the upstream slope other than the vegetative cover. Approximately 6 to 8 in. of erosion due to wave action was noted at and above the water line on the upstream slope.

The toe drain under the downstream slope shows no flow emanating from its outlets. The downstream left slope is wet over the bottom 15 ft. This may be the result of seepage or natural groundwater from the abutment. No staining was observed.

Animal burrows were noted in the right upstream and downstream slopes.

2) Emergency Spillway (See Photos 6, 7, and 8)

This spillway is in good condition. Some wet areas were noted but they are the result of natural groundwater or ponded runoff. Some debris was noted in the channel and should be cleared.

c. Appurtenant Structures

1) Drop Inlet Service Spillway (See Photos 1 and 2)

The structure is in good condition with no evidence of spalling, cracking, or efflorescence. The trash racks are in good condition, and free from debris accumulation.

2) Pond Drain Inlet Pipe

At the time of inspection, the 12 in. pond drain inlet was completely submerged and could not be observed.

d) Reservoir Area (See photos 5 and 8)

The shore of the reservoir is generally shallow sloping pasture or woodland. It appears to be stable and in good condition.

e) Downstream Channel (See photo 4)

The downstream channel is a narrow channel passing over relatively flat flood plain. There is rip rap protection of the plunge pool. Some erosion of the right bank has taken place downstream of the plunge pool.

3.2 Evaluation

The dam is generally in good condition. The potential problems noted during the visual inspection are listed below.

- a) The wet area noted over the bottom 15 ft. on the downstream left slope.
- b) Drainage gullies along the right downstream abutment.
- c) Animal burrows on the right upstream and downstream slopes.
- d) Debris on upstream slope and in the emergency spillway channel.
- e) Erosion of the downstream channel and the upstream slope of the dam at the waterline.
- f) Brush growing on the upstream slope and the right abutment contact.
- g) Operation of the drain gate could not be checked due to its inaccessibility.

SECTION 4 - OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

No written operation and maintenance procedures exist for the project. The normal operation of the project consists of allowing water to flow through the service spillway outlet pipe.

4.2 MAINTENANCE OF DAM

It is reported that maintenance of the dam is performed when the need arises. Maintenance is considered adequate.

4.3 WARNING SYSTEM IN EFFECT

No warning system is in effect or in preparation.

4.4 EVALUATION

The overall condition of the dam and appurtenant structures appears to be good. Recommendations in connection with regular maintenance are discussed in Section 7.

SECTION 5 - HYDRAULIC/HYDROLOGIC

5.1 Drainage Area Characteristics

Davis Brook Dam is located on Davis Brook, a tributary of Conewango Creek in the Allegheny River basin, and has a drainage area of 1.6 square miles. The dam is situated approximately 2.5 miles northwest of Kennedy New York. The topography of the watershed is hilly woodland and pastures.

5.2 Design Data

This dam was designed as a Class C structure in accordance with criteria established in Washington Engineering Memorandum SCS-27. Under this classification, the emergency spillway is designed for a rainfall equal to $P(100) + 0.26 [PMP - P(100)]$, while the freeboard pool is designed for the PMP rainfall.

The Soil Conservation Service (SCS) design calculations have been reviewed. The dam was designed to contain the runoff for the 100-year flood without discharging through the emergency spillway. The peak outflow is 126 cfs and the peak elevation is 1356.8 ft. (MSL). The SCS design allowed for a 50-year sediment accumulation with a storage of 23.3 acre-ft. The principal spillway consists of 30 in. diameter reinforced concrete water pipe and a 2.5 ft. x 7.5 ft. reinforced concrete riser with two 7.5 ft. x 15 in. openings with a crest elevation of 1351.4 ft. (MSL). The riser has a 1.0 ft. x 1.3 ft. orifice with a crest elevation of 1337.7 ft (MSL). The emergency spillway control cross section is 200 ft. wide, with side slopes of 3 horizontal to 1 vertical and a crest elevation of 1356.8 ft. (MSL). The dam crest elevation is 1361.6 ft. (MSL).

5.3 Analysis Criteria

The analysis of the spillway capacity of the dam and the storage of the reservoir was performed using the Corps of Engineers HEC-1 Dam Safety Version computer model. The unit hydrograph was defined by the Snyder Synthetic Unit Hydrograph method, and the Modified Puls routing procedure was incorporated. The Probable Maximum Precipitation (PMP) was 22.8 in. (24 hours 200 sq. miles) from Hydrometeorological Report #33 in accordance with the Recommended Guidelines of the Corps of Engineers. The dam is 48 ft. high and impounds approximately 273 acre-ft. at the top of the dam. The dam is classified as a HIGH hazard and INTERMEDIATE in size, according to the Recommended Guidelines of the Corps of Engineers. The spillway design flood is the Probable Maximum Flood (PMF). The floods selected for analysis were 20, 40, 50, 60, 80 and 100% of the PMF flows. The PMF inflow of 3261 cfs was routed through the reservoir and the peak outflow was determined to be 3254 cfs. The peak PMF outflow would produce a velocity of 7.0 ft./sec. on the emergency spillway and should not create an erosion problem.

5.4 Reservoir Capacity

The reservoir capacities at the crest of the emergency spillway and at the top of the dam are 175 acre-ft. and 273 acre-ft., respectively. Surcharge storage between the emergency spillway crest and the top of dam is equivalent to 1.1 in. of runoff from the drainage area.

5.5 Experience Data

There are no flood records for the dam site, however, during the field investigation, evidence of recent high water was observed at elevation 1347.5 ft. (MSL). This reservoir elevation corresponds to a peak outflow of 16 cfs.

5.6 Overtopping Potential

The maximum capacity of the spillways is 7000 cfs which is greater than the PMF peak outflow of 3254 cfs. The dam is not overtopped by the PMF, the peak elevation being 1.9 ft. below the top of the dam.

5.7 Analysis of Downstream Impacts

During the field investigation, dwellings and highways located downstream of the dam were identified and referenced to the channel invert. The cross section locations used in the downstream channel routing are shown on Page D-2, Appendix D. The impacts of the PMF on dwellings located downstream of the dam are shown in Table 5.1. For the purposes of this analysis, a danger of loss of life was assumed to exist if the computed PMF water surface was above the first floor elevation of a structure. This situation does not occur at any of the structures and no roads are overtopped during the PMF. In spite of these results, the potential danger of loss of life and economic damage is substantial enough to warrant classification as a HIGH hazard dam.

5.8 Evaluation

The spillway of Davis Brook Dam will safely pass the PMF without overtopping, and is therefore assessed as "Adequate". Potential problems include:

- a) The danger of loss of life and economic damage downstream of the dam for the test flood conditions.

TABLE 5.1
SUMMARY OF DOWNSTREAM IMPACTS FOR PMF

<u>Location #</u> <u>(see page D-2</u> <u>Appendix D)</u>	<u>Location</u>	<u># of Dwellings</u>	<u>Structure</u> <u>Height above</u> <u>Streambed*</u> <u>(ft)</u>	<u>Peak</u> <u>Flow</u> <u>(cfs)</u>	<u>Peak</u> <u>Stage</u> <u>(ft)</u>	<u>Comments</u>
1	1600' d/s of dam	1	14	3254	6	
2	1100' d/s Location #1	2	12	3251	8	
3	1600' d/s of Location #2	1 house 1 trailer	12.7 9.6	3246 3246	8 8	
4	500' d/s of Location #3	1 1	11.1 7.7	3246 3246	7 7	

*The structure height above the streambed is the difference between the first floor elevation and the channel invert.

SECTION 6 STRUCTURAL STABILITY

6.1 Visual Observations

There does not appear to be significant displacement or distress associated with the embankments at this site. The dam appears to be in good condition at the present time.

6.2 Design and Construction Data

Analyses carried out by the Soil Conservation Service during the design and construction phase included slope stability analyses by the infinite slope and Swedish circle methods. The soil parameters assumed for the final analysis were: Relative density 97%, $\phi = 31.5^\circ$ and $c = 675$ psf. Based on these assumptions, the factors for safety were higher than 2.5 for both upstream and downstream slopes. The dam is therefore considered to have adequate factors of safety for stability.

6.3 Post Construction Changes

There have been no known changes to any of the embankments or structures at this dam.

6.4 Seismic Stability

The dam is located in Seismic Zone No. 2 and, in accordance with the recommended Phase I guidelines, a seismic stability analysis is not warranted.

SECTION 7 - ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

Examination of the available documents and visual inspections of the Conewango Creek Watershed Davis Brook Dam (Site 1) and appurtenant structures did not reveal any conditions which constitute a hazard to human life or property. The dam and its appurtenances are considered to be in good condition at the present time.

Using the Corps of Engineers screening criteria for review of spillway adequacy, it has been determined that the dam would not be overtopped for the spillway design flood of the full PMF nor for one-half the PMF. The principal and auxiliary spillway capacity are, therefore, judged as adequate.

b. Adequacy of Information

This report and its conclusions are based on visual inspection, interview data, contract drawings, and office hydrologic/hydraulic studies. This information and data are adequate for a Phase I inspection.

c. Need for Additional Investigations

It is recommended that the services of a qualified registered professional engineer be retained to evaluate the wet condition observed on the lower portion of the left downstream slope.

The engineer should make recommendations for remedial measure if warranted and the owner should implement the findings of these studies.

d. Urgency

The recommended investigation should be completed within 12 months of notification to owner and remedial actions resulting from these investigations completed in the subsequent 12 months. The remedial measures or actions listed below should be completed within one year from notification to owner.

7.2 RECOMMENDED MEASURES

It is recommended that the owner institute the following remedial measures:

- 1) Develop a formal written downstream warning system to alert the appropriate officials and residents in the event of an emergency.
- 2) Develop and maintain a program of periodic technical inspections.

- 3) Implement a program of diligent and periodic maintenance including but not limited to: mowing of slopes and spillway channels; backgilling ruts, drainage gullies, and animal burrows with suitable compacted material; clearing debris from trash racks and upstream slopes; and checking the operability of the drain gate.
- 4) Remove trees and brush from slopes including the roots. The resulting voids should be backfilled with suitable compacted material.
- 5) Regrade and fill in the erosion gullies on the downstream right slope and reseed the disturbed areas.
- 6) Install ladder rungs on the riser to provide access to the drain gate housing.

APPENDIX A -
VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam Davis Brook Dam
Fed. I.D. # NY 00564 DEC Dam No. 8B-3805
River Basin Allegheny
Location: Town Randolph County Cattaraugus
Stream Name Tributary of Davis Brook
Tributary of Conewango Creek
Latitude (N) 42° 09.7' Longitude (W) 79° 03.4'
Type of Dam Earth Embankment
Hazard Category High
Date(s) of Inspection April 3, 1981
Weather Conditions Sunny, 70°
Reservoir Level at Time of Inspection Approximately elevation 1338.2 ft.

b. Inspection Personnel Mr. James Reynolds, Mr. Jeff Hardin, Mr. Bob Farrell,
Mr. Ken Avery

c. Persons Contacted (including Address & Phone No.)
U.S. Soil Conservation Service Rm 771-Federal Bldg., 100 So. Clinton St., Syracuse, NY
State Construction Eng: Philip "Skip" Nelson 1-315-423-5502
ARea 1 Proj. Engr. (Batavia): Pete Wright 1-716-343-3364
Contracting Ofc. (Conewango Creek Commission) Dick Shields 1-716-267-4801

d. History:

Date Constructed 1971 Date(s) Reconstructed _____
Designer U.S.D.A. Soil Conservation Service
Constructed by _____
Owner _____

Embankment

a. Characteristics

- (1) Embankment Material Gravelly or silty sand (SM) to clayey silt, gravelly sand (SC-SM) and (SP)
- (2) Cutoff Type Earthfill trench of variable bottom width
- (3) Impervious Core None
- (4) Internal Drainage System A dual graded filter makes up the downstream embankment, a 4 foot wide trench drain below the downstream embankment
- (5) Miscellaneous _____

b. Crest

- (1) Vertical Alignment Good
- (2) Horizontal Alignment Good
- (3) Surface Cracks None noted
- (4) Miscellaneous _____

c. Upstream Slope

- (1) Slope (Estimate) (V:H) 1 vertical to 3 horizontal
- (2) Undesirable Growth or Debris, Animal Burrows Brush growth approximately 30 feet right of intake structure, minor amounts of debris
- (3) Sloughing, Subsidence or Depressions None noted

(4) Slope Protection Vegetative cover and berm at water level 6 to 8 inches of wave erosion at or just above the present water level

(5) Surface Cracks or Movement at Toe None noted

d. Downstream Slope

(1) Slope (Estimate - V:H) 1 vertical to 2.5 horizontal

(2) Undesirable Growth or Debris, Animal Burrows Burrows 40 feet from right abutment 6 feet below crest (6" diameter), two more down slope

(3) Sloughing, Subsidence, or Depressions None noted

(4) Surface Cracks or Movement at Toe None noted

(5) Seepage Bottom 15 feet of left downstream slope is wet. This may be seepage or natural groundwater from the abutment, no flow could be discerned. No flow from toe drain outlets

(6) External Drainage System (Ditches, Trenches, Blanket) None noted

(7) Condition Around Outlet Structure Good

(8) Seepage Beyond Toe None noted

e. Abutments - Embankment Contact

A 6' x 6' slough has occurred approximately 12 feet below the crest at the left upstream contact. Heavy brush at right upstream contact

(1) Erosion at Contact None noted other than slough at left upstream contact

(2) Seepage Along Contact None noted other than seepage at left downstream slope discussed at 2-d-5

3) Drainage System

(a) Description of System 4 ft. wide trench drain containing a system of 8 in. diameter perforated pipe exiting on either side of the principal spillway outlet conduit

(b) Condition of System No flow was observed from the system

(c) Discharge from Drainage System None noted

4) Instrumentation (Monumentation/Surveys, Observation Wells, Weirs, Piezometers, etc.) None installed

5) Reservoir

a. Slopes Appear stable and in good condition

b. Sedimentation Very minor accumulation

c. Unusual Conditions Which Affect Dam None noted

6) Area Downstream of Dam

a. Downstream Hazard (No. of homes, highways, etc) Refer to Table 5.1

b. Seepage, unusual growth None noted

c. Evidence of movement beyond toe of Dam None noted

d. Conditions of Downstream Channel Small Slough on downstream right bank, approximately 20 ft. downstream of plunge pool

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

a. General Good

b. Condition of Service Spillway Good, no evidence of cracking, spalling or efflorescence

c. Condition of Emergency Spillway Generally good; needs mowing and clearing of debris

d. Condition of Discharge Conveyance Channel Good

8) Reservoir Drain/Outlet

Type: Pipe X Conduit _____ Other _____

Material: Concrete _____ Metal _____ Other Cast Iron

Size: 12" I.D. Length 42' (from dwgs)

Invert Elevations: Entrance 252 ft. Exit 252 ft.

Physical Condition (Describe): _____ Unobservable X

Material: _____

Joints: _____ Alignment _____

Structural Integrity: _____

Hydraulic Capability: _____

Means of Control: Gate _____ Valve X Uncontrolled _____

Operation: Operable _____ Inoperable X Other _____

Present Condition (Describe): Could not be operated due to missing handle.

9) Structural

- a. Concrete Surfaces N/A
- b. Structural Cracking N/A
- c. Movement - Horizontal & Vertical Alignment (Settlement) N/A
- d. Junctions with Abutments or Embankments N/A
- e. Drains - Foundation, Joint, Face N/A
- f. Water Passages, Conduits, Sluices N/A
- g. Seepage or Leakage N/A
- h. Joints - Construction, etc. N/A
- i. Foundation N/A
- j. Abutments N/A
- k. Control Gates N/A
- l. Approach & Outlet Channels N/A

m. Energy Dissipators (Plunge Pool, etc) _____ N/A

n. Intake Structures _____ N/A

o. Stability _____ N/A

p. Miscellaneous _____ N/A

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

a. Description and Condition _____ None

APPENDIX B

ENGINEERING DATA

APPENDIX B

<u>TITLE</u>	<u>PAGE</u>
Cover Sheet	B-2
Plan of Storage Area	B-3
Plan of Structural Works	B-4
Cut-Off Trench Excavation	B-5
Emergency Spillway	B-6
Fill Placement & Principal Spillway-Excavation	B-7
Drainage System	B-8
Drainage System	B-9
Plan Profile of Principal Spillway	B-10
Riser Structural Details	B-11
Riser Structural Details	B-12
Riser Structural Details	B-13
Riser Structural Details	B-14
Riser Trash Racks	B-15
Conduit Details	B-16
Reservoir Drain Inlet Details	B-17

1

CONEWANGO CREEK WATERSHED FLOODWATER RETARDING DAM SITE I

DRAINAGE AREA
FLOOD STORAGE
(TO EMERGENCY SPILLWAY SHEET)
WATER SURFACE AREA
(SEDIMENT POOL)
HEIGHT OF DAM
VOLUME OF FILL

10

54,5
61,3

BUILT UNDER THE WATERSHED PROTECTION
FLOOD PREVENTION ACT

BY

CONEWANGO CREEK WATERSHED COMM

WITH THE ASSISTANCE OF THE
SOIL CONSERVATION SERVICE

OF THE

U. S. DEPARTMENT OF AGRICULTURE

INDEX

SHEET 1	COVER SHEET
SHEET 2	PLAN OF STORAGE AREA
SHEET 3	PLAN OF STRUCTURAL WORKS
SHEET 4	CUTOFF TRENCH EXCAVATION
SHEET 5	EMERGENCY SPILLWAY
SHEET 6	FILL PLACEMENT AND PRINCIPAL SPILLWAY EXCAVATION
SHEET 7	DRAINAGE SYSTEM
SHEET 8	DRAINAGE SYSTEM
SHEET 9	PLAN PROFILE OF PRINCIPAL SPILLWAY
SHEET 10	RISER STRUCTURAL DETAILS
SHEET 11	RISER STRUCTURAL DETAILS
SHEET 12	RISER STRUCTURAL DETAILS
SHEET 13	RISER STRUCTURAL DETAILS
SHEET 14	RISER TRASH RACKS
SHEET 15	CONDUIT DETAILS
SHEET 16	RESERVOIR DRAIN INLET DETAILS
SHEET 17	FENCING DETAILS
SHEET 18	LOGS OF TEST HOLES
SHEET 19	LOGS OF TEST HOLES

/

ERSHED PROJECT G DAM

1030 Acres

175 Ac Ft.

4 Acres

43 Feet

~~54,500~~ Cu.Yds

61,361

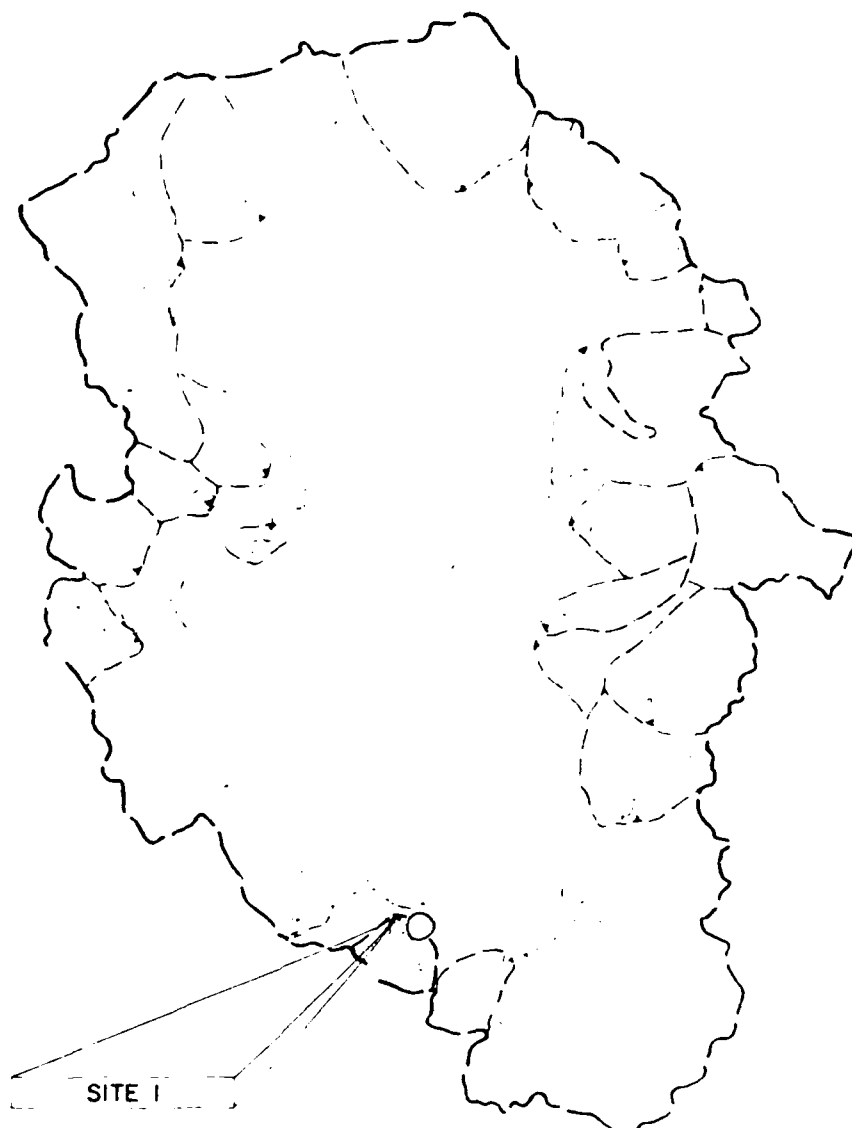
PROTECTION AND
FACT

ED COMMISSION

OF THE
VICE

CULTURE

ATION



SITE I

July 1st 1971
AS BUILT

NEW YORK STATE
SITE I
FLOODWATER RETARDING DAM
CATARAUGUS COUNTY, NEW YORK

ENGINEER
J.E. POLULECH 3/69

W. J. Polulech
19 NY 2155 P

B-2

CONSTRUCTION DETAILS

1. ALL AREAS FOR CLEARING AND GRUBBING INCLUDE THE FOLLOWING

- ✓ a. DASH AREA OF DAM NO. 1. FIVE EXPANSIONS BOTH UPSTREAM AND DOWNSTREAM FROM THE OF DAM. ALSO FOUNDATION EXCAVATION ON LEFT ABUTMENT AS SHOWN ON SHEET 2
- ✓ b. DASH AREA OF DAM NO. 1
- ✓ c. THE ENTIRE SPILLWAY INCLUDING 1 FEET OUTSIDE THE SLOPED AREA. AREA EXTENDING THE FULL WIDTH OF SPILLWAY AT THE BUTTRESS DOWN TO ELEV. 1330. ✓

✓ AS BUILT

✓ d. LIMITS OF AREA TO BE CLEARED AND GRUBBED SHALL BE STAKED IN THE FIELD BY THE ENGINEER.

2. DEPTH AND LIMITS OF WORKING EXCAVATION SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER AS REQUIRED. SLOPING OF THE WORKING AREA SHALL BE NO STEEPER THAN 4 HORIZONTAL TO 1 VERTICAL.

3. AREAS UPSTREAM FROM DAM AND BELOW ELEVATION 1340 SHALL BE CLEAR D. LIMITS OF AREA TO BE CLEAR D SHALL BE STAKED IN THE FIELD BY THE ENGINEER.

4. BOTTOM SECTION OF DAM AND SPILLWAY TO BE COVERED WITH TOP SOIL FROM STATION 1340 APPROX. STATION 1340.

ELEVATIONS

B.M. #3	1316.48	
TBM #1	1329.75	DISK-NAIL-CHERRY TREE ON CREEK BANK
TBM #4	1366.46	DISK-NAIL-CHERRY TREE FENCE LINE 12" TRUCK RIGHT ABUTMENT
TBM #5	1350.35	DISK-NAIL-ELM TREE LEFT ABUTMENT - Downstream From E Dam

70" STEEL PIPE
IN ELEV. 1367.9



12 1/2 mi.
to New York

515 01 1/2 mi.

17 1/2 mi.

1/2 mi. to New York

104 ft

CONSERVATION

BORROW AREA

TRUCK

375

CONSERVATION

CONSERVATION

375

TO NEW YORK

ROUTE 17

114 1316 18
(4012 1316 18)

CONSERVATION

July 1957
AS BUILT

CONEWANGO CREEK WATERSHED
SITE I

CONSERVATION AREA

PLAN OF STORAGE AREA

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

J. E. POLULECH 8/68

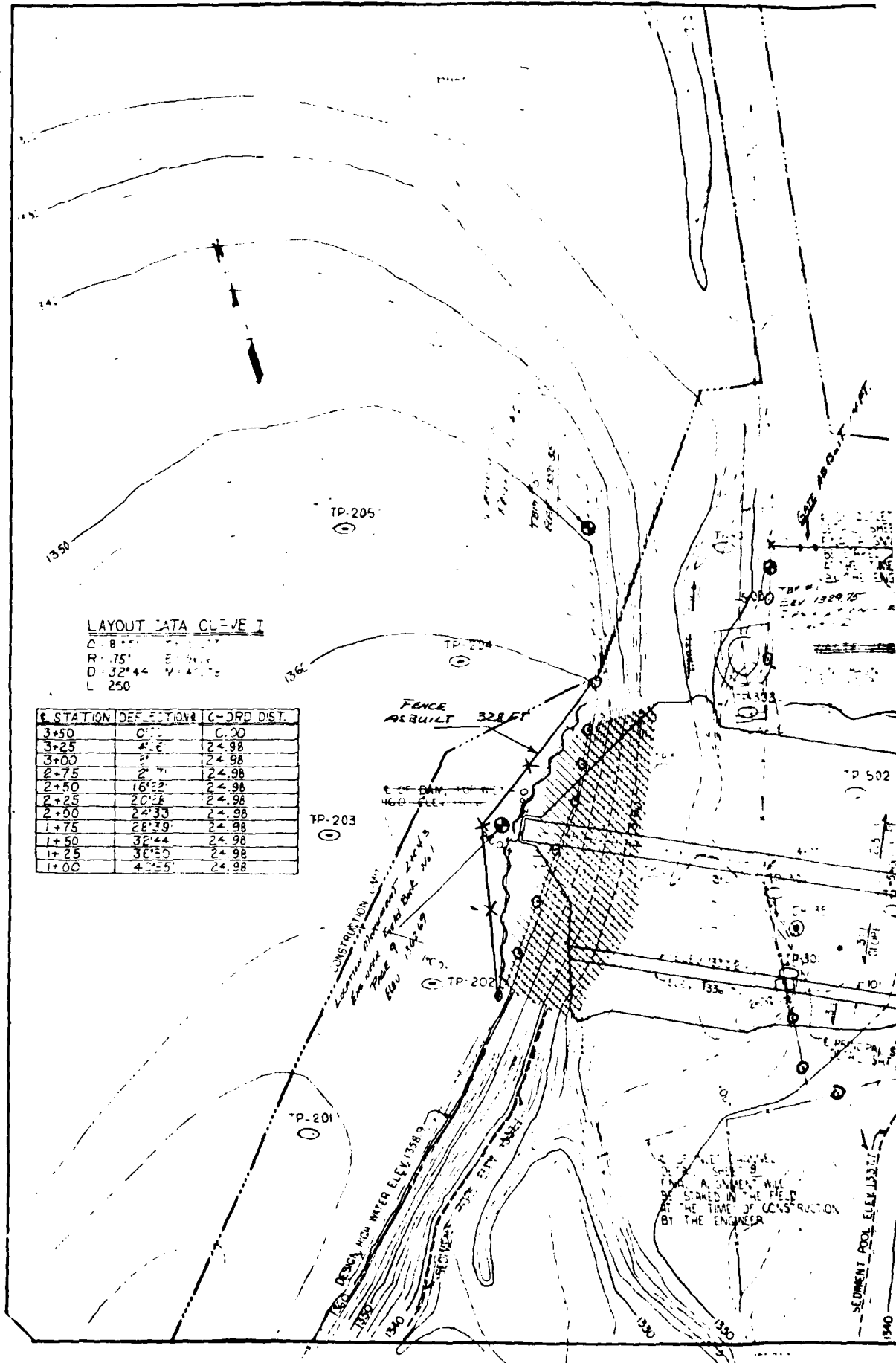
NY-2155 P

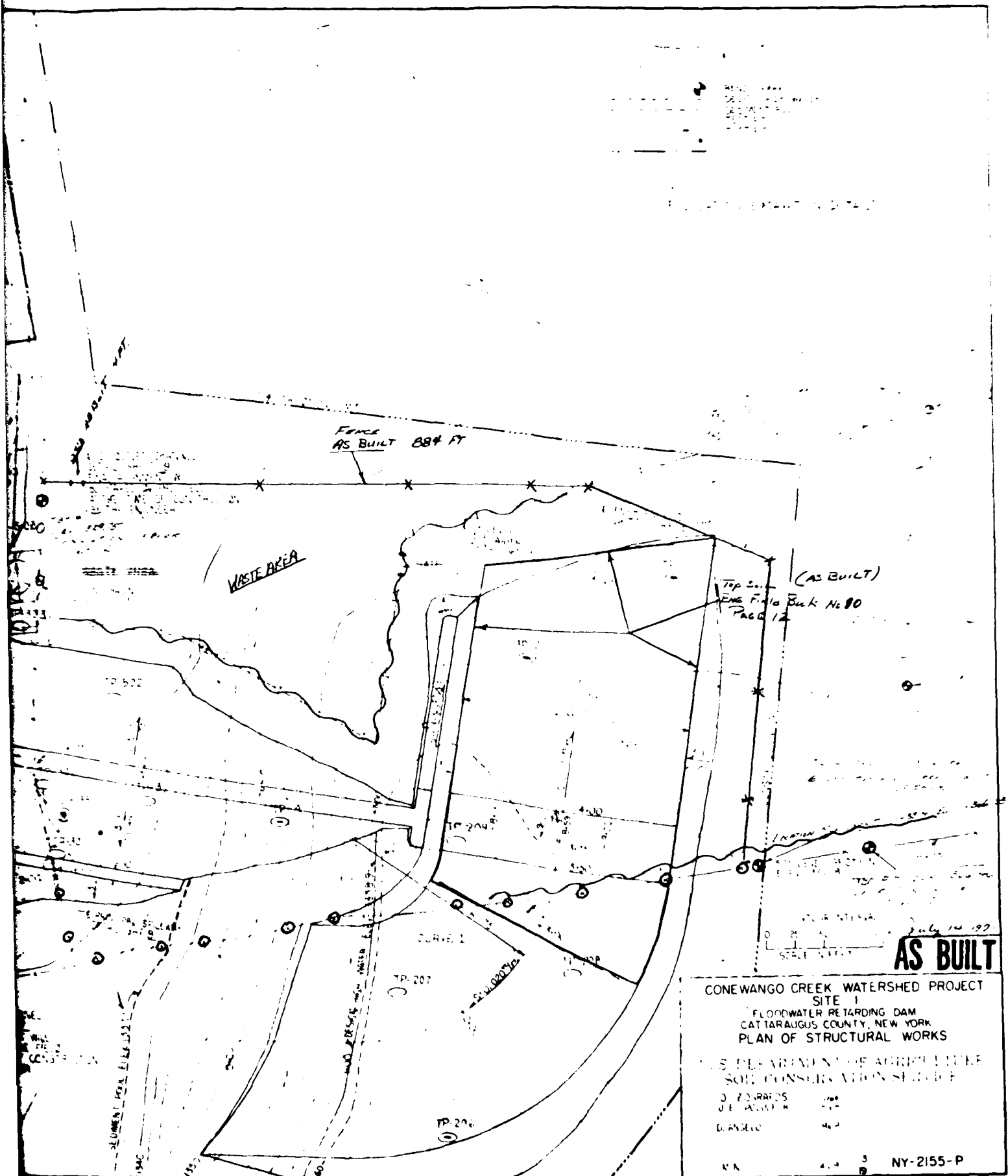
B-3

LAYOUT DATA CURVE I

C = 8.00
 R = 75' E
 D = 32° 44' V
 L = 250'

STATION	DEFLECTION	C-ORD. DIST.
3+50	0° 00'	0.00
3+25	4° 00'	24.98
3+00	8° 00'	24.98
2+75	12° 00'	24.98
2+50	16° 00'	24.98
2+25	20° 00'	24.98
2+00	24° 00'	24.98
1+75	28° 00'	24.98
1+50	32° 00'	24.98
1+25	36° 00'	24.98
1+00	40° 00'	24.98





See Bank Sections
 STA 2+20, 2+40, 3+00
 See Sheet 18A

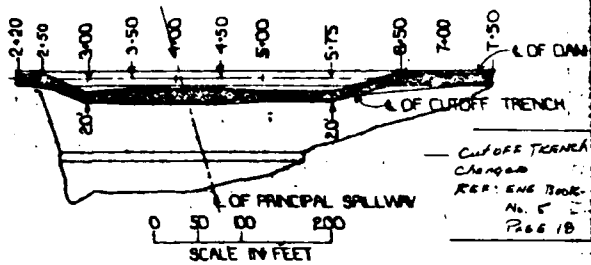
SECTION OF CUTOFF TRENCH AT STA 2+00
 TYPICAL FROM APPROX STA 1+00 TO STA 3+00 AND
 FROM STA 5+00 TO APPROX STA 6+00

SECTION OF CUTOFF TRENCH AT STA 3+25
 TYPICAL FROM STA 3+00 TO STA 3+50 AND FROM
 STA 4+00 TO STA 5+00

MAXIMUM SLOPE
 ONE HORIZONTAL
 TO ONE VERTICAL

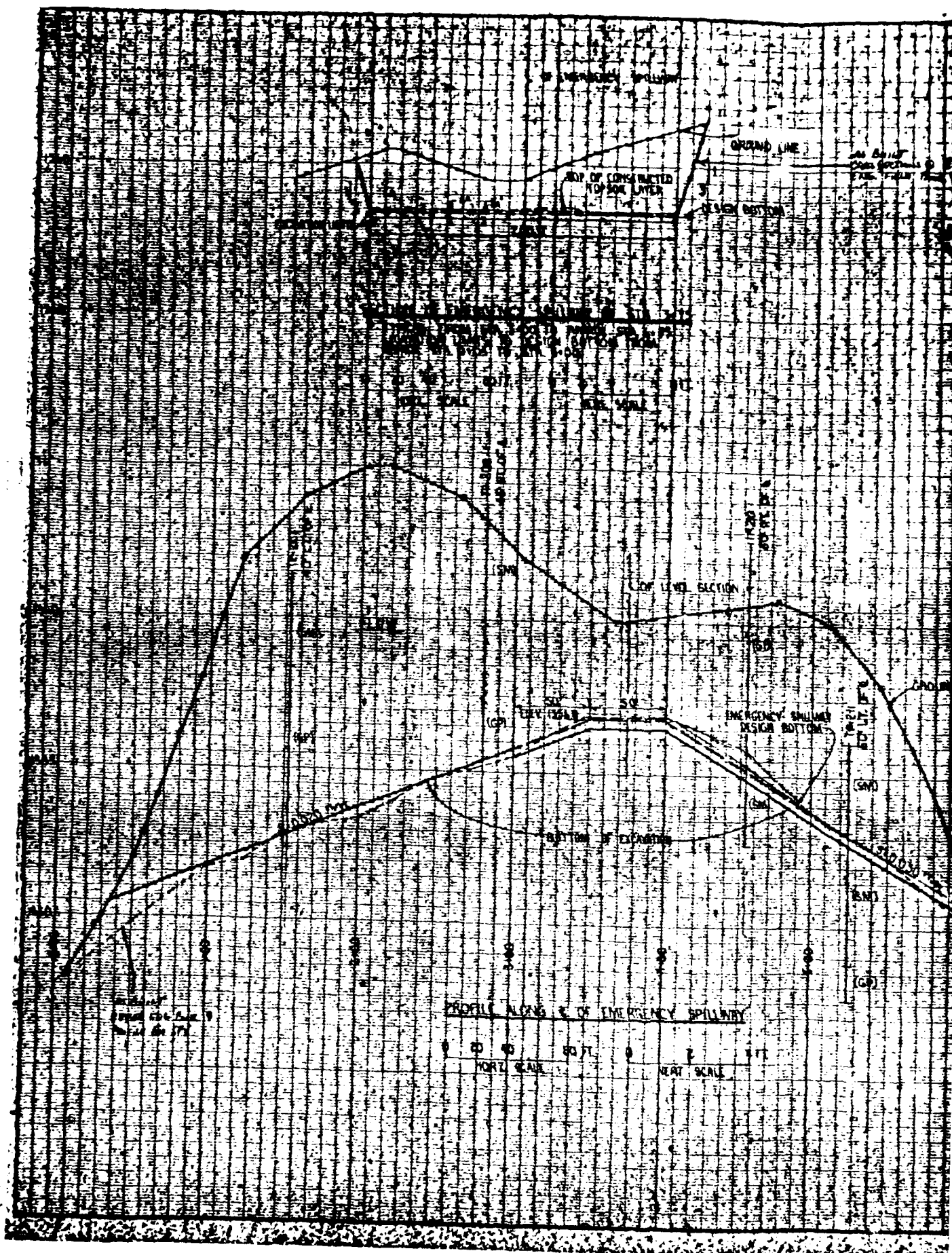
BOTTOM OF FOUNDATION
 EXAMINATION
 SEE FOUNDATION EXAM
 DETAILS, SHEET 23

INTERFACE BETWEEN ASSUMED
 AND EMBANKMENT SHALL BE
 NO STEEPER THAN TWO (2)
 HORIZONTAL TO ONE (1) VERTICAL



PROFILE ALONG E OF CUTOFF TRENCH
 (ALL STATIONING FROM E DAM)

VERTICAL SCALE

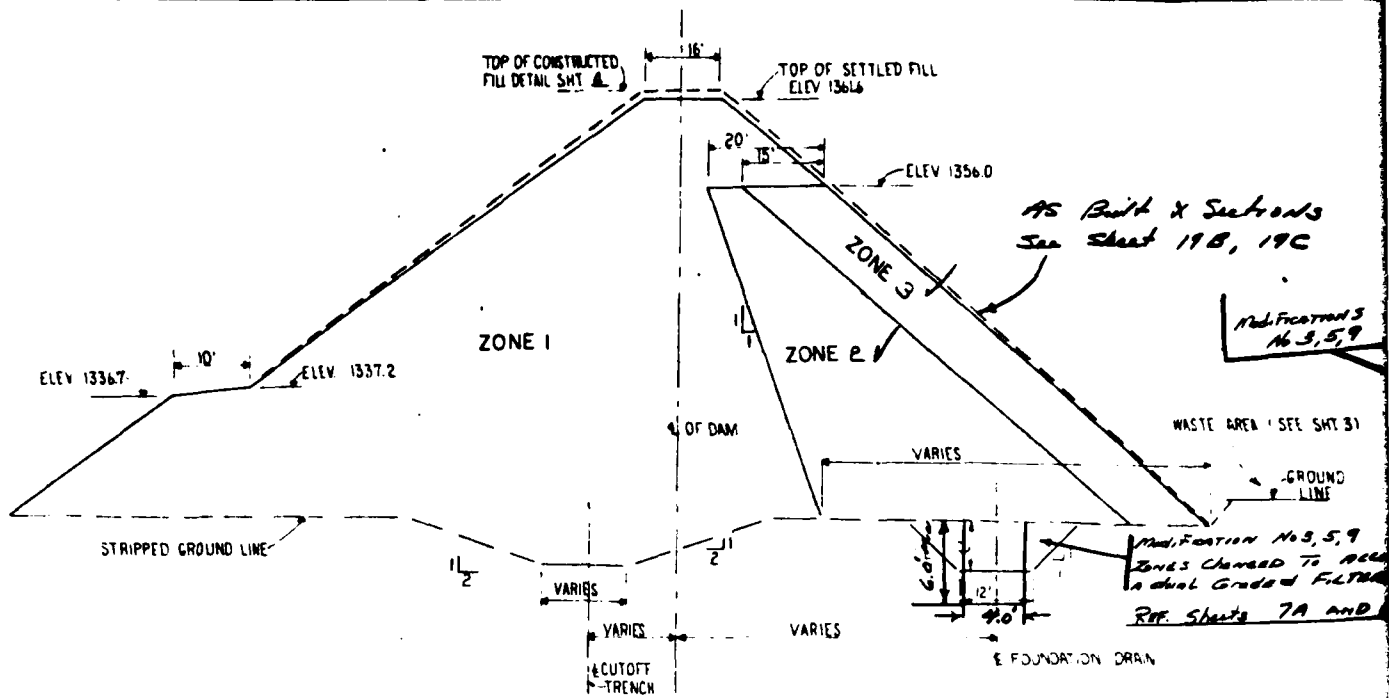


See Sheet 19D - R Built

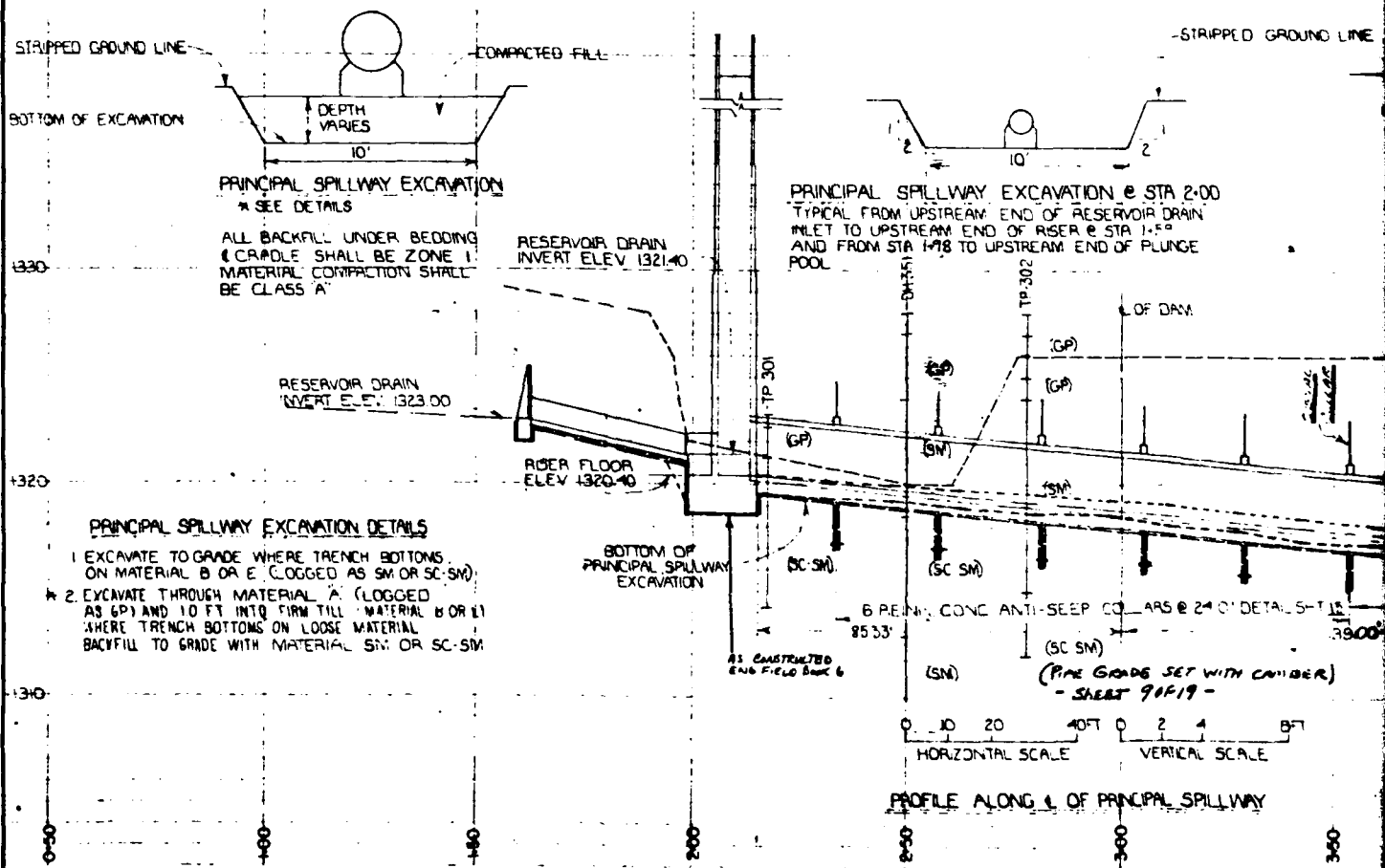


AS BUILT

CONEWANGO CREEK WATERSHED PROJECT SITE I FLOODWATER RETARDING DAM CATARAUGUS COUNTY, NEW YORK EMERGENCY SPILLWAY			
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE			
Designed by J. E. POLLECH	Date 8/58	Approved by W. E. GRAHAM, JR.	Date 8/58
Drawn by W. E. GRAHAM, JR.	Date 8/58	Checked by D. C. CHAPMAN	Date 4/59
Project No. 6		Drawing No. NY-2158-P	



SECTION OF DAM AT STA 3+00
TYPICAL FROM APPROX STA 1+80 TO STA 7+58



with x Sections
Sheet 118, 119C

Modification 5
16, 5, 5, 9

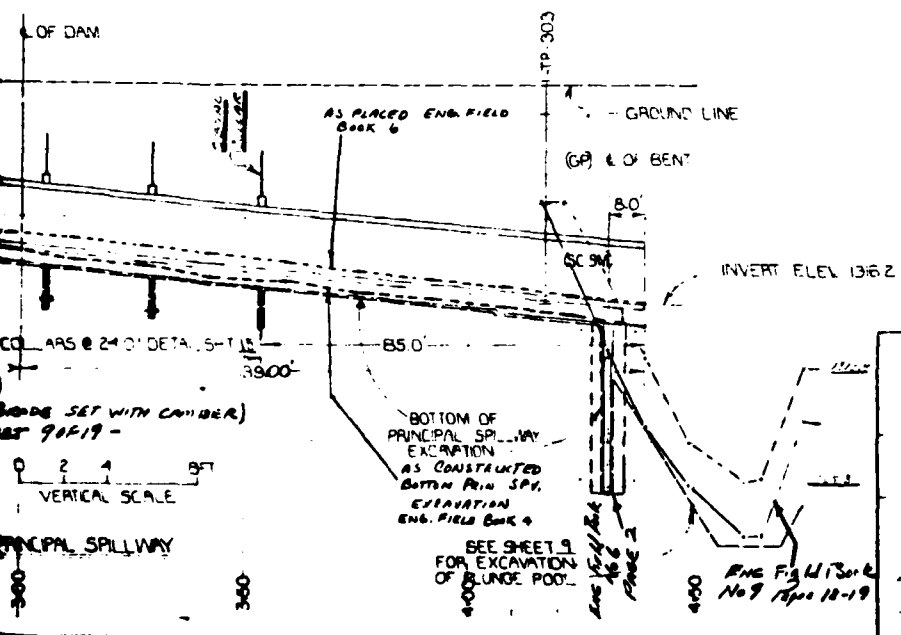
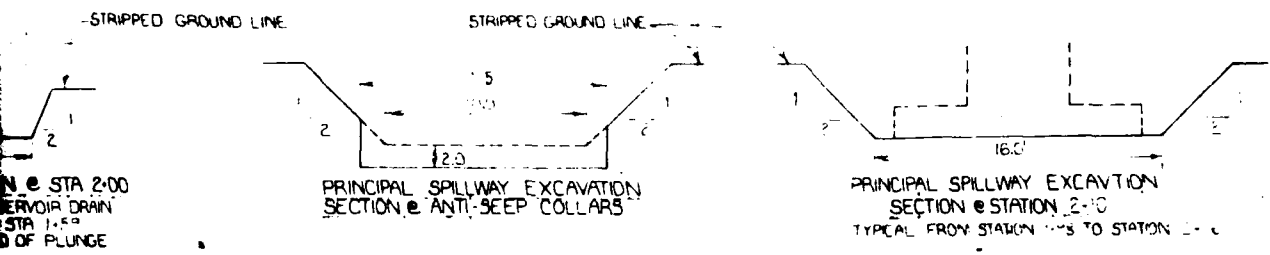
WASTE AREA (SEE SHT 3)
GROUND LINE
Modification No 3, 5, 9
ZONES CHANGED TO ALLOW
A DUAL GRADED FILTER
SEE SHEETS 7A AND 8A

EARTH FILL REQUIREMENTS					
ZONE	MATERIAL	MAX ROCK SIZE 2/	MAX LIFT THICK 3/	REQUIRED WATER CONTENT 4/	COMPACTION 5/
1	MATERIALS B, D, E, G, AND H AS LABELLED ON SHEET 11 AND REPRESENTED BY: TP 101 FROM 1' TO 12' TP 211 FROM 29' TO 73' TP 212 FROM 35' TO 8' TP 206 FROM 0.5' TO 27' TP 401 FROM 2' TO 5' TP 202 FROM 1.5' TO 5.5'	6"	4"	MINIMUM WATER CONTENT SHALL BE 2 PERCENTAGE POINTS BELOW OPTIMUM	CLASS A 97% STD DENSITY BASED ON ASTM D-698, METHOD A
2	MATERIAL "A" AS LABELLED ON SHEET 11 AND REPRESENTED BY: TP 205 FROM 2' TO 4.5'	6"	4"	WET 2/	SEE CONSTRUCTION SPECIFICATION 2
3	SAME AS MATERIAL IN ZONE 2 PLUS OVERSIZE REMOVED FROM ZONE 2	18"	27"	WET 2/	SEE CONSTRUCTION SPECIFICATION 2

- 1/ THE PLACEMENT TABLE INDICATES PLACEMENT OF MATERIAL.
- 2/ MAXIMUM ROCK SIZE PLACED IN HAND COMPACTED BACKFILL SHALL BE 5 INCHES.
- 3/ MAXIMUM LIFT THICKNESS PRIOR TO COMPACTION.
- 4/ WATER CONTENT AT TIME OF COMPACTION.
- 5/ FOR TYPICAL COMPACTION CURVES SEE SHEET 11A.
- 6/ WET MATERIAL THOROUGHLY BUT NOT EXCESSIVELY TO CAUSE SOIL TO ADHERE TO WHEELS OR TRACKS OF EQUIPMENT OR TO BOUNCE DOWN EQUIPMENT.

CONSTRUCTION DETAILS

- 1 THE FOUNDATION SURFACE THROUGH THE BASE AREA OF THE DAM SHALL BE SCARIFIED TO A DEPTH OF 6 INCHES AND COMPACTED PRIOR TO PLACEMENT OF FILL MATERIAL.
- 2 ZONE BOUNDARIES INDICATED ARE APPROXIMATE. ADJUSTMENTS WILL BE MADE BY THE ENGINEER TO PERMIT THE CONTRACTOR TO UTILIZE ANY USABLE REQUIRED EXCAVATION WITHIN THE NEAR LINED OF THE EMBANKMENT.
- 3 ~~THE 10' TO 12' MATERIAL SHALL BE USED FOR THE~~
~~EXCAVATION OF THE EMBANKMENT TO WHICH IT WILL BE~~
~~INCORPORATED WITHIN THE BOUNDARY OF THE EXCAVATION~~
~~INDICATED BY THE ENGINEER.~~



NOTE FOR GRADERS FOR (CUT-H)
ANTI-SEEP COLLARS, PRINCIPAL
SPILLWAY, BENT FROM RIN SPI
TO ENGINEERING FIELD BOOK 6

July 14, 1971
AS BUILT

CONEWANGO CREEK WATERSHED PROJECT
SITE 1
FLOODWATER RETARDING DAM
CATTARAUGUS COUNTY, NEW YORK
FILL PLACEMENT & PRIN SPWY EXCAVATION
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

D ZOGRAFOS	249
J DE VITA III	260
D ZOGRAFOS	369

NY-2155-P

17' From E Dam
Sta 2000
Ref. Sheet 6A of 19
Also Ref. ENG Field Book
No. 7 - Nov 17

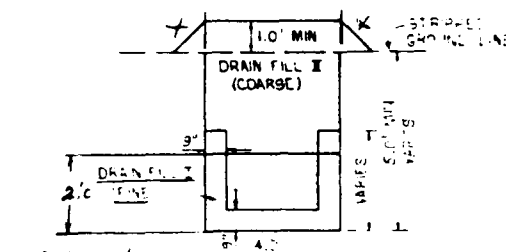
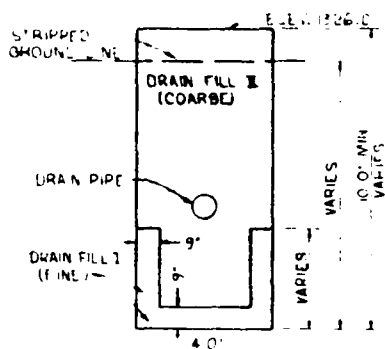
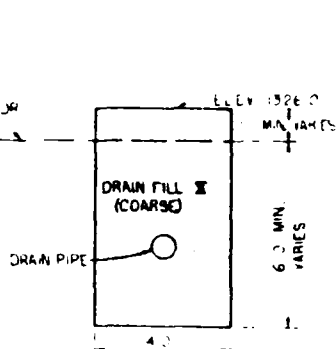
1. DRAIN FILL #1 (FINE) SHALL MEET THE GRADATION OF ASTM C33-A2 FOR FINE AGGREGATE. IN ADDITION, THE PERCENTAGE OF MATERIAL IN DRAIN FILL #1 FINER THAN A #200 SIEVE SHALL NOT BE MORE THAN 3 PERCENT.
2. DRAIN FILL #2 (COARSE) SHALL MEET THE GRADATION OF ASTM C33-A2 FOR COARSE AGGREGATE #1. IN ADDITION, THE PERCENTAGE OF MATERIAL IN DRAIN FILL #2 FINER THAN A #20 SIEVE SHALL NOT BE MORE THAN 3 PERCENT.

DRAINAGE OF THE DRAINAGE

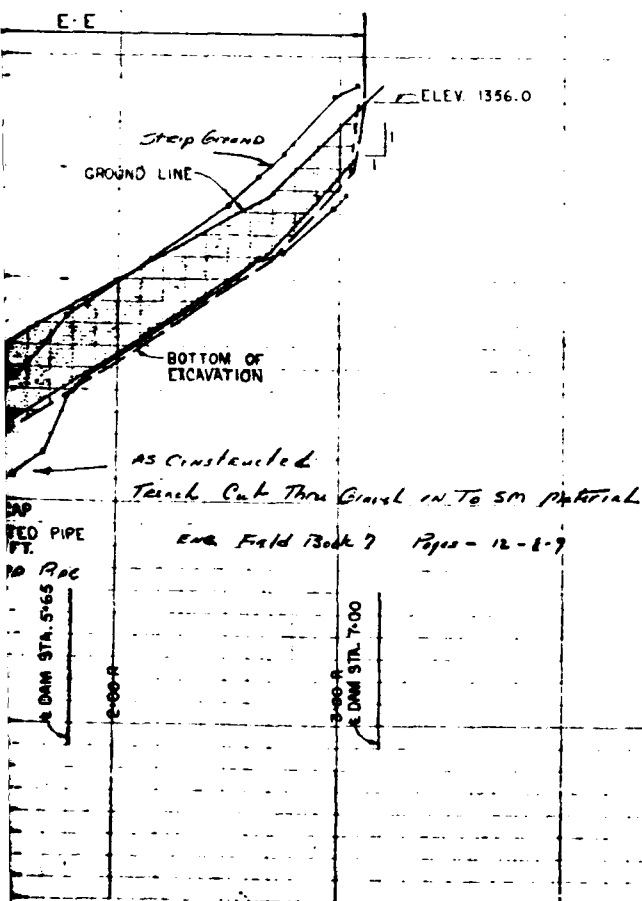
1. ALL DRAIN PIPE SHALL CONFORM TO THE FOLLOWING: 1.1 IN. SMALL R. P. DIA., SHALL BE THE MINIMUM SIZE OF THE PIPE.
2. THE PROFILE AT THE BOTTOM OF ALL DRAIN SHALL BE SUCH AS TO SHOW ARE ONLY APPROX. TO THE ACTUAL. THE ACTUAL ARE WILL BE ESTABLISHED IN THE FIELD. A. THE ACTUAL CONSTRUCTION OF THE DRAIN.

PA: 17, A4

- 670 CU. YDS. DRAIN FILL 2' DIA. (INTERNAL ANGLE)
70 CU. YDS. DRAIN FILL 1' DIA. (INTERNAL ANGLE)
264 FT. OF 8" DIA. PERFORATED PIPE
46 FT. OF 8" DIA. NON PERFORATED PIPE
(1) 3-PIECE 90° ELBOW 8" DIA. (INTERNAL ANGLE)
(1) 3-PIECE 11 1/2 3/4° ELBOW 8" DIA. (INTERNAL ANGLE)
(2) SMALL ANIMAL GUARDS
(2) METAL END CAPS



826 1.16
Sheet 8A of 19



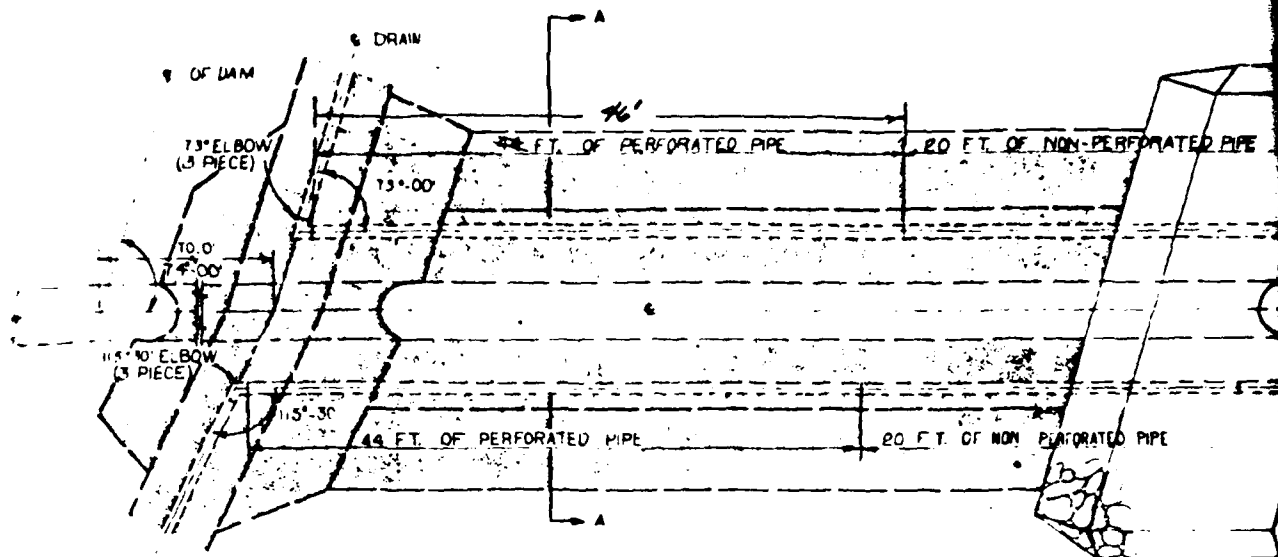
CONTRACT MODIFICATION NO. 3

**CONEWANGO CREEK WATERSHED PROJECT
SITE I
FLOODWATER RETARDING DAM
CATTARAUGUS COUNTY, NEW YORK
DRAINAGE SYSTEM**

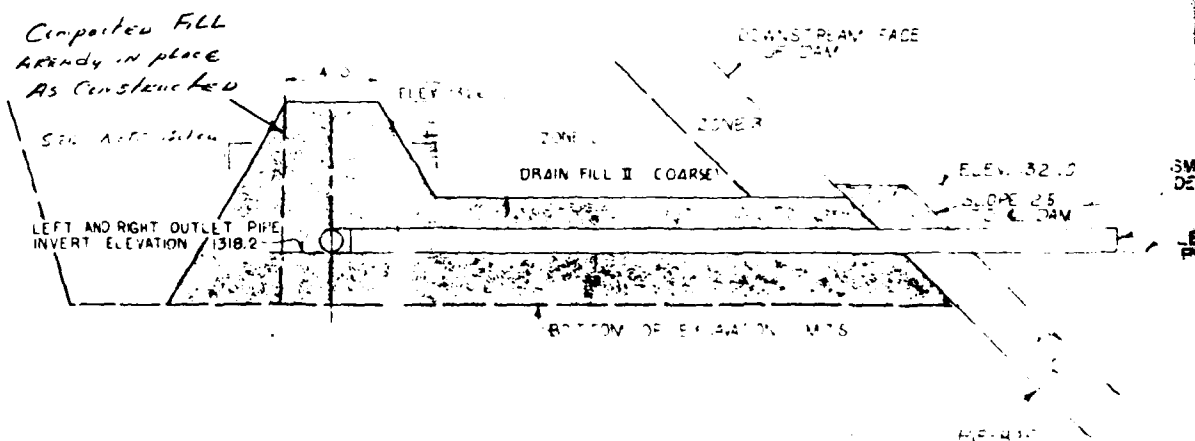
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Drawn by	A FEMER	4-71 (info)	Approved by
	DENE ZOGRAFOS	2-69	1-10
Drawn			
	Q ANGELD	11-69	
Traced			1-10
Indexed			Sheet
	J E POLULECH	4-71	7A
			19

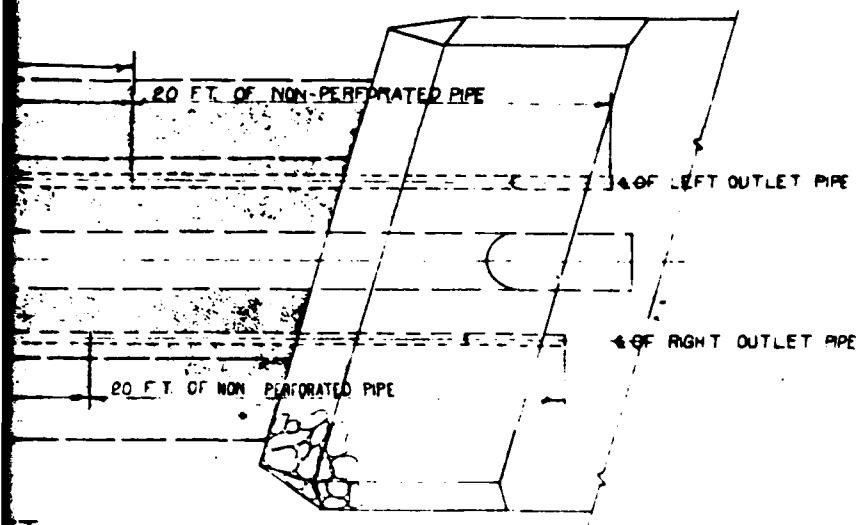
NY-2155-P



PLAN OF DRAIN OUTLET
(NOT TO SCALE)

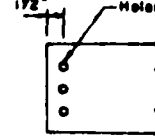
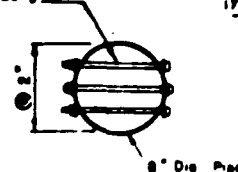


PROFILES ALONG DRAIN OUTLETS

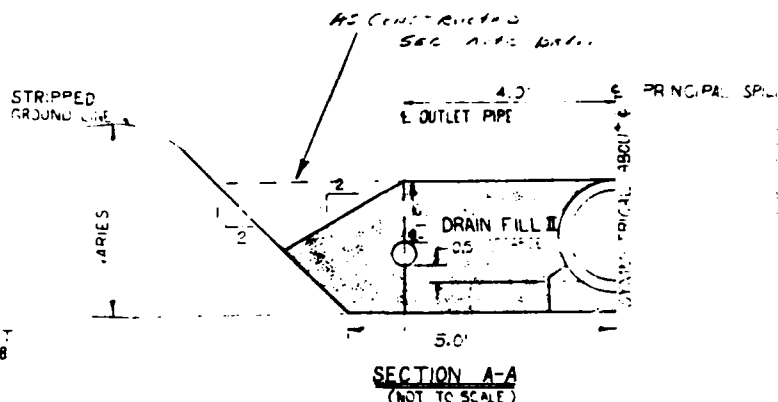
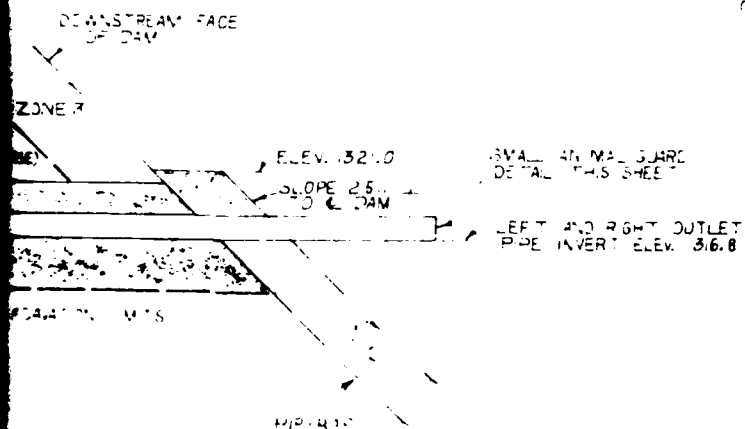


3/8" Dia. Bolts
w/ Hex Nuts And Washers
9" Long

Drill 1/2" Dia.
Holes



SMALL ANIMAL GUARD DETAILS



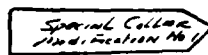
*Note (Sheet 7A-19 - Sheet 8A-19)
REF: To Job Diary Report No
(117-118)*

*ALL Changes Made OK by
lessor, Clerk And Dr. Shucklin*

*John Shucklin
Chief of Field*

CONTRACT MODIFICATION # 3	
CONEWANGO CREEK WATERSHED PROJ	
SITE 1	
FLOODWATER RETARDING DAM	
CATTARAUGUS COUNTY, NEW YORK	
DRAINAGE SYSTEM	
U. S. DEPARTMENT OF AGRICULTURE	
SOIL CONSERVATION SERVICE	
A. FENER	4-71
DENE ZOGRAFOS	2/69
G. BURDICK	3/69
JEP	4-71
DC	3/69
BA	NY-2155-P

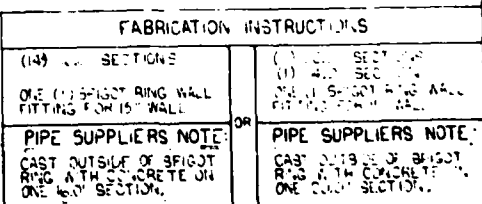
	376.58		
6 6435	1319.15		
" "	1319.15		
6 1850	1319.15		
6 6626	1319.15		
6 1875	1319.15		
6 875	1319.15		
6 1875	1319.15		
6 6626	1319.15		
6 1875	1319.15		
6 8	1319.15		
6 1276	1319.15		



I		108	2	
II			3	
III		126	3	44
V			15	
VII		179	15	

[illegible]

ALL RIPRAP SHALL BE GRADED FROM A MAX. SIZE OF 18" TO A MAX. SIZE OF 3". A MAX. OF 20% SHALL BE LESS THAN 6" (≈ 10 LB.) AND A MAXIMUM OF 60% SHALL BE LESS THAN 12" (≈ 80 LB.)



WHEN PIPE IS SUPPLIED IN 20.0' LENGTHS THE ENGINEER
SHALL PROVIDE THE CONTRACTOR WITH A REVISION OF THE
SHEET SHOWING ORDER OF INSTALLATION AND PIPE INVERT
ELEVATIONS.

July 14, 1971
AS BUILT

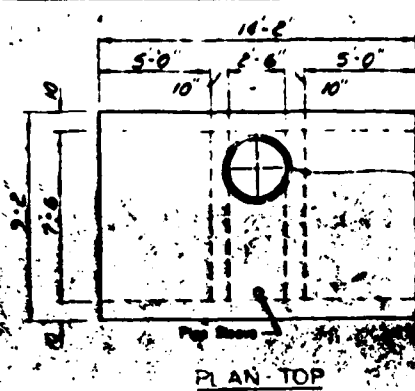
**CONEWANGO CREEK WATERSHED PROJECT
SITE I
FLOODWATER RETARDING DAM
CATARAUGUS COUNTY, NEW YORK
PLAN PROFILE OF PRINCIPAL SPILLWAY
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE**

D ZOGRAFOS	12/68
D ANGELO	12/68

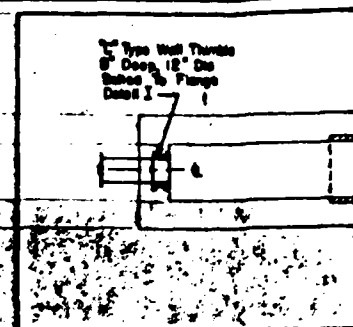
M. A. POLULECH

NY-2155-P

B-10

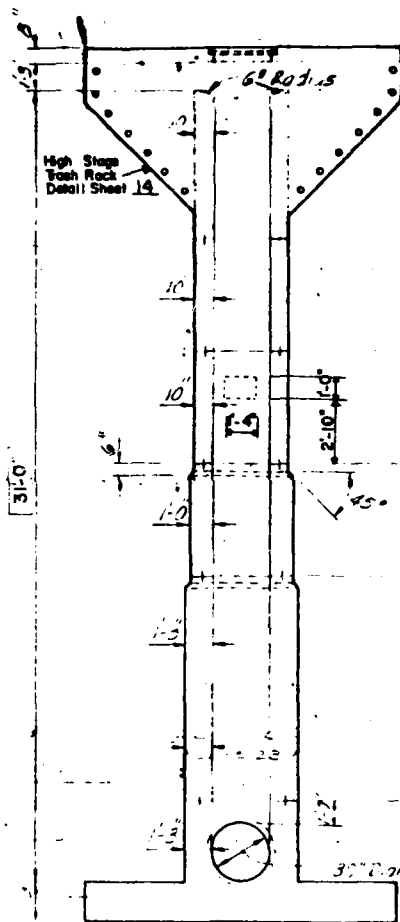


**Manhole Frame
Manhole Assembly Details**
Circle Manhole Assembly
Minimum Clear Opening 50"
Hesselt Pumping Company
Model R-648 - MN With
Bottom Cap Service Or
Approved Equivalent

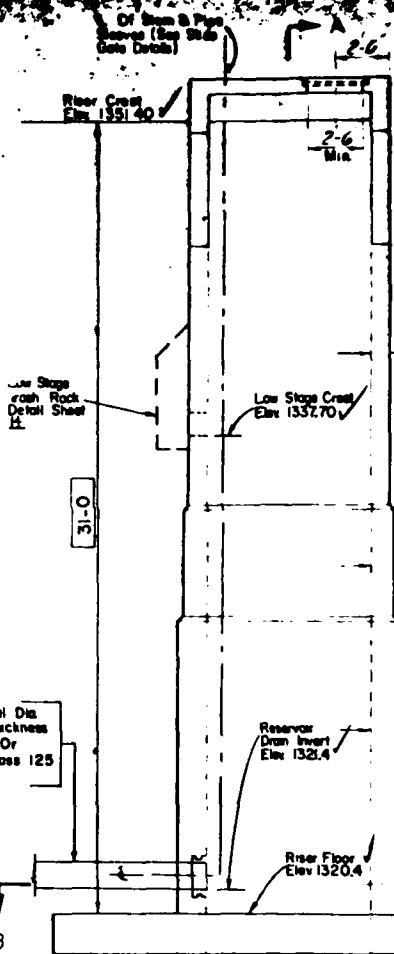


Spiral
Detail Sheet

Continuous
Splices Shall
Welded
Lapped 3"
Lapped 3"



Construction
Unit



**PLAT
CONSTR.**

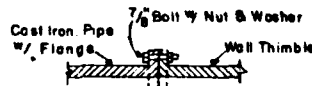


CONSTR. II

SECTION A

CONSTRUCTION DETAILS

1. SPECIFIED BAR DIMENSIONS ARE MEASURED TO OUTSIDE EDGE OF ALL BENDS.
2. RADIUS OF BENDS EQUALS 3 BAR DIAMETERS FOR SIZES EQUAL TO OR LESS THAN #7.
3. THE 2" AND 3" DISTANCE FROM SPECIFIED CONCRETE SURFACES ARE CLEAR DISTANCES WHERE NOT OTHERWISE SPECIFIED ALL REINFORCING STEEL PLACED IN CONCRETE POURED AGAINST THE GROUND SHALL HAVE A MINIMUM OF 3" COVER. ALL REINFORCING STEEL PLACED IN CONCRETE POURED IN FORMS SHALL HAVE A MINIMUM OF 2" CLEAR COVER.
4. ALL EXPOSED EDGES OF CONCRETE TO HAVE A 3/4" CHAMFER UNLESS OTHERWISE NOTED.



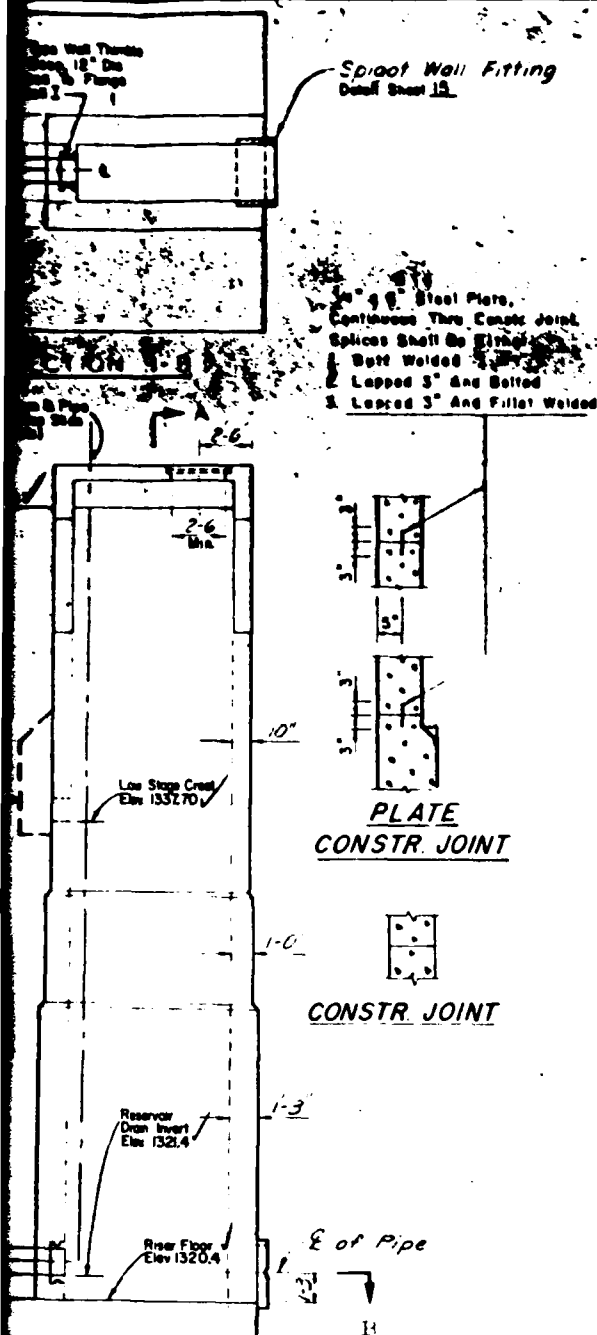
DETAIL I

SIDE ELEVATION

QUANTITIES

16'-0"				
#4 Bars	3545-0	Lin. Ft.	244	Lbs.
#5 Bars	1695-10	Lin. Ft.	3697	Lbs.
#6 Bars	105-6	Lin. Ft.	2547	Lbs.
#7 Bars	459-3	Lin. Ft.	1238	Lbs.
#8 Bars			1226	Lbs.
Total			8948	Lbs.

Length of #5 Bars = 1351-0" x 2 Bars = 2702-0"
Length of #6 Bars = 242-0" x 2 Bars = 484-0"
Total Concrete = 4000 cu. yds.



STEEL SCHEDULE											
Mark	Size	Quantity	Length	Type	B	C	Total Length	Mark	Size	Quantity	Length
B1	8 7	16	13-6	1			216-0				
B2	8 8	14	15-0	1			210-0				
B3	8 6	13	7-9	1			100-9				
B4	8 6	30	10-3	21	3-5	6-10	303-6				
B5	8 6	16	15-0	1			240-0				
B6	8 6	10	13-6	1			135-0				
B7	8 8	11	12-6	1			138-6				
B8	8 6	8	6-0	1			48-0				
B9	8 6	6	7-9	21	1-0	6-9	167-3				
B10	8 6	19	7-9	21	1-0	6-9	187-0				
B11	8 6	14	8-6	1			119-0				
B12	8 6	3	3-6	1			10-8				
B13	8 6	3	2-9	1			8-3				
B14	8 6	2	2-9	1			5-6				
B15	8 6	10	6-9	21	0-10	3-11	67-6				
B16	8 6	18	9-3	21	3-4	5-11	166-6				
R1	8 6	22	7-7	1			166-10				
R2	8 6	4	8-6	1			34-0				
R3	8 6	2	3-5	1			7-0				
R4	8 6	2	5-5	1			151-8				
R5	8 6	8	3-3	21	3-4	5-11	74-0				
R6	8 6	4	8-6	1			119-0				
R7	8 6	10	3-0	1			35-0				
R8	8 6	10	2-8	1			95-4				
R9	8 6	10	8-4	21	3-4	5-7	315-0				
R10	8 6	4	8-3	21	1-0	5-4	11-0				
R11	8 6	20	6-9	1			138-0				
R12	8 6	14	8-3	1			116-2				
R13	8 6	10	3-6	1			36-0				
R14	8 6	20	3-0	1			60-0				
R15	8 6	10	2-3	1			30-0				
R16	8 6	30	4-0	1			120-0				
R17	8 6	2	3-0	21	2-9	3-3	30-0				
R18	8 6	10	11-0	1			110-0				
R19	8 6	14	4-3	1			60-2				
R20	8 6	5	3-3	1			16-5				
R21	8 6	20	1-3	1			26-0				
R22	8 6	40	5-1	1			204-0				
R23	8 6	10	0-1	1			10-0				
R24	8 6	5	2-3	1			15-0				
R25	8 6	14	8-0	21	3-4	5-11	124-0				

Bees Checked - Found To meet Specs - Bees from Republic Steel Corporation
June 28 1970

SLIDE GATE DETAILS

- 12" DIA FLAT FRAME SLIDE GATE (SELF CONTAINED UNIT)
- CLASS 032
- SLIDE GATE SHALL CONFORM TO SPEC 501 AND SHALL BE TYPE MHS 1
- C TYPE WALL THIMBLE 8" DEEP
- PIPE SLEEVE, STEM & STEM GUIDES SIZED AND SPACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS. REMOVABLE T HANDLE WRENCH, WRENCH SOCKET AND TOP OF STEM LOCATED WITHIN PIPE SLEEVE.
- PAINT IN ACCORDANCE WITH SPEC 22
- HOLES DRILLED IN BACK FLANGE OF WALL THIMBLE BY GATE MANUFACTURER ACCORDING TO A S.A. CLASS 125 FLANGE SPEC

DIAMETER OF BOLT CIRCLE 17"
NUMBER OF BOLT HOLES - 12
DIAMETER OF BOLT HOLES - 1"

BLOCKED IN DIMENSIONS
NOT TO SCALE

AS BUILT

CONEWAGO CREEK WATERSHED PROJECT
SITE 1

FLOODWATER RETARDING DAM
CATARAUGUS COUNTY, NEW YORK
RISER STRUCTURAL DETAILS

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

D. ZOGRAFOU

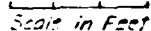
12/68

J.E. POLUECH

4/69

NY-2155-P

B-11

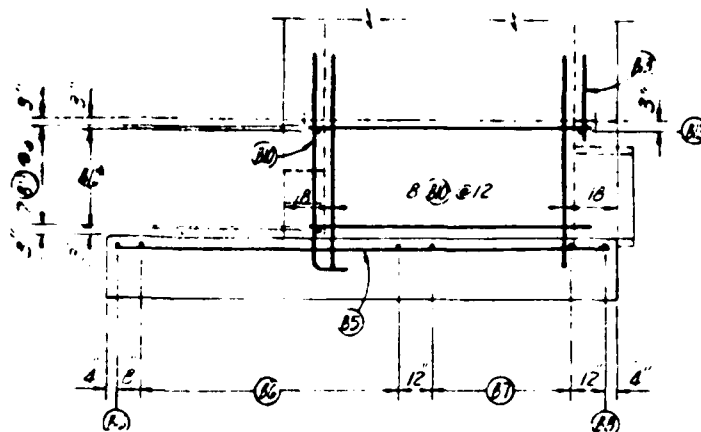


Steel 2nd From N

Steel 2" from Top of Footing

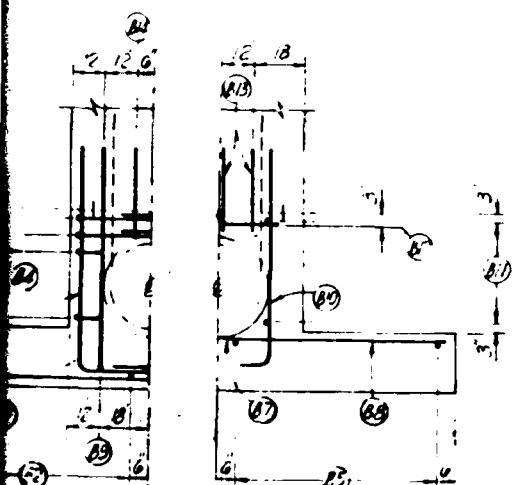
Steel 2" from M

DOWNSTREAM ELEVATION

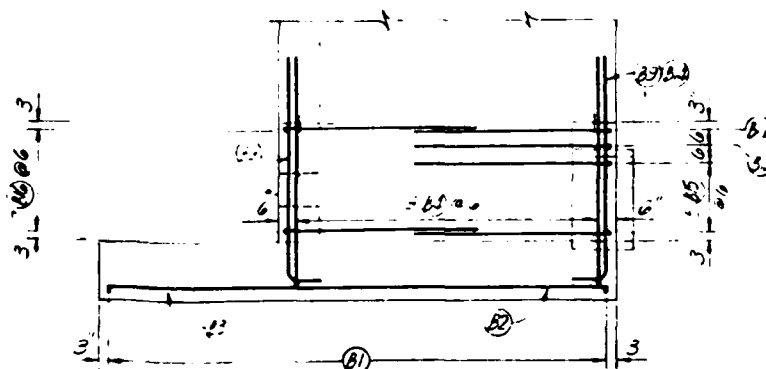


Steel: 2" From Inside Face
and 2" From Top of Footing
SIDEWALL ELEVATION

UPSTREAM ELEVATION



Outside Face Steel 2" from Inside Face
DOWNSTREAM ELEVATION



2' From Outside Face and
3' From Bottom of Footing

SIDEWALL ELEVATION

0 2 4 *July 14, 1971*
Scale in Feet **AS BUILT**
Unless Otherwise Shown

AS BUILT

CONEWANGO CREEK WATERSHED PROJECT
SITE 1
FLOODWATER RETARDING DAM
CATARAUGUS COUNTY, NEW YORK
RISER STRUCTURAL DETAILS

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Assigned	Date	Assigned By
☐ ZOGRAFOS	1-69	Fisher
Drawn		
Trapped		
Checked		
	Shovel	Drilling Rig
	Box 11	
	42 19	NY-255-P

B-12

0 1 2 3
Scale: in feet



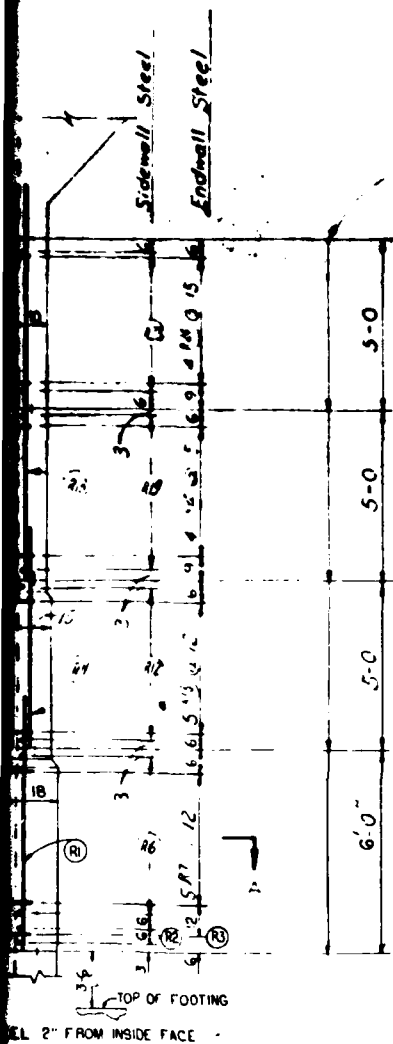
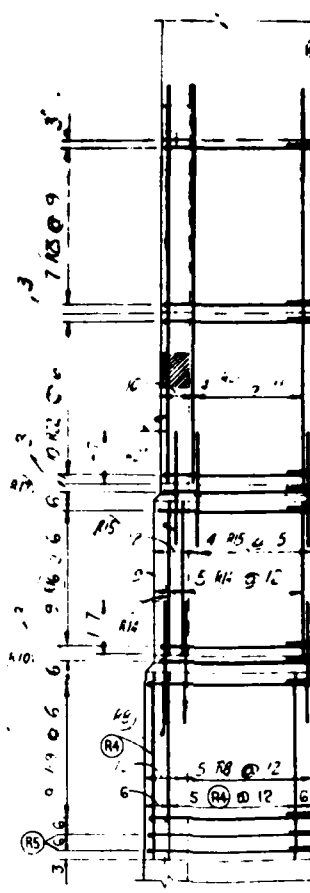
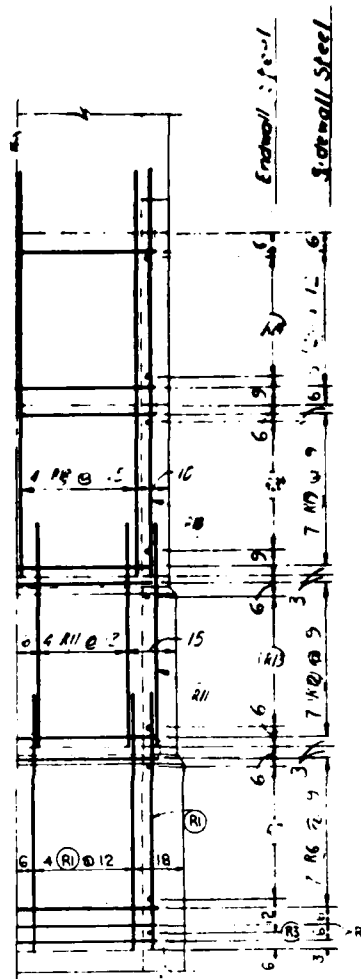


Plate Construction Joints



STEEL 2" FROM OUTSIDE FACE



STEEL 2" FROM INSIDE FACE

SIDEWALL ELEVATION

0 2 4 July 14, 1971
 Scale in Feet **AS BUILT**
 Unless Otherwise Shown

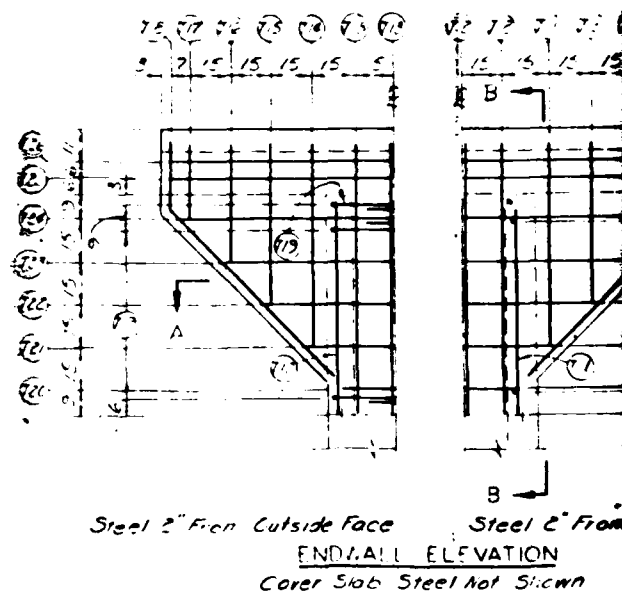
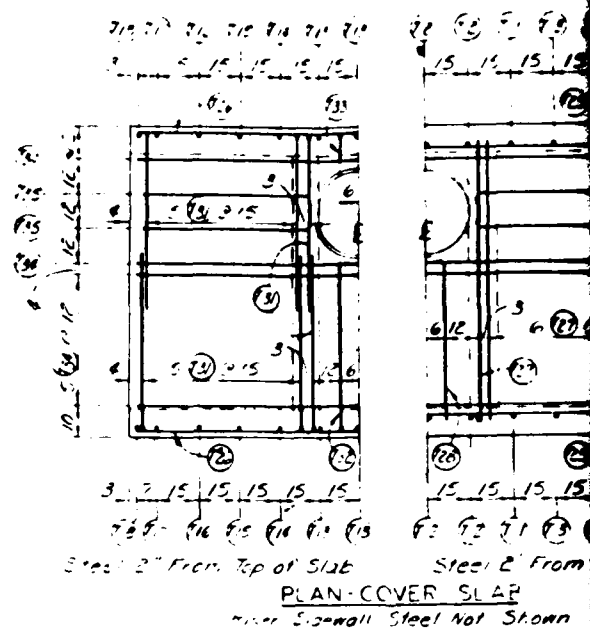
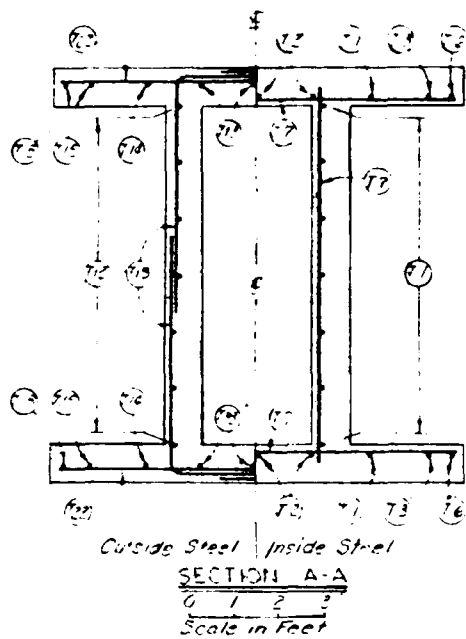
CONEWANGO CREEK WATERSHED PROJECT
 SITE 1
 FLOODWATER RETARDING DAM
 CATTARAUGUS COUNTY, NEW YORK
 RISER STRUCTURAL DETAILS

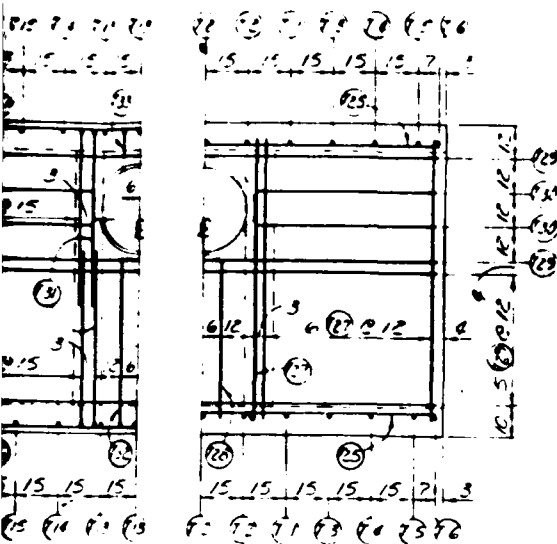
U. S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE

Accepted	DATE	DESIGNER	DATE

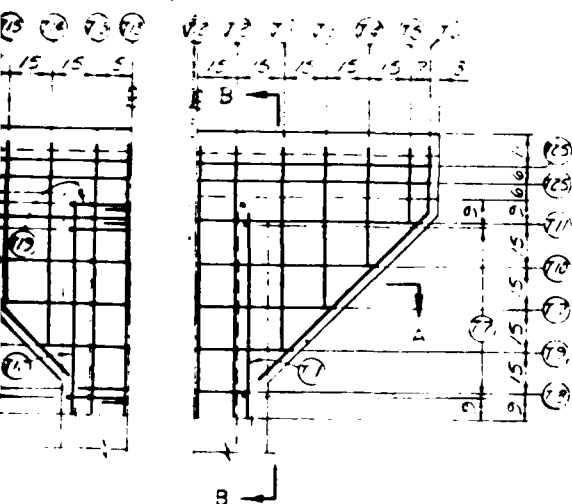
NY-255-P

B-13

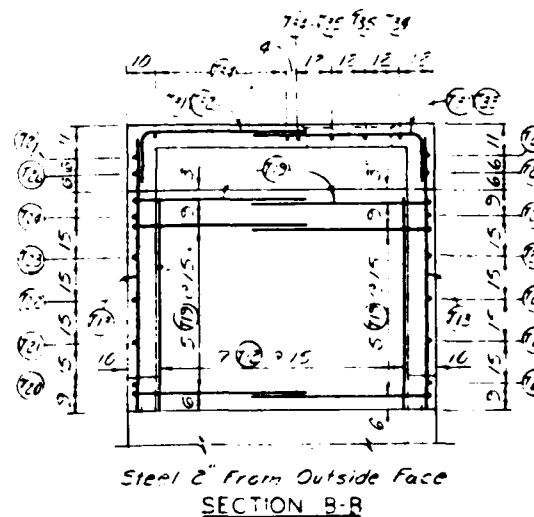
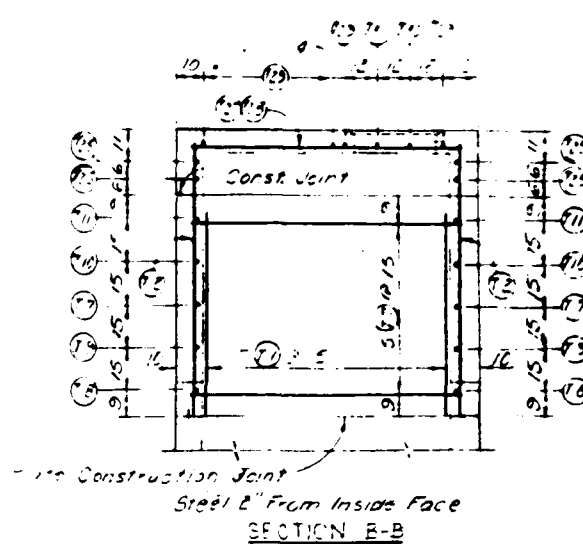




PLAN-COVER SLAB
Riser Sewall Steel Not Shown



End Wall Elevation
Cover Slab Steel Not Shown



July 14, 1971
Scale in Feet
Unless Otherwise Shown

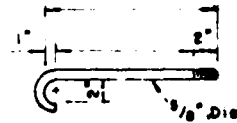
CONEWANGO CREEK WATERSHED PROJECT SITE I FLOODWATER RETARDING DAM CATTARAUGUS COUNTY, NEW YORK RISER STRUCTURAL DETAILS	
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	
Designer: D. ZOGANFOS Date: 1-65	Approved By: _____ Title: _____ Date: _____
NY-2155-P	

LOW STAGE TRASH RACK BILL OF MATERIALS

ITEM		SIZE	LENGTH	QUANTITY
Angle	A	2 x 2 x 1/4	8' - 6"	2
Angle	B	"	1' - 6"	2
Angle	C	"	4' - 0"	2
Angle	D	"	2' - 1 1/2"	2
Angle	E	"	3' - 7 1/4"	2
Angle	F	"	3' - 10 3/4"	2
Angle	G	"	4' - 2 3/4"	7
Angle	H	"	1' - 7 3/8"	14
Angle	I	"	2' - 5 3/8"	6
Angle	J	"	1' - 2 3/8"	2
Angle	K	"	0' - 6 3/8"	2
Angle	L	"	0' - 6 3/8"	2
Hook Bolts		5/8" Dia.	2' x "	4
Pipe Sleeves		3/4" Dia.	2' x "	4

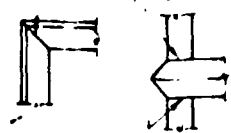
CONSTRUCTION DETAILS

1. All points of contact between angles to be welded.
2. Low stage trash rack to be galvanized in accordance with Spec 119. If necessary for galvanizing, trash rack may be fabricated in sections and bolted with the approval of the Engineer.
3. Material in low stage trash rack shall conform to Spec 117 for structural carbon steel plates, shapes and bars.

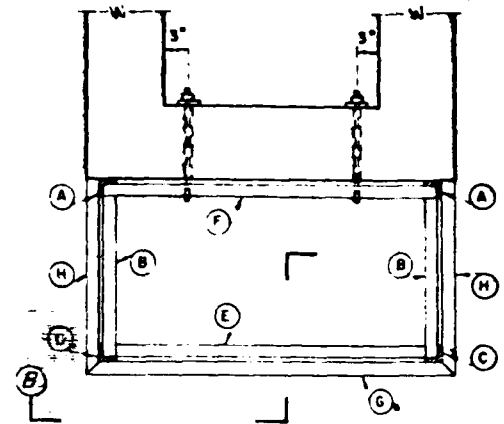


"HOOK" BOLT

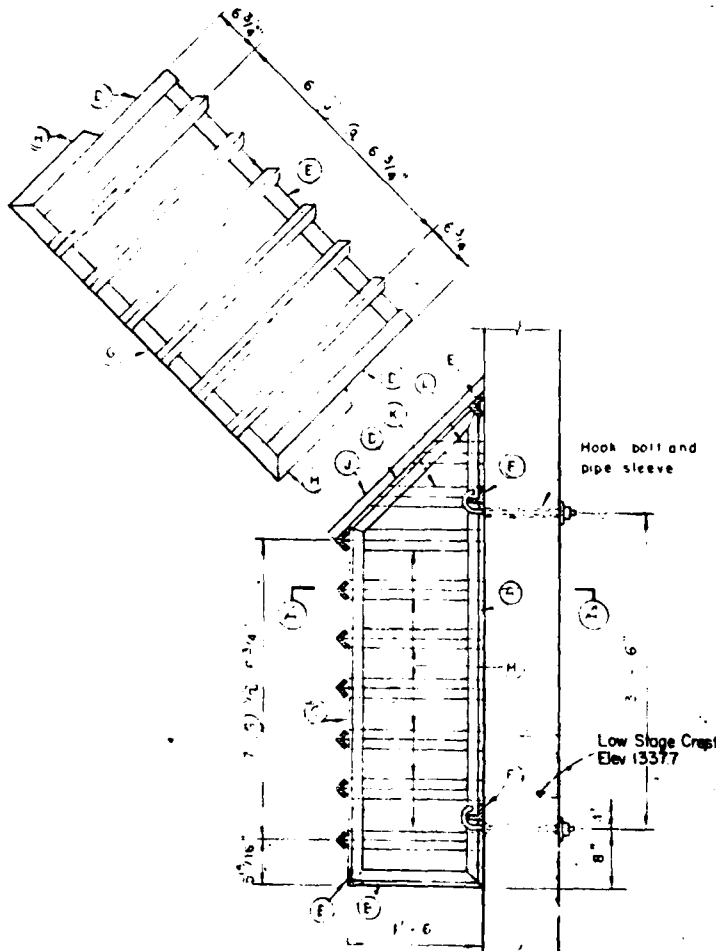
Supply with washer and Type 2 nut



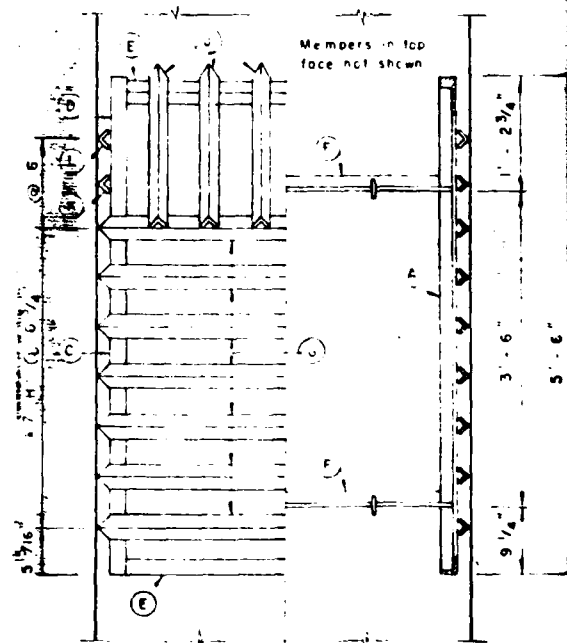
WELDING DETAILS



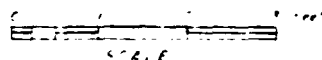
SECTION A A



SECTION C C

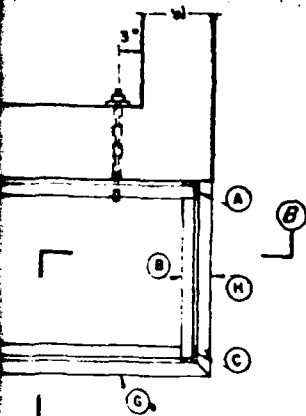


SECTION B B



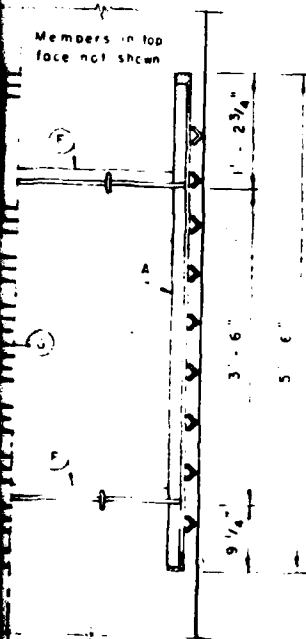
LOW STAGE TRASH RACK DETAILS

WELDING DETAILS

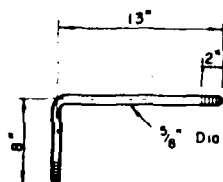
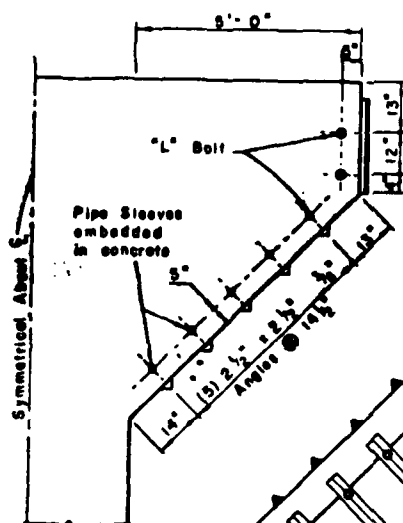


ON AA

Members in top face not shown

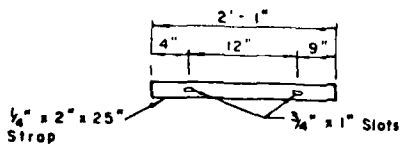


ON BB

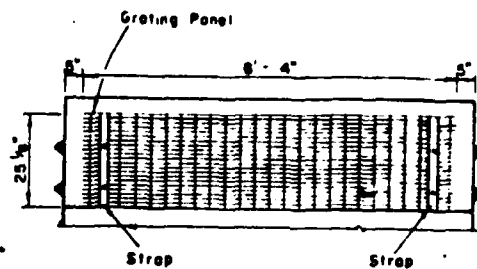


"L" BOLT (Galvanized)

Supply with washers and Type 2 nuts



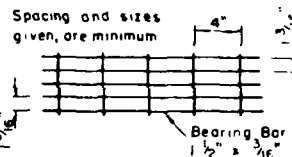
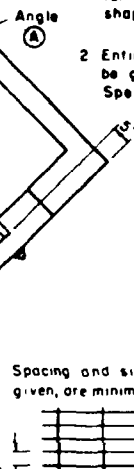
STRAP



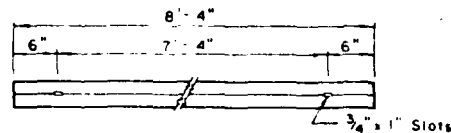
CONSTRUCTION DETAILS

1 Material in high stage trash rack shall conform to Spec 117 for structural carbon steel plates, shapes, and bars.

2 Entire high stage trash rack to be galvanized in accordance with Spec 119



GRATING PANEL



ANGLE (A)

HIGH STAGE TRASH RACK DETAILS

0 1 2 Feet
Scale

July 14, 1971
AS BUILT

HIGH STAGE TRASH RACK BILL OF MATERIALS				
ITEM	SIZE	LENGTH	QUANTITY	
Angles (A)	2 1/2" x 2 1/2" x 3/8"	8'-4"	10	
Strap	1/4" x 2" x 25"	-	4	
"L" Bolt	3/8" Dia	8" x 13"	28	
Grating Panel	25 1/8" x 8'-4"	-	2	
Sleeves	3/4" Dia	10"	28	

CONEWANGO CREEK WATERSHED
SITE 1
FLOODWATER RETARDING DAM
CATARAUGUS COUNTY, NY
RISER TRASH RACKS

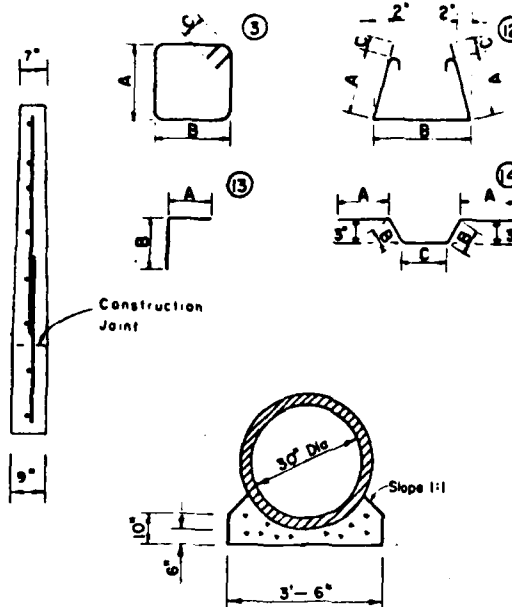
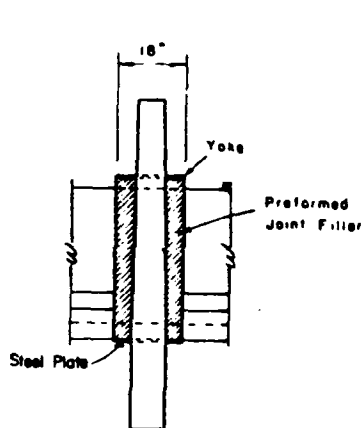
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Author: D. ZOGRAFOS	Date: 1/69
Drawn: W. H. Morgan	Check: [blank]
Field: B. L. Allen	Date: 6/68
Project: [blank]	Sheet: 14 of 19

NY-2155-P

B-15

ANTI-SEEP COLLAR STEEL SCHEDULE



Mo	Se	Fr	Sa	Su	Mo	Se	Fr	Sa	Su
A	4				4				~~30-0~~
A-2	4	5-0			5				240-0
A-3	4	3-3			6				~~180-0~~
A-4	4	11-0			4				264-0
A-5	4	1-6			4				36-0
A-6	4	3-9			8				180-0

Mark	Location	Quan	Size	Length	Type	A	B	C	Total Length
B-1	BENT	8	5	7'-0"	13	1-0	6-0		56'-0"
B-2		4	8	6'-3"	1				25'-0"
B-3		6	4	6'-4"	3	1-1	1-7	0-6	38'-0"
B-4		4	5	6'-6"	14	2-3	0-4	1-6	26'-6"
B-5		1	4	5'-10"	3	0-10	1-7	0-6	5'-10"
D-1	CRADLE	26	4	8'-5"	12	1-8	4-3	0-5	235'-8"
D-2		8	9	14'-11"	1				119'-4"
D-3		4	4	14'-2"	1				56'-6"
D-4		4	7	14'-8"	1				58'-8"

Bones checked - found to most spec. - Bones from Reg. bld
 QUANTITIES Star Corp. Nov 23 1970

QUANTITIES

STEEL				
No 4	Bar	1242.2	Ft	729 Lbs
No 5	Bar	82.7	Ft	86 Lbs
No 7	Bar	58.7	Ft	120 Lbs
No 8	Bar	25.0	Ft	67 Lbs
No 9	Bar	119.3	Ft	406 Lbs

10/11/11
 C. Eng. Tech.
 Etc.
 Contrast Modification
 No 1

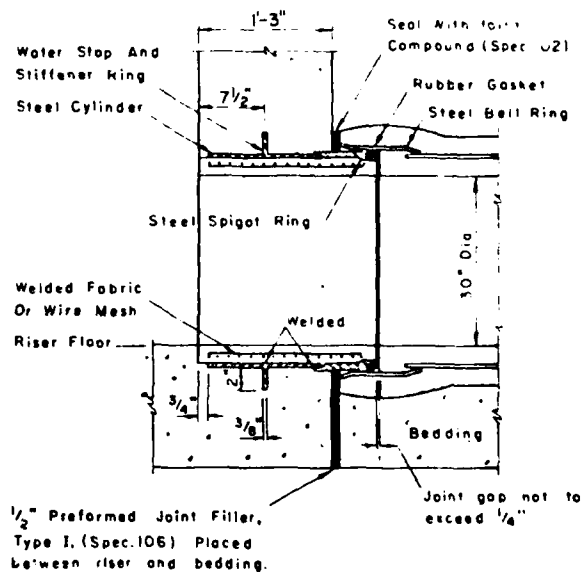
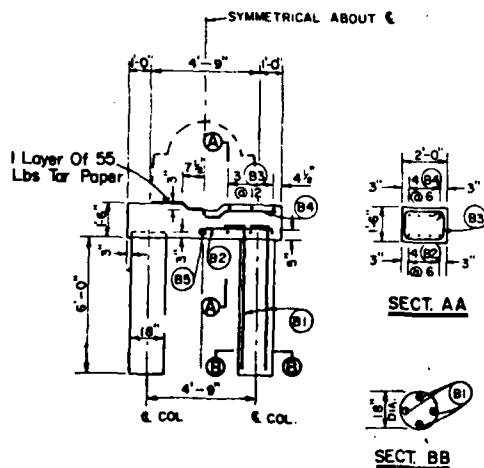
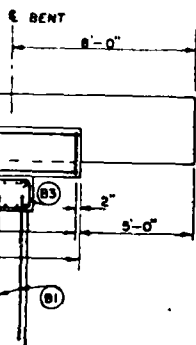
CONCRETE

REINFORCED	<u>22.8</u>	Cu Yds
NON-REINF.	22.8	Cu Yds

CONSTRUCTION DETAILS SHEET 10

COLLAR

6 - Req'd.



SPIGOT WALL FITTING *July 14/92*

AS BUILT

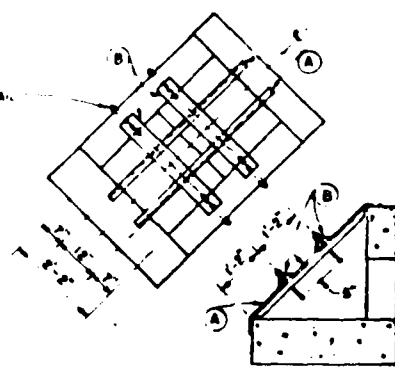
CONEWANGO CREEK WATERSHED PROJECT
SITE 1
FLOODWATER RETARDING DAM
CATTARAUGUS COUNTY, NEW YORK
CONDUIT DETAILS

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	D. ZOGRAFOS	Date	12/68	Approved by	
Drawn	M. B. Manning	Net	FR	Title	
Traced				Title	
Checked	D.C.B.	Sheet	No 15	Drawing No	NY-2155-P
			of 16		

SEE HOIST
DETAIL

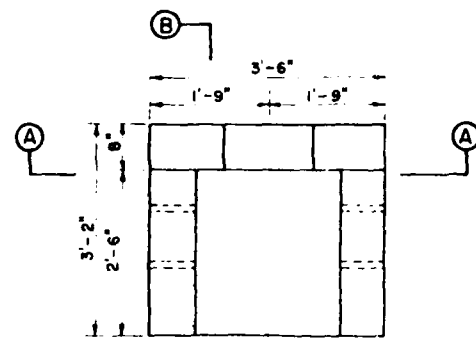
WELDING DETAILS



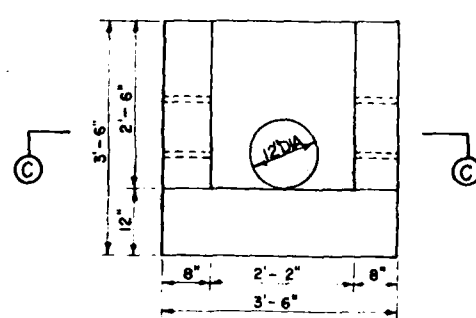
SECTION ON E

ANGLE IRONS

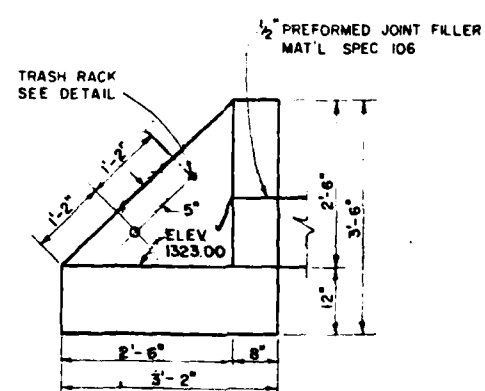
POND DRAIN INLET TRASH RACK DETAILS
NOT TO SCALE



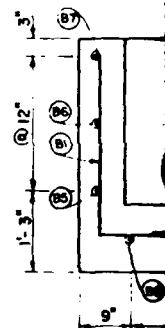
PLAN



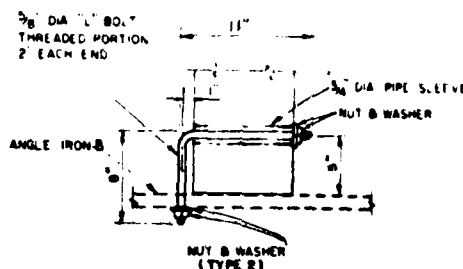
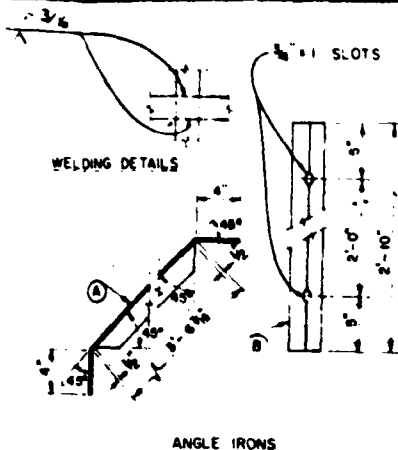
UPSTREAM ELEVATION



SECTION ALONG E

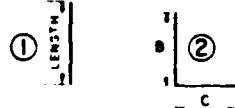


0 3 6 12 24
SCALE IN INCHES

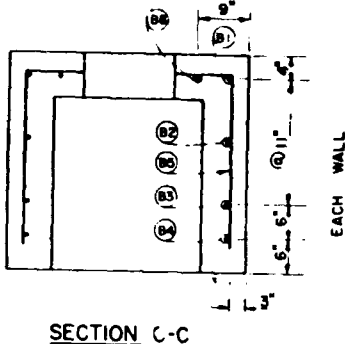


STEEL SCHEDULE									
MARK	SIZE	QUAN	LENGTH	TYPE	B	C	TOTAL	FT	
B-1	4	2	4-10	2	2-9	2-1		967	
B-2	4	2	4-2	2	2-1	2-1		833	
B-3	4	2	3-5	2	1-4	2-1		684	
B-4	4	2	2-10	2	0-9	2-		567	
B-5	4	2	3-5	2	2-6	0-11		683	
B-6	4	2	3-6	2	1-5	2-1		700	
B-7	4	2	2-7	2	0-6	2-1		517	
B-8	4	2	5-6	2	2-9	2-9		1100	
B-9	4	1	2-9	1				275	

Bars Checked - Found 15 more bars - class here
Republic Steel Corp. Marks - June 28 1971
Peter Sullivan
BAR TYPES C. E. T. D.



TRASH RACK DETAILS
NOT TO SCALE



BOLT DETAIL GALVANIZED
NOT TO SCALE

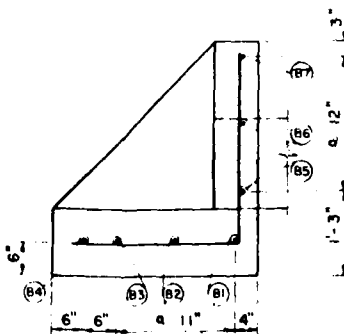
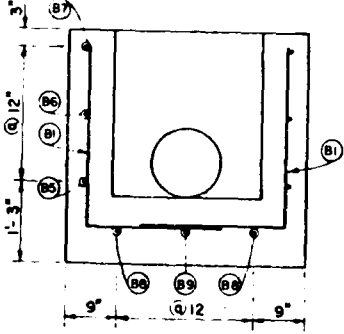
RESERVOIR DRAIN INLET QUANTITIES

STEEL
NO 4 BARS 63.25 LIN FT 423 LBS

CONCRETE
REINFORCED 0.9 CU YDS

BILL OF MATERIALS			
ITEM	SIZE	LENGTH	QUAN
ANGLE IRON (A)	2"x2"x3/8"	4'-2 7/8"	2
ANGLE IRON (B)	2"x2"x3/8"	2'-10"	2
BOLT (GALV.)	3/8" DIA	8"-11"	4
GALV PIPE SLEEVE	3/8" DIA	0'-8"	4

REFORMED JOINT FILLER
STL SPEC 106



CONSTRUCTION DETAILS

1. ALL JOINTS IN TRASH RACK SHALL BE WELDED.
2. MATERIAL IN TRASH RACK SHALL CONFORM TO SPECIFICATION FOR STRUCTURAL CARBON STEEL PLATES, SHAPES AND BARS.
3. TRASH RACK SHALL BE INSTALLED IN ACCORDANCE WITH SPEC 22.

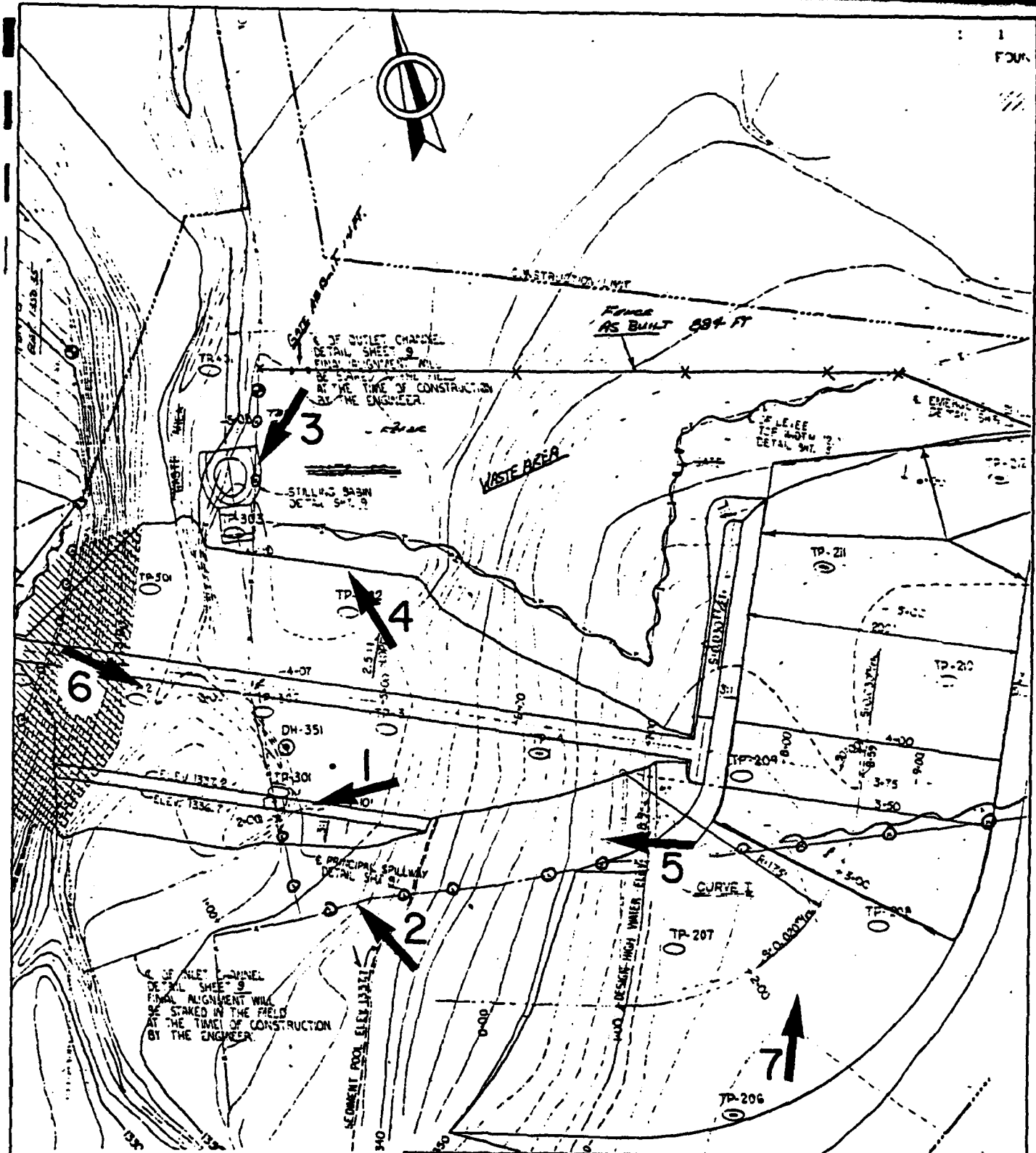
July 14, 1971
AS BUILT

0 3 6 12 24
SCALE IN INCHES

CONEWANGO CREEK WATERSHED PROJECT
SITE 1
FLOODWATER RETARDING DAM
CATTARAUGUS COUNTY, NEW YORK
RESERVOIR DRAIN INLET DETAILS
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
D. ZOGRADOS 12/66
W E GRAJCO JR.
J. E. POLMECH 4/69 16 NY-2155-P

APPENDIX C

PHOTOGRAPHS



DAVIS BROOK DAM (SITE I)
NY00564

PHOTO ORIENTATION PLAN

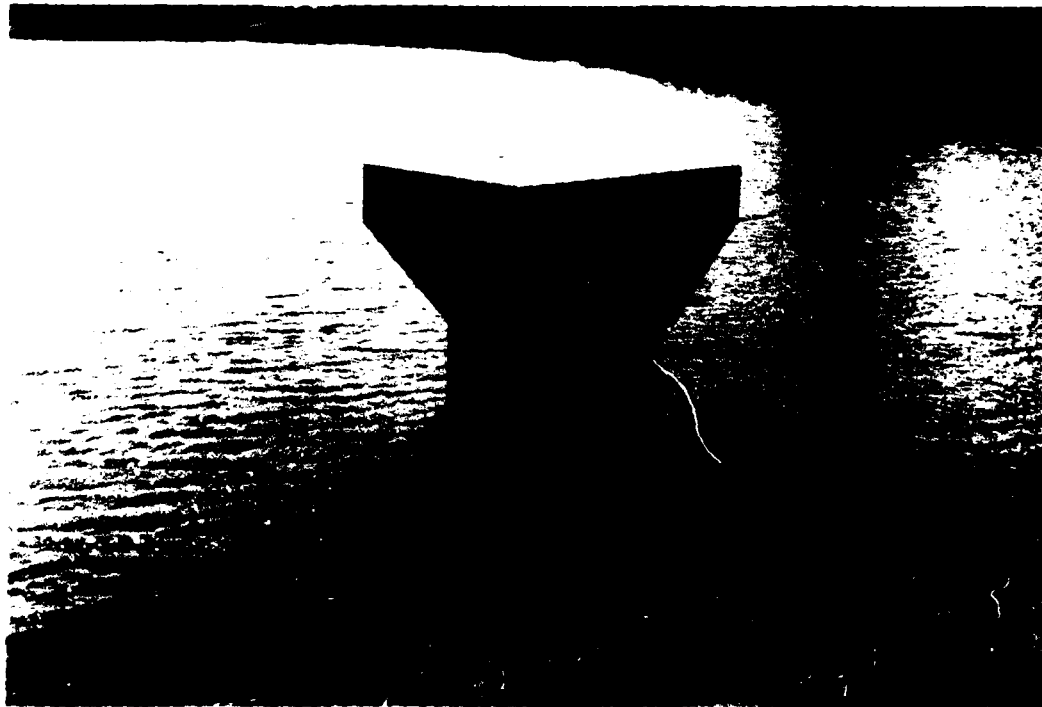
ENDMAN, ANTHONY, ASSOCIATES
CONSULTING ENGINEERS & PLANNERS

DATE
MAY 1981

C-1



1. Principal spillway inlet structure



2. Principal spillway inlet structure showing low stage inlet and trash rack



3. Principal spillway outlet pipe and plunge pool



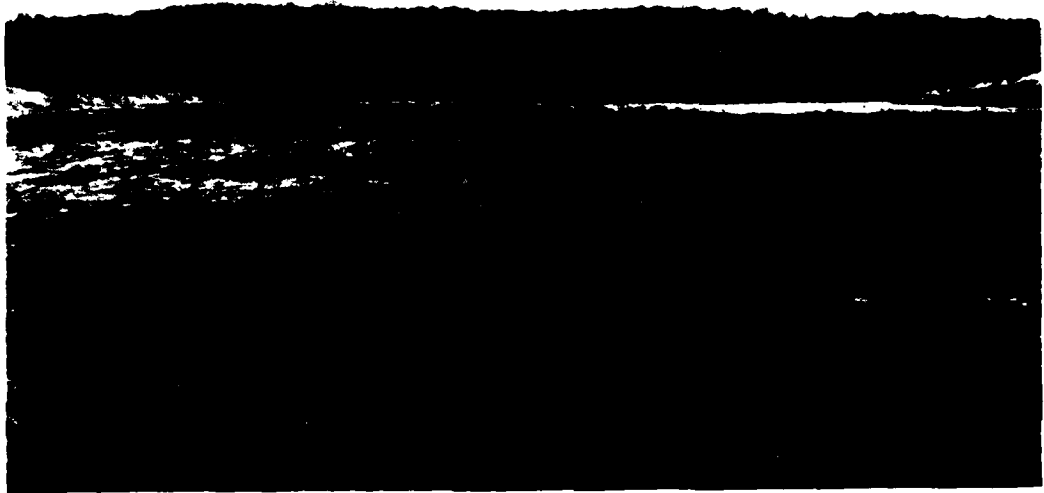
4. Plunge pool and downstream channel



5. Upstream face of dam and impoundment



6. Upstream face of dam and emergency spillway



7. Emergency spillway



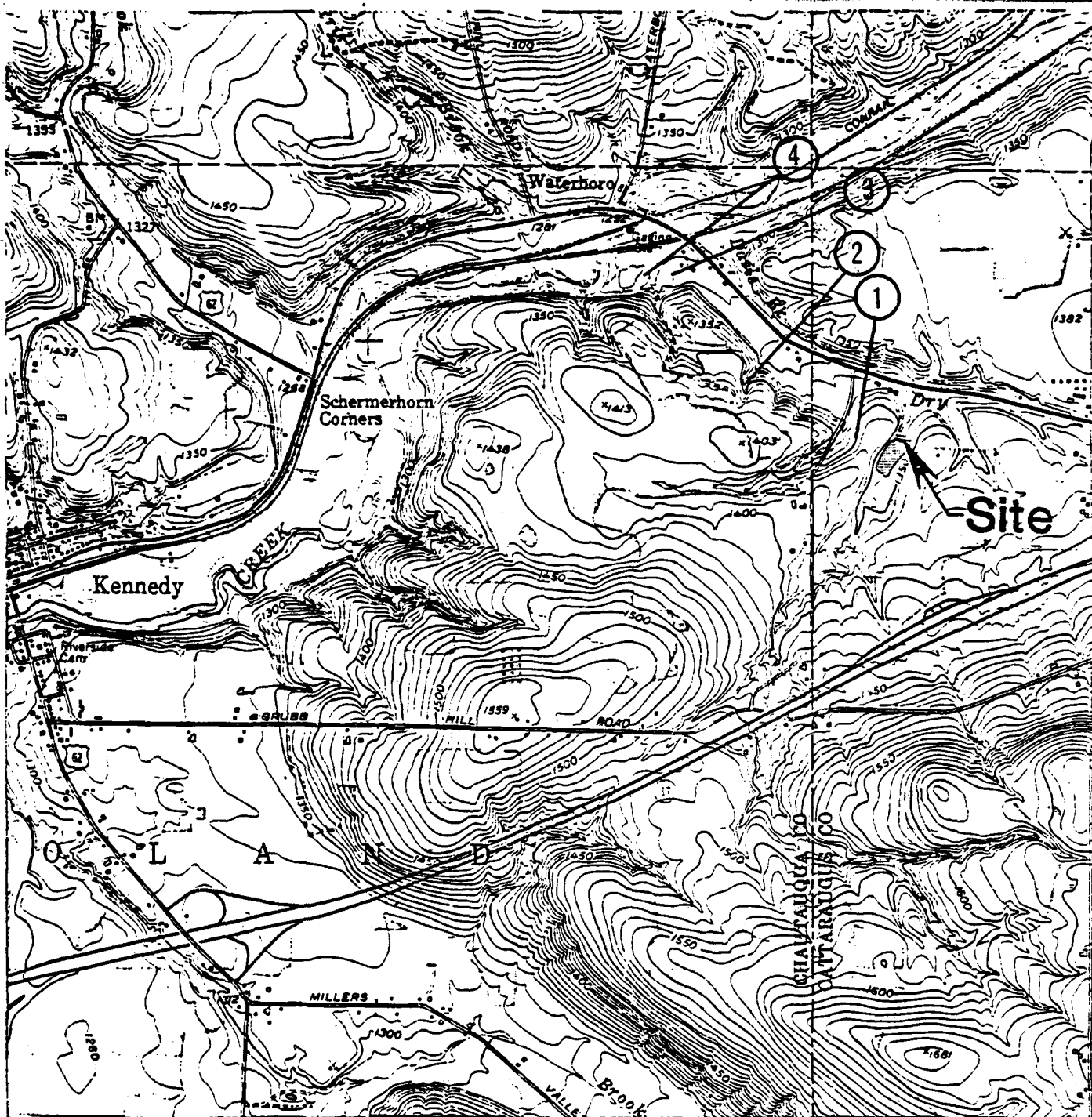
8. Aerial view

APPENDIX D

HYDRAULIC AND HYDROLOGIC COMPUTATIONS

APPENDIX D

	<u>PAGE</u>
Cross Section Location Plan	D-2
HEC-1 Dam Safety Version Computer Program - Input	D-3
HEC-1 Dam Safety Version Computer Program - Output	D-4
Supporting Calculations	
● Hydrology	D-12
● Spillway Hydraulics	D-14
● Downstream Channel Routing	D-25



Davis Brook Dam (Site 1)

CROSS SECTION LOCATION PLAN

Scale: 1"=2000'

OK, SFG #HEC108

OK, SEG #HEC108
 ENTER PROJECT NUMBER
 80166-00.04
 INPUT FILE ? NY564
 FLOOD HYDROGRAPH PACKAGE (HEC-1)
 DAM SAFETY VERSION JULY 1978
 LAST MODIFICATION 26 FEB 79

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNOFF HYDROGRAPH AT
 UTFLOW
 ROUTE HYDROGRAPH TO
 ROUTE HYDROGRAPH TO
 ROUTE HYDROGRAPH TO
 ROUTE HYDROGRAPH TO
 ROUTE HYDROGRAPH TO
 END OF NETWORK

FLOOD HYDROGRAPH PACKAGE (HEC-1)
 DAM SAFETY VERSION JULY 1978
 LAST MODIFICATION 26 FEB 79

RUN DATE: 4/28/
 TIME: 8:28 AM

ANALYSIS OF DAM OVERTOPPING USING RATIOS OF PMF
 HYDROLOGIC-HYDRAULIC ANALYSIS OF SAFETY OF DAVIS BROOK DAM
 RATIOS OF PMF ROUTED THROUGH THE RESERVOIR AND DOWNSREAM

JOB SPECIFICATION
 NO NHR NMIN IDAY THR IMIN METRC IPLY IPRT INSTAN
 100 0 15 0 0 0 -1 4 0
 JOPER NWT LROPT TRACE
 5 0 0 0

MULTI-PLAN ANALYSES TO BE PERFORMED

RTIOS= 0.20 0.40 0.50 0.60 0.80 1.00
 NPLAN= 1 NRTIO= 6 LRTIO= 1

SUB-AREA RUNOFF COMPUTATION

CALCULATION OF INFLOW HYDROGRAPH TO RESERVOIR
 ISTAQ ICOMP IECON ITAPE JPLY JPRT INAPE ISTAGE IAUTO
 INFLOW 0 0 0 0 0 0 0 0 0 0

HYDROGRAPH DATA
 JHYD JUNG TAREA SNAP TRSDA TRSPC RATIO ISNOV ISAME LOCAL
 1 1 1.60 0.00 1.60 0.00 0.000 0 1 0

PEAK OUTFLOW IS.	621.	AT TIME	43.50 HOURS
PEAK OUTFLOW IS	1301.	AT TIME	43.00 HOURS
PEAK OUTFLOW IS	1626.	AT TIME	43.00 HOURS
PEAK OUTFLOW IS	1951.	AT TIME	43.00 HOURS
PEAK OUTFLOW IS	2604.	AT TIME	43.00 HOURS
PEAK OUTFLOW IS	3254.	AT TIME	43.00 HOURS

HYDROGRAPH ROUTING.

CHANNEL: ROUTING -MOD PULS RESERVOIR -1

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	ISPRAT	ISLSTR	ISLSTG	ISLSTG	ISLSTG	ISLSTG
0.0	0.000	0.000	1	1	0	0	0.000	0.000	0.000	0.000	0.000	0.000

NORMAL DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	ELNVT	ELMAX	RLNTH	SEL
0.0450	0.0500	0.0450	1298.0	1350.0	1600.	0.04000

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2
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MAXIMUM STAGE IS	1300.6
MAXIMUM STAGE IS	1301.8
MAXIMUM STAGE IS	1302.4
MAXIMUM STAGE IS	1303.0
MAXIMUM STAGE IS	1303.8
MAXIMUM STAGE IS	1304.4

HYDROGRAPH ROUTING

CHANNEL ROUTING -MOD PULS REACH 1-2

ISTAQ	ICOMP	IRECON	ITAPE	JPLT	JPRT	INAVE	ISTAGE	IAUTO
2	1	0	0	0	0	1	0	0
CROSS	AVG	IRCS	ISAME	IOPT	IPMP		LSTR	
0.0	0.00	1	1	0	0			
NSTPS	NSTOL	LAG	AMSK	X	TSK	STORA	ISPRAT	
1	0	0	0.000	0.000	0.000	0	0	

NORMAL DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	ELNVT	ELMAX	RLNTH	SEL
0.0750	0.0500	0.0750	1287.0	1310.0	1100.	0.01000

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC

0.00	1310.00	100.00	1300.00	582.00	1294.00	597.00	1287.00
632.00	1294.00	700.00	1300.00	890.00	1310.00		

	0.00	0.69	1.54	2.55	3.71	5.04	6.60	10.56	17.91	21.65
STORAGE	42.79	60.24	79.39	99.62	120.92	143.30	166.75	191.27	216.86	241.53
OUTFLOW	0.00	84.89	282.54	584.92	996.47	1524.14	2208.94	3296.75	4987.28	7514.82
	11877.87	16017.80	22733.38	30727.40	39876.66	50474.09	62221.90	75228.27	89505.47	115061.61
STAGE	1247.00	1288.21	1289.42	1290.63	1291.84	1293.05	1294.26	1295.47	1296.68	1297.89
	1299.10	1300.31	1301.53	1302.74	1303.95	1305.16	1306.37	1307.58	1308.79	1310.00
FLOW	0.00	84.89	282.54	584.92	996.47	1524.14	2208.94	3296.75	4987.28	7514.82
	11877.87	16017.80	22733.38	30727.40	39876.66	50474.09	62221.90	75228.27	89505.47	115061.61

MAXIMUM STAGE IS 1290.7

MAXIMUM STAGE IS 1292.5

MAXIMUM STAGE IS 1293.2
 MAXIMUM STAGE IS 1293.8
 MAXIMUM STAGE IS 1294.7
 MAXIMUM STAGE IS 1295.4

HYDROGRAPH ROUTING

CHANNEL ROUTING - MOD PULS REACH 2-3

IAUTO 0

IAPE 1

IPRT 0

JPLT 0

ITAE 0

IECON 0

ICOMP 1

IATA 3

IATA 3

IATA 3

IATA 3

IATA 3

IATA 3

IATA 3

ROUTING DATA

IRES 1

ISAME 1

IOPT 0

IPMP 0

IPMP 0

IPMP 0

IPMP 0

LAG AMSKK X

NSTDL 0

NSTDL 0

NSTDL 0

NSTDL 0

NSTDL 0

NSTDL 0

NSTDL 0

TSC STORA ISPRAT

TSC STORA ISPRAT

TSC STORA ISPRAT

TSC STORA ISPRAT

TSC STORA ISPRAT

TSC STORA ISPRAT

TSC STORA ISPRAT

TSC STORA ISPRAT

NORMAL DEPTH CHANNEL ROUTING

DN(1) DN(2) DN(3) ELNVT ELMAX RLNTH SEL
 0.0750 0.0500 0.0750 1262.0 1275.0 1700. 0.01500

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC
 0.00 1275.00 300.00 1270.00 700.00 1269.00 715.00 1262.00 735.00 1262.00
 750.00 1269.00 850.00 1270.00 950.00 1275.00

STORAGE	0.00	0.57	1.22	1.95	2.76	3.65	4.61	5.66	6.78	7.98
	9.25	13.27	25.82	41.68	59.01	77.79	98.03	119.74	142.98	167.53
OUTFLOW	0.00	39.47	128.25	258.82	430.06	642.43	897.04	1195.33	1538.90	1921.44
	2368.67	3084.79	4255.19	6355.04	9136.22	12574.61	16668.92	21427.97	26865.85	32991.66
STAGE	1262.00	1262.68	1263.37	1264.05	1264.74	1265.42	1266.10	1266.79	1267.47	1268.16
	1268.84	1269.52	1270.21	1270.89	1271.58	1272.26	1272.95	1273.63	1274.31	1275.00
FLOW	0.00	39.47	128.25	258.82	430.06	642.43	897.04	1195.33	1538.90	1921.44
	2368.67	3084.79	4255.19	6355.04	9136.22	12574.61	16668.92	21427.97	26865.85	32991.66

MAXIMUM STAGE IS 1265.4
 MAXIMUM STAGE IS 1267.8
 MAXIMUM STAGE IS 1267.6
 MAXIMUM STAGE IS 1268.2

MAXIMUM STAGE IS 1269.1
MAXIMUM STAGE IS 1269.7

HYDROGRAPH ROUTING

CHANNEL ROUTING --MOD PULS REACH 3-4

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAVE	ISTAGE	IAUTO
0.0450	0.0500	0.0450	0.0450	0.000	0.000	0.000	0.000	0.000

ROUTING DATA	IPMP	LSTR
0.000	0.000	0.000

WSTPS	WSTOL	LAG	AMSKK	X	TSK	STOMA	ISPRAT
1	0	0	0.000	0.000	0.000	0.000	0.000

NORMAL DEPTH CHANNEL ROUTING

ON(1)	ON(2)	ON(3)	ELNVT	ELMAX	RLNTH	SEL
0.0450	0.0500	0.0450	1255.0	1270.0	475	0.01500

CROSS SECTION COORDINATES--STA+ELEV, STA+ELEV--ETC
0.00 1270.00 205.00 1260.00 215.00 1255.00 245.00 1255.00 255.00 1260.00
300.00 1270.00 301.00 1270.00 320.00 1270.00

STORAGE	0.00	0.27	0.57	0.90	1.25	1.63	2.00	2.33
	4.90	5.04	7.34	8.82	10.47	12.29	14.27	16.43
OUTFLOW	0.00	75.46	245.02	492.71	814.36	1208.78	1676.19	2135.11
	4489.36	5708.04	7189.16	8958.86	11042.13	13462.91	16244.30	19408.60
STAGE	1255.00	1255.79	1256.58	1257.37	1258.16	1258.95	1259.74	1260.53
	1262.89	1263.68	1264.47	1265.26	1266.05	1266.84	1267.63	1268.42
FLOW	0.00	75.46	245.02	492.71	814.36	1208.78	1676.19	2135.11
	4489.36	5708.04	7189.16	8958.86	11042.13	13462.91	16244.30	19408.60
MAXIMUM STAGE IS	1257.7							
MAXIMUM STAGE IS	1259.1							
MAXIMUM STAGE IS	1259.6							
MAXIMUM STAGE IS	1260.2							
MAXIMUM STAGE IS	1261.1							
MAXIMUM STAGE IS	1261.8							

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	RATIO 3	RATIO 4	RATIO 5	RATIO 6
				0.20	0.40	0.50	0.60	0.80	1.00
HYDROGRAPH AT INFLOW		1.60	1	652.	1305.	1631.	1957.	2609.	3261.
	(	4.14)	(	18.47)	36.94)	46.17)	55.41)	73.88)	92.35)
ROUTED TO		1.60	1	621.	1301.	1626.	1951.	2604.	3254.
	(	4.14)	(	17.58)	36.84)	46.04)	55.25)	73.72)	92.15)
ROUTED TO		1.60	1	623.	1300.	1625.	1951.	2602.	3254.
	(	4.14)	(	17.64)	36.80)	46.03)	55.23)	73.69)	92.14)
ROUTED TO		1.60	1	619.	1302.	1626.	1949.	2602.	3251.
	(	4.14)	(	17.53)	36.86)	46.03)	55.18)	73.67)	92.07)
ROUTED TO		1.60	1	622.	1298.	1623.	1948.	2598.	3246.
	(	4.14)	(	17.60)	36.76)	45.94)	55.16)	73.56)	91.93)
ROUTED TO		1.60	1	622.	1300.	1624.	1948.	2597.	3246.
	(	4.14)	(	17.61)	36.81)	45.98)	55.15)	73.55)	91.92)

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
	1351.40	1356.80	1361.60
	86.	175.	273.
	23.	126.	7008.

RATIO OF PMF	MAXIMUM RESERVOIR ELEVATION	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
0.20	1357.51	0.00	188.	621.	0.00	43.50	0.00
0.40	1358.27	0.00	202.	1301.	0.00	43.00	0.00
0.50	1358.54	0.00	207.	1626.	0.00	43.00	0.00
0.60	1358.80	0.00	212.	1951.	0.00	43.00	0.00
0.80	1359.25	0.00	221.	2604.	0.00	43.00	0.00
1.00	1359.66	0.00	230.	3254.	0.00	43.00	0.00

PLAN 1 STATION 1
 MAXIMUM MAXIMUM TIME

RATIO	FLOW,CFS	STAGE,FT	HOURS
0.20	623.	1300.6	43.50
0.40	1300.	1301.0	43.00
0.50	1625.	1302.4	43.00
0.60	1951.	1303.0	43.00
0.80	2602.	1303.8	43.00
1.00	3254.	1304.4	43.00

PLAN 1 STATION 2

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
0.20	619.	1290.7	43.50
0.40	1302.	1292.5	43.00
0.50	1626.	1293.2	43.00
0.60	1949.	1293.8	43.00
0.80	2602.	1294.7	43.00
1.00	3251.	1295.4	43.00

PLAN 1 STATION 3

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
0.20	622.	1265.4	43.75
0.40	1298.	1267.0	43.25
0.50	1623.	1267.6	43.25
0.60	1948.	1268.2	43.00
0.80	2598.	1269.1	43.25
1.00	3246.	1269.7	43.25

PLAN 1 STATION 4

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
0.20	622.	1257.7	43.75
0.40	1300.	1259.1	43.25
0.50	1624.	1259.6	43.25
0.60	1948.	1260.2	43.00
0.80	2597.	1261.1	43.25
1.00	3246.	1261.8	43.25

DAM 564 DAVIS BROOK DAM

REF. QUAD. KENNEDY, N.Y.

DISTANCE L & LCA MEASURED BY MAP MEASURING WHEEL (1" = 2000')

COMPUTATIONS FOR L DISTANCE

RUN	MEAS. DIST.	AVG. DIST.	COEF.	L DISTANCE
A	1 = 7.9'			
	2 = 8.0'			
	15.9' ÷ 2 = 7.95'			
			x 2000'	= 15900 FT. *

* L = 15900 FT.

COMPUTATIONS FOR LCA DISTANCE

RUN	MEAS. DIST.	AVG. DIST.	COEF.	LCA DISTANCE
A	1 = 4.3'			
	2 = 4.4'			
	8.7' ÷ 2 = 4.35'			
			x 2000'	= 8700 FT. *

* LCA = 8700 FT.

$$T_p = C_c (L L_{ca})^{0.3}$$

$$C_c = 2.00$$

$$C_p = 0.63$$

$$T_r = \frac{T_p}{5.5}$$

$$T_{PR} = T_p + 0.25(T_R - T_r)$$

$$L = 15900' = 3.01 \text{ mi}$$

$$L_{ca} = 8700' = 1.65 \text{ mi}$$

$$T_p = 2 (3.01 \times 1.65)^{0.3} = 3.23 \text{ hr.} \checkmark$$

$$T_r = \frac{3.23}{5.5} = 0.59 \checkmark \text{ hr} \implies T_R = 1.0 \checkmark \text{ hr.}$$

$$T_{PR} = 3.23 + 0.25(1 - 0.59) = 3.33 \checkmark \text{ hr.}$$

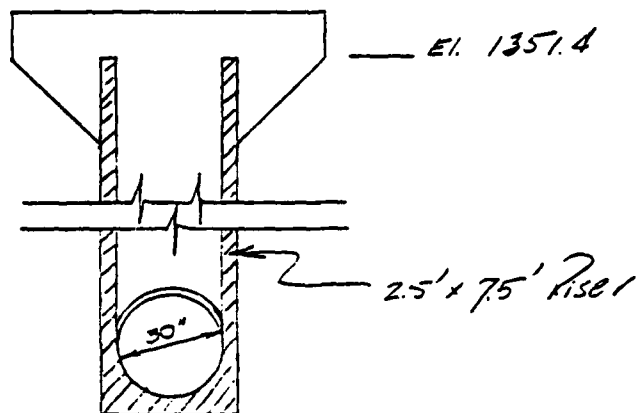
Service Spillway:

Assume that the 30" RCP is the control & develop an eqn. of the form $Q = CA\sqrt{2gH}$ to describe the flow.

From Design Report

$$Q_s = 23 \text{ cfs @ El. 1351.4}$$

$$Q_s = 126 \text{ cfs @ El. 1356.8}$$



$$A_o = \pi(1.25')^2 = 4.9 \text{ ft}^2 \checkmark$$

Determine C_o from $Q_s = 126 \text{ cfs}$ & $Q_s = 23 \text{ cfs}$

$$H_o = 1356.8 - 1351.4 = 5.4$$

$$C_o = \frac{Q_s}{A_o \sqrt{2gH_o}} = \frac{126 \text{ cfs} - 23 \text{ cfs}}{4.9 \sqrt{2(32.2)(5.4)}} = 1.13 \checkmark$$

$$Q_s = 1.13(4.9 \text{ ft}^2)(\sqrt{2(32.2)}) H_o^{0.5} + 23 \text{ cfs} = 44.43 H_o^{0.5} + 23$$

$$Q_s = 44.43 H_o^{0.5} + 23 \checkmark$$

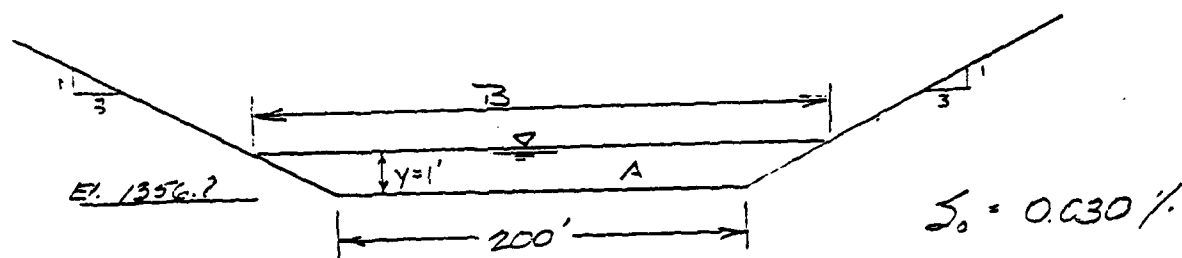
Elev.	H_o	Q_s	
1356.8	5.4	126	✓
1358.0	6.6	137	✓
1359.0	7.6	145	✓
1360.0	8.6	153	✓
1361.0	9.6	161	✓
1362.0	10.6	168	✓
1363.0	11.6	174	✓
1361.6	10.2	165	✓

Emergency Spillway

Ref: "Brater & King" Table 8-7 pg. 8-59

Determining the Discharge Q of a Trapezoidal Channel when the flow is at Critical Depth

Check to see if flow passes through critical depth.
 Determine critical slope for a flow depth of $y = 1.0'$. If spillway slope $>$ critical slope, then flow passes through the critical depth and Table 8-7 holds



Critical depth flow $\frac{Q_c}{g} = \frac{A^3}{B} \Rightarrow Q_c = \sqrt{\frac{g A^3}{B}}$

For $y = 1.0'$

$A = 200(1') + 2(\frac{1}{2} \times 3 \times 1') = 203 \text{ ft}^2 \checkmark$

$B = 200' + 2(3 \times 1') = 206 \text{ ft} \checkmark$

$Q_c = \sqrt{\frac{32.2(203 \text{ ft}^2)^3}{206}} = 1144 \text{ cfs} \checkmark$

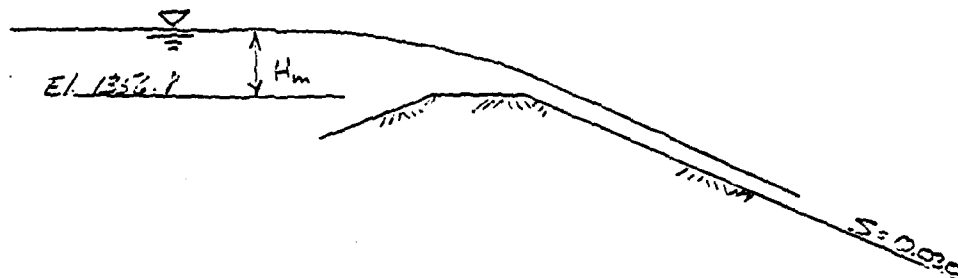
$$K = \frac{149 AR^{2/3}}{n} = \frac{149 (203.4)}{0.03} \left(\frac{203.4^2}{206.32} \right)^{2/3} = 9974 \checkmark$$

$n = 0.030$ for Earth, fairly uniform section w/ grass & some weeds.

$$S_c = \left(\frac{Q_c}{K} \right)^2 = \left(\frac{1144}{9974} \right)^2 = 0.013 \checkmark$$

Spillway slope $>$ critical slope
 $0.030 > 0.013 \therefore$

flow passes through the critical depth for $y = 10'$ and also for $y > 10'$. Else Table 8-7.



$$Z = 3/1 = 3.0$$

$$b = 200 \text{ ft}$$

Elev.	H_m	H_m^2/b	C_2	Q_E
1356.7	0	0	0	0
1358.0	1.2	.018	3.13	823
1359.0	2.2	.033	3.15	2,056
1360.0	3.2	.048	3.19	3,652
1361.0	4.2	.063	3.21	5,526
1362.0	5.2	.077	3.25	7,708
1363.0	6.2	.093	3.27	10,096

$$Q_E = C_2 b H_m^{1.5} \checkmark$$

$$1361.6 \quad 4.9 \quad .072 \quad 3.23 \quad 6794 \checkmark$$

DAVIS BROOK DAM

\$A = RAREA RESERVOIR SURFACE AREA IN ACRES

\$E = RELEV RESERVOIR ELEVATION IN FEET.

REF. U.S. DEPT. OF A.S.C.A. AS BUILT PLAN DWG. NY-2155-P

SCALE 1" = 200 (1/2 REDUCTION SCALE 1" = 400')

$$\text{Eq. } \text{in}^2 \times \frac{400 \text{ ft}^2}{\text{in}^2} \times \frac{1 \text{ AC.}}{43560 \text{ ft}^2} = \text{AC.}$$

ELEV. 1337.7 = 4.1 AC GIVEN DESIGN REPORT sh. 4

$$\text{ELEV. } 1345 = 2.40 \text{ in}^2 \times \frac{400 \text{ ft}^2}{\text{in}^2} \times \frac{1 \text{ AC.}}{43560 \text{ ft}^2} = 8.82 \text{ AC.} \checkmark$$

ELEV. 1351.4 = 13.8 AC. GIVEN DESIGN REPORT sh. 4

ELEV. 1356.8 = 17.8 AC. GIVEN DESIGN REPORT sh. 4

ELEV. 1358.9 = 20.0 AC. GIVEN DESIGN REPORT sh. 4

ELEV. 1361.6 = 22.8 AC. GIVEN DESIGN REPORT sh. 4

$$\text{ELEV. } 1365 = 7.40 \text{ in}^2 \times \frac{400 \text{ ft}^2}{\text{in}^2} \times \frac{1 \text{ AC.}}{43560 \text{ ft}^2} = 27.18 \text{ AC.} \checkmark$$

NOTE: The stage-storage from the SCS design report was used.

Total Spillway Discharge ($Q_s + Q_e$)

Elev.	$Q_s + Q_e$	Reservoir Surface Area
1337.7	0	4.1
1345.0	—	8.8
1351.4	23	13.8
1356.8	126	17.8
1358.0	960	—
1358.9	—	20.0
1359.0	2,201	—
1360.0	3,805	—
1361.0	5,687	—
1361.6	6,959	22.8
1362.0	7,876	—
1363.0	10,270	—
1365.0	—	27.2

✓

✓

✓

✓

✓

✓

✓

AD-A105 841

ERDMAN ANTHONY ASSOCIATES ROCHESTER NY
NATIONAL DAM SAFETY PROGRAM. DAVIS BROOK DAM (SITE 1) (INVENTOR--ETC(U)
AUG 81 R J FARRELL
DACW51-81-C-0017

F/8 13/13

UNCLASSIFIED

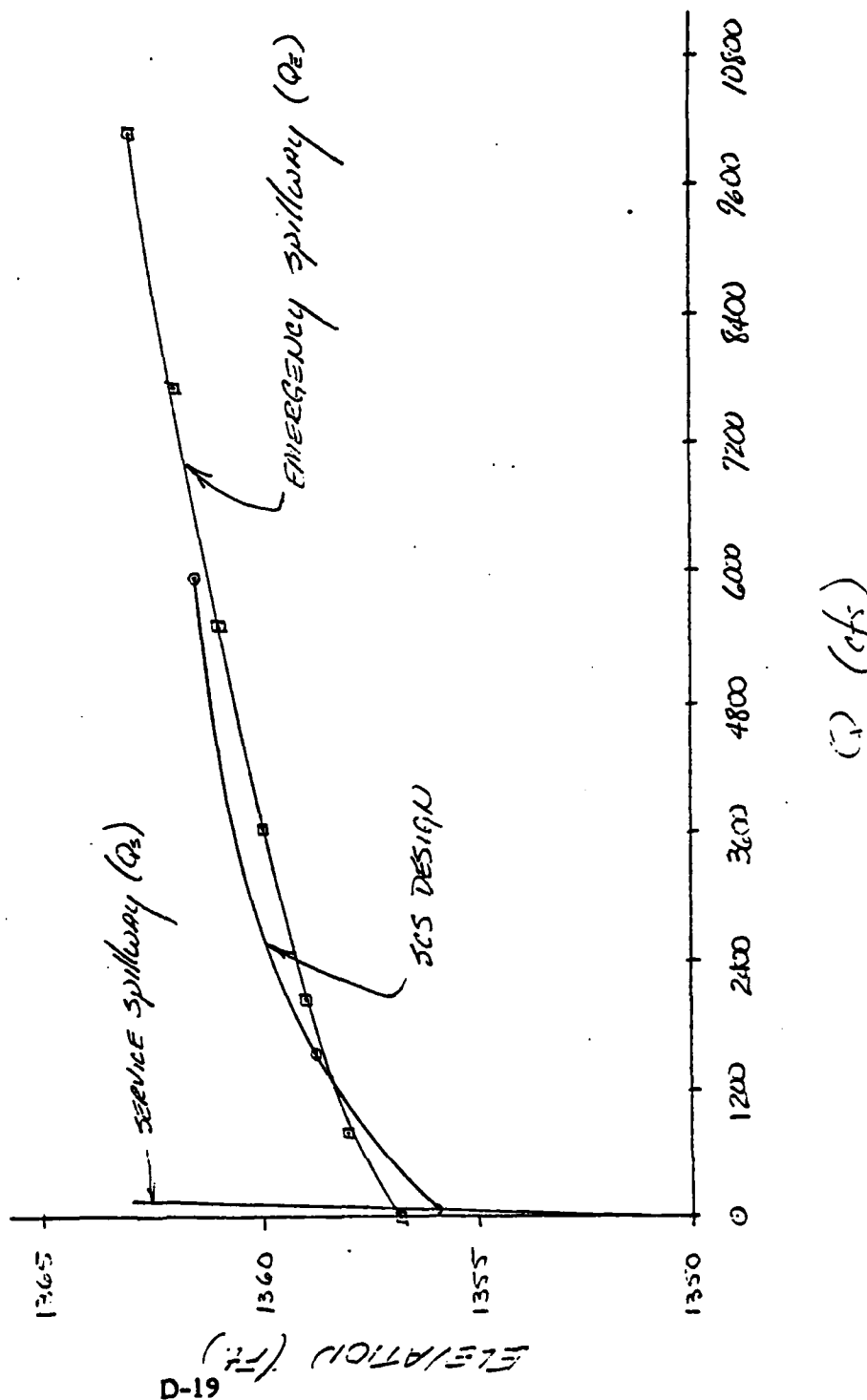
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2 of 2
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END
DATE
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Spillway Rating Curve - Dam 561



ERDMAN, ANTHONY, ASSOCIATES

SHEET 7 OF 15

DATE 5/17/61

DATE 5/17/61

SUBJECT DAM #564-Hydraulics

SUB-SHEET NO. 7

OWNER

PROJECT NAME DAM SURVECTIONS (80166-570.05)

Overtopping DATA

Dam Height = 136.6 ✓

Discharge Coefficient (C) = 2.7

Exponent (E) = 1.5

Length of Dam Crest = 564.6 ✓

Integrated Spillway Capacity @ Tilt Flood (Elev. 1359.7)

	ELEV.	Q	
Principal	1359.0	145	✓
	1360.0	153	✓
Emergency	1359.0	2,056	✓
	1360.0	3,452	✓

Principal Cap @ 1359.7

$$\frac{1.0}{8} = \frac{0.7}{x} \quad x = 5.6$$

$$\text{Capacity} = 145 + 5.6 = 150.6 \text{ cfs} \quad \text{Say } 151 \text{ cfs} \quad \checkmark$$

Emergency Cap. @ 1359.7

$$\frac{1.0}{1596} = \frac{0.7}{x} \quad x = 1117.2$$

$$\text{Capacity} = 2,056 + 1117.2 = 3173.2 \quad \text{Say } 3,173 \text{ cfs} \quad \checkmark$$

$$Q_{\text{Total}} (\text{from HEC I}) = 3254 \text{ cfs}$$

$$- Q_{\text{principal}} = \underline{151 \text{ cfs}}$$

$$Q_{\text{emergency}} = 3103 \text{ cfs} \quad \checkmark$$

8' 11 DATE 5-17/81 ERDMAN, ANTHONY, ASSOCIATES SHEET 11 OF 15
 CRY R.R. DATE 5-17/81 SUBJECT DAM STA-Hydraulics SUB-SHEET NO. 9
 OWNER PROJECT NAME DAM INSPECTIONS (20116-P.05)

Reservoir Surface Area @ Test Flood (El 1359.7)

<u>Elev</u>	<u>SA</u>
1358.9	20.0
1361.6	22.8

$$\frac{2.7}{2.8} = \frac{0.8}{x} \quad x = 0.83$$

SA = 20.83 acres ✓

Emergency Spillway Capacities

FLOOD	Q _{TOTAL}	Elev.	Q _{es}	A	V	Comments
7MF	3254	1359.66	3103	446	7.0	<8.0 no erosion
1 MF	1626	1358.54	1489	284	5.2	<8.0 no erosion

7MF

Assume $y_n/b < 0.02 \Rightarrow y_n = 0.789 \left(\frac{Q_n}{b S_0^{1/2}} \right)^{0.6}$

$y_n = 0.789 \left(\frac{3103(0.06)}{200(0.03)^{1/2}} \right)^{0.6} = 2.16' \checkmark y_n/b = \frac{2.16}{200} = 0.01 < 0.02 \underline{OK}$

$A = (2.16)(200) + 2 \left(\frac{1}{2} (2.16)(3)(2.16) \right) = 446 \text{ ft}^2 \checkmark$

$V = \frac{Q}{A} = \frac{3103}{446} = \underline{7.0 \text{ ft/sec}} \checkmark$

1 MF

Elev	Q _{es}
1358	823
1359	2056

$Q_{1358.54} = 823 \text{ cfs} + .54(2056 - 823) = 1489 \text{ cfs}$

Assuming $y_n/b < 0.02$

$y_n = 0.789 \left(\frac{1489(0.06)}{200(0.03)^{1/2}} \right)^{0.6} = 1.39' \checkmark y_n/b = 0.007 < 0.02 \underline{OK}$

$A = (1.39')(200') + 2 \left(\frac{1}{2} (1.39')(3)(1.39') \right) = 284 \text{ ft}^2 \checkmark$

$V = \frac{Q}{A} = \frac{1489}{284} = \underline{5.2 \text{ ft/sec}} \checkmark$

DAVIS BROCK DAM - STAGE vs STORAGE RELATIONSHIP

Elevation

Storage

1337.7

23.3'

1351.4

85.8'

1356.8

174.8'

1358.9

213.5'

1361.6

273.0'

Ref: SCS design report

DATE 3-20-81 ERDMAN, ANTHONY, ASSOCIATES SHEET 14 OF 15
 B.R. DATE 3/24/81 SUBJECT DAM 564 ROUTING SUB-SHEET NO. 1
 PROJECT NAME DAM INSPECTION 80166-00-05
 B.R. 4/13/81
 92A 4/13/81 DAVIS BROOK DAM

DAM DATA FROM AS BUILT PLAN

DAM TOP ELEV. 1361.7

DAM INV. 1316.2

$\frac{1350}{0}$, $\frac{1320}{400}$, $\frac{1305}{742.5}$, $\frac{1298}{752.5}$, $\frac{1298}{772.5}$, $\frac{1305}{782.5}$, $\frac{1320}{950}$, $\frac{1350}{1025}$ ✓

REACH 1 LENGTH = 1600'

CROSS SECT. $\frac{1350}{0}$, $\frac{1320}{400}$, $\frac{1300}{750}$, $\frac{1298}{766}$, $\frac{1298}{765}$, $\frac{1300}{775}$, $\frac{1320}{950}$, $\frac{1350}{1025}$

SLOPE: DAM INV. - REACH 1 INV. = $h \div L = \text{SLOPE}$
 $1316.2 - 1298 = 18.2 \div 1600' = 0.0114$ ✓

REACH 2 LENGTH = 1100' $\frac{1310}{0}$, $\frac{1300}{100}$, $\frac{1294}{582}$, $\frac{1287}{597}$, $\frac{1287}{617}$, $\frac{1294}{632}$, $\frac{1300}{700}$, $\frac{1310}{890}$ ✓

CROSS SECT = $\frac{1310}{0}$, $\frac{1300}{100}$, $\frac{1290}{575}$, $\frac{1287}{602}$, $\frac{1287}{612}$, $\frac{1290}{640}$, $\frac{1300}{700}$, $\frac{1310}{890}$

SLOPE: REACH 1 INV. - REACH 2 INV. = $h \div L = \text{SLOPE}$
 $1298 - 1287 = 11 \div 1100' = 0.010$ ✓

REACH 3 LENGTH = 1700' $\frac{1275}{0}$, $\frac{1270}{300}$, $\frac{1269}{700}$, $\frac{1262}{715}$, $\frac{1262}{735}$, $\frac{1269}{750}$, $\frac{1270}{850}$, $\frac{1275}{950}$ ✓

CROSS SECT. $\frac{1275}{0}$, $\frac{1270}{300}$, $\frac{1270}{600}$, $\frac{1262}{720}$, $\frac{1262}{730}$, $\frac{1270}{850}$, $\frac{1275}{950}$

SLOPE: REACH 2 INV. - REACH 3 INV. = $h \div L = \text{SLOPE}$
 $1287 - 1262 = 25 \div 1700' = 0.015$ ✓

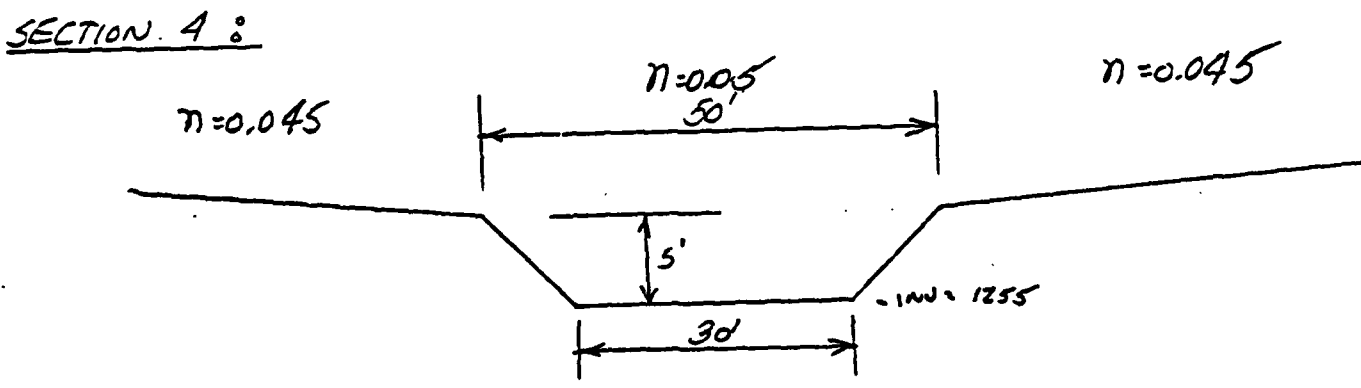
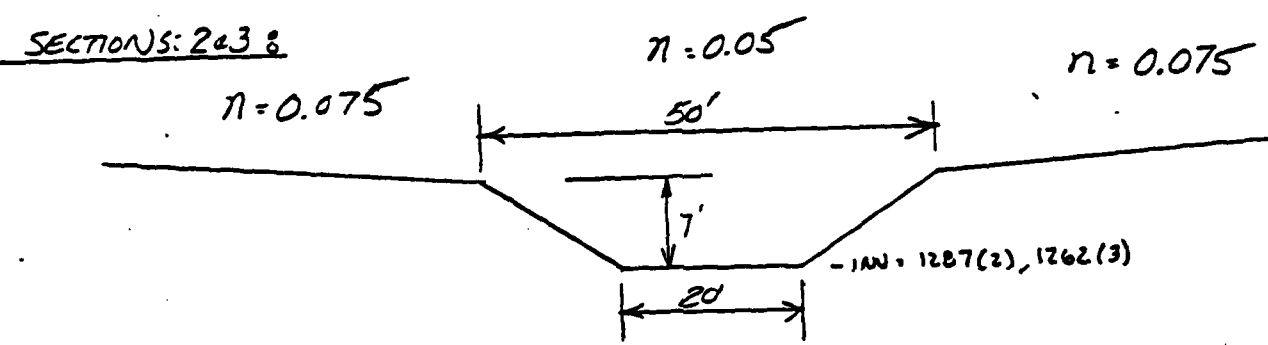
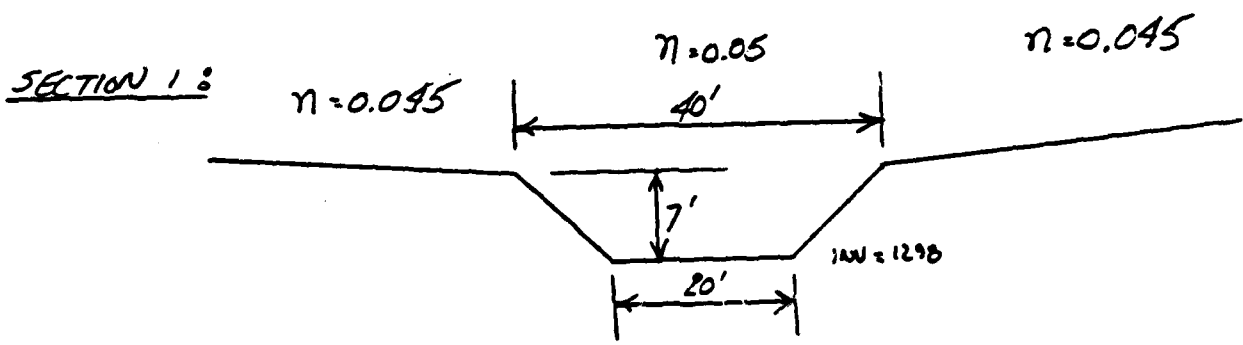
REACH 4 LENGTH = 475'

CROSS SECT. $\frac{1270}{0}$, $\frac{1260}{200}$, $\frac{1255}{225}$, $\frac{1255}{235}$, $\frac{1260}{265}$, $\frac{1270}{300}$

SLOPE: REACH 3 INV. - REACH 4 INV. = $h \div L = \text{SLOPE}$
 $1262 - 1255 = 7 \div 475' = 0.015$ ✓

$\frac{1270}{0}$, $\frac{1260}{205}$, $\frac{1255}{215}$, $\frac{1255}{245}$, $\frac{1260}{255}$, $\frac{1270}{300}$ ✓

DAM 564 - CHANNEL SECTIONS



APPENDIX E

INFORMATION AS CONTAINED IN
THE NATIONAL INVENTORY OF DAMS

INVENTORY OF DAMS

00/11/10, PAGE 125

FORM	ITEM	NOMENCLATURE	DATA	NOMENCLATURE	DATA
4474	1	DIVISION	NAD	28	(SEE REFLW)
4474	2	STATE	33	29	D/S HAZARD
4474	3	COUNTY	009 (CATARAUGUS)	30	CREST LENGTH
4474	4	COUNTY	39	31	SPILLWAY TYPE
4474	5	COUNTY	39	32	SPILLWAY WIDTH
4474	6	2ND STATE	39	33	MAX DISCHARGE
4474	7	2ND COUNTY	39	34	VOLUME
4474	8	2ND CONGR	DAVIS BROOK DAM	35	POWER INSTALLED
4474	9	OFF. DAM NAME	DAVIS BROOK DAM	36	POWER PROPOSED
4474	10	LATITUDE	42-09.7	37	NO. OF LOCKS
4474	11	LONGITUDE	079-03.4	38-45	LOCK LEN/MID
4474	12	REPORT DATE	00/09/10	46	OWNER NAME
4474	13	POPULAR NAME	NONE	47	ENGINEERING
4474	14	IMPOUND. NAME	UNKNOWN	48	CONSTRUCTION
4474	15	REGION	05	49	REG. DESIGN
4474	16	BASIN	01	50	REG. CONBY
4474	17	RIVER/STREAM	TR-COMMUNO-CREEK DAVIS BROOK	51	REG. OPER.
4474	18	R/C CITY-TOWN	NONE	52	REG. MAINT.
4474	19	DISTANCE	000	53	INSPECTOR
4474	20	POPULATION	0000000	54	INSP. DATE
4474	21	TYPE OF DAM	RE	55	INSP. AUTH.
4474	22	YEAR COMPLETED	1969	56	(SEE REFLW)
4474	23	PURPOSES	C	57	INSP. INIT.
4474	24	STR. HEIGHT	044.48	58	UNSAFE
4474	25	HYD. HEIGHT	044.43	59	URGENCY
4474	26	MAX CAPACITY	0000000	60	INSP. COMPL.
4474	27	NORMAL CAP.	0000000	61	RPT. APPR.
4474	27A	CORPS DIST.	ORP	62	GOV. NOTIF.
4474	27B	OWNER CODE	N	63	INSPECTOR
4474	27C	FED. REGULATED	N	64	GOV. RPT.
4474	27D	PVT. ON FED.	N	65	DEFICIENCY
4474	27E	SCS AID	Y		OP
4474	27F	VERIFY DATE	00/09/25		

2A REMARK 1-10-88-3805 1920-UNKNOWN

56 REMARK 3-2-88-3805 1920-UNKNOWN

30- EMERGENCY SPILLWAY; PRINCIPAL SPILLWAY IS A 30 IN. CONDUIT WITH 7.5' x 2.5' RISER.

INSP. REMARK 33 - TOTAL OF EMERGENCY AND PRINCIPAL SPILLWAYS

