BRIDGE COUNTY NEW YORK
INVENTORY NO. P.Y. 719
PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

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NEW YORK DISTRICT CORPS OF ENGINEERS

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

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

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

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

Several minor deficiencies were noted on this structure. Among these deficiencies were a small depression on the upstream slope near the riser, ponding of water in the bottom of the auxiliary spillway channel, and a substantial accumulation of debris around the intake of the principal spillway riser. These deficiencies should be corrected within 6 months of the date of notification of the owner. In addition, an emergency action plan for notification of downstream residents should be developed within 6 months.
**REPORT DOCUMENTATION PAGE**

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

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

The examination of documents and visual inspection of the Finch Hollows Site 2 Dam did not reveal conditions which constitute a hazard to human life or property.
PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
FINCH HOLLOW WATERSHED PROJECT SITE 2 (Inventory Number 719)
SUSQUEHANNA RIVER BASIN,
BROOME COUNTY, NEW YORK

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ASSESSMENT

OVERVIEW PHOTOGRAPH

1 PROJECT INFORMATION

2 ENGINEERING DATA

3 VISUAL INSPECTION

4 OPERATION AND MAINTENANCE PROCEDURES

George, Koch

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B. VISUAL INSPECTION CHECKLIST
C. HYDROLOGIC/HYDRAULIC ENGINEERING DATA AND COMPUTATIONS
D. REFERENCES
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ASSESSMENT

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

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

Several minor deficiencies were noted on this structure. Among these deficiencies were a small depression on the upstream slope near the riser, ponding of water in the bottom of the auxiliary spillway channel, and a substantial accumulation of debris around the intake of the principal spillway riser. These deficiencies should be corrected within 6 months of the date of notification of the owner. In addition, an emergency action plan for notification of downstream residents should be developed within 6 months.

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

Approved By:
Col. Clark H. Benn
New York District Engineer

Date: 8/0 may 80
PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
FINCH HOLLOW, LITTLE CHOCONUT, & TROUT BROOK WATERSHED PROJECT
SITE 2
I.D. No. NY 719
(#96A-3844)
SUSQUEHANNA RIVER BASIN
BROOME COUNTY, NEW YORK

SECTION 1: PROJECT INFORMATION

1.1 GENERAL

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

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

1.2 DESCRIPTION OF PROJECT

a. Description of Dam
The Finch Hollow Watershed Project Site 2 consists of an earth dam with a service spillway conduit passing through the embankment and an auxiliary spillway passing around the eastern end of the embankment.

The dam consists of a zoned compacted earth embankment which is 57 feet high, has a crest length of 1050 feet and a crest width of 14 feet. The upstream slope is 1 vertical on 3 horizontal and the downstream slope is 1 vertical on 2.5 horizontal. The crest and exposed slopes are covered by crownvetch. An earth cutoff trench of varying depth and width keys the embankment into the foundation soils.

The principal spillway consists of a rectangular concrete drop inlet structure, a rectangular cast-in-place concrete conduit 6 feet wide by 7 feet high, and a plunge pool cut into bedrock at the outlet end of the conduit. A reservoir drain consisting of a 24 inch diameter cast-iron pipe extends from a point out in the reservoir to the base of the principal spillway riser, a vertical slide gate mechanism mounted along the inside of the riser controls the flow through the reservoir drain. The auxiliary spillway is in a rock cut and has a bottom width of 75 feet.

An internal drainage system consisting of a gravel and sand filter with perforated 10 inch diameter asbestos cement collector pipes is located at the base of the embankment near the downstream toe. Seepage is collected and conducted through this drain and outleted into the plunge pool.
b. Location
Finch Hollow Watershed Project Site 2 is located on the Little Choconut Creek, approximately 3/4 miles north of Johnson City. A four lane highway going to the county airport is adjacent to the reservoir. The dam is in the Town of Dickinson, New York.

c. Size Classification
The dam is 57 feet high and has a maximum storage capacity of 1480 acre-feet. Therefore, the dam is in the intermediate size category as defined by the Recommended Guidelines for Safety Inspection of Dams.

d. Hazard Classification
The dam is classified as "high" hazard due to the presence of a number of homes in Johnson City and a major highway downstream of the dam.

e. Ownership
The dam is owned and operated by the County of Broome, New York. The contracting office's representative is Charles Kark. His phone number is (607)772-2114.

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

g. Design and Construction History
The dam was designed by the U.S. Department of Agriculture, Soil Conservation Service (SCS). The dam was constructed in 1972 by the Port Cannon Construction Company of Vestal, New York. The SCS office at the Broome County Airport has a design folder containing hydrologic, hydraulic and structural design information, in addition to the as-built plans and contract documents.

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

1.3 PERTINENT DATA

a. Drainage Area (sq. mi.)
11.72

b. Discharge at Dam (cfs)
- Principal spillway at maximum high water 1,493
- Principal spillway at auxiliary spillway crest elevation 1,092
- Auxiliary spillway at maximum high water 31,403
- Reservoir drain at principal spillway crest elevation 48

c. Elevation (USGS Datum)
- Top of Dam 976.4
- Auxiliary Spillway Crest 950.8
- Principal Spillway Crest 931.6
- Reservoir Drain, invert elevation 922.9
d. Reservoir Surface Area (acres)
   - Top of Dam: 69.0
   - Auxiliary Spillway Crest: 30.9
   - Principal Spillway Crest: 4.7

e. Storage Capacity (acre-feet)
   - Top of dam: 1480
   - Auxiliary Spillway Crest: 300
   - Principal Spillway Crest: 20

f. Dam
   Embankment type - A 3 zoned compacted earth fill with a keyed earth cut-off trench and drain parallel to axis of dam

   - Embankment Length(ft): 1050
   - Slopes Upstream: 1 vertical on 3 horizontal
   - Downstream: 1 vertical on 2 1/2 horizontal
   - Crest width(ft): 14

f. Principal Spillway
   Type: Ungated, reinforced concrete drop inlet (6 x 18 ft), rising 12.6 feet above the invert of the 6.0 x 7.0 ft. concrete conduit; length of conduit 313.1 ft; riprap plunge pool cut into rock.

   - Weir length (ft): 32.0

h. Auxiliary Spillway
   Type: Channel cut into bedrock with trapezoidal cross section

   - Bottom Width(ft): 75
   - Side Slopes (V:H): 1:3
   - Length of level section(ft): 50
   - Exit Slope(ft/ft): 0.019

i. Reservoir Drain
   Type: 24 inch diameter cast iron pipe with reinforced concrete inlet
   Control: Manually operated vertical slide gate mounted along the inside of the principal spillway riser.
SECTION 2: ENGINEERING DATA

2.1 GEOTECHNICAL DATA

a. Geology
The Finch Hollow Watershed Project Site 2 Dam is located in the glaciated portion of the Appalachian uplands (northern extreme of the Appalachian Plateau) physiographic province of New York State. These uplands were formed by dissection of the uplifted but flat lying sandstones and shales of the Middle and Upper Devonian Catskill Delta. The plateau surface is represented by flat-topped divide with drainage generally southwest toward the Susquehanna River system.

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

b. Subsurface Investigations
A subsurface investigation program was conducted by SCS in 1966 prior to construction of the dam. This program consisted of 37 drill holes and 32 test pits at locations along the dam, auxiliary spillway, structural elements, and borrow area. Applicable subsurface information is included in Appendix E (Drawings #25 and 26.)

In general, the soils in the vicinity of the dam are of glacial till origin, gravelly silts and silts overlying a shaly silt - stone bedrock from 10 to 30 feet below the original ground surface. With the exception of those soils having high gravel contents, the soils are of low or very low permeability.

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

2.3 CONSTRUCTION RECORDS
Complete construction records are available from the SCS office at the Broome County Airport. Several changes from the original design were made during construction. These changes have been indicated on the as built plans shown in Appendix E.

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

2.5 EVALUATION OF DATA
The data presented in this report has been compiled from information obtained
from the Soil Conservation Service as well as the New York State Department of Environmental Conservation files. It appears to be adequate and reliable for Phase I inspection purposes.
SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection of the Site 2 Dam was conducted on November 8, 1979. The weather was overcast and the temperature was in the forties. The water surface at the time of the inspection was at the crest of the principal spillway riser.

b. Embankment

No signs of distress were observed in the earth embankment and no evidence of seepage, misalignment, subsidence, or surface cracking were noted on the embankment. Several minor deficiencies were noted. Vehicle wheel paths had been worn into the crest. A small bush was growing on the upstream slope at the east end of the dam. There was a depression on the upstream slope in the vicinity of the principal spillway riser. This depression might have been the result of scouring action of water flowing into the riser.

An internal drainage system composed of 2 - 10 inch diameter pipes surrounded by "drain fill" material and extending parallel to the axis of the dam provides drainage at the embankment-subgrade contact. These pipes outlet into the plunge pool adjacent to the principal spillway conduit. At the time of the inspection, each pipe was discharging a small quantity of clear water.

c. Principal Spillway

The principal spillway consists of a vertical drop inlet structure, a cast-in-place rectangular concrete conduit, a plunge pool at the outlet to the conduit, and an outlet channel. These components appeared to be in satisfactory condition. The only deficiency noted was a build up of debris surrounding the inlet to the spillway riser.

d. Auxiliary Spillway

The auxiliary spillway for this structure is located in an earth and rock cut at the eastern end of the dam. The channel was in satisfactory condition. However, there was a rather large area in which water ponds on the channel bottom. In some places this water was as much as 6 inches deep.

e. Reservoir Drain

The 24 inch diameter reservoir drain and manually operated slide gate may be used to lower the reservoir. The slide gate control mechanism is located at the top of the riser. This system was reported to be operational.

f. Downstream Channel

The downstream channel below the plunge pool is riprapped. The channel appeared to be in satisfactory condition.
Reservoir
There were no signs of soil instability in the reservoir area.

3.2 EVALUATION

Visual inspection of this dam revealed the following deficiencies:

1. A small depression on the upstream slope behind the principal spillway riser.
2. Wheel paths worn into the embankment along the crest.
3. Debris collecting around the inlet to the principal spillway riser.
4. Ponding in the bottom of the auxiliary spillway channel.
SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

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

4.2 MAINTENANCE OF THE DAM

The dam is maintained by the owner, Broome County. Increased maintenance is required to correct deficiencies such as the debris surrounding the principal spillway riser and the water ponding in the auxiliary spillway channel.

4.3 WARNING SYSTEM IN EFFECT

There is no warning system in effect.

4.4 EVALUATION

The operation procedures for this structure are satisfactory. Increased maintenance efforts are required to correct the deficiencies noted above.
SECTION 5: HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

Delineation of the 11.72 square mile watershed of the Site 2 dam was made using the USGS 7.5 minute quadrangle for Castle Creek, New York. The watershed consists of open grassed fields and woodlands. Relief in the drainage area ranges from moderate to steep.

The analysis for this report was performed using the entire drainage area for this structure. There are several other dams which are part of this watershed project upstream of this reservoir. No attenuation due to storage in these reservoirs was assumed in this analysis.

5.2 ANALYSIS CRITERIA

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

5.3 SPILLWAY CAPACITY

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

The spillways have sufficient capacity for discharging the peak outflow from the PMF. For this storm, the peak inflow is 12,746 cfs and the peak outflow is 12,657 cfs. When the spillways are discharging the peak outflow, the water surface will be 10.9 feet below the top of the dam. Further information concerning this analysis is included in Appendix C.

5.4 RESERVOIR CAPACITY

Normal flood control storage capacity of the reservoir between the principal and auxiliary spillway is 291 acre-feet which is equivalent to a runoff depth of 0.5 inches over the drainage area. Surcharge storage capacity to the maximum high water elevation is an additional 1180, acre-feet, equivalent to a runoff depth over the drainage area of 1.9 inches. Total storage capacity of the dam is 1480 acre-feet.

5.5 FLOODS OF RECORD

The maximum known flood occurred on September 27, 1975. The pool level at this time was reported to be about 5.0 feet above the principal spillway crest. The calculated discharge for this flood is as follows:

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5.6 OVERTOPPING POTENTIAL

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

5.7 EVALUATION

This dam has sufficient capability to impound and adequately discharge floodwaters expected to result from the PMF.
SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

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

b. Design and Construction Data
   No information regarding the slope stability analysis performed for the design of this structure was available from SCS. A slope stability analysis of the earth embankment is beyond the scope of work of this Phase I report. However, the slopes are relatively flat and there was no evidence of any instability.

c. Seismic Stability
   No seismic stability analysis was performed for this structure.
SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety
The Phase I inspection of the Finch Hollow Dam Site 2 dam did not reveal conditions which constitute a hazard to human life or property. The earth embankment is considered to be structurally stable and the spillways are capable of retarding and safely discharging floodwaters resulting from the Probable Maximum Flood (PMF).

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

c. Need for Additional Investigations
No additional investigations are necessary at this time.

7.2 RECOMMENDED MEASURES

a. Repair the small depression on the upstream slope behind the principal spillway riser.

b. Modify the grading in the auxiliary spillway channel to eliminate the ponding.

c. Remove the debris which surrounds the intake of the principal spillway riser. Provide a program of periodic inspection and maintenance of the dam and appurtenances, including operation and lubrication of the slide gate mechanism. Document this information for future reference.

d. Develop an emergency action plan for notification of downstream residents and the proper authorities in the event of large auxiliary spillway discharge.
APPENDIX A

PHOTOGRAPHS
CREST of EMBANKMENT LOOKING WEST

OUTLET of PRINCIPAL SPILLWAY CONDUIT and DOWNSTREAM CHANNEL
UPSTREAM SLOPE of EMBANKMENT and PRINCIPAL SPILLWAY RISER

PHOTO SHOWING RELATIVE LOCATIONS of PRINCIPAL SPILLWAY RISER and ENTRANCE to AUXILIARY SPILLWAY CHANNEL
PRINCIPAL SPILLWAY RISER
NOTE DEBRIS AROUND INLET

PRINCIPAL SPILLWAY RISER WITH INLET TO AUXILIARY SPILLWAY CHANNEL IN BACKGROUND
OUTLET to PRINCIPAL SPILLWAY CONDUIT

OUTLETS to PRINCIPAL SPILLWAY CONDUIT and to INTERNAL DRAINAGE SYSTEM
ENTRANCE to AUXILIARY SPILLWAY CHANNEL

AUXILIARY SPILLWAY CHANNEL LOOKING DOWNSTREAM
PONDED WATER on BOTTOM of AUXILIARY SPILLWAY CHANNEL

DOWNSTREAM SLOPE of DAM WITH OUTLET
to AUXILIARY SPILLWAY CHANNEL at RIGHT
APPENDIX B

VISUAL INSPECTION CHECKLIST
VISUAL INSPECTION CHECKLIST

1) Basic Data
   a. General
      Name of Dam  **FINCH HOLLOW SITE NO. 2**
      Fed. I.D. #  719      DEC Dam No. 96A-3844
      River Basin  **SUSQUEHANNA**
      Location:  Town **DICKINSON** County **BROOME**
      Stream Name  **LITTLE CHOCOconut CREEK**
      Tributary of ___________________________
      Latitude (N)  **42° 8'.2**'    Longitude (W)  **75° 56.5'**
      Type of Dam  **EARTH**
      Hazard Category  **C**
      Date(s) of Inspection  **11/8/79**
      Weather Conditions  **40° OVERCAST**
      Reservoir Level at Time of Inspection  **68'4" BELOW TOP OF RISER**
   b. Inspection Personnel  **R. WARRENDEr**  **W. LYNICK**
   c. Persons Contacted (Including Address & Phone No.)
      **GARY PAGE**  **SCS AREA OFFICE**
      **BROOME CO. AIRPORT**  607-773-2751
      **SCOTT SNOWER**  315-423-5526  **SCS - SYRACUSE OFFICE**
   d. History:
      Date Constructed  **1972**    Date(s) Reconstructed __________
      Designer  **SCS**
      Constructed By  **PORT CANNON CONSTRUCTION CO., VEStAC, NEW YORK**
      Owner  **BROOME COUNTY**
2) Embankment
   a. Characteristics
      (1) Embankment Material  **EARTH AND ROCK FILL**
      (2) Cutoff Type          **EARTH**
      (3) Impervious Core      **NONE**
      (4) Internal Drainage System **PERFORATED PIPE SURROUNDED BY DRAIN FILL**
      (5) Miscellaneous        **ALL SLOPES HAVE A SATISFACTORY VEGETATIVE COVER EXCEPT FOR SMALL ROCKFILL AREA JUST ABOVE OUTLET CONDUIT**
   b. Crest
      (1) Vertical Alignment   **SATISFACTORY**
      (2) Horizontal Alignment **CURVILINEAR - SATISFACTORY - THERE WAS A SIGNIFICANT ALTERATION TO ORIGINAL DESIGN. SEE AS BUILT PLANS**
      (3) Surface Cracks       **NONE**
      (4) Miscellaneous        **VEHICLE WHEEL PATH ALONG CREST. CREST IS HIGHER THAN COUNTY AIRPORT ROAD - 4 LANE DIVIDED**
   c. Upstream Slope
      (1) Slope (Estimate) (V:H)  **1 ON 3**
      (2) Undesirable Growth or Debris, Animal Burrows **1 SMALL BUSH AT EAST END OF DAM**
      (3) Sloughing, Subsidence or Depressions **NONE - SLIGHT DEPRESSION ON SLOPE SIDE OF RISER**
(4) Slope Protection **NONE OTHER THAN CROWN VETCH**
GRASS VEGETATION

(5) Surface Cracks or Movement at Toe **NONE**

---

d. Downstream Slope

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

(2) Undesirable Growth or Debris, Animal Burrows **NONE CROWN VETCH**
**WITH GRASS SATISFACTORY VEGETATIVE COVER**

(3) Sloughing, Subsidence or Depressions **NONE**

(4) Surface Cracks or Movement at Toe **NONE**

(5) Seepage **NONE**

(6) External Drainage System (Ditches, Trenches; Blanket) **ROCK LINED CHANNELS ALONG ABUTMENTS ON DOWNSTREAM SLOPE**

(7) Condition Around Outlet Structure **HEAVY RIPRAP EXTENDING INTO DOWNSTREAM CHANNEL BANKS ON RIGHT SIDE LEFT SIDE ROCK CUT**

(8) Seepage Beyond Toe **NONE**

---

e. Abutments - Embankment Contact

**RIPRAP AT INTERFACE ON BOTH SIDES**
(1) Erosion at Contact  **NONE**

(2) Seepage Along Contact **NONE**

3) **Drainage System**
   a. Description of System  **10" DIAMETER ASBESTOS CEMENT PIPE**
      **W/ ANIMAL GUARDS AT OUTLET**

   b. Condition of System  **SATISFACTORY - FUNCTIONING**

   c. Discharge from Drainage System  **LESS THAN 1 GAL. PER MIN. FROM BOTH - DISCHARGE WAS CLEAR WATER**

4) **Instrumentation** (Monumentation/Surveys, Observation Wells, Weirs, Piezometers, Etc.)  **NONE**
5) Reservoir
   a. Slopes RIGHT SIDE - EMBANKMENT OF COUNTY AIRPORT ROAD
      LEFT SIDE - HILLSIDE - NATURAL
   b. Sedimentation NONE APPARENT
   c. Unusual Conditions Which Affect Dam NONE

6) Area Downstream of Dam
   a. Downstream Hazard (No. of Homes, Highways, etc.) RTE 17 - COUNTY AIRPORT ROAD - HIGHLY RESIDENTIAL AREAS IN JOHNSON CITY
   b. Seepage, Unusual Growth NONE
   c. Evidence of Movement Beyond Toe of Dam NONE
   d. Condition of Downstream Channel SATISFACTORY

7) Spillway(s) (Including Discharge Conveyance Channel)
   SCS SINGLE STAGE VERTICAL RISER W/ 6'X7' CONCRETE CONDUIT Rock Cut Auxiliary Spillway
   a. General RISER - LARGE DEBRIS AT ALL ENTRANCES - PLUS ON ALL WEIR CRESTS & INTERMIXED WITH SUBMERGED STEEL BARS
   b. Condition of Service Spillway - EXCEPT FOR DEBRIS THE PRINCIPAL SPILLWAY IS IN SATISFACTORY CONDITION
c. Condition of Auxiliary Spillway

**Rock Cut - Large Wet Area with Standing Water in Invert of the Channel. Area is Just Upstream of the Axis of the Dam & Downstream**

**Spillway Outlet - Natural Vertical Rock Plunge Into Downstream Channel**

d. Condition of Discharge Conveyance Channel **Satisfactory**

---

8) **Reservoir Drain/Outlet**

Type: Pipe ✓ Conduit Other

Material: Concrete Metal ✓ Other

Size: 24" Length 40'

Invert Elevations: Entrance 922.9 Exit 918.3

Physical Condition (Describe): Unobservable ✓

Material: 

Joints: ___________________ Alignment ______________

Structural Integrity: ________________________________

Hydraulic Capability: ______________________________

Means of Control: Gate ✓ Valve Uncontrolled

Operation: Operable Inoperable Other

Present Condition (Describe): Debris Collected Behind Gate Lifting Rod
9) **Structural**

a. Concrete Surfaces **All Satisfactory**

b. Structural Cracking **None Apparent**

c. Movement - Horizontal & Vertical Alignment (Settlement) **None**

d. Junctions with Abutments or Embankments


e. Drains - Foundation, Joint, Face

f. Water Passages, Conduits, Sluices **Satisfactory**

g. Seepage or Leakage **None Observed**
h. Joints - Construction, etc. 

i. Foundation 

j. Abutments 

k. Control Gates 

l. Approach & Outlet Channels 

m. Energy Dissipators (Plunge Pool, etc.) **natural rock w/rip rap sides to elevation of tap conduit**

n. Intake Structures **riser okay except for the debris**

o. Stability 

p. Miscellaneous
APPENDIX C

HYDROLOGIC/HYDRAULIC
ENGINEERING DATA AND COMPUTATIONS
**CHECK LIST FOR DAMS**  
HYDROLOGIC AND HYDRAULIC  
ENGINEERING DATA

**AREA-CAPACITY DATA:**

<table>
<thead>
<tr>
<th></th>
<th>Elevation (ft.)</th>
<th>Surface Area (acres)</th>
<th>Storage Capacity (acre-ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Top of Dam</td>
<td>976.4</td>
<td>69.0</td>
<td>1980</td>
</tr>
<tr>
<td>2) Design High Water (Max. Design Pool)</td>
<td>958.8</td>
<td>41.7</td>
<td>590</td>
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<tr>
<td>3) Auxiliary Spillway Crest</td>
<td>950.8</td>
<td>30.9</td>
<td>300</td>
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<tr>
<td>4) Pool Level with Flashboards</td>
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</tr>
<tr>
<td>5) Service Spillway Crest</td>
<td>931.6</td>
<td>4.7</td>
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**DISCHARGES**

<table>
<thead>
<tr>
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<th>Volume (cfs)</th>
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<tr>
<td>1) Average Daily</td>
<td></td>
</tr>
<tr>
<td>2) Spillway @ Maximum High Water</td>
<td>32,200</td>
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<tr>
<td>3) Spillway @ Design High Water</td>
<td>5,270</td>
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<tr>
<td>4) Spillway @ Auxiliary Spillway Crest Elevation</td>
<td>1,889</td>
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<td>5) Low Level Outlet</td>
<td>48</td>
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<tr>
<td>6) Total (of all facilities) @ Maximum High Water</td>
<td>32,200</td>
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<tr>
<td>7) Maximum Known Flood</td>
<td>787</td>
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<tr>
<td>CREST:</td>
<td>ELEVATION: 976.4</td>
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<tr>
<td>---------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Type: GRASSED EARTH</td>
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<tr>
<td>Width: 14'</td>
<td>Length: 1050'</td>
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<tr>
<td>Spillover: AUXILIARY CHANNEL</td>
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<tr>
<td>Location: EASTERN END OF DAM</td>
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<table>
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<th>SPILLWAY:</th>
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<tr>
<td>PRINCIPAL</td>
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<tr>
<td>Elevation: 931.6</td>
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<tr>
<td>RC DROP INLET</td>
</tr>
<tr>
<td>6' x 18'</td>
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<tr>
<td>Type: UNCONTROLLED</td>
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<tr>
<td>Controlled:</td>
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<td>Type</td>
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<tr>
<td>(Flashboards; gate)</td>
</tr>
<tr>
<td>Number</td>
</tr>
<tr>
<td>Size/Length</td>
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<td>Invert Material</td>
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<td>Anticipated Length</td>
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<td>of operating service</td>
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<td>Chute Length</td>
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<tr>
<td>Height Between Spillway Crest &amp; Approach Channel Invert (Weir Flow)</td>
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<tr>
<td>EMERGENCY</td>
</tr>
<tr>
<td>Elevation: 950.8</td>
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<tr>
<td>Type: TRAPEZOIDAL CHANNEL</td>
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<td>Width: 75'</td>
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</table>
OUTLET STRUCTURES/EMERGENCY DRAWDOWN FACILITIES:

Type:  Gate  Sluice  Conduit  Penstock

Shape:  Gate - Flat Circular  Conduit Round Cast/Iron

Size:  24"  24"

Elevations:  Entrance Invert  922.9
Exit Invert  921.4

Tailrace Channel:  Elevation

HYDROMETEOROLOGICAL GAGES:

Type:  None

Location:  

Records:
  Date - None
  Max. Reading -

FLOOD WATER CONTROL SYSTEM:

Warning System:  None

Method of Controlled Releases (mechanisms):
  Reservoir Drain
DRAINAGE AREA: 11.72 sq. mi.

DRAINAGE BASIN RUNOFF CHARACTERISTICS:
Land Use - Type: RESIDENTIAL + OPEN FIELDS
Terrain - Relief: MODERATE TO STEEP
Surface - Soil: GLACIAL TILL
Runoff Potential (existing or planned extensive alterations to existing (surface or subsurface conditions)
    NONE - BUT LAND IS DEVELOPABLE

Potential Sedimentation problem areas (natural or man-made; present or future)
    NONE

Potential Backwater problem areas for levels at maximum storage capacity including surcharge storage:
    SEWAGE PUMP STATION 6' BELOW U.PSTREAM
    CROSSING AT LEWIS ROAD - CONSTRUCTED AFTER DAM WAS BUILT.

Dikes - Floodwalls (overflow & non-overflow) - Low reaches along the Reservoir perimeter:
    Location: NONE
    Elevation:__________________________

Reservoir:
    Length @ Maximum Pool ____________________________ (Miles)
    Length of Shoreline (@ Spillway Crest) _____________ (Miles)
# Project Grid

**Job**
FINCH HOLLOW SITE Z

**Subject**
HYDRAULIC COMPUTATIONS

<table>
<thead>
<tr>
<th>SHEET NO.</th>
<th>CHECKED BY</th>
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<table>
<thead>
<tr>
<th>PRINCIPAL SPILLWAY CAPACITY</th>
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<tr>
<td>FROM SCS REPORT - FORMULAS</td>
</tr>
<tr>
<td>WEAIR FLOW CRIFICE FLOW</td>
</tr>
<tr>
<td>( Q = 99.2 , \text{cfs} )</td>
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</table>

<table>
<thead>
<tr>
<th>WATER SURFACE AT TOPOGRAPHIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>( Q = (99.2)(4.98) = 211.96 , \text{cfs} )</td>
</tr>
</tbody>
</table>

**This Controls**

<table>
<thead>
<tr>
<th>WATER SURFACE AT AUXILIARY SPILLWAY CREST</th>
</tr>
</thead>
<tbody>
<tr>
<td>( Q = 99.2(19.2)^{1/3} = 8346 , \text{cfs} )</td>
</tr>
</tbody>
</table>

**This Controls**

<table>
<thead>
<tr>
<th>WATER SURFACE AT MAXIMUM KNOWN LEVEL</th>
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</thead>
<tbody>
<tr>
<td>( Q = 99.2(5)^{1/3} = 1109 , \text{cfs} )</td>
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</table>

**This Controls**

<table>
<thead>
<tr>
<th>RESERVOIR DRAIN CAPACITY</th>
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</thead>
<tbody>
<tr>
<td>WATER SURFACE AT PRINCIPAL SPILLWAY CREST</td>
</tr>
<tr>
<td>( Q = \sqrt{\frac{2gH}{1 + k_3 + k_6 + k_0}} )</td>
</tr>
<tr>
<td>( A = \pi(1)^2 = 3.14 )</td>
</tr>
</tbody>
</table>

---

**New York State Department of Environmental Conservation**

Formerly CA-17

**Project Grid**

<table>
<thead>
<tr>
<th>JOB</th>
<th>SHEET NO.</th>
<th>CHECKED BY</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Weekly Unnumbered**

**Note:**

- Date: 3/13/80
- Computed by RLD

---

**Table Entries:**

- Principal Spillway Capacity
- Weir Flow
- Orifice Flow
- Water Surface at Topographic
- Water Surface at Auxiliary Spillway Crest
- Water Surface at Maximum Known Level
- Reservoir Drain Capacity

**Formulas:**

- \( Q = 99.2 \, \text{cfs} \)
- \( Q = 201.09 \, \text{cfs} \)
- \( Q = (99.2)(4.98) = 211.96 \, \text{cfs} \)
- \( Q = 201.09(55.1) = 11,471 \, \text{cfs} \)
- \( Q = 99.2(19.2)^{1/3} = 8346 \, \text{cfs} \)
- \( Q = 201.09(21.5) = 1692 \, \text{cfs} \)
- \( Q = 99.2(5)^{1/3} = 1109 \, \text{cfs} \)
- \( Q = 201.09(15.8) = 787 \, \text{cfs} \)
- \( Q = \sqrt{\frac{2gH}{1 + k_3 + k_6 + k_0}} \)
- \( A = \pi(1)^2 = 3.14 \)
- \( A = 47.6 \, \text{cfs} \)
### LITTLE CHOCONUT CREEK WATERSHED
#### SITE 2
#### NY-2015-D

**DESIGN DATA**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>UNIT</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Location:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latitude</td>
<td>--</td>
<td>42°08'12&quot; N</td>
</tr>
<tr>
<td>Longitude</td>
<td>--</td>
<td>75°57'35&quot; W</td>
</tr>
<tr>
<td>Drainage Area:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Uncontrolled) Sq.Mi.</td>
<td></td>
<td>3,200</td>
</tr>
<tr>
<td>Acres</td>
<td></td>
<td>5.00</td>
</tr>
<tr>
<td>Total Sq.Mi.</td>
<td></td>
<td>11.75</td>
</tr>
<tr>
<td>Class of Structure:</td>
<td></td>
<td>(c)</td>
</tr>
<tr>
<td>Principal Spillway:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pipe size (inside diameter)</td>
<td>Ft.</td>
<td>6x7</td>
</tr>
<tr>
<td>Riser size</td>
<td>Ft.</td>
<td>6x18</td>
</tr>
<tr>
<td>Pipe length (approx.)</td>
<td>Ft.</td>
<td>310</td>
</tr>
<tr>
<td>Riser Crest Elev.</td>
<td>Ft.</td>
<td>931.6</td>
</tr>
<tr>
<td>Pipe Outlet Invert Elev.</td>
<td>Ft.</td>
<td>918.0</td>
</tr>
<tr>
<td>Emergency Spillway:</td>
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<td></td>
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<tr>
<td>Bottom width</td>
<td>Ft.</td>
<td>75</td>
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<tr>
<td>Level section length</td>
<td>Ft.</td>
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<tr>
<td>Entrance length</td>
<td>Ft.</td>
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<tr>
<td>Roughness coefficient</td>
<td>--</td>
<td>0.04</td>
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<tr>
<td>Entrance slope ($S_o$)</td>
<td>Percent</td>
<td>2</td>
</tr>
<tr>
<td>Crest elevation ($E_e$)</td>
<td>Ft.</td>
<td>950.8</td>
</tr>
<tr>
<td>Exit slope ($S_e$)</td>
<td>Percent</td>
<td>2.5</td>
</tr>
<tr>
<td>Storage:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retarding (Min. $V_{sp}$)</td>
<td>Ac.Ft.</td>
<td>300</td>
</tr>
<tr>
<td>Releases:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak Principal Spillway ($Q_p$)</td>
<td>cfs</td>
<td>1089</td>
</tr>
<tr>
<td>Emergency Spillway Hydrograph $E_w$</td>
<td>Ft.</td>
<td>958.8</td>
</tr>
<tr>
<td>Top of Dam</td>
<td>Ft.</td>
<td>976.4</td>
</tr>
</tbody>
</table>
Little Choconut Creek Watershed

Site 2
NY, 2015-0

Stage-Storage Curve

Total Storage minus V_{sp} = 300 AC FT

V_{w} = 20 AC FT

Crest of Riser

Elev. 294.6

Elev. 294.0

Elev. 293.7

Elev. 293.5

Elev. 293.0

Elev. 292.5

Elev. 292.0

Elev. 291.5

Elev. 291.0

Elev. 290.5

Elev. 290.0

Elev. 289.5

Elev. 289.0

Elev. 288.5

Elev. 288.0

Elev. 287.5

Elev. 287.0

Elev. 286.5

Elev. 286.0

Elev. 285.5

Elev. 285.0

Elev. 284.5

Elev. 284.0

Elev. 283.5

Elev. 283.0

Elev. 282.5

Elev. 282.0

Elev. 281.5

Elev. 281.0

Elev. 280.5

Elev. 280.0
WEIR FLOW - CREST OF RISER

\[ Q = C L H^{3/2} \]
\[ Q = (3.1)(32.0) H^{3/2} \]
\[ Q = 99.2 H^{3/2} \]

NOTE: TWO SPLINTER WALLS 1.0' THICK WERE USED.

\[ L = 18 + 18 - 4(1) = 32.0 \text{ ft} \]
\[ c = 3.1 \]

PIPE FLOW - FOR 7x6 CONCRETE MONOLITH

\[ Q = C A \sqrt{2} g h \]
\[ Q = (0.597)(42.0)(8.02) h^{1/2} \]
\[ Q = 201.09 h^{1/2} \]

\[ \frac{1}{C} = \frac{1}{1 + \frac{K_e}{C} + K_c P} \]
\[ \frac{1}{C} = \frac{1}{\sqrt{2 + (0.026)(310)}} \]
\[ C = \frac{1}{2.806} \]
\[ C = 0.3575 \]
\[ C = 0.597 \]

\[ A_p = 42.0 \text{ ft}^2 \]
\[ L_p = 310.0 \text{ ft} \]
\[ n = 0.013 \]
\[ K_e = 1.0 \]
\[ K_c = 0.00260 \]
Little Chocowut Creek Watershed
Site 2
NY-2015-D
Cross Section of Emer Spwy

Scale: 1:20
1:5
<table>
<thead>
<tr>
<th>Site</th>
<th>PIF</th>
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FINCH HILLS LITTLE CHOCONIT SITE 2
PHASE 1

JOB SPECIFICATION

Z 20 10

1DAY 130

TIME HETCOR TPLT IPRT ISTALL

JOPER MT LDRPT TRACE

5 0 0

MULTI-PLAN ANALYSES TO BE PERFORMED

PLAN= 1 INR= 2 LKJ= 1

UTC= 0.50 1.00

SUB-AREA RUNOFF COMPUTATION

INFLL FROM TOTAL BASIN

ISTAG IFCOM IFCON ITAPE JPLT JPRT ISTALL IAUTO

1 0 0 0 2 0 1 0

HYDROGRAPH DATA

IMHG DT TAHAG SHORT TRPGA TRSPC PTIO ISNOW ISAME LONCL

1 1 11.72 0. 11.72 0. 0 0 1 0

PRCIP DATA

SPFE P0S R6 RT2 R24 R48 PT2 R96

22.50 96.00 110.00 121.00 129.00 129.00 0. 0.

TSPC COMPUTED BY THE PROGRAM IS 0.036

LOSS DATA

LDRPT STRK DLTK RTIL EMAK STAKS RTJNK STN LUNL ALSN RENP

0 0 0 0. 0. 1.00 0. 0. 1.00 1.00 1.00 0.10 0. 0.

UNIT HYDROGRAPH DATA

TP= 5.40 CP= 0.63 NTA= 0

RECESSION DATA

STRT= -2.00 OCRSN= -0.09 RTR= 1.00

APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SLOPES CP AND TP ARE TC= 11.98 AND RT= 10.05 INTERVALS

UNIT HYDROGRAPH AC END-OF-PERIOD ORDINATES

LAG 5.39 IMPRS CP= 0.63 VOl= 1.00

24 91 1.15 2.24 413 537 759 933 880
37 191 21 762 673 609 849 184 167 131
17 323 32 275 309 225 206 184 167 131
41 41 41 37 34 31 26 25 23 21
14 17 15 14 13 11 10 9 8

END-OF-PERIOD RUN
### HYDROGRAPH ROUTING

**ROUTE: TAPPAN RESERVOIR**
- **LAST**: 1
- **ICNP**: 1
- **IFCN**: 1
- **ITAPE**: 1
- **IJPL**: 2
- **JPLT**: 0
- **JNAME**: 1
- **ISTAGE**: 0

**ROUTING DATA**
- **NLUS**: 0
- **CLOS**: 0
- **AVG**: 0
- **IND**: 1
- **ITMP**: 1
- **IIN**: 0

**:STPS**: 1
- **NISTOL**: 0
- **LAG**: 0
- **ANSK**: 0
- **TSK**
- **STURA**
- **ISPAT**: 1

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<th>Q3</th>
<th>Q4</th>
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**FLUID**
- **C.**: 0
- **Q**: 0

**CAPACITY**: 0
- **C.**: 0
- **Q**: 0

**ELEVATION**: 934.00
- **C.**: 0
- **Q**: 0

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**DAM DATA**
- **TIPPE**: 976.4
- **COOP**: 3.0
- **F:XPW**: 1.5
- **C:QOL**: 1050.

**STATION**
- **1**: PLAN
- **1**: KAATU 1

#### END-OF-PERIOD HYDROGRAPH ORDINATES

**OUTFLOW**

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PEAK CUTFLOW IS 12657 AT TIME 45:00 HOURS
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)

<table>
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<tr>
<th>Operation</th>
<th>Station</th>
<th>Area</th>
<th>Plan Ratio 1</th>
<th>Plan Ratio 2</th>
<th>Ratios Applied to Flows</th>
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<td>HYD GRPH AT</td>
<td>1</td>
<td>11.72</td>
<td>1</td>
<td>6473.64</td>
<td>12746.62</td>
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<tr>
<td></td>
<td></td>
<td>0.00</td>
<td>(180.46)</td>
<td>(360.92)</td>
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<tr>
<td>HYD ETU</td>
<td>1</td>
<td>11.72</td>
<td>1</td>
<td>6492.98</td>
<td>12657.97</td>
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<td>0.00</td>
<td>(178.74)</td>
<td>(358.39)</td>
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## SUMMARY OF DAM SAFETY ANALYSIS

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<th>Plane</th>
<th>Elevation</th>
<th>Initial Value</th>
<th>Spillway Crest</th>
<th>Top of Dam</th>
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<td>1</td>
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<td>976.40</td>
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<td>Outflow</td>
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<tr>
<th>Ratio</th>
<th>Maximum Reservoir Depth</th>
<th>Maximum Storage</th>
<th>Maximum Outflow</th>
<th>Maximum Duration</th>
<th>Time of Maximum Outflow</th>
<th>Time of Failure</th>
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APPENDIX D

REFERENCES

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


APPENDIX E
DRAWINGS
VICINITY MAP
FINCH HOLLOW WATERSHED PROJECT
SITE 2
I.D. No. NY 719
TOPOGRAPHIC MAP
FINCH HOLLOW WATERSHED PROJECT
SITE 2
I.D. No. NY 719
SEEDING LIMITS

WASTE AREA

AS BUILT
### Test Pit 1

- **Material:**
  - **Sample:** 1
  - **Test:** 223 (0.41, 0.42, 0.41)
  - **Test:** 228 (0.41, 0.42, 0.41)
  - **Test:** 233 (0.41, 0.42, 0.41)
  - **Test:** 232 (0.41, 0.42, 0.41)

- **Overburden Material Removed from Zone 1 and Surfaces, Gravel, Sand, Silt, and Associated Bedrock Represented by Test Pit 1 (0.42, 0.43, 0.42)
  - **Drill Hole:** 232 (0.41, 0.42, 0.41)

### Test Pit 2

- **Rock from the Emergency Spillway:**
  - **Test:** 264 (0.41, 0.42, 0.41)

---

### Construction Details

1. The foundation surface throughout the base area of the dam shall be scarified (except where foundation is bedrock) to a depth of 0.6 to 0.9 m and compacted prior to placement of earth fill.
2. Zone boundaries indicated are approximate. Adjustments will be made by the engineer to permit the contractor to utilize all usable required excavation within the material zones.
3. Topsoil that is suitable for use shall be incorporated within the slopes of the earth fill as directed by the engineer.

---

### Test Placements Table

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<th>Zone</th>
<th>Material</th>
<th>Basis</th>
<th>Limit</th>
<th>Classification</th>
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<td>Material in test pit 1</td>
<td>26%</td>
<td>Type B Mix (sand)</td>
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<tr>
<td>2</td>
<td>Overburden</td>
<td>Material removed from Zone 1 and surfaces, gravel, sand, silt, and associated bedrock represented by Test Pit 1</td>
<td>24%</td>
<td>Type B Mix (sand)</td>
</tr>
</tbody>
</table>

### Typical Compaction Curve

- **For Typical Compaction Curves see this sheet.**

---

### Principal Spillway Excavation

- **At Anti-Seep Collars**

---

### Principal Spillway Excavation

- **Excav. Common:** 5344 cu.yds.
- **Rock Excav.:** 1562 cu.yds.
- **Fill:** 4294 cu.yds.

---

### Fill Placement & Principal Spillway Excavation

- **U.S. Department of Agriculture, Soil Conservation Service**

---

### Modal Analysis

- **Principal Spillway:**
  - **Excav. Common:** 745 cu.yds.

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### Fill Placement & Principal Spillway Excavation

- **U.S. Department of Agriculture, Soil Conservation Service**

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### Modal Analysis

- **Principal Spillway:**
  - **Excav. Common:** 745 cu.yds.
PLAN OF DRAINAGE SYSTEM

SECTION AA
Not to Scale

SECTION BB
Not to Scale

SECTION CC
Not to Scale

SECTION DD
Not to Scale

EXCAV. 450CU.YDS
DRAIN FILL 1066CU.YDS.

PROFILE ALONG CENTERLINE OF DRAIN TUNNELING MAINSTREAM
USE STANDARD MECHANICAL JOINTS.
PIPE SHALL CONFORM TO SPEC. 500 AND SHALL BE 24" NOMINAL DIA
THICKNESS CLASS 1.

REIN CONC MONOL. THE CONDUIT CLASS 4000 CONC DETAIL SHEETS 15. IMP.

PROFILE ALONG C OF PRINCIPAL SPILLWAY LOOKING DOWNSTREAM.
CONSTRUCTION DETAILS

1. Materials of reservoir drain trash rack and section 88-3 are in accordance with spec. 117 for structural carbon steel plates, shapes, and bars.

2. Trash rack to be painted in accordance with spec. 22.

ANCHOR BOLT (GALVANIZED)

Stainless steel Class 304, 304L, or 304L, Condition A

Supplied with washers and Type 2 nuts

NOT TO SCALE
**MATERIAL DESCRIPTIONS**

A
Gravel, coarse - 3/16-1/2 in angular to subangular, and flagstones from 2 to 3 in size in silty matrix - yellow/brown - dry to moist - loosely packed - very slightly permeable - slightly weathered - Wisconsin stage. (GP)

B
Gravel, coarse in medium - subangular and sub-rounded cobbles from 2 to 3 in size in silty matrix - gray - moist to wet - loose to medium dense - rapidly permeable - recent alluvium. (GP)

C
Gravel, alluvial - 3/16-1/2 in angular, often thin, weathered flagstones from 3-10 in size in silty matrix - large 3-6 in boulders common - brown - moist to wet - loosely to medium dense - slowly permeable - glacial till - Wisconsin stage.

D
Breciated shales - broken gray siltslate in silty matrix - slate gray - moist - slowly to very slightly permeable - glacial marine deposits. (CM)

E
Sand, silty - 100-200 in angular to subangular flagstones 3-10 in size in gray silty lenses - brown - moist - soft - medium permeable - glacial till - Wisconsin stage. (SP)

F
Silt, sandy - WO smaller than 80 mesh screen, some subangular flagstone - brown - moist - soft - very slightly permeable - ice contact deposit. (NL)

G
Silt, fine to coarse - no large aggregates - slate gray - moist - soft - slowly permeable - lacustrine deposit. (NL)

H
Siltstone, interbedded with fine grained, gray sandstone, sometimes varved, sand - hard - dense - fossiliferous - horizontal bedding from thin to 36 in - occasionally vertical tension fissures. (as, slate)

I
City dump trash - 50% rubber refuse from local shoe industry - bouncing - smelling - moist to wet. (as)

J
Topsoil - organic matter - some stones and boulders - brown - dry - loose - permeable. (as)

**RAINEY PIT SITES**

<table>
<thead>
<tr>
<th>TP 1, C/F, Elev. 939.2</th>
<th>0.5</th>
<th>Topsoil - Material F</th>
<th>9.5</th>
<th>10.0 Material C (CM)</th>
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</thead>
<tbody>
<tr>
<td>TP 2, C/F, Elev. 939.2</td>
<td>0.5</td>
<td>Topsoil - Material K</td>
<td>8.5</td>
<td>9.0 Material D (GP)</td>
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<tr>
<td>TP 3, C/F, Elev. 939.2</td>
<td>8.0</td>
<td>11.5</td>
<td>C (CM)</td>
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<tr>
<td>TP 4, C/F, Elev. 939.2</td>
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<td>Material K (CD)</td>
<td>3.0</td>
<td>3.0 Material K (CD)</td>
</tr>
<tr>
<td>TP 5, C/F, Elev. 939.2</td>
<td>3.0</td>
<td>Material K (CD)</td>
<td>6.3</td>
<td>D (GP)</td>
</tr>
<tr>
<td>TP 6, C/F, Elev. 939.2</td>
<td>6.3</td>
<td>H (as, slate)</td>
<td></td>
<td></td>
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</tbody>
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<thead>
<tr>
<th>TP 7, C/F, Elev. 939.2</th>
<th>0.5</th>
<th>Topsoil - Material K</th>
<th>1.0</th>
<th>5.0 Material A (GP)</th>
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</thead>
<tbody>
<tr>
<td>TP 8, C/F, Elev. 939.2</td>
<td>1.0</td>
<td>Topsoil - Material K</td>
<td>5.0</td>
<td>5.0 Material E (SM)</td>
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<tr>
<td>TP 9, C/F, Elev. 939.2</td>
<td>10.0</td>
<td>11.5</td>
<td>C (CM)</td>
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**NOTE:** Slight seepage 0.5%.

**TOPSOL**

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<th>TP 10, C/F, Elev. 939.2</th>
<th>0.5</th>
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<th>8.0</th>
<th>9.0 Material D (GP)</th>
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<tbody>
<tr>
<td>TP 11, C/F, Elev. 939.2</td>
<td>8.0</td>
<td>11.5</td>
<td>C (CM)</td>
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<td>TP 12, C/F, Elev. 939.2</td>
<td>3.0</td>
<td>Topsoil - Material K</td>
<td>5.0</td>
<td>5.0 Material A (GP)</td>
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<td>TP 13, C/F, Elev. 939.2</td>
<td>5.0</td>
<td>5.0 Material A (GP)</td>
<td>9.0</td>
<td>11.0 Material E (SM)</td>
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<td>TP 14, C/F, Elev. 939.2</td>
<td>9.0</td>
<td>11.5</td>
<td>E (CM)</td>
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**NOTE:** Heavy boulders (shale) in Material C.

**TOPSOIL, C/F, Elev. 939.2**

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<th>TP 15, C/F, Elev. 939.2</th>
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<th>9.0</th>
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<tr>
<td>TP 16, C/F, Elev. 939.2</td>
<td>0.5</td>
<td>Topsoil - Material K</td>
<td>1.0</td>
<td>2.0 Material A (GP)</td>
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**NOTE:** Hole abandoned due to heavy boulders.
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<tr>
<td>0.0</td>
<td>Material D</td>
<td>0.0</td>
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<tr>
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<td>Material E</td>
<td>10.0</td>
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<tr>
<td>10</td>
<td>Material C</td>
<td>2.0</td>
</tr>
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<td>1</td>
<td>Material H</td>
<td>19.5</td>
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Note: Hole water tested, no absorption.

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