LEVEL II

National Dam Safety Program
LOCK 32 - ERIE CANAL

MONROE COUNTY, NEW YORK

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Prepared by
THOMSEN ASSOCIATES
105 CORONA AVE. GROTON, N.Y.

Prepared for
DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
NEW YORK, NEW YORK

SEPTEMBER 1980

323970  80 10 29 010
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 a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to human life or property. However, increased maintenance...
is required to correct concrete deterioration in the general lock area, of the spillway intake structure, and of the foot bridge which crosses the spillway discharge pool. Also, a detailed emergency operation-action plan and warning system should be developed and implemented.

No additional investigations are deemed necessary at this time. Because flow to Lock 32 is controlled by other structures, no hydrologic/hydraulic analyses were possible.
DISCLAIMER NOTICE

THIS DOCUMENT IS BEST QUALITY PRACTICABLE. THE COPY FURNISHED TO DTIC CONTAINED A SIGNIFICANT NUMBER OF PAGES WHICH DO NOT REPRODUCE LEGIBLY.
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, DC 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 INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
LOCK 32 ERIE CANAL
I. D. NO. N.Y. 791
MONROE COUNTY, NEW YORK

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ASSESSMENT

Examination of available documents and a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to human life or property. However, increased maintenance is required to correct concrete deterioration in the general lock area, of the spillway intake structure, and of the foot bridge which crosses the spillway discharge pool. Also, a detailed emergency operation-action plan and warning system should be developed and implemented.

No additional investigations are deemed necessary at this time. Because flow to Lock 32 is controlled by other structures, no hydrologic/hydraulic analyses were possible.

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Gary W. Wood, P.E.
Thomsen Associates
N.Y. License #44504

APPROVED BY

Colonel W. H. Smith, Jr.
New York District Engineer
Overview Photo of Upstream Works

Overview Photo of Lock 32
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 lock and its appurtenant structures, to identify deficiencies and hazardous conditions, to determine if they constitute hazards to human life and property, and to recommend remedial measures where necessary.

1.2 DESCRIPTION OF PROJECT

a. Description of the Lock and Appurtenant Structures
Lock 32 is a concrete, pile supported structure set in an earth embankment. The interior of the lock is approximately 340 feet long, 44 feet wide, and 40 feet deep. There are vertically hinged gates at the west (upstream) and east (downstream) end of the lock. The approximate head differential is 25 feet.

The only spillway is located south (See layout plan and sections, Appendix D, for compass directions) of the lock. It is an open, riprap-lined channel approximately 1000 feet in length. The entrance to the spillway consists of five gates, each approximately 8½ feet wide. These
gates are equipped with stoplogs. The downstream end of the spillway consists of a double box culvert under Route 65. This culvert empties into a pool at the downstream end.

b. Location
The lock is located on the Erie Canal of the New York State Barge Canal system, south of the City of Rochester, and just west of the Village of Pittsford. It is near the intersection of Routes 252 and 65.

c. Size Classification
This lock has a head of approximately 25 feet, and a storage volume of approximately 360 acre-feet. Therefore, it is classified as a small dam.

d. Hazard Classification
The dam is classified "high" hazard because of downstream residences and the potential impact on navigation.

e. Ownership
Lock 32 is owned by the New York State Department of Transportation, Waterways Maintenance Subdivision. The controlling office is located near Rochester, New York.

New York State Department of Transportation
Region 4
Jefferson Road
Rochester, New York
Mr. Clarence Burkwit
716-442-8550

f. Purpose of the Dam
The sole purpose of Lock 32 is to facilitate navigation along the New York State Barge Canal. The impounded waters behind the dam provide a storage pool used for gravity inflow to the lock.
g. Design and Construction History

The New York State Barge Canal in the vicinity of Lock 32 is an artificial waterway. Plans are dated 1908, and the lock was constructed a short time after this.

h. Normal Operational Procedures

During the navigation season, the upstream and downstream water levels are maintained as nearly as possible to the design levels of 487.5 (BCD-Barge Canal Datum) and 462.4 (BCD). These levels are established by the spillway stoplogs in the upstream and downstream locks, as well as this one. Manipulation of these stoplogs is not normally required. Staff gauge readings upstream and downstream of the lock are recorded daily. During the winter, the canal in the vicinity of Lock 32 is drained by closing the inlet gates at the Genesee River, some 5 miles upstream.

1.3 PERTINENT DATA

a. Elevations (Barge Canal Datum-BCD)

<table>
<thead>
<tr>
<th>Description</th>
<th>Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top of Dam</td>
<td>490.0</td>
</tr>
<tr>
<td>Design Pool</td>
<td>487.5</td>
</tr>
<tr>
<td>Maximum Recorded Pool</td>
<td>488+</td>
</tr>
<tr>
<td>Spillway Crest (Minimum)</td>
<td>485.5</td>
</tr>
<tr>
<td>Spillway Crest (Maximum)</td>
<td>490.0</td>
</tr>
<tr>
<td>Streambed at Dam Centerline (Upstream)</td>
<td>475.5+</td>
</tr>
<tr>
<td>Streambed at Dam Centerline (Downstream)</td>
<td>450.4+</td>
</tr>
<tr>
<td>Design Tailwater</td>
<td>462.4</td>
</tr>
<tr>
<td>Maximum Recorded Tailwater</td>
<td>463+</td>
</tr>
</tbody>
</table>

b. Reservoir (feet)

<table>
<thead>
<tr>
<th>Description</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of Normal Pool</td>
<td>6800+</td>
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c. Storage (acre-feet)

<table>
<thead>
<tr>
<th>Description</th>
<th>Storage</th>
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<tbody>
<tr>
<td>Normal Pool</td>
<td>360+</td>
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d. Reservoir Surface (acres)

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<th>Description</th>
<th>Surface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Pool</td>
<td>30+</td>
</tr>
</tbody>
</table>

e. Dam

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Lock</td>
</tr>
<tr>
<td>Length</td>
<td>350'+</td>
</tr>
<tr>
<td>Height (Head)</td>
<td>25'+</td>
</tr>
<tr>
<td>Top Width</td>
<td>50'+</td>
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</table>

f. Spillway

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Crest Elevation</th>
<th>Gates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Open Channel (Rip-Rap lined)</td>
<td>485.5-490.0</td>
<td>5 gates, each 8.5' wide, with stoplogs</td>
</tr>
</tbody>
</table>
SECTION 2: ENGINEERING DATA

2.1 GEOTECHNICAL DATA

a. Geology

Lock 32 is located approximately 1.5 miles west of Pittsford, a southeastern suburb of Rochester, New York. The site lies north of the Onondaga Escarpment, a cuesta which trends east-west across upstate New York, and therefore, is situated in the Erie-Ontario Lowlands physiographic province. This province is characterized by the general low relief of a glacial lake plain, above which rise hills and drumlins composed of glacial till and bedrock.

Bedrock in the immediate Lock 32 vicinity consists of the Upper Silurian Salina Group of interbedded shales, siltstones, dolostones and evaporites. The shale and siltstone units are characteristically gysiferous and many units are known to be cavernous. Despite a regional southward dip, stratification may be considered horizontal over short distances; no major or active faults are to be found in the area. The depth to bedrock is uncertain.

Lock 32 is situated in a region classified as Zone 3 seismicity, as shown on Figure 1 of the Recommended Guidelines for Safety Inspections of Dams.

Pleistocene glaciation of the region has left, as its most marked effect, extensive fine-grained lacustrine deposits which once formed the floor of proglacial Lake Iroquois. Subsequent to final retreat of the Wisconsinan Stage ice sheet and reduction of Lake Iroquois to present Lake Ontario, drainage channels dissecting the lake plain became the site of stratified sand and gravel outwash deposits. Throughout the lacustrine phase, uplands of sufficient elevation such as drumlins and knolls of till and bedrock, remained free of sedimentation.
b. Subsurface Investigations
No records of subsurface investigations were available. Based upon the available plans and the site characteristics, it appears that the lock and spillway intake are founded on piles. The lengths and type(s) of the piles are uncertain.

2.2 DESIGN/CONSTRUCTION RECORDS
Plans dated 1908 and identified as Contract 23 show the existing lock, spillway, and appurtenant structures as they presently exist. Selected drawings are included in Appendix D.

2.3 OPERATION RECORDS
This site has an attendant on a continuous basis during the navigation season. During the winter, the lock and canal are drained. Upstream and downstream water elevation readings are recorded daily during the navigation season. These levels are maintained as nearly as possible to the design levels of 487.5 (BCD) and 462.4 (BCD). The upstream level can be controlled by stoplogs at the spillway entrance.

2.4 EVALUATION OF DATA
The data presented in this report were obtained during the site inspection and from the files of the New York State Department of Transportation. The information is considered adequate for Phase I inspection purposes.
SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General
Visual inspection of the lock and appurtenant structures was conducted on June 12, 1980. The weather was generally fair. The upstream and downstream water elevations were 486.2 (BCD) and 462.5 (BCD) respectively.

b. Lock
The lock was observed in operation and no mechanical, electrical, or hydraulic problems were noted. Concrete deterioration was noted in the general lock area, including upstream and downstream dock walls.

c. Spillway
Concrete deterioration was noted at the spillway intake structure, and very significant concrete deterioration (including exposed reinforcing bars) was noted at the foot bridge which crosses the downstream spillway pool.

d. Upstream and Downstream Canals
The conditions of the canals upstream and downstream of the lock appeared to be satisfactory. Slopes in the Lock 32 vicinity are generally graded to 1 vertical on 2 horizontal. No signs of instability were noted.

3.2 EVALUATION OF OBSERVATIONS
The following deficiencies were noted, and are shown in the photographs in Appendix A.

1) Concrete deterioration in the general lock area.
2) Concrete deterioration of the spillway intake structure.
3) Concrete deterioration of the foot bridge.
SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES
Normal practice is to maintain the upstream and downstream water elevations as nearly as possible to the design levels of 487.5 (BCD) and 462.4 (BCD). These levels are affected by Locks 33 (upstream) and 31 (downstream). The water level within the lock is gravity-controlled by means of valves.

4.2 MAINTENANCE OF LOCK
The lock is maintained by the New York State Department of Transportation. Most of the lock maintenance is performed on an as-needed basis, with the largest part of the work being done during the portions of the year when the canal is drained. Every year, one of the four lock gates and its motor and operating mechanism are overhauled. Increased maintenance is required to correct concrete deterioration in the general lock area, including upstream and downstream dock walls.

4.3 MAINTENANCE OF SPILLWAY AND APPURTENANT STRUCTURES
The spillway and its appurtenant structures are maintained by the New York State Department of Transportation. Increased maintenance is required to correct concrete deterioration of the spillway intake structure, and of the foot bridge which crosses the downstream spillway pool.

4.4 WARNING SYSTEM IN EFFECT
No apparent warning system is present.

4.5 EVALUATION
It appears that past maintenance practices have largely ignored the concrete portions of the lock and its appurtenances and additional maintenance now is required to correct concrete deterioration in the general lock area, of the spillway intake structure, and of the foot bridge. In addition, a detailed emergency warning system should be developed.

-7-
SECTION 5: HYDROLOGIC/HYDRAULIC

5.1 HYDRAULIC CHARACTERISTICS

The New York State Barge Canal in the vicinity of Lock 32 is an artificial waterway. There are no tributaries. Flow to the lock and its spillway can be controlled by the following structures:

- The Court Street Dam in Rochester. This dam maintains the Genesee River at an elevation of approximately 513.1 (BCD) during the navigation season, and supplies water for the Barge Canal.
- Gates near the intersection of the Barge Canal and the Genesee River. These gates, which can be lowered even in the event of a power failure, are designed to prevent excessively high river waters from entering the canal. The top elevation of these gates is approximately 524 (BCD).
- Lock 33. Through the use of stoplogs, the spillway crest of this lock can be made as high as approximate elevation 517 (BCD).

5.2 ANALYSIS CRITERIA

Because the canal in the vicinity of Lock 32 is an artificial waterway, and flow to the lock is controlled by other structures, no conventional hydrologic/hydraulic analyses were possible.

5.3 SPILLWAY CAPACITY

The spillway capacity was computed using an equation for orifice flow, and assuming that the water surface elevation was at the top of the lock walls (elevation 490.0-BCD). It was also assumed that all stoplogs were removed. With this analysis, a discharge of 1510 cubic feet per second was obtained.
5.4 RESERVOIR CAPACITY
The canal between Locks 32 and 33 was estimated to have a water surface area of approximately 30 acres, and a design depth of approximately 12 feet. The approximate storage, therefore, was computed as 360 acre-feet. The surcharge depth of 2 1/2 feet between normal water level and the top of embankment adds approximately 75 acre-feet, for a total storage capacity of approximately 435 acre-feet.

5.5 FLOOD OF RECORD
The maximum upstream pool elevation at Lock 32 has been approximately 488 (BCD). This level was noted during an isolated occurrence when an unusually high amount of water was discharged through Lock 33.

5.6 OVERTOPPING POTENTIAL
There is no record of the lock and/or spillway ever being overtopped.

5.7 EVALUATION
Because flow to Lock 32 is controlled by other structures, no hydrologic/hydraulic analyses were possible.
SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

No visible evidence of structural instability was noted. The horizontal and vertical alignments, abutments, and joints between structural elements all appeared to be satisfactory. The concrete deterioration noted in the visual inspection does not affect structural stability (except that of the footbridge which does not affect the structure per se) at this time.

b. Stability Evaluation

No stability analyses (either overturning or sliding) were deemed applicable to this structure because of its configuration as a monolithic box.

A review of design parameters* for earth embankments of compacted sands and gravels indicates that embankment slopes of approximately 1 vertical on 2 horizontal will have adequate factors of safety with respect to shear failures.

Seismic stability was not considered during the design phase and was not evaluated as a part of this investigation since stability of the concrete structure was not applicable and there is no data available for stability analyses of the levee section.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

The Phase I inspection of Lock 32 did not reveal conditions which constitute an immediate hazard to human life or property. However, increased maintenance is required to correct deterioration in the general lock area, of the spillway intake structure, and of the foot bridge.

Because the flow to Lock 32 and its spillway is controlled by other structures, hydrologic/hydraulic analyses were not possible. In the event of a possible emergency (such as might result from impending failure of an upstream structure), however, continuous surveillance should be provided to warn of high floodwater conditions. Such surveillance procedures and other measures deemed necessary should be developed, documented, and placed in readiness for future use as part of a detailed emergency operation-action plan. A warning system should also be developed and implemented.

b. Adequacy of Information

The information available for preparation of this report is considered adequate.

c. Necessity for Additional Investigations

No additional investigations are deemed necessary at this time.

d. Urgency

The deficiencies noted in this investigation should be corrected before the next navigation season.
7.2 RECOMMENDED MEASURES

The following actions should be undertaken:

a) Correct concrete deterioration in the general lock area, of the spillway intake structure, and of the foot bridge.

b) Develop and implement a detailed emergency operation-action plan and warning system.
Downstream staff gauge;
NOTE: Concrete deterioration

Upstream staff gauge;
NOTE: Concrete deterioration

Concrete deterioration on North Lock Wall
APPENDIX B

VISUAL INSPECTION CHECKLIST
## VISUAL INSPECTION CHECKLIST

### 1) Basic Data

#### a. General

<table>
<thead>
<tr>
<th>Description</th>
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<tr>
<td>Name of Dam</td>
<td>Liske Creek Canal</td>
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<tr>
<td>I.D. #</td>
<td>40D</td>
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<tr>
<td>DEC. Dam No.</td>
<td>721</td>
</tr>
<tr>
<td>River Basin</td>
<td>Seneca River</td>
</tr>
<tr>
<td>Location: Town</td>
<td>Pittsford</td>
</tr>
<tr>
<td>County</td>
<td>Monroe</td>
</tr>
<tr>
<td>U.S.G.S. Quadrangle</td>
<td>Pittsford</td>
</tr>
<tr>
<td>Stream Name</td>
<td>Seneca Creek</td>
</tr>
<tr>
<td>Tributary of</td>
<td>Seneca Creek</td>
</tr>
<tr>
<td>Latitude (N)</td>
<td>43° 5'</td>
</tr>
<tr>
<td>Longitude (W)</td>
<td>72° 32' 3&quot;</td>
</tr>
<tr>
<td>Type of Dam</td>
<td>Rock</td>
</tr>
<tr>
<td>Hazard Category</td>
<td>High</td>
</tr>
<tr>
<td>Date(s) of Inspection</td>
<td>6/12/10</td>
</tr>
<tr>
<td>Weather Conditions</td>
<td>Sunny</td>
</tr>
<tr>
<td>Reservoir Level at Time of Inspection</td>
<td>135'5&quot;</td>
</tr>
<tr>
<td>Tailwater Level at Time of Inspection</td>
<td>16'4&quot;</td>
</tr>
</tbody>
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#### b. Inspection Personnel

- [ ]
- [ ]

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

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
<th>Phone No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cave Creek F.</td>
<td>Higbee Dept.</td>
<td>315-330-330</td>
</tr>
<tr>
<td>Riley E.</td>
<td>Higbee Dept.</td>
<td>315-330-330</td>
</tr>
<tr>
<td></td>
<td>Higbee Dept.</td>
<td>315-330-330</td>
</tr>
</tbody>
</table>

#### d. History:

- **Date Constructed**: 1908
- **Date(s) Reconstructed**: (1908)

| Designated       | New York State                |
| Designated       | New York State                |
| Owner            | NYS DOT                      |

#### e. Seismic Zone

- [ ]
2) Embankment
   a. Characteristics
      1) Embankment Material
      2) Cutoff Type
      3) Impervious Core
      4) Internal Drainage System
      5) Miscellaneous
   b. Crest
      1) Vertical Alignment
      2) Horizontal Alignment
      3) Surface Cracks
      4) Miscellaneous
   c. Upstream Slope
      1) Slope (Estimate) (V:H)
      2) Undesirable Growth or Debris, Animal Burrows
      3) Sloughing, Subsidence or Depressions
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CONSULTING G EOTEHCNICAL ENGINEERS & GEOLoGISTS

VISUAL INSPECTION CHECKLIST

4) Slope Protection  

5) Surface Cracks or Movement at Toe  

---

d. Downstream Slope

1) Slope (Estimate - V:H)  

2) Undesirable Growth or Debris, Animal Burrows  

3) Sloughing, Subsidence or Depressions  

4) Surface Cracks or Movement at Toe  

5) Seepage  

6) External Drainage System (Ditches, Trenches; Blanket)  

7) Condition Around Outlet Structure  

8) Seepage Beyond Toe  

---

e. Abutments-Embankment Contact  

---
THOMSEN ASSOCIATES
CONSULTING GEOTECHNICAL ENGINEERS & GEOLOGISTS

VISUAL INSPECTION CHECKLIST

1) Erosion at Contact

2) Seepage Along Contact

3) Drainage System
   a. Description of System
   b. Condition of System
   c. Discharge from Drainage System

4) Instrumentation (Monumentation/Surveys, Observation Wells, Weirs, Piezometers, Etc.)
THOMSEN ASSOCIATES
CONSULTING GEOFTECHNICAL ENGINEERS & GEOLOGISTS

VISUAL INSPECTION CHECKLIST

5) Reservoir
   a. Slopes
   b. Sedimentation
   c. Unusual Conditions Which Affect Dam

6) Area Downstream of Dam
   a. Downstream Hazard (No. of Homes, Highways, etc.)
   b. Seepage, Unusual Growth
   c. Evidence of Movement Beyond Toe of Dam
   d. Condition of Downstream Channel

7) Spillway(s) (Including Discharge Conveyance Channel)
   a. General
   b. Condition of Service Spillway
VISUAL INSPECTION CHECKLIST

c. Condition of Auxiliary Spillway


d. Condition of Discharge Conveyance Channel


8) Reservoir Drain/Outlet

Type: Pipe _______ Conduit _______ Other _______
Material: Concrete _______ Metal _______ Other _______
Size: _______ Length _______
Invert Elevations: Entrance _______ Exit _______
Physical Condition (Describe): _______
  Material: _______
  Joints: _______ Alignment _______
  Structural Integrity: _______
  Hydraulic Capability: _______
  Means of Control: Gate _______ Valve _______ Uncontrolled _______
  Operation: Operable _______ Inoperable _______ Other _______
  Present Condition (Describe): _______
9) Structural
   a. Concrete Surfaces  Some Deterioration
   
   b. Structural Cracking  None Noted
   
   c. Movement - Horizontal & Vertical Alignment (Settlement)  None Noted
   
   d. Junctions with Abutments or Embankments  Average Good
   
   e. Drains - Foundation, Joint, Face  N.A.
   
   f. Water Passages, Conduits, Sluices  Average Good
   
   g. Seepage or Leakage  Some Noted Thrown Lock Gates
h. Joints - Construction, etc.  *AFFECTED GOOD*

i. Foundation  *UNOBSERVABLE*

j. Abutments  *GOOD*

k. Control Gates  *GENERALLY GOOD*

l. Approach & Outlet Channels  *GOOD*

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

n. Intake Structures  *SOME CONCRETE DECAY*

o. Stability  

p. Miscellaneous  

APPENDIX C

HYDROLOGIC/HYDRAULIC:
ENGINEERING DATA AND COMPUTATIONS
Determine Maximum Spillway Capacity
(With Water Surface at Top of Walls, Elevation 490). 

Use Orifice Discharge Equation 

\[ Q = CA \sqrt{2gh} \]

C = 0.61

\[ A = (5)(5.5)(4) = 130 \, \text{ft}^2 \]

\[ g = 32.2 \, \text{ft/s}^2 \]

\[ H = 490.0 - 487.5 = 2.5 \, \text{ft} \]

\[ Q = (0.61)(130) \sqrt{(2)(32.2)(2.5)} = 1500 \, \text{ft}^3/\text{s} \]
APPENDIX D

DRAWINGS
TOPOGRAPHIC MAP
LOCK 32 ERIE CANAL
I.D. NO. N.Y. 791
Contract No. 23,
Erie Canal Section S.
From Kings Bend to the Genesee River.
LAYOUT PLAN & SECTIONS OF LOCK 32 & VICINITY SHOWING PROTECTION WORK
Scales as indicated.
Prepared and Approved.

Details of Shaving Post Settings
Scale 3'-1"
Contract No. 23
Erie Canal
From Kings Bend to the Genesee River
FOUNDATION PLAN OF LOCK 32
Scale: 16 feet to the inch.
The following sections shall be built as a monolith and
mix once begun shall be continued without inter-
ruption until the section is completed: Fig.
Side wall between limits 86.153 66.3 54.6 from El 4579 to El 4659
\( Y_1 \), Y2, Y, Yn 66.5 66.5 66.5 66.5
Both thrust walls between El 2154-22.5 2159-22.5 66.5 66.5 66.5
66.5
Spaces under and around masonry shall be backfilled
where so required, with material placed as specified
for forming embankment.

The floor shall be built,

with a right angle

of lock. Backfill shall

monolith.

The base of each structure shall

in place of this contact shall be

approximate, and after

the Sixth Engineer, or with

aberration and may demand

proper foundation.
Contract No. 23
Erie Canal
Section 9.
From Kings Bench to the Genesee River
PLAN & ELEVATION OF LOCK 32
Scale: 15 feet = 1 inch

For directions relating to modification of foundations see sheet No. 30
For detailed dimensions of lock area see sheet No. 33034
Top of lock walls to be crowned 3 inches.
Top edges of all walls are to be rounded to radius of 2 inches otherwise shown.
For reinforcement of all chamber walls and lower thrust walls see sheet No. 32438
Contract No. 23
Erie Canal
Section 9.
From Kings Bend to the Genesee River.
SECTIONS OF LOCK 32
Scale: 18 feet to the inch.
Contract No. 23.
Erie Canal Section 9.
From Kings Bend to the Genesee River.
UPPER GUIDE WALL & UPPER SPILLWAY
LOCK 32.
Scales as indicated.

[Diagram with labels and measurements]
Contract No. 23
Erie Canal
From Kings Bend to the Genesee River.
UPPER GUIDE WALL & UPPER SPILLWAY
LOCK 32
Scales as indicated.
Contract No. 23

Erie Canal
Section 9.
From Kings Bend to the Genesee River.
LOWER GUIDE WALL & BY-PASS OUTLET
LOCK 32

Scales as indicated.

[Signature]
Engineer and approved
[Stamp]
Chief Deputy State Engineer
Contract No. 23
Erie Canal  Section 9
From Kings Bend to the Genesee River.
LOWER SPILLWAY & CULVERT UNDER
KINGSLEY ROAD LOCK 32
Scales as indicated.