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NATIONAL DAM SAFETY PROGRAM. LOCK 32 - ERIE CANAL (INVENTORY NU--ETC(U)
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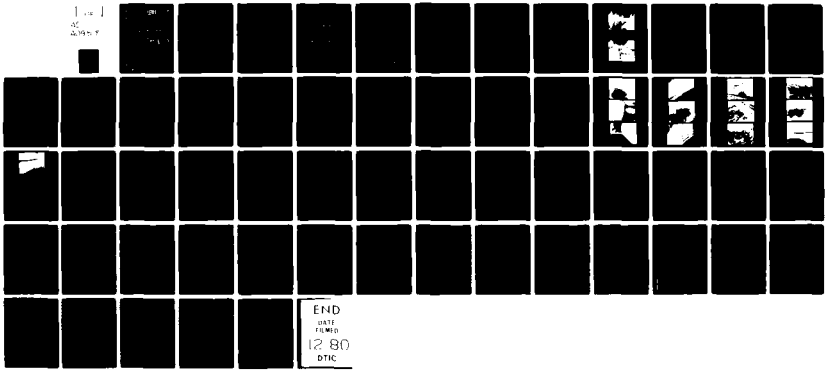

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LOCK 32 - ERIE CANAL

(Inventory Number N.Y. 791),

MONROE COUNTY, NEW YORK.

~~INVENTORY NO. N.Y. 791~~

PHASE I INSPECTION REPORT.
NATIONAL DAM SAFETY PROGRAM

(11) Sep 80 (12) 58

(15) DACW51-79-C-0001

Prepared by

THOMSEN ASSOCIATES

105 CORONA AVE. GROTON, N.Y.

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Prepared for

DEPARTMENT OF THE ARMY

NEW YORK DISTRICT, CORPS OF ENGINEERS

NEW YORK, NEW YORK

SEPTEMBER 1980

APPROVED FOR PUBLIC RELEASE;
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Lock 32
Erie Canal
Monroe County
Seneca River

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

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

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

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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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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, 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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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

NAME OF DAM:	Lock 32 Erie Canal I.D. No. N.Y. 791
STATE LOCATED:	New York
COUNTY LOCATED	Monroe
WATERSHED:	Seneca River
STREAM:	New York State Barge Canal
DATE OF INSPECTION:	June 12, 1980

from p2

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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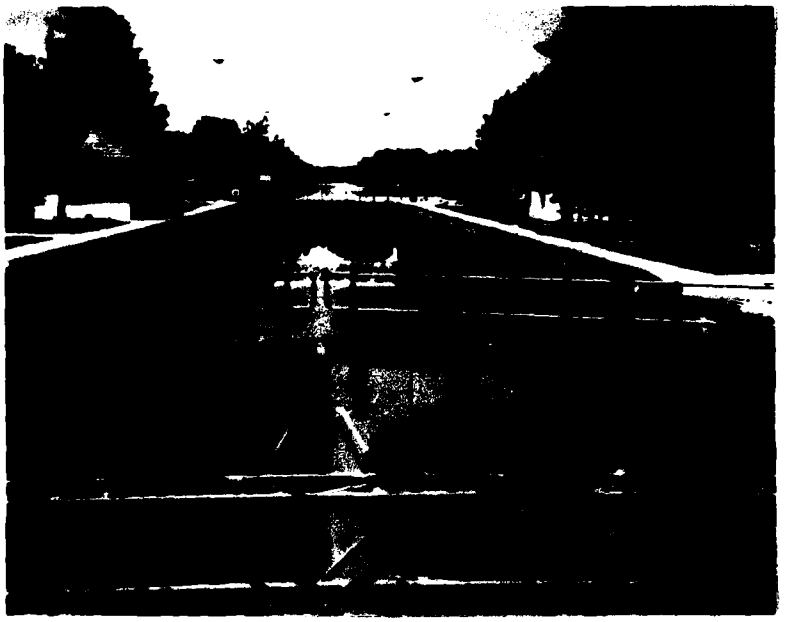
APPROVED BY

9/30/80
Colonel W. M. Smith, Jr.
New York District Engineer

Overview Photo of
Upstream Works



Overview Photo of
Lock 32

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
LOCK 32 ERIE CANAL
I.D. NO. N.Y. 791
MONROE 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 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)

Top of Dam	490.0
Design Pool	487.5
Maximum Recorded Pool	488±
Spillway Crest (Minimum)	485.5
Spillway Crest (Maximum)	490.0
Streambed at Dam Centerline (Upstream)	475.5±
Streambed at Dam Centerline (Downstream)	450.4±
Design Tailwater	462.4
Maximum Recorded Tailwater	463±

b. Reservoir (feet)

Length of Normal Pool	6800±

c. Storage (acre-feet)

Normal Pool	360±

d. Reservoir Surface (acres)

Normal Pool	30±

e. Dam

Type	Lock
Length	350'±
Height (Head)	25'±
Top Width	50'±

f. Spillway

Type	Open Channel (Rip-Rap lined)
Crest Elevation	485.5-490.0
Gates	5 gates, each 8.5' wide, with stoplogs

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 gypsiferous 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.

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.

*"Design of Small Dams", U.S. Department of Interior, Bureau of Reclamation, 1977.

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

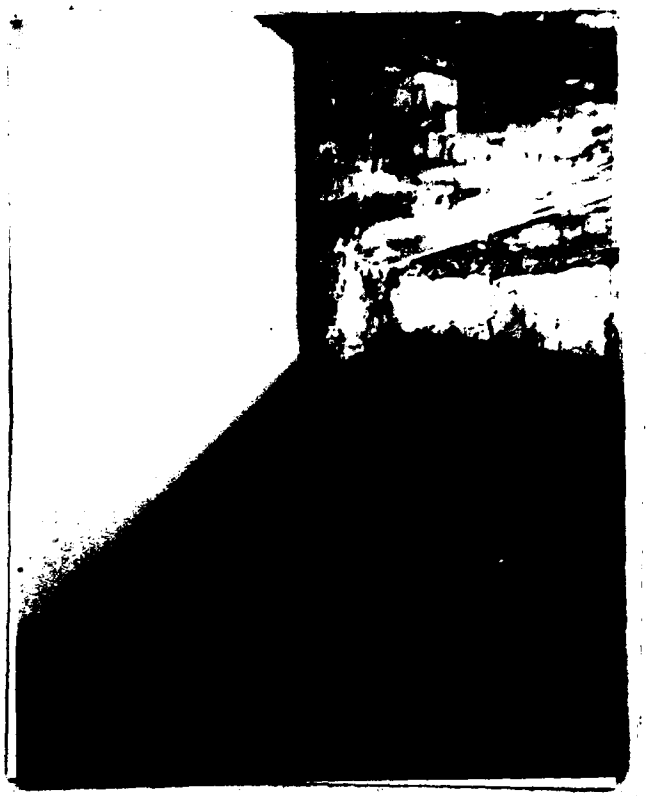
The following actions should be undertaken:

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.

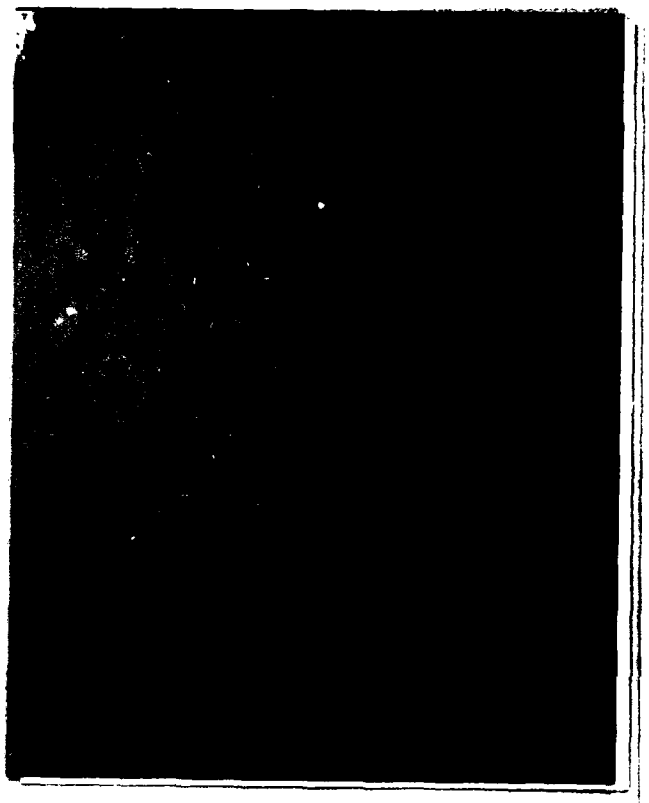
APPENDIX A

PHOTOGRAPHS



Downstream staff gauge;
NOTE: Concrete deterioration

Upstream staff gauge;
NOTE: Concrete deterioration

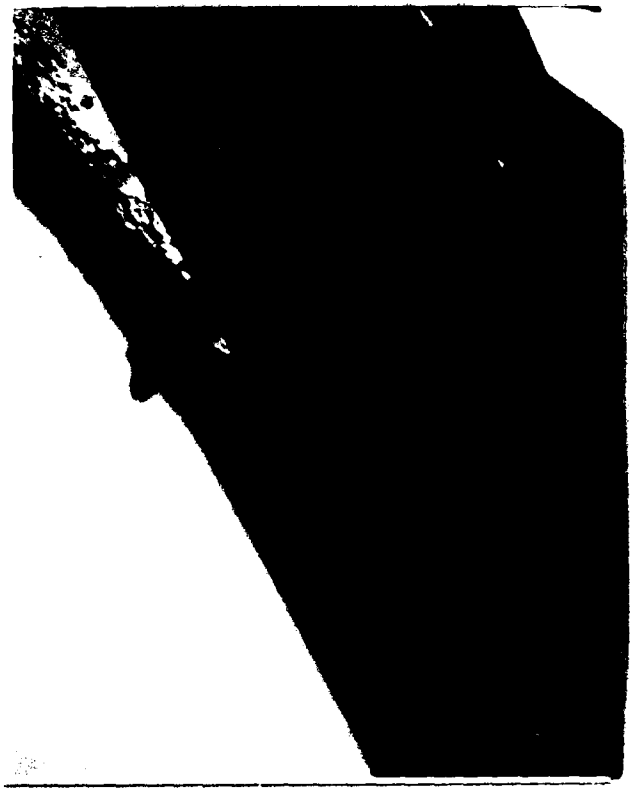


Concrete deterioration on
North Lock Wall

Leakage through downstream gates

Leakage through upsteam gates

Concrete deterioration on Downstream south wall



Upper spillway

Spillway entrance;
NOTE: Concrete deterioration

Spillway entrance;
NOTE: Concrete deterioration

Box culvert and downstream spillway pool

Lower spillway

Upper spillway

Foot bridge;
NOTE: Concrete deterioration including exposed reinforcing bars

APPENDIX B

VISUAL INSPECTION CHECKLIST

THOMSEN ASSOCIATES
CONSULTING GEOTECHNICAL ENGINEERS & GEOLOGISTS

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam Lock 32 Erie Canal

I.D. # 40 D DEC. Dam No. 791

River Basin Seneca River

Location: Town Pittsford County Monroe

U.S.G.S. Quadrangle Pittsford

Stream Name Erie Canal

Tributary of Seneca River

Latitude (N) 43° 5' Longitude (W) 77° 32' 30"

Type of Dam Lock

Hazard Category High

Date(s) of Inspection 6/12/90

Weather Conditions Sunny

Reservoir Level at Time of Inspection [illegible] (465.5 Eng. Plans)

Tailwater Level at Time of Inspection [illegible] (462.4)

b. Inspection Personnel F. Thomsen (T.O.)

F. Hahn (T.O.)

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

Clarence Eckhart, NYSDOT (716-442-8550)

Dick Barker, NYSDOT (716-442-8550)

d. History:

Date Constructed 1908 (Plans) Date(s) Reconstructed

Designer New York State

Constructed by New York State

Owner NYSDOT

e. Seismic Zone 2

THOMSEN ASSOCIATES
CONSULTING GEOTECHNICAL ENGINEERS & GEOLOGISTS

VISUAL INSPECTION CHECKLIST

2) Embankment

a. Characteristics

1) Embankment Material EARTH

2) Cutoff Type NONE

3) Impervious Core NONE

4) Internal Drainage System NONE

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) VARIES, ALL APPEAR STABLE

2) Undesirable Growth or Debris, Animal Burrows

NONE NOTED

3) Sloughing, Subsidence or Depressions

NONE NOTED

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CONSULTING GEOTECHNICAL ENGINEERS & GEOLOGISTS

VISUAL INSPECTION CHECKLIST

4) Slope Protection SLOPES VEGETATED

5) Surface Cracks or Movement at Toe UNOBSERVABLE

d. Downstream Slope

1) Slope (Estimate - V:H) VARIES ALL ABOUT STABLE

2) Undesirable Growth or Debris, Animal Burrows

NONE NOTED

3) Sloughing, Subsidence or Depressions

NONE NOTED

4) Surface Cracks or Movement at Toe

UNOBSERVABLE

5) Seepage NONE NOTED

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

NONE OTHER THAN SPILLWAY

7) Condition Around Outlet Structure

GENERALLY GOOD

8) Seepage Beyond Toe UNOBSERVABLE

e. Abutments-Embankment Contact

THOMSEN ASSOCIATES
CONSULTING GEOTECHNICAL ENGINEERS & GEOLOGISTS

VISUAL INSPECTION CHECKLIST

1) Erosion at Contact NONE NOTED

2) Seepage Along Contract NONE NOTED

3) Drainage System

a. Description of System N.A.

b. Condition of System N.A.

c. Discharge from Drainage System N.A.

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

2 STAFF GAUGES - NOT TESTED 1 PIEZOMETER

THOMSEN ASSOCIATES
CONSULTING GEOTECHNICAL ENGINEERS & GEOLOGISTS

VISUAL INSPECTION CHECKLIST

5) Reservoir

a. Slopes GENERALLY GOOD

b. Sedimentation IMPERCEPTIBLE

c. Unusual Conditions Which Affect Dam NONE NOTED

6) Area Downstream of Dam

a. Downstream Hazard (No. of Homes, Highways, etc.) SEVERAL HOMES

b. Seepage, Unusual Growth NONE NOTED

c. Evidence of Movement Beyond Toe of Dam NONE NOTED

d. Condition of Downstream Channel GENERALLY GOOD

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

a. General FLASHBOARDS; 5 GATES, EACH 8.5' WIDE; CREST VARIABLE 485.5 - 490.0; 50' WIDE; 1000'± LONG

b. Condition of Service Spillway

THOMSEN ASSOCIATES
CONSULTING GEOTECHNICAL ENGINEERS & GEOLOGISTS

VISUAL INSPECTION CHECKLIST

c. Condition of Auxiliary Spillway N. A.

d. Condition of Discharge Conveyance Channel Good

8) Reservoir Drain/Outlet (Bypass)

Type: Pipe _____ Conduit _____ Other Tunnel
Material: Concrete _____ Metal _____ Other Brick
Size: 5'x7' Length Approx. 700'
Invert Elevations: Entrance 469.0 Exit 461.9
Physical Condition (Describe): Unobservable X
Material: _____
Joints: _____ Alignment _____
Structural Integrity: _____
Hydraulic Capability: _____
Means of Control: Gate _____ Valve X Uncontrolled _____
Operation: Operable X Inoperable _____ Other _____
Present Condition (Describe): Apparently Good

THOMSEN ASSOCIATES

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 Appear Good

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

f. Water Passages, Conduits, Sluices Appear Good

g. Seepage or Leakage Some Noted Through Lock Gates

THOMSEN ASSOCIATES

h. Joints - Construction, etc. APPEAR 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 DETERIORATION

o. Stability

p. Miscellaneous

APPENDIX C

HYDROLOGIC/HYDRAULIC: ENGINEERING DATA AND COMPUTATIONS

L-3 x 32

HYDROLOGIC / HYDRAULIC ANALYSES

DETERMINE MAXIMUM SPILLWAY CAPACITY (WITH WATER SURFACE AT TOP OF WALLS, ELEV. 490).

USE ORIFICE DISCHARGE EQUATION

$$Q = CA\sqrt{2gH}$$

$C = 0.7$ ✓

$A = (5)(8.5)(4) = 170$ FT^2 ✓

$g = 32.2$ FT/SEC^2

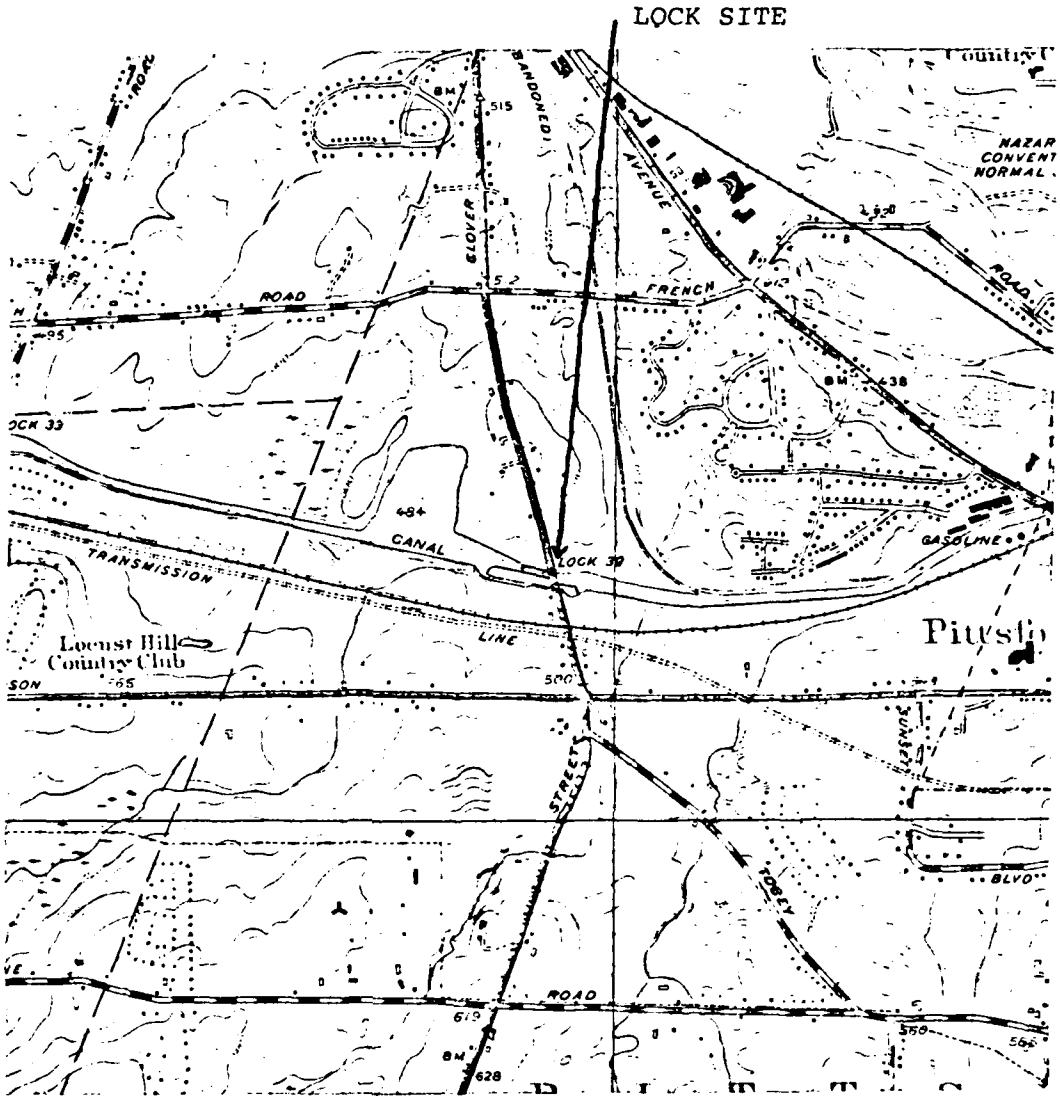
$H = 490.0 - 487.5 = 2.5'$ ✓

$$Q = (.7)(170)\sqrt{(2)(32.2)(2.5)} = \underline{1510 \text{ CFS}}$$ ✓

✓ = APP 9/25

APPENDIX D

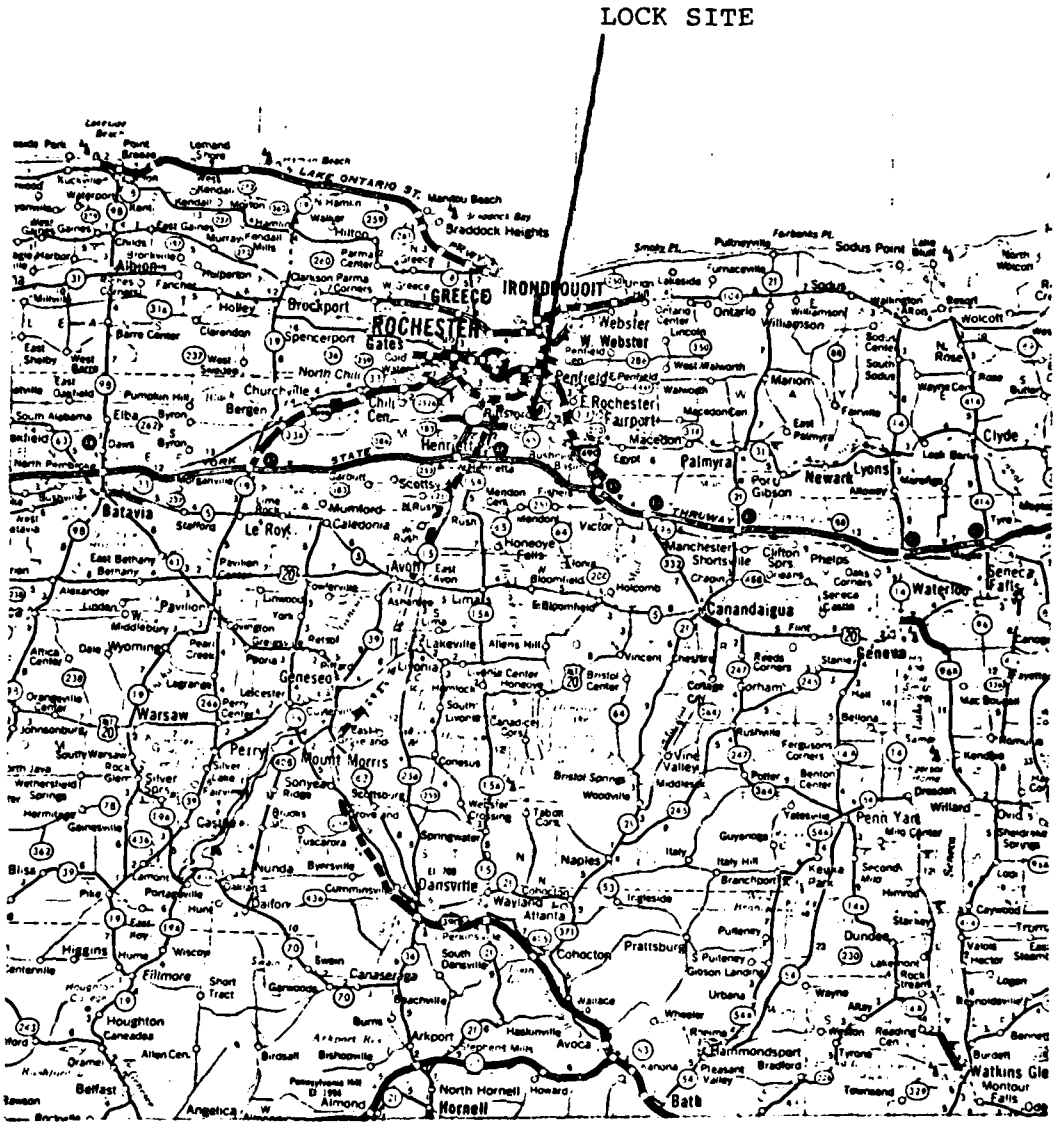
DRAWINGS



TOPOGRAPHIC MAP

LOCK 32 ERIE CANAL

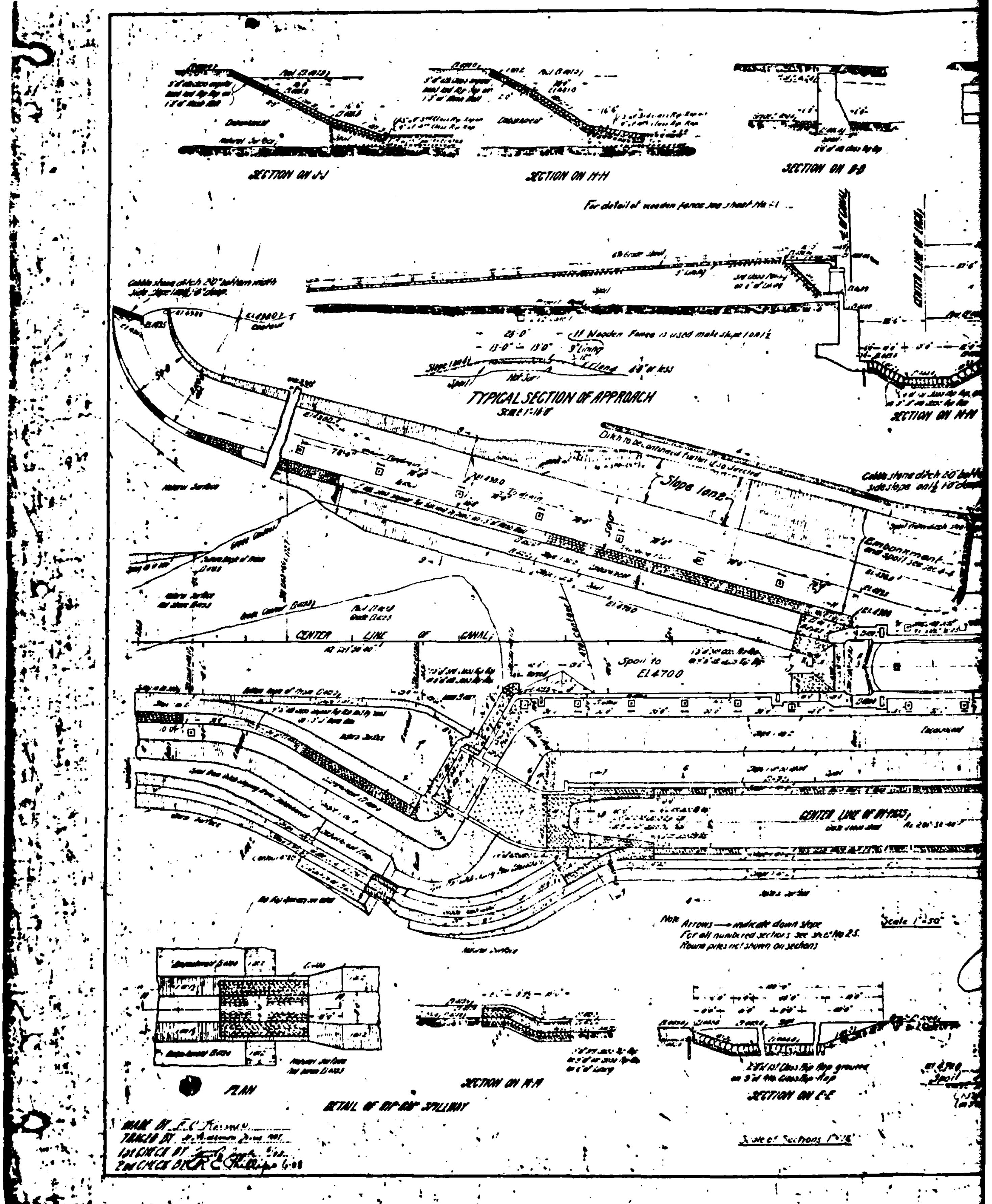
I.D. NO. N.Y. 791



VICINITY MAP

LOCK 32 ERIE CANAL

I.D. NO. N.Y. 791


SECTION ON J-J
SECTION ON H-H
SECTION ON B-B
TYPICAL SECTION OF APPROACH
CENTER LINE OF LOCK
SECTION ON N-N
Slope lone
Embankment and spoil see sec 4-4
CENTER LINE OF CANAL
Spoil to El 4700
CENTER LINE OF BY-PASS
Note Arrows —— indicate down slope
For all numbered sections see sheet No 25.
Round piles not shown on sections
Scale 1"=50'
PLAN
SECTION ON M-M
SECTION ON E-E
DETAIL OF RIP-RAP SPILLWAY
MADE BY
TRACED BY
1st CHECK BY
2nd CHECK BY
Scale of Sections 1"=16'

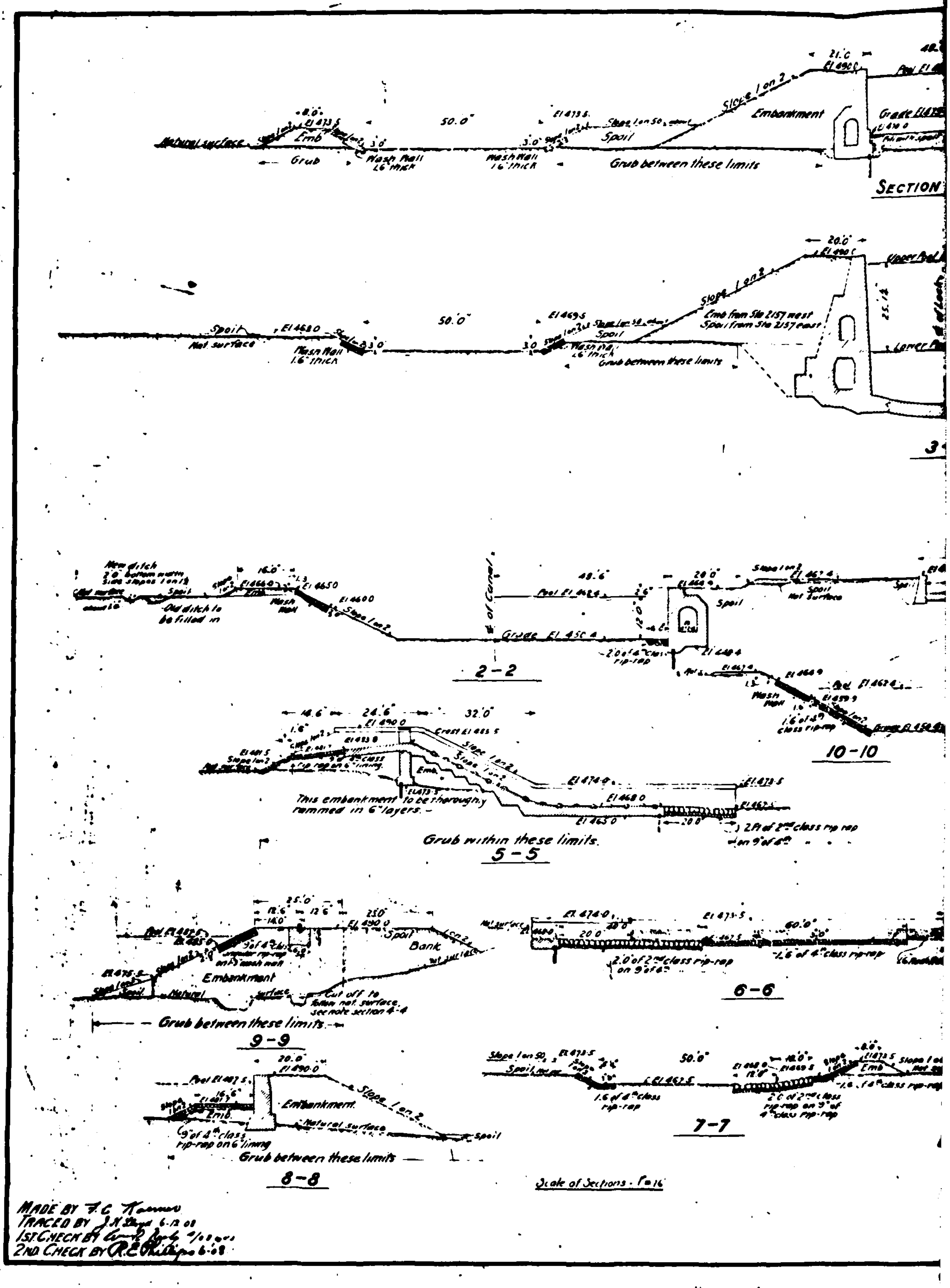
Contract No. 23.

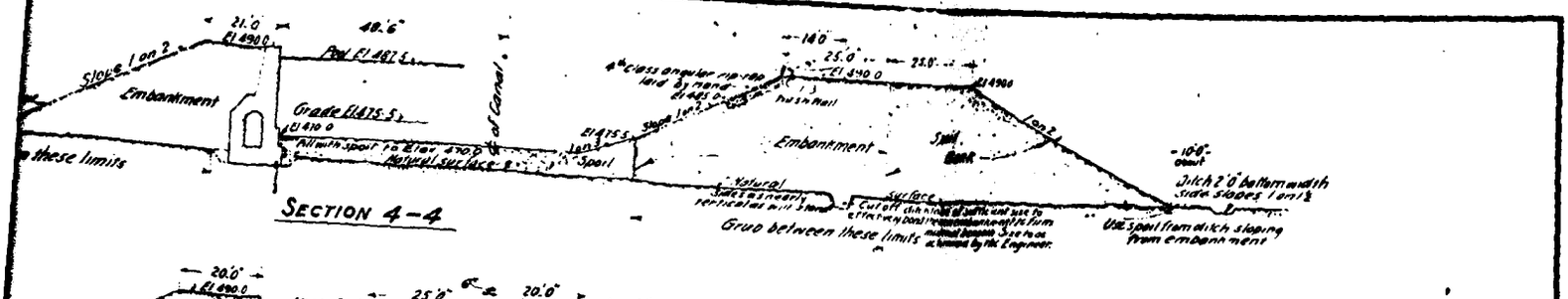
Erie Canal — Section 9.

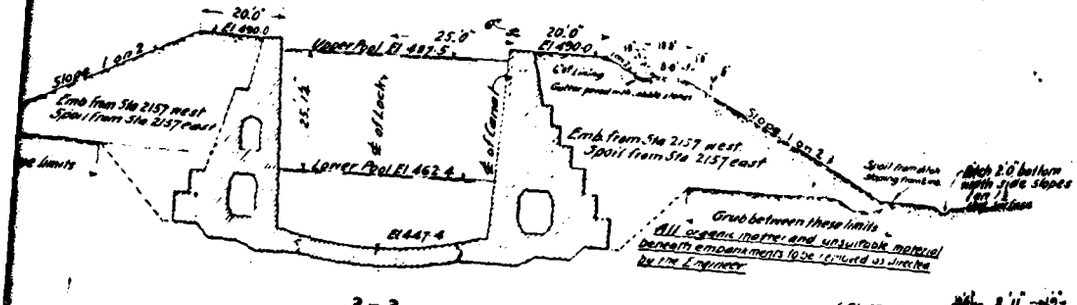
From Kings Bend to the Genesee River.

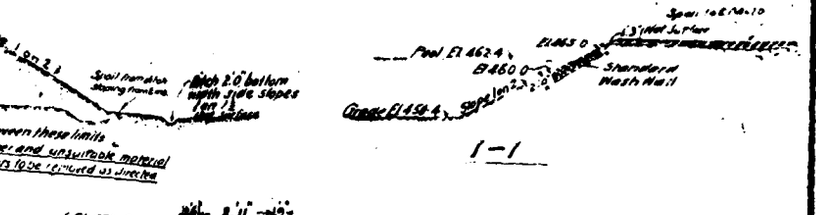
LAYOUT PLAN & SECTIONS OF LOCK 32 & VICINITY SHOWING PROTECTION WORK.

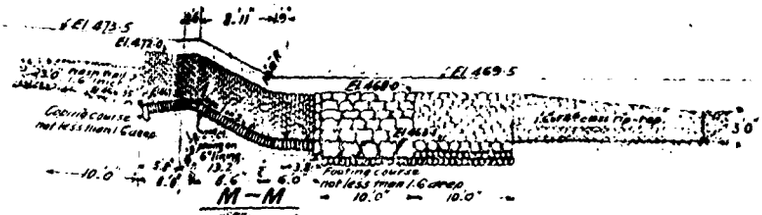
Scales as indicated.

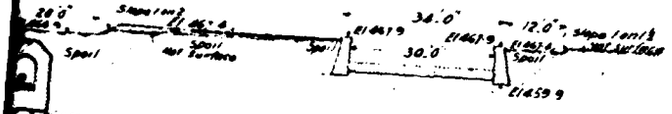

SECTION
Embankment
Slope 1 on 2
Grub between these limits
Natural surface
Grub
Wash Wall 1.6" thick
50.0'
Spoil
Emb from Sta 2157 west
Spoil from Sta 2157 east
Upper Pool
Lower Pool
Nat surface
Old ditch to be filled in
Grade El 450.4
Pool El 462.4
2-2
10-10
Crest El 485.5
This embankment to be thoroughly rammed in 6" layers.
Grub within these limits.
5-5
Embankment
Spoil
Bank
Cut off to follow nat. surface, see note section 4-4
Grub between these limits
9-9
2.0' of 2nd class rip-rap on 9" of 6"
1.6' of 4th class rip-rap
6-6
Embankment
Natural surface
9" of 4th class rip-rap on 6" lining
Grub between these limits
8-8
1.6' of 4th class rip-rap
7-7
Scale of Sections - 1"=16'
MADE BY F.C. Koerner
TRACED BY J.H. Lloyd 6-12-08
1ST CHECK BY
2ND CHECK BY R.E. Phillips 6-08

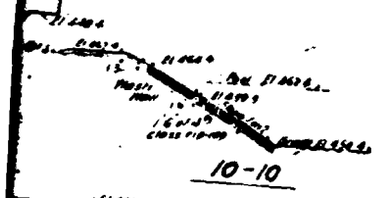


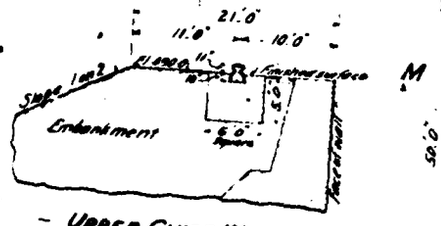


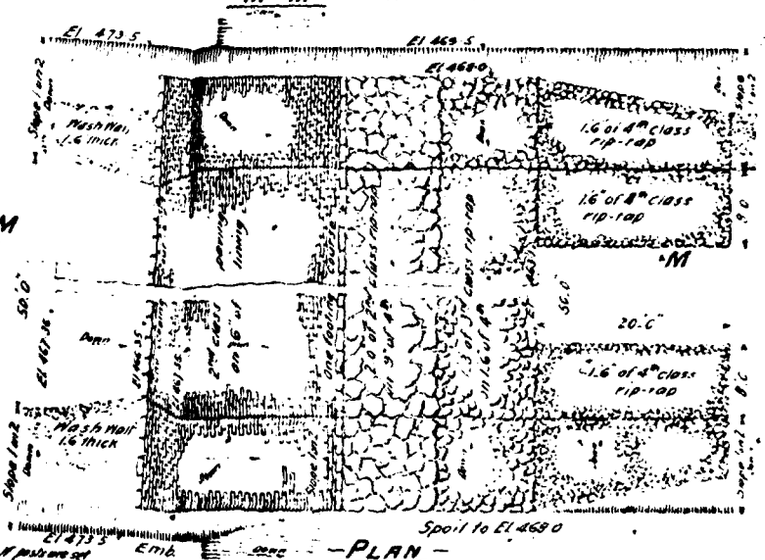




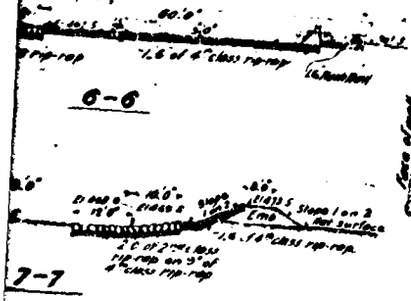


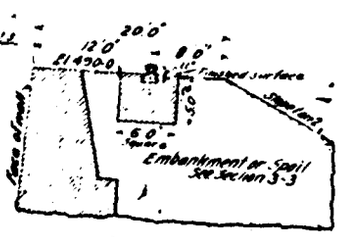






DETAIL OF MIDDLE SPILLWAY
Scale 1"=8'





DETAILS OF SNUBBING POST SETTINGS
Scale ¾"=1'

Contract No. 23.

Erie Canal — Section 9.

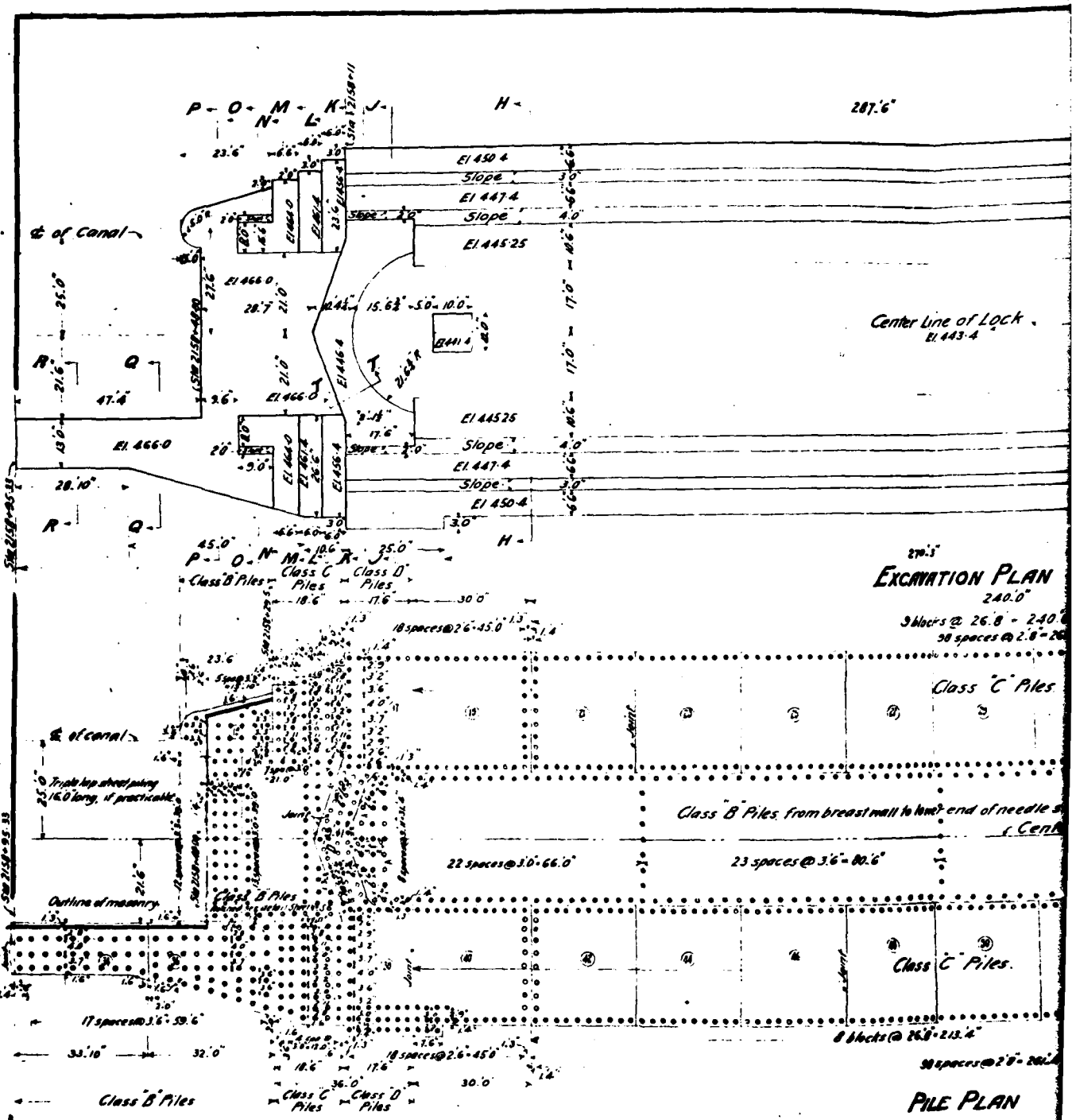
From Kings Bend to the Genesee River.

LAYOUT PLAN & SECTIONS OF LOCK 32 & VICINITY SHOWING PROTECTION WORK

Scales as indicated.

Examined and approved

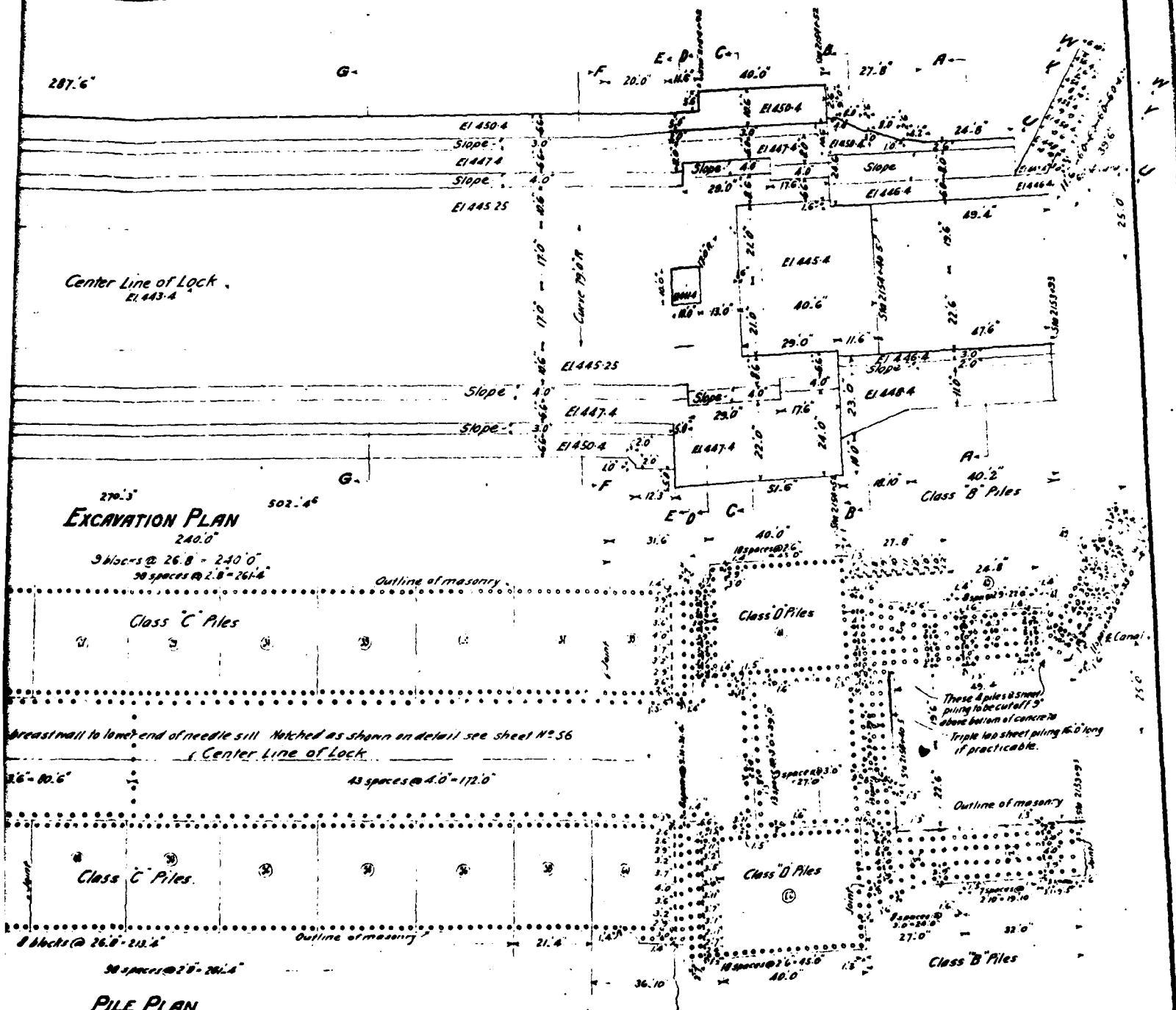
2



Elevations refer to bottom of concrete.
Round piles to be cut 1.6" above elevations shown.
Length of round piles to be determined by test driving according to specifications. In case however local conditions are found such that the specified penetration is exceeded, the State Engineer may direct the contractor to drive such additional piles as may be necessary, or to spread and reinforce the footings or to use both methods in order to obtain a stable foundation All such work shall be done at contract prices. subject to the requirements of the contract regarding alterations.

Triple
See d
Within
for ex
in pla
Spaces
so req
em
Top of
except
See Sp

MADE BY Underhill 5-6
TRACED BY J.K. Lloyd 5-1-08
1ST CHECK BY O.F. Ruttman 5-09
2ND CHECK BY [illegible]



Triple lap sheet piling to be 3 pieces of 2" plank 10 or 12 inches wide See detail Sheet No 56

Within the boundaries of the structure where different elevations for excavation are encountered the material shall be held in place by sheeting where so directed.

Spaces under and around masonry shall be backfilled, where so required, with material placed as specified for forming embankment.

Top of wooden sheet piling shall be embedded 12" in concrete except where otherwise noted.

See Special Specifications for clause about omitting piles.

vn.
driving according
er local conditions
vision
contractor to
r to spread and
ds in order to
done of contract prices.
regarding alterations

Contract No. 23.

Section 9.

Erie Canal

From Kings Bend to the Genesee River.

FOUNDATION PLAN OF LOCK 32

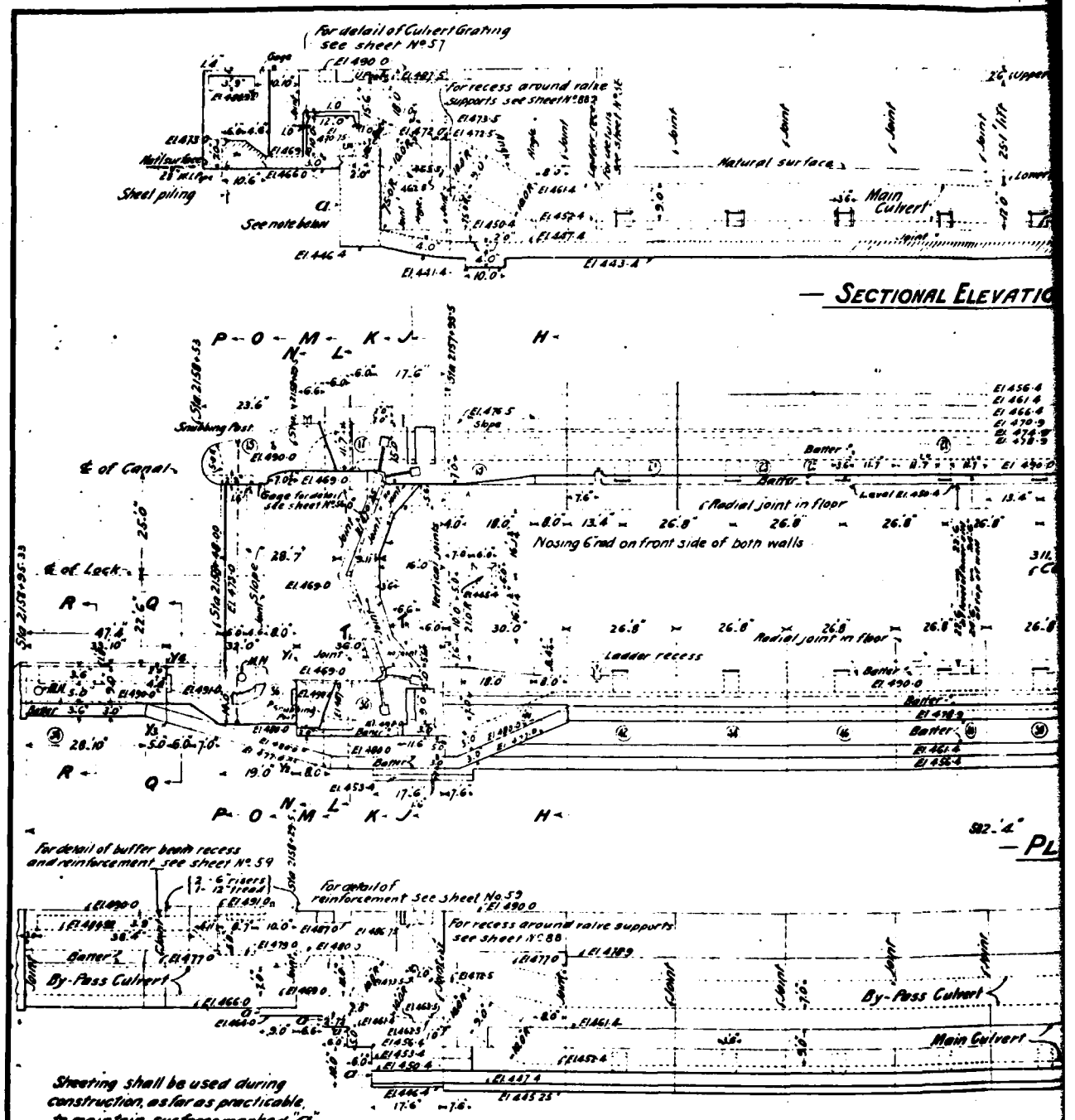
Scale: 16 feet to the inch.

Examined and passed

.....1901

30

2



The following sections shall each be built as a monolith and work once begun thereon shall be continued without interruption until the section is completed viz:-

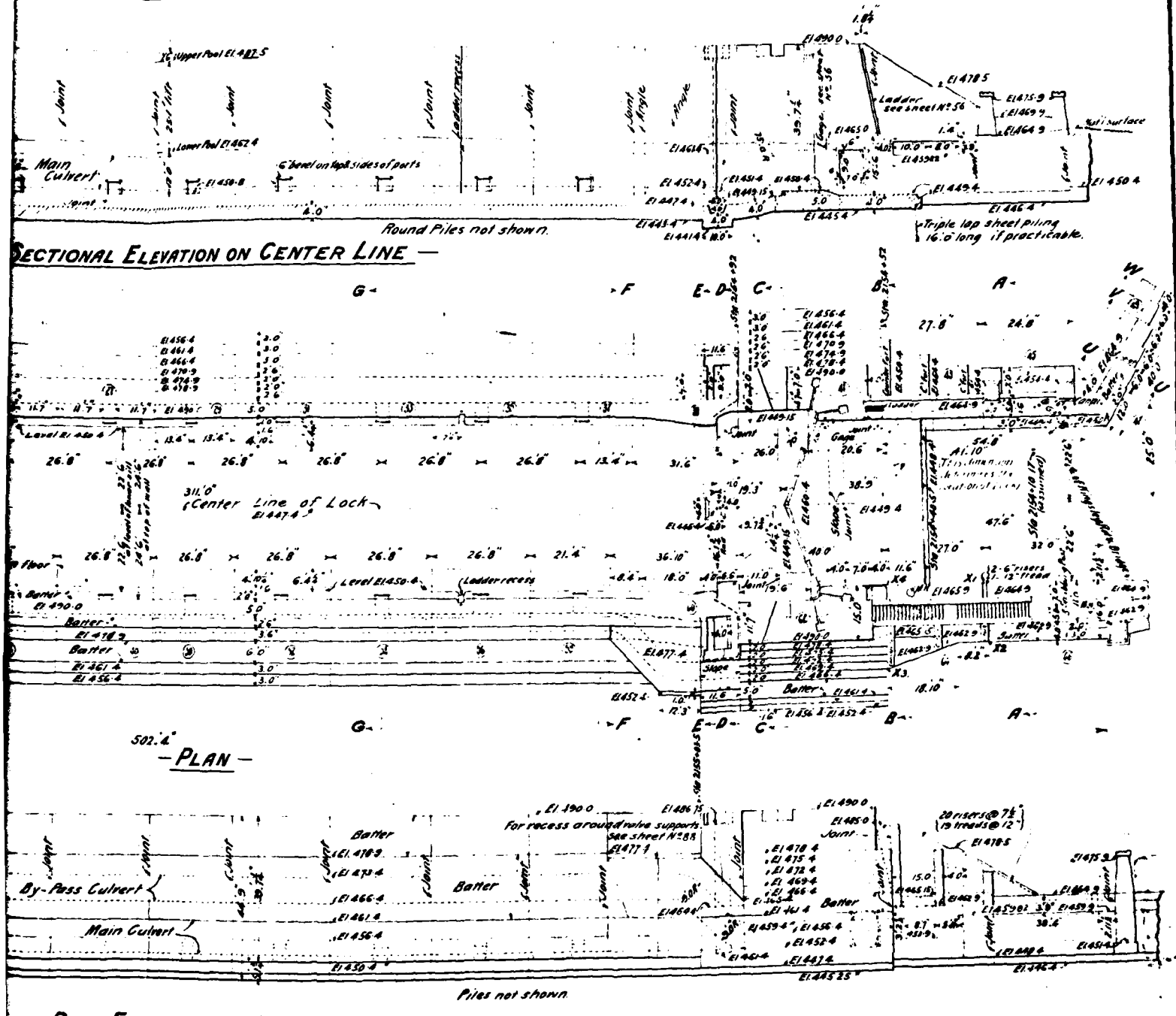
Side wall between limits of X_1, X_2, X_3 & X_4 from El 457.9 to El 465.9
" " " " Y_1, Y_2, Y_3 & Y_4 " El 480.0 to El 491.0
Both thrust walls bet. Stns. 2154+52 & 2154+92 El 484.0 to El 490.0
" " " 2157+93 & 2158+29.5 " El 484.0 to El 490.0

Spaces under and around masonry shall be back filled where so required, with material placed as specified for forming embankment

The floor shall be built in dividing lines at right angles of lock. Each section shall monolith

The bases of structures sh plans of this contract shall b approximate only, and ma the State Engineer in writ elevation and of any dimensi a proper foundation

MADE BY O.P.B. 3-00
TRACED BY J.K. 4-22-00
1ST CHECK BY [illegible] 5-00
2ND CHECK BY [illegible] 5-8



SECTIONAL ELEVATION ON CENTER LINE —

— PLAN —

— REAR ELEVATION OF SOUTH WALL —

The floor shall be built in sections with dividing lines at right angles to center line of lock. Each section shall be built as a monolith.

The bases of structures shown on any of the plans of this contract shall be considered as approximate only, and may be ordered by the State Engineer in writing to be at any elevation and of any dimensions necessary to give a proper foundation.

For directions relating to modification of foundations see sheet No 30

For detailed dimensions of Lock ends see sheet No 33 & 34.

Top of Lock walls to be crowned ½ inch. Top edges of all walls are to be rounded to a radius of 2" unless otherwise shown for reinforcement of toe of chamber walls, and lower thrust walls see sheet No 32 & 58

2

Contract No. 23.

Erie Canal Section 9.

From King's Bend to the Genesee River.

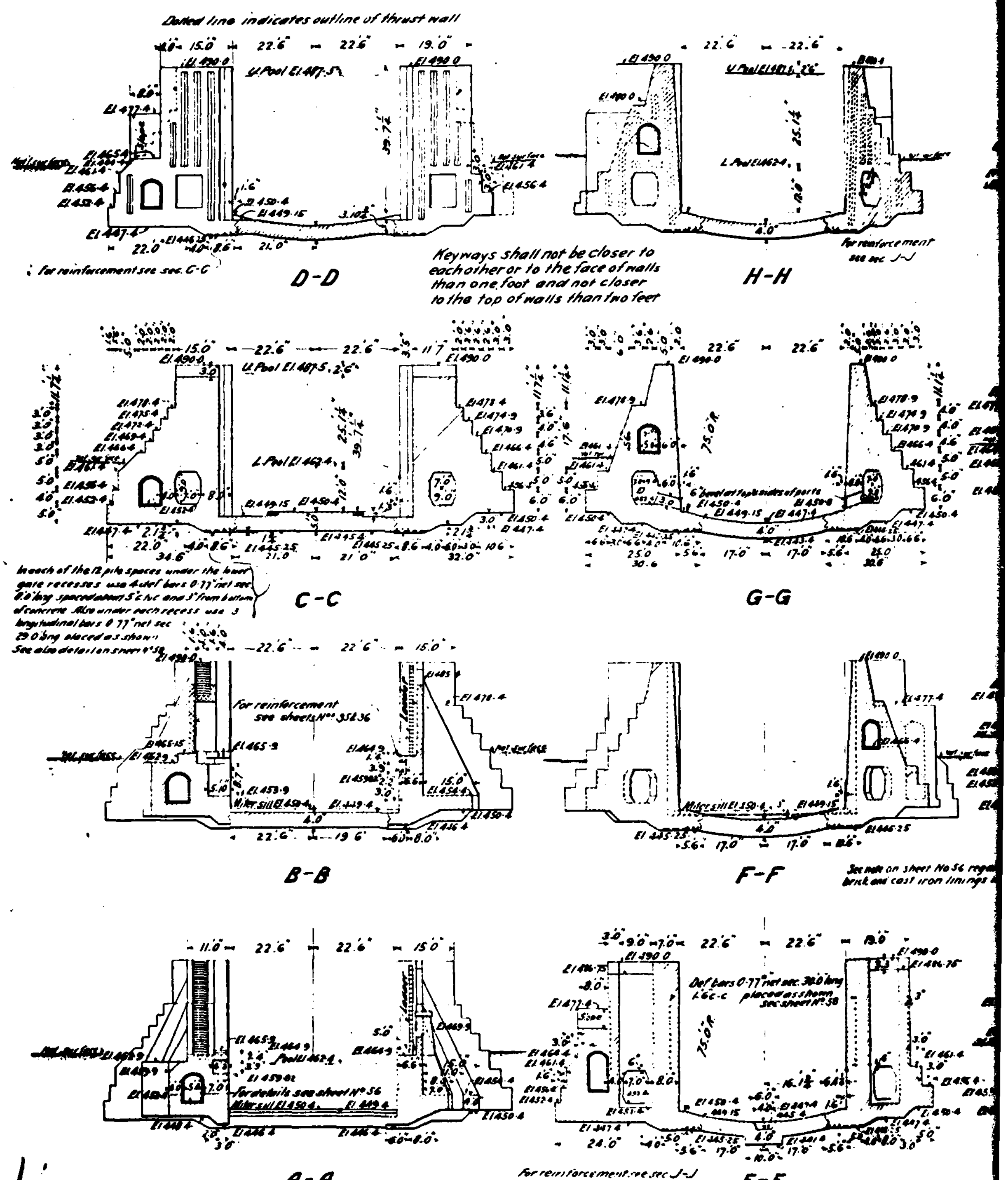
PLAN & ELEVATION OF LOCK 32

Scale: 16 feet to e ch.

Examined and approved,

Deputy State Engineer.

31

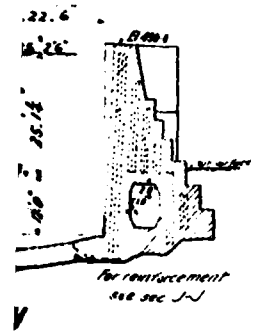


1'

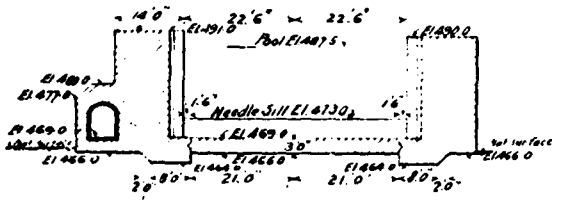
MADE BY O. B. [illegible]
TRACED BY [illegible]
1ST CHECK BY Underhill
2ND CHECK BY [illegible]

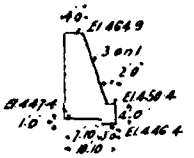
Masonry shown on this sheet shall be second class concrete except where otherwise shown as reinforced concrete.
Top of lock walls to be crowned ⅛ inch.

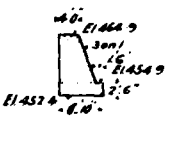
Top edges of all walls are to be rounded to a radius of 2 inches unless otherwise shown.
For directions relating to modification of foundations see sheet N° 30.
For additional notes see Lock Drawing Sheet N° 31.

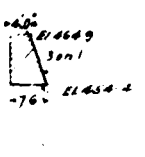


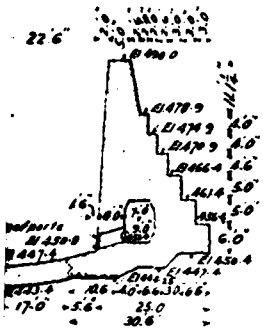
V

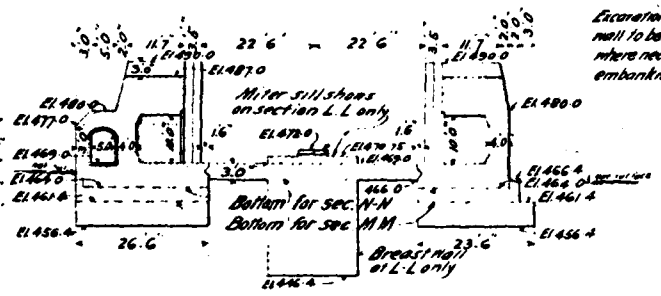




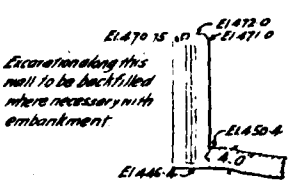




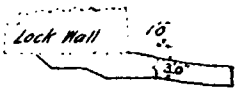


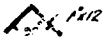


G

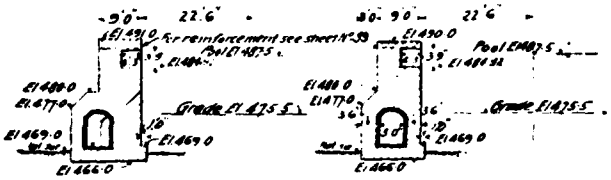


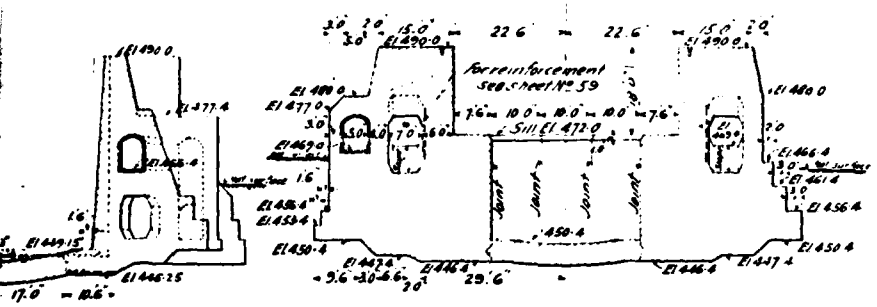
If the floor and the footings of any part of the walls are built at the same time, the joints between them shall be made as shown by this sketch. Groove to be cleaned out and filled with concrete after adjacent wall has been completed long enough to take care of any settlement.



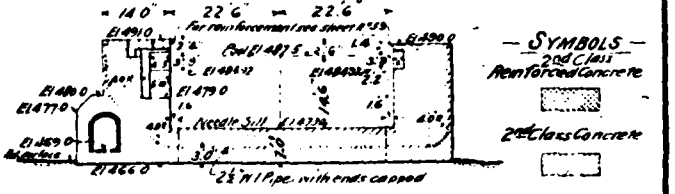


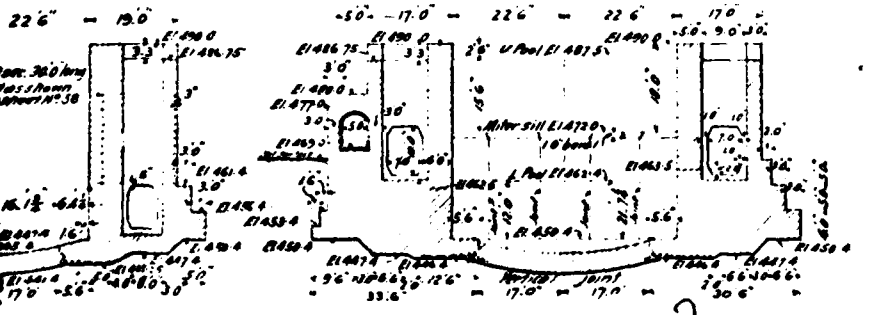
FORM FOR KEYWAY





See note on sheet No 56 regarding the omission of the brick and cast iron linings in the by pass culvert





to be rounded to a radius
rwise shown
he modification of fount-
JC
Lock Drawing Sheet No. 31

In each pile space under toe of chamber wall from the lower gate recess to angle at breast wall use 4 rods of bars 0.77" net section 10.0 long spaced about 6" c to c and 3" from bottom of concrete, also place three rows of bars 0.77" net section with ends lapped not less than 3'6" spaced as shown. See also detail sheet No 58

Contract No. 23.

Erie Canal **Section 9.**

From Kings Bend to the Genesee River.

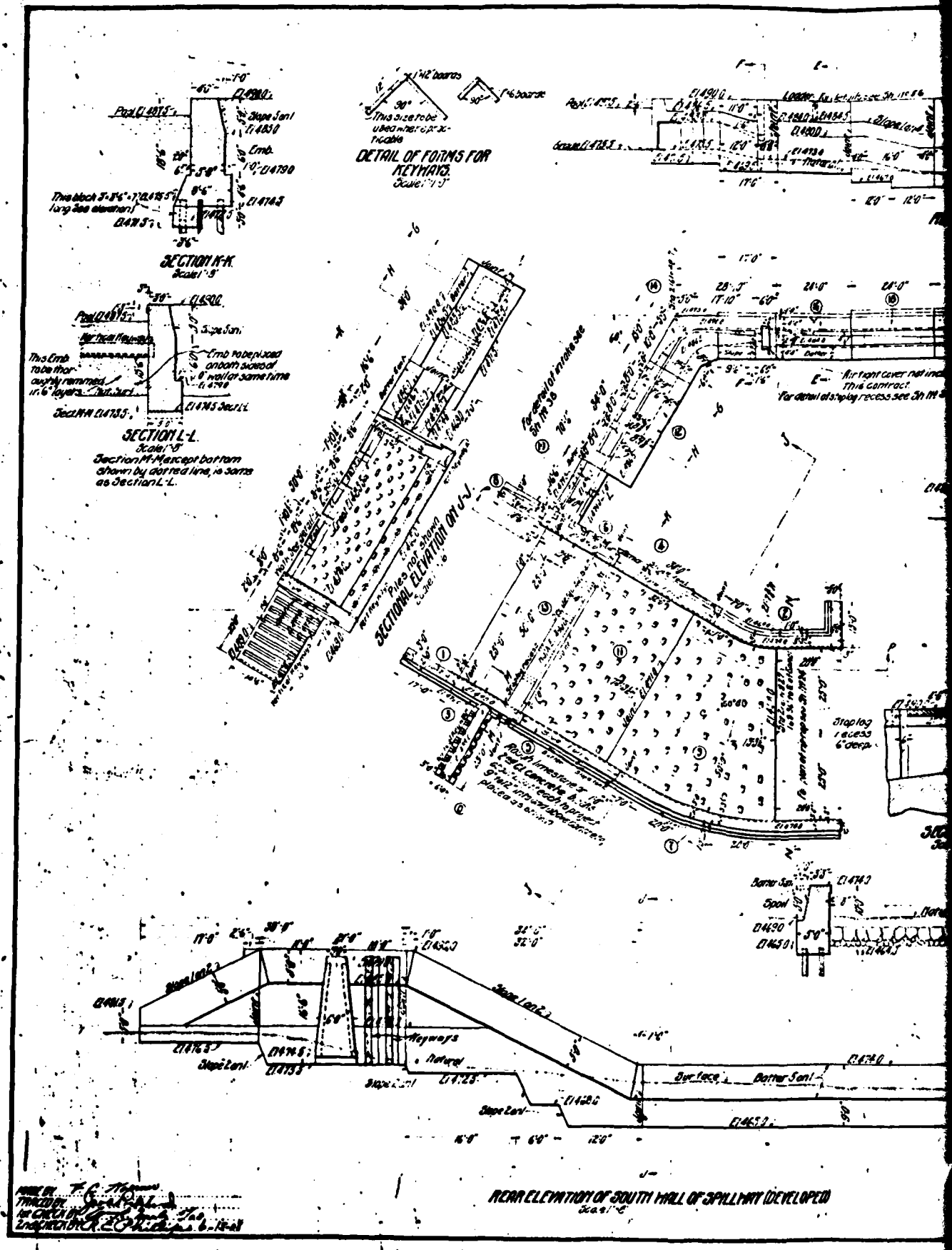
SECTIONS OF LOCK 32

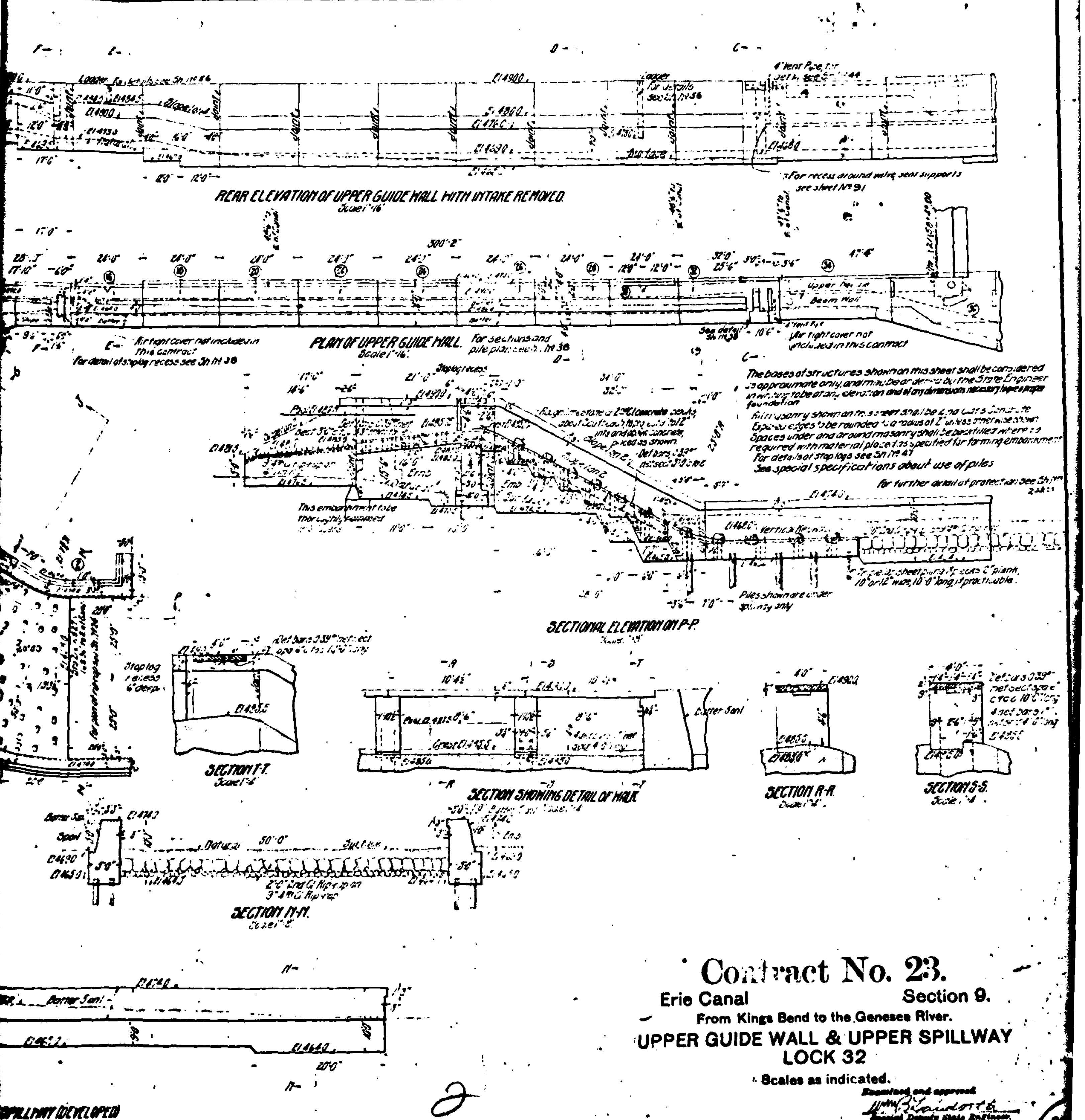
Scale: 16 feet to the inch.

Examined and approved

Superintending Civil Engineer

19


DETAIL OF FORMS FOR KEYWAYS.
SECTION K-K.
SECTION L-L.
SECTIONAL ELEVATION ON J-J.
REAR ELEVATION OF SOUTH WALL OF SPILLWAY (DEVELOPED)



Contract No. 23.

Erie Canal — Section 9.

From Kings Bend to the Genesee River.

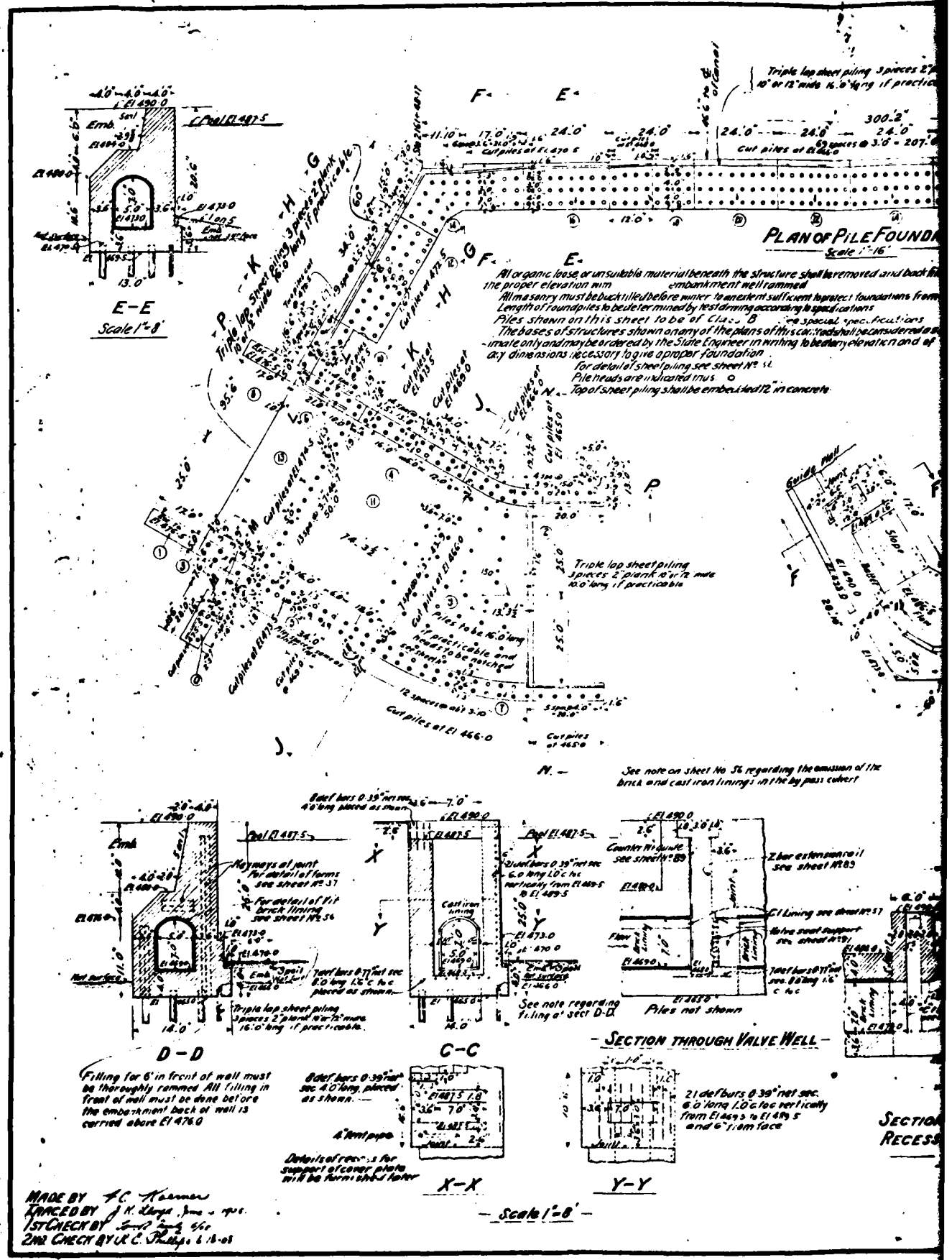
UPPER GUIDE WALL & UPPER SPILLWAY
LOCK 32

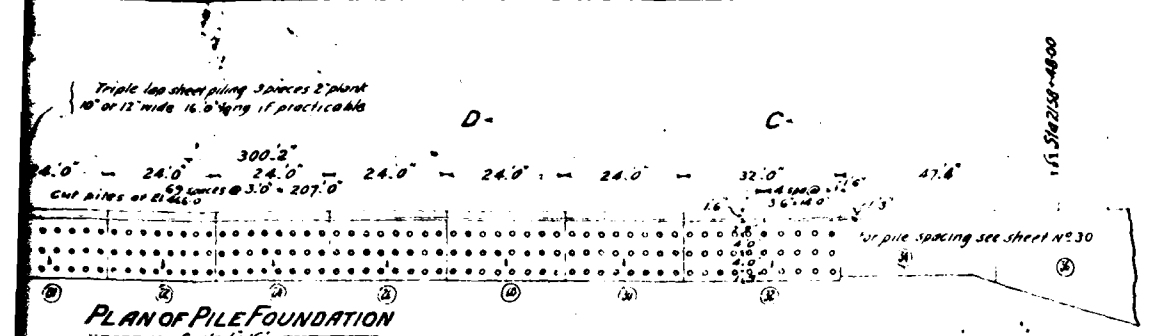
Scales as indicated.

Examined and approved

Special Deputy State Engineer.

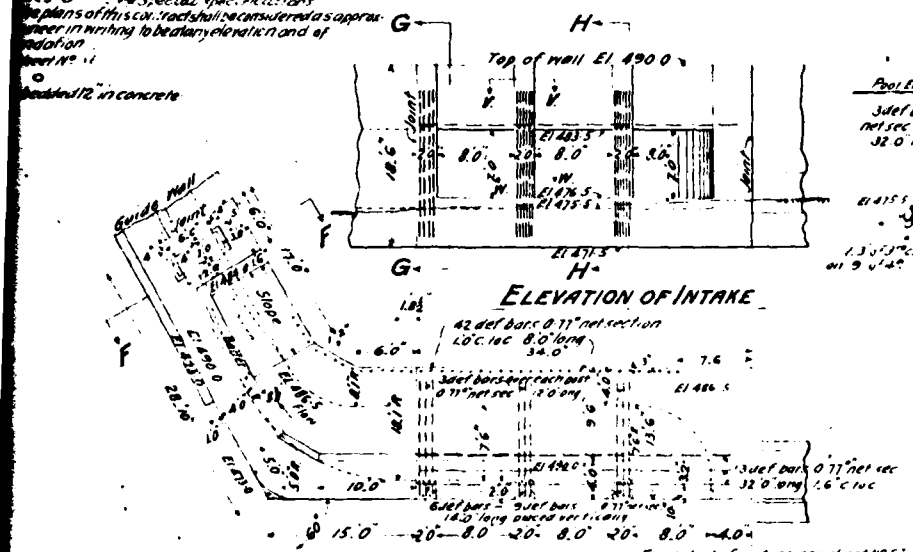
190__


PLAN OF PILE FOUNDA
Scale 1"-16'
E-E
Scale 1"-8'
All organic loose, or unsuitable material beneath the structure shall be removed and back fill
the proper elevation with embankment well rammed
All masonry must be backfilled before winter to an extent sufficient to protect foundations from
Length of round piles to be determined by test driving according to specifications
Piles shown on this sheet to be of Class B
The bases of structures shown on any of the plans of this contract shall be considered as
mate only and may be ordered by the State Engineer in writing to be of any elevation and of
any dimensions necessary to give a proper foundation
For detail of sheet piling see sheet No 51
Pile heads are indicated thus ○
Top of sheet piling shall be embedded 12" in concrete
Triple lap sheet piling 3 pieces 2" plank 10" or 12" wide 10.0' long if practicable
Piles to be 16.0' long if practicable and heads to be notched
Cut piles at El 466.0
Cut piles at 465.0
See note on sheet No 56 regarding the omission of the brick and cast iron linings in the by pass culvert
D-D
C-C
X-X
Y-Y
- SECTION THROUGH VALVE WELL -
Filling for 6' in front of wall must be thoroughly rammed All filling in front of wall must be done before the embankment back of wall is carried above El 476.0
Details of recess for support of corner plate will be furnished later
Piles not shown
See note regarding filling at sect D-D
MADE BY H.C. Koerner
TRACED BY J.K. Lloyd, Jr.
1ST CHECK BY
2ND CHECK BY H.C. Phillips 6/18/08
- Scale 1"=8' -



PLAN OF PILE FOUNDATION

Scale 1"=16'

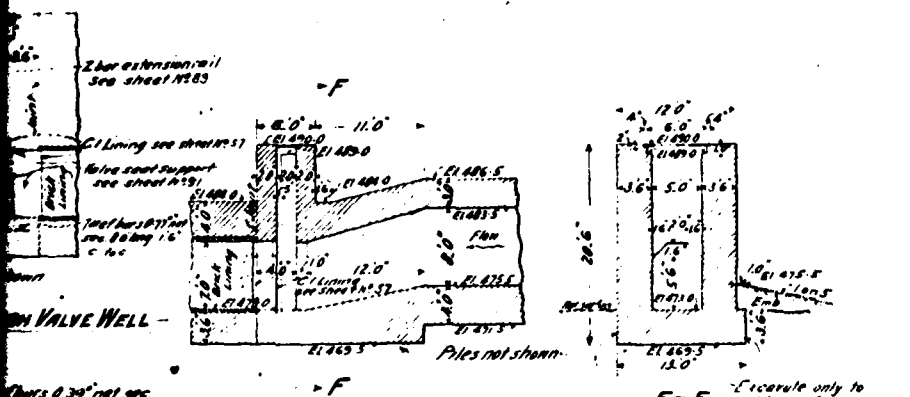


ELEVATION OF INTAKE

PLAN OF INTAKE

Scale 1"=8'

For detail of grating see sheet No 51

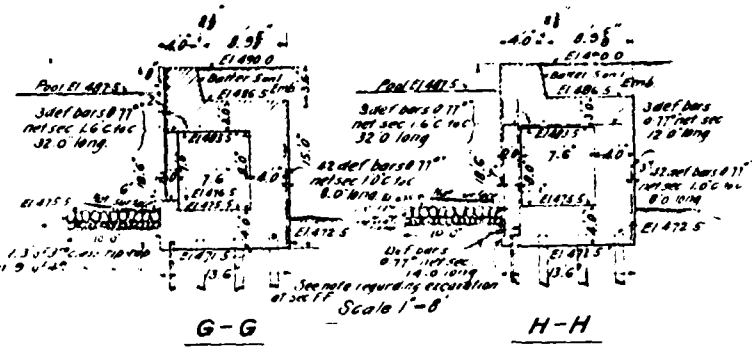


SECTION SHOWING STOP LOG RECESS & DROP IN CULVERT

Scale 1"=8'

F-F

Excavate only to neat lines of masonry if practicable If not backfill with embankment well rammed This note applies wherever the natural surface is above El 470



Contract No. 23.

Erie Canal — **Section 9.**

From Kings Bend to the Genesee River.

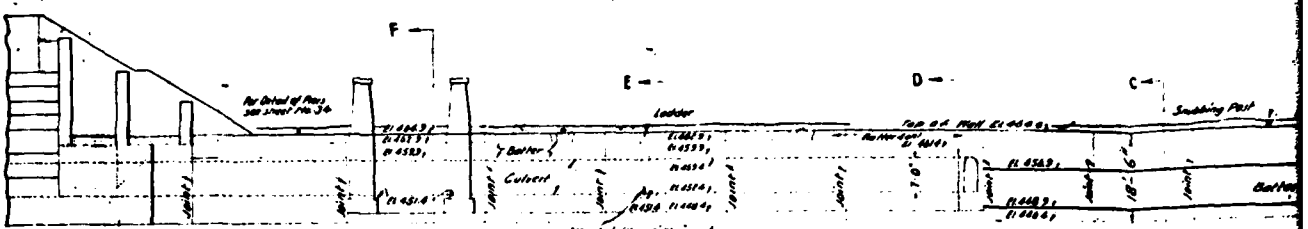
UPPER GUIDE WALL & UPPER SPILLWAY LOCK 32

Scales as indicated.

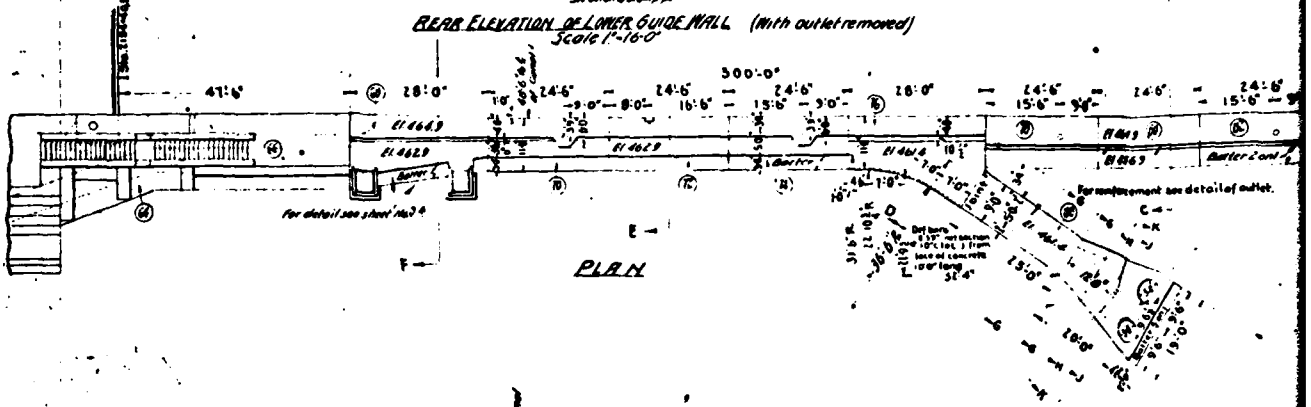
Examined and approved

_____ Deputy State Engineer

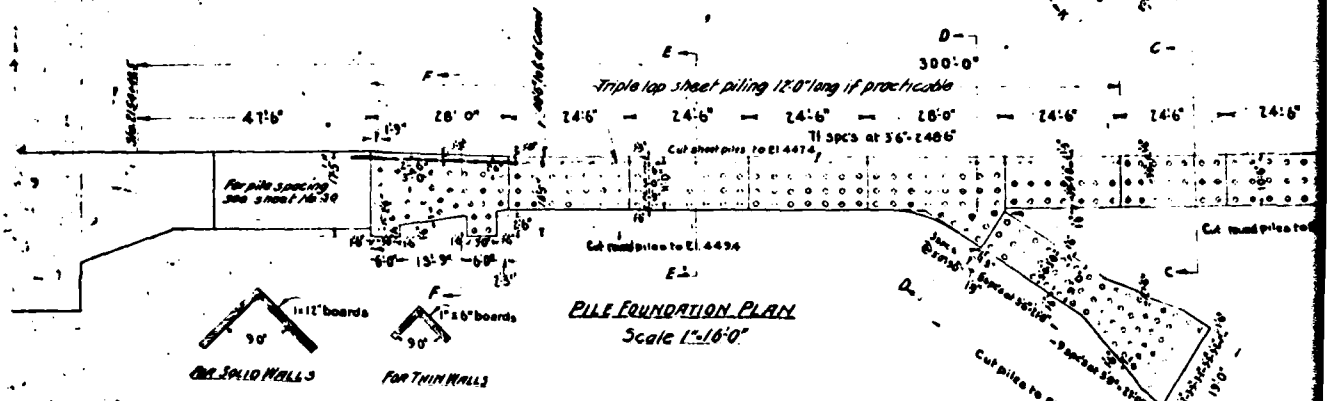
_____ 19__



REAR ELEVATION OF LOWER GUIDE WALL (With outlet removed)
Scale 1"-16'-0"



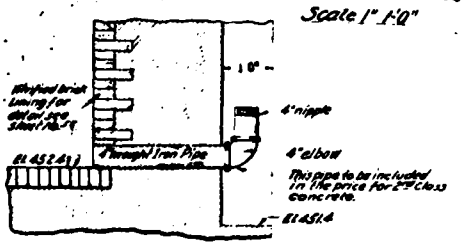
PLAN



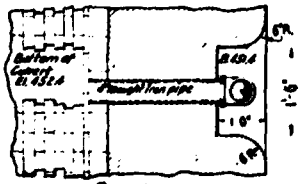
PILE FOUNDATION PLAN
Scale 1"-16'-0"

FOR SOLID WALLS FOR THIN WALLS

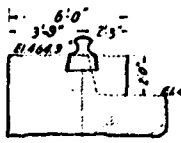
DETAIL OF FORM FOR KEYWAYS
Scale 1" = 1'-0"



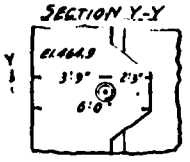
SECTION SHOWING
Wrought Iron Drain Pipe
Scale 3"-1'-0"



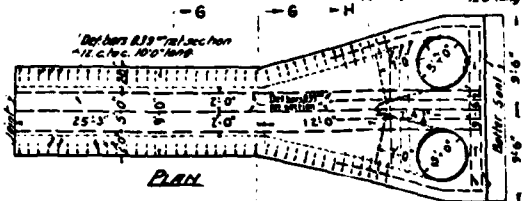
Page
Scale 3"-1'-0"



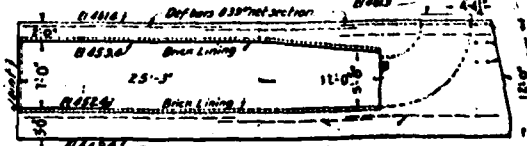
SECTION Y-Y



DETAIL OF SNUBBING POST SETTING
Scale 1:40"



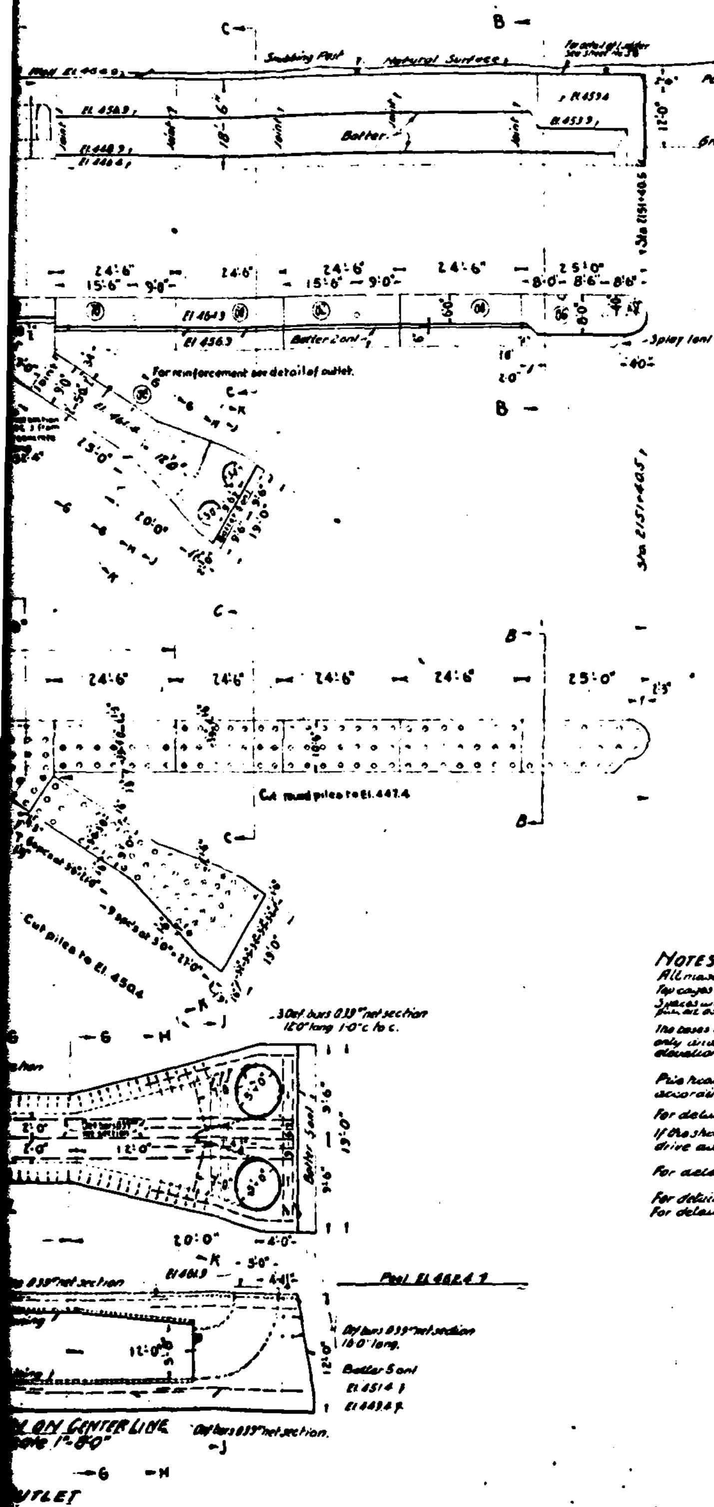
PLAN

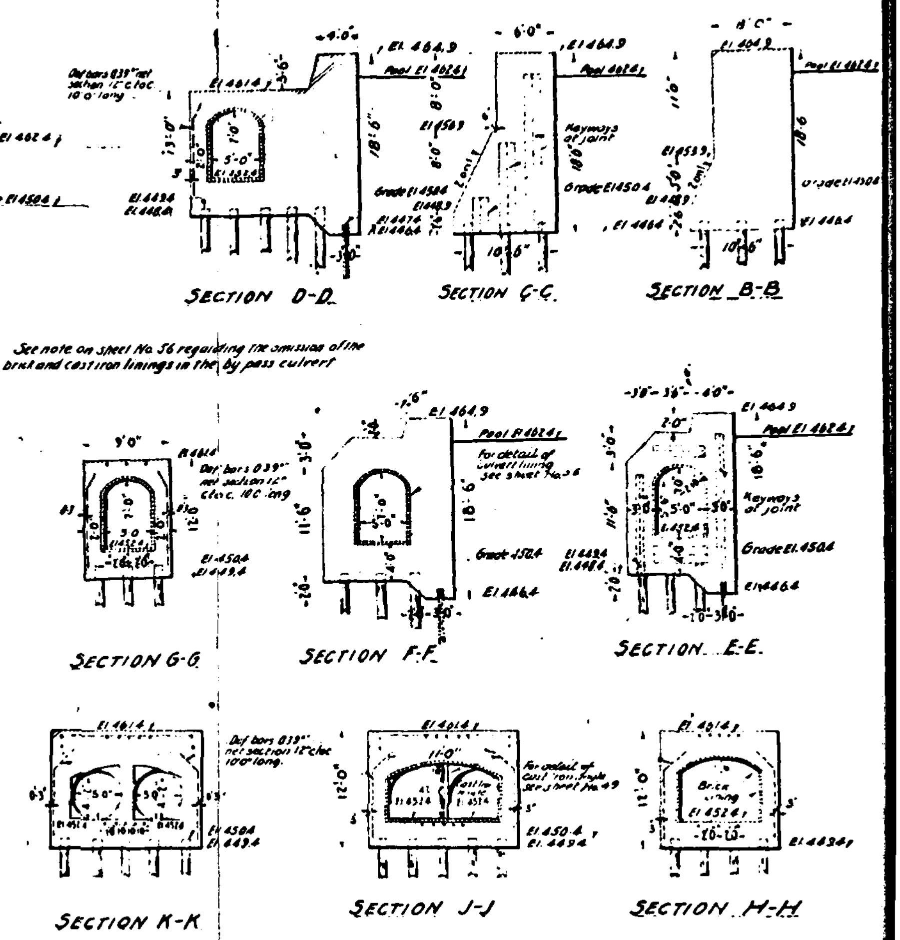


"Cast Iron Lining For details see sheet No 57

SECTION ON CENTER LINE
Scale 1"-8'-0"

DETAIL OF OUTLET





SCALE OF SECTIONS
1" = 8'-0"

NOTES:
All masonry shown on this sheet shall be second class concrete
Top edges of all walls are to be rounded to a radius of two inches unless otherwise shown
Spaces under and around masonry shall be backfilled where so required with material [illegible]
The bases of structures shown on the plans shall be considered as approximate only and may be ordered by the State Engineer in writing to be at any elevation and of any dimension necessary for a proper foundation.
Pile heads are indicated thus o Length of piles to be determined by test driving according to specifications Piles shown on this sheet to be of class 'B'
For detail of ladder and recess see sheet No. 56 For detail of snubbing post see sheet No. 56
If the sheet piling prove insufficient for bearing, the contractor shall upon order of the State Engineer drive additional round piles of suitable length and number at the contract price therefor
For details of sheet piling see sheet No. 56
For detail of of Cast Iron Angle see sheet No 49
For detail of Cast Iron Elbows see sheet No 49

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.

Examined and approved
[signature]
Special Deputy State Engineer

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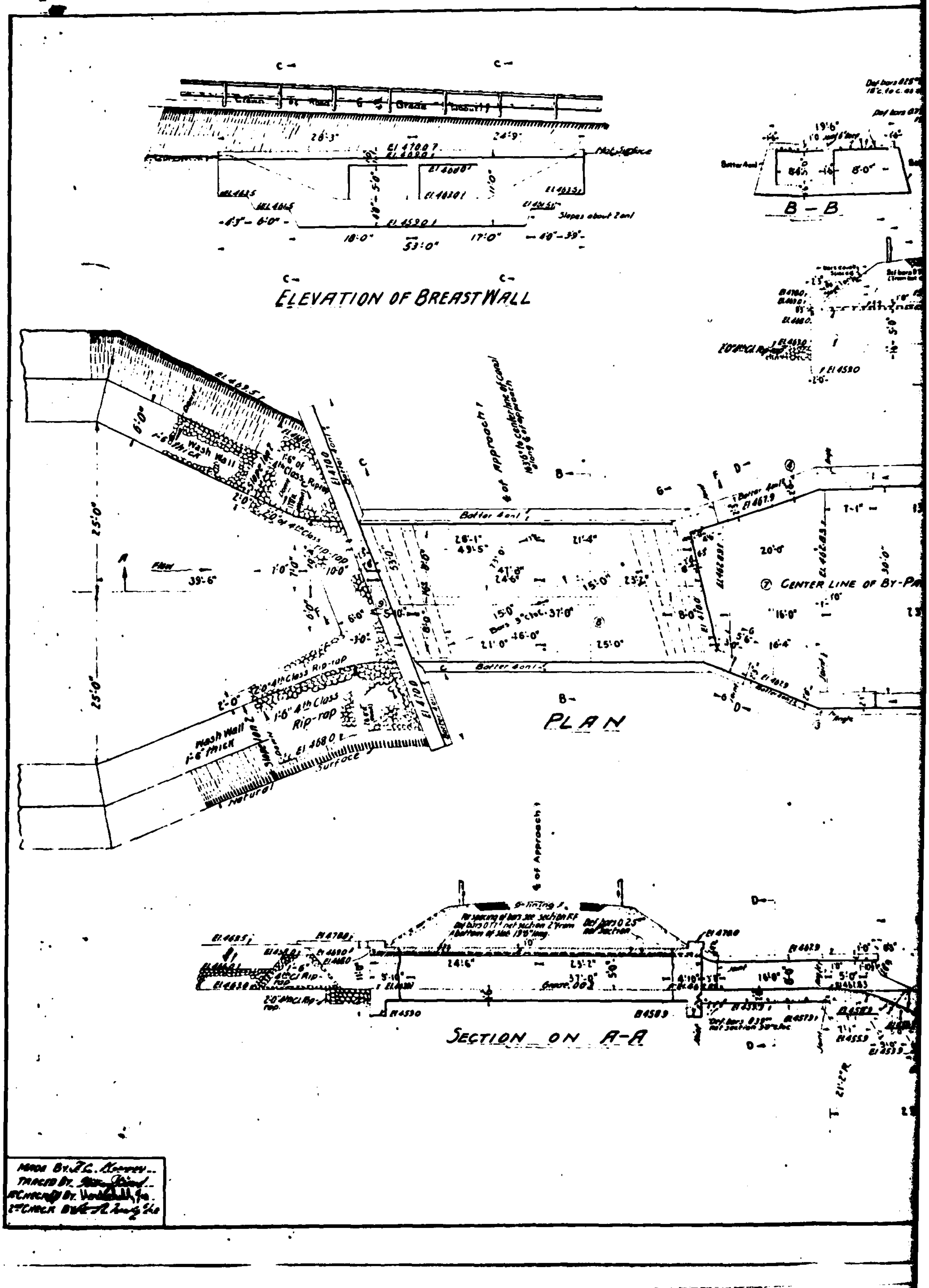
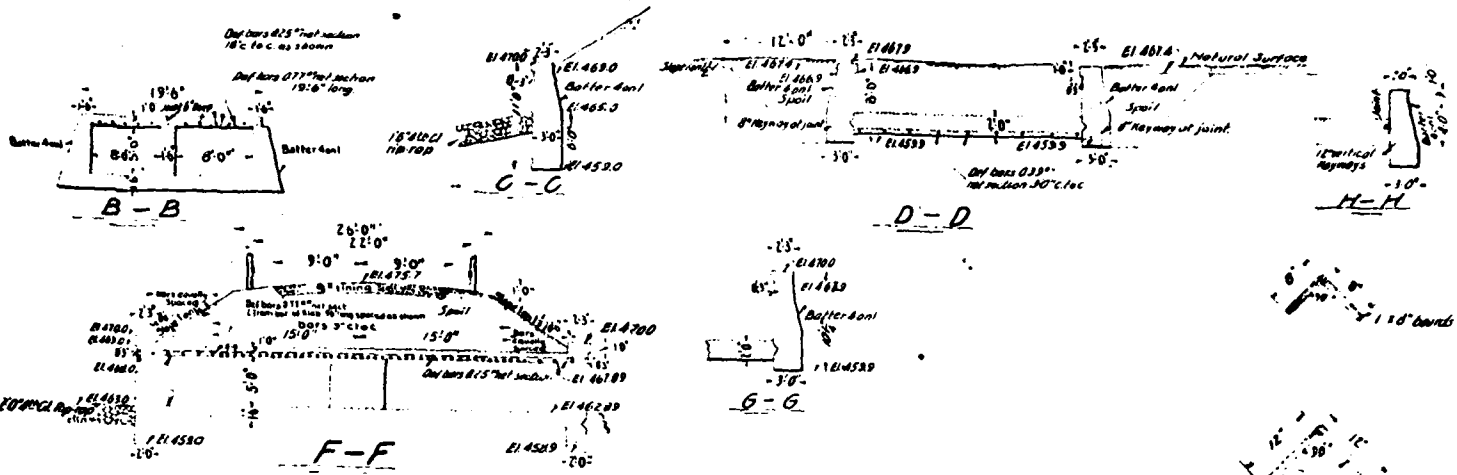
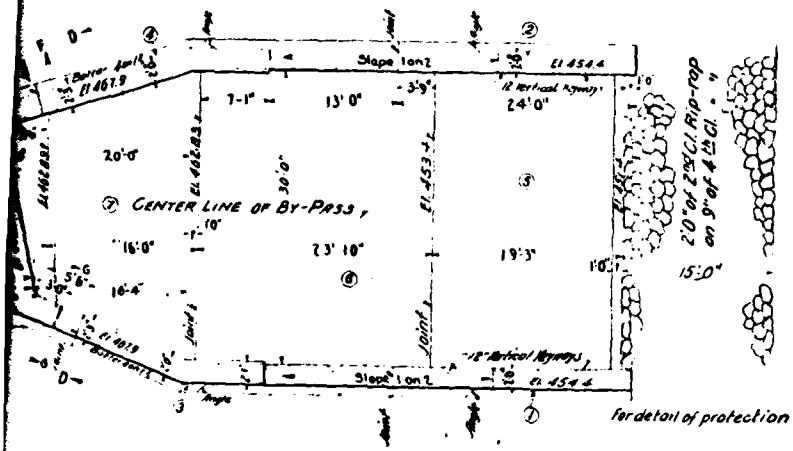


ELEVATION OF BREAST WALL
Slopes about 2 on 1
53'-0"
B - B
PLAN
Wash Wall 1'-6" thick
1'-6" of 4th Class Rip-rap
2'-0" of 4th Class Rip-rap
Natural Surface
Batter 4 on 1
Center Line of By-Pa
℄ of Approach
25'-0"
39'-6"
Flow
SECTION ON A-A
MADE BY
TRACED BY
1st CHECKED BY
2nd CHECK BY

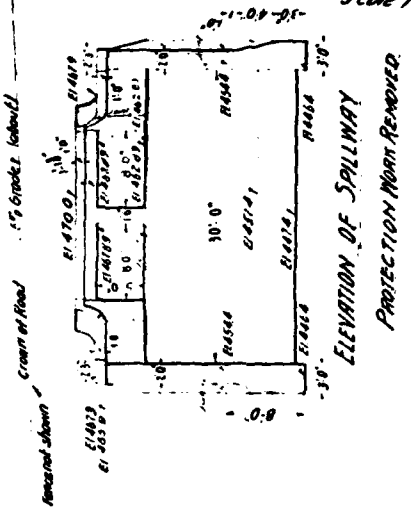


1"x12" boards

DETAIL OF FORM FOR KEYWAYS
Scale 1"=1'0"

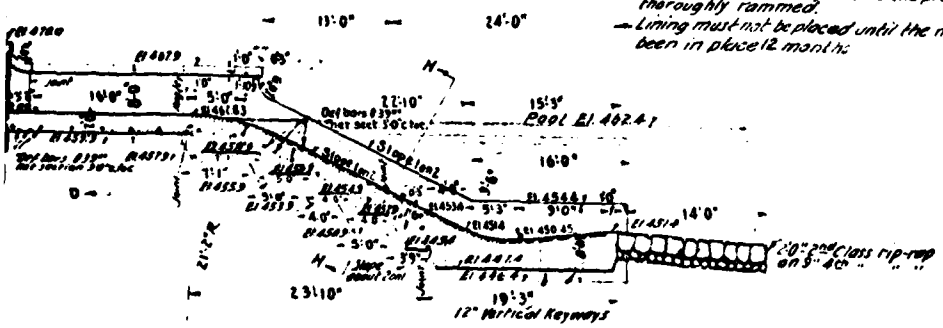


For detail of protection work see sheet Nos 24 & 25



All masonry shown on this sheet to be 2nd Class concrete
The bases of structures shown on this plan shall be considered as approximate only and may be ordered by the State Engineer in writing to be at any elevation and of any dimensions necessary to give a proper foundation

All exposed edges to be rounded to a radius of 2" unless otherwise shown.
All organic matter, loose or unsuitable material beneath the structures shall be removed and backfilled to the proper elevation, with embankment thoroughly rammed.
Lining must not be placed until the material on which it rests shall have been in place 12 months



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.

Examined and approved

Special Deputy State Engineer