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HISTORIC STRUCTURES REPORT

PART II
ON

LOCKS OF JAMES RIVER
and
KANAWHA CANAL

BLUE RIDGE PARKWAY

002238

HISTORIC STRUCTURES REPORT

Part II

LOCKS OF

JAMES RIVER AND KANAWHA CANAL

See memo #30 SER(RS) Ltd 9-8-64

U. S. Department of Interior

National Park Service

Blue Ridge Parkway

HISTORIC STRUCTURES REPORT

PART II

on

LOCKS OF

JAMES RIVER AND KANAWHA CANAL

BY
SAM P. WEEMS
1964

RECOMMENDED

_____ Date (H30) memo 9/3/64
Superintendent

Eugene R. de Liets Date 9/11/64
Chief, EODC, Acting

APPROVED

_____ Date _____
Regional Director, Southeast Region

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1. ADMINISTRATIVE DATA

a. Name of Structure - James River Canal and Locks (no number).

b. Proposed Use - To be restored to as nearly original condition as feasible and interpreted to the public by aluminum exhibit panels.

c. Provision for Operating - Although the structure will be restored to operatable condition and filled with water, it will be used as a static exhibit-in-place. Gates may be opened or closed from time to time to change the water level or provide for clean-out and maintenance.

d. Cost Estimate -

Canal excavation, 5200 yds.		$4,900
Trail, 550 ft.		1,100
Trail bridge		1,000
Post and rail fencing		200
Exhibit panels and mounts (2)		1,800
Lock clean-up		2,200
Gate construction (4)		5,000
Rebuilt lock		3,500
Dam structures		7,500
Towpath bridge		1,000
	Total	$28,200

2. HISTORICAL DATA

a. History Narrative -

During the early 1700's several men discussed the feasibility of transportation between the upper James River and the Ohio drainage, and in the mid-century George Washington began to push for a canal or canal combined with road, to connect the James with the Ohio. Under Washington's urging, a toll-financed river improvement company, the James River Company, was chartered in 1785. Under this charter they were to improve the falls above Richmond. The canal was built and traffic initiated on the river, but financial difficulties forced the state to take over the company in 1820.

Under state operation a canal was completed upstream from Richmond for 27 miles, and a 7 1/2 mile section was built through the Blue Ridge to by-pass the dangerous rapids there. This latter section extended from just west of the Parkway's locks to the vicinity of Glasgow, but did not include our lock.

This operation was a headache for the state, and in 1832 they chartered a new company, the James River and Kanawha Company, whose plans were to continue the canal westward to the headwaters of the James, thence to lock up and over the Alleghanies, connecting with the Ohio system at the Great Falls of the Kanawha River. This plan was later revised to include a road or railroad between the headwaters of the two rivers.

Canal construction was resumed in 1835 and reached Lynchburg in 1840. From there it continued westward, but was held up between 1842 and 1847 because of financial difficulties. Resumed in 1847, the canal reached Buchanan in 1851.

Work westward from Buchanan was contracted for in 1853, but lack of funds caused its abandonment in 1856, marking the end of canal construction westward.

The canal was heavily used between 1825 and 1880, and about 1860 this was the largest freight carrier in Virginia.

In 1880 the canal was in deep financial straits, and was sold to the Richmond and Alleghany Railway Company (predecessor to the present Chesapeake and Ohio), and the rail line was built up the canal route, bringing an end to a fascinating era of transportation.

Records on the Parkway lock have never been found, but other information indicates that the section including this lock was completed to Balcony Falls, a short distance above, by 1850. From this we can estimate this lock's construction date as about 1849.

This particular lock was only one in the series of lift locks along this section of the canal, but it saw much activity and had its share of personal interest. General Stonewall Jackson's body was brought through it on its way to Lexington, and in 1884 the first of Cyrus McCormick's "Virginia Reapers" were transported through here on their way west.

With the building of the railroad, this lock gradually filled and was forgotten, along with the remainder of the canal, until restoration work was started in the fall of 1963, by the Blue Ridge Parkway.

Selected Bibliography

Bagby, G. W., The Old Virginia Gentleman
Chas. Scribner's Sons, 1910

Bagby, G. W., Canal Reminiscences
Richmond, 1879

Bill, A. H., The Beleagued City
Alfred A. Knopf, 1946

Couper, Col. Wm., Claudius Crozet
Charlottesville, Va., 1936

Dunaway, W. F., History of James River and Kanawha Company
N. Y., 1922

Harlow, Alvin F., Old Towpaths
D. Appleton & Company, N. Y., 1926

Pothery, Agnes, New Roads in Old Virginia
Houghton Mifflin Company

Sixteenth Annual Report of James River and Kanawha Company (1850)
Chief Engineer Walter Gwynn

Strother, Col. D. H., Virginia Illustrated
Harper and Brothers, 1871

Various newspaper and magazine articles, and minor references.

b. Relevant Illustrative Documentation -

We have absolutely no documentation of any kind on this lock or any of its particular type. It is believed that all plans, records and other documentation on construction was destroyed when the company headquarters was sacked and burned during the Civil War.

c. Description of Historical Evidence Uncovered by Investigation -

Excavation of the lock revealed a number of interesting and heretofore unknown facts about its construction, including the following important items:

1. Method of pivoting the gate hinge post at the bottom.

2. The A-frame bumper construction details at the bottom of the gate.

3. A retaining wall up-stream from the upper gate, providing for full-length gates at both ends of the locks.

4. A heavy plank floor on the bottom of the lock chamber.

5. A plank lining inside the stones for the first 5 feet up from the bottom of the lock.

6. The proper type of construction for the water-sealing device behind the gate hinge posts.

7. The depth of the lock chamber to be 20 feet, instead of the supposed 12 feet.

8. The relatively good condition of the rock masonry walls inside the lock chamber, and the relatively large amount of work to be done on the wing walls.

9. "River-jack" rip-rap on the canal walls immediately down-river from the lock.

10. Contrary to expectations, we found no remains of the original gates in the bottom of the lock chamber.

3. ARCHITECTURAL DATA

a. Description of Existing Conditions -

Excavations revealed the lock to be in generally very good condition. Most of the stonework was in place, with only occasional blocks having crumbled or fallen out in the main chamber. The retaining wall at the upstream end of the upper lock bay was completely destroyed, though, and the upper sections of the upstream wing-walls. (See photos.) Mortar work between the stones will need replacing in most places. All stones appeared to be native, and from all available information it appears that they were quarried and cut not too far from the lock, with the exception of the cap-rocks, which required machining. These were supposed to have been cut at a nearby town and transported in.

The A-frame on the bottom was made of 10" x 13" native wood. The flooring and facing on the sides was of 2" x 12" planking, the latter being nailed into 4" x 4" pieces inset between the rocks in the wall. All woodwork below the filled surface was in surprisingly good condition, that on the floors and side walls sound enough to remain in most instances.

The specimen gates salvaged from the Lynchburg lock were completely rotted above ground, but quite sound below. After excavation the two gates were hauled to the Parkway and stored as models for reconstruction. Exposure to the air in storage started rapid deterioration, but not before measurements and drawings were made.

The iron sluice gates from the two salvaged gates can be re-used in the new ones, and possibly some of the other iron work.

b. Proposed Construction Activity -

From information now available, we propose the following reconstruction procedures (not necessarily in order listed):

1. Re-building of end wing walls and retaining wall at upper end of west gate bay.

2. Replacement of missing or damaged stone with similar stone salvaged from other locks nearby.

3. Re-mortaring all joints in rock walls.

4. Replacement of all unsound woodwork on the bottom of the lock basin.

5. Reconstruction of four lock gates after the pattern of those salvaged from the Lynchburg lock of the same original construction job.

6. Replacement of two of the sluice gates with those salvaged, and an attempt to salvage the other two gates from Lynchburg to see if we can use them. The latter will be difficult, as they are still under water and fill at the upper end of the old lock there.

7. If the above cannot be salvaged, two more gates will have to be cast after the pattern of those we now have.

8. Salvage of all iron work, both on the gates and tie strips on the cap rocks, as is possible, both from this and similar locks nearby. Any additional needed will be made up from new material.

9. Construction of a dam across Battery Creek to divert water into the lock and retain the proper water level above the lock. (See plan of area.)

10. Construct a controlled water outlet at the downstream end of the project to provide for drainage of the lock for maintenance and clean-out.

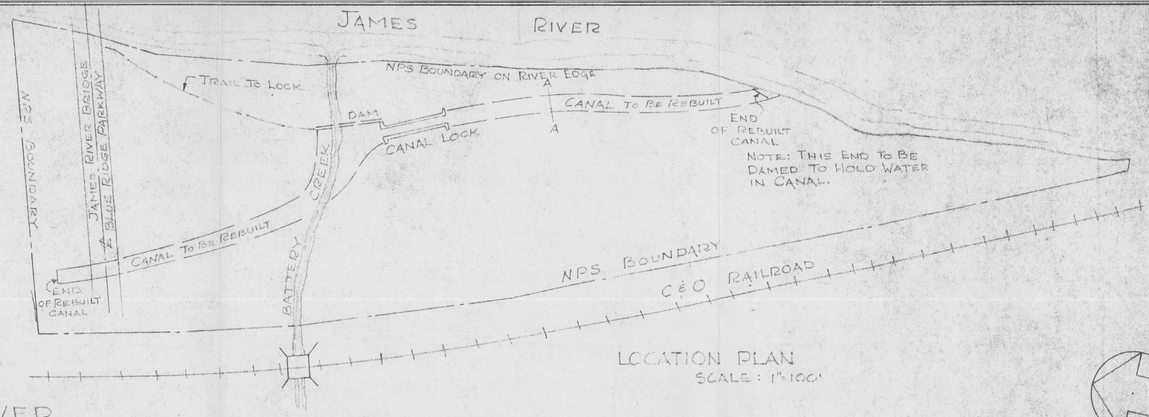
11. Excavation of the canal for approximately 550 feet above and 150 feet below the lock, much as it was in the 19th century.

12. Reconstruction of tow path and berm bank on either side of excavated canal and along the lock.

13. Construction of a trail from the river bridge to the lock, to bring people from the visitor center across the river.

14. Erection of two exhibits (probably cast aluminum, as the area is subject to periodic river flooding) telling the story of the lock and its place in the canal system. The general story of the canal as a whole is told in the visitor center across the river, from which the visitors will enter the area.

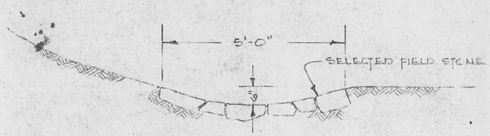
15. Landscape treatment of the areas as described below.



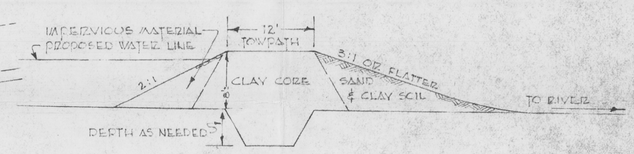
LOCATION PLAN
SCALE: 1"=100'



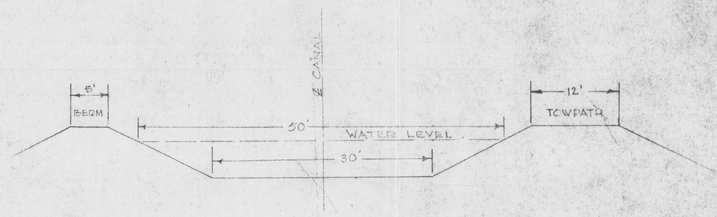
PLAN
SCALE 1"=40'



SECTION OF SPILLWAY
SCALE: ½"=1'-0"



DAM SECTION B-B'
SCALE: 1"=10'



TYPICAL CANAL SECTION
SCALE 1"=10'
5 FEET OF WATER

BASIC DATA

• PRELIMINARY PROJECT DRAWING

SCALE As NOTED

RECOMMENDED

DATE

CHIEF, EODC.

SUPERINTENDENT

APPROVED

REGIONAL DIRECTOR

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
EASTERN OFFICE, DESIGN AND CONSTRUCTION
PREPARED BY
ROANOKE
OFFICE

JAMES RIVER CANAL LOCK EXHIBIT
TITLE OF DRAWING
SECT. 1-H
LOCATION WITHIN AREA
BLUE RIDGE PARKWAY
NAME OF AREA

ORIENTATION

REVIEWED

OPERATIONS REGION

WASHINGTON

INTERP. REGION

WASHINGTON

COOP. ACTV. REGION

WASHINGTON

DES. & CONST.
STERN
A.
E.
L.A.
WASHINGTON
A.
E.
L.A.

OTHER

PREPARED
WDH DESIGNED
WDH DRAWN
ABRAHAM CHECKED

REVISED

DATE	INITIAL
11/26/69	DSS

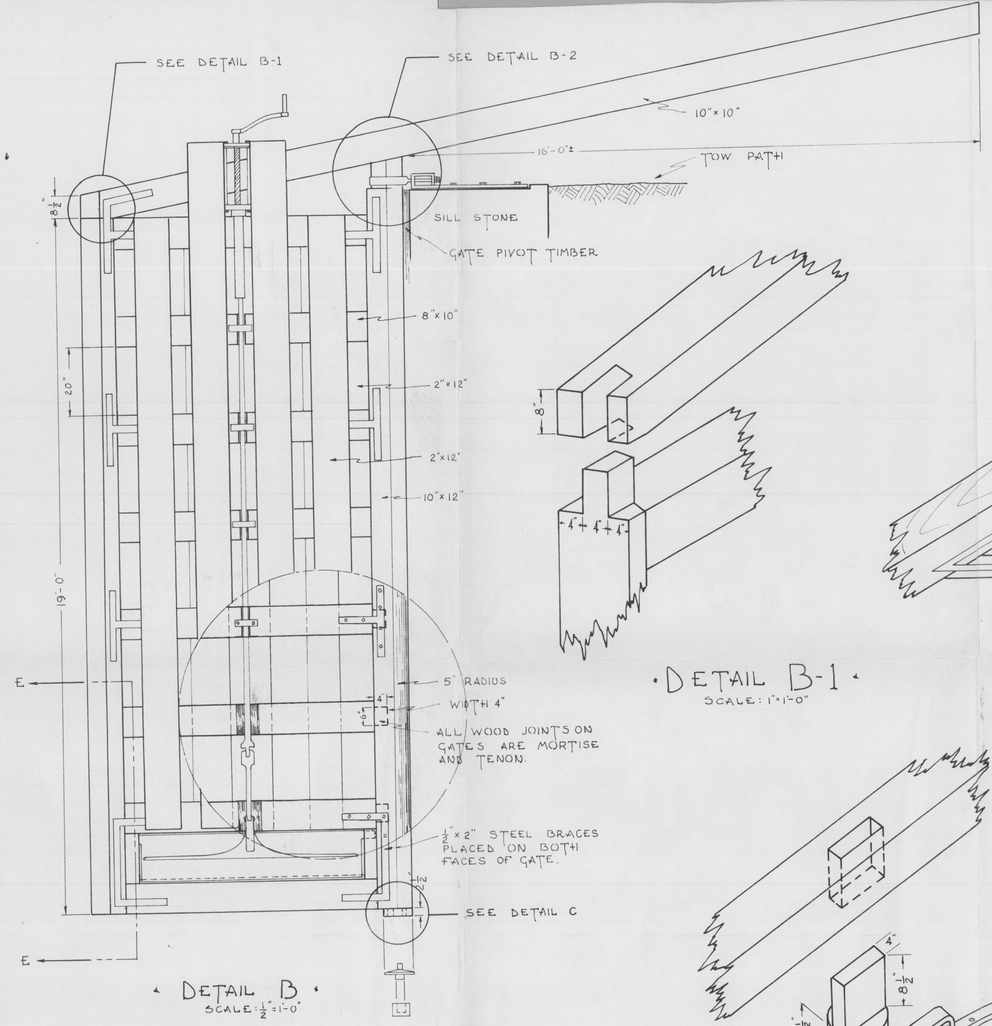
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PCP: A-548

SHEET OF

DRAWING NO. PKY 80 1H-2076

DATE 1/26/70

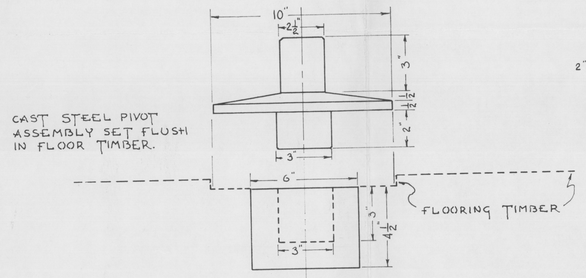


DETAIL B

SCALE: ½"=1'-0"

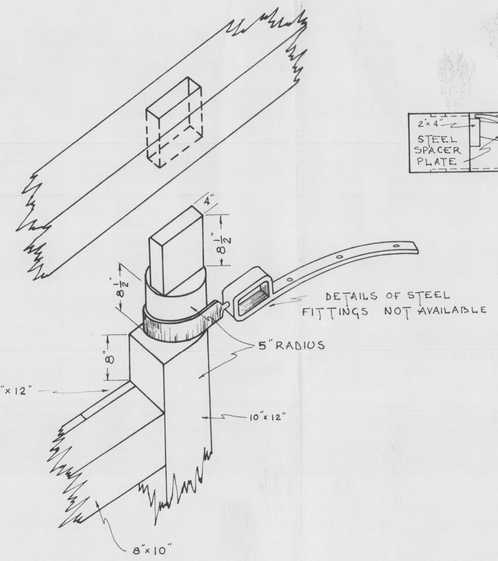
DETAIL B-1

SCALE: 1"=1'-0"



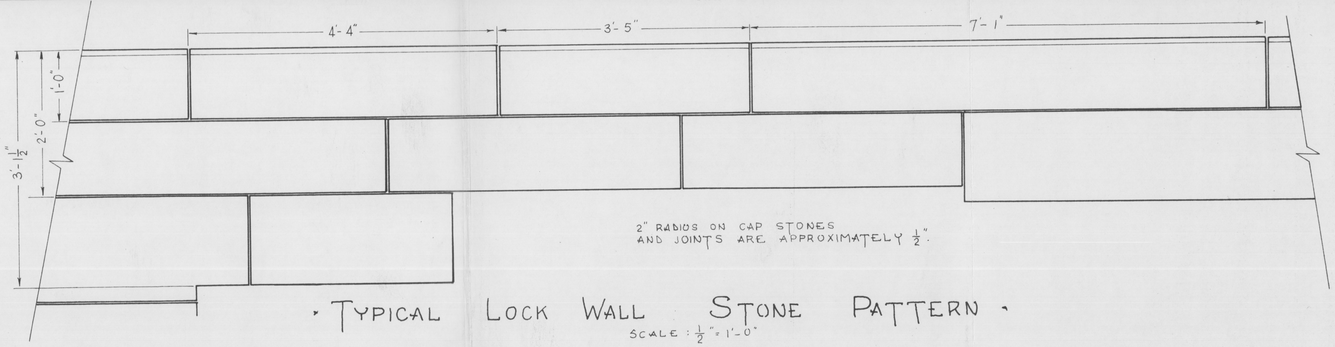
DETAIL B-3

SCALE: 3"=1'-0"



DETAIL B-2

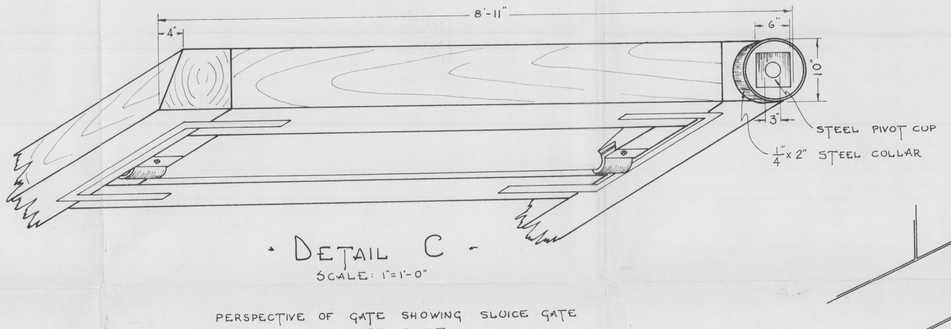
SCALE: 1"=1'-0"



2" RADIUS ON CAP STONES AND JOINTS ARE APPROXIMATELY ½".

TYPICAL LOCK WALL STONE PATTERN

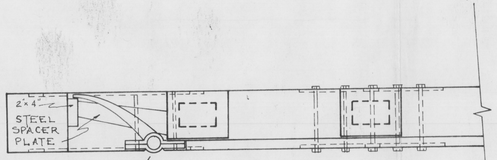
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DETAIL C

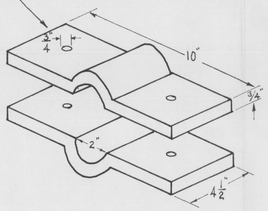
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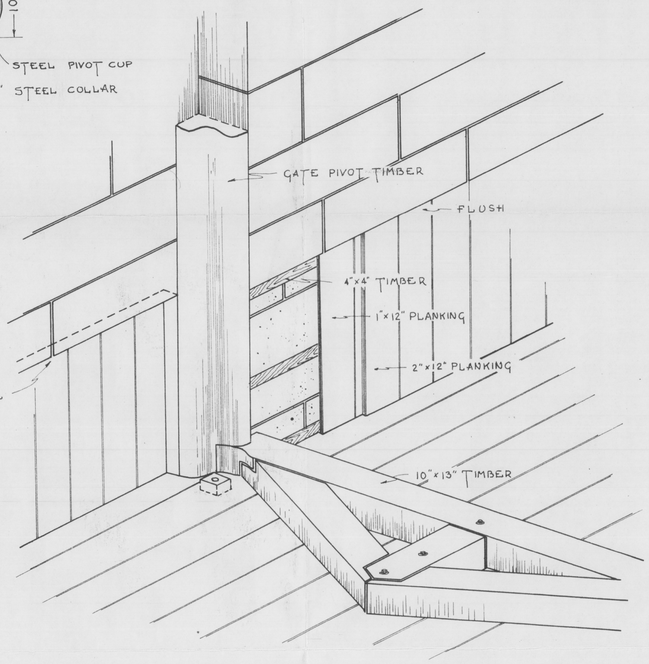
PERSPECTIVE OF GATE SHOWING SLUICE GATE ASSEMBLY, AND GATE PIVOT.



SECTION E-E

SCALE: 1"=1'-0"





DETAIL - D

SCALE: ½"=1'-0"

NOTES:

GATES TO BE CONSTRUCTED AS SHOWN USING SALVAGED STEEL FITTINGS AND REPLICAS OF THE SALVAGED FITTINGS.
BOLTS ARE ¾"×12" MACHINE BOLTS.

SCALE: AS INDICATED

BASIC DATA: ON SITE INVESTIGATIONS WITH PHOTOGRAPHS BY BR-PKY, BEDFORD COUNTY, VIRGINIA.

RECOMMENDED

DATE

CHIEF E.O.D.C. :

SUPERINTENDENT :

APPROVED

REGIONAL DIRECTOR

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
EASTERN OFFICE DESIGN & CONSTRUCTION
PREPARED BY
ROANOKE : OFFICE
OFFICE

JAMES RIVER AND KANAWA CANAL LOCK
TITLE OF DRAWING
SECTION I-H, JAMES RIVER DISTRICT
LOCATION WITHIN AREA
BLUE RIDGE PARKWAY
NAME OF AREA

ORIENTATION REVIEWED

OPERATIONS REGION
WASHINGTON

INTERP. REGION
WASHINGTON

COOP. ACTV. REGION
WASHINGTON

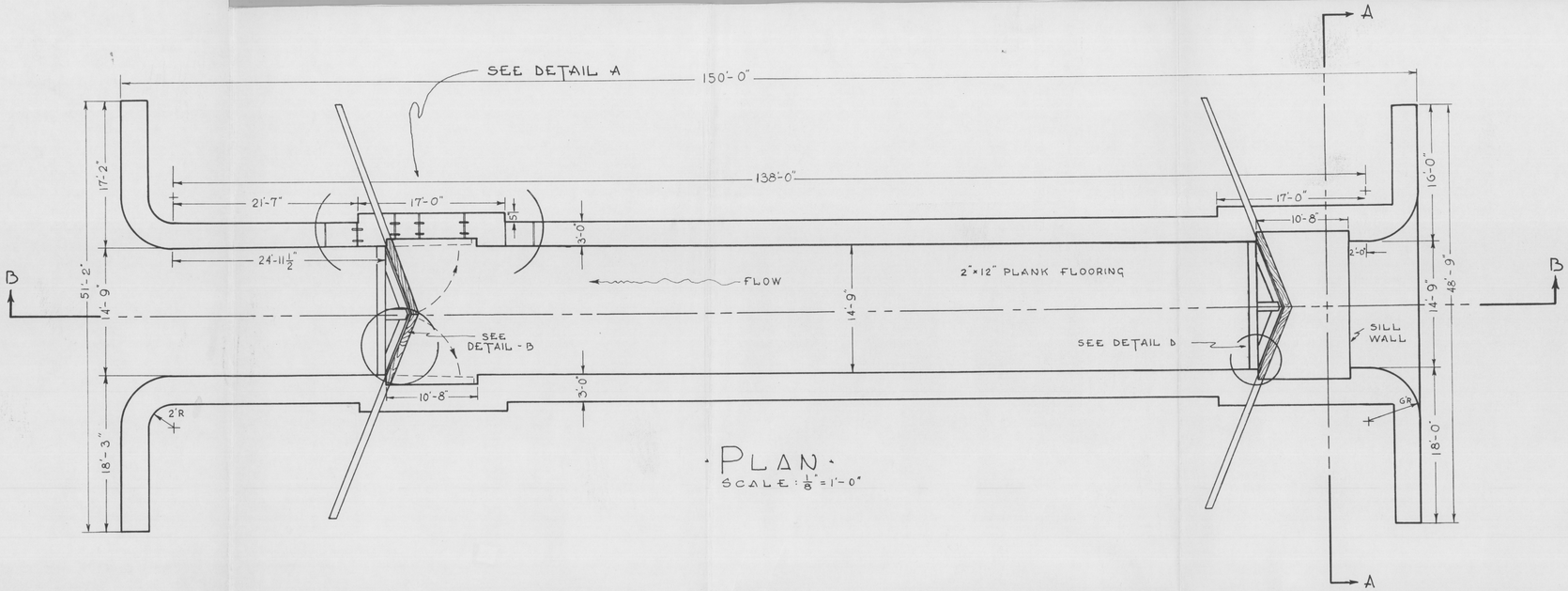
DES. & CONST.
STERN
A.
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WASHINGTON
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L.A.

OTHER

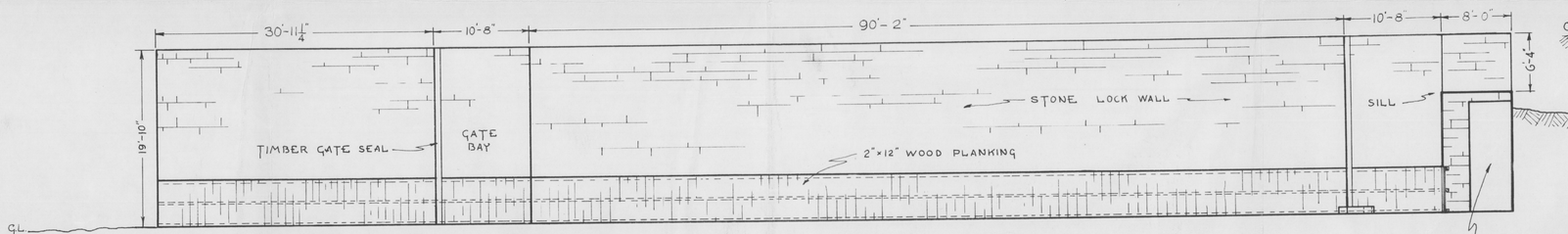
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REVISED
DATE | INITIAL

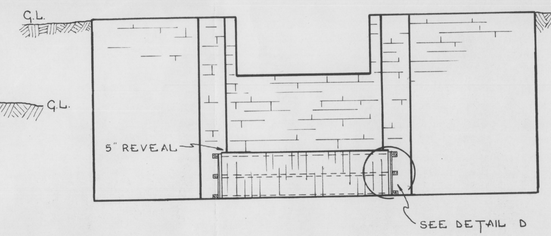
REGION ONE
PCP: A-368
SHEET 2 OF 2
DRAWING NO. PKY.-BR. IH-3051
DATE 8-12-64



PLAN
SCALE: 1/8" = 1'-0"

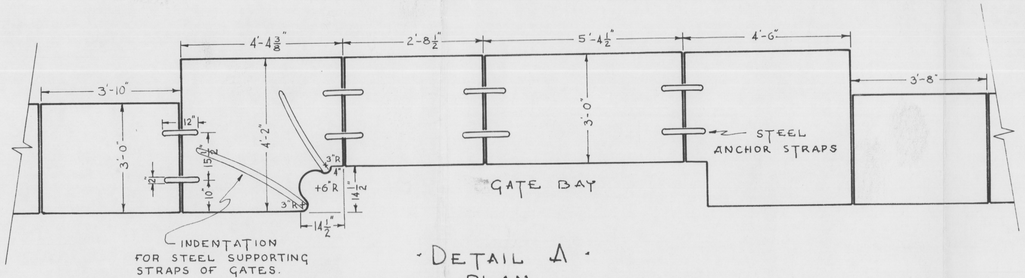


SECTION B-B
SCALE: 1/8" = 1'-0"



COMPLETE DETAILS OF SILL AND GROUND LEVEL BEYOND SILL NOT KNOWN.

SECTION A-A
SCALE: 1/8" = 1'-0"



INDENTATION FOR STEEL SUPPORTING STRAPS OF GATES.

DETAIL A
PLAN
SCALE: ½" = 1'-0"

DETAIL OF CAP STONE CONSTRUCTION AT GATE BAY.

BASIC DATA: ON SITE INVESTIGATIONS WITH PHOTOGRAPHS BY BR-PKY, BEDFORD COUNTY, VIRGINIA.

ORIENTATION REVIEWED

OPERATIONS REGION
WASHINGTON

INTERP. REGION
WASHINGTON

COOP. ACTV. REGION
WASHINGTON

DES. & CONST. STERN
A.
E.
L.A.
WASHINGTON
A.
E.
L.A.

OTHER

PREPARED
DESIGNED GARRITY
DRAWN BEYER
CHECKED

REVISED
DATE | INITIAL

RECOMMENDED
DATE
CHIEF E.O.D.C.
SUPERINTENDENT
APPROVED
REGIONAL DIRECTOR

SCALE: AS INDICATED

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
EASTERN OFFICE DESIGN & CONSTRUCTION
PREPARED BY ROANOKE OFFICE
OFFICE

JAMES RIVER AND KANAWA CANAL LOCK
TITLE OF DRAWING
SECTION 1-H, JAMES RIVER DISTRICT
LOCATION WITHIN AREA
BLUE RIDGE PARKWAY
NAME OF AREA

REGION ONE
PCP: MP-368
SHEET 1 OF 2
DRAWING NO. PKY-BR 1H-3051
DATE 7-22-64



View of excavated lock from James River Bridge (looking east, or downstream).



Downstream end of lock and excavated portion of canal.



West wing wall, north side, before restoration.

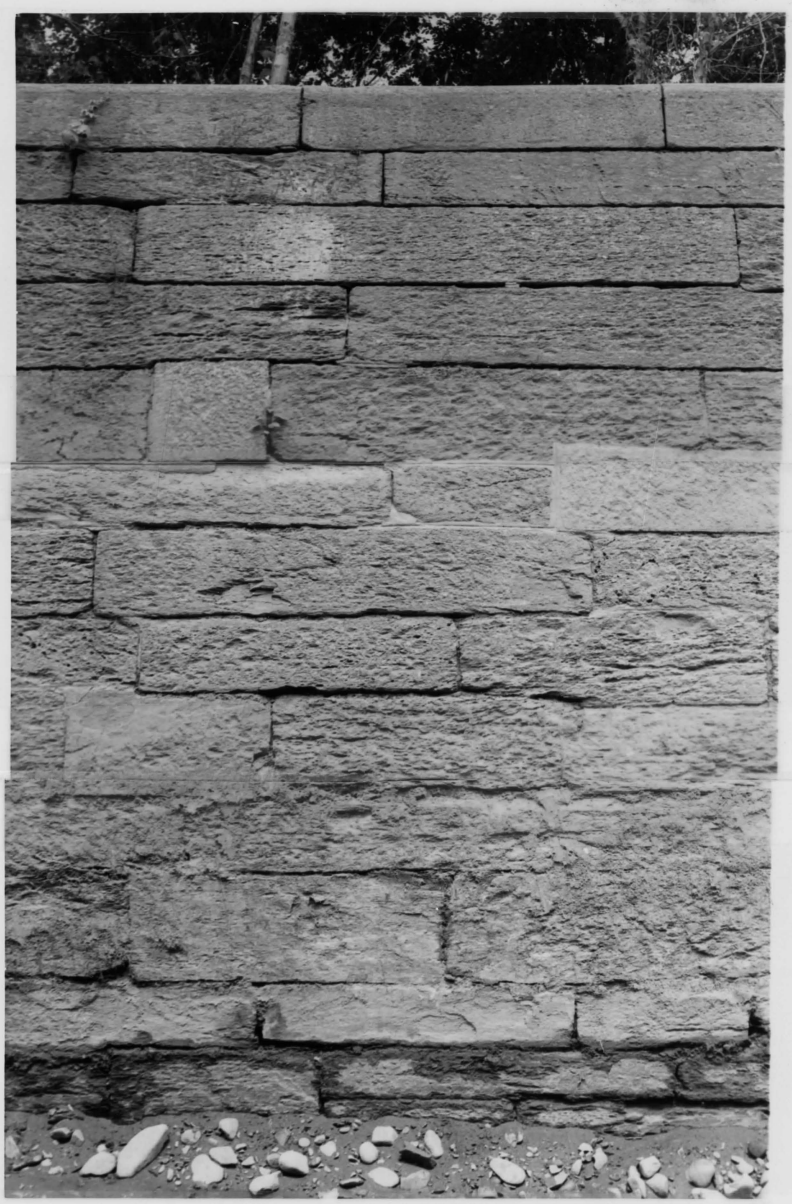


West wing wall, south side, before restoration.





West end of lock showing remains of stone retaining sill at upstream end of west (upstream) gate bay. This wall formed the change in vertical grade of canal flow.



Vertical section of wall, showing typical stonework (bottom 4 feet not uncovered).



Typical section of lock wall showing jointing of rock work.



Hinge post end of lock gate bay, showing remains of water seal device in which post turned (bottom).





A-frame on bottom to
serve as gate stop
and water seal.





2" vertical facing at bottom of lock (one piece removed for inspection).





Bearing at bottom of gate hinge post.

Specimen Gate from Lynchburg Locks



Buried gate in old Lynchburg Locks.

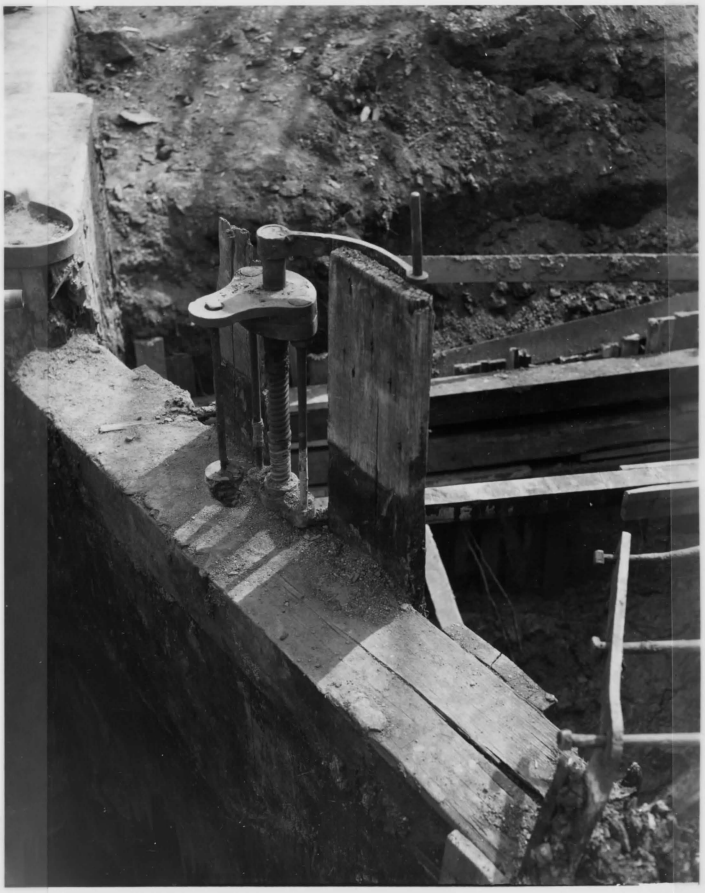


Lynchburg gate after removal from Locks.

Specimen Gate from Lynchburg Locks



Top of gate before removal. Contrast condition of exposed portion to that which was buried.



Sluice gate lifting handle, showing mounting detail.

Specimen Gate from Lynchburg Locks



Close-up of downstream side of sluice gate.



Close-up of upstream side of sluice gate.

Specimen Gate from Lynchburg Locks



Strap mechanism to hold gate hinge post.



Typical anchorage for hinge post strap.

SPECIMEN GATE FROM LYNCHBURG LOCKS



Sluice gate control mechanism.

4. LANDSCAPE DATA

As little landscape treatment as possible will be done in the area, confining this activity mostly to the following:

1. Removal of trees and other growth from the canal, berm bank and tow path.

2. Planting of restored tow path and berm bank with a durable grass to keep down dust and to prevent erosion.

3. Construction of low post and rail fences where necessary to control pedestrian traffic and add a bit of scenic interest to the area.