W. E. Bone, [illegible] Civil Engineer, 249 WB

W. E. Gilbert, Asst Civil Engineer (Highway and Railroad), 249 WB

July 12, 1967

KINGSTON STEAM PLANT - ASH DIKES

On July 3, 1967, J. B. Miller Stevens and Robert J. Monson met with Ridge Brewer, Jr., and Fulton Johnson of Power Production and Buford Crane, Assistant Superintendent, and Hubert Stout, Mechanical Supervisor, of the Kingston Steam Plant at Kingston Steam Plant for an inspection of the ash dikes.

All dikes look to be in good shape. There is very little erosion by wave action on the outside slopes which are about 6:1. Noticeable wave action erosion has occurred on the inside but is not serious. All the dikes, with the exception of 200 to 300 feet on the south end of the east dike, are made of earth with a retaining backbone of ash. The south end of the east dike for about 200 to 300 feet is composed entirely of ash, but has flat slopes and has withstood the wave action as good, if not better, than the earth dikes. Vegetation has been established on the dikes except where the dikes are made of ash.

At the time of our visit the people at the plant were taking about a 3-foot increase in the elevation of the water on the inside of the dike. This would require raising of the dike to prevent the 4- to 6-foot waves that have been observed from overtopping the dike. Even a 3-foot increase in water elevation without raising the dike would reduce the freeboard below a safe minimum. The reason for raising the water level was understood to be to provide more dilution. Unless additional depth is proved to be required, the depth of water on the inside should be kept about as it now is, in order to minimize wave action and load against the dikes.

Both pipe spillways are flowing full at the top with water only a few inches above the lip and seem to have no difficulty in taking care of the water that is discharged into the pond. Consideration should be given to installing an additional spillway to allow overabbing to reduce the inside wave heights. At the present time the ash at the end of the sluice pipe is being vented by mechanical equipment. The recommendation was made that an immediate start be made on raising the dikes. We will make a revision on the 10W500 drawing giving specifications for raising the dikes.

[redacted]

On July 2, 1942, there was approximately an inch of the crest of floating dam from 2-1/2 to 3 inches thick. The insertion varies with the wind, but usually is diametrically opposite the spillways. A square wooden skimmer floating on metal drums (see photo) is used here instead of the circular metal type we have designed. We see no objection to the wood type except this one does not extend far enough below and above the water level to hold back floating ash.

The outlets of the pipe culverts under the access railroad and Dam Road Road that discharge into the ash pond are considerably lower than the ultimate top of ash, and special provisions will have to be made to keep them open when the ash reaches their outlet elevations which will not be for many time. MPP is aware of this situation, but our plan will be revised to show recommended solution.

An inspection of the pavement was made along the access highway and truck roads. The pavement was in fair shape with the asphalt concrete showing signs of impending failure at places where humps and valleys were present. The Portland cement concrete pavement was in excellent condition except at the point where the asphalt concrete ends and the Portland cement concrete begins (see attached photos). One corner of the concrete pavement is badly broken.

In summary, the dikes show no signs of being in any danger of failure provided proper cross section is used in raising them to higher elevations. The skimmer at the spillways should be made more effective.

W. E. Colvert

JTW:EJB:MWF
Attachments
CC (Attachments):
Major Brewer, Jr., 1022 EB, Chattanooga
J. E. Parrish, 505 EB

North Dike

Ash Disposal Area

WATTS BAR RESERVOIR

Clinch River

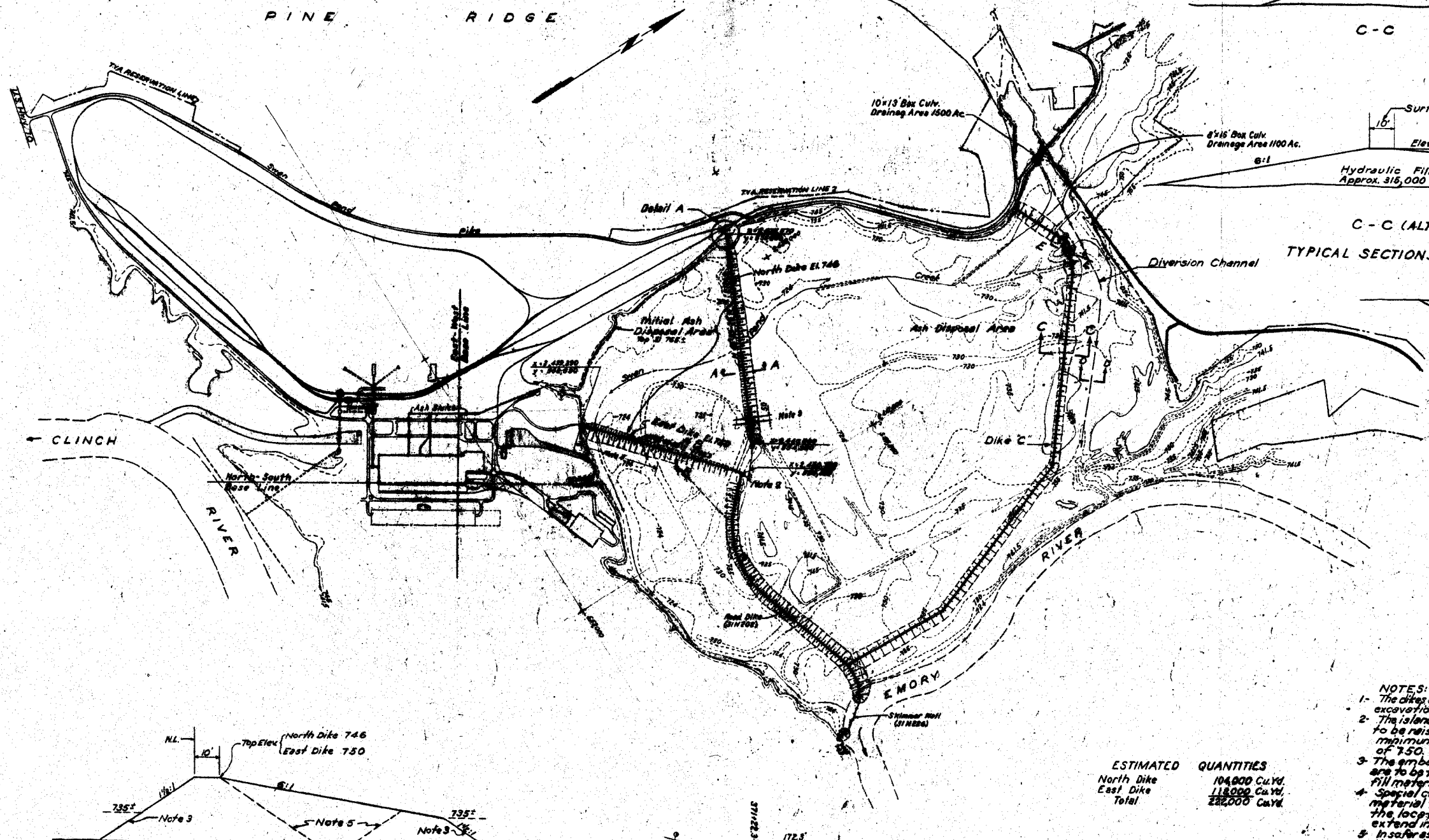
Utility Bldg.

Coal Storage Yard

Empty Storage Yard

TO KINGSTON

CONSTRUCTION AREA



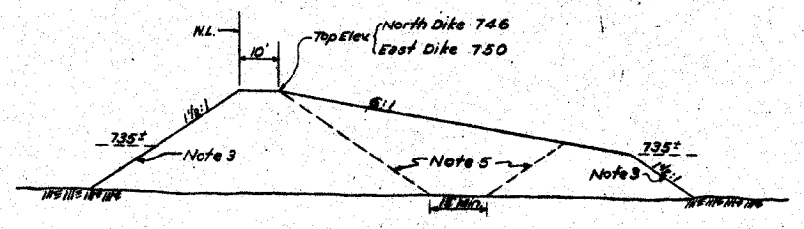
C - C

C - C (ALTERNATE) - Note 8

TYPICAL SECTIONS - DIKE 'C'

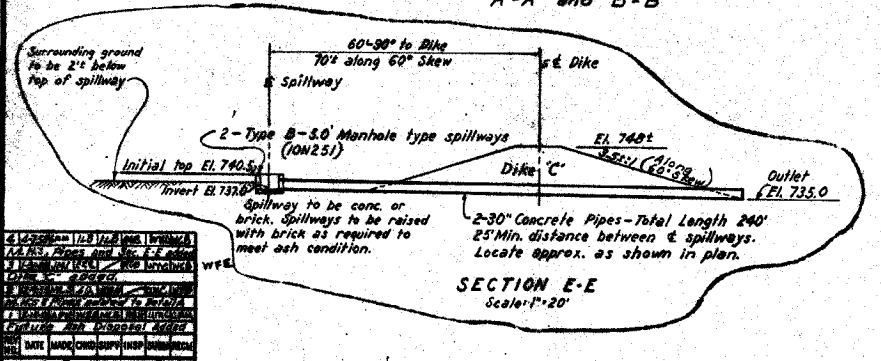
D - D

TYPICAL SECTION OF DIVERSION CHANNEL



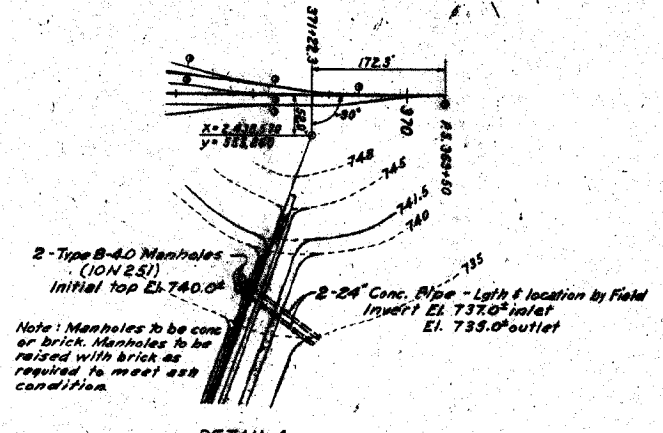
TYPICAL DIKE SECTION

A-A and B-B



SECTION E-E

Scale: 1"=20'



DETAIL A

Scale: 1"=100'

ESTIMATED	QUANTITIES
North Dike	104,000 Cu.Yd.
East Dike	118,000 Cu.Yd.
Total	222,000 Cu.Yd.

NOTES:-

1- The dikes are to be constructed of unclassified excavation.
2- The island between the east ends of the dikes, is to be raised and widened if necessary to provide minimum width of 10 feet and minimum elevation of 750.
3- The embankment slopes below elevation 735± are to be the angle of repose of the submerged fill material.
4- Special care is to be taken to select firm shale material to be placed below the water level, at the location indicated, so that slope will not extend into the area of the intake channel.
5- In so far as it is feasible and practical the core of the east dike, as indicated, should be constructed of earth and fine material to provide a relatively impervious dam.
6- Top of Dike 'C' to be surfaced with slag and ashes, 6" compacted thickness.
7- Quantities shown for Dike C are net fill for section shown and do not include shrinkage etc.
8- Section C-C is the minimum section to be used. The slopes shown for the hydraulic fill section are assumed and may be steeper if material can be placed on steeper slopes.
9- Remove existing dike for minimum width of 50 ft. and to elevation 742 or lower after Dike 'C' has been completed to at least elevation 748.

Scale: 1"=500' except as noted

GENERAL

ASH DISPOSAL AREA

KINGSTON STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF DESIGN

SUBMITTED	RECOMMENDED	APPROVED
W. N. Edwards Jr.	D. A. Mayes	R. O. Morrow

KNOXVILLE	8-8-51	36	C	4	10N400 R4

PINE RIDGE

TVA RESERVATION LINE

South Pond

Pike

Detail A

TVA RESERVATION LINE 2

10'x13' Box Culv. Drainage Area 1600 Ac.

8'x16' Box Culv. Drainage Area 1100 Ac.

North Dike El. 746

Creek

Diversion Channel

Initial Ash Disposal Area Top El 765±

17 Yrs Ash Disposal Area

East-West Base Line

Ash Sluice

Road Ditch El. 730

Note 3

Note 2

Dike 'C'

CLINCH RIVER

North-South Base Line

Road Ditch (Typ)

Shimmer Wall (Typ)

FACTORY

This area is built out of ash

good check

S@2.00 L-150

Surfacing (Note 6)

10'

Elev. 748±

Borrow and haul Approx. 160,000 c.y.

3:1

6:1

735±

C - C

Surfacing (Note 6)

10'

Elev. 748±

12:1±

6:1

Hydraulic Fill Approx. 315,000 c.y.

C - C (ALTERNATE) - Note 8

TYPICAL SECTIONS - DIKE 'C'

2:1

Level EL732±

12' Min.

D - D

TYPICAL SECTION OF DIVERSION CHANNEL

N.L.

Top Elev. North Dike 746 East Dike 750

10'

1½:1

735±

Note 3

Note 5

Note 3

1½:1

TYPICAL DIKE SECTION

A-A and B-B

Surrounding ground to be 2' below top of spillway

60°-90° to Dike

70' along 60° Skew

℄ Spillway

℄ Dike

2 - Type B-5.0' Manhole type spillways (ION251)

El. 748±

Initial top El. 740.5

Invert El. 733.0

Dike 'C'

Outlet ℄ El. 735.0

Spillway to be conc. or brick. Spillways to be raised with brick as required to meet ash condition.

2-30" Concrete Pipes - Total Length 240' 25' Min. distance between ℄ spillways. Locate approx. as shown in plan.

SECTION E-E

Scale: 1"=20'

172.5'

X=1,438,870

y=351,240

748

745

741.5

740

2 - Type B-4.0 Manhole (ION251) Initial top El. 740.0±

2-24" Conc. Pipe - Lgth & location by Field Invert El. 737.0± inlet El. 735.0± outlet

Note: Manholes to be conc or brick. Manholes to be raised with brick as required to meet ash condition.

DETAIL A

Scale: 1"=100'

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7- Quantities shown for Dike 'C' are net fill for section shown and do not include shrinkage etc.
8- Section C-C is the minimum section to be used. The slopes shown for the hydraulic fill section are assumed and may be steeper if material can be placed on steeper slopes.
9- Remove existing dike for minimum width of 30ft. and to elevation 742 or lower after Dike 'C' has been completed to at least elevation 745.

Scale: 1"=500' except as noted

Nov 741

D.D. 735

GENERAL

ASH DISPOSAL AREA

KINGSTON STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF DESIGN

SUBMITTED	RECOMMENDED	APPROVED
W.N. Belmont Jr.	O.O. Mayer	A.A. Munroe

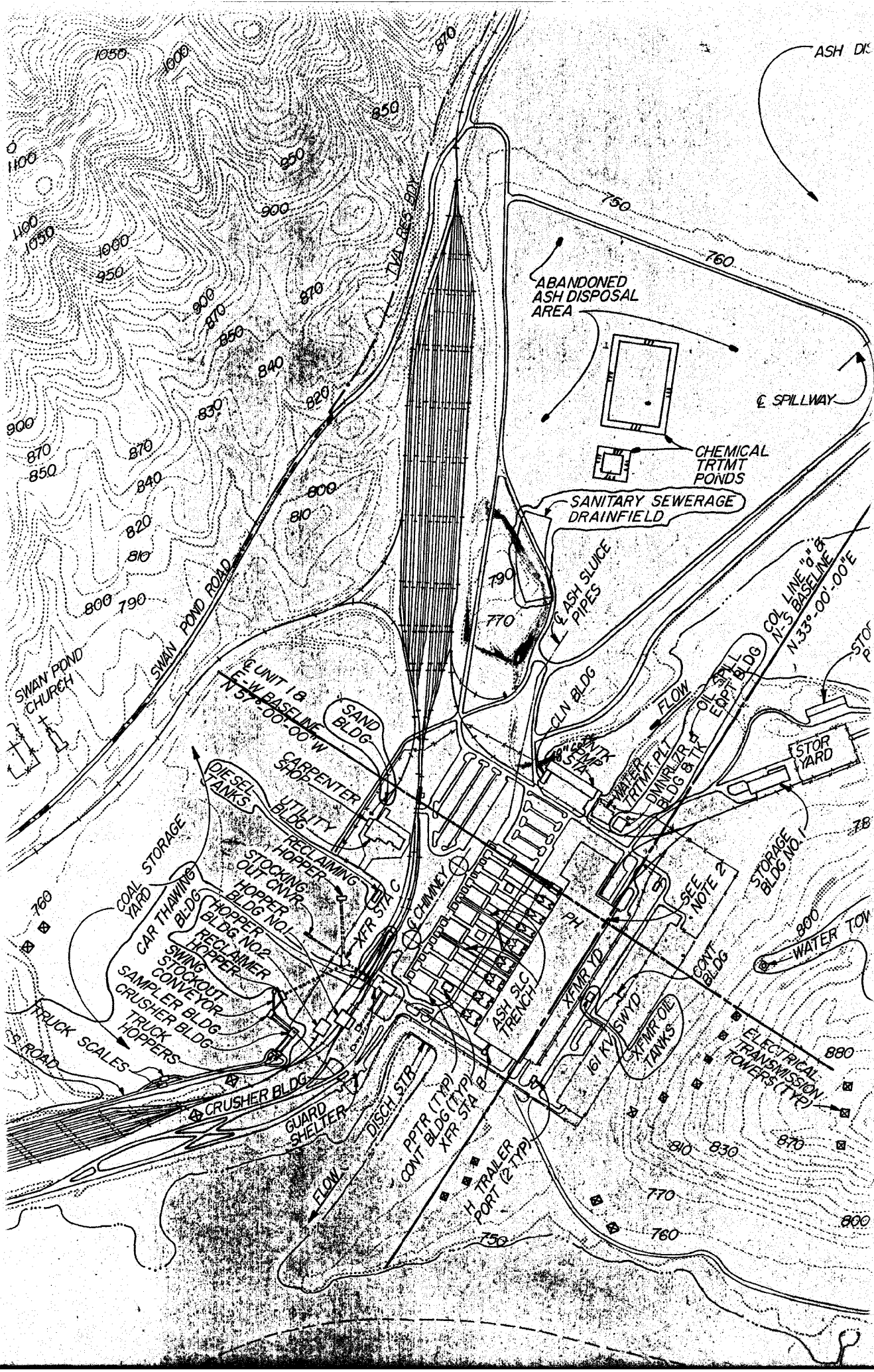
KNOXVILLE	8-8-51	36	C	4	10N400 R4

RECORD DRAWING AS CONSTRUCTED

NO.	DATE	BASIC	CHKD	SUPV	INSP	SUBMISSION
1	6-4-52					Initial Ash Disposal Area

DESIGN C.W.E. DATE 5-5-52
DRAWN G. Mac-Pherson DATE 5-12-52
CHKD. C.W.E.
TRCD.
CHKD.
DRAWING No. 10N400

TVA-00005715



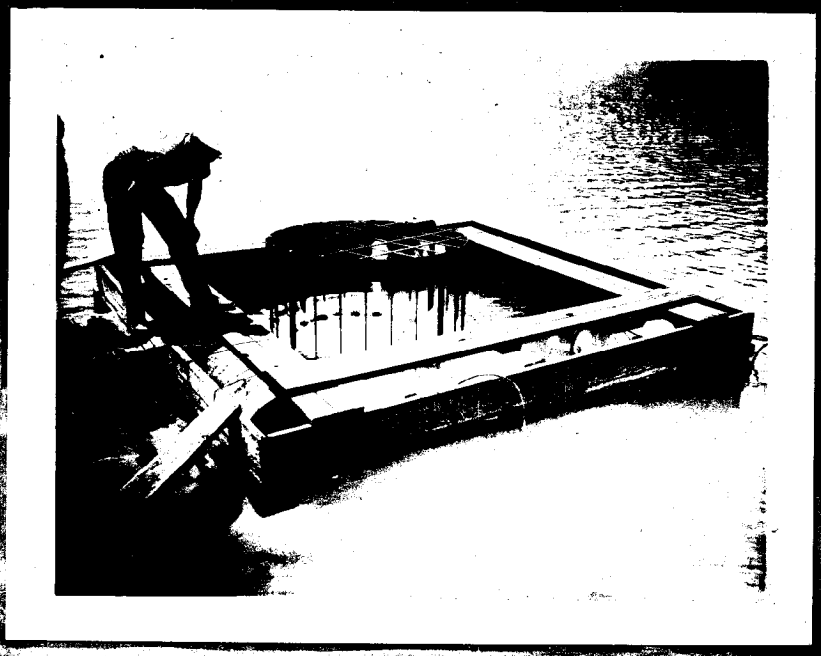
Flat slopes inside and outside of dike
7-3-67

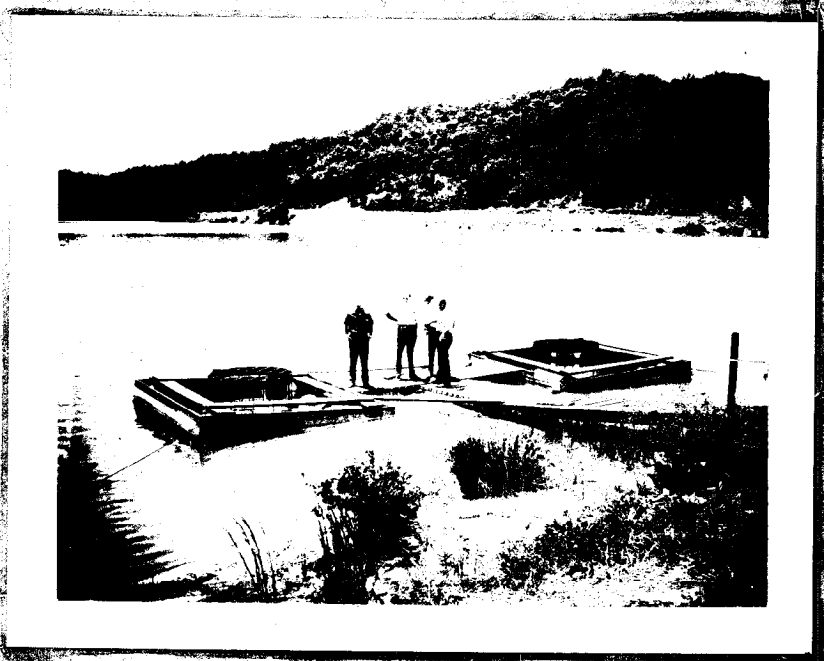
Kingston

Wave action inside dike cuts back into fill,
7-3-67

Point where asphaltic concrete joins Portland cement concrete showing break

Kingston S.P.





Pictures showing Spillway inside Res. to. Structure is too short to extend far enough [illegible] water to skim off all ash and to prevent [illegible] from going over. 7-3-67

Kingston S.P.