

*Kingston
Ash Disposal*

Civil Engineering and Design Branch Files

J. P. Hillier Stivers, Civil Engineer (Site Development, Highway, and Railroad Design), W3A23 C-K

August 27, 1976

KINGSTON STEAM PLANT - RAISING OF ASH DISPOSAL AREA DIKES - INSTALLATION OF NEW SPILLWAYS - FOUNDATION IMPROVEMENT

On August 23, 1976, Oliver Bains and I at the request of CEB met with General Foreman J. W. Truett and Doyle Cardwell to inspect the installation of new spillways in the existing ash disposal area at Kingston Steam Plant.

Following are the discussion of conditions during the visit and the agreement reached for correcting the present installation and improving the foundation for all installations in the ash area.

The foundation for the pondward portion of the spillways is in light ash. It has not been possible to excavate to firm ground for structure foundations because of water and ash inflow into the excavations. Construction by attempting to firm up the soft ash with earthfill has been unsuccessful, and settlements have occurred on the partially installed structures.

SPILLWAY DESCRIPTION

The inlet of each of the six spillways is composed of a reinforced concrete box with inside dimensions of 4 feet by 4 feet and 2-foot sections of 48-inch reinforced concrete pipe above the box. One section is to be installed initially and additional sections added as needed. The outlet of the box is through a 36-inch reinforced concrete pipe laid horizontal to a reinforced concrete headwall. The boxes are spaced 50 feet on center with the horizontal pipes converging to a spacing of 10 feet on center at the headwall.

STATUS OF CONSTRUCTION

The headwall has been constructed as has been the complete length of horizontal pipes for two of the spillways and their inlet boxes. Approximately 50 percent of the horizontal length of pipe for each of the remaining four spillways has also been installed.

DESCRIBED FOUNDATION CONDITIONS

Headwall

The headwall is founded on firm original ground. The original ground was excavated approximately 2 feet below grade and backfilled with compacted clay.

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OF NEW SPILLWAYS - FOUNDATION IMPROVEMENT**

Horizontal Pipes and Inlet Boxes

From the headwall to approximately midway of the horizontal pipes the foundation is in natural ground or the original dike. The foundation was excavated approximately 2 feet below grade and backfilled with compacted clay. From midway of the horizontal pipes to and including the inlet boxes the foundation material is light ash which when wet is soft and unstable. The water level in the light ash at the spillways is caused by the fact that the pond is in active use and water is being sluiced into the pond. The ash was excavated approximately 4 feet below grade and backfilled with clay that was tamped in place with backhoe equipment for both the horizontal pipes and the inlet boxes.

Hand probing with a steel rod during our visit indicated a depth of soft ash from 5 feet below grade at the present pipe ends to 8 feet or more at the presently installed inlet boxes.

CONDITION OF HORIZONTAL PIPES

Visual inspection of the horizontal pipes showed settlement of all pipes that were laid on the light ash. Closer inspection of one pipe by crawling through the pipe showed the joints were spreading apart in varying amounts to a maximum of 1-1/2 inches. One section has a 3/8-inch crack completely around the pipe barrel. One section has the end of the barrel broken off to where the "O" ring gasket can be seen.

The other pipes are to be inspected by crawling through the pipes. The joints are to be closed, and the sections that are cracked or broken are to be removed and replaced.

FOUNDATION IMPROVEMENT

All pipes and inlet boxes that are on light ash are to be removed and a firm foundation prepared by placing large stones on the soft ash and compacting with heavy equipment to force the stones down to solid bearing.

It was first considered to remove as much of the light ash as can be removed with equipment for a width of 15 feet each side of the inlet boxes with lateral trenches where the horizontal pipes are. It was decided that it was more practical to excavate the entire width from 15 feet outside the inlet boxes to where the pipes are on solid foundation.

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**KIMBERLY DAM PLANT - BANKING OF AERIAL SERVICE AREA DITCH - INSTALLATION
OF NEW SPILLWAYS - FOUNDATION IMPROVEMENT**

ROCK PLACING

Initial rock is to weigh from 200 to 400 pounds each with no smaller stones permitted. These rocks are to be forced through the soft material to a firm foundation with heavy equipment. The placing of the 200- to 400-pound stones is to continue to 1 foot below the grade of the pipes and inlet boxes. The top of the large stones is to be choked with smaller stones and surfaced with compacted crushed stone. Instrument observations on the large stone layer and on the crushed stone are to be taken to ensure the rockfill has been compacted to provide a non-settling foundation. Two additional passes of heavy equipment are to be made on the large stone layer and on the crushed stone after surveys indicate no further settlement.


J. P. Miller Stivers

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September 28, 1976

KINGSTON STEAM PLANT - ANNUAL ASH DISPOSAL AREA INSPECTION

Attached is a report from J. P. Millier Stivers to Frank D. Stansberry dated September 27, 1976, of the joint inspection at Kingston Steam Plant which includes a recommendation that another inspection be made as soon as CSB has finished raising the dikes. I concur in this recommendation.

Original Signed By
F. P. Lacy

Roy H. Dunham

GLB:JPMS:BLM

Attachment

CC (Attachment):

- G. L. Buchanan, W3C126 C-K (2)
- H. G. Dwyer, W9B224 C-K
- MEES, E4837 C-K
- B. S. Montgomery, 5100 MIB-K
- Power Manager's File, 630 PFB-C
- E. F. Thomas, 818 PFB-C

Frank D. Stansberry, Head Civil Engineer (Site Development, Highway, Railroad, and Bridge Design), W3A30 C-K

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September 27, 1976

KINGSTON STEAM PLANT - ANNUAL ASH DISPOSAL AREA INSPECTION

On September 15, 1976, Larry Wall of P PROD, Chattanooga; L. B. Kennedy, Assistant Plant Superintendent; and I inspected the ash disposal areas at Kingston Steam Plant. Our findings were discussed with Monette L. Butler, Plant Superintendent.

The areas were last inspected on September 11, 1975.

On the attached print of drawing 10N420, the different areas are designated.

Change in Dikes Since Last Inspection

At the time of this inspection, CSB was in the process of raising the dikes and installing new spillways in accordance with EN DES drawings and specifications.

All of the original dikes, with the exception of the west dike of the initial area and the south end of dike C, were built with equipment-compacted earth and widened with ash. The west dike of the initial area and the south end of dike C were built and widened with ash.

The outside slopes of dike C, east dike, and the road dike have an excellent cover of vegetation except in the areas where construction has removed the vegetation. The original dikes are in good condition with no visible signs of instability.

Change in Pond Operation Since Last Inspection

There has been no change in operation since last inspection. All ash is sluiced into the initial area. Part of the ash is picked up with a dragline, allowed to drain, then dry hauled to the ash disposal area adjacent to the north dike where the ash is deposited in stages. As each stage reaches the elevation of the top of the north dike, it is covered with earth and seeded.

The ash water carrying light ash that was not picked up by the dragline flows through two plant-constructed spillways and skimmers into the ash disposal area where the rest of the ash settles out. The water then goes into Watts Bar Lake through two standard spillways and skimmers in dike C.

