

PORTSMOUTH GASEOUS DIFFUSION PLANT, X-600 STEAM
PLANT
3930 U.S. Route 23 South
Piketon vicinity
Pike County
Ohio

HAER OH-142-Q
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WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240

HISTORIC AMERICAN ENGINEERING RECORD
PORTSMOUTH GASEOUS DIFFUSION PLANT, X-600 STEAM PLANT

HAER No. OH-142-Q

Location: Portsmouth Gaseous Diffusion Plant (PORTS), 3930 U.S. Route 23 South, Piketon vicinity, Scioto Township, Pike County, Ohio

The X-600 Steam Plant is located at Ohio State Plane South coordinates at easting 1826782.024267 ft, northing 366978.704281456 ft and at Universal Transverse Mercator Zone 17N easting 326936.4018 m, northing 4319399.374 m. The coordinate represents the approximate center of the X-600 Steam Plant. This coordinate was obtained on June 19, 2019 by plotting its location in EnviroInsite 10.0.0.37. The accuracy of the coordinates is +/- 12 meters. The coordinate datum is North American Datum 1983.

Date of Construction: 1954

Designer/Builder: Peter Kiewit Sons' Construction Company

Previous Owner: N/A

Present Owner: The Atomic Energy Commission (AEC) oversaw construction and operation of PORTS until 1974, when the Energy Research and Development Administration was established with responsibility for research and development duties from 1974-1977. In 1977, the U.S. Department of Energy was established, overseeing operations at PORTS.

Present Use: Demolished in 2013

Significance: The former X-600 Steam Plant provided steam to heat buildings, vaporize uranium, maintain process temperatures, and clean equipment. The former X-600 Steam Plant produced 125-pounds per square inch (psi) saturated steam and consisted of three boilers, each rated for continuous operation at 125,000 pounds of steam per hour at 125 psi. The boilers were fired with coal fed through stokers. This facility was part of PORTS, which was a part of the U.S. Cold War nuclear weapons complex. PORTS' primary Cold War era mission was the production of highly enriched uranium by the gaseous diffusion process for defense/military purposes.

Project Information: Fluor-BWXT Portsmouth LLC photographed the site on July 31, 2012 and August 13, 2012. Gray & Pape, Inc., Cincinnati, Ohio, served as the primary author of the historical narrative and resource descriptions drawing from numerous historical records and reports, drawings, photographs and plans. For additional contextual information, see Portsmouth Gaseous Diffusion Plant, HAER no. OH-142. This X-600 Steam Plant HAER was completed in 2021.

Part I. Historical Information

In support of this report, there are three appendices: Appendix A through C, which consist of survey photographs, historical photographs, and historical drawings, respectively.

Construction History of the X-600 Steam Plant:

Peter Kiewit Sons' Company and the AEC awarded the subcontract for the X-600 Steam Plant to the James Leck Company of Minneapolis, Minnesota, with Peter Kiewit Sons' Company expediting and coordinating the work. Excavation proceeded from January to October 1953 with a total of 5,093 cubic yards excavated (Appendix B, Figures 4 and 5). Eight hundred and thirty-four cubic yards of concrete were laid between July 1953 and January 1954 (Figures 6 through 9). Towne Construction Company erected 214 tons of structural steel, using both bolted and riveted connections, between August and November 1953 (Figures 10 through 12). All work was completed on the initial phase of the X-600 Steam Plant by early October 1954 (Figures 13 through 19). A view of the X-600 Steam Plant in 1990 is shown in Figure 20. The X-600 Steam Plant was demolished in 2013.

Historical drawings of building plans are provided in Appendix C (Figures 21 through 32).

Part II. Site Information

Description of the X-600 Steam Plant:

The former X-600 Steam Plant was a large facility located in the south-central portion of PORTS, approximately 300' southeast of the X-326 Process Building. The X-600 Steam Plant provided the steam for the gaseous diffusion process and building heating, uranium vaporization, and equipment cleaning. The building had a floor space of approximately 19,506 square feet. The building had a rectangular plan with two connected areas, a 72' high east wing, and a 37' high west wing (Appendix A, Figures 1 through 3). Both wings were approximately 99½' long with two main floor levels and operating platforms. A control room addition was built on the west facade sometime after the plant's initial construction.

The building featured a reinforced, poured concrete, raised foundation that covered the first floor of the plant. The upper story of the building was composed of a reinforced steel frame with corrugated cement-asbestos siding. Each wing of the building had a flat steel-decked roof covered with built-up material and slag. A row of air-intake louvers lined the top of the west wall of the east wing, with additional venting in the first story concrete wall. The west wall of the west wing featured steel industrial windows running the length of the facade.

The eastern portion of the plant was occupied by three large coal-fired boilers and stacks. To the east of the stacks were three steel hopper-like chambers, built ca. 1990. Additionally, two silos were located on the southwest corner to store ash. One silo dated to the plant's original construction and was made of tile block, and the other silo was added later and was built of concrete. A coal conveyor was attached to the south façade of the taller west wing of the plant to transport coal from the yard to the southeast.

The interior of the building consisted of a concrete slab floor resting on compacted fill on the first story and another concrete slab floor on the second story, which was supported by the steel frame and concrete perimeter walls. Mezzanines, platforms, and stairs were steel. The building housed boilers and their auxiliary units, coal-feed equipment, condensate storage tanks and piping, electrical equipment and controls, and other mechanical equipment. Personnel facilities in the building included lockers, restrooms, and showers.

Part III. Sources of Information

Department of Energy. *The Role of the Portsmouth Gaseous Diffusion Plant in Cold War History*. Piketon, OH: U.S. Department of Energy, 2017.

Department of Energy. *Remedial Investigation and Feasibility Report for the Process Buildings and Complex Facilities Decontamination and Decommissioning Evaluation Project at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, DOE/PPPO/03-0245&D3. Piketon, OH: U.S. Department of Energy, 2014.

Department of Energy. *Engineering Evaluation/Cost Analysis for the Plant Support Buildings and Structures at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio*, DOE/PPPO/03-0207&D4. Piketon, OH: U.S. Department of Energy, October 2011.

Department of Energy. *National Historic Preservation Act Section 110 Survey of Architectural Properties at the Portsmouth Gaseous Diffusion Plant in Scioto and Seal Townships, Piketon, Ohio*, DOE/PPPO/03-0147&D1. Piketon, OH: U.S. Department of Energy, January 2011.

Giffels & Vallet, Inc. *Gaseous Diffusion Plant at Portsmouth, Ohio, Project History and Completion Report* (Redacted). Washington, D.C.: U.S. Atomic Energy Commission, 1957.

Portsmouth Gaseous Diffusion Plant Virtual Museum – accessed at <http://www.portsvirtualmuseum.org/> operated and managed by Fluor-BWXT Portsmouth for DOE.

Appendix A: Survey Photographs

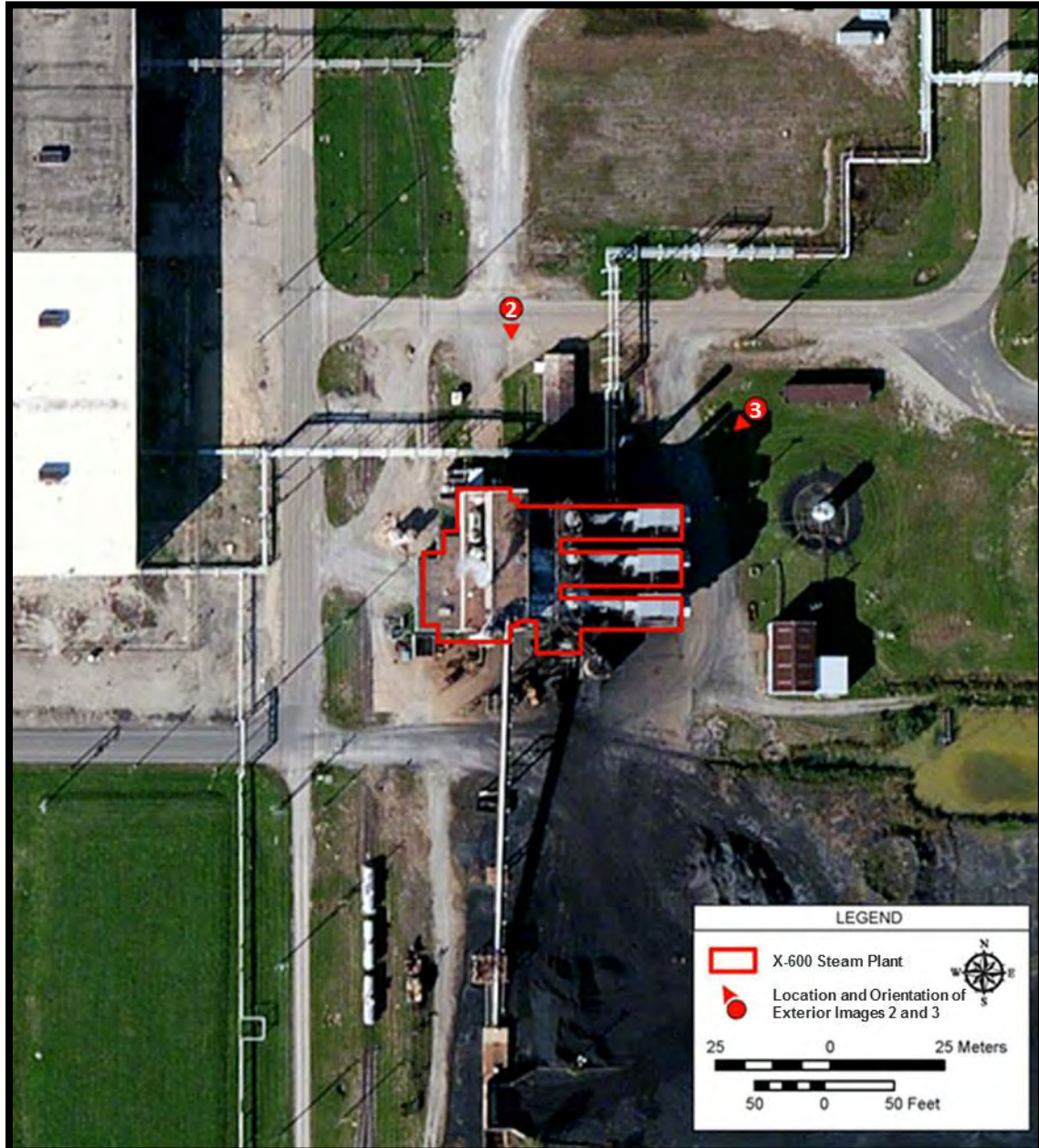


Figure 1: Location and Orientation of Exterior Photographs (2 and 3)



Figure 2: North Side of the X-600 Steam Plant, August 2012, Facing South



Figure 3: North Side of the X-600 Steam Plant, August 2012, Facing South

Appendix B: Historical Photographs



Figure 4: Grading Work for the X-600 Steam Plant, June 1953



Figure 5: Grading and Foundation Work for the X-600 Steam Plant, June 1953



Figure 6: Excavation Work for the X-600 Steam Plant, June 1953

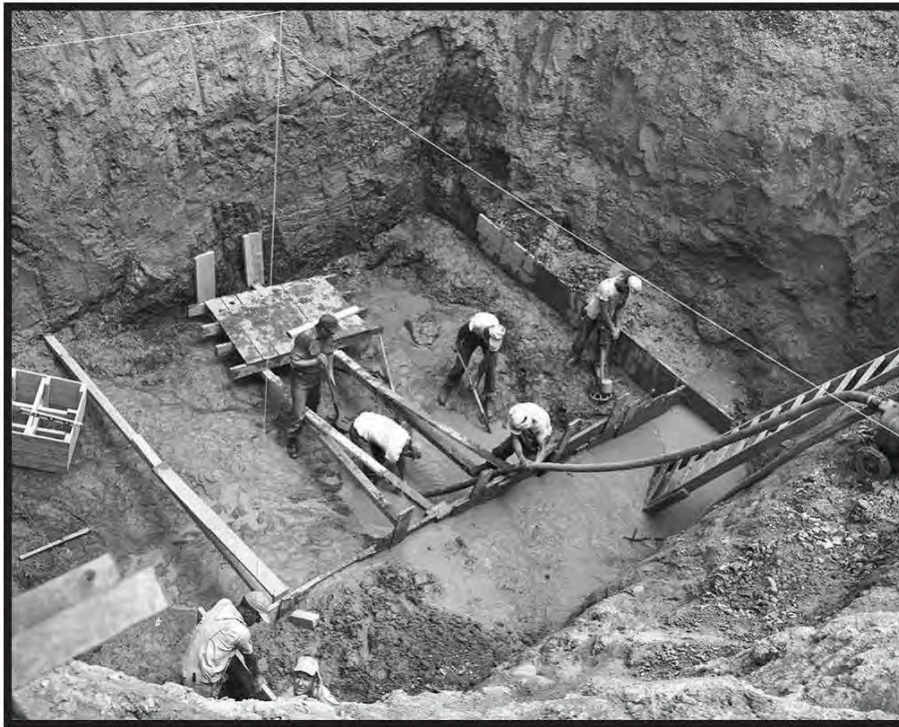


Figure 7: Excavation Work for the X-600 Steam Plant, June 1953



Figure 8: Grading and Foundation Work for the X-600 Steam Plant, July 1953



Figure 9: Foundation Work for the X-600 Steam Plant, July 1953



Figure 10: Steel Framework for the X-600 Steam Plant, Looking South, August 1953

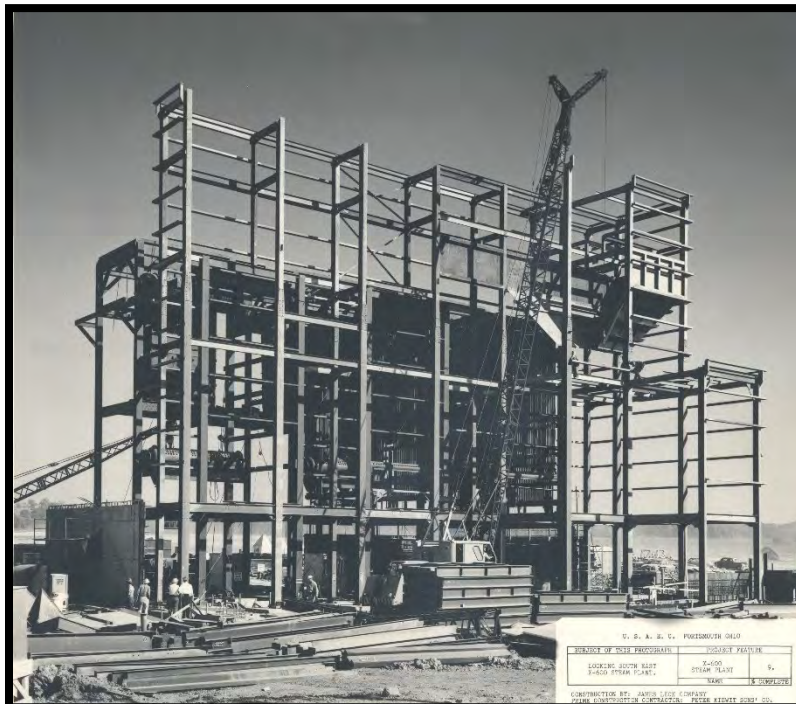


Figure 11: Steel Framework for the X-600 Steam Plant, Looking Southeast, September 1954

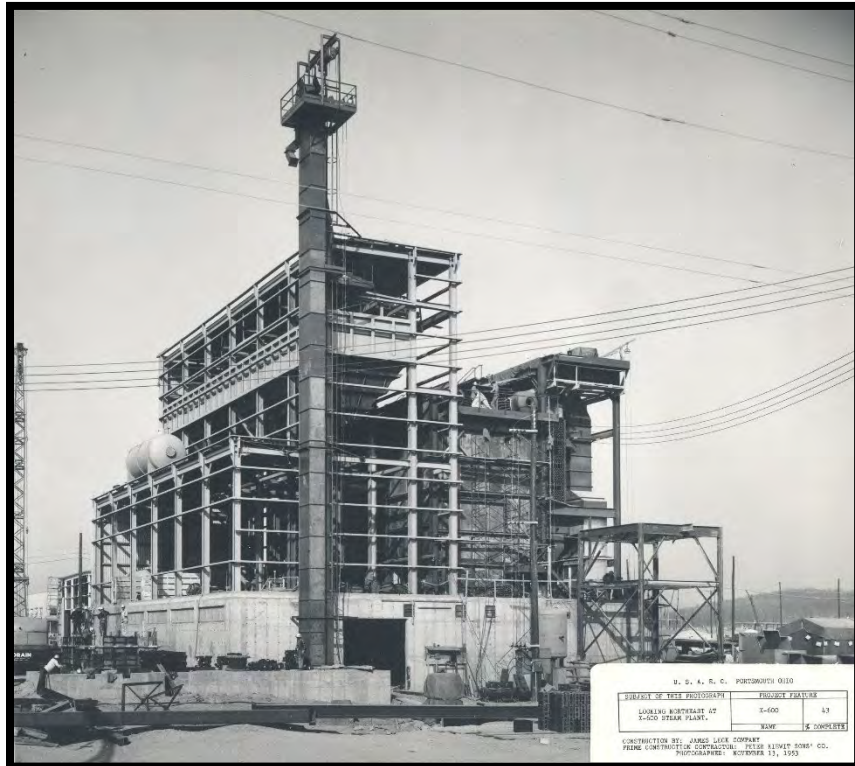


Figure 12: The X-600 Steam Plant, Looking Northeast, November 1953

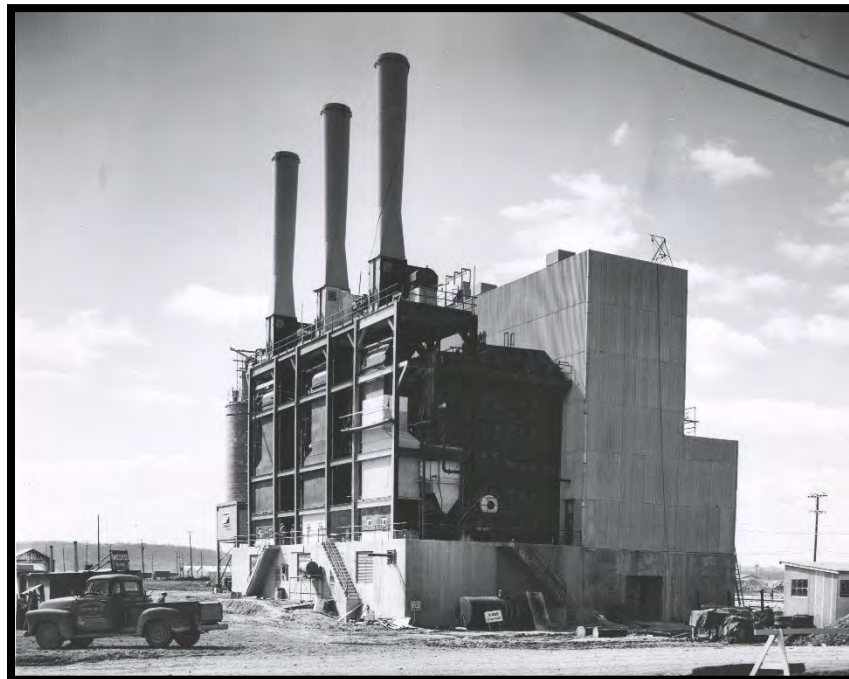


Figure 13: The X-600 Steam Plant, December 1953



Figure 14: The X-600 Steam Plant, December 1953



Figure 15: The X-600 Steam Plant, December 1953



Figure 16: The X-600 Steam Plant, January 1954



Figure 17: Interior View of the X-600 Steam Plant, March 1954

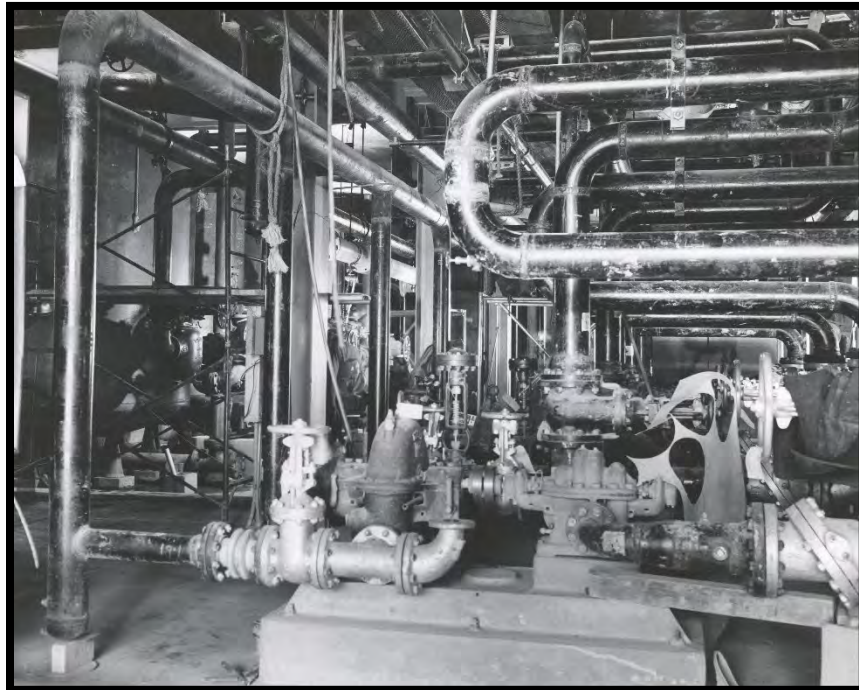


Figure 18: Interior View of the X-600 Steam Plant, March 1954

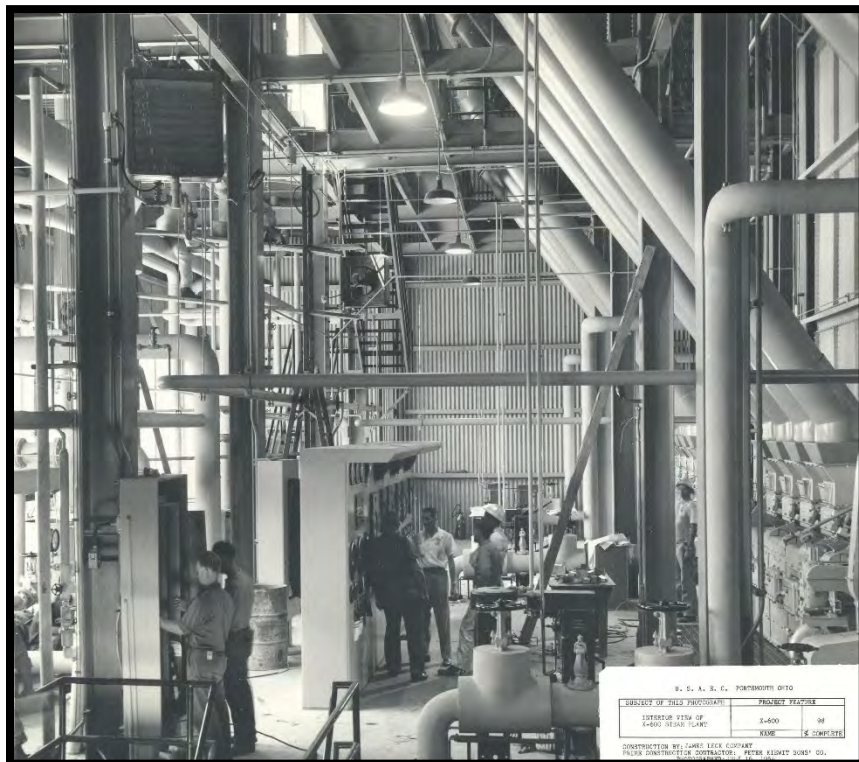


Figure 19: Interior View of the X-600 Steam Plant, July 1954



Figure 20: The X-600 Steam Plant, 1990

Appendix C: Historical Drawings

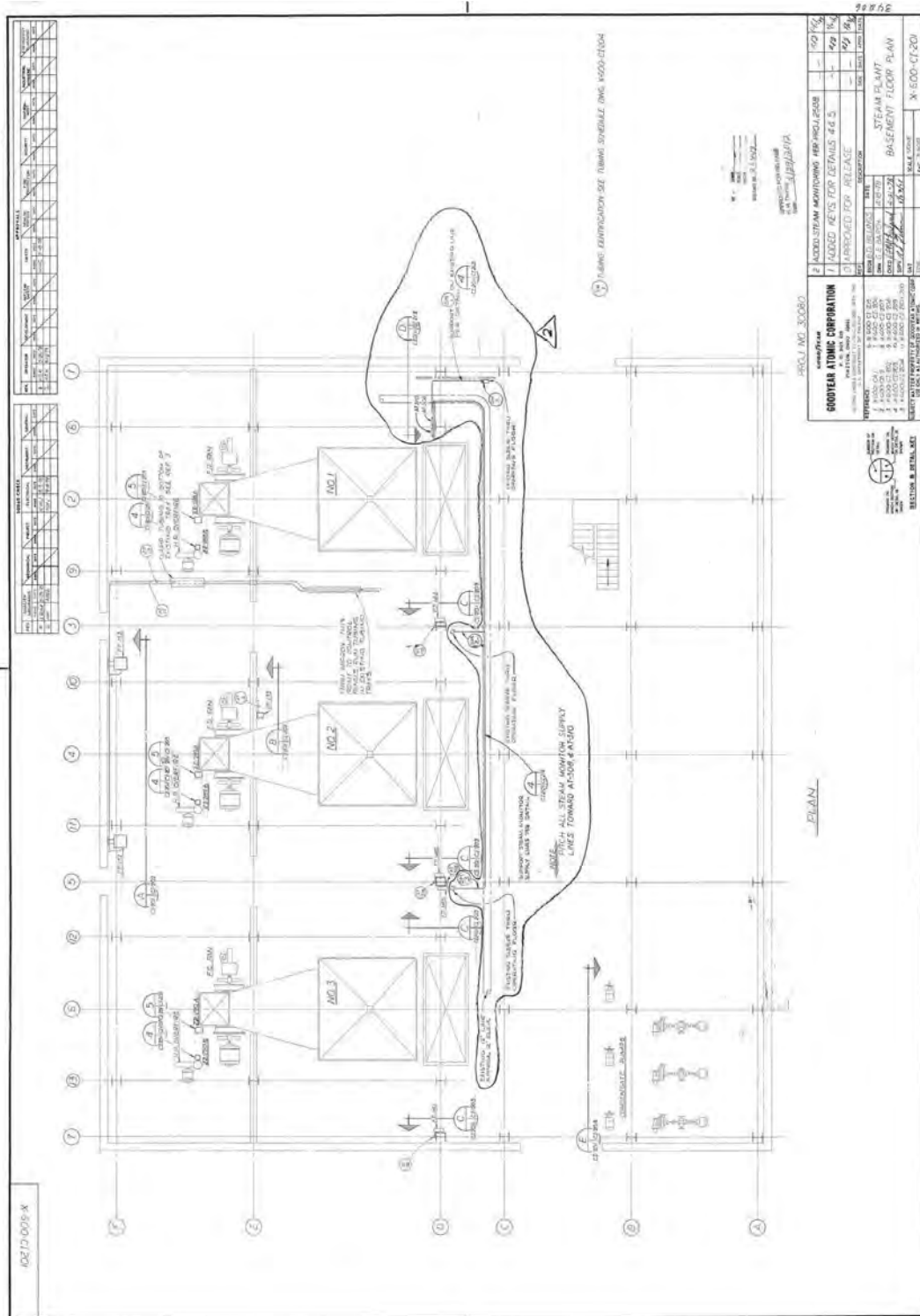


Figure 21: Basement Floor Plan

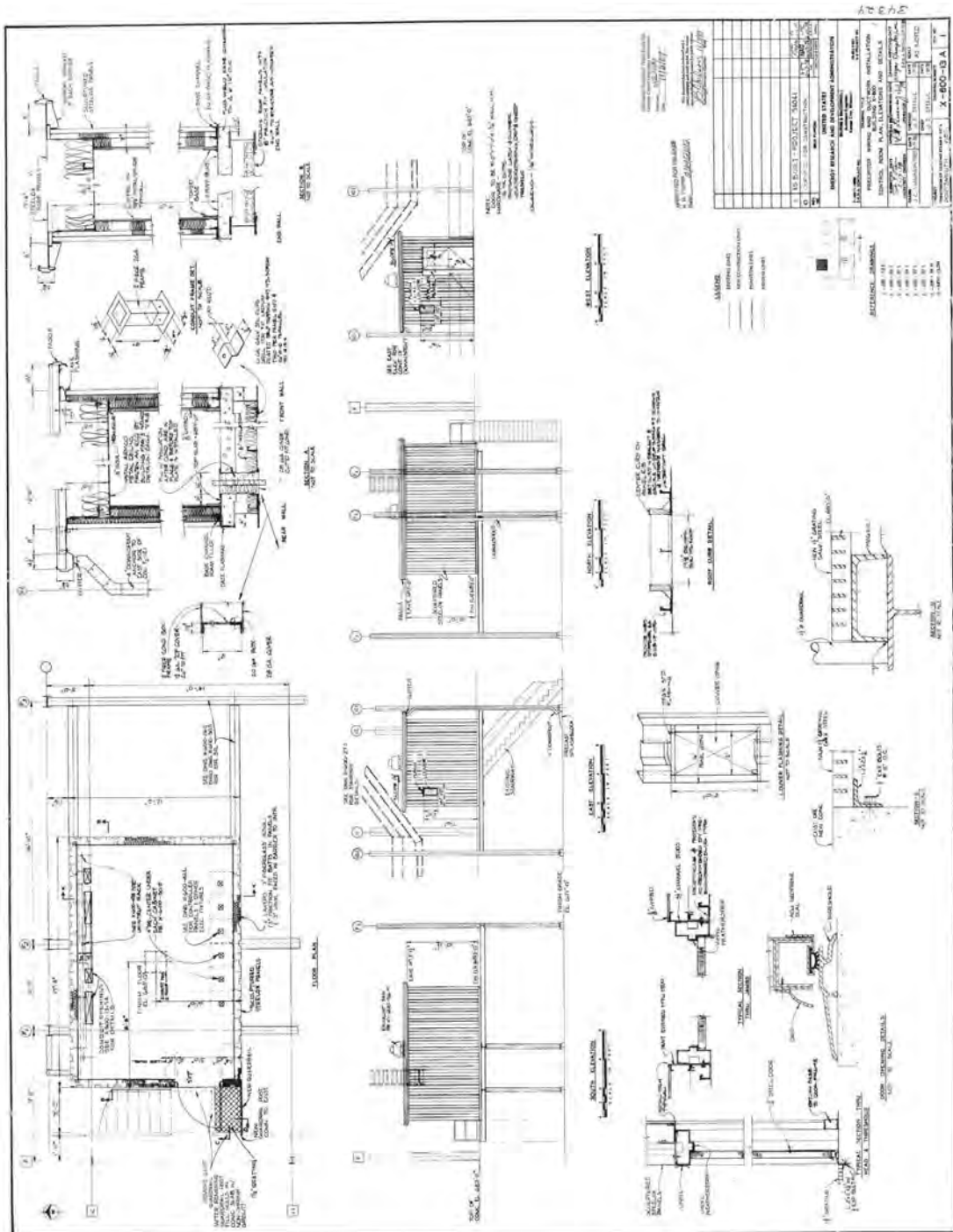


Figure 26: Wiring and Ductwork

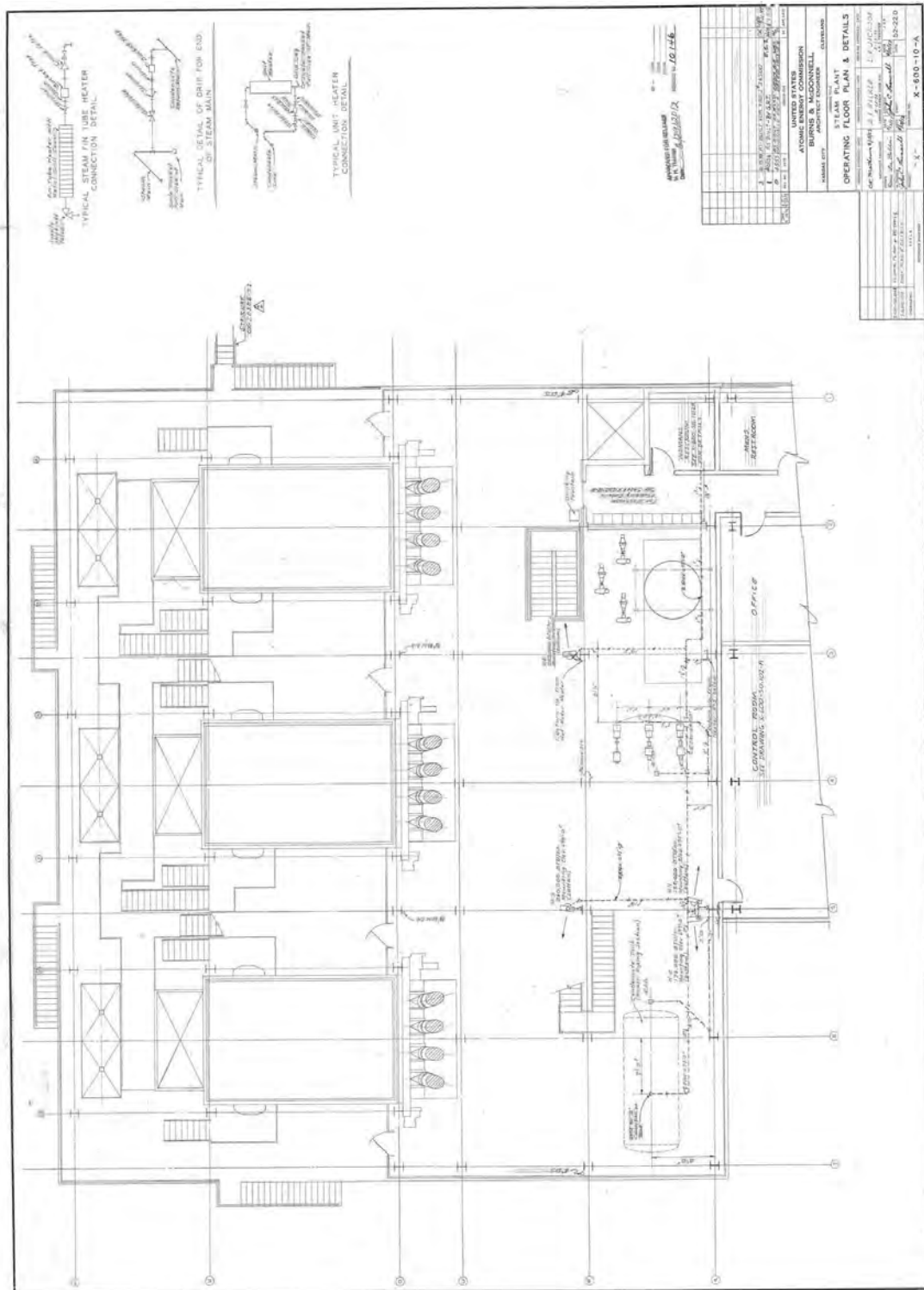


Figure 27: Operating Floor Plan and Details

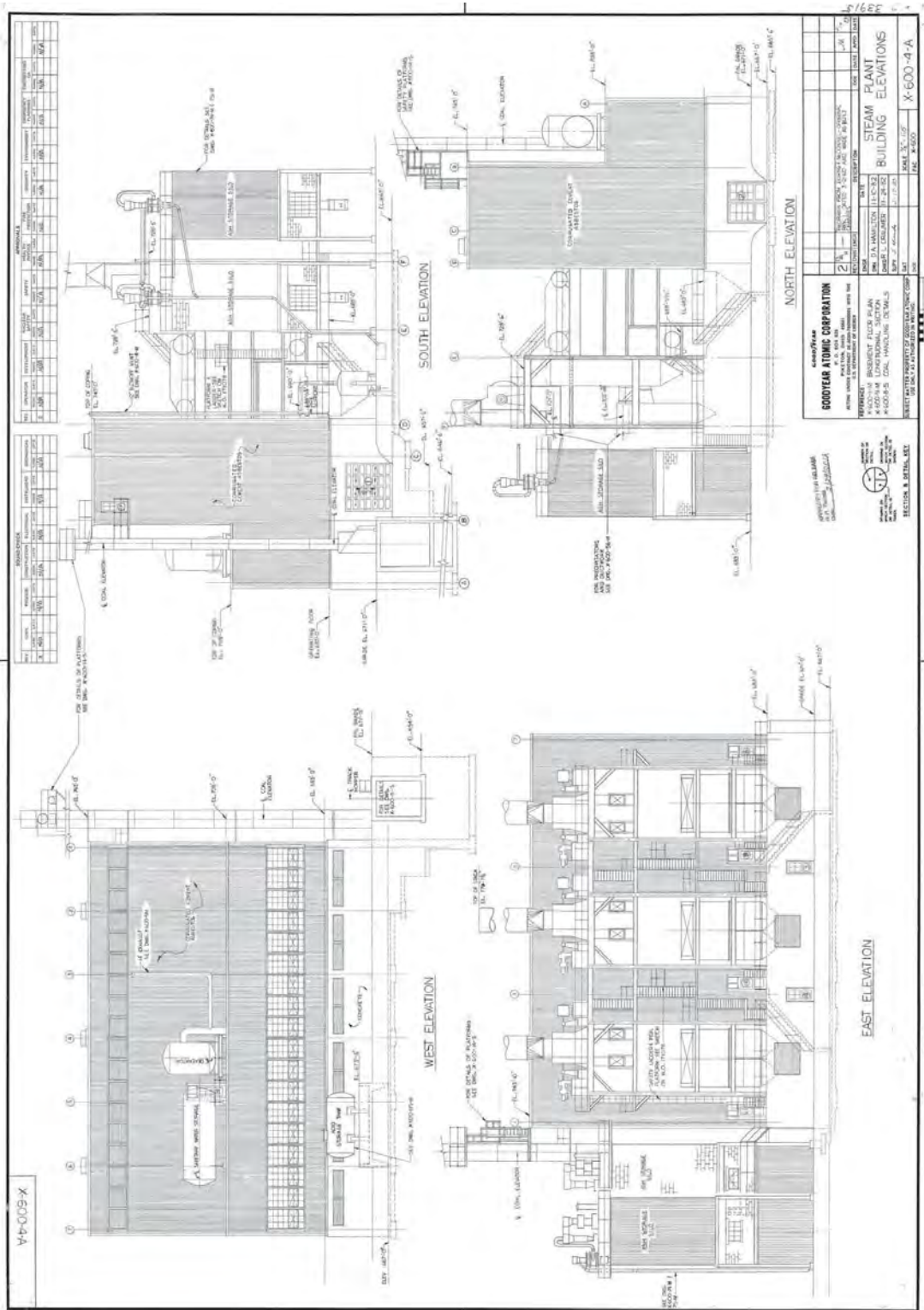


Figure 29: Elevations

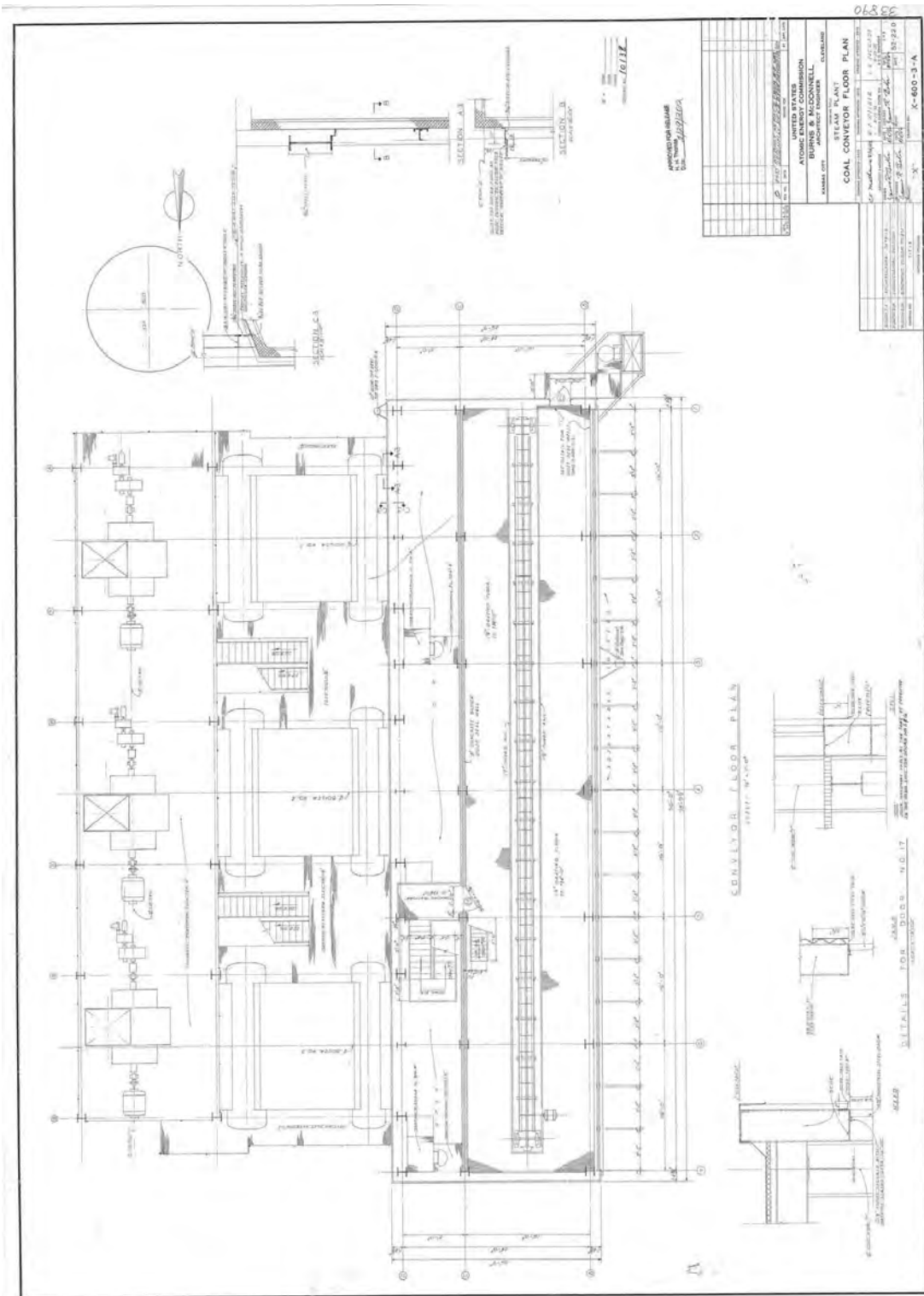


Figure 30: Coal Conveyor Floor Plan

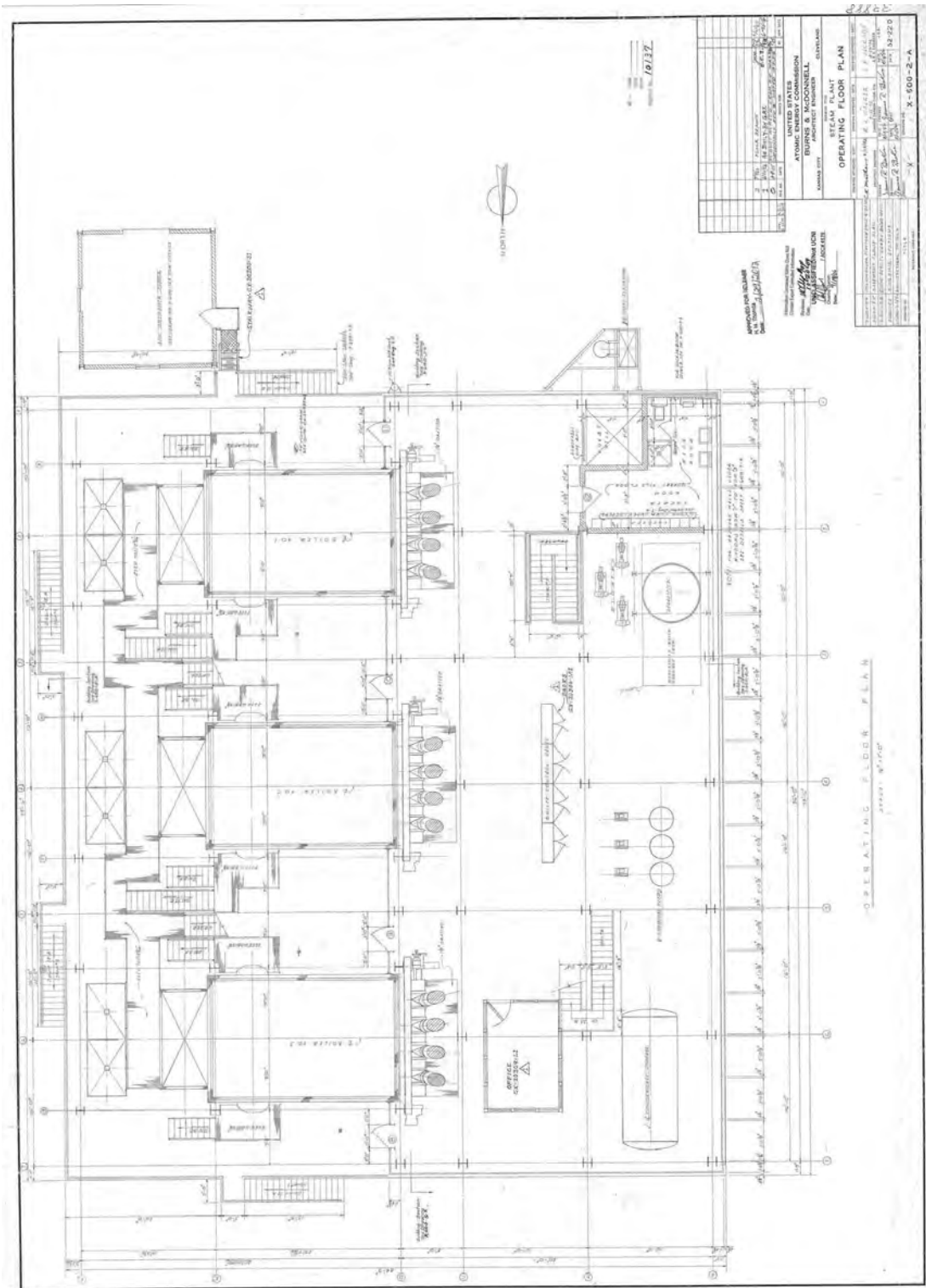


Figure 31: Operating Floor Plan

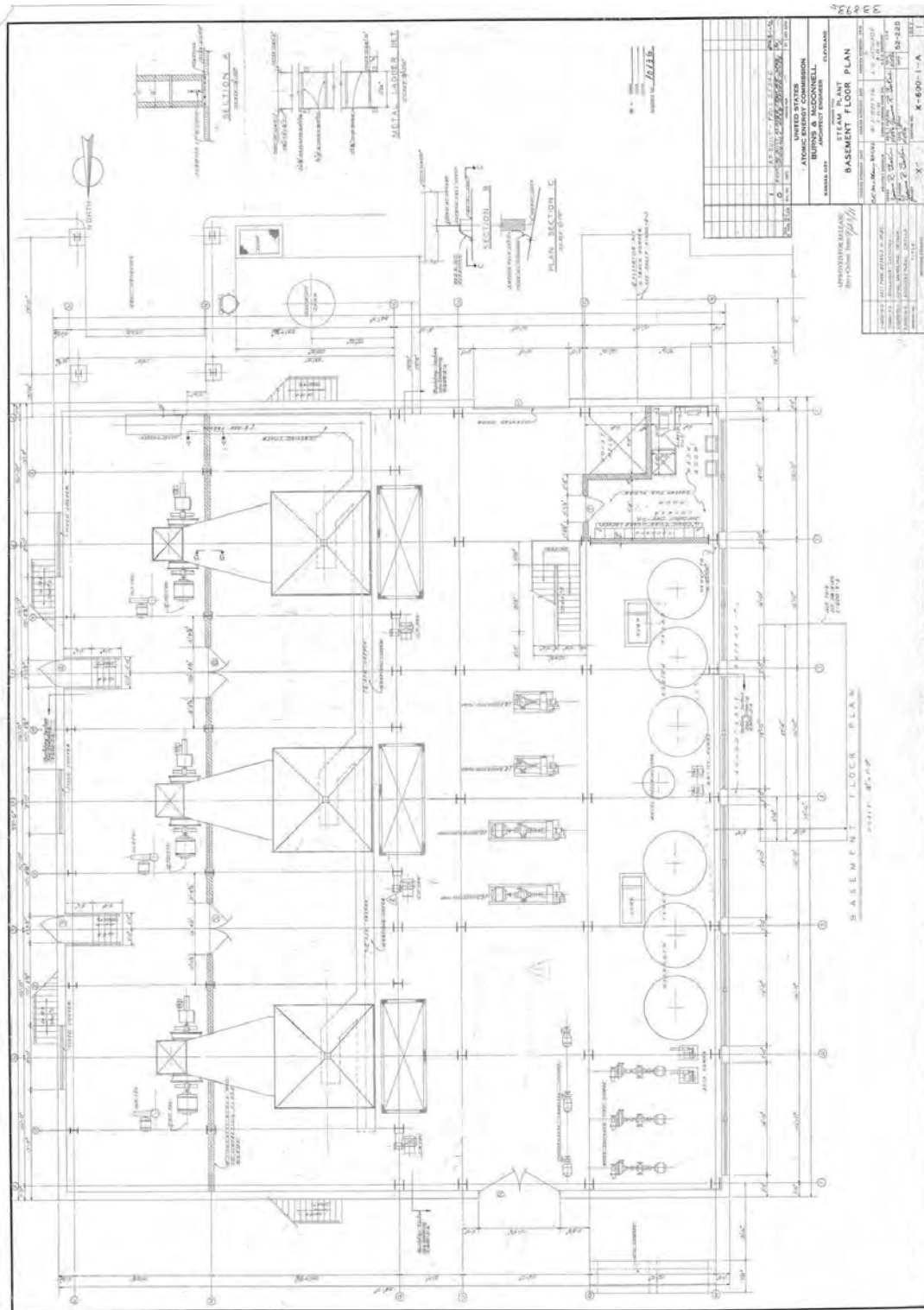


Figure 32: Basement Floor Plan