PORTSMOUTH GASEOUS DIFFUSION PLANT, X-300 PLANT
CONTROL FACILITY
3930 U.S. Route 23 South
Piketon vicinity
Pike County
Ohio

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-300 PLANT CONTROL FACILITY

HAER No. OH-142-B

Location:	Portsmouth Gaseous Diffusion Plant (PORTS), 3930 U.S. Route 23 South, Piketon vicinity, Scioto Township, Pike County, Ohio The X-300 Plant Control Facility Building is located at Ohio State Plane South coordinates at easting 1826909.840476 ft, northing 368267.797102893 ft and at Universal Transverse Mercator Zone 17N easting 326981.8147 m, northing 4319791.602 m. The coordinate represents the approximate center of the X-300 Plant Control Facility Building. 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 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:	Although PORTS is no longer operating in an enrichment capacity, the X-300 Plant Control Facility continues to monitor operations vital to dispersing power throughout PORTS, including communications and other necessary functions.
Significance:	The X-300 Plant Control Facility is the control center for all plant operations; without it, it would not have been able to perform its critical Cold War mission. It houses the personnel and equipment needed for the coordination, supervision, and direction of the gaseous diffusion process. This building is 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 in August 2014 and in November of 2017. Gray & Pape, Inc., Cincinnati, Ohio, served as primary authors 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-300 Plant Control Facility Building 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-300 Plant Control Facility:
Peter Kiewit Sons' Company awarded the subcontract for construction of the X-300 Plant Control Facility to Chism and Miller, Inc., of Springfield, Illinois, for all construction work with the exception of the instrumentation, process controls, alarm systems, and communication systems, which were installed by Peter Kiewit Sons' Company. Construction work on the facility began in November 1953 (Appendix B, Figures 5 through 14).

During construction, 155 tons of reinforcing steel and 1,736 cubic yards of concrete were used in the construction of the walls, flooring, footings, columns, and roof slab. Additionally, 4,500 concrete blocks were used to create interior wall partitions. Upon completion of concrete pouring, the structure was waterproofed and backfilled. Interior finishes and electrical and mechanical work were undertaken concurrently with the waterproofing and backfilling, with all being complete by November 1954. The process control equipment, alarm systems, and communication equipment were then installed by Peter Kiewit Sons' Company. All work was essentially completed by November 1955, with the final turnover of the facility to the operating contractor occurring on February 10, 1956.

Historical drawings of building plans are included in Appendix C (Figures 15 through 19).

Part II. Site Information

Description of the X-300 Plant Control Facility:
The X-300 Plant Control Facility is a large circular domed, concrete building located in the east-central portion of PORTS, just east of the X-326 Process Building. The main structure of the X-300 Plant Control Facility is approximately 100' in diameter and features approximately 16,000 square feet of floor space between the main floor and the basement (Figures 1 through 4).

The X-300 Plant Control Facility essentially operates as the "nerve center" of PORTS. Personnel in the X-300 Plant Control Facility monitor the operating conditions vital to the production cascade and power systems. In case of an emergency, operators in the X-300 Plant Control Facility have the ability to sectionalize, shut down, and monitor the performance of process systems after the evacuation of operating personnel. Operators also monitor and adjust the power capacity to the entire facility and provide communications to the plant, including radio, Private Automatic Exchange system, conventional telephones, plant public address systems, and evacuation alarm systems.

The X-300 Plant Control Facility is housed in one of the few buildings at PORTS that features a full poured-concrete basement. Building power equipment, communications equipment, and air conditioning and ventilation equipment are located in the basement. Control and instrumentation tunnels extend from the basement of the X-300 Control Facility to each of the process buildings. These tunnels were used as a means of entry for communication, control, and instrumentation cables from the six area control rooms, the switch houses, and the telephone building.

The circular building features reinforced concrete walls, no window openings, and a domed roof covered with 18" concrete panels and a spray-applied plastic coating. The building was designed to be Class I Blast Resistant. The building also features a wing on the northeast that follows the curved wall of the main structure. The wing uses the same construction methods as the main building to ensure appropriate blast resistance, including the plastic coating on the wing's flat concrete roof. The wing houses the main rectangular entry with solid metal blast doors. A metal access hatch is located just north of the wing that allows secondary access to the basement level. The X-220A Instrumentation Tunnels carry the wiring and cables that allow the X-300 Plant Control Facility to monitor and communicate with the process buildings. The tunnels terminate in an arc around the northwest portion of the basement foundation. A concrete addition with large vents is located on the west side of the building.

The round shape of the X-300 Plant Control Facility serves a dual purpose. In addition to providing blast resistance, the curved walls also provide facility personnel with an unobstructed view of the control panel layout and panel-mounted equipment. The first floor contains the central control room, three offices, restrooms, a kitchen, janitor's facilities, and the specially designed entry wing. The three offices are located in the southeast section of the building and extend from the circular outer wall to approximately halfway to the center point of the building. The offices open onto the main control room floor facing the control panel layout. A communications console is located in the sunken center of the first floor facing the control panels. The panels themselves follow the curve of the building with separate panels for each of the three process buildings (X-326, X-330, and X-333), occupying approximately three quarters of the circular wall. Within this arc in the northwest quadrant of the building on the first floor, a sunken floor area houses power control instrument panels and power communications consoles. Two small concrete stairwells access this pit from either side of the record desk near the center of the building. Between the two sets of stairs are three communications consoles from which every panel in the room can be seen. The first floor features a suspended metal acoustical ceiling with typical inset troffer-type fluorescent lighting fixtures and recessed can lights. Flooring on the first floor consists primarily of asphalt tiles and polished concrete. Two floor openings are located on the northwest of the sunken area and are covered with metal grates.

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.

Appendix A: Survey Photographs

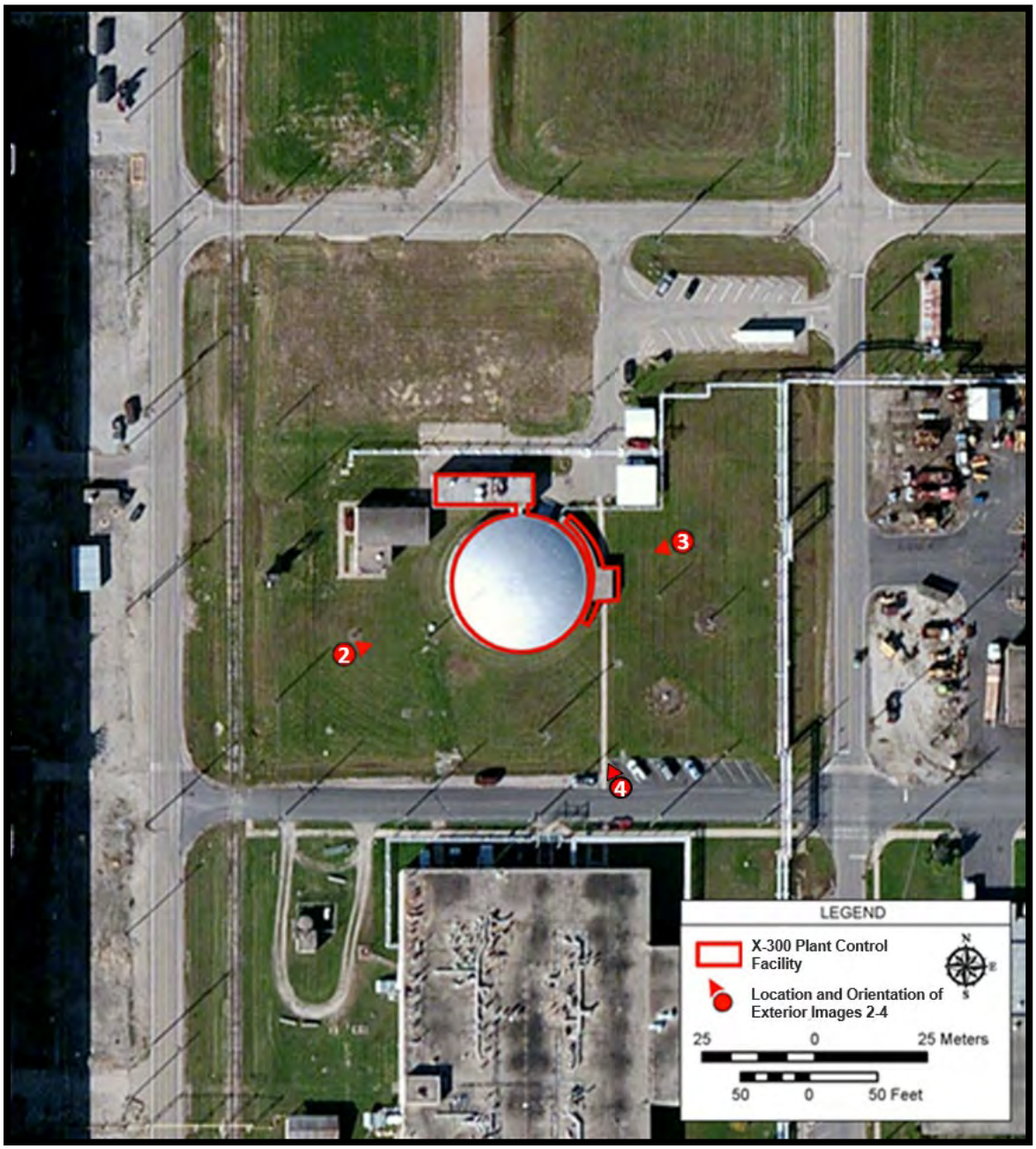

Figure 1: Location and Orientation of Exterior Photographs (A-2 through A-4)

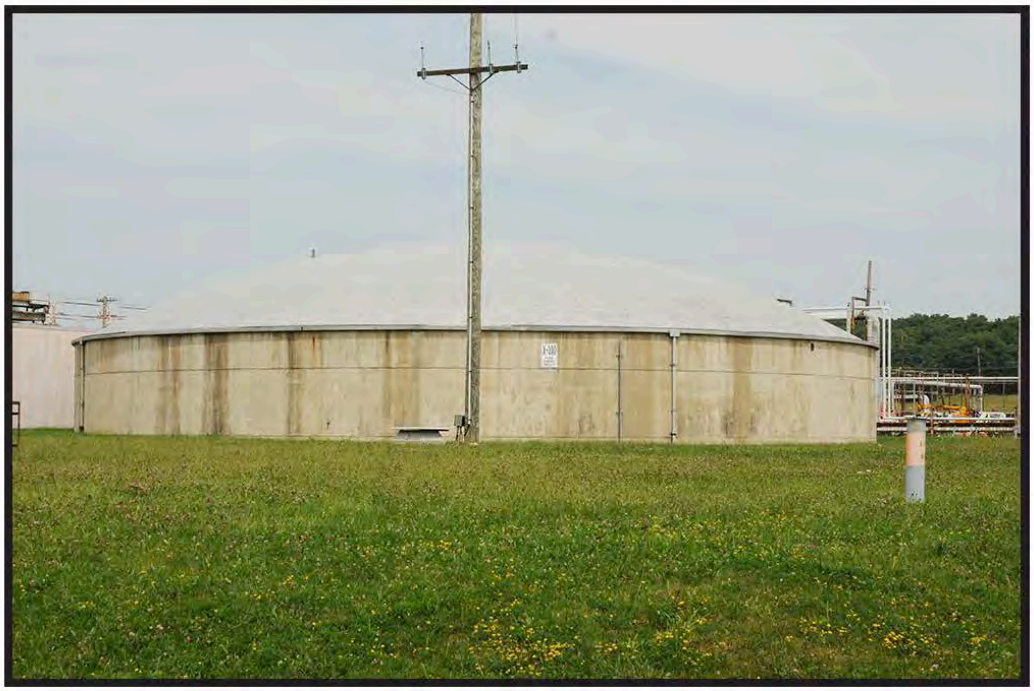

Figure 2: South Side of the X-300 Plant Control Facility, August 2014, Facing Northeast

Figure 3: East Side of the X-300 Plant Control Facility, August 2014, Facing West

Figure 4: South Side of the X-300 Plant Control Facility, November 2017, Facing Northwest

Appendix B: Historical Photographs

Figure 5: Construction Photo of the X-300 Plant Control Facility, January 1954

Figure 6: Construction Photo of the X-300 Plant Control Facility, January 1954

Figure 7: Construction Photo of the X-300 Plant Control Facility, January 1954

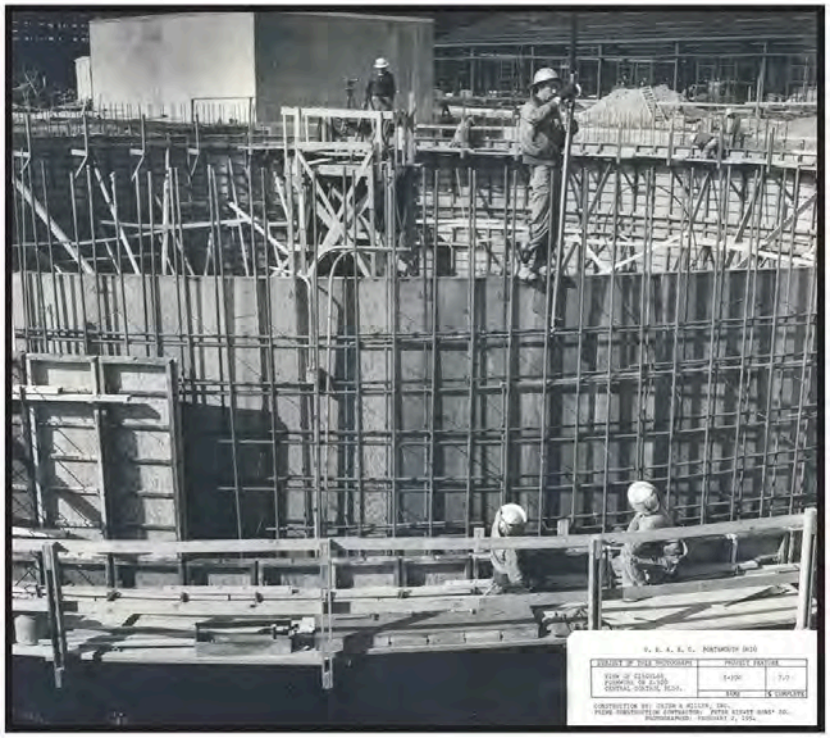

Figure 8: Construction Photo of the X-300 Plant Control Facility, January 1954

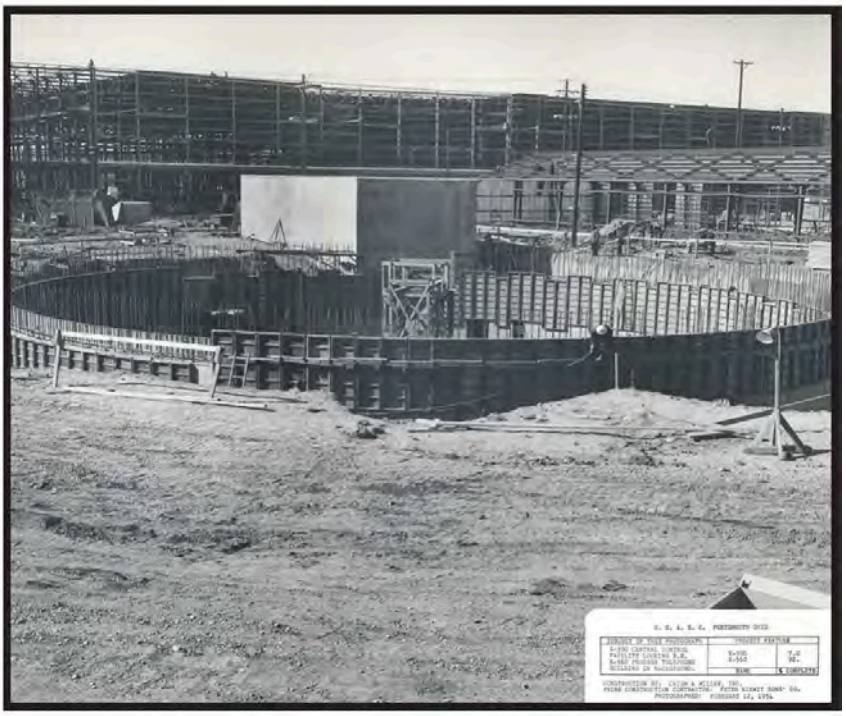

Figure 9: Construction Photo of the X-300 Plant Control Facility, January 1954

Figure 10: Construction Photo of the X-300 Plant Control Facility, March 1954

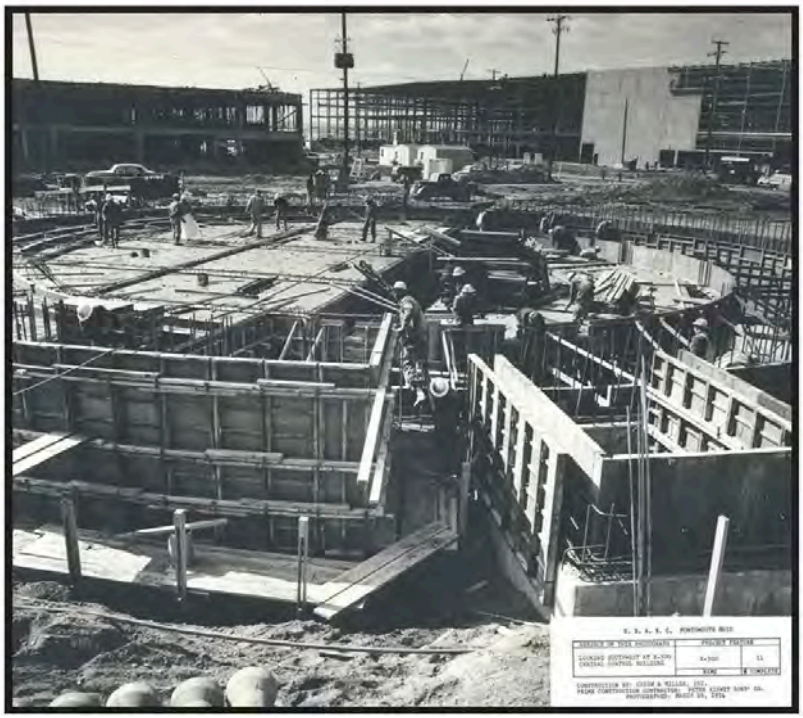

Figure 11: Construction Photo of the X-300 Plant Control Facility, March 1954

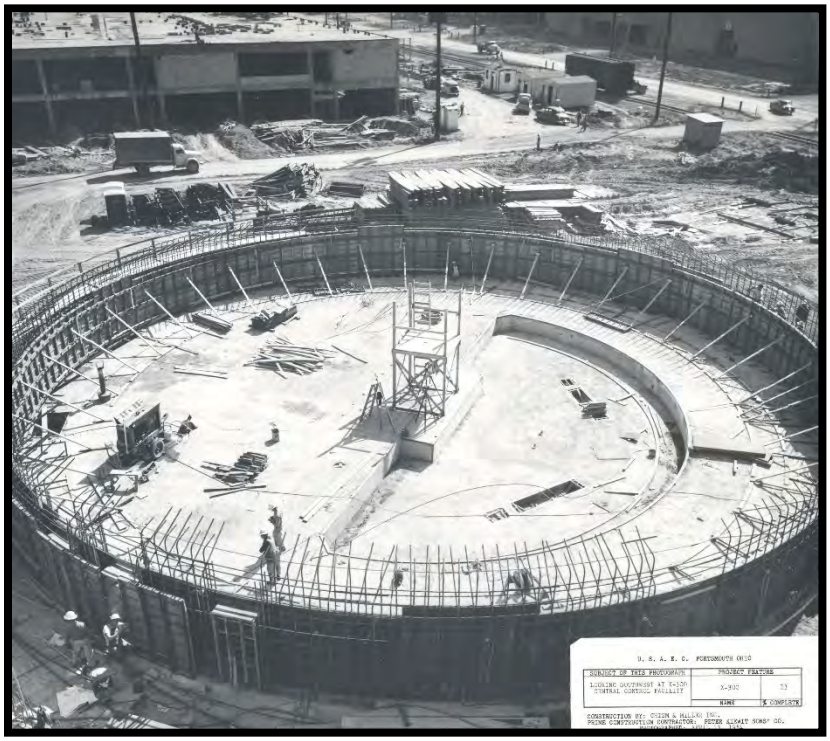

Figure 12: Construction Photo of the X-300 Plant Control Facility, March 1954

Figure 13: Construction Photo of the X-300 Plant Control Facility, May 1954

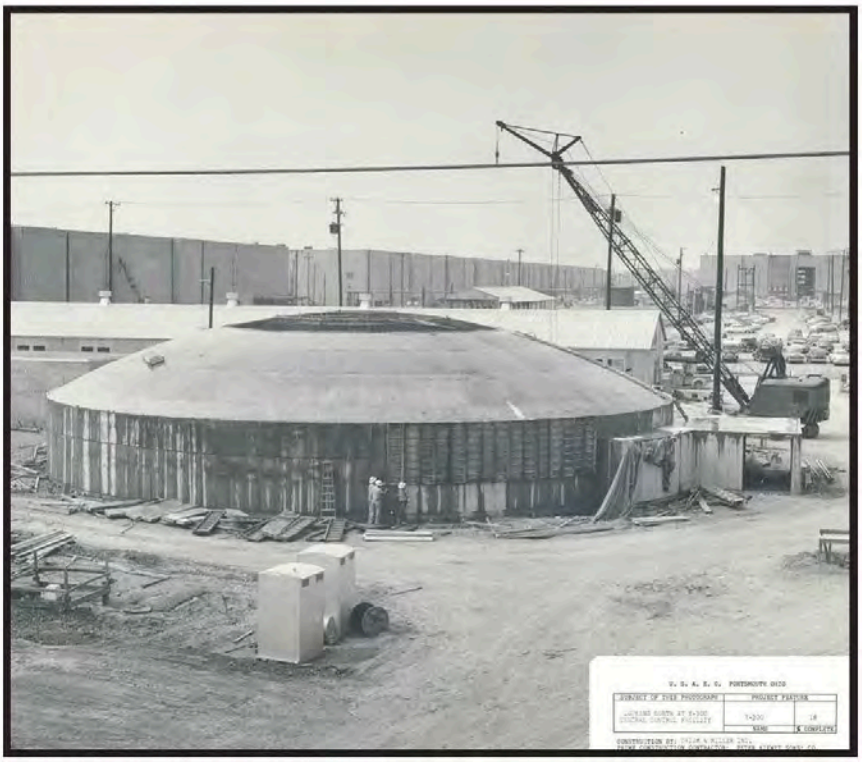

Figure 14: Construction Photo of the X-300 Plant Control Facility, May 1954

Appendix C: Historical Drawings

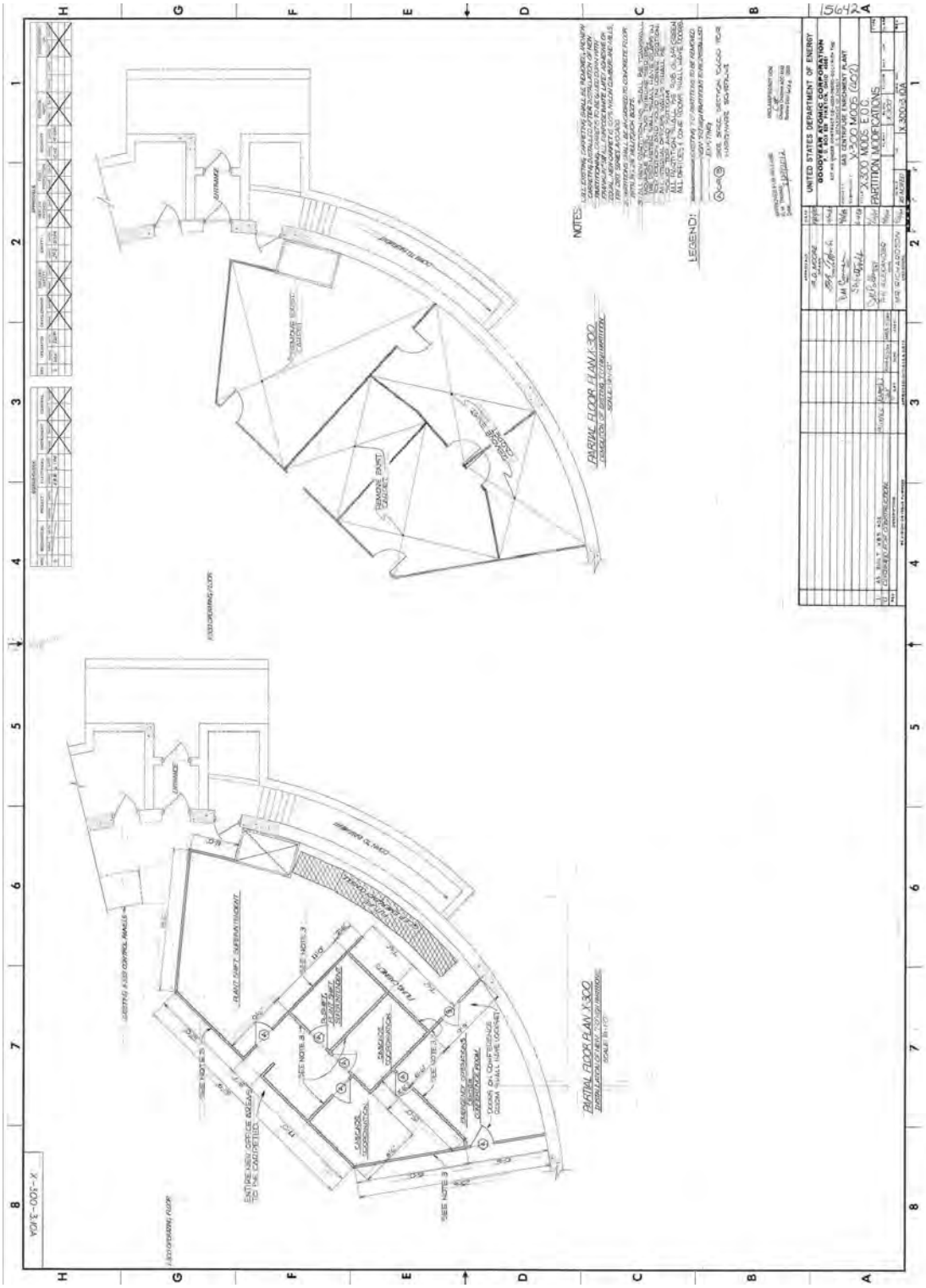

Figure 15: Partition Modifications

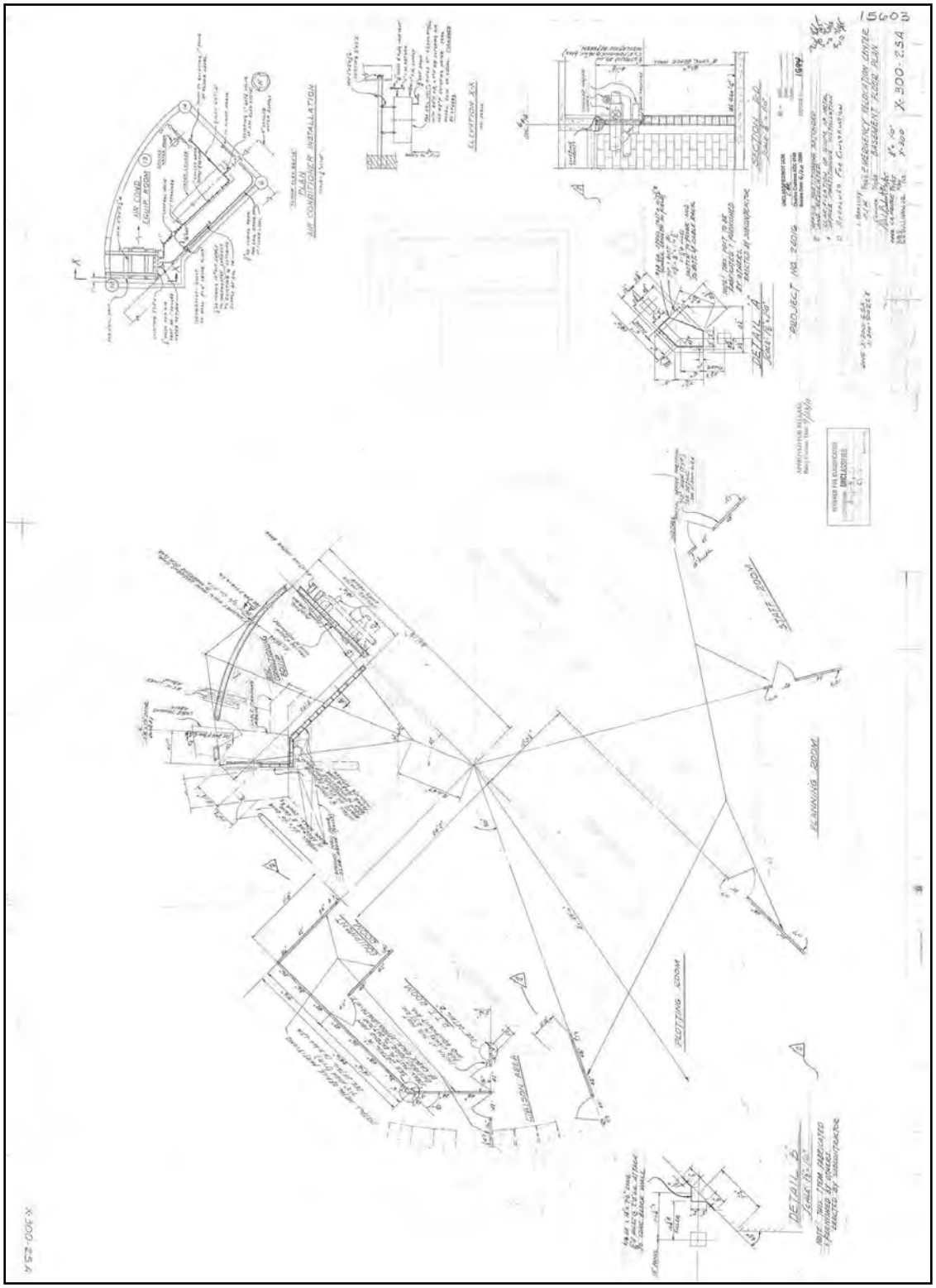

Figure 16: Basement Floor Plan

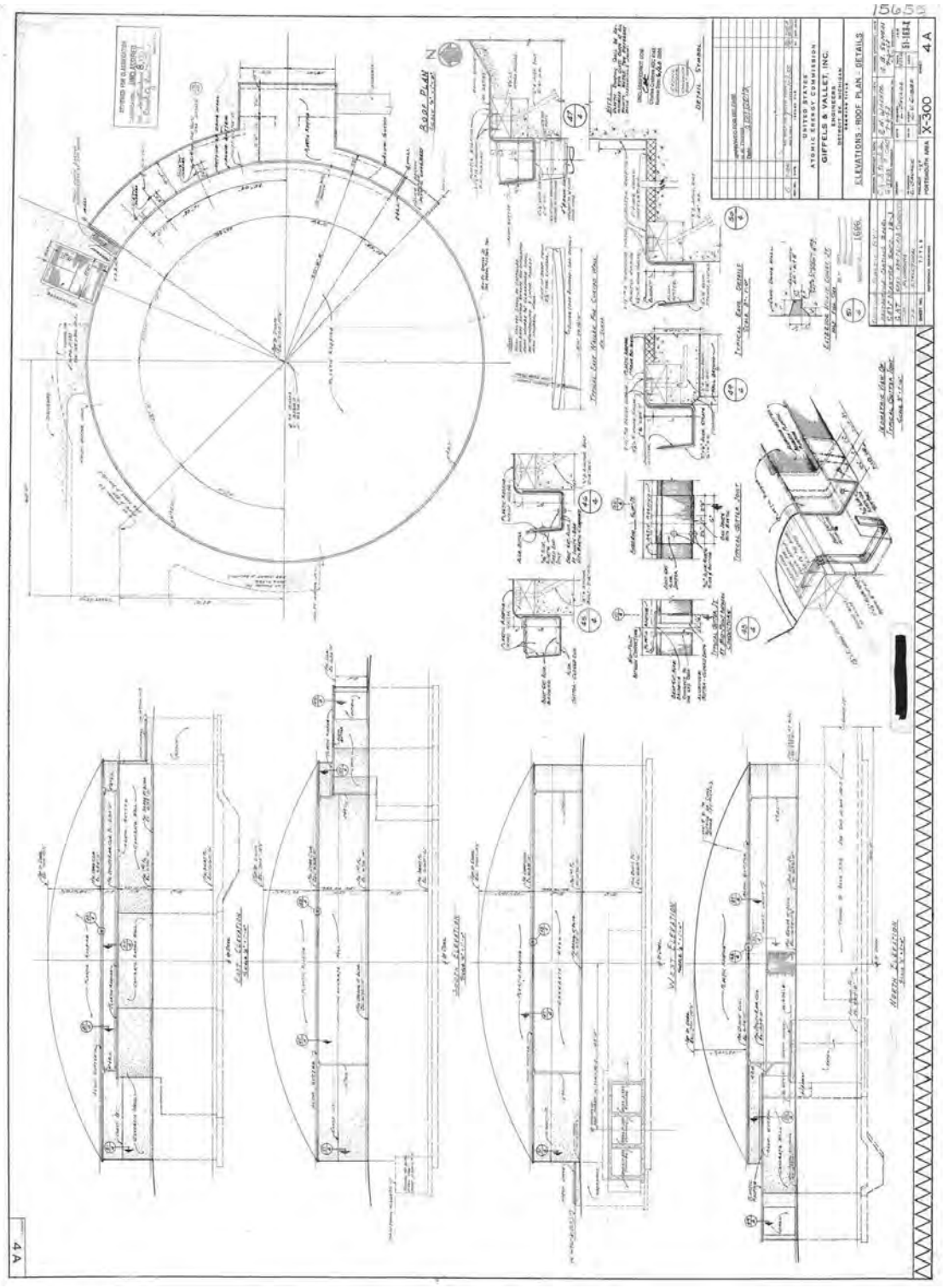

Figure 17: Elevations - Roof Plan - Details

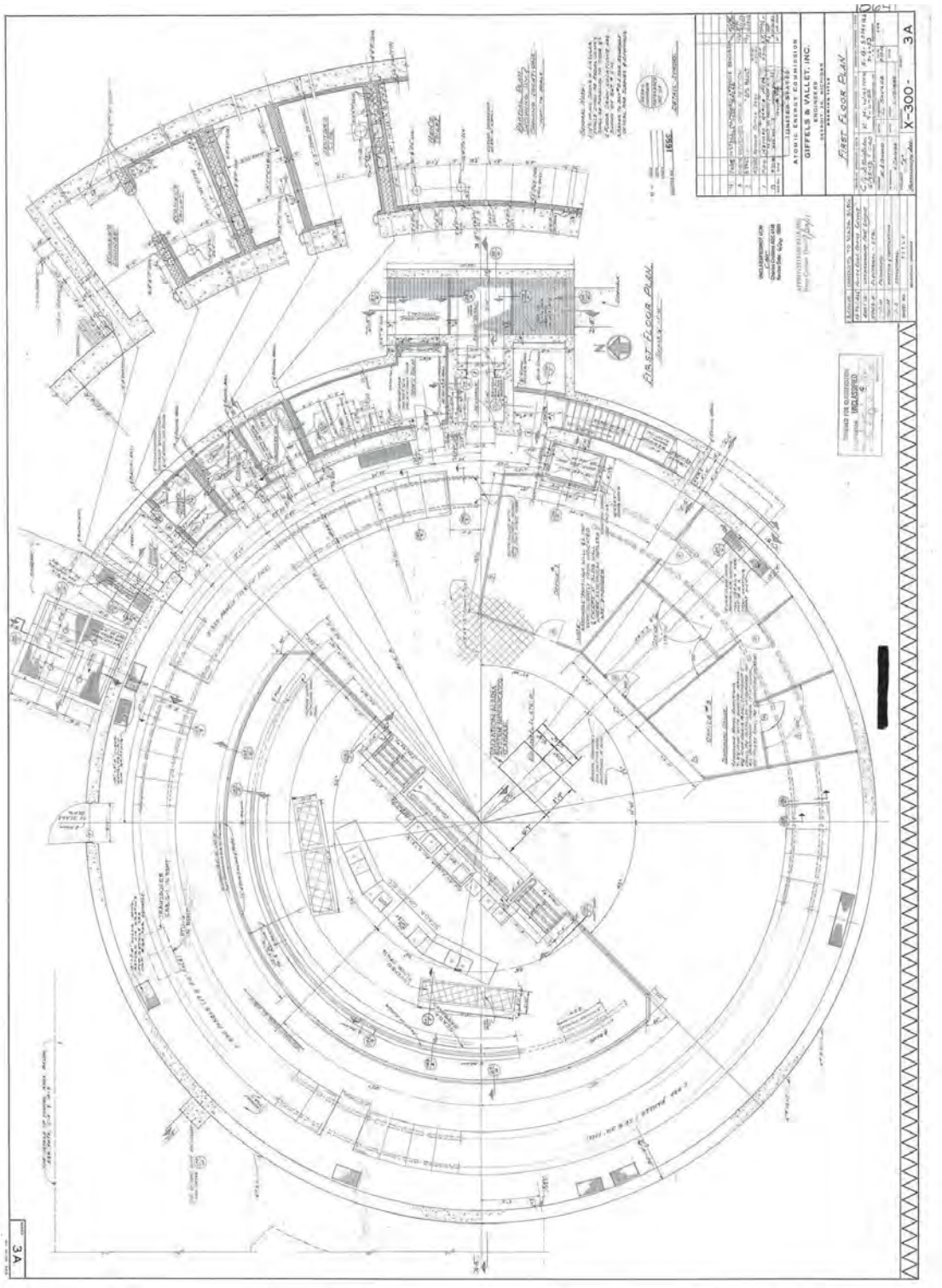

Figure 18: First Floor Plan

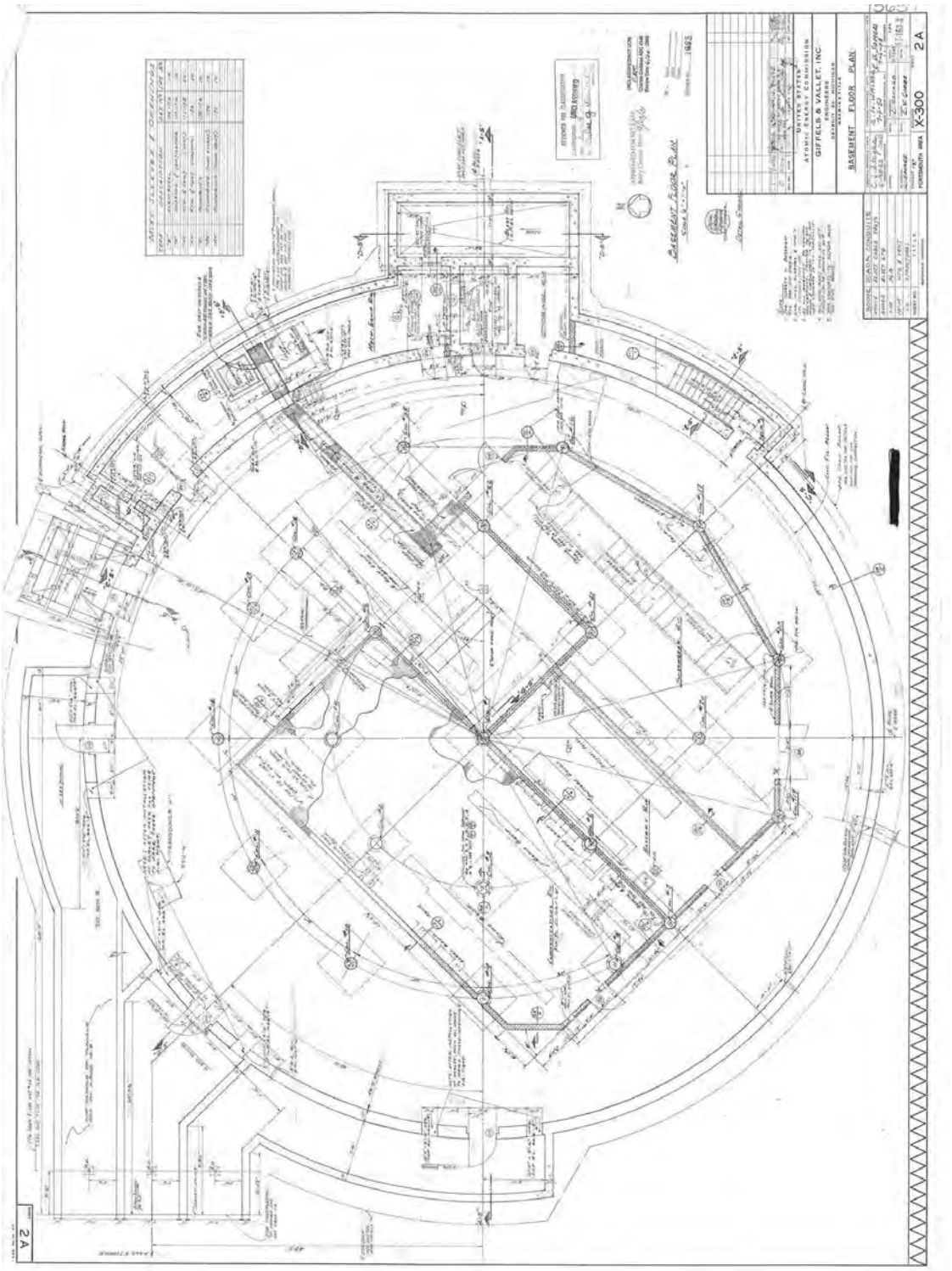

Figure 19: Basement Floor Plan