PORTSMOUTH GASEOUS DIFFUSION PLANT, X-344A URANIUM HEXAFLUORIDE GAS SAMPLING FACILITY
3930 U.S. Route 23 South
Piketon vicinity
Pike County
Ohio

HAER OH-142-G
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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-344A URANIUM HEXAFLUORIDE GAS SAMPLING FACILITY

HAER No. OH-142-G

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

The X-344A Uranium Hexafluoride (UF_6) Sampling Facility is located at Ohio State Plane South coordinates at easting 1826069.708714 ft, northing 372270.270827010 ft and at Universal Transverse Mercator Zone 17N easting 326745.8325 m, northing 4321015.619 m. The coordinate represents the approximate center of the X-530 Electrical Switchyard Complex. 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: 1958

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: The X-344A UF_6 Sampling Facility supports UF_6 sampling activities, as well as other activities required for the daily operation of PORTS.

Significance: Originally, the X-344A UF_6 Sampling Facility housed 40 fluorine generators and a flame tower, which were used to convert uranium tetrafluoride to UF_6, critical to PORTS uranium enrichment mission. The X-344 Project was a general expansion of the existing fluorine-generating and feed-vaporization plant of which the X-344A comprised the major added structure and the new fluorine facility and components. Abandoned in 1962, the X-344A Facility was converted to serve as the shipping and receiving point for low assay uranium. 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 2017. 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-344A UF_6 Sampling Facility HAER was completed in 2021.

Part I. Historical Information

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

Construction History of the X-344A UF_6 Sampling Facility:
In March 1956, the AEC awarded the contract for the X-344A Facility to the Blount Brothers Construction Company of Montgomery, Alabama. The facility was built during final major phase of PORTS construction, which occurred from 1952 to 1956. Prior to contracting with Blount Brothers, Peter Kiewit Sons' Company performed the initial grading, backfilling, and site work (Appendix B, Figures 6 through 9).

Blount Brothers subcontracted the X-344A Facility's electrical work to Walter Truland Corporation of Washington, D.C. The James F. O'Neil Company, of New Orleans, Louisiana, received a subcontract to perform all mechanical work for the X-344A Facility. The O'Neil Company in turn awarded a subcontract for heating and ventilation work to James F. Dye, location unknown. The Breeding Insulation Company, of Knoxville, Tennessee, won a subcontract to install insulation around mechanical piping and equipment. The Minneapolis-Honeywell Company, of Minneapolis, Minnesota, received a subcontract for control work, and the Taylor Instrument Company, of Rochester, New York, won a subcontract to install instrumentation for the X-344A Facility.

Blount Brother's forces began pouring concrete for the X-344A Facility on March 30, 1956. Most of the concrete work for the X-344A Facility was complete by January 1957. As work on the concrete slabs and footers continued, the International Steel Company, of Evansville, Indiana, delivered steel to the building site for the X-344A Facility's steel framework. Blount Brothers set the first base plates in place on June 18, 1956. Workers completed all steelwork by November 1956 (Figures 10 through 12).

W. Biddle Walker, location unknown, began installing the metal roof panels in September 1956. Roof work transpired simultaneously with the bolting of the buildings' metal frames. Walker began installation of siding in October 1956.

Mechanical and electrical work commenced in April 1956. J. F. O'Neil Company completed installation of interior underground piping by early September 1956. Electricians completed most of the electrical work by January 1957, and the X-344A Facility was largely complete by this time.

Historical drawings of building plans are provided in Appendix C (Figures 13 through 18).

Part II. Site Information

Description of the X-344A UF_6 Sampling Facility:
The X-344A UF_6 Sampling Facility is located in the north-central portion of PORTS. The X-344A Facility is connected on the west and south sides to the X-342A Feed, Vaporization, and Fluorine Generation Facility. The X-344A Facility was originally used to produce UF_6 feed material from uranium tetrafluoride, also known as "green salt." The higher assay UF_6 feed material, manufactured in the X-344A Facility, was mixed with depleted UF_6. These two facilities combined provided the feed material for the cascades in the PORTS process buildings.

The X-344A Facility is a one-and-two-story, utilitarian building set atop a concrete pier and slab foundation (Appendix A, Figures 1 through 5). The plan of the building results in a ground floor area of approximately 62,700 square feet. The walls consist of steel framing covered with cement-asbestos panels. The X-344A Facility has few window openings. The building, however, has several louvered metal vents. The roof is relatively flat, with a metal-deck and waterproof membrane. Entries to the building consist of multiple, metal doors for pedestrians and multiple rolling metal overhead doors for vehicular and rail access.

The interior of the X-344A Facility contains a variety of equipment used in the manufacturing of UF_6. It also includes a fluorination facility for producing UF_6 from green salt. This facility includes 40 fluorine generators, a flame tower, and the high assay sampling area. In addition, the building includes office space, hot and cold locker and shower rooms, and lunch rooms in both the northwest corner and the northeast corner of the building. The facility now provides for sample and transfer of UF_6 from production cylinders to shipping cylinders.

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. *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.

Department of Energy. Highly *Enriched Uranium: Striking a Balance, A Historical Report on the United States Highly Enriched Uranium Production, Acquisition, and Utilization Activities from 1945 to September 30, 1996*, Revision 1. Washington, D.C.: National Nuclear Security Administration, U.S. Department of Energy, 2001.

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

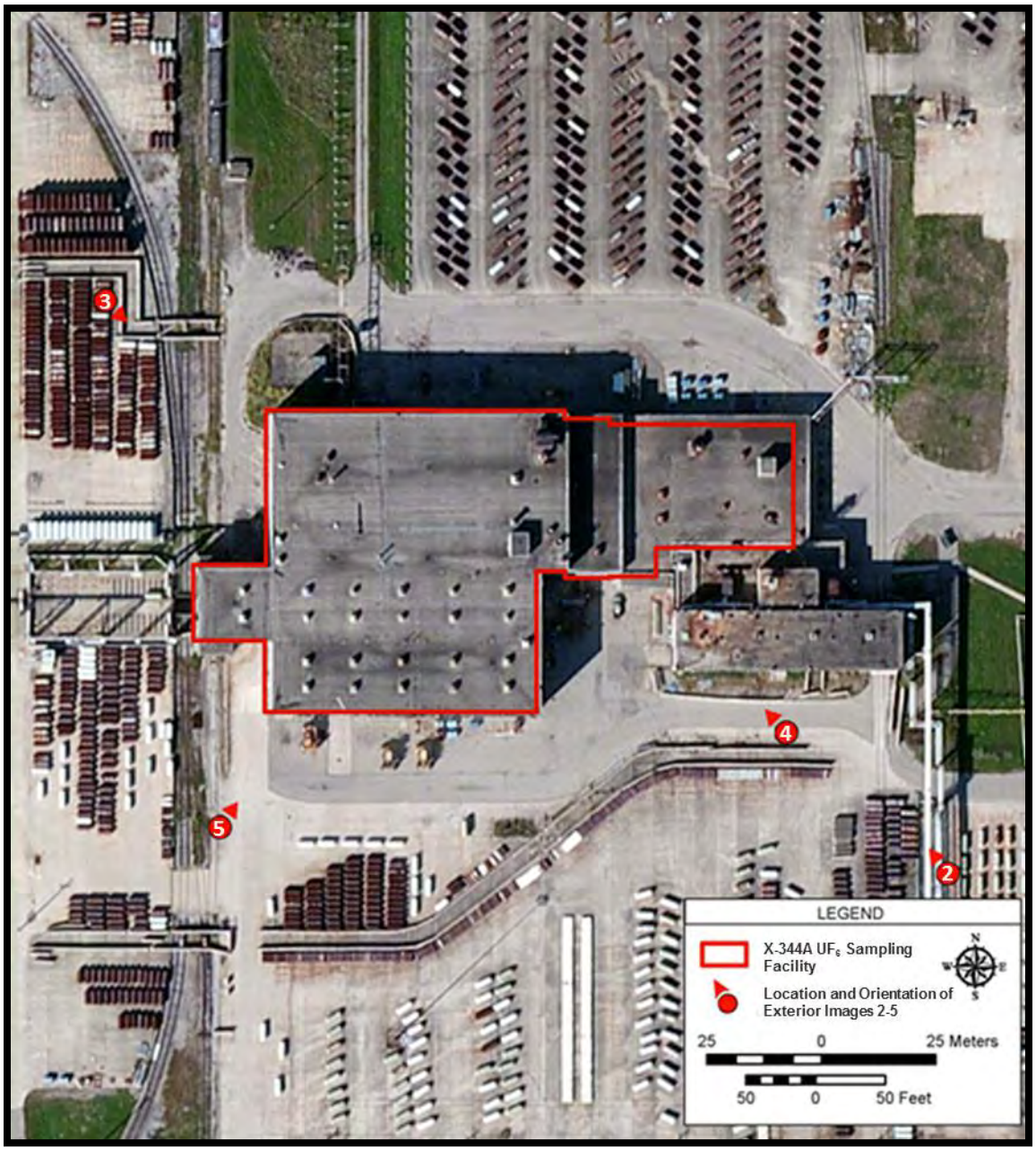

Figure 1: Location and Orientation of Exterior Photographs (2 and 5)

Figure 2: South Side of the X-344A UF_6 Sampling Facility, August 2014, Facing Northwest, Cylinders in the Foreground

Figure 3: North Side of the X-344A UF_6 Sampling Facility, November 2017, Facing Southwest, Cylinders in the Foreground

Figure 4: South Side of the X-344A UF_6 Sampling Facility and X-342A Feed Vaporization and Fluorine Generation Facility, August 2014, Facing Northwest, Cylinders in the Foreground

Figure 5: South Side of the X-344A UF_6 Sampling Facility, August 2014 Facing Northeast, Cylinders in the Foreground

Appendix B: Historical Photographs

Figure 6: Looking Northeast at Site of the X-344A UF_6 Sampling Facility Site, October, 1955

Figure 7: Looking Northeast Showing Construction in West Part of the X-344A UF_6 Sampling Facility Site, June 1956

Figure 8: Looking West Across Reactor Pit for the X-344A UF_6 Sampling Facility, June 1956

Figure 9: General View of X-344A UF_6 Sampling Facility Construction, Looking East, June 1956

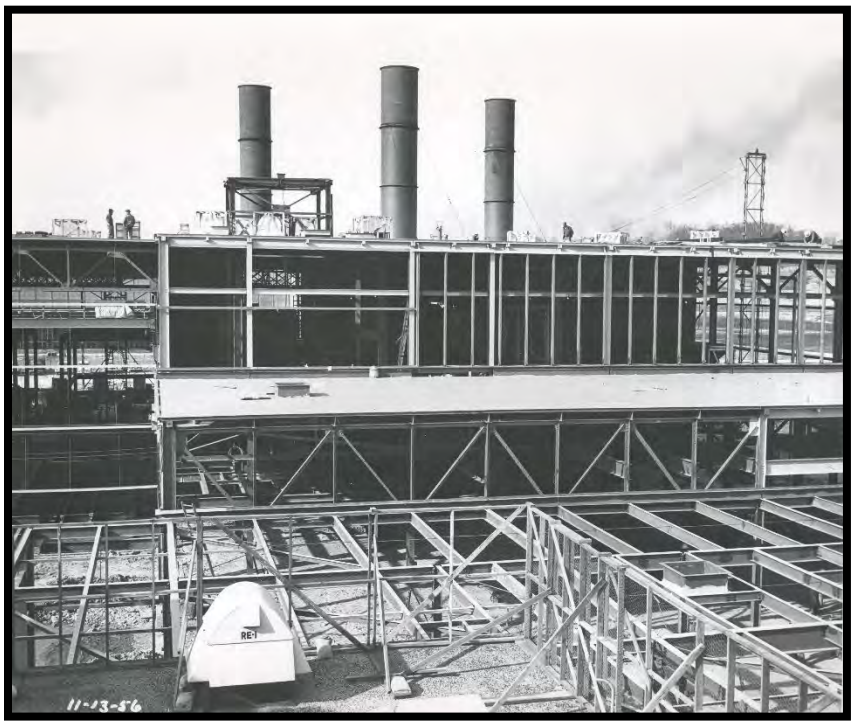

Figure 10: The X-344A UF_6 Sampling Facility, November 1956

Figure 11: The X-344A UF_6 Sampling Facility, November 1956

Figure 12: The X-344A UF_6 Sampling Facility, November 1956

Appendix C: Historical Drawings

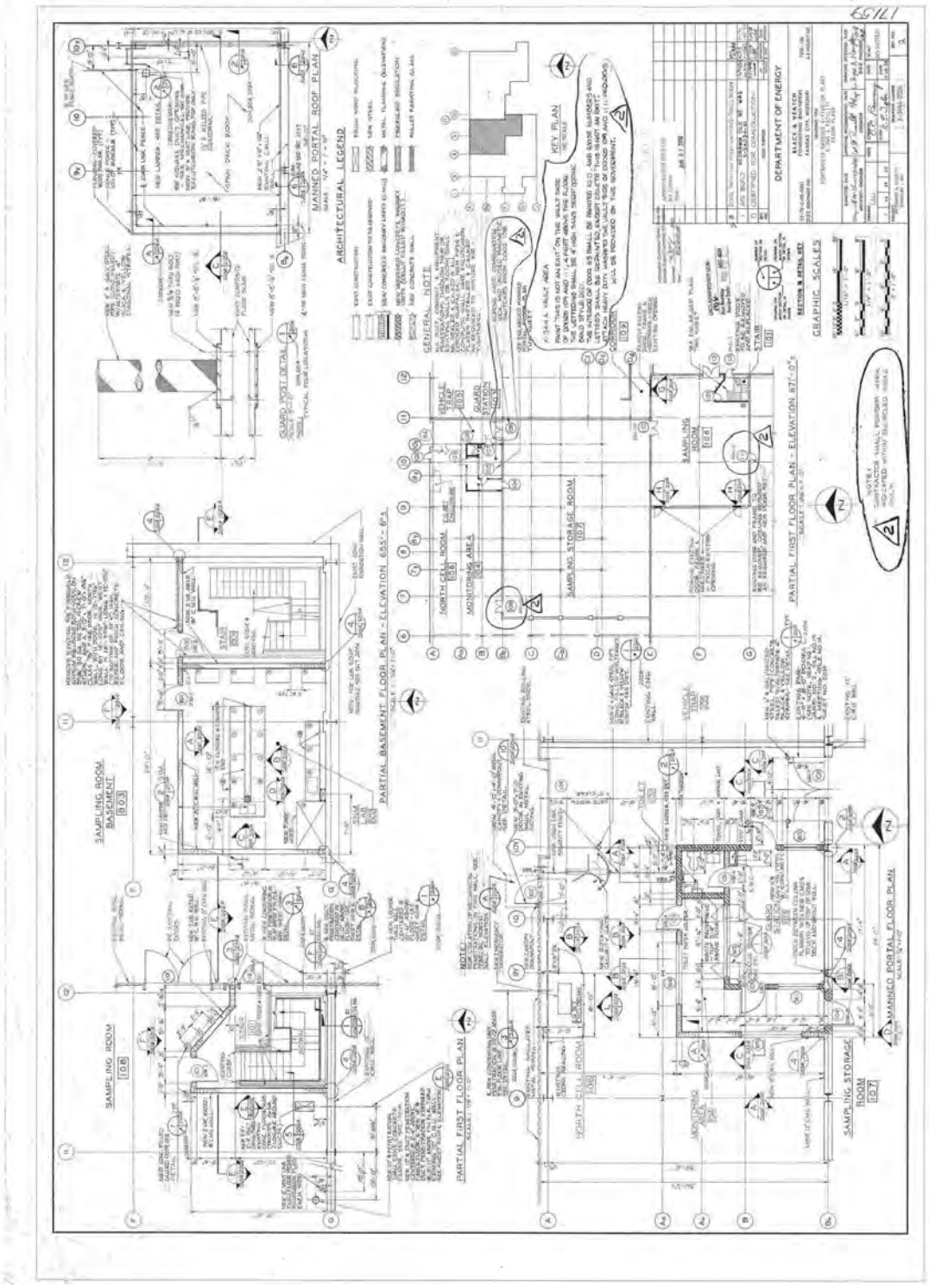

Figure 13: Floor Plans

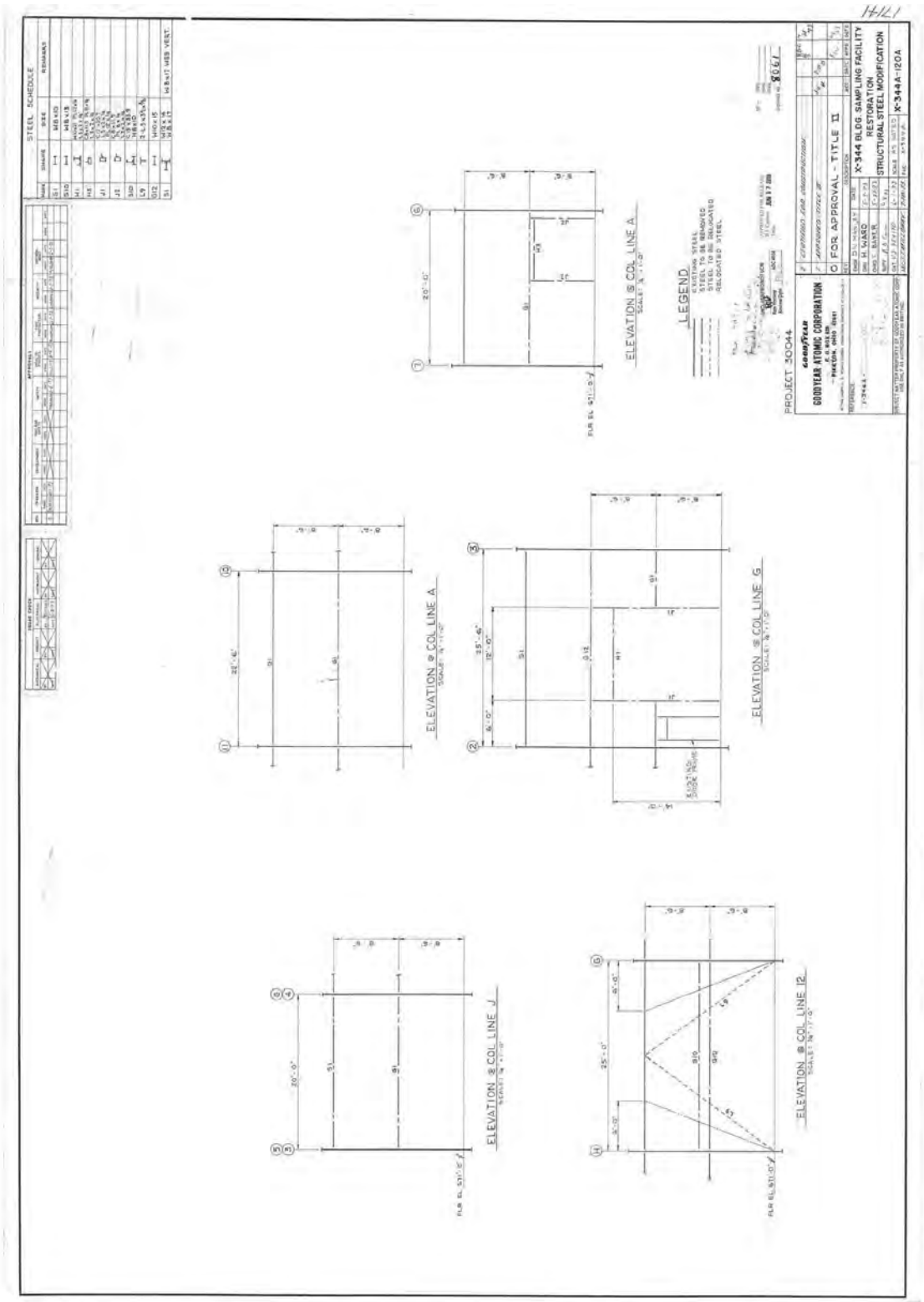

Figure 14: Structural Steel Modification

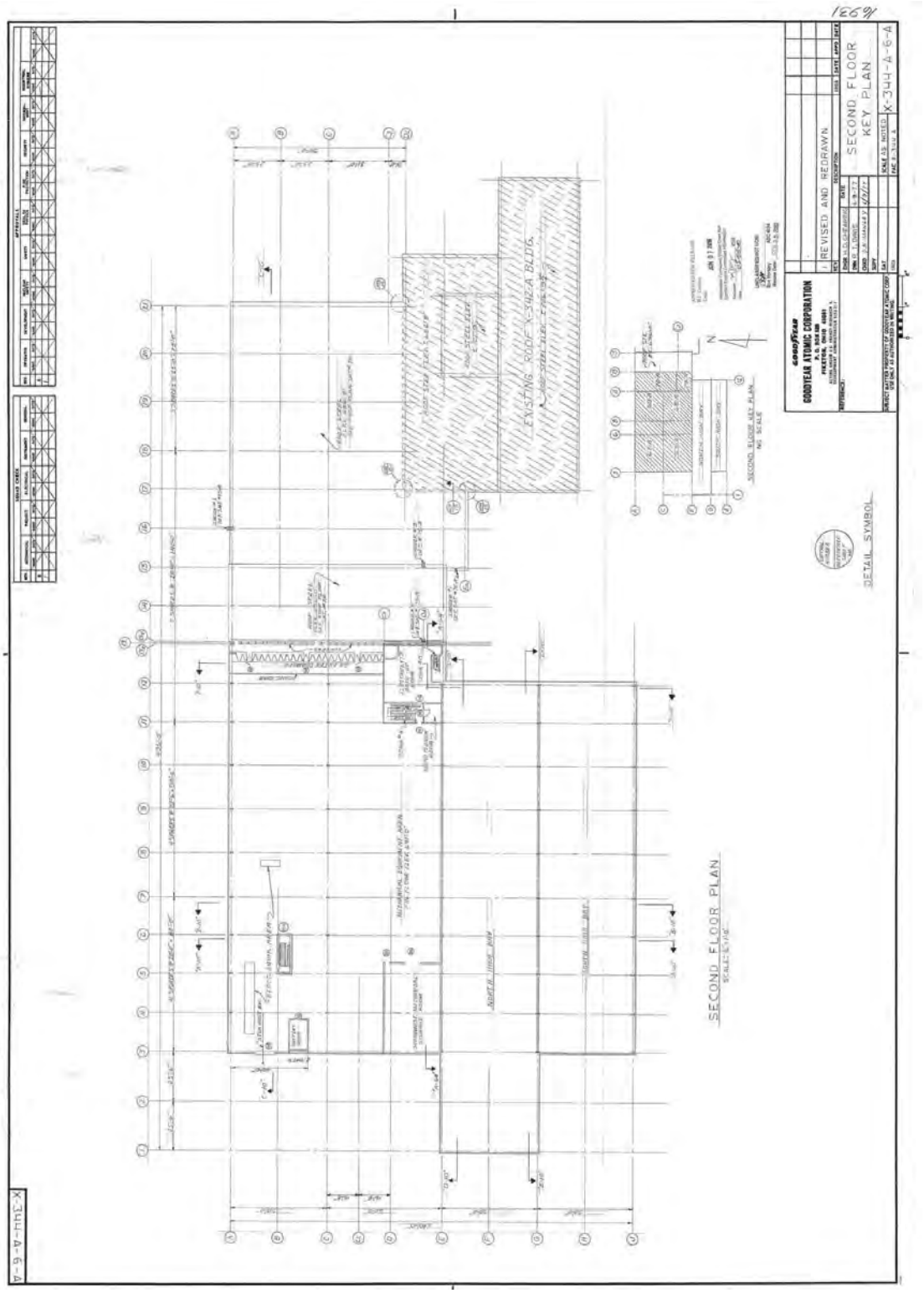

Figure 15: Second Floor Key Plan

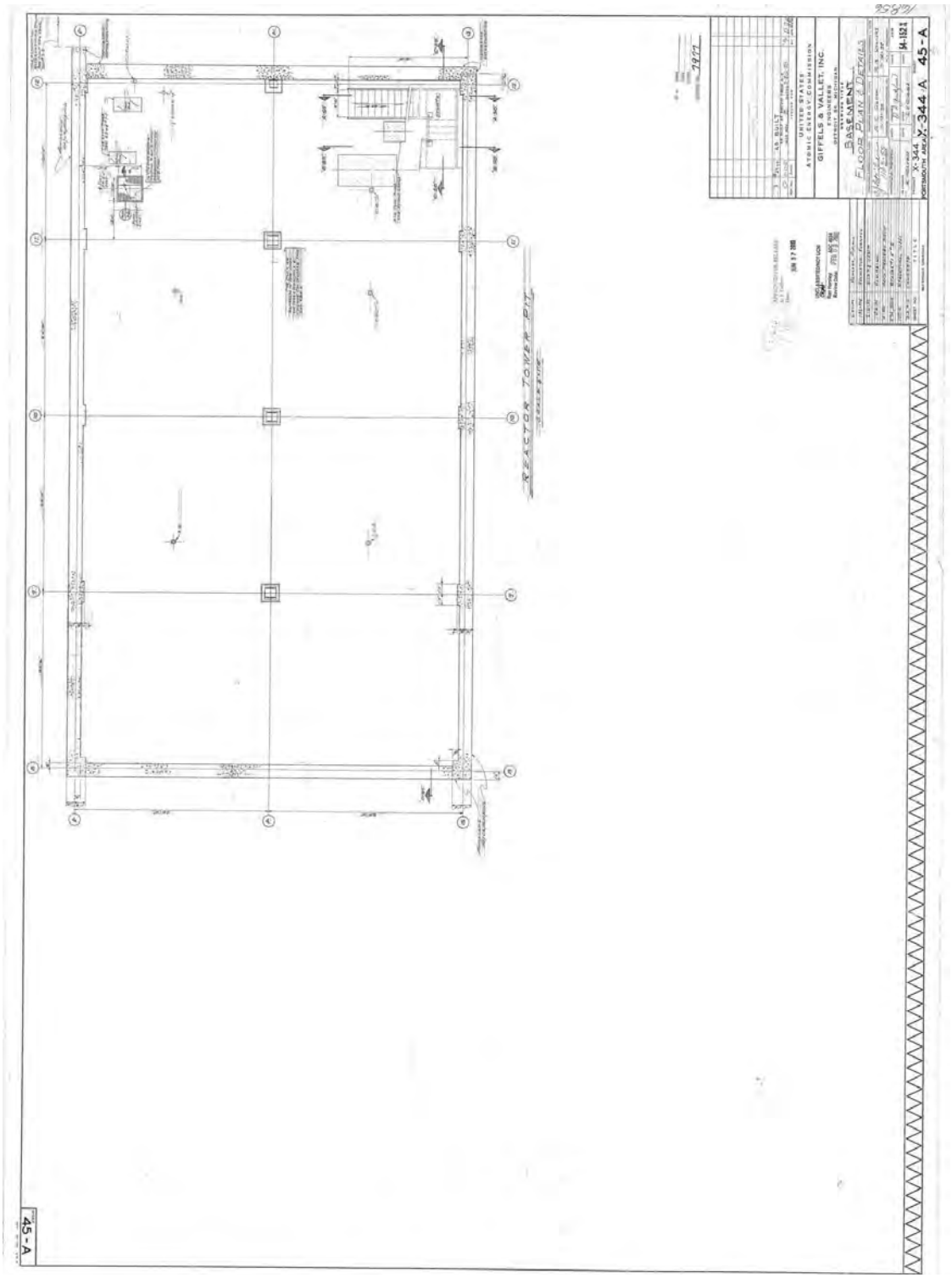

Figure 16: Basement Floor Plan

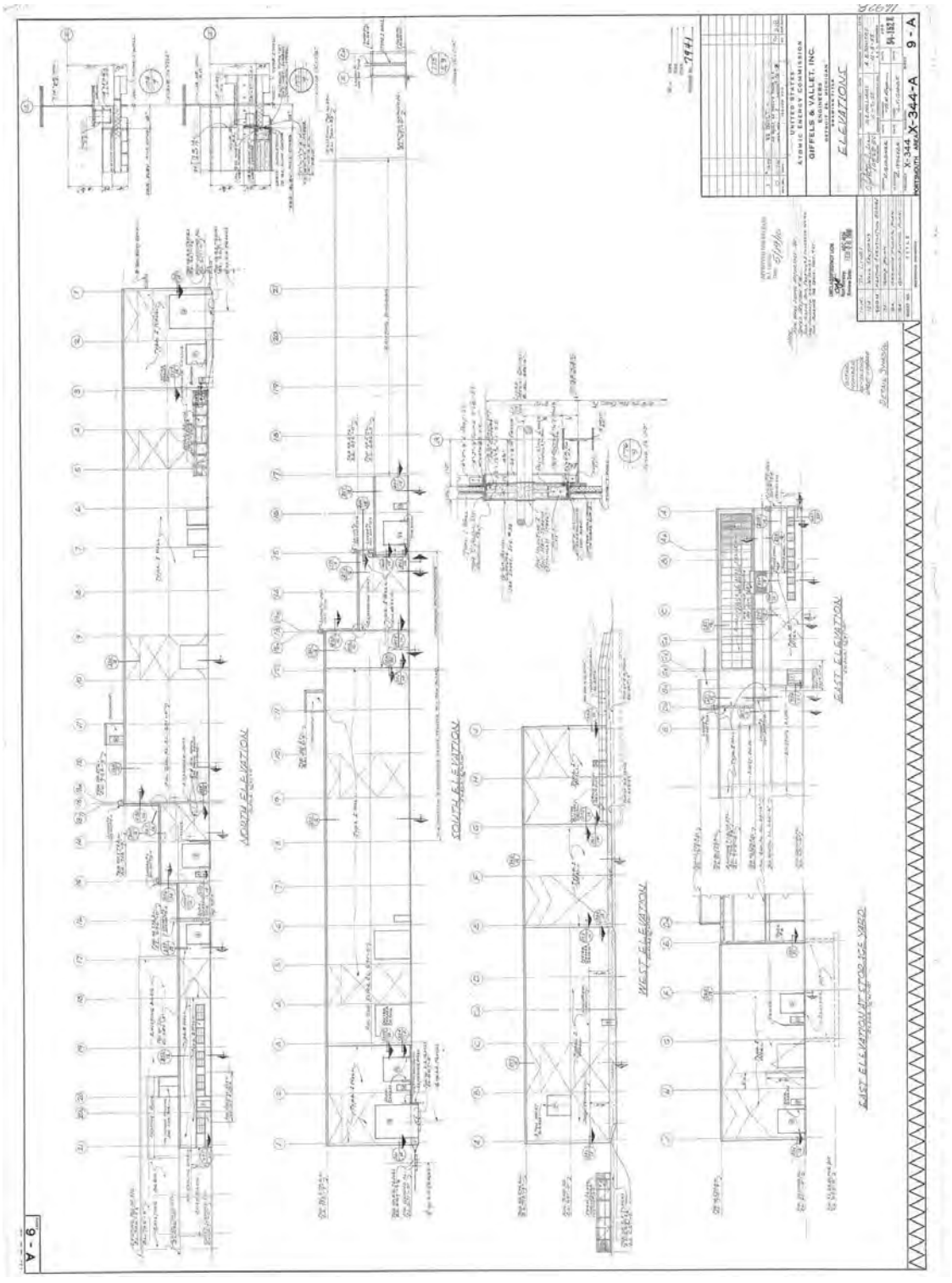

Figure 17: Elevations

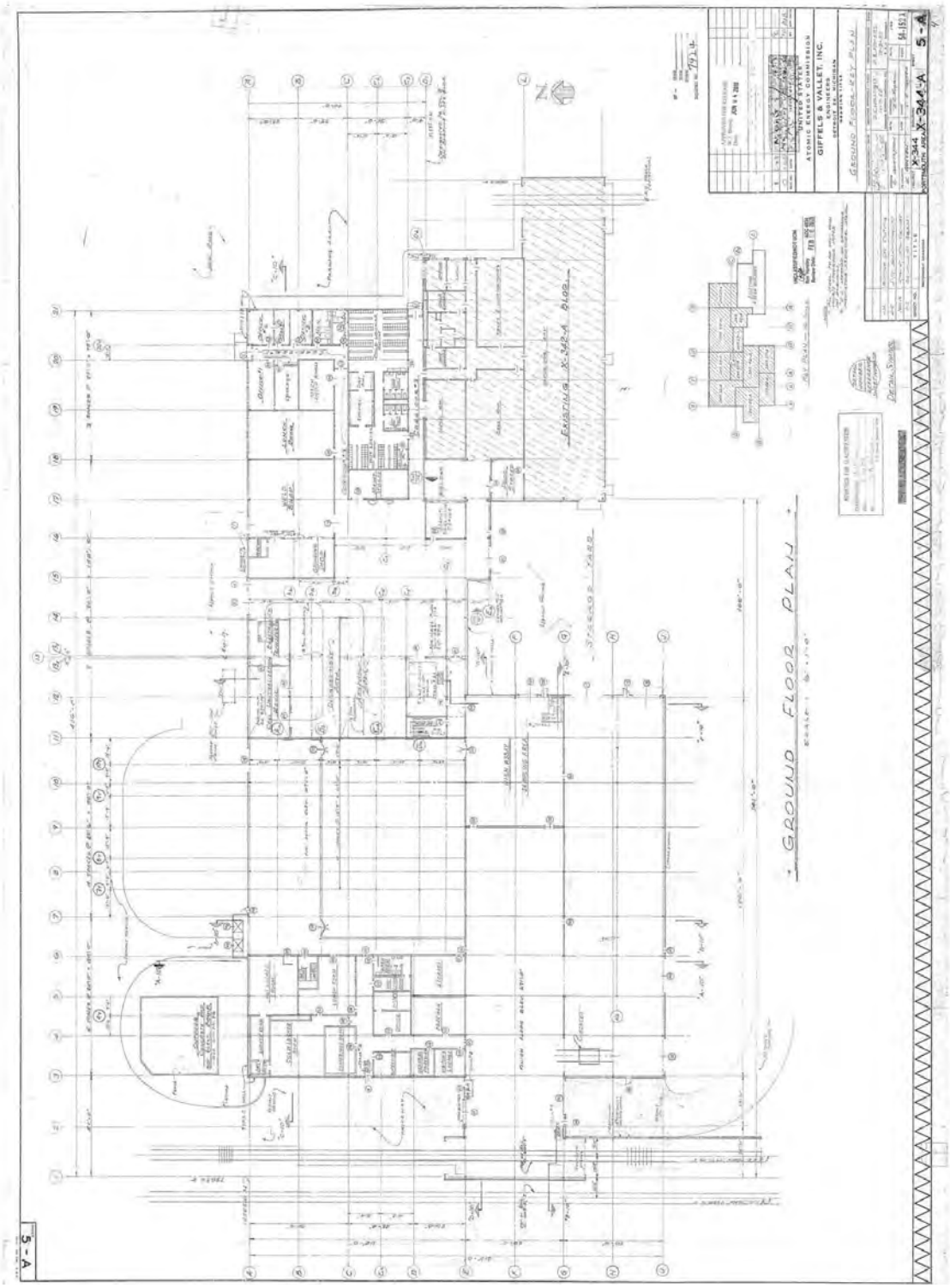

Figure 18: Ground Floor Key Plan