

PORTSMOUTH GASEOUS DIFFUSION PLANT, X-705
DECONTAMINATION BUILDING
3930 U.S. Route 23 South
Piketon vicinity
Pike County
Ohio

HAER OH-142-W
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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-705 DECONTAMINATION BUILDING

HAER No. OH-142-W

- Location: Portsmouth Gaseous Diffusion Plant (PORTS), 3930 U.S. Route 23 South, Piketon vicinity, Scioto Township, Pike County, Ohio
- The X-705 Decontamination Building is located at Ohio State Plane South coordinates at easting 1827233.292842 ft, northing 370241.633413935 ft and at Universal Transverse Mercator Zone 17N easting 327090.2825 m, northing 4320391.533 m. The coordinate represents the approximate center of the X-705 Decontamination 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: 1955
- 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: The X-705 Decontamination Building facilitates the ongoing process of equipment decontamination.
- Significance: The X-705 Decontamination Building is used for the disassembly and decontamination of process equipment and decontamination and cleaning of small parts. The gaseous diffusion X-705 Decontamination Building also supports chemical analysis for the X-705 Decontamination Building itself, as well as the X-700 Converter Shop and Cleaning Facility, X-720 Maintenance and Stores Building, and the X-342A Feed, Vaporization and Fluorine Generation Building. The X-705 Decontamination 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 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-705 Decontamination Building 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-705 Decontamination Building:

To expedite construction of the X-705 Decontamination Building, the Peter Kiewit Sons' Construction Company issued a lump-sum sub-contract for its construction. They issued three subcontracts altogether, with the George Sheaf & Company, of Columbus, Ohio, winning the contract to build the entire building. A second subcontract went to the Blount Brothers Construction Company, of Montgomery, Alabama, to furnish and install a long list of items, including monorails, cranes, hoists, conveyor systems, catwalks, stairs, piping, and many other systems within the X-705 Decontamination Building. The third sub-contract went to the Brown-Neil Corporation, of Clarksburg, West Virginia, for furnishing and installing the spray-booth equipment. Peter Kiewit Sons' installed the building's fire alarm system.

Excavation for footers commenced in October 1953 (Appendix B, Figures 5 through 8). As encountered elsewhere on the PORTS construction site, workers soon discovered "fat clay" (clay with high plasticity) within the X-705 Decontamination Building construction site. This unstable soil required removal and backfilling with class D concrete. By November 1953, construction crews had completed excavation work.

Concrete work began in early October 1953. The H.E. Pederson Company, Inc. (location not known) was in charge of placing the reinforcing steel, while the George Sheaf Company performed the actual concrete work. They poured class D concrete under the footers. Due to cold conditions, workers covered the concrete with straw and canvas, and in some instances, used electric heaters to keep the concrete warm. By mid-December 1953, workers had completed pouring concrete for the building's footers, foundation walls, piers, machine bases, and slabs. Altogether the foundation work required 4,848 cubic yards of concrete.

Ironworkers of the Crawford Steel Corporation, of Cincinnati, Ohio, began erecting the building's steel frame in January 1954 (Figures 9 and 10). By mid-April, they had advanced far enough that workers began installing the steel roof decking (Figure 11). Electrical and plumbing work began in early October. Workers began installing equipment within the building in December 1954 (Figures 12 through 19), and all work on the building was complete by mid-June 1955.

Historical drawings of building plans are provided in Appendix C (Figures 20 through 30).

Part II. Site Information

Description of the X-705 Decontamination Building:

The X-705 Decontamination Building is located roughly 600' east of the X-330 Process Building and about 230' south of the X-333 Process Building. The building was used for decontaminating radioactive materials found on process equipment and clothing, as well as reclaiming uranium residues during the decontamination process.

The building measures 163' wide by 532' long and houses 102,500' of floor space. Built of steel frame construction, the X-705 features a flat roof with a clerestory down the length of the building (Appendix A, Figures 1 through 4). An 8' tall concrete block wall extends around the bottom of the building. A continuous band of multi-light steel sash industrial windows rests atop this wall. Additional steel sash windows are located at the mezzanine levels and on both sides of the clerestory. Like many of the buildings on the PORTS reservation, the X-705 Decontamination Building is clad with corrugated asbestos-cement panels.

At the time of its construction, the steel framing of the building conformed to the Pacific Coast Building Code for Zone 1 earthquake hazard. All catwalks and access platforms are comprised of steel framing. Floors consist of reinforced concrete with a rating of 4,000 pounds per square foot. There are a number of tunnels and pits formed within the concrete floor. Below grade, the concrete walls were coated with ironite to protect them against moisture.

The interior of the building includes several mezzanines in addition to the ground floor level. The interior space is divided into seven operating areas and areas for storage, maintenance, administration, laboratory, and auxiliary service use, such as hot and cold changing rooms, showers, toilets, laundry, and lunch room for 150 staff members. A mezzanine along the north side of the building features a five-ton hydraulic elevator moving chemicals and other materials. A series of pits and tunnels are located below the ground level for the process piping and equipment. Monorails, hoists, and jib cranes are used to handle materials that require cleaning. The south bay features a pair of 23-ton cranes.

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.

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

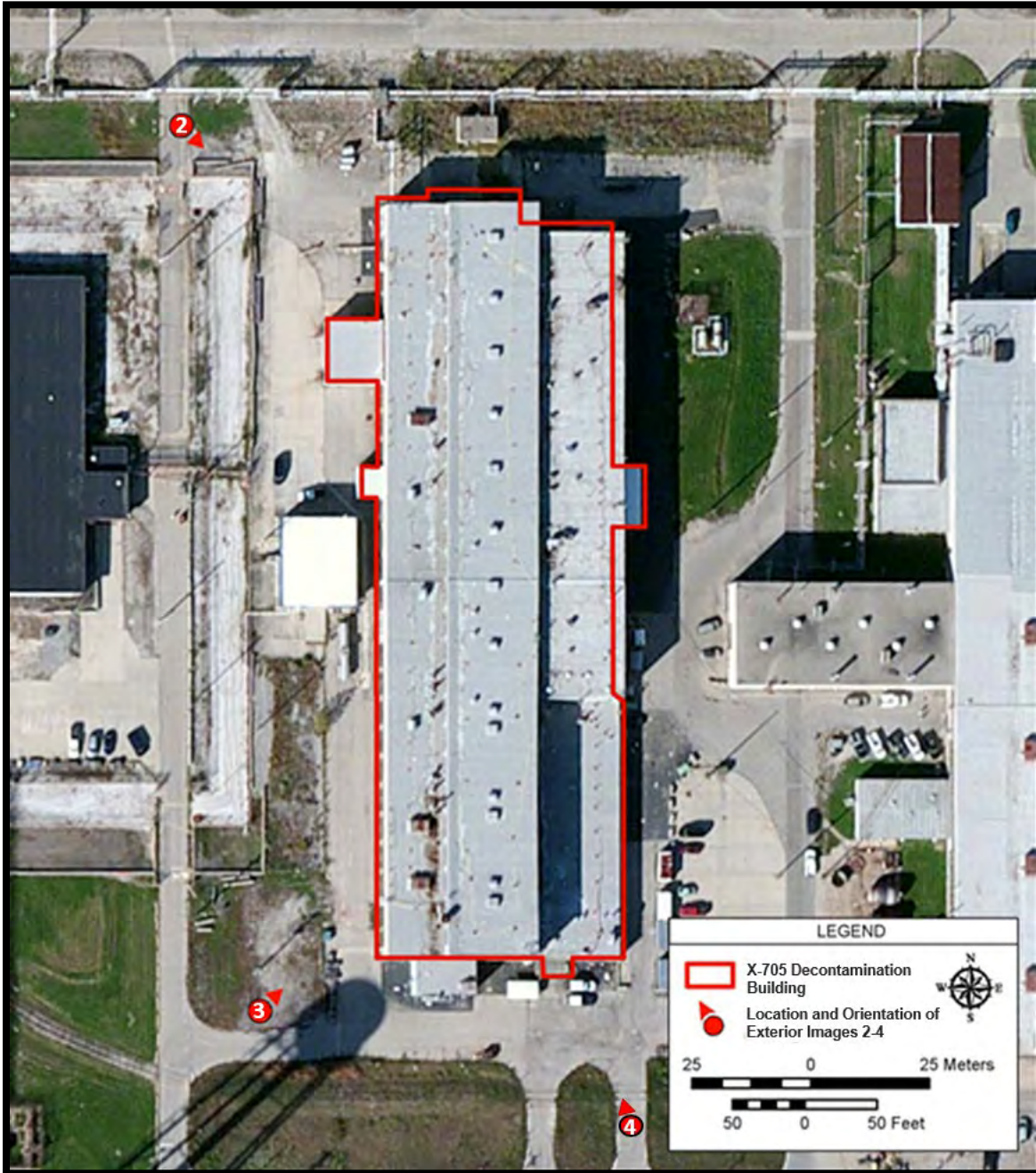


Figure 1: Location and Orientation of Exterior Photographs (2 through 4)



Figure 2: North Side of the X-705 Decontamination Building, August 2014, Facing Southeast



Figure 3: South Side of the X-705 Decontamination Building, August 2014, Facing Northeast



Figure 4: South Side of the X-705 Decontamination Building, November 2014, Facing Northwest

Appendix B: Historical Photographs



Figure 5: Interior View of the X-705 Decontamination Building Site, Looking North, September 1953



Figure 6: Looking North at the X-705 Decontamination Building Site, December 1953



Figure 7: Looking North at the X-705 Decontamination Building Site, January 1954



Figure 8: Looking North at the X-705 Decontamination Building, February 1954

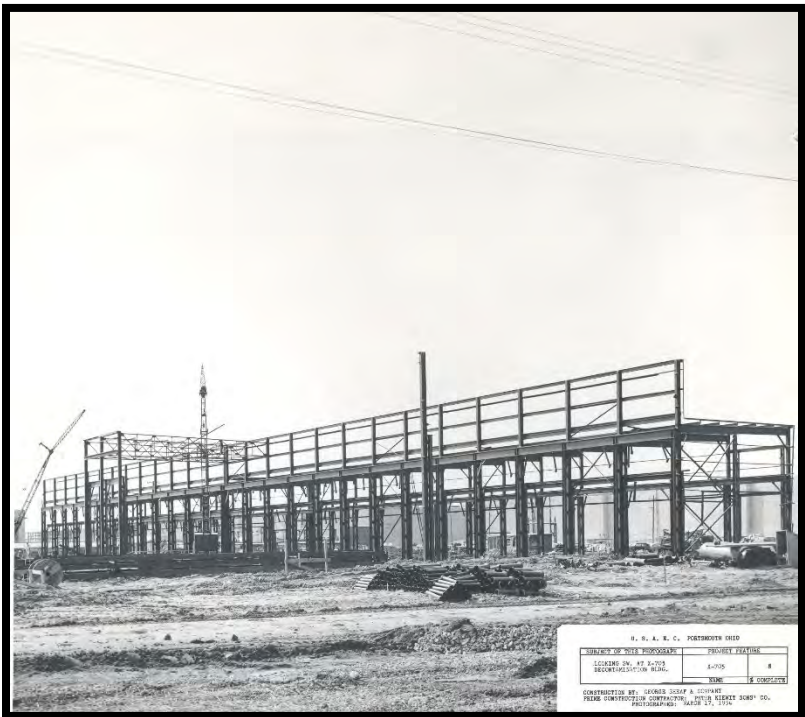


Figure 9: Looking Southwest at the X-705 Decontamination Building, March 1954



Figure 10: Looking South at the X-705 Decontamination Building, April 1954



Figure 11: Looking Southwest at the X-705 Decontamination Building, June 1954



Figure 12: Interior View of the X-705 Decontamination Building, July 1954



Figure 13: Interior View of the X-705 Decontamination Building, July 1954



Figure 14: The X-705 Decontamination Building, July 1954



Figure 15: Interior View of the X-705 Decontamination Building, July 1954



Figure 16: Interior View of the X-705 Decontamination Building, July 1954



Figure 17: Overall View of the X-705 Decontamination Building, Looking North, July 1954



Figure 18: The X-705 Decontamination Building, July 1954



Figure 19: Interior View of the X-705 Decontamination Building, July 1954

Appendix C: Historical Drawings

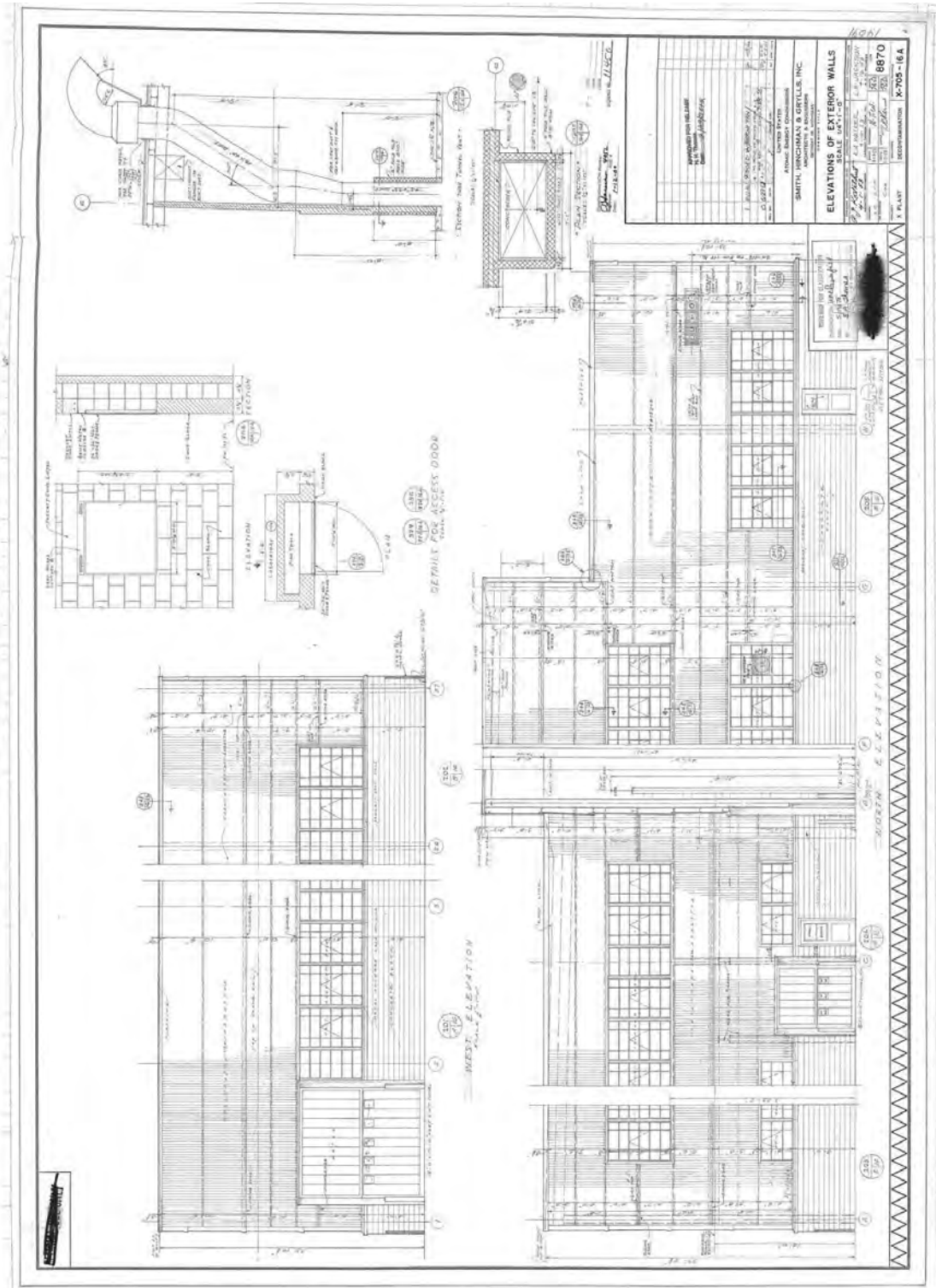


Figure 20: Elevations of Exterior Walls

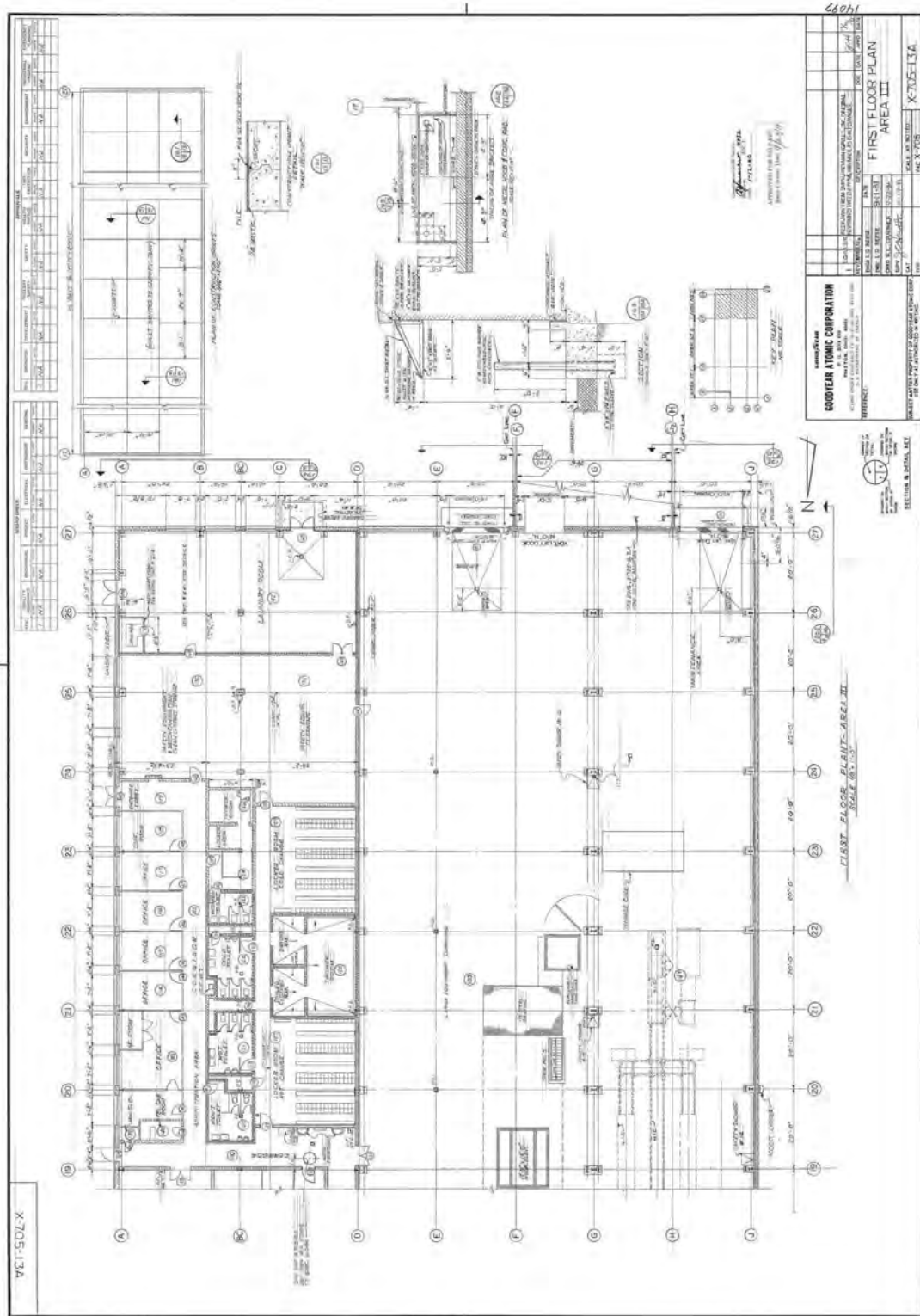


Figure 22: First Floor Plan Area 3

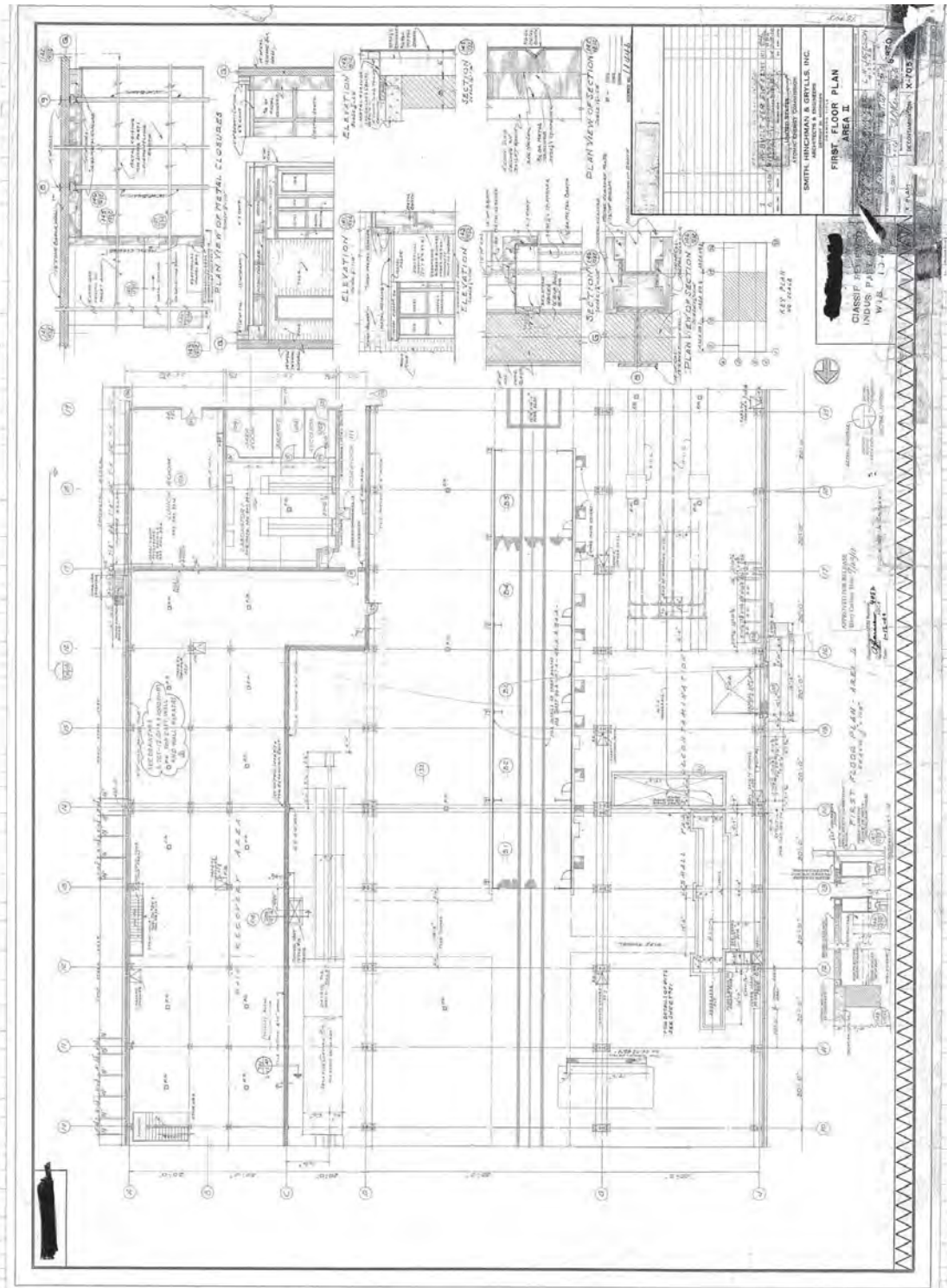


Figure 23: First Floor Plan Area 2

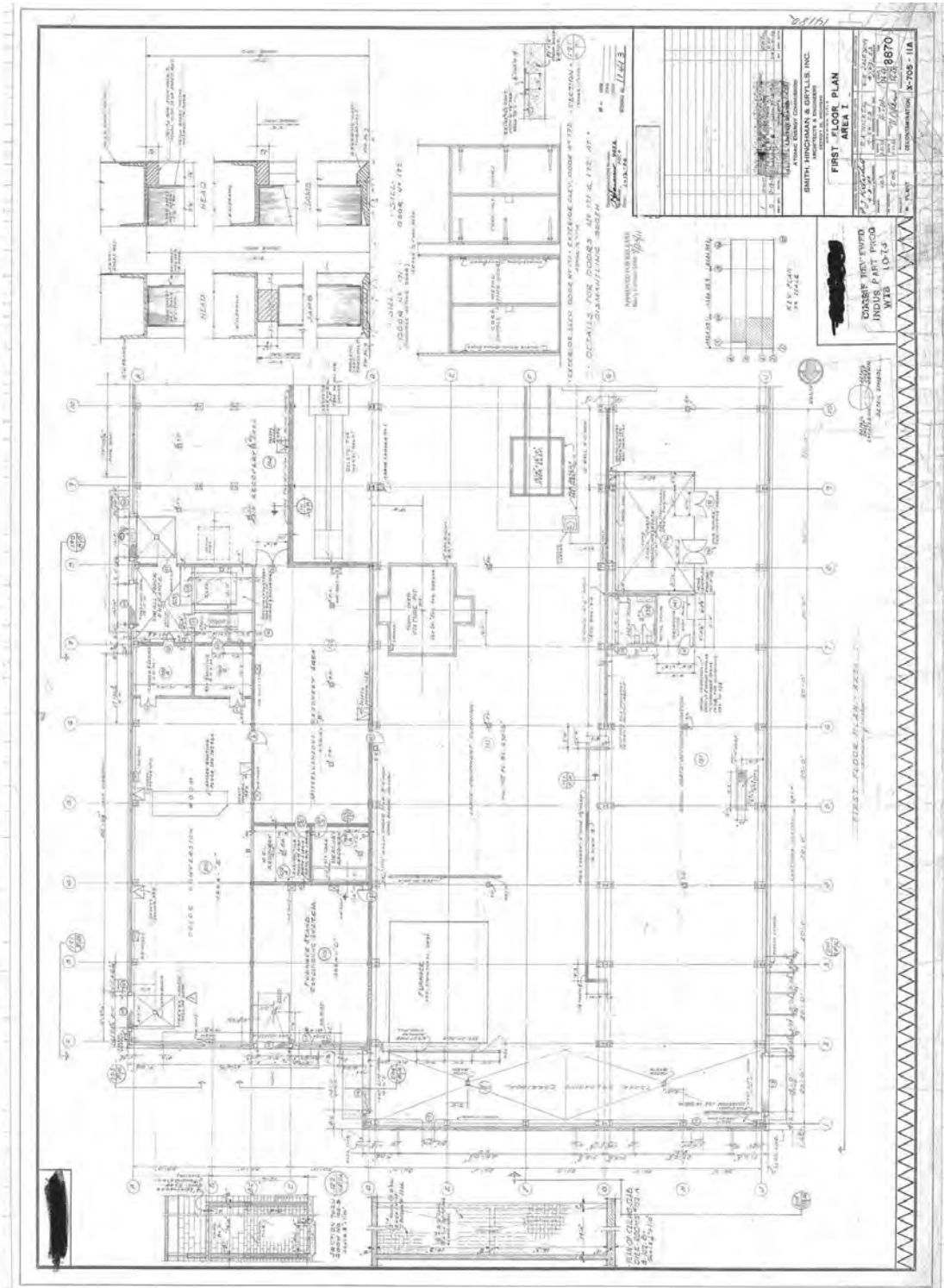


Figure 25: First Floor Plan Area 1

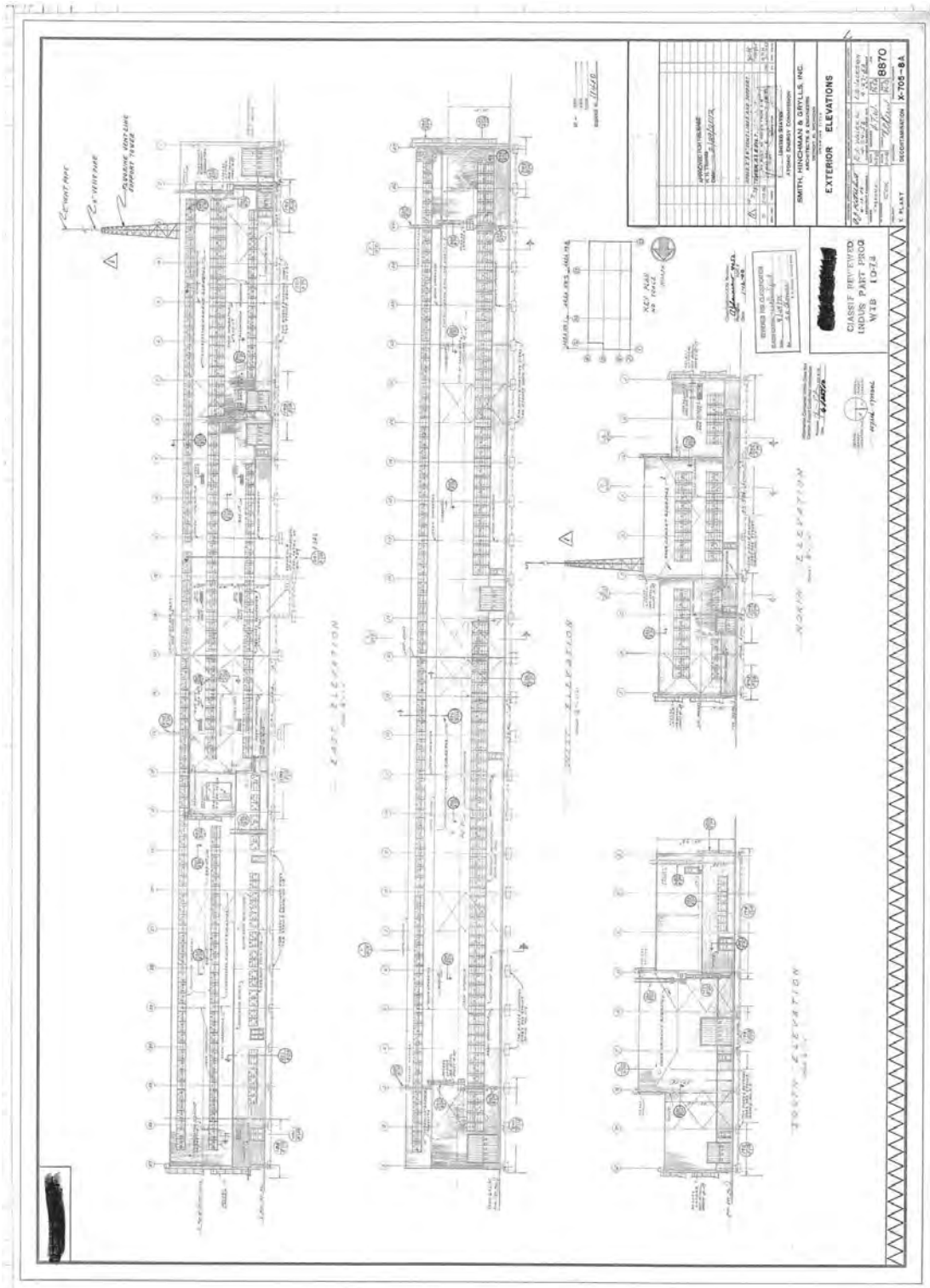


Figure 26: Exterior Elevations

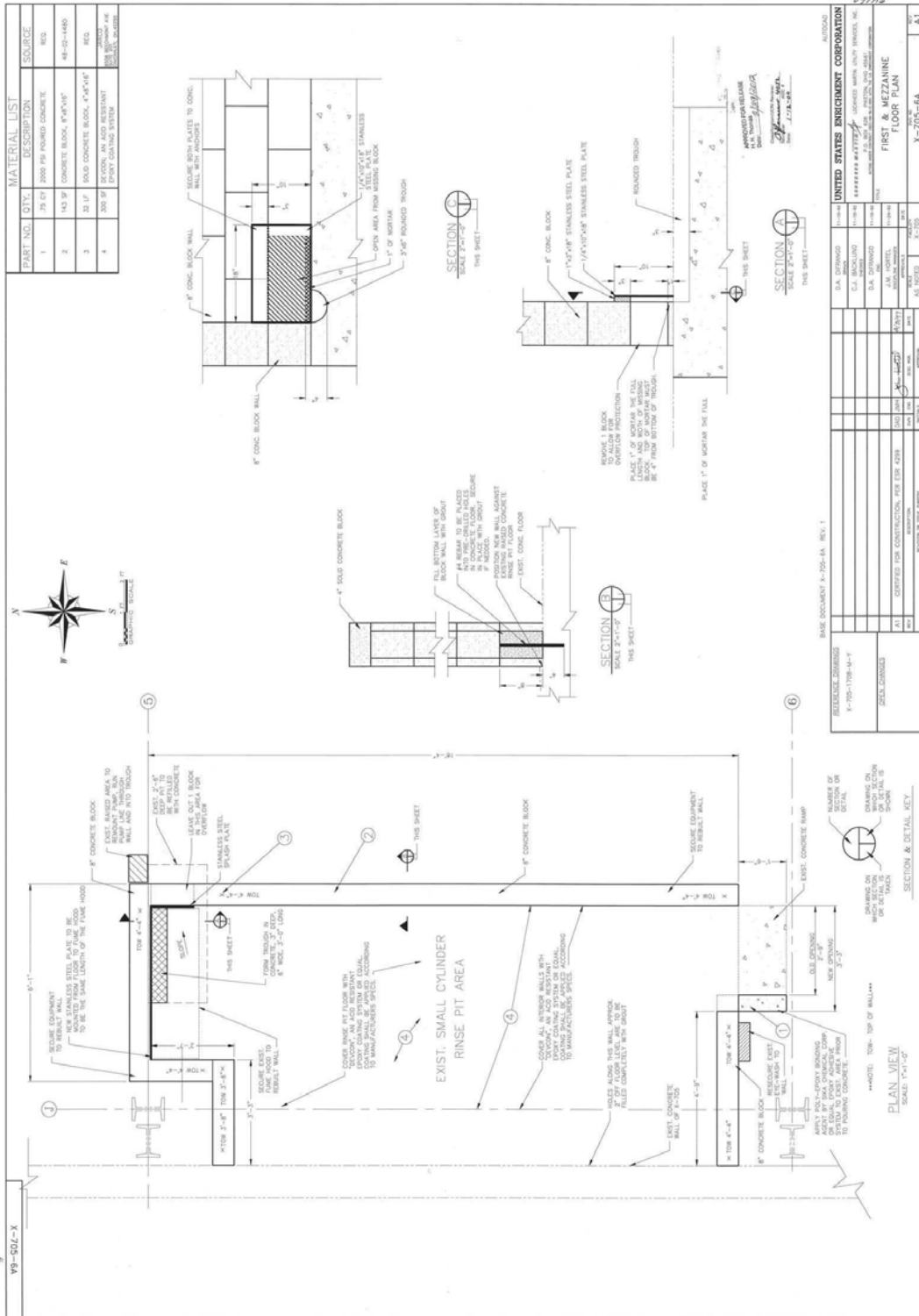


Figure 27: First and Mezzanine Floor Plan

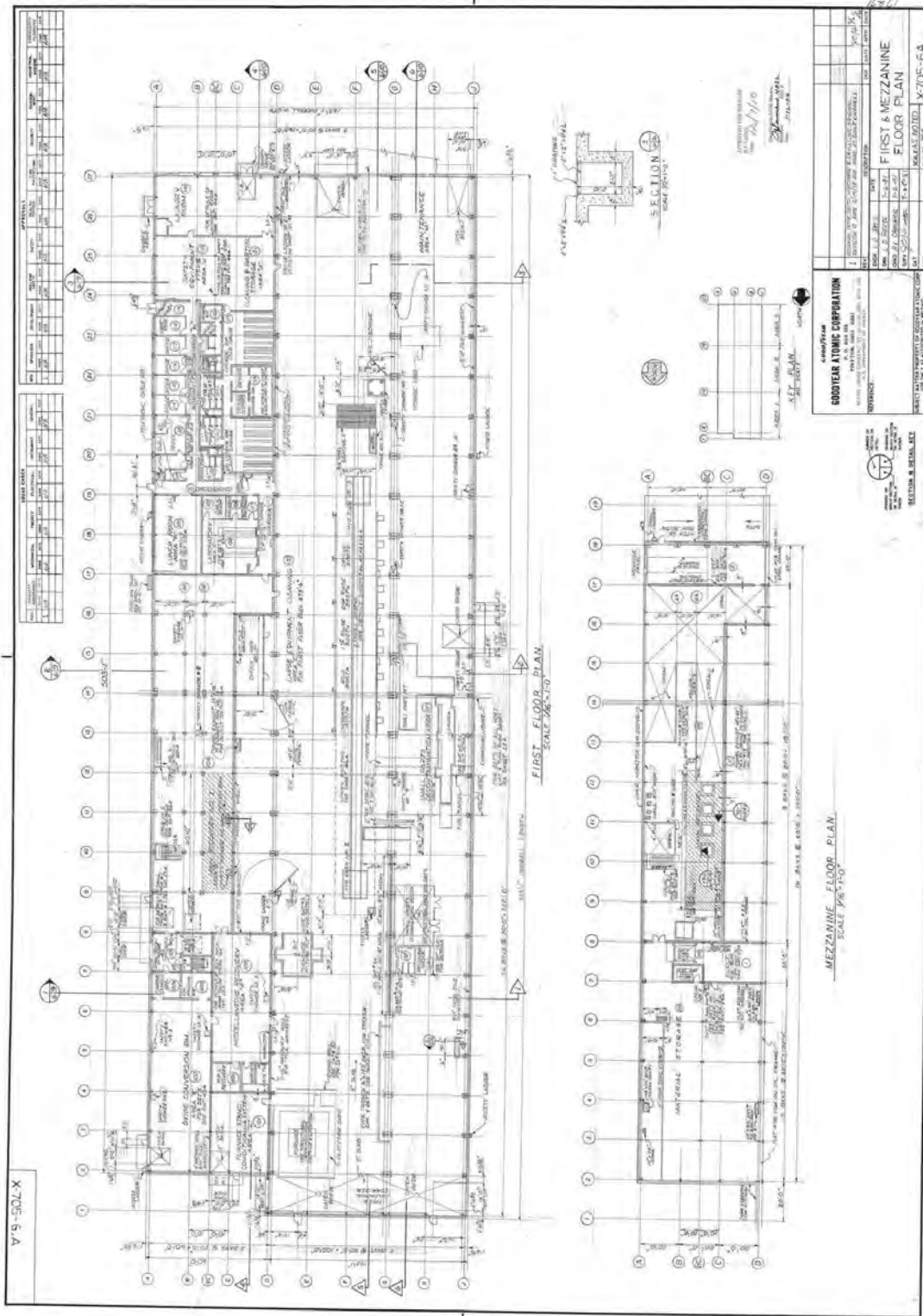


Figure 28: First and Mezzanine Floor Plan

