

PORTSMOUTH GASEOUS DIFFUSION PLANT, X-720
MAINTENANCE AND STORES BUILDING
3930 U.S. Route 23 South
Piketon vicinity
Pike County
Ohio

HAER OH-142-Y
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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-720 MAINTENANCE AND STORES BUILDING

HAER No. OH-142-Y

<u>Location:</u>	<p>Portsmouth Gaseous Diffusion Plant (PORTS), 3930 U.S. Route 23 South, Piketon vicinity, Scioto Township, Pike County, Ohio</p> <p>The X-720 Maintenance and Stores Building is located at Ohio State Plane South coordinates at easting 1827492.345671 ft, northing 369445.868768993 ft and at Universal Transverse Mercator Zone 17N easting 327165.2441 m, northing 4320147.715 m. The coordinate represents the approximate center of the X-720 Maintenance and Stores 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.</p>
<u>Date of Construction:</u>	1954
<u>Designer/Builder:</u>	Peter Kiewit Sons' Construction Company
<u>Previous Owner:</u>	N/A
<u>Present Owner:</u>	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.
<u>Present Use:</u>	The X-720 Maintenance and Stores Building is used for process and auxiliary equipment maintenance, as a storage area for spare parts and maintenance equipment, and for equipment testing and inspection.
<u>Significance:</u>	The X-720 Maintenance and Stores Building is used for a variety of shop activities, offices, and storage of parts. The building is also used for the testing and inspection of process and auxiliary equipment. 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.
<u>Project Information:</u>	Fluor-BWXT Portsmouth LLC photographed the site in August 2014. 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-720 Maintenance and Stores 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-720 Maintenance and Stores Building:

Subcontractors to Peter Kiewit Sons' Construction Company built the X-720 Maintenance and Stores Building under a lump-sum subcontract. Peter Kiewit Sons' Construction Company furnished some of the critical equipment and materials required to build the X-720 Maintenance and Stores Building. Goodyear Atomic Corporation, in conjunction with the Atomic Energy Commission, supplied most of the maintenance equipment, tools, furnishings, and other supplies required to operate the building.

H. K. Ferguson Company, of Cleveland, Ohio, received the contract for excavation, as well to erect the X-720 Maintenance and Stores Building; the X-720A Gas Manifold Shed; the neutralization pit; dust collector; loading dock; concrete aprons around the building ramp; concrete platform and fence for the test station; and storm and sanitary sewers. They also installed critical items of equipment supplied by Peter Kiewit Sons' Construction Company. Charles A. Koch Erecting Company, of Louisville, Kentucky, furnished and installed the screens and blinds. E. F. Hauserman Company, of Cleveland, Ohio, furnished and installed the metal partitions. Standard Asbestos Manufacturing and Insulating Company, of Kansas City, Missouri, furnished and installed all pipe insulation, and the Portsmouth Glass Company, of Portsmouth, Ohio, furnished the glass and glazing work for the building's many windows.

Excavation work commenced in March 1953 (Appendix B, Figure 4). As elsewhere on the plant site, workers encountered difficulties with "fat clay," forcing them to conduct test borings to determine how much earth would have to be removed to reach a solid bearing. Fat clay is a term used to describe clay with a high plasticity. Workers encountered it throughout the area during construction. Due to its plasticity, it makes for an unstable foundation. Workers countered this problem by excavating the fat clay until they reached a more solid subsurface. This necessitated infilling with concrete and stable fill material. Ultimately, workers excavated 80,000 cubic yards of earth in preparation of pouring concrete.

Concrete work began in early April 1953. The concrete contractor erected a mixing plant onsite (Figure 5). The floors and footers required 14,300 cubic feet of Class A concrete, which has a mixture strength of 3,500 pounds per square feet. The contractor completed all concrete work by late November 1953. Atop the concrete slab, steel workers from Crawford Steel Corporation, of Cincinnati, Ohio, began erecting the structural members for the building (Figures 6 through 11). Steel erection began in May 1953 and continued until the end of September 1953. Unlike the larger process buildings, which relied on bolted connections, plans for the X-720 Maintenance and Stores Building called for riveted connections.

H. K. Ferguson Company contracted for the roofing work (Figures 14 and 15). They in turn subcontracted with Hunt Construction Company, of Indianapolis, Indiana, who began installing the steel roof deck in June 1953. By the end of November 1953, they had completed installing the 2,840 square foot roof. The Industrial Roof and Sheet Metal Company, also under subcontract with H. K. Ferguson Company, was in charge of the built-up roof work.

Paras Sheeting and Painting Company, a subcontractor of H. K. Ferguson Company, installed the asbestos siding. Hatfield Electric Company, of Indianapolis, Indiana, installed all electrical equipment, including substations, switchgear, voltage regulators, lighting, and power wiring. Hatfield began work in

June 1953 and completed the job in May 1954. Subcontractors of H. K. Ferguson Company installed the mechanical systems, including the plumbing, heating and ventilation, elevators, cranes, sprinkler systems and other items (Figures 16 through 23).

Historical drawings of building plans are provided in Appendix C (Figures 24 through 30).

Part II. Site Information

Description of the X-720 Maintenance and Stores Building:

The X-720 Maintenance and Stores Building is located just east of the X-326 and X-330 Process Buildings, and south of the X-705 Decontamination Building and the X-700 Converter Shop and Chemical Cleaning Facility. Measuring 373' wide by 763' long (approximately 284,600 square feet), the X-720 Maintenance and Stores Building is among the largest buildings at PORTS. The building stands 42' tall and features two floors in the center and south sides of the building. The remainder of the building consists of one tall story. Like the other buildings on site, the X-720 Maintenance and Stores Building is utilitarian in appearance (Appendix A, Figures 1 through 3). Construction consists of steel framing. The north, east, and west walls feature extensive bands of steel sash windows. The remaining wall surfaces are clad with corrugated cement-asbestos panels.

The interior of the building is divided into the maintenance area and the stores and mezzanine area. A cinderblock wall extends the length of the interior of the building, separating the major work and storage areas. Within the stores area, cinderblock walls further divide the space into a large bin area, special storage rooms, stairwells, toilet rooms, and smaller shop areas. Two rows of offices are located within the mezzanine. A central corridor extends the length of the mezzanine, providing access to the offices. The stairwell within the mezzanine is comprised of cinderblock. The offices themselves were originally fitted with gypsum board partitions.

Metal partitions separate work areas within the main shop. The various spaces include tools and equipment for swapping out seals, working on compressors, and performing welding, carpentry, painting, sheet metal work, electrical and instrument work, and vacuum testing. Overhead cranes assist with the movement of heavy equipment and machinery. These cranes range in capacity from 23 tons to 7½ tons. The floors in the X-720 Maintenance and Stores Building consist of monolithic concrete slabs. The contractor chemically hardened the concrete in areas that were not covered with tiles. The floors in the mezzanine offices and lounge were covered with asphalt tiles. The locker and restroom floors were covered with ceramic tiles, and the dismantling and cleaning room of the electric room received a covering of vinyl tiles.

As with most buildings at PORTS, the interior finishes of the X-720 Maintenance and Stores Building were designed to be easy to clean and safe for workers. Any exposed ferrous metal and concrete block surfaces were painted for protection against corrosion and leakage. General use areas were painted for light reflection and to promote efficiency of workers. Safety stripes were applied to walkways, stairs, and obstructions. The built-in removable office partitions were covered with flush-panel, glazed wood installations.

The overall building was designed to support equipment and live loads, as well as to resist earthquake forces equal to two percent gravity. At the time of its construction in 1953, this was slightly less than the Pacific Coast Building Code for a Zone I Earthquake area.

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 (Figures 2 and 3)



Figure 2: North Side of the X-720 Maintenance and Stores Building, August 2014, Facing Southwest



Figure 3: South Side of the X-720 Maintenance and Stores Building, August 2014, Facing Northeast

Appendix B: Historical Photographs



Figure 4: Grading Work for the X-720 Maintenance and Stores Building,
February 1953



Figure 5: Steel Framing for the X-720 Maintenance and Stores Building,
May 1953

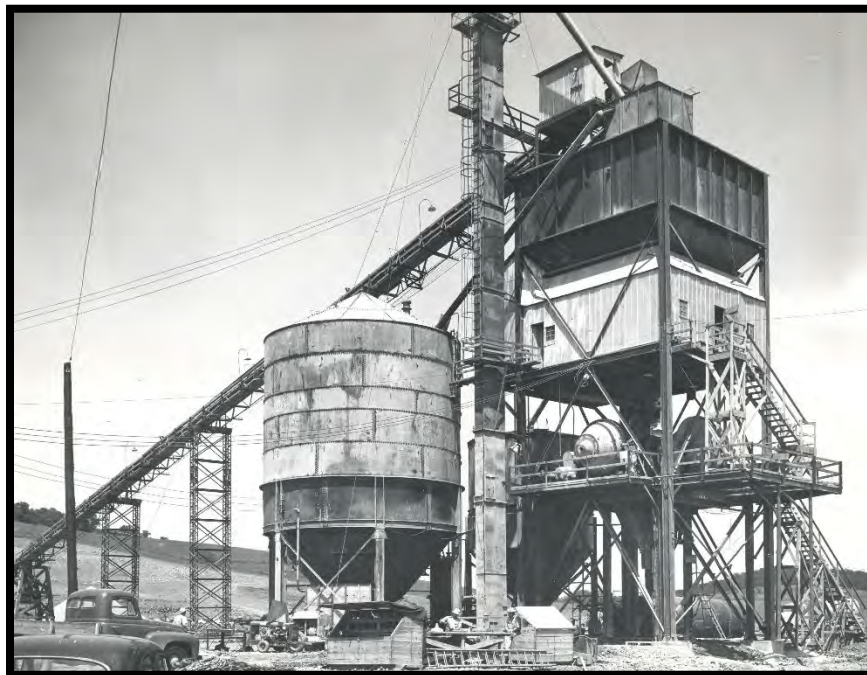


Figure 6: Batch Plant for the X-720 Maintenance and Stores Building, May 1953



Figure 7: Steel Framing for the X-720 Maintenance and Stores Building, May 1953

PORTSMOUTH GASEOUS DIFFUSION PLANT, X-720 MAINTENANCE
AND STORES BUILDING
HAER No. OH-142-Y
(Page 9)



Figure 8: Looking Southwest at the X-720 Maintenance and Stores Building,
August 1953

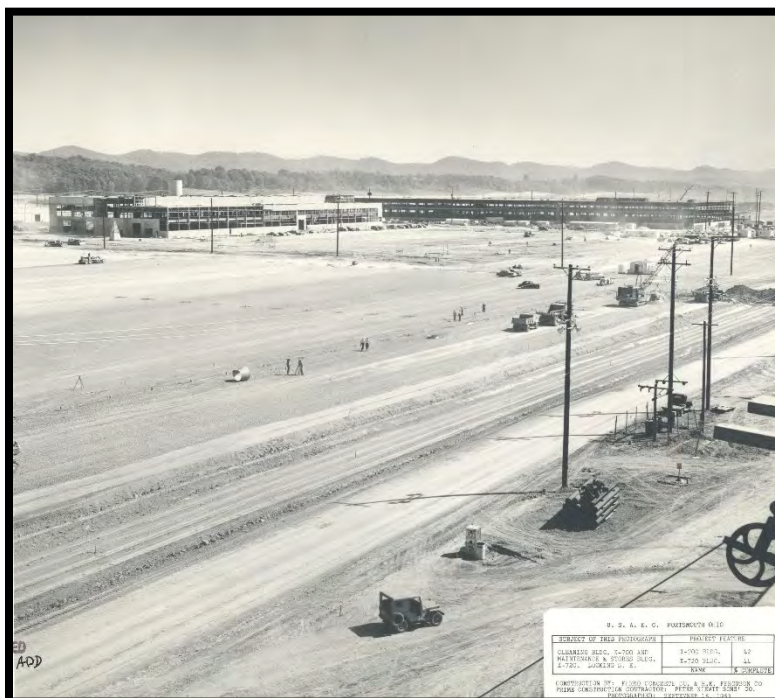


Figure 9: The X-700 Cleaning Building and the X-720 Maintenance
and Stores Building, Looking Southeast, September 1953

PORTSMOUTH GASEOUS DIFFUSION PLANT, X-720 MAINTENANCE
AND STORES BUILDING
HAER No. OH-142-Y
(Page 10)



Figure 10: Looking Southwest at the X-720 Maintenance and Stores Building,
September 1953



Figure 11: Looking Southwest at the X-720 Maintenance and Stores Building,
October 1953

PORTSMOUTH GASEOUS DIFFUSION PLANT, X-720 MAINTENANCE
AND STORES BUILDING
HAER No. OH-142-Y
(Page 11)



Figure 12: Looking North at the Interior of the X-720 Maintenance and Stores Building, November 1953



Figure 13: Looking Northwest at the X-720 Maintenance and Stores Building, November 1953

PORTSMOUTH GASEOUS DIFFUSION PLANT, X-720 MAINTENANCE
AND STORES BUILDING
HAER No. OH-142-Y
(Page 12)



Figure 14: Interior View of the Stores Area of the X-720 Maintenance and Stores Building, January 1954



Figure 15: Interior View of the X-720 Maintenance and Stores Building, January 1954

(Page 13)

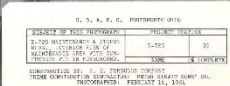


Figure 16: Interior View of the X-720 Maintenance and Stores Building Showing Compressor Pit in the Foreground, February 1954

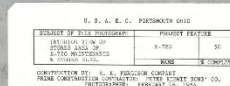


Figure 17: Interior View of the Stores Area of the X-720 Maintenance and Stores Building, February 1954

PORTSMOUTH GASEOUS DIFFUSION PLANT, X-720 MAINTENANCE
AND STORES BUILDING
HAER No. OH-142-Y
(Page 14)



Figure 18: Interior View of the X-720 Maintenance and Stores Building, March 1954

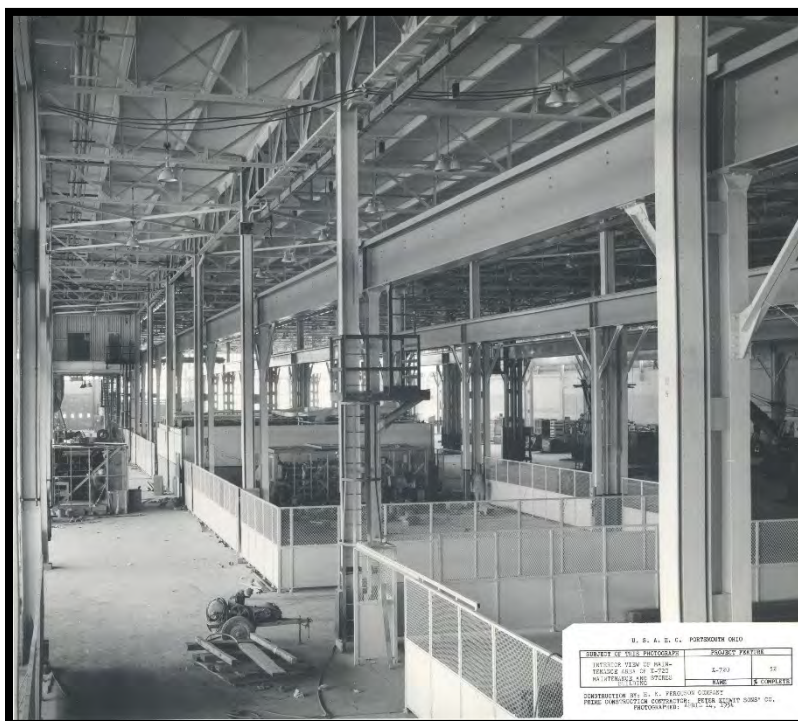


Figure 19: Interior View of the Maintenance Area of the X-720 Maintenance and Stores Building, April 1954

PORTSMOUTH GASEOUS DIFFUSION PLANT, X-720 MAINTENANCE
AND STORES BUILDING
HAER No. OH-142-Y
(Page 15)

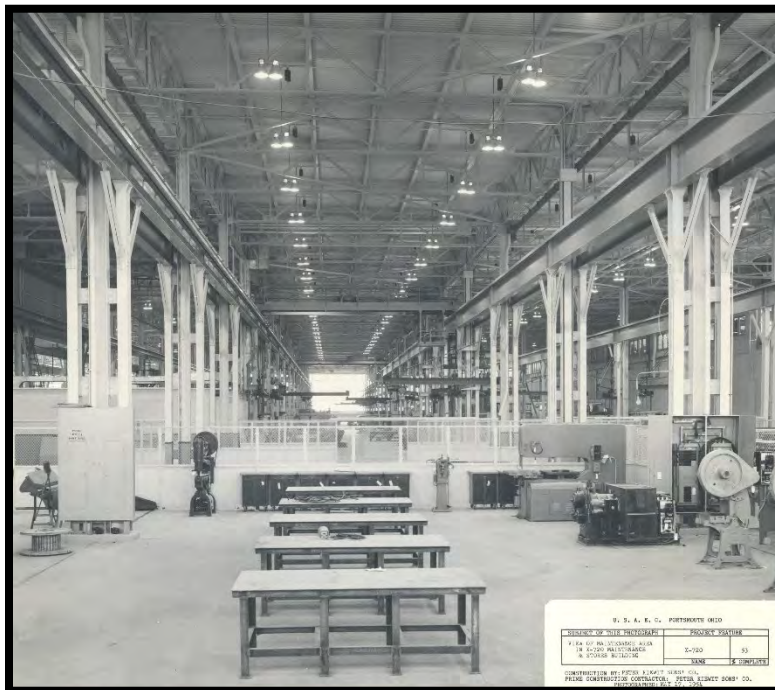


Figure 20: View of Maintenance Area in the X-720 Maintenance and Stores Building, May 1954

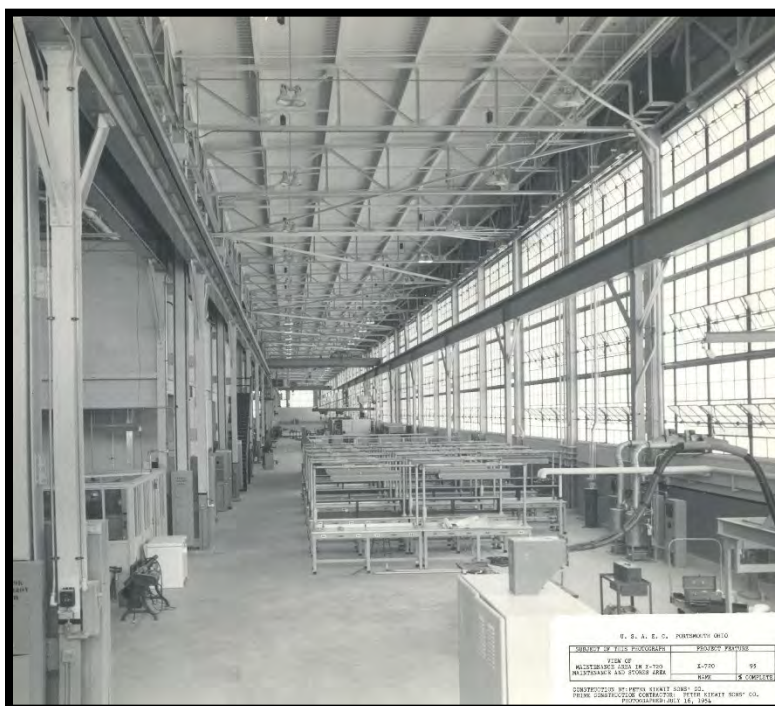


Figure 21: View of the Maintenance Area in the X-720 Maintenance and Stores Building, July 1954.

PORTSMOUTH GASEOUS DIFFUSION PLANT, X-720 MAINTENANCE
AND STORES BUILDING
HAER No. OH-142-Y
(Page 16)



Figure 22: The X-720 Maintenance and Stores Building Equipment Foundation, October 1955



Figure 23: Machine Installation in the X-720 Maintenance and Stores Building, December 1955

PORTSMOUTH GASEOUS DIFFUSION PLANT, X-720 MAINTENANCE
AND STORES BUILDING
HAER No. OH-142-Y
(Page 17)

Appendix C: Historical Drawings

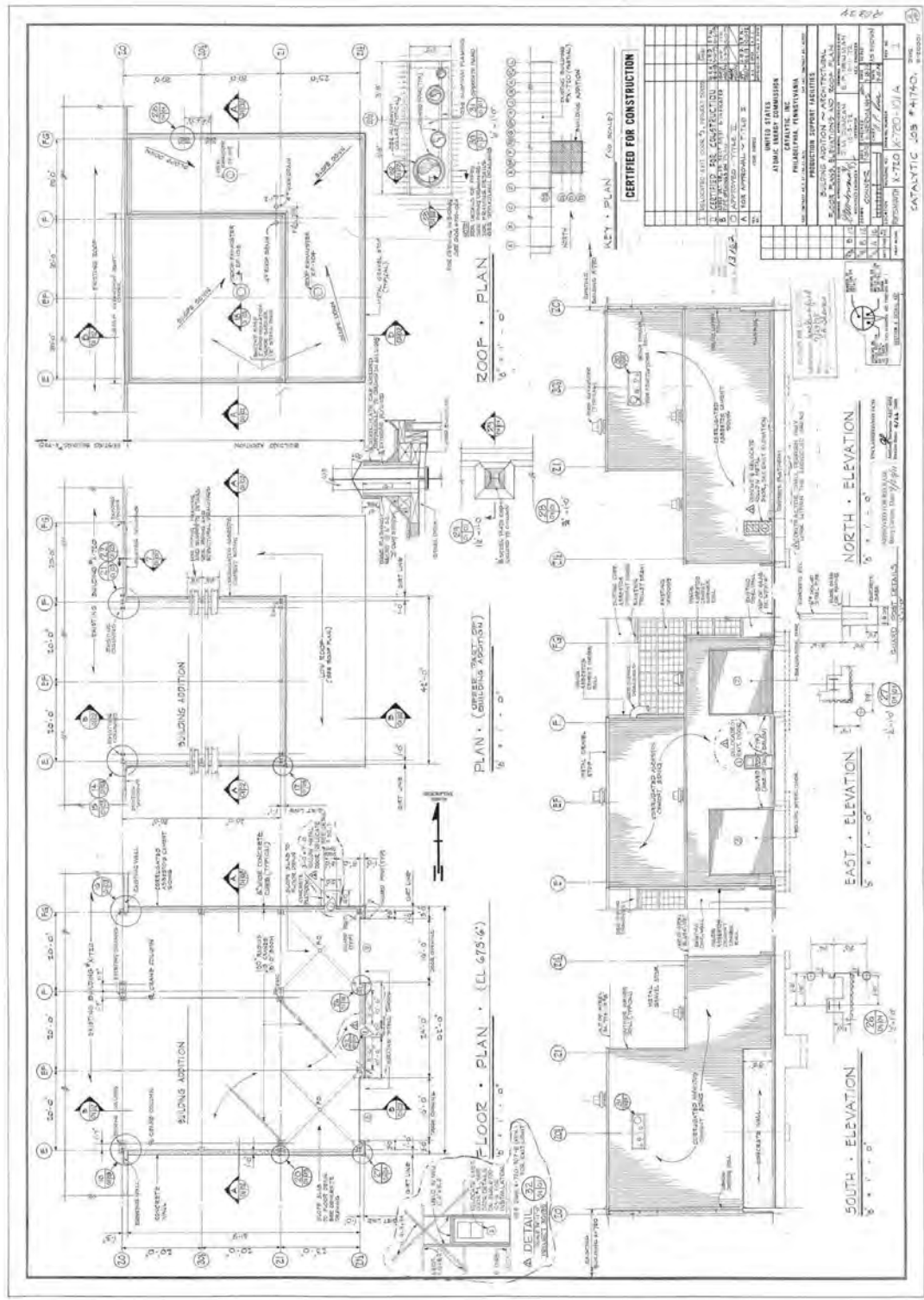


Figure 24: Floor Plans, Elevations, and Roof Plan

(Page 18)



PORTSMOUTH GASEOUS DIFFUSION PLANT, X-720 MAINTENANCE
AND STORES BUILDING
HAER No. OH-142-Y
(Page 19)

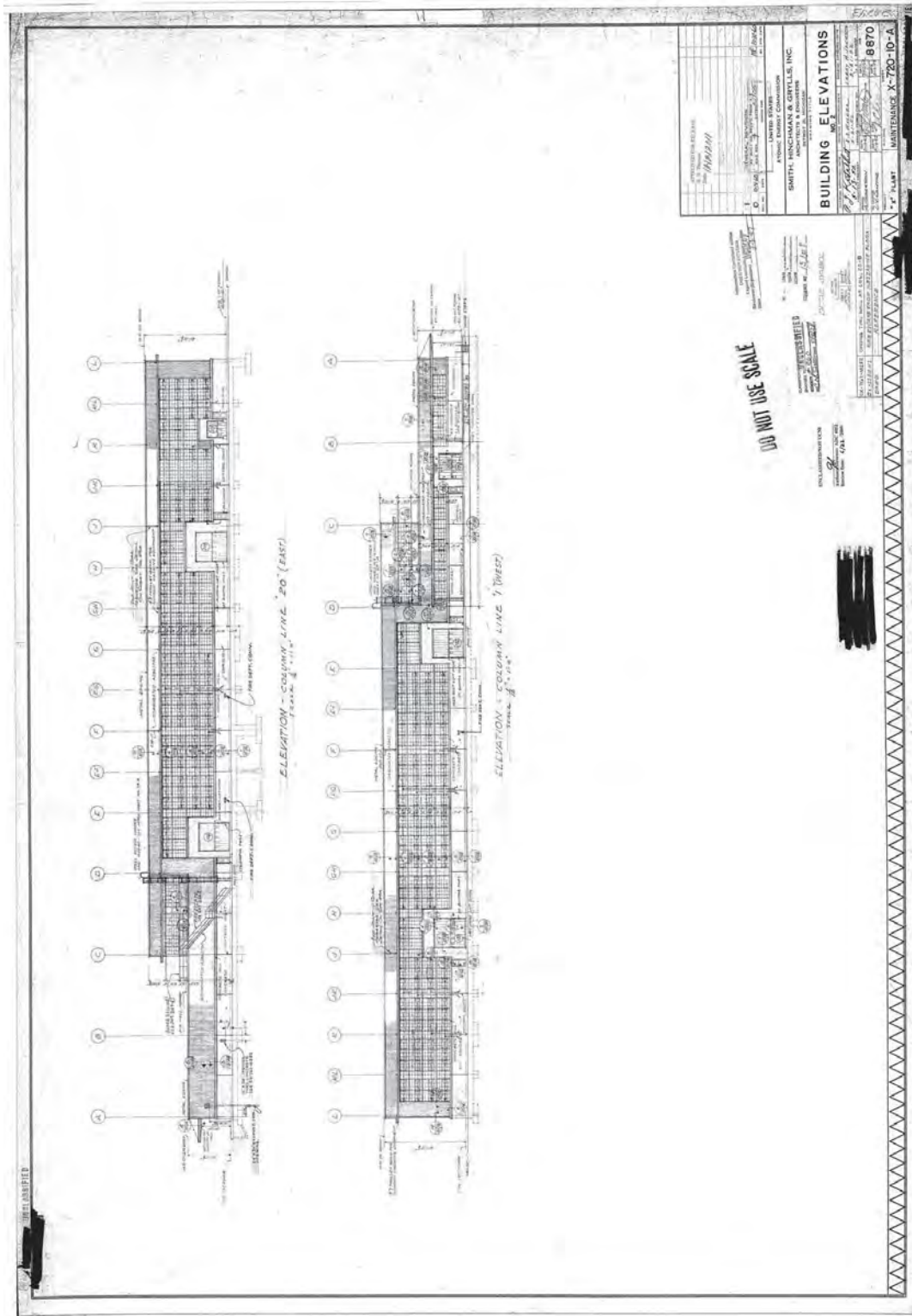


Figure 26: Building Elevations

PORTSMOUTH GASEOUS DIFFUSION PLANT, X-720 MAINTENANCE
AND STORES BUILDING
HAER No. OH-142-Y
(Page 20)

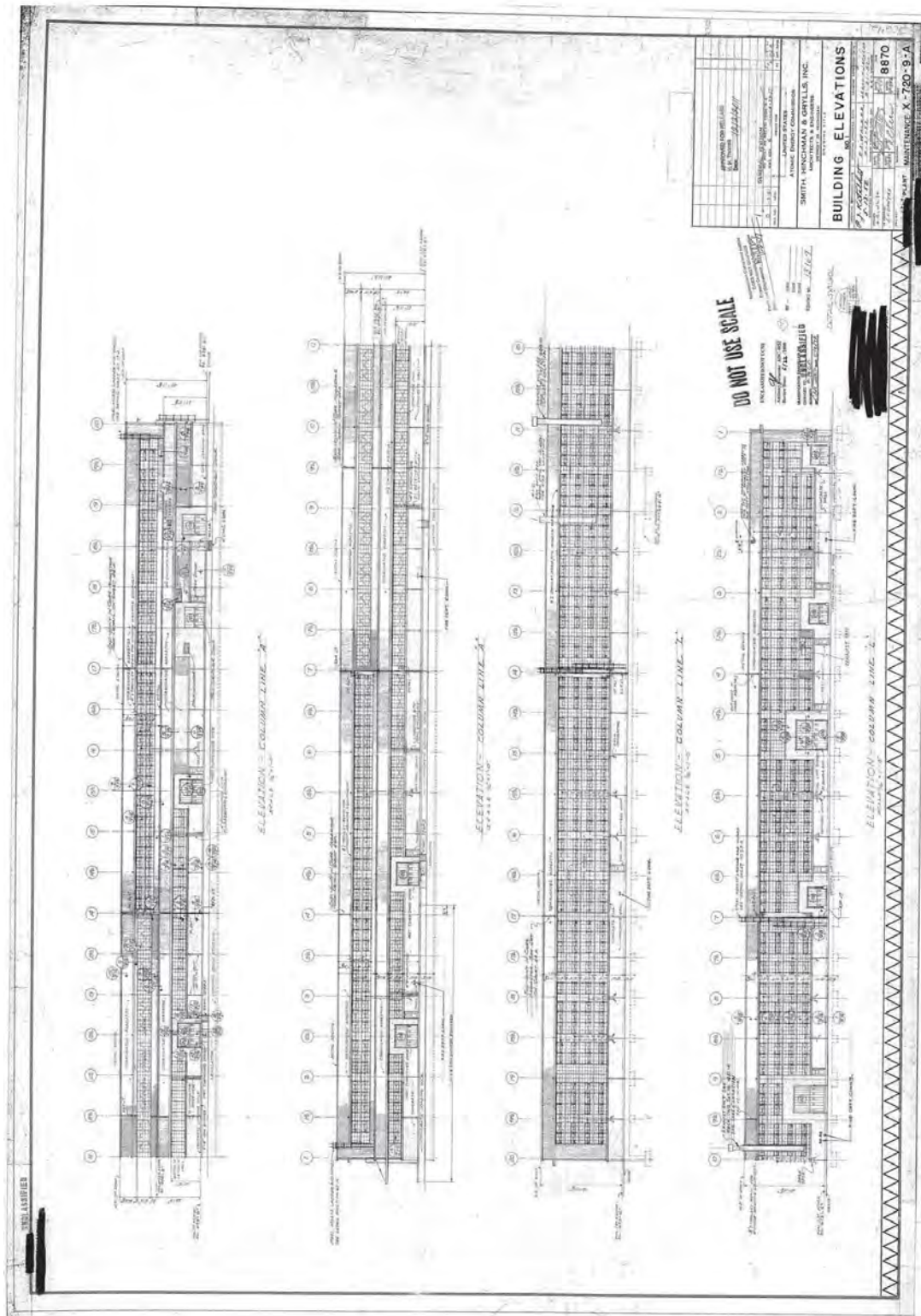


Figure 27: Building Elevations

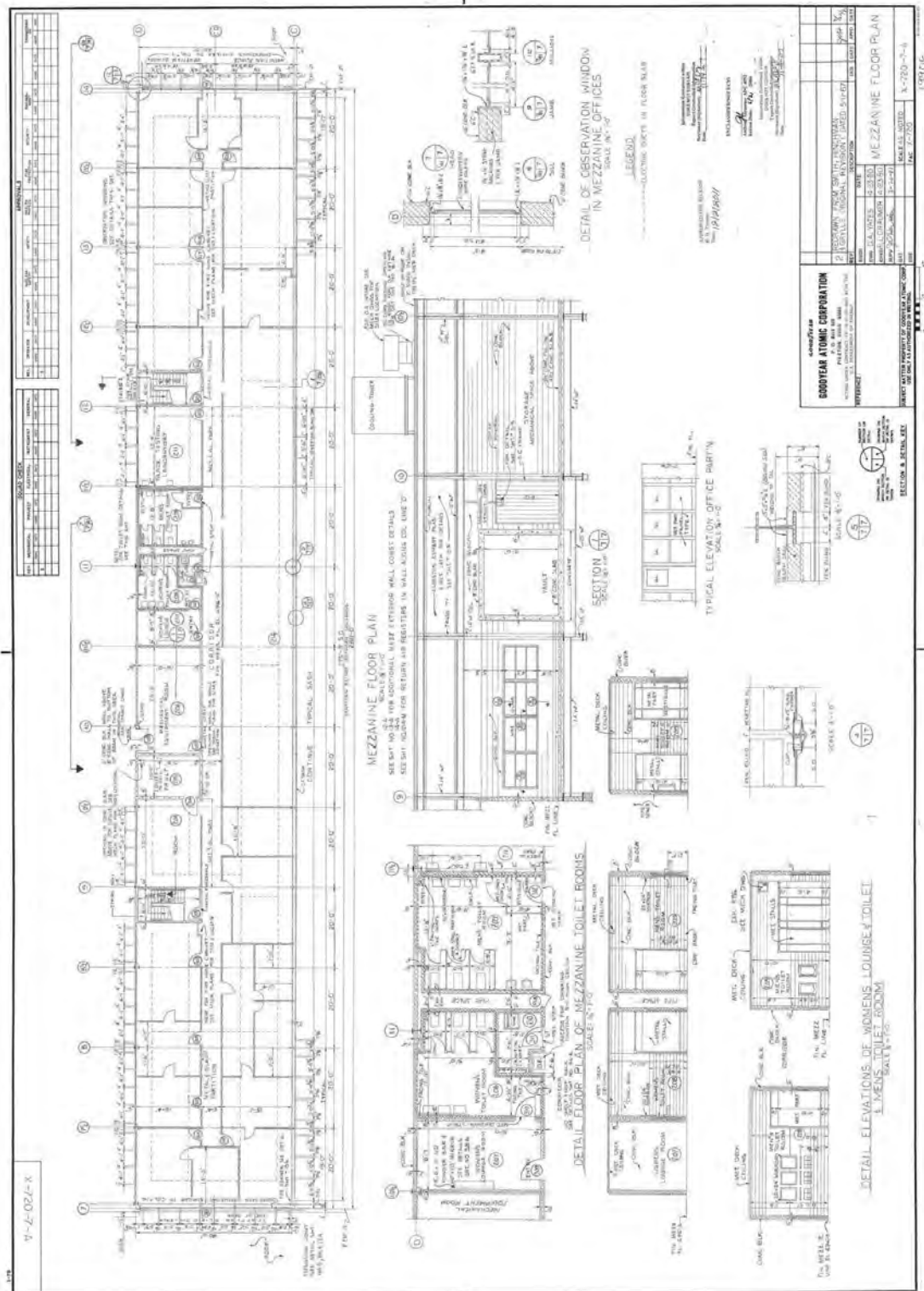


Figure 28: Mezzanine Floor Plan

PORTSMOUTH GASEOUS DIFFUSION PLANT, X-720 MAINTENANCE
AND STORES BUILDING
HAER No. OH-142-Y
(Page 22)

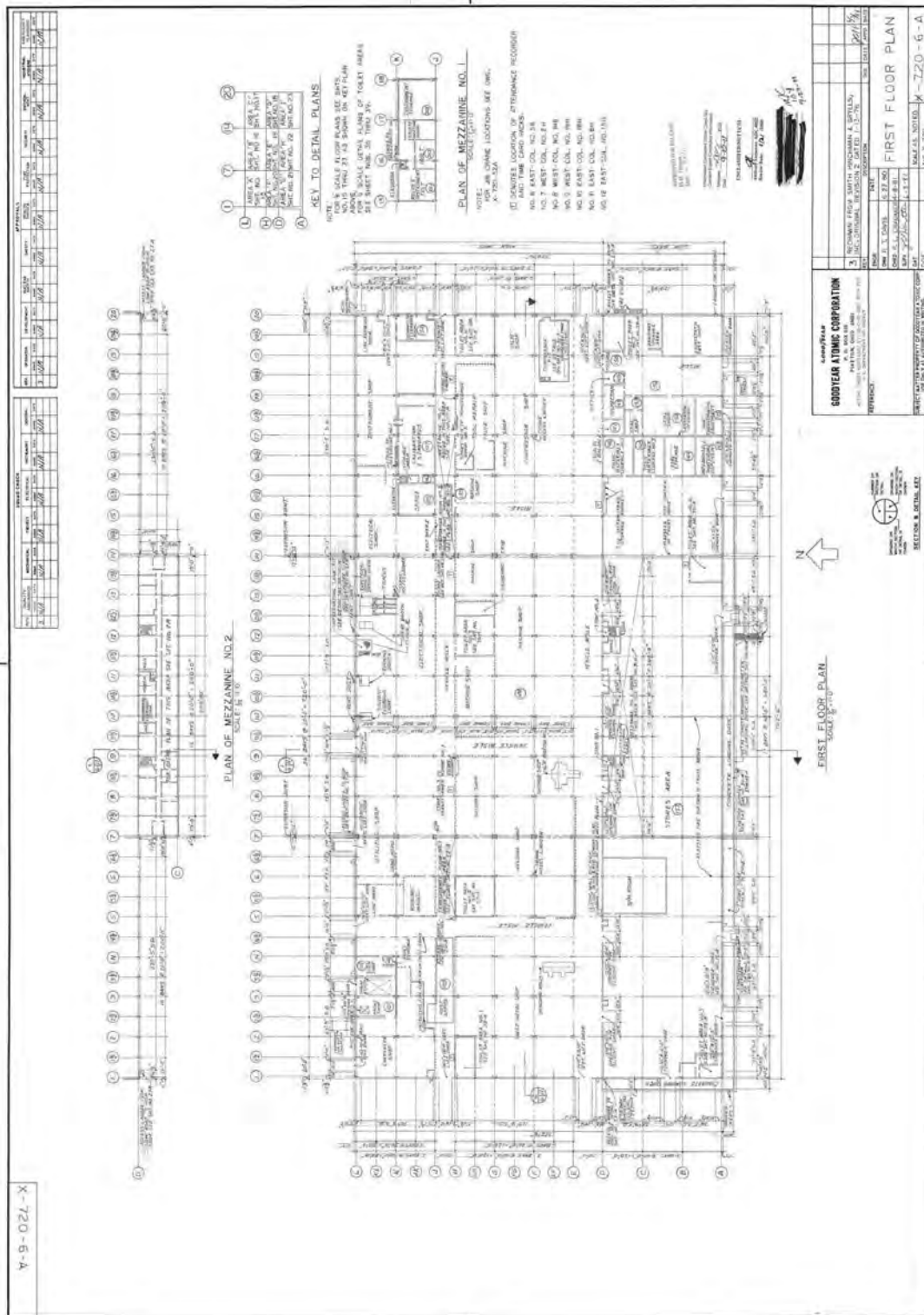


Figure 29: First Floor Plan

INDEX OF DRAWINGS

NO.	TITLE	OF	DRAWING
1	GENERAL NOTES	1	
2	GENERAL NOTES	2	
3	GENERAL NOTES	3	
4	GENERAL NOTES	4	
5	GENERAL NOTES	5	
6	GENERAL NOTES	6	
7	GENERAL NOTES	7	
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29	GENERAL NOTES	29</	

Figure 30: Plot Plan and Index