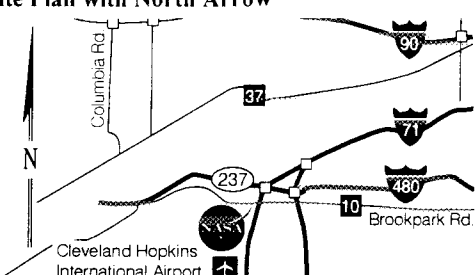


OHIO HISTORIC INVENTORY

1. No. CUY-4608-15
2. County Cuyahoga
4. Present Name(s) NASA Lewis Research Center Propulsion Systems Laboratory
5. Historic or Other Name(s) Building 64, 65, 66, 67, 68, 69, 70, 73, 74, 75, 76, 95, 96, 97, 123, 124, 125, 126, 144

6. Specific Address or Location Complex is located on block defined by Walcott, Westover, Durand, and Moffett roads. Central Area
16. Thematic Association(s) National aeronautic and space programs
17. Date(s) or Period 1951-57
17b. Alteration 1964, 1972, 1980

6a. Lot, Section or VMD
7. City or Village If Rural, Township & Vicinity Cleveland
8. Site Plan with North Arrow



18. Style or Design
18a. Style of Addition or Elements(s)
19. Architect or Engineer
19a. Design Sources

20. Contractor or Builder Hunkin-Conkey, Cleveland, OH (64)(cont'd)
21. Building Type or Plan
22. Original Use, if apparent technical facility

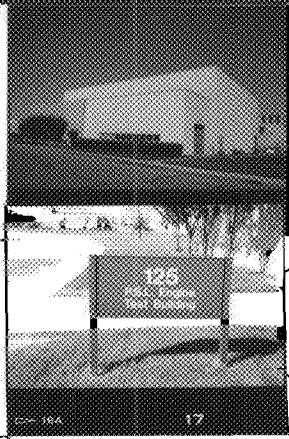
23. Present Use technical facility
24. Ownership Public [X] Private [ ]
25. Owner's Name & Address, if known United States of America NASA Lewis Research Center 21000 Brookpark Road Cleveland, OH 44135

26. Property Acreage
27. Other Surveys in Which Included
28. No. of Stories
29. Basement? Yes [X] No [ ]

30. Foundation Material concrete
31. Wall Construction steel frame: masonry
32. Roof Type & Material flat, built-up
33. No. of Bays Front Side
34. Exterior Wall profiled metal siding, brick
35. Plan Shape irregular
36. Changes (Explain in #42) Addition [X] Altered [ ] Moved [ ]

37. Window Types
38. Building Dimensions entire block
39. Endangered Yes [ ] No [X]
40. Chimney Placement
41. Distance from and Frontage on Road varies from 150' to ~30'

42. Further Description of Important and Exterior Features (Continue on reverse if Building 66, the PSL Access Building, is a two-story, T-shaped plan building with a concrete foundation and flat roof. The building is clad with horizontal profiled metal siding. The main entrance to this building is centrally located on the west facade, which faces onto Walcott Road. This entry consists of a set of metal doors with glass insets with a boxed metal canopy above. A concrete stoop is located in front of the entry. Two spans of windows flank this entry. These windows are multi-paned factory-type windows, some of which are glazed with clear glass while others are filled with frosted or opaque glass. The (cont'd)



43. History and Significance (Continue on reverse if necessary) The Lewis Research Center was established in 1941 as the Aircraft Engine Research Laboratory of the National Advisory Committee on Aeronautics. The AERL served as the propulsion research center of NACA until 1958 when the lab became part of the newly-formed National Aeronautics and Space Administration. As a part of this organization, the LeRC has continued its aeronautic research, (cont'd)

44. Description of Environment and Outbuildings (see #52) The PSL Complex occupies an entire block within the Central Area. Parking is permitted on the north and south sides of the complex at designated sites. Areas of lawn are located on the Walcott and Durand Road sides. The cooling towers are located across Walcott Road in a remote area near Abram Creek Valley.

45. Sources of Information Plans of Buildings and Structures, NASA LeRC Real Property Records, NASA LeRC, Real Property Division Overall Cultural Resource Reconnaissance Survey of NASA Lewis Research Center, Cleveland, Ohio, Gray & Pape, 1996 (Cont'd)
46. Prepared by Debra A. McClane
47. Organization Gray & Pape, Inc.
48. Date Recorded in Field May, 1996
49. Revised by 50a. Date
50b. Reviewed by

1. No. CUY-4608-15
2. County Cuyahoga
4.5. Present or Historic Name NASA LeRC Propulsion Systems Laboratory Complex
6. Specific Address or Location occupies the entire block defined by Walcott, Westover, Durand, and Moffett roads, Central Area

**51. Condition of Property**

- Excellent       Ruin  
 Good/Fair       Destroyed/Burned  
 Deteriorated
- Date \_\_\_\_\_

**52. Historic Outbuildings and Dependencies**  
Barn Type(s)

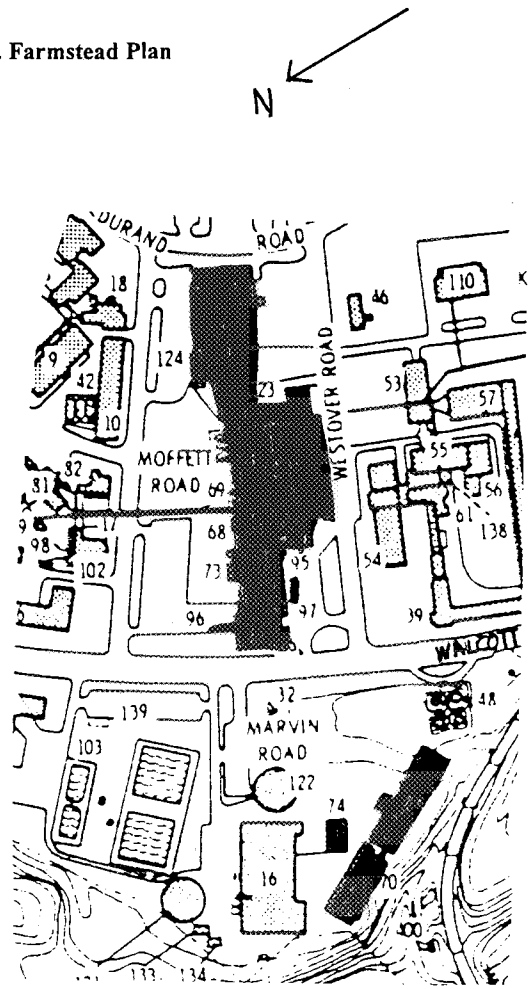
- Corn Crib or Shed       Smoke House       Privy        
 Summer Kitchen       Spring House       Garage        
 Silo       Ice House        
 Designed landscape

**53. Affiliated OAI Site** \_\_\_\_\_ and \_\_\_\_\_ multiple

Archaeological Features:    Observed      Expected on Basis of Archival Research

Well	_____	_____
Privy	_____	_____
Cistern	_____	_____
Foundation	_____	_____
Structural Rubble	_____	_____
Formal Trash Dump	_____	_____
Other	_____	_____

**54. Farmstead Plan**



**42. (Cont'd)**

symmetrically arranged facade has a long expanse of windows on the second story. The north facade of this building is clad on the first story with metal panels and on the second story with profiled metal siding. A large span of multi-pane, factory-type windows is located on the second floor. A second floor entrance is located on this facade and is accessed by an exterior metal staircase. The south facade of this building has a cargo door flanked by an entry door and short span of multi-pane windows. The second floor contains a large span of these windows. This building was constructed in 1951 by the Sam W. Emerson Co. of Cleveland, Ohio. (Cont'd)

**43. (Cont'd)**

while also advancing technologies in aerospace propulsion, and space flight systems.

The Propulsion Systems Laboratory is an altitude simulation facility capable of testing full-scale gas turbine engines operating continuously at simulated altitudes up to 70,000 feet and simulated velocities up to Mach 3.0. After components are tested at other facilities at the center, complete engines are tested at the PSL. The facility consists of two engine test cells, which measure 24' in diameter and 38' in length. Flight simulation is achieved by closely controlling test chamber altitude as well as the inlet-air pressure and temperature, so as to match flight conditions. These test chambers are capable of testing large-scale airbreathing engine systems under controlled simulated altitude, temperature, and pressure conditions. Modifications to the test chambers, supplying inlet air in limited quantities at temperatures up to 3000 F, allows testing in the hypersonic regime (up to Mach 6.0). The PSL support complex includes central air system equipment, an exhaust-gas cooler, a closed-coupled air temperature conditioning plant, and a cooling tower water system. System studies in the PSL evaluate engine thrust, fuel consumption, airflow, stall limits, blowout limits, temperature, pressure, fuel distortion and starting characteristics. (cont'd)

**44. (Cont'd)**

3. Roll 3 Frames 7, 8, 10, 11, 14  
Roll 6 Frames 2, 3, 4

Photographs provided by NASA: C-90-09311, C-90-09295, C-90-09352, cutaway schematic, C-79-4008, C-68791

5. Central Air Building; PSL Altitude Chambers (2); PSL Access Building; PSL Primary Coolers (2); PSL Secondary Cooler; PSL Tie Lines; PSL Cooling Tower No. 3; Service Support Building (Control Components Laboratory); PSL Cooling Tower Water Pump Building; Substation "J"; PSL Combustion Air Heaters (3); PSL Dessiccant Air Dryer; PSL Fuel Storage Building; PSL Oxidant Storage Building; PSL Primary and Secondary Cooler; PSL Heater Building; PSL Engine Test Building; PSL Cooling Tower No. 6; PSL Turbo-Expander No. 2.

20. Treadwell Construction (65); Sam W. Emerson Co., Cleveland, Ohio (66); R. Hansen Co., Cleveland, Ohio (Foundation at 70; 74); Foster Wheeler (Cooling Tower at 70); John G. Taubman (73); Pittsburgh-Des Moines Steel Company (123); Neville Island, Pittsburgh, PA (123); Gillmore-Olsen, Cleveland, OH (124; 125); Fluor Corporation, Santa Rosa, CA (126); Feldman Mechanical, Cleveland, OH (144). Contractors working on Substation "J," Building 75 included: Westinghouse Corp., Collier Construction Co., General Electric Co., Phillips Electric Co., and Hansen Co.

42. Building 65, the PSL Altitude Chambers (2), connects to the eastern end of Building 66. This building is a two-story, concrete structure that is rectangular in plan. Spans of multi-pane, factory-type windows are located on the north and south facades on the second floor level. Some windows are also located on the first floor, but these are obscured by a series of large steel pipes. This building was constructed between 1949 and 1952 by Treadwell Construction Co. and consisted of two steel tanks supported on concrete foundations.

Building 97, the PSL Oxidant Storage Building, is a detached shed like structure. It has a concrete foundation and a gable roof covered with interlocking metal. It is clad with vertical metal siding. Windows are located on the north and south facades and are eight-pane. The west facade consists of a large cargo door, while metal entry doors are located on the south and north facades. These doors are covered by thin metal shed roofs. This building was erected in 1964 and measures 50' by 16'.

Building 95, the Desiccant Air Dryer, is a one-story, concrete structure that is square in plan. It appears to be clad with transite panels and has a flat, built-up roof. Strips of factory type windows are located on the west and east sides. A metal entry door is located on the east. Two large dryer tanks are located to the north and south of this building. This building was constructed in 1955.

Building 76, the PSL Combustion Air Heaters, consists of three large steel tanks set on concrete foundations. Two of these heaters were installed in 1952. Building 64, the PSL Central Air Equipment Building, is a large square building that consists of a brick base approximately 6' in height, a concrete sill, and horizontal profiled metal siding above. The building is a one-story structure with a mezzanine and basement level. It was constructed in 1952 by the Hunkin-Conkey Construction Co. of Cleveland. The west facade, which faces onto Westover Road, consists of a long expanse of multi-pane, factory type windows that is centered on the top level and a cargo bay on the western end that is accessed by a concrete ramp from Westover Road. A pedestrian access door is centrally located on this facade and consists of a set of concrete steps and a set of double glass doors with an upwardly curving canopy. Two projecting brick vent stacks are located on the eastern end of this facade flank another overhead cargo door that is also covered with an upwardly curving metal canopy.

Building 123, PSL Primary and Secondary Cooler, is a large pill-shaped steel structure that is connected to Building 125 by way of additional steel pipes. This building includes an exhaust plenum, dry cooler, de-mister and water cooled shell. It was constructed in 1972 by Pittsburgh-Des Moines Steel Company of Pittsburgh.

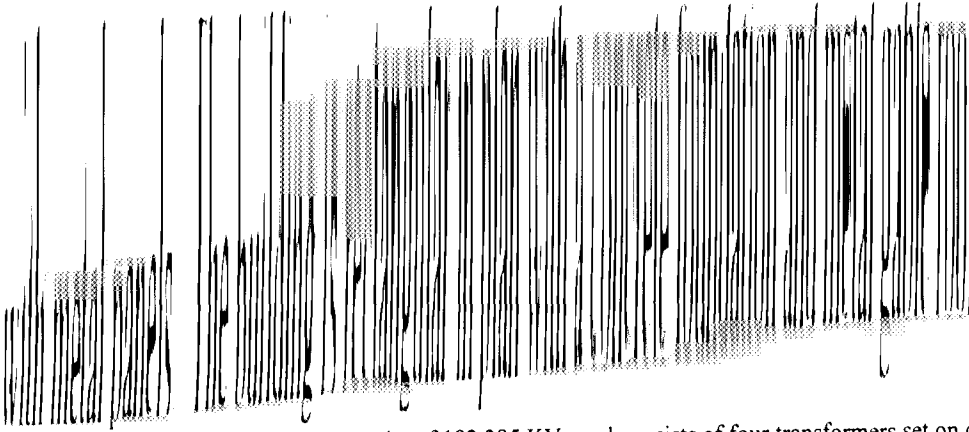
Building 125, PSL Engine Test Building, consists of two units. The front part of the building is two-stories and rectangular in plan with one half clad in brick and one half clad with profiled metal siding. The wall of the brick portion of this building is articulated by brick pilasters. The main entrance to Building 125 is located in this part of the building and consists of a set of double glass doors, glass sidelights and glass transom. The entry is covered by a curved metal canopy. The profiled metal portion of the building has a long strip of multi-paned, horizontally divided windows on the first floor.

The rear unit of the building is completely clad with profiled metal siding with a one-story brick addition on the south side. Two overhead cargo doors are located on the north facade of this building. This part of the building houses two large test chambers.

Building 70, PSL Cooling Tower No.3, is rectangular in plan and three-stories in height. The frame, 10 cell cooling tower rests on a tall concrete foundation with walls of corrugated plastic. The lower portions of these walls are louvered, supported by wooden joists, and covered with screen. Access into the cooling tower is located on the southeast side. Building 70 is joined to Building 126 on the southeast side by a system of catwalks. Building 126, PSL Cooling Tower No. 6, is similar in construction and materials to Building 70. Located on the southeast facade of this building there is a one-story concrete structure that is rectangular in plan. This building appears to function as a pump house. Access into the building is by a single metal door located on the north facade.

42. Building 74, PSL Cooling Tower Water Pump Building, is a one-story structure with a basement level. The building is rectangular in plan with a concrete foundation and flat roof. The walls are clad with transite panels and are punctuated by large multi-paned windows with a concrete sill below. Single metal entry doors are located on the northeast and northwest corners of the building.

Several other structures that are part of the PSL complex: Building 124, PSL Heater Building, is clad with vertical profiled metal siding with an overhead cargo door on the north side. Four tall air intake stacks are located on the west side of this building. Building 73, the Service Support Building, is a steel frame building clad with transite panels. The building formerly served as the High Pressure Pump Station. In 1986, the building received its current name designation. Building 96, the PSL Fuel Storage Building, is a one-story, steel frame structure clad



Building 75, Substation "J," has a capacity of 182,395 KVa and consists of four transformers set on concrete foundations.

Building 144, the PSL Turbo-Expander No. 2, is a one story building constructed of concrete block with a flat roof. It is rectangular in plan with a concrete foundation. It was built in 1978 as part of an open pit originally constructed in the 1950s for the col/warm air piping addition to the PSL complex. The pit has reinforced concrete walls. Building 144 was created by constructing two concrete block walls across the width of this pit and enclosing it. This building serves as a housing for refrigerated air turbo expander no. 2.

Building 69, the PSL Tie Lines, run from the PSL complex across Moffett Road into the Engine Research Building complex. These lines are a series of steel pipes on steel supports. These pipes measure 6' in diameter and run for approximately 510'.

Building 67, the PSL Primary Coolers, are two metal structures set on concrete pads. These were constructed in 1952.

Building 68, the PSL Secondary Cooler, was also constructed in 1952 and is similarly is an all metal structure set on a concrete foundation.

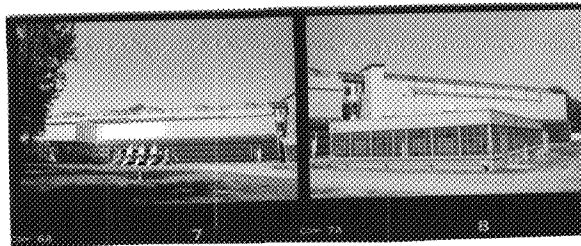
43. Tests evaluate engine calibration, blade flutter, engine/nozzle controls, inlet flow distortion, heat transfer, and advanced materials.

45. Technical Facilities, NASA LeRC, c.1983

Lewis Research Center R&D Facilities, NASA LeRC, 1991.



facing northwest

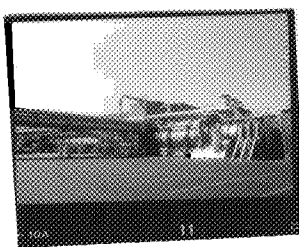


facing west

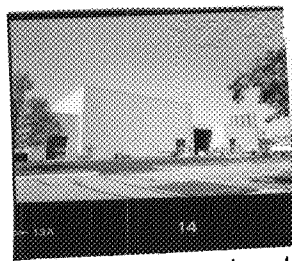
facing west/northwest



facing southwest



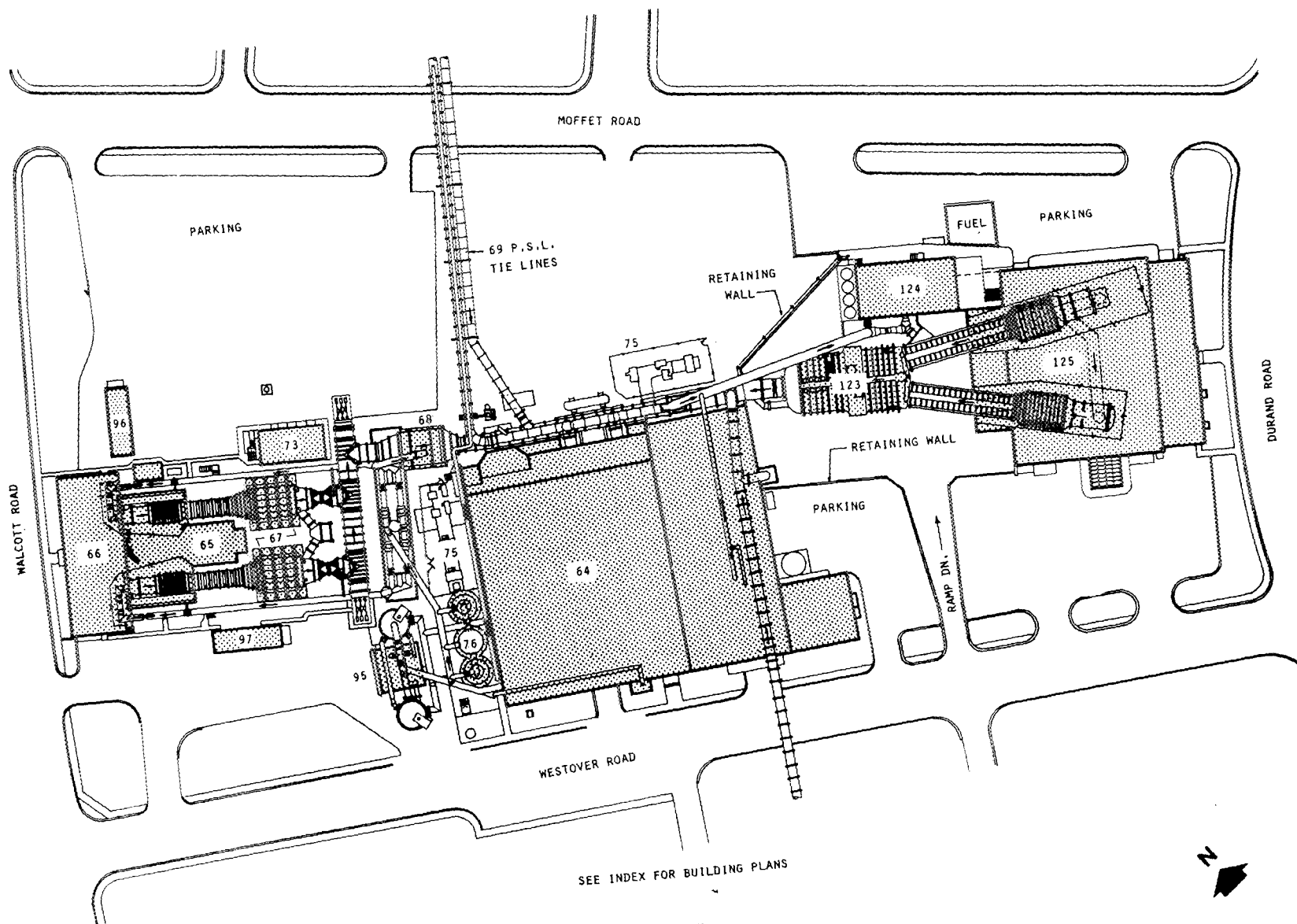
facing south



facing southwest



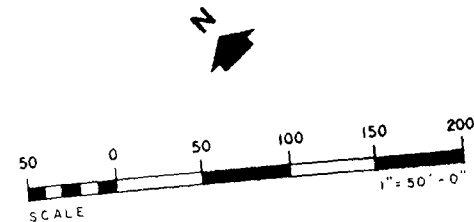
# NASA LEWIS RESEARCH CENTER CLEVELAND, OHIO

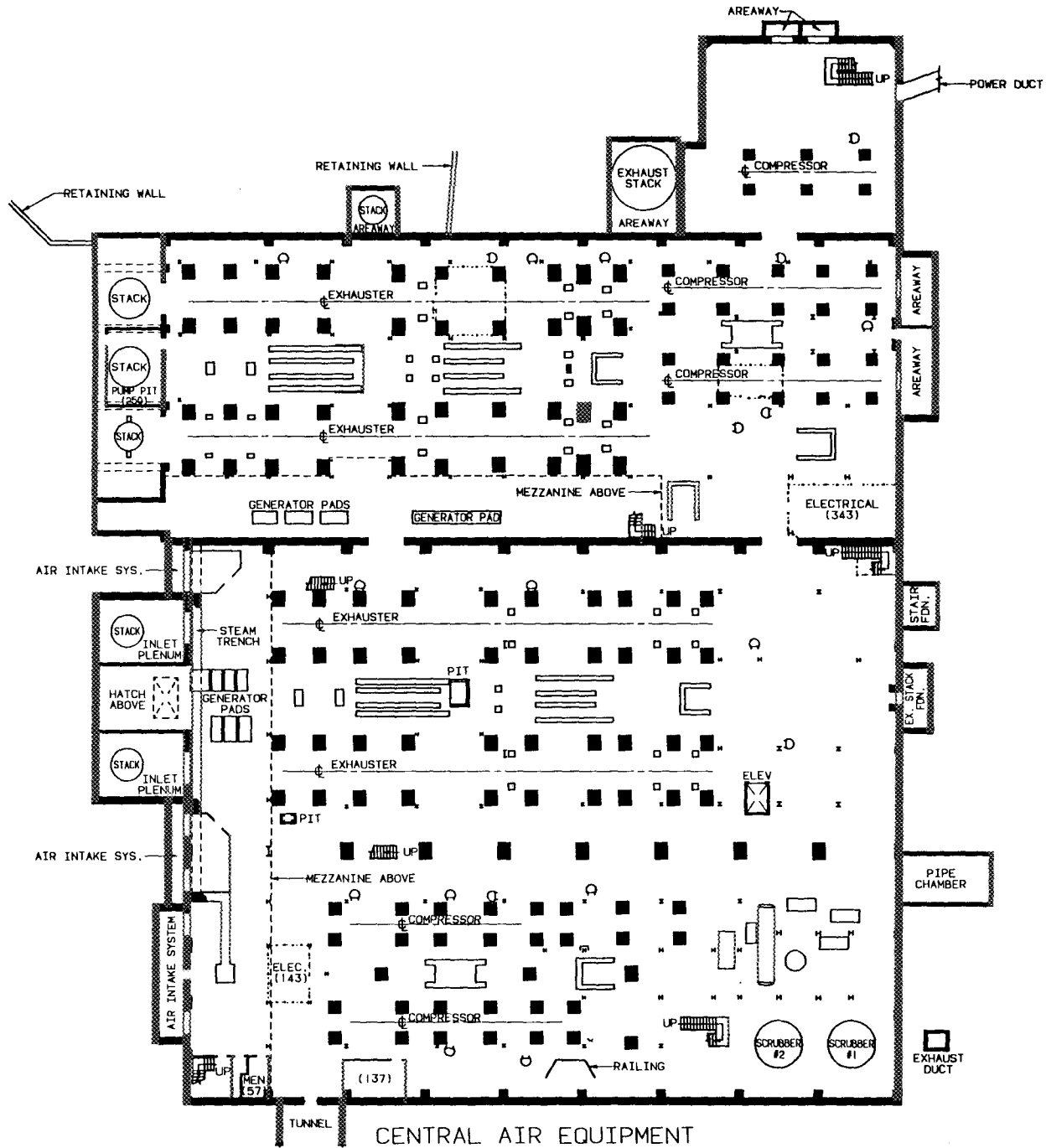


SEE INDEX FOR BUILDING PLANS

PLAN

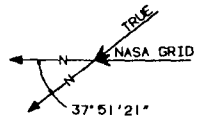
## PROPULSION SYSTEMS LABORATORY GROUP



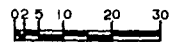


CENTRAL AIR EQUIPMENT  
BUILDING 64  
BASEMENT FLOOR PLAN

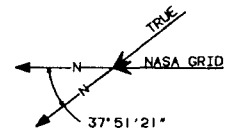
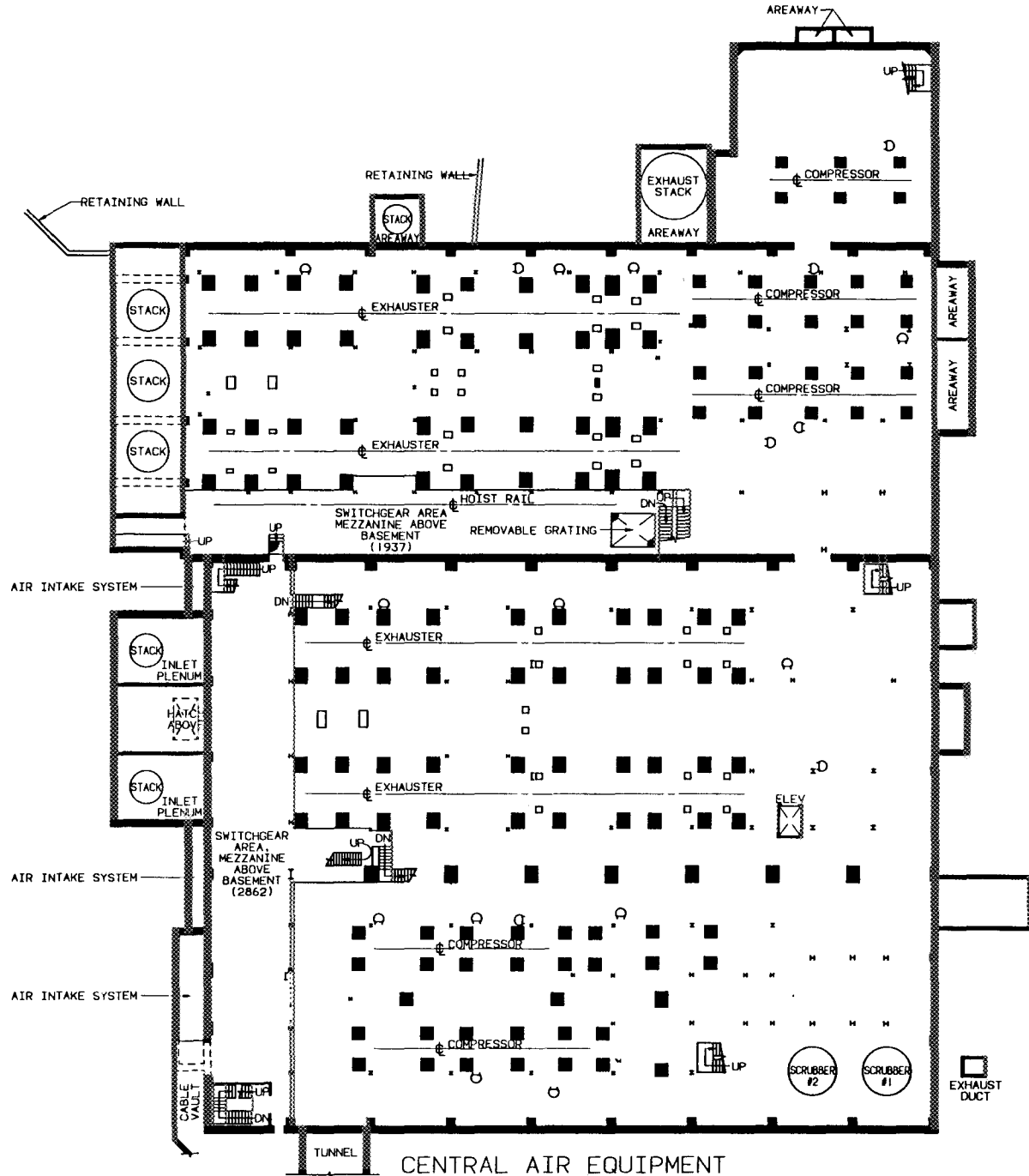
REF DWG CE-111761, CD-116064, CD-112152,  
CE-104748, & CE104701, CF-120886



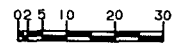
XXX — ROOM NUMBER  
(XXX) — AREA SQ. FT.



GRAPHIC SCALE



XXX — ROOM NUMBER  
{XXX} — AREA SQ. FT.



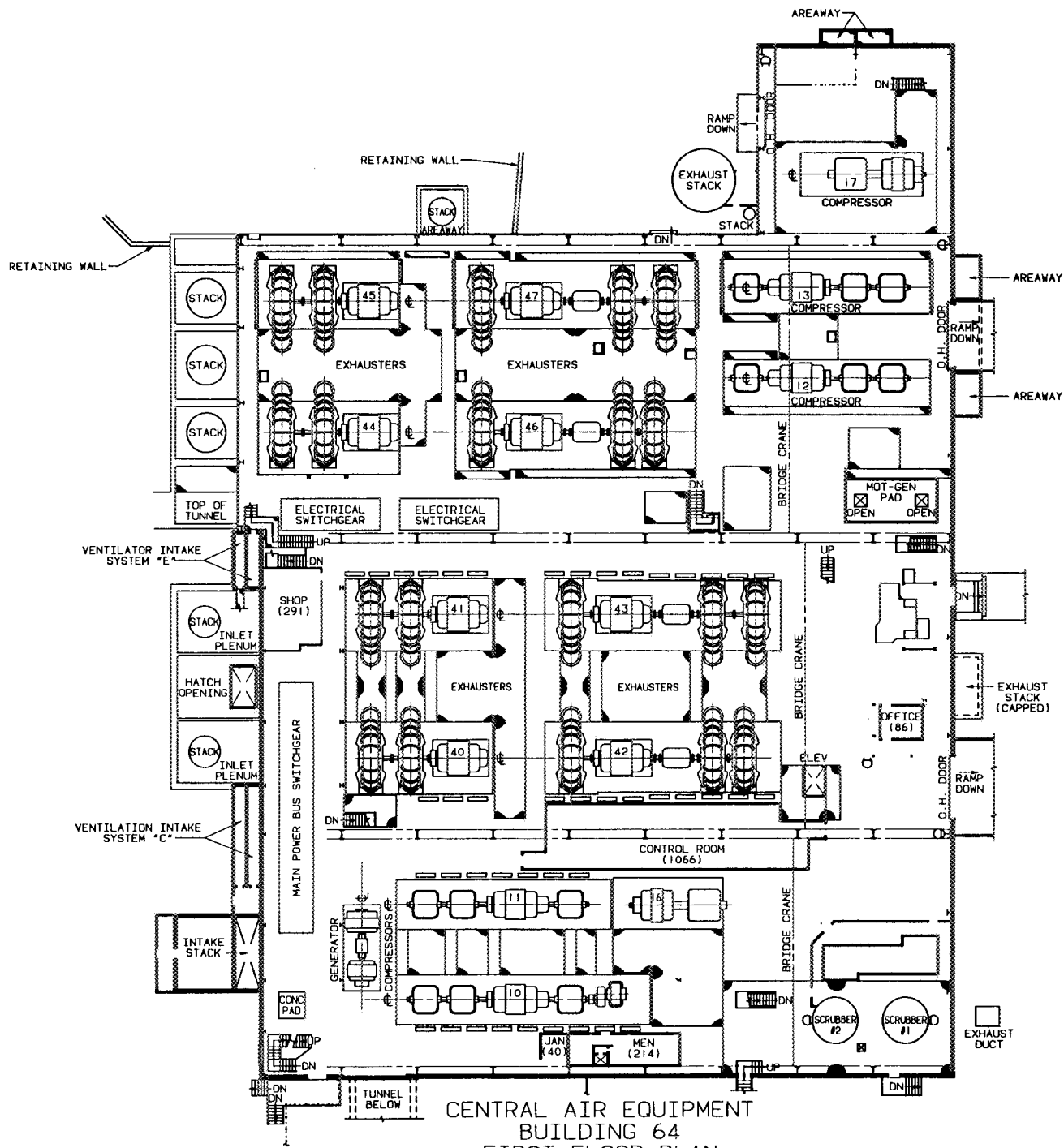
GRAPHIC SCALE

CENTRAL AIR EQUIPMENT  
BUILDING 64  
BASEMENT MEZZANINE FLOOR PLAN

REF DWG CE-111761, CE104704 & CF-120887

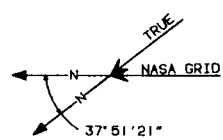
REVISED 03/25/92  
DRAWING IS AVAILABLE ON CADAM



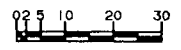


CENTRAL AIR EQUIPMENT  
BUILDING 64  
FIRST FLOOR PLAN

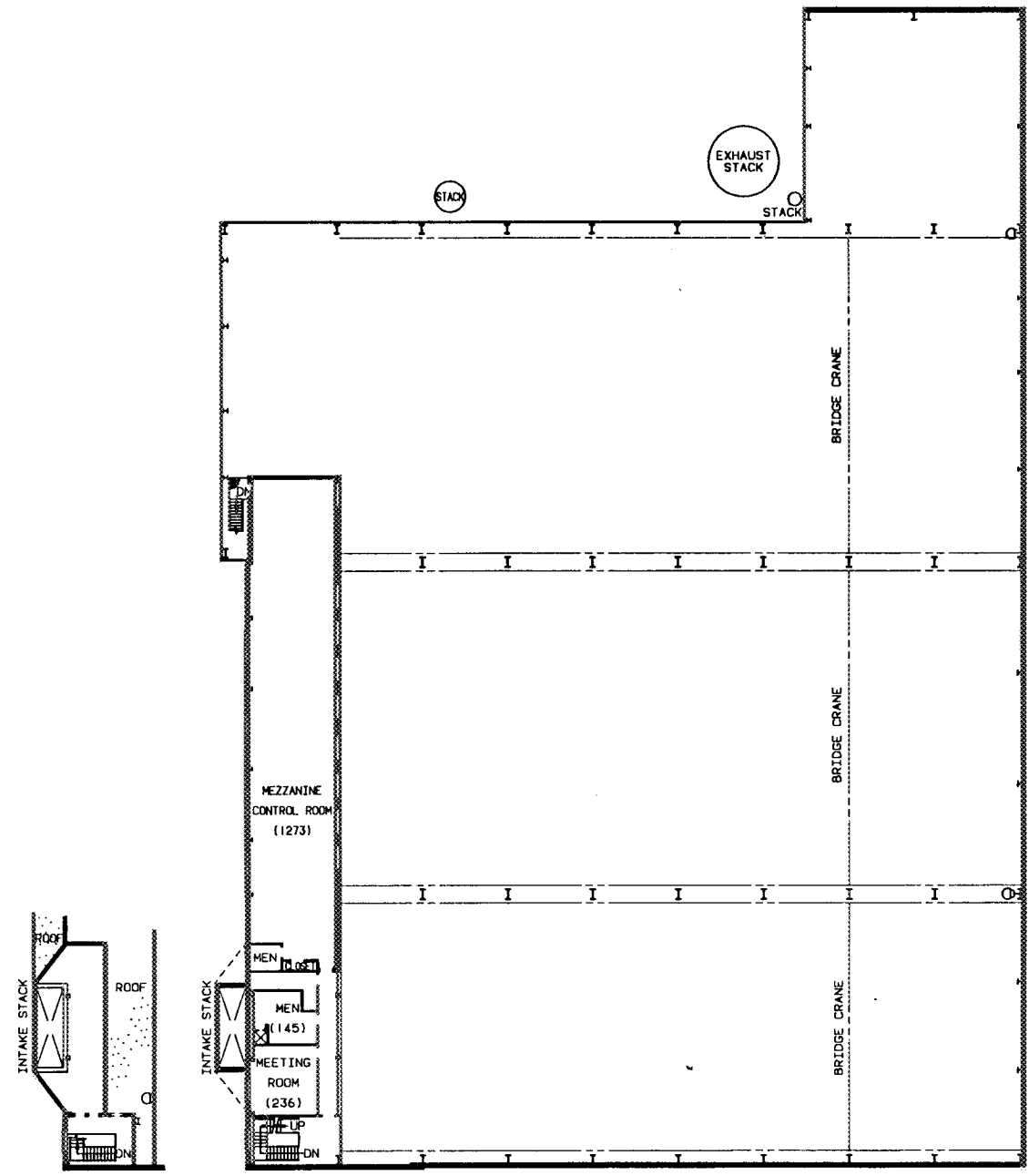
REF DWG CE-111762, CE-104702,  
CD-112177 & CF-120888



XXX — ROOM NUMBER  
(XXX) — AREA SQ. FT.

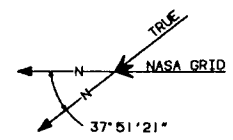


GRAPHIC SCALE

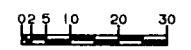


PLAN AT ROOF

CENTRAL AIR EQUIPMENT  
BUILDING 64  
MEZZANINE FLOOR PLAN  
REF DWG CE-111762, CE104704 & CF-120889

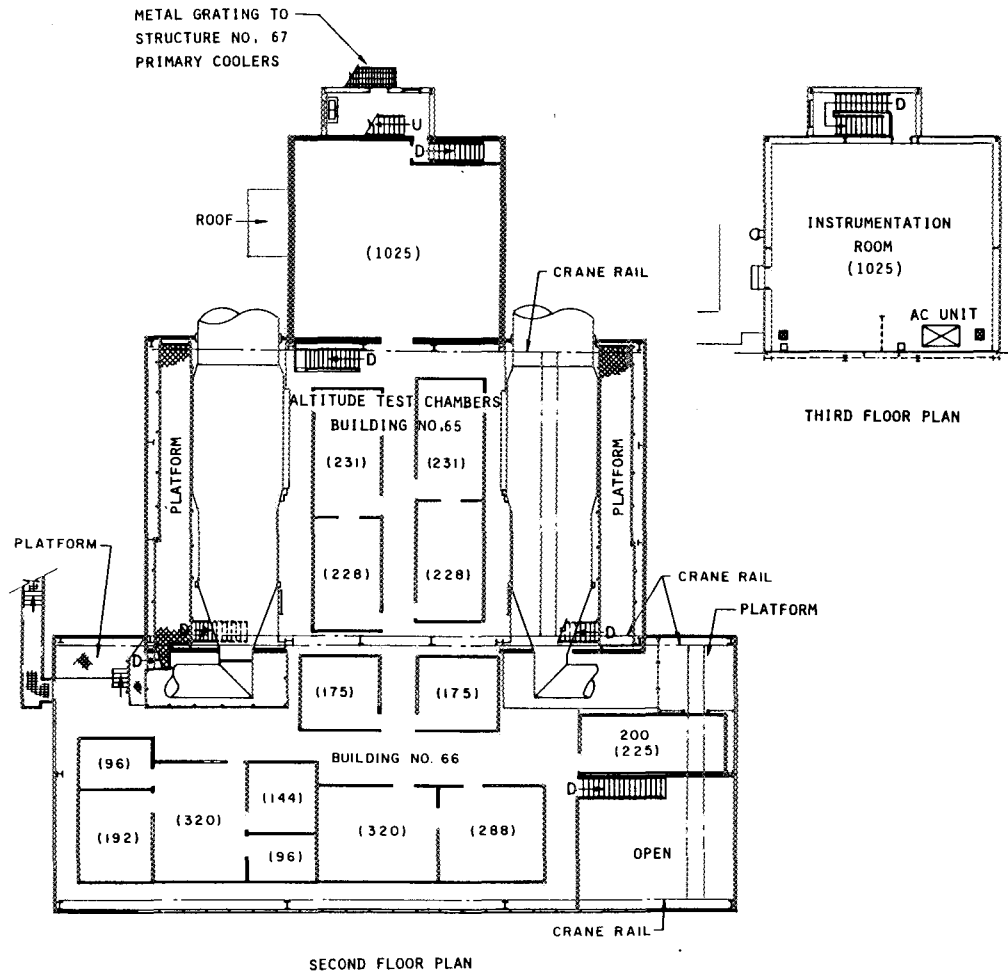
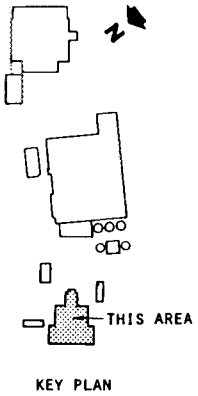


XXX — ROOM NUMBER  
(XXX) — AREA SQ. FT.



GRAPHIC SCALE

# NASA LEWIS RESEARCH CENTER CLEVELAND, OHIO



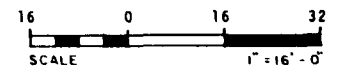
SECOND AND THIRD FLOOR PLANS

REF. DWG. NO. CD-111804, CD-104139 & CD-111828

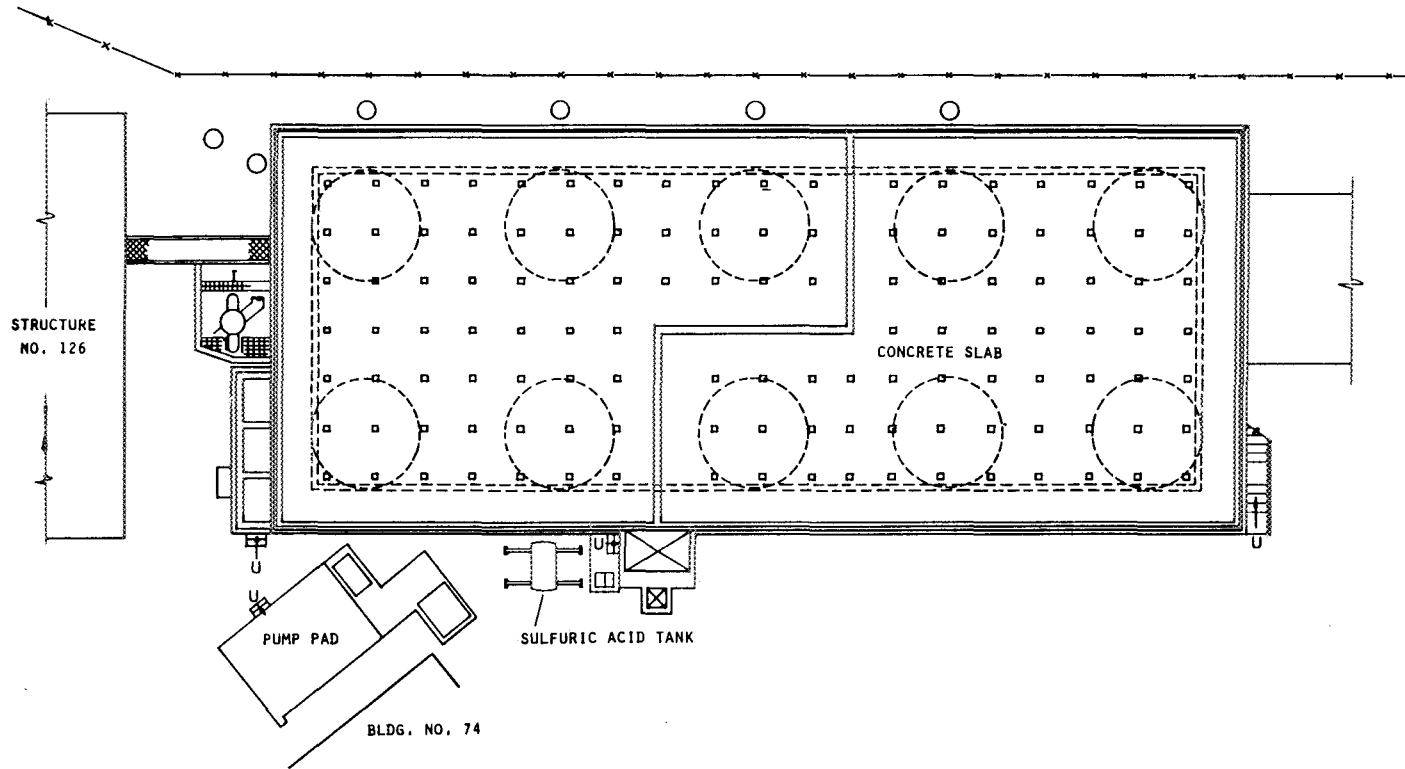
## P.S.L. ALTITUDE CHAMBERS & ACCESS BUILDING

BUILDING NO.  
65 & 66

( ) AREA, SQ. FT.



NASA LEWIS RESEARCH CENTER  
CLEVELAND, OHIO

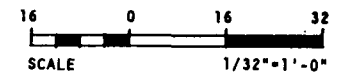


BASIN PLAN  
REF. DWG. NO. CE-104575

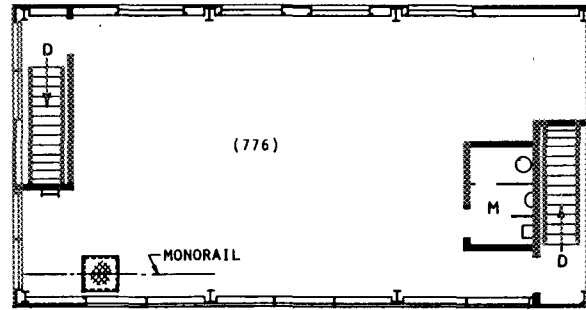
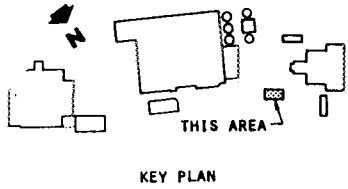
PSL COOLING TOWER NO. 3

STRUCTURE NO.  
70

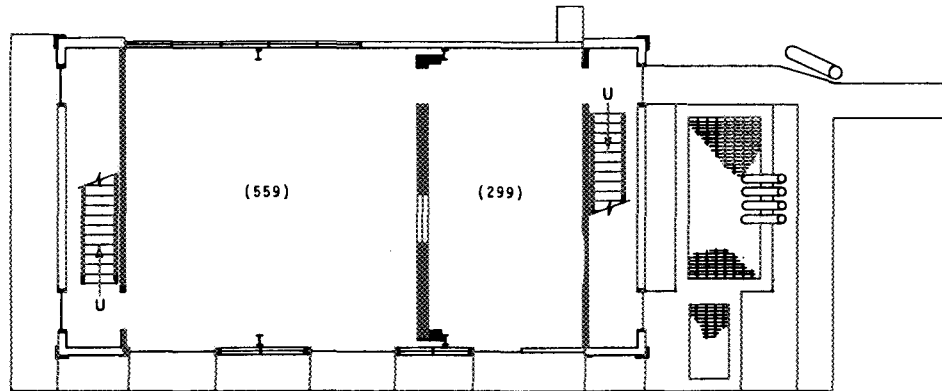
( ) AREA, SQ. FT.



NASA LEWIS RESEARCH CENTER  
CLEVELAND, OHIO



SECOND FLOOR PLAN



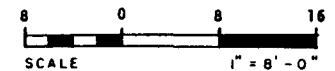
FIRST FLOOR PLAN

FLOOR PLANS  
REF. DWG. NO. CD-111767

CONTROL COMPONENTS LABORATORY

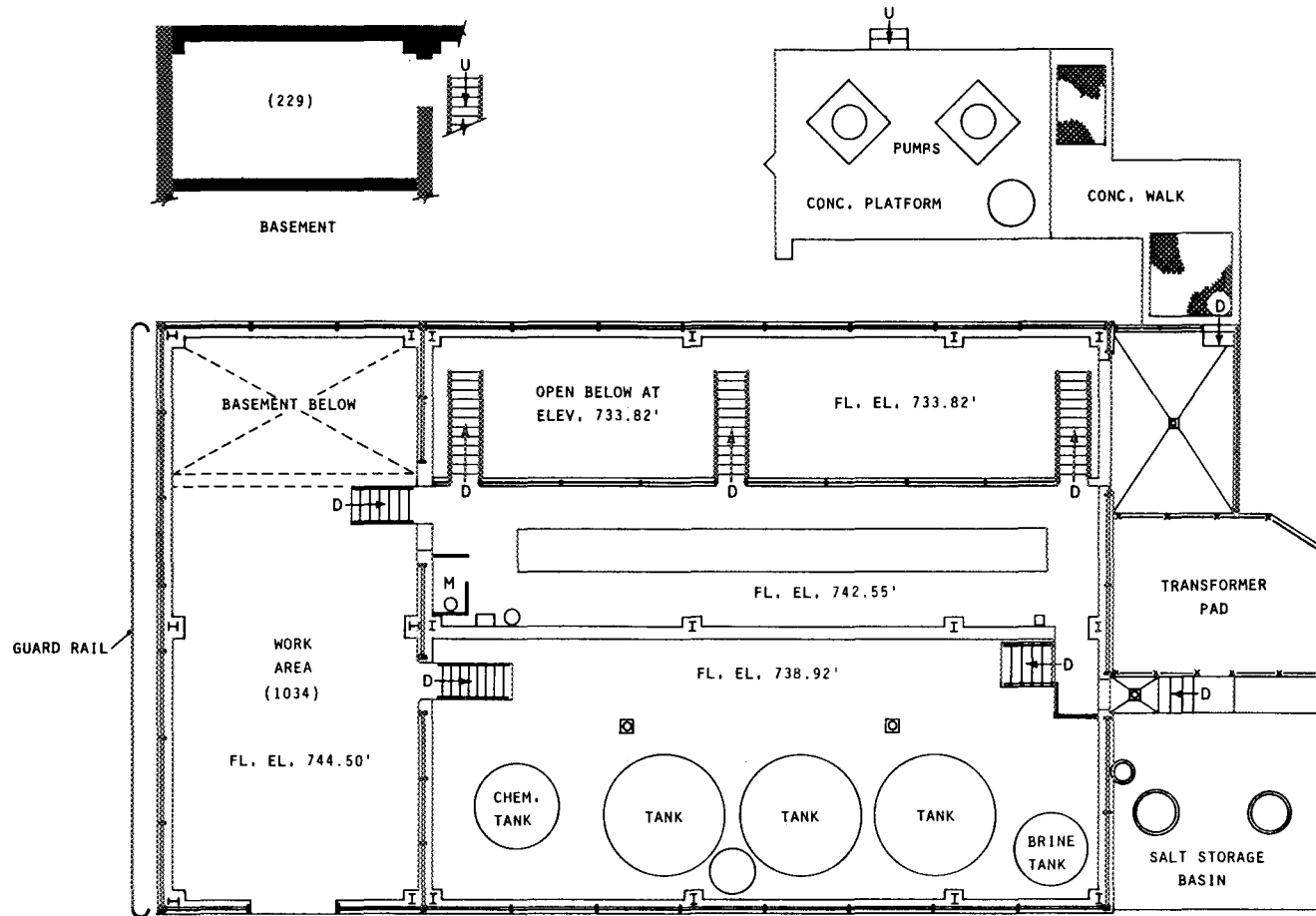
BUILDING NO.  
73

( ) AREA, SQ. FT.



# NASA LEWIS RESEARCH CENTER CLEVELAND, OHIO

not in PSL Group



FLOOR PLAN  
REF. DWG. NO. CE-104579

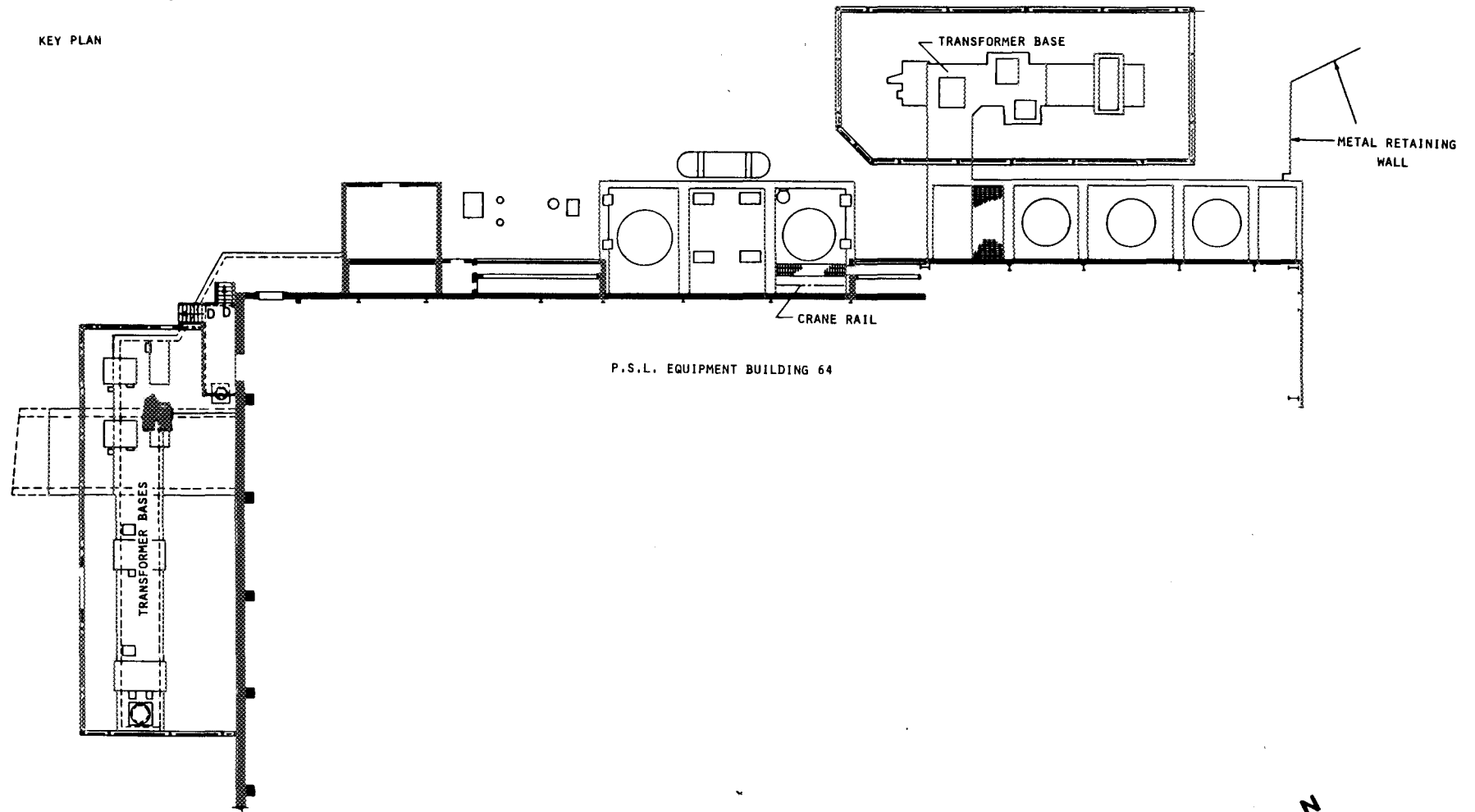
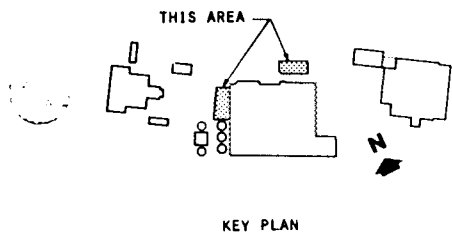
## P.S.L. COOLING TOWER WATER PUMP BUILDING

BUILDING NO.  
74

( ) AREA, SQ. FT.



NASA LEWIS RESEARCH CENTER  
CLEVELAND, OHIO

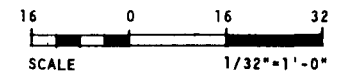


PLAN  
REF. DWG. NO. CF-104401

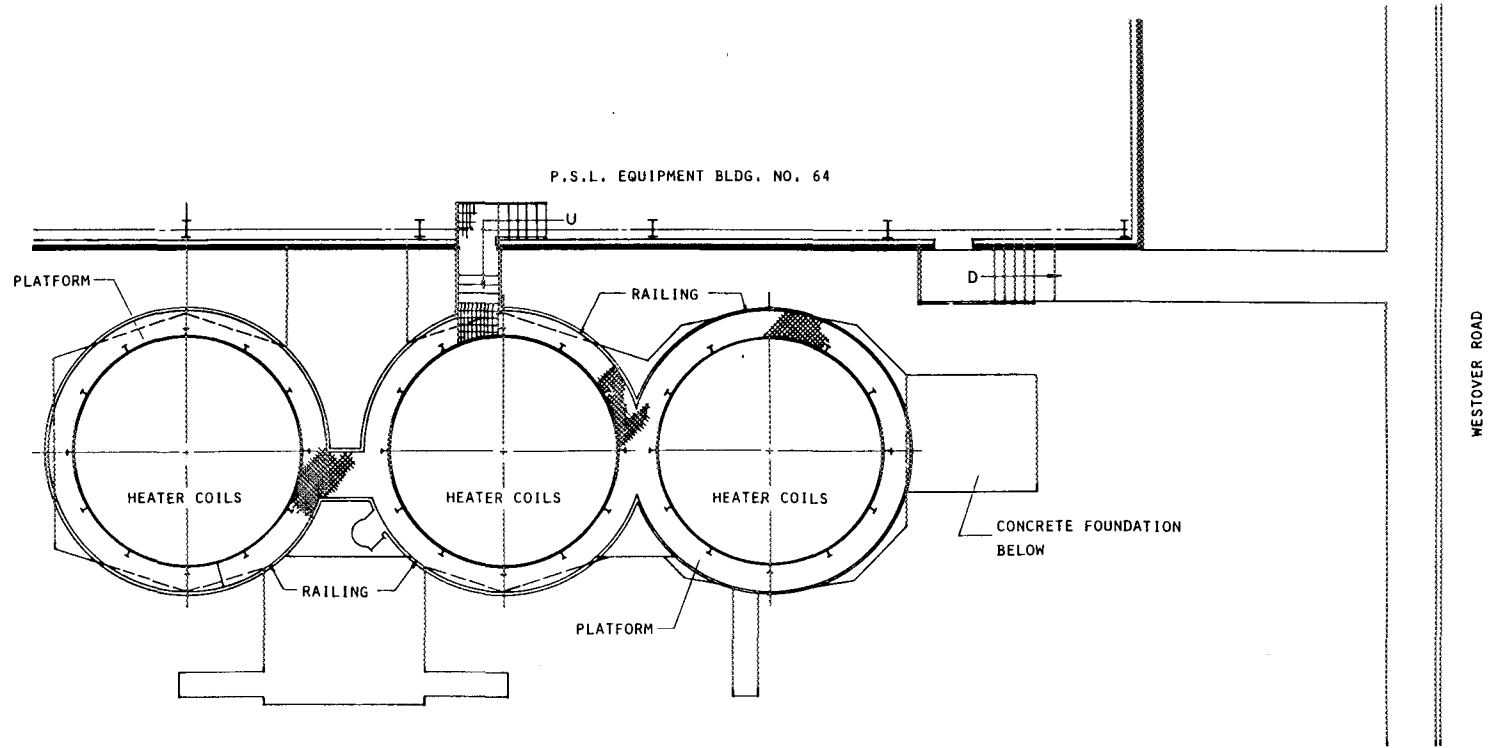
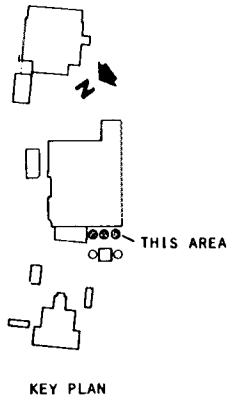
P.S.L. SUBSTATION "J"

STRUCTURE NO.  
75

REVISED JULY 1978



# NASA LEWIS RESEARCH CENTER CLEVELAND, OHIO



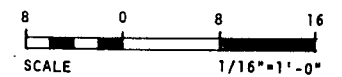
PLAN  
REF. DWG. NO. CD-104042

## P. S. L. COMBUSTION AIR HEATERS (3)

STRUCTURE NO.  
76

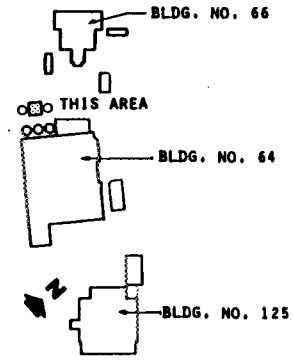


( ) AREA, SQ. FT.

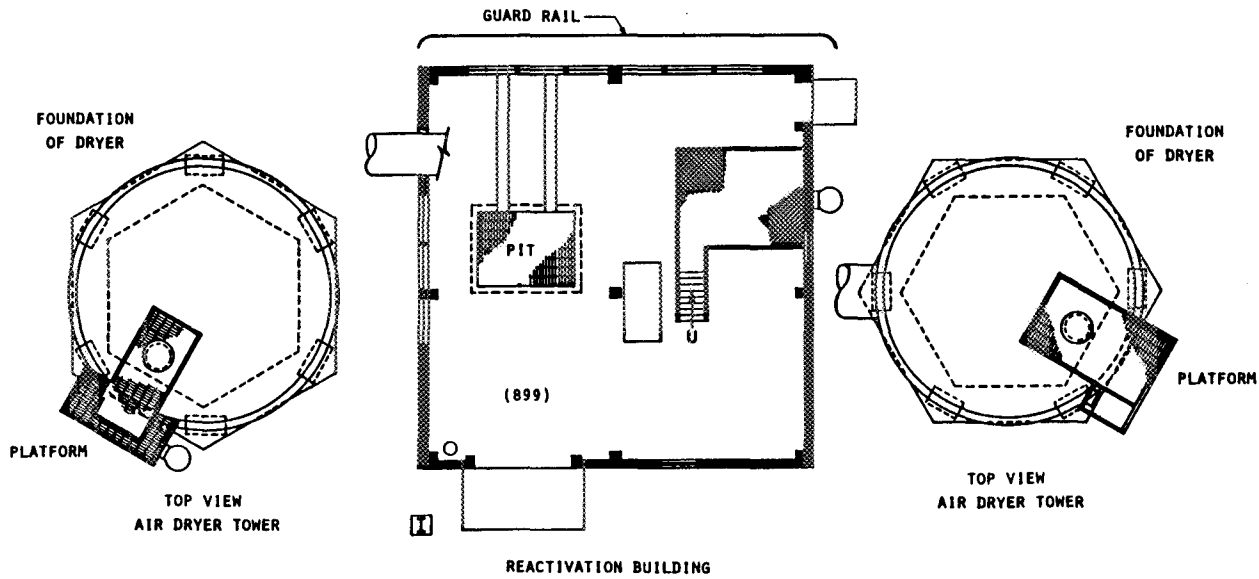
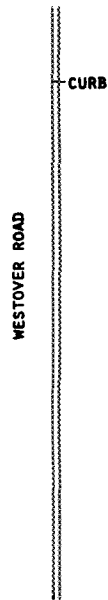




# NASA LEWIS RESEARCH CENTER CLEVELAND, OHIO



KEY PLAN



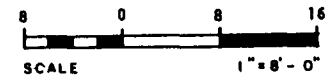
↓  
BLDG. NO. 64

FLOOR PLAN  
REF. DHG. NO. CC-104043

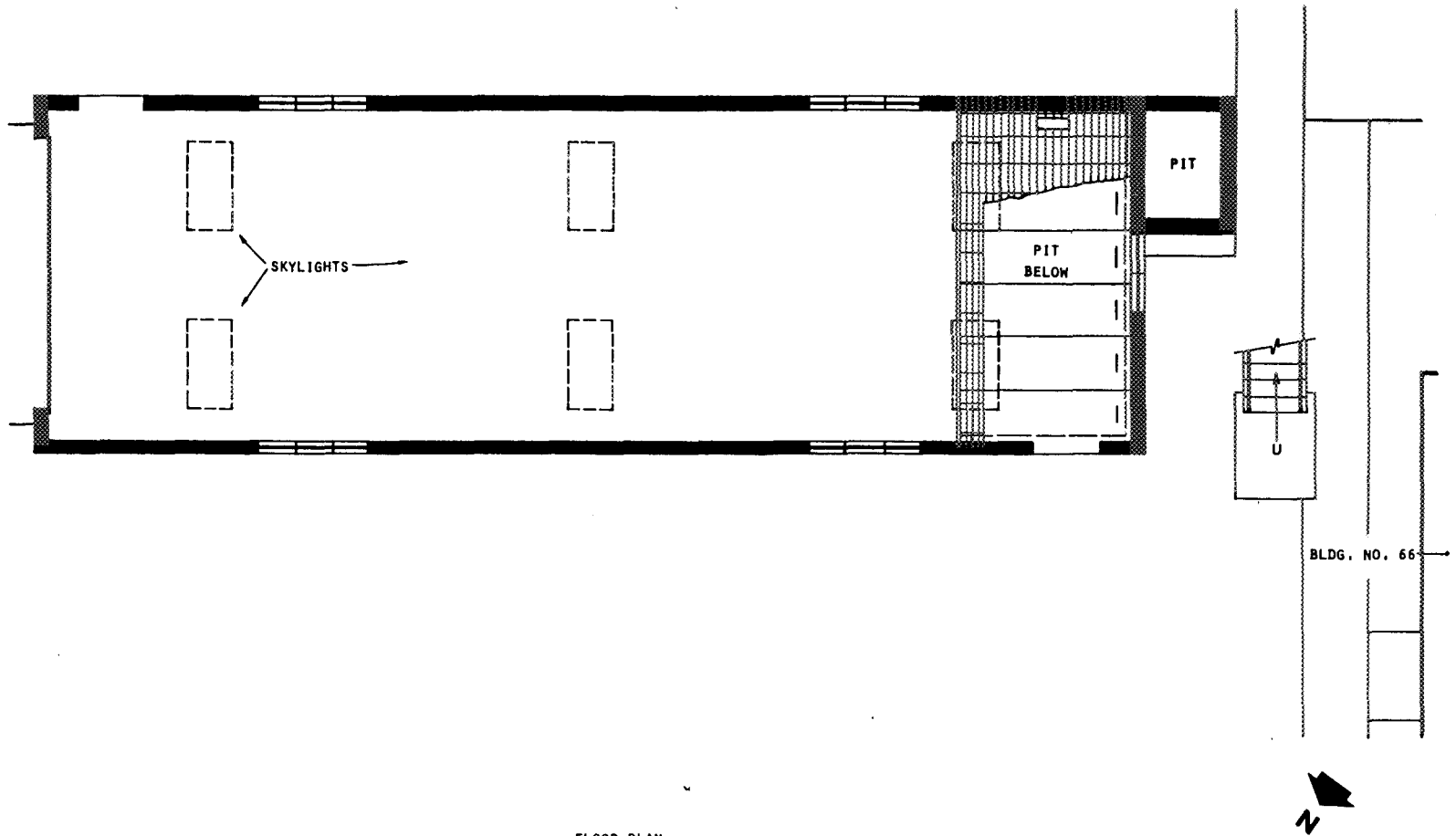
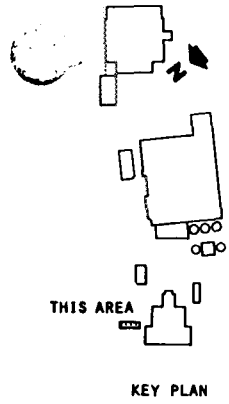
## P.S.L. DESSICANT AIR DRYER

BUILDING NO.  
95

( ) AREA, SQ. FT.



NASA LEWIS RESEARCH CENTER  
CLEVELAND, OHIO

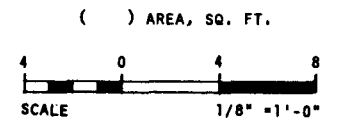


FLOOR PLAN  
REF. DWG. NO. CD-112879

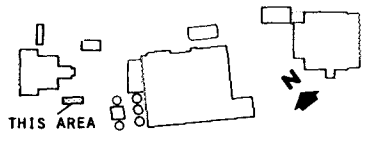
P.S.L. FUEL STORAGE BUILDING

BUILDING NO.  
96

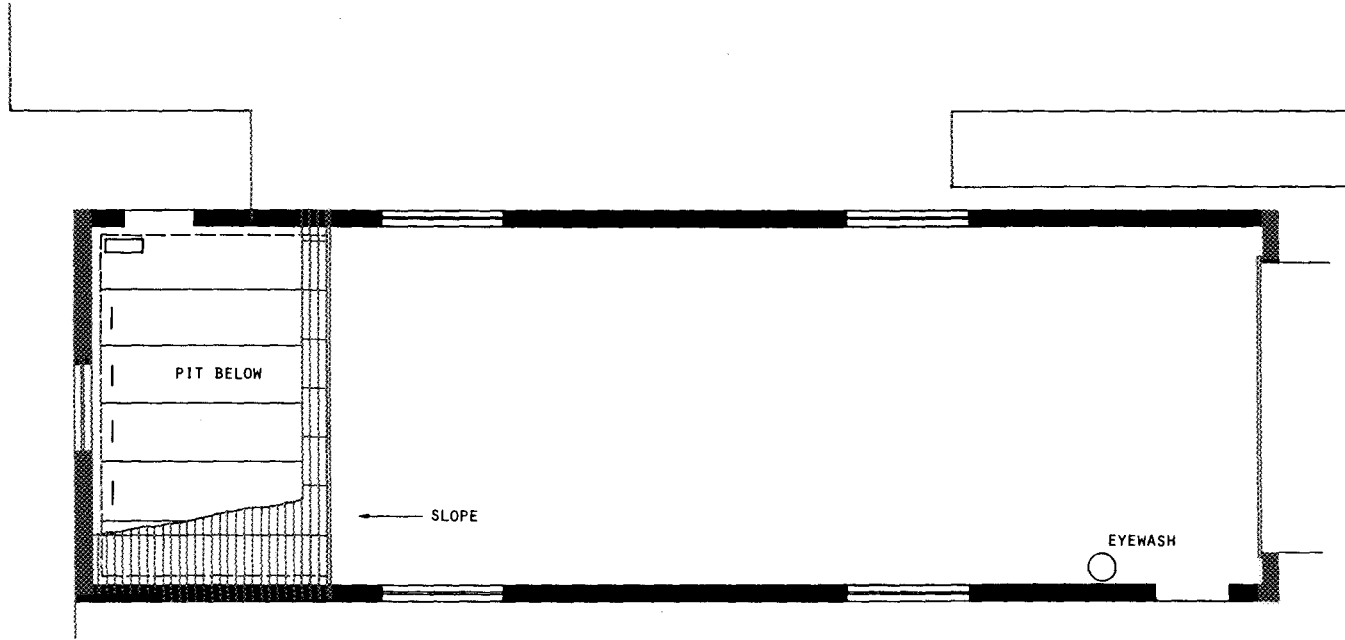
REVISED JULY 1978



# NASA LEWIS RESEARCH CENTER CLEVELAND, OHIO



KEY PLAN

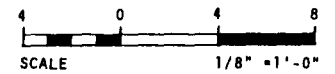
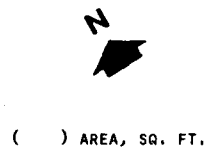


FLOOR PLAN  
REF. DWG. NO. CD-112879

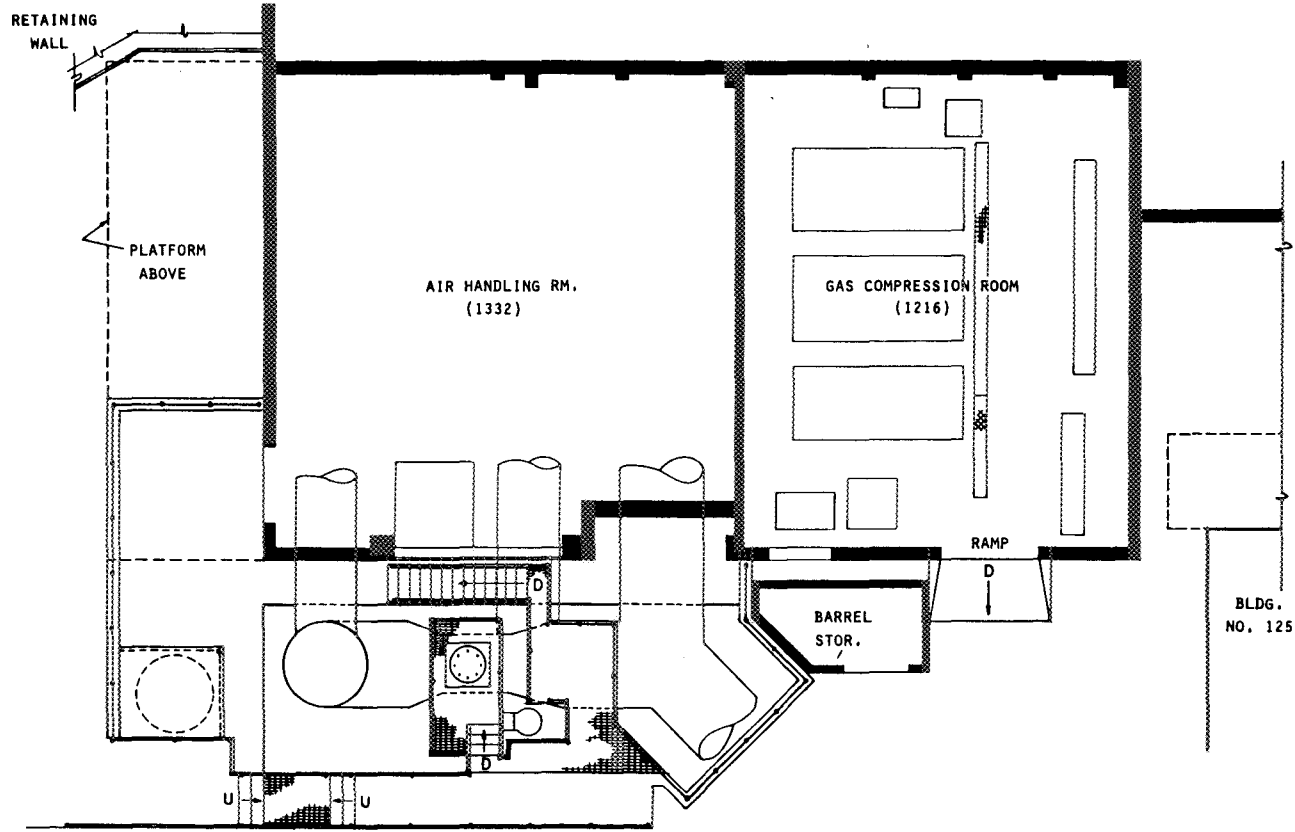
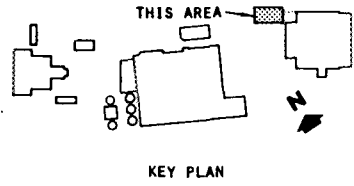
## P.S.L. OXIDANT STORAGE BUILDING

BUILDING NO.  
97

REVISED JULY 1978



# NASA LEWIS RESEARCH CENTER CLEVELAND, OHIO



BASEMENT FLOOR PLAN  
REF. DWG. NO. CF-153061

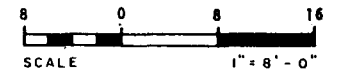
## P. S. L. HEATER BUILDING

BUILDING NO.  
124

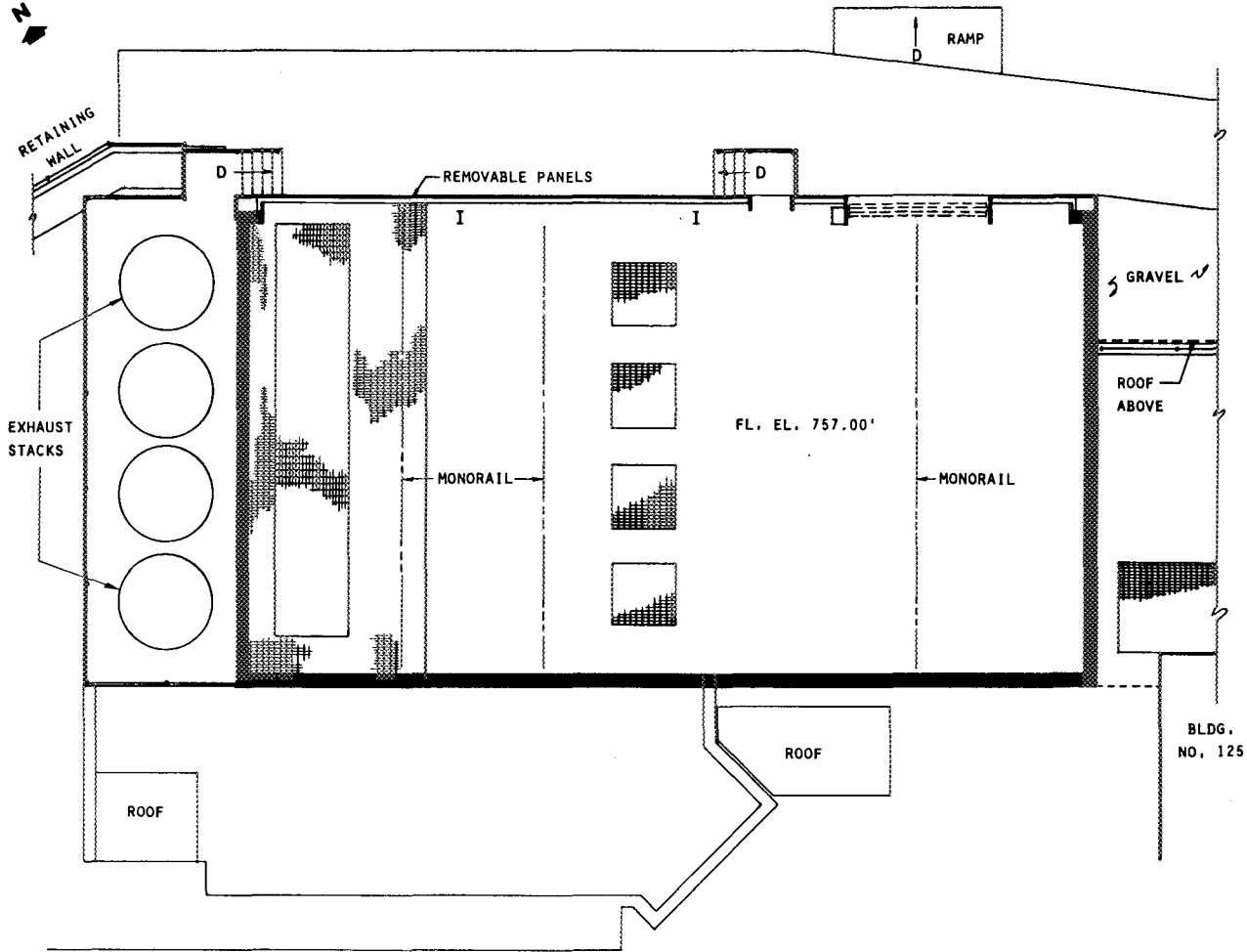
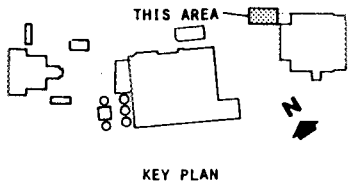
REVISED APRIL 1985



( ) AREA, SQ. FT.



NASA LEWIS RESEARCH CENTER  
CLEVELAND, OHIO



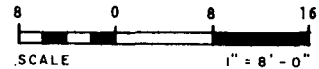
FIRST FLOOR PLAN  
REF. DWG. NO. CF-153061

P. S. L. HEATER BUILDING

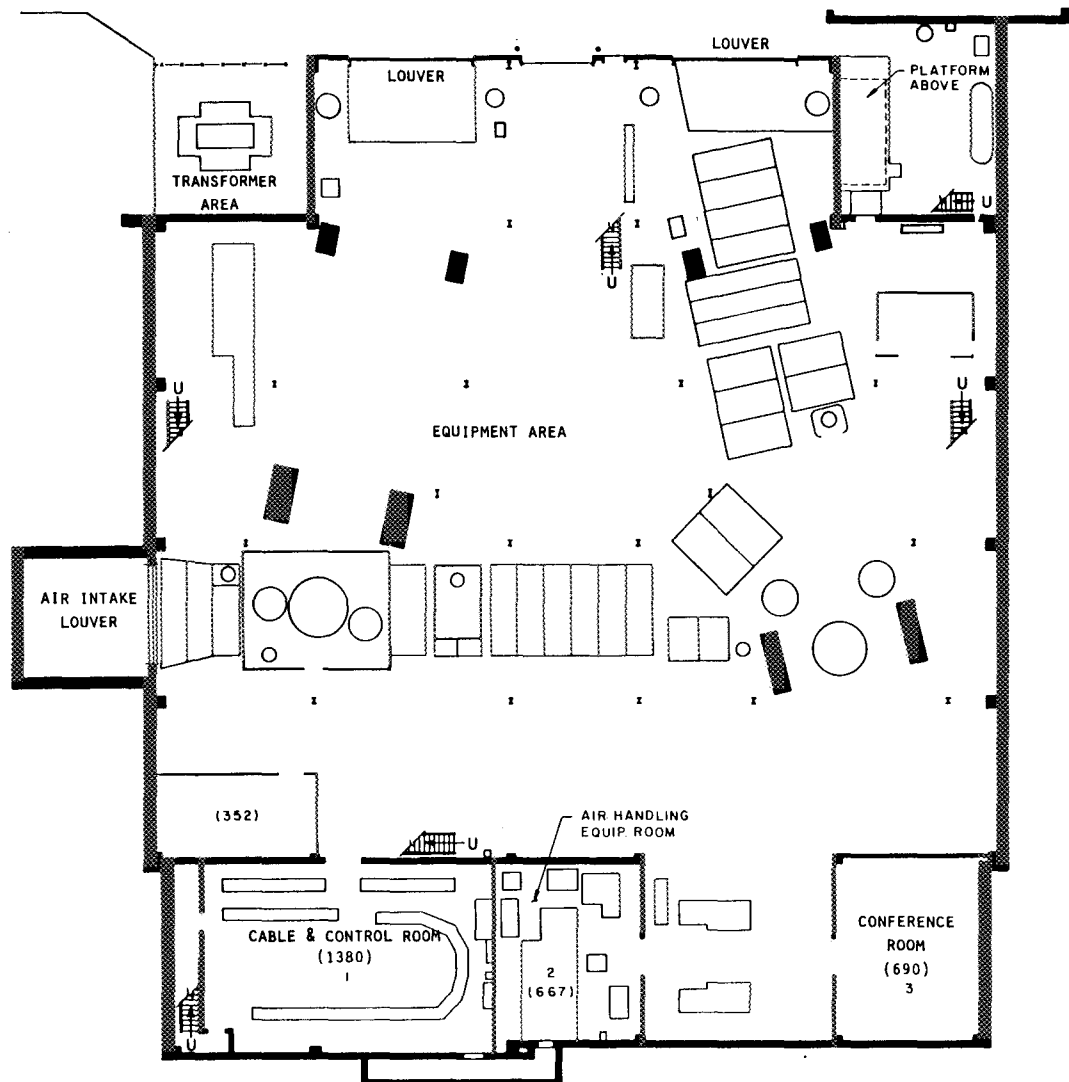
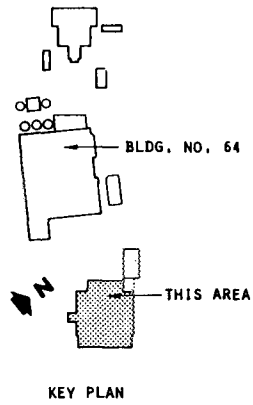
BUILDING NO.  
124



( ) AREA, SQ. FT.



# NASA LEWIS RESEARCH CENTER CLEVELAND, OHIO



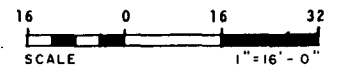
BASEMENT FLOOR PLAN  
REF. DWG. NO. CF-153052

## P.S.L. ENGINE TEST BUILDING

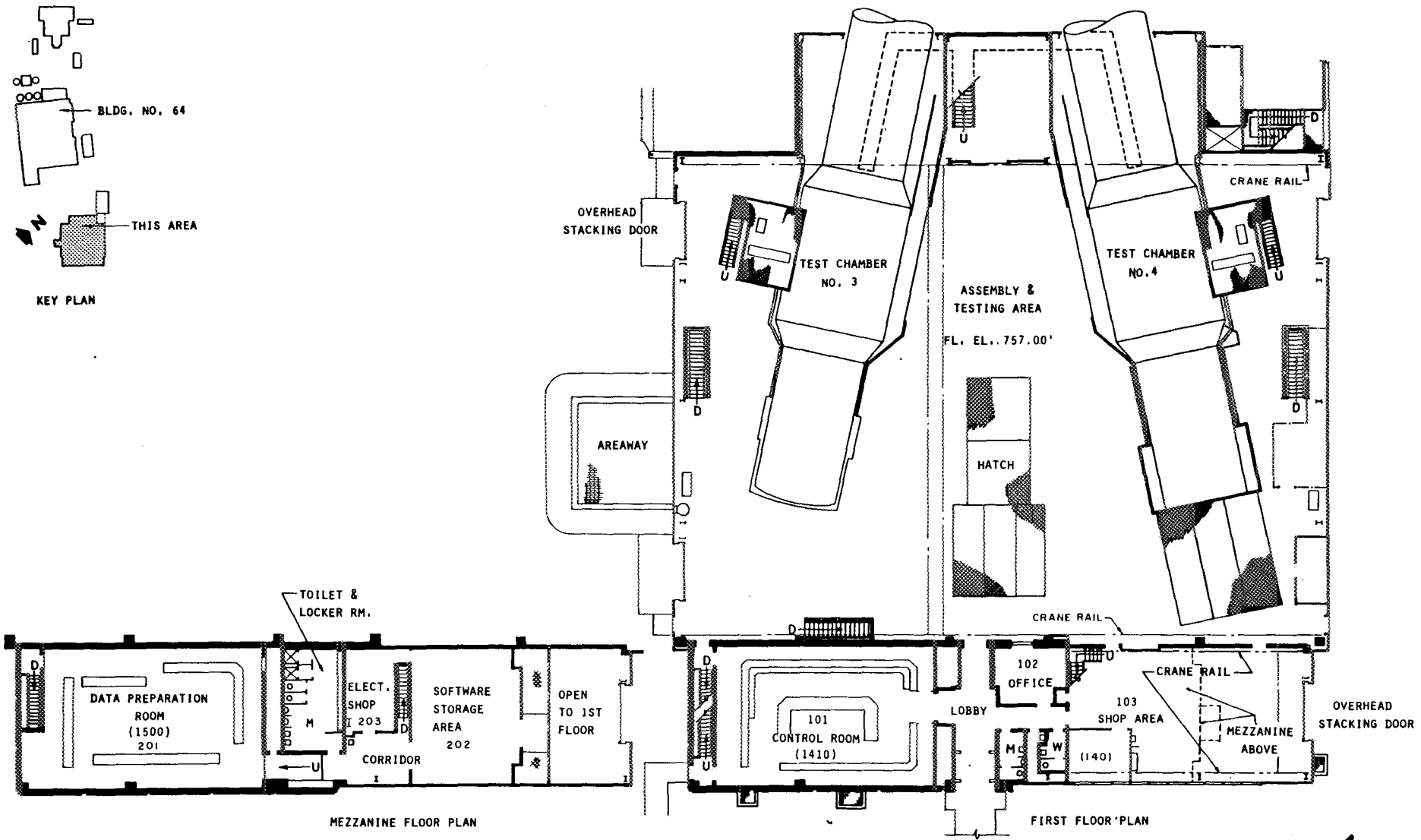
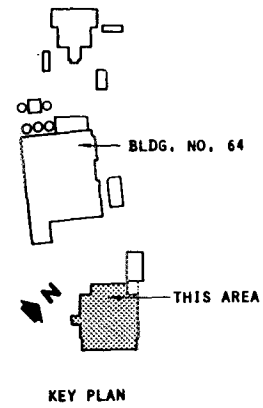
BUILDING NO.  
125



( ) AREA, SQ. FT.



NASA LEWIS RESEARCH CENTER  
CLEVELAND, OHIO

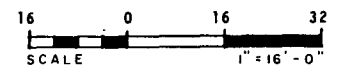


FIRST FLOOR & MEZZANINE PLANS  
REF. DWG. NO. CF-153051

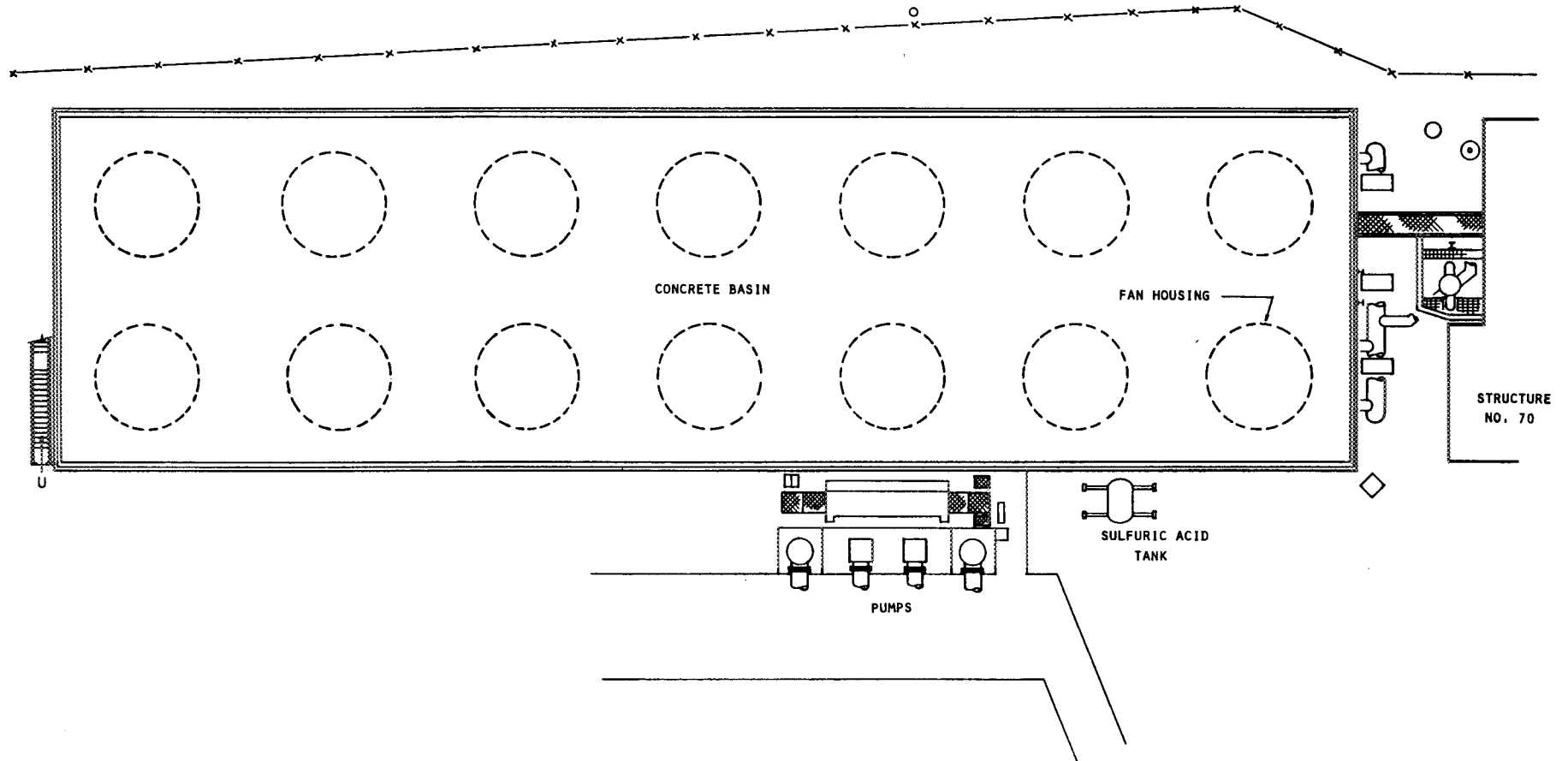
P.S.L. ENGINE TEST BUILDING

BUILDING NO.  
125

( ) AREA, SQ. FT.



# NASA LEWIS RESEARCH CENTER CLEVELAND, OHIO

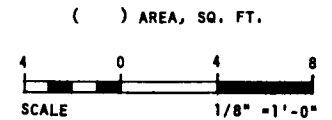


BASIN PLAN  
REF. DWG. NO. CF-153363

## PSL COOLING TOWER NO.6

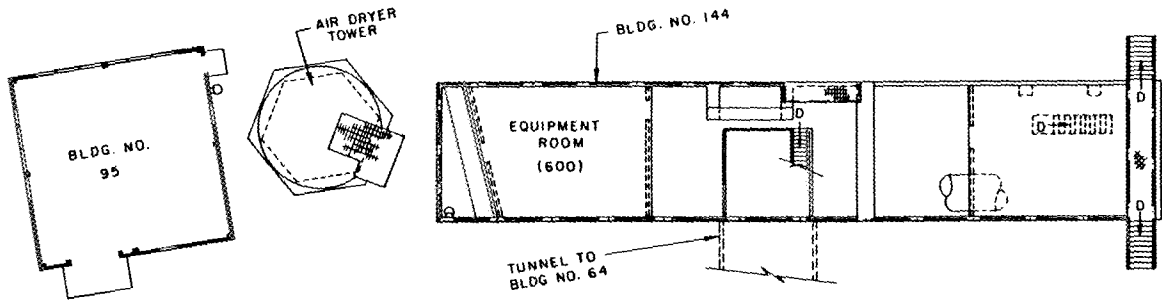
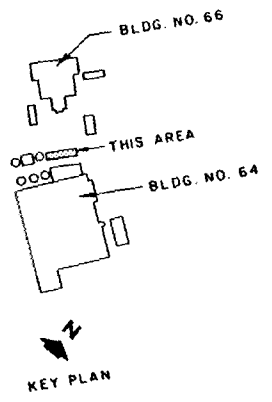
STRUCTURE NO.  
126

REVISED JULY 1978

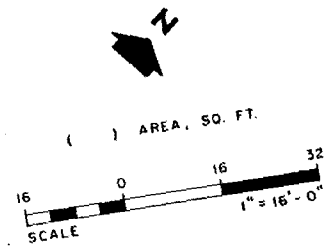




# NASA LEWIS RESEARCH CENTER CLEVELAND, OHIO



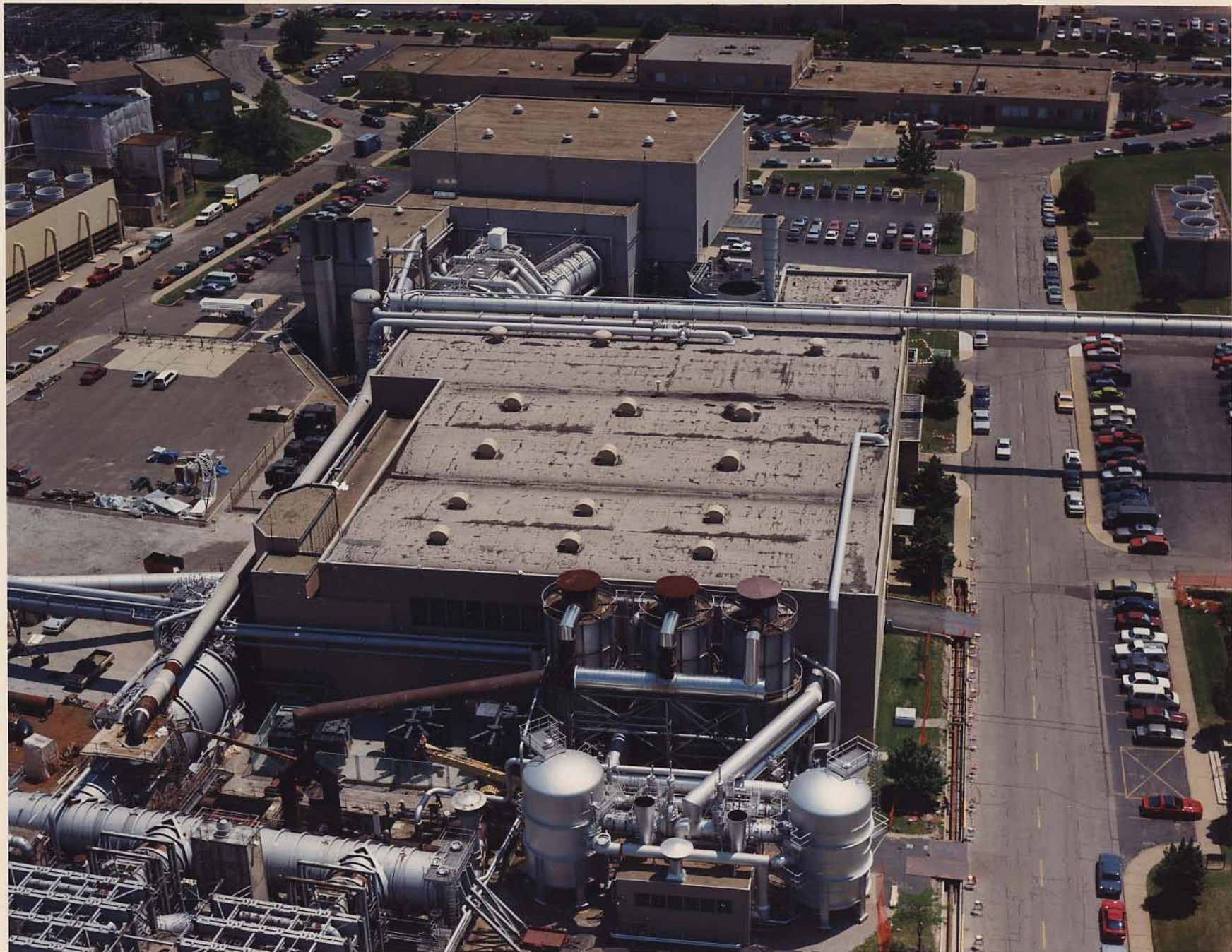
FLOOR PLAN  
REF. DWG. NO. CF-120563  
**P.S.L. TURBO EXPANDER NO. 2 EQUIPMENT ROOM**  
BUILDING NO.  
144



REVISED JULY 1985

**NASA Lewis Research Center Propulsion Systems Laboratory Group**  
**Buildings 5, 64, 65, 66, 67, 68, 69, 70, 73, 74, 75, 76, 95, 96, 97, 123, 124, 125, 126, 144**  
**Laser Prints Courtesy of NASA Lewis Research Center Imaging Technology Center**

1. C-90-09311, 1990  
Aerial view looking northeast at the western end of the PSL complex. The corner of Walcott Road and Westover Road is visible at the lower right.
2. C-90-09295, 1990  
Aerial view looking east/southeast at the eastern end of the PSL complex. Westover Road is located at the right.
3. C-90-09352, 1990  
Aerial view looking west at the cooling tower complex for the PSL.
4. Schematic cutaway view of Building 125 and test chambers at the PSL.
5. C-79-4008, 1979  
Aerial view looking west/northwest at the PSL complex. Durand Road is in foreground.
6. C-68791, n.d.  
View of engine mounted in test chamber at PSL.

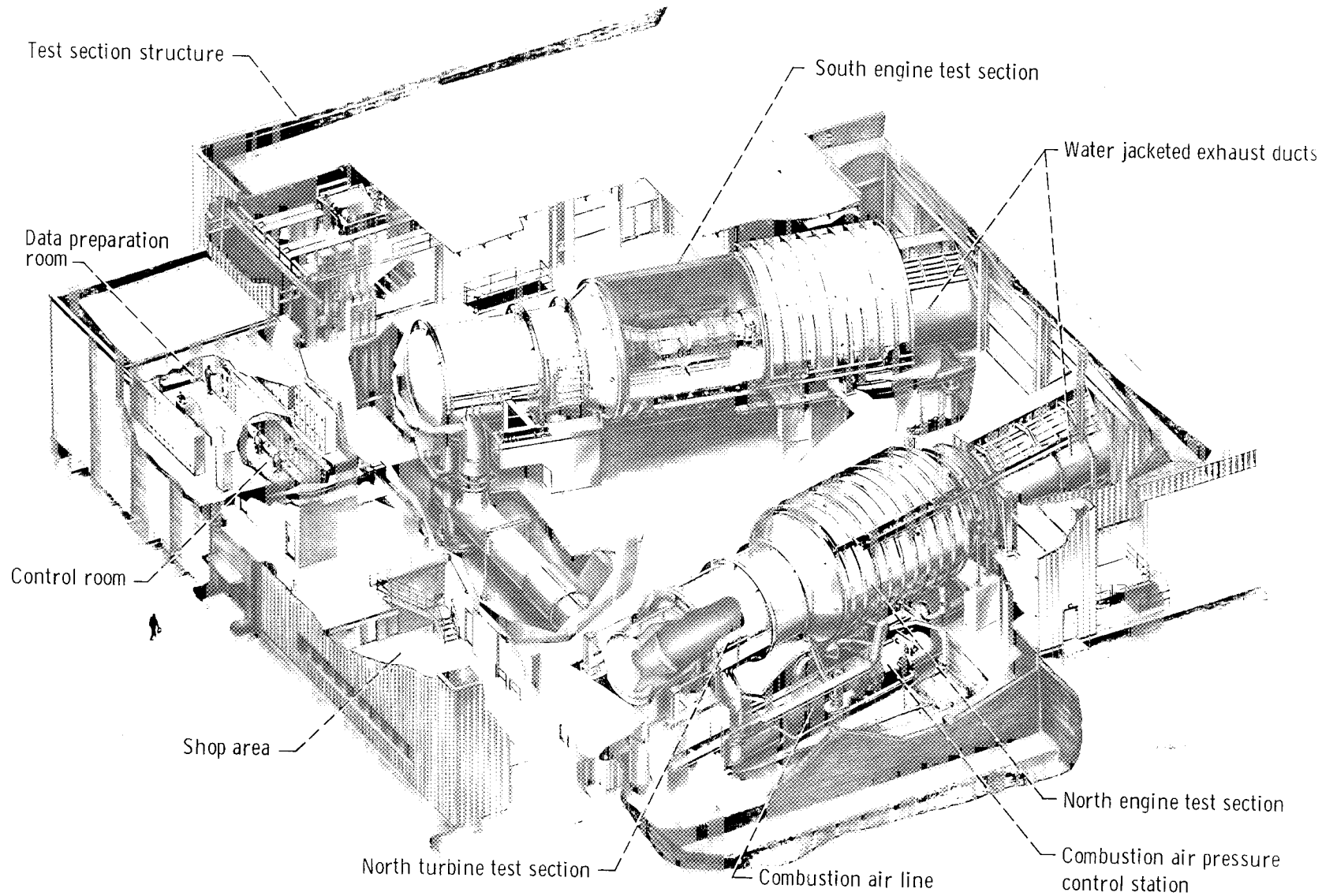












- Cutaway view of Propulsion Systems Laboratory.





AVIATION  
C-68791

