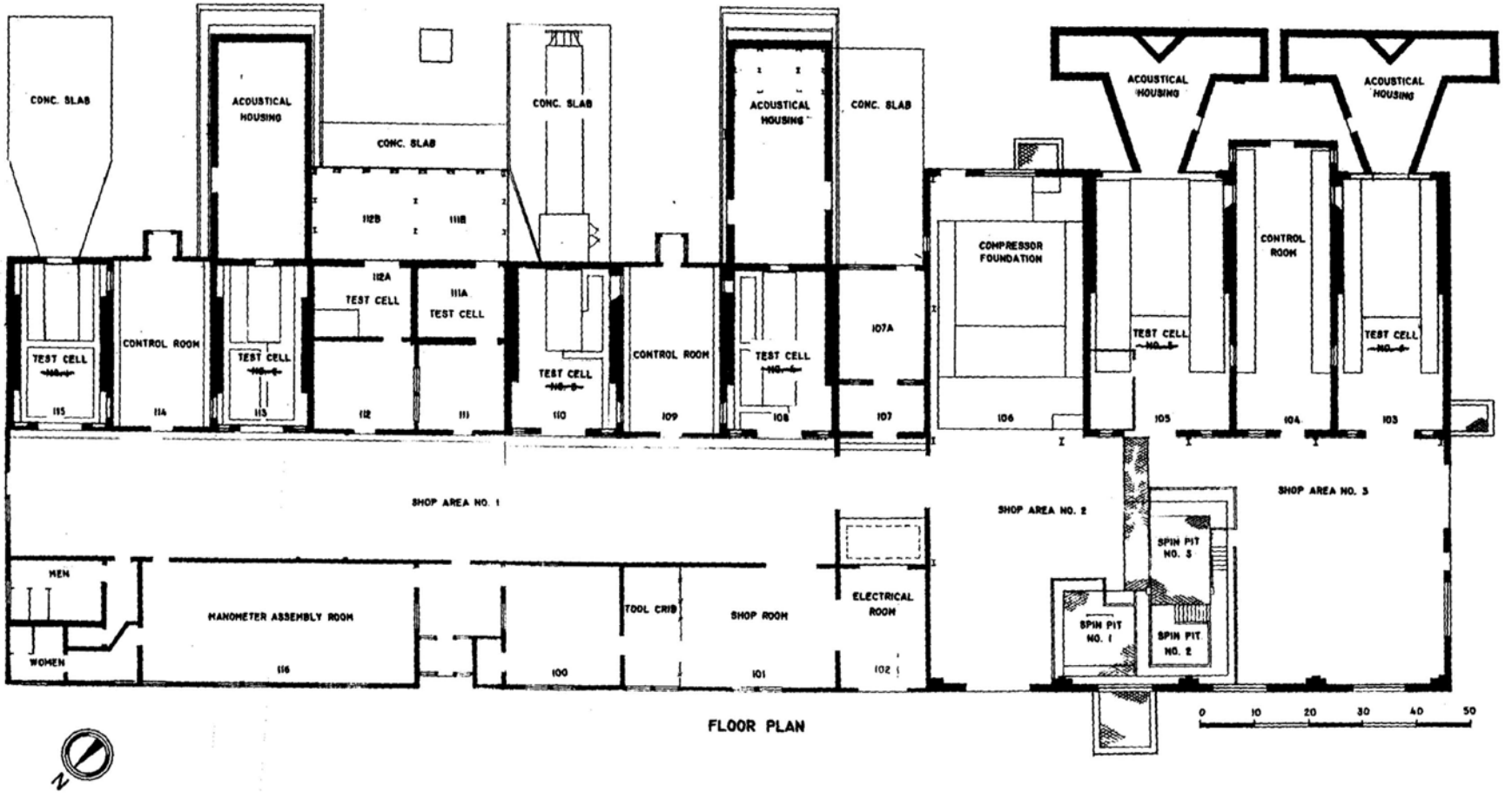
NACA-Lewis Jet Propulsion Static Test Laboratory.



FLOOR PLAN

JET PROPULSION STATIC TEST LABORATORY

Structure No.

I. Facility Designation

Jet Propulsion Static Test Laboratory

Construction started 1943
Operation started 1943

II. Purpose

A. To investigate

1. Full scale turbo-jet engine performance and control
2. After-burner performance
3. Turbine blades

B. Information gained

1. Thrust (Cell 103, up to 5,000 lbs.; Cell 105 up to 10,000 lbs.)
2. Pressures and temperatures
3. Methods of cooling blades
4. Blade vibration characteristics
5. Effect of notches upon blade rupture
6. Plastic flow of turbine discs
7. Heat transfer (under AEC classification)

III. Structures and Equipment

A. No. 24 - Jet Propulsion Static Test Laboratory

1. Single story
2. Floor plan - 67' x 235'

B. Facilities for turbo-jet engine research testing at sea level conditions (laboratory elevation 760 feet) including:

1. Six turbo-jet engine test cells with instrumentation
2. Spin-pit test facilities
3. Heat transfer (500 KW) test facility (AEC Classified)

C. Engine test cells and bedplates are as follows:

Test Cell	103	105	108	110	113	115
Bed Plate	21'0"x8'3"	21'0"x 8'3"	19'0"x 4'7"	11'0" x4'9"	10'7" x4'7"	10'7" x4'7"
Thrust, lbs.	10,000	9,000	8,000	6,000	6,000	

D. Spin pits

Spin pit No. 1- 10'x10'x7'6" deep
Spin pit No. 2 & 3- 9'6" x 23' x 10' deep

III. Structures and Equipment (continued)

E. Other Equipment

1. Air Compressor

a. Ingersoll Rand - 500 HP, 2-stage, reciprocating type
b. Provides auxiliary air pressure of 125 psi at 180#/min. or 2500 cfm.
c. Can be used either as a booster tie-in for entire laboratory or can be isolated to provide service for JPSTL, M&S, and FS&CL
d. Used also for spin pit operation and as a source of air supply in turbine cooling tests

2. Induction Heating Units - Three

a. Spin Pit #1. 75 K.W. induction heating unit
b. Cell 107 15 K.W. induction heating unit
c. Cell 115 30 K. W. induction heating unit
d. All above units used to provide hi-temperature to parts being tested under operating conditions.

3. M.G. Sets and One Electro Starter

a. M.G. set - 3 K.W. capacity, to provide power for instruments used in building
b. M.G. set - 20 K.W. capacity, for starting the air compressor and for starting test rig in Cell 112
c. Portable Electro starter, 300 K. W. Capacity, used for engine starting.

4. Fuel Supply

a. Fuel tanks

(2) 12,000 gallons - J.P.
(1) 5,000 gallons - special fuels
(2) 1,500 gallons - J.P.
(2) 1,500 gallons - water and alcohol
(2) 1,500 gallons - portable J.P.

5. Utility Services

a. 6" air supply line, 125 psig.
b. 12"steam - 100# combustion air line, 150 psig.
c. Water - 4" line - City pressure
d. Electrical energy:
500 K.V.A. supplied at 120 and 208 volts and a 2400 volt supply from Sub "G" for heat transfer rig and compressor.

III. Structures and Equipment (continued)

6. Material Handling

One Ten Ton Crane, servicing
Cells 103 and 105
Shop areas 2 and 3 and the loading dock

7. Vacuum Pumps

a. Spin Pit No. 1, one Kinney Vacuum Pump, size 14918
b. Cell 107, one Beach Russ Vacuum Pump (100D)
c. Cell 115, one Beach Russ Vacuum Pump (100D)

All three pumps are used to evacuate spin test facilities

8. Cardox Tank

One 2-ton cardox tank for Cells 1-6 with manual operation-push button to open master valve and an individual hand wheel for each cell