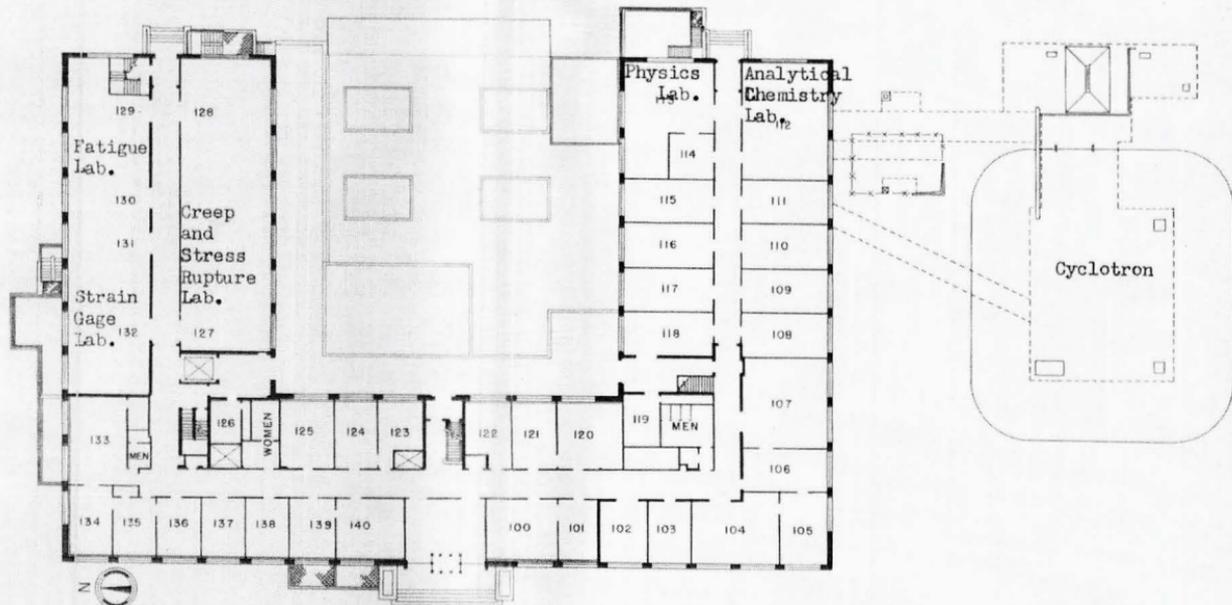




NACA-Lewis Materials and Stresses Laboratory.

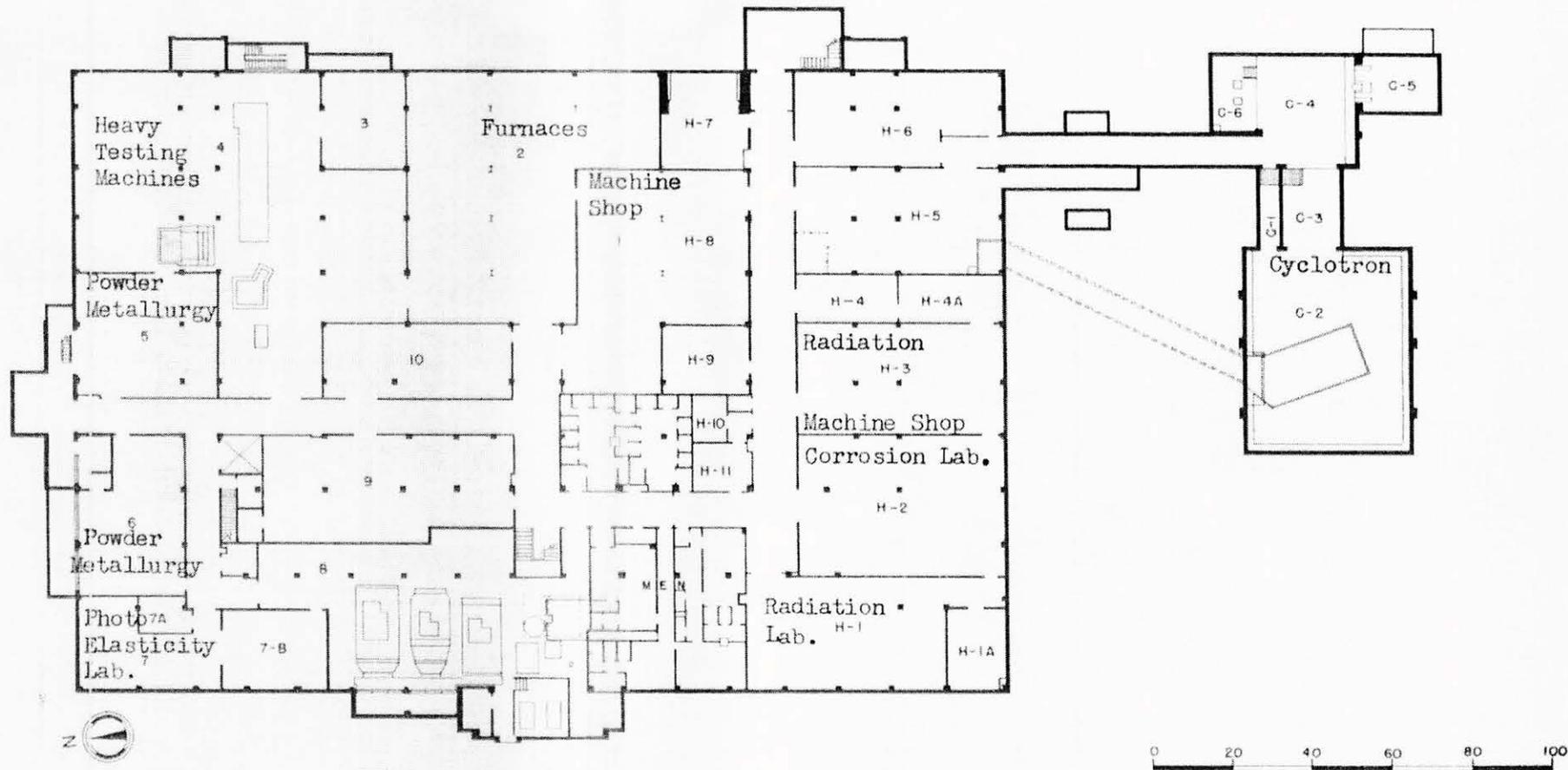


FIRST FLOOR PLAN



MATERIALS AND STRESSES BUILDING

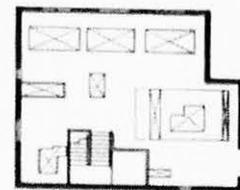
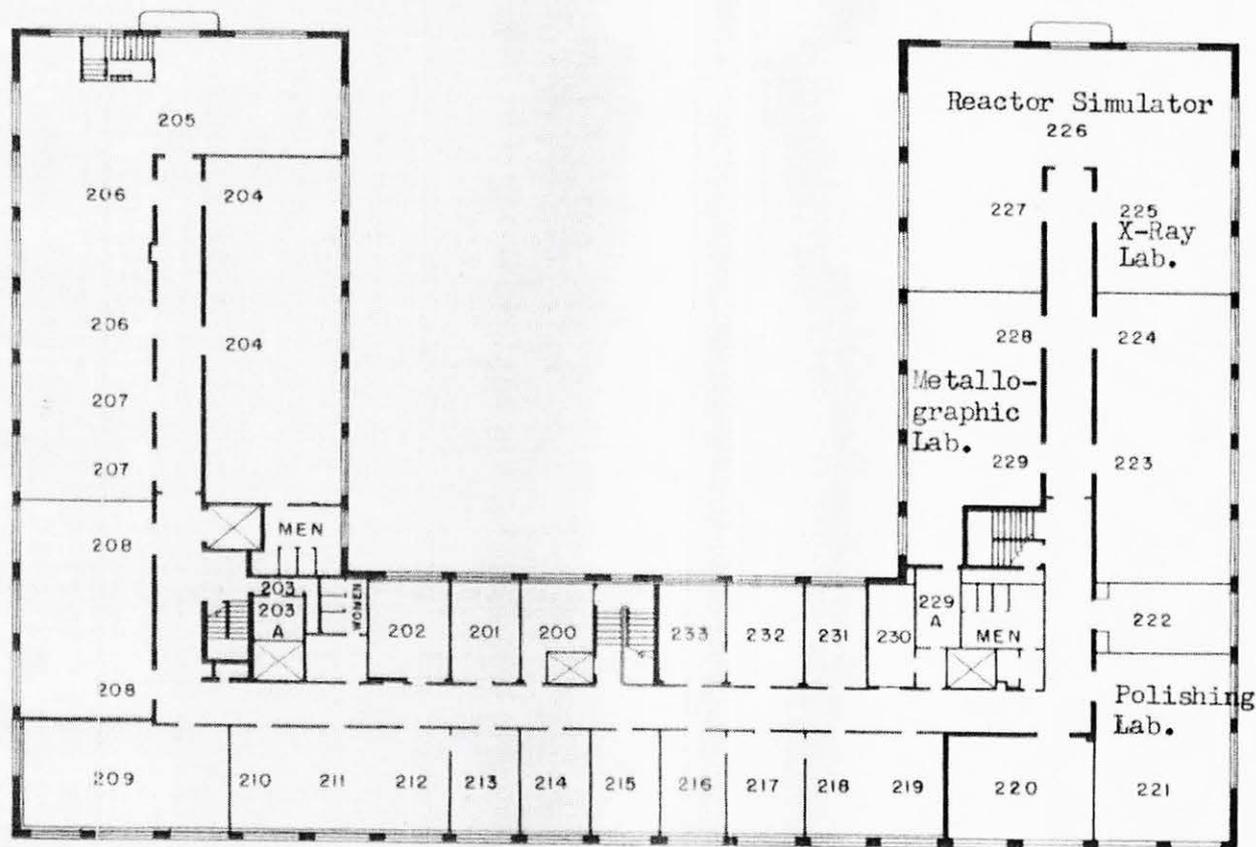
Structure No.



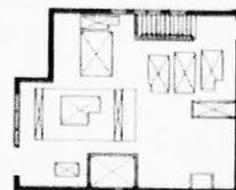
BASEMENT FLOOR & SOUTH WING PLAN

MATERIALS AND STRESSES BUILDING

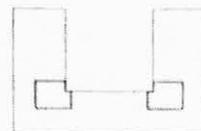
Structure No.



NORTH PENTHOUSE FLOOR PLAN



SOUTH PENTHOUSE FLOOR PLAN



KEY ROOF PLAN



SECOND FLOOR PLAN



MATERIALS AND STRESSES BUILDING

Structure No.

I. Facility Designation

	Construction	1948
Materials and Stresses Building -	Operation	1949

II. Purpose

A. To investigate

1. Materials studied fundamentally (Physics of Solids) Typical of the studies are the theory of the strength of metals, radiation damage in materials, effect of order-disorder on properties of materials, and the diffusion process in metals.
2. Materials studied to improve properties at high temperatures and high stresses. Cermet materials and low strategic element content alloys are being developed for turbine blades.
3. Materials studied under conditions of high temperatures (2000° to 2600°F), high stresses, high thermal gradients (thermal shock), fatigue, corrosion in liquid metals and hot gases.

B. Information gained

The information gained in materials research leads to a better understanding of why materials behave as they do. This leads to methods of developing materials to withstand conditions of increasingly higher temperatures and stresses.

III. Structure and Equipment

A. Identification

Structure No.	Name
49	Materials and Stresses Building

B. Description

1. The building has two stories above ground and a complete one-level basement. The Cyclotron facility attached to the building by an underground passage is below ground and completely covered by an earth mound. The M&S Bldg. floor area is 86,000 sq.ft. of which 10,000 sq. ft. is office space.

The M&S Building has many individual laboratories, having specific functions in the study of materials. These laboratories are listed as follows with their major pieces of equipment:

III. Structure and Equipment (continued)

(a) Physics of Solids Laboratory

1. 60-inch cyclotron
2. Helium Cryostat
3. Cloud Chamber
4. Metallurgy cave
5. Electron diffraction machine
6. Analytical chemistry facilities

(b) Metallographic Laboratory

1. Two metallosopes
2. Six X-ray diffraction machines
3. Metallographic polishing equipment
4. Miscellaneous microscopes, hardness testers, dilatometers, and photographic developing facilities

(c) Furnace Room

1. 200 KW induction machine
2. 50 KW induction machine
3. 4500°F graphite resistance furnace
4. Swager
5. Rolling mill
6. Miscellaneous sintering and heat treating furnaces

(d) Powder Laboratory

1. Ball mills
2. Hoods
3. 3000 ton press
4. 60 ton press

(e) Stresses Laboratory

1. 53 stress-rupture machines
2. 6 fatigue machines
3. 400,000 lb. Tensile machine
4. 120,000 lb. Tensile machine
5. 30,000 lb. Tensile machine
6. 10,000 lb. Tensile machine