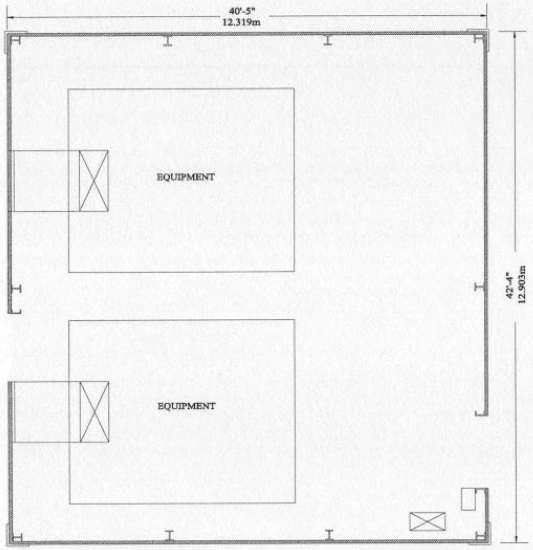
BUILDINGS 205, 206 AND OBSERVATION BLOCKHOUSE

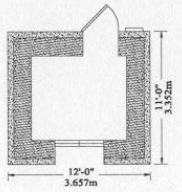


BUILDING 205 FLOOR PLAN

1/4" = 1'-0" 0 5' 10FT 1:48 0 3M NORTH

Building 205 is located approximately 170 feet northeast of the Rocket Engine Test Cell in Building 202. The structure covers a surface area of about 1,710 square feet. This building is lightly constructed, with a framing of pipe uprights that is welded to channel iron cross members. Light steel I-beams support the roof. The side of the building is sheathed with opaque fiberglass panels, while translucent fiberglass panels cover the roof.

The significance of Building 205 lies in its relationship to the reactant distribution system for the Rocket Engine Test Facility (RETF). Building 205 housed a compressor and an automated control system used to pressurize helium gas to 6,000 psi for distribution throughout the complex. Liquid oxygen boils at -183°C, which can make pumping and distribution of this substance difficult. Mechanical pumps available at the time for handling cryogenic fluids were not ideally designed for forcing liquid oxygen at high flow rates into test engines. To force liquid oxygen through the piping system and into test engines, the designer of RETF developed a pumping system powered by pressurized helium gas supplied by the compressor in Building 205. An inlet at the top of the main liquid oxygen outlet pipe was located below the liquid level. Control valves admitted pressurized helium at 4,000 psi that flowed at up to 3.5 pounds per second into the tank and forced liquid oxygen into the test rig.



OBSERVATION BLOCK-HOUSE FLOOR PLAN

1/4" = 1'-0" 0 5' 10FT 1:48 0 3M NORTH

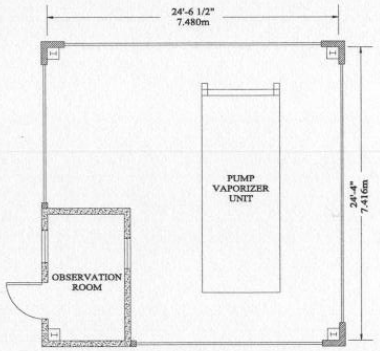
During the early years of operation at the Rocket Engine Test Facility (RETF), technicians and engineers relied on direct observation of engine firing tests to supplement instrument readings. One observation post was a large periscope in the terminal room of Building 202, which was adjacent to the test cell. A second viewing location was the Observation Blockhouse, which was a plain reinforced concrete bunker located approximately 260 feet north of the test cell. The blockhouse protected observers from flying debris in case of catastrophic engine failure during testing.

Built from 1955-1957, the Observation Blockhouse covers 132 square feet, and its reinforced concrete walls are 6" thick. Observers entered the bunker through a door in the north elevation. A ladder next to this door led to the roof. The south elevation has a deeply recessed thick glass window that measures approximately 4' wide and is divided into two sections by a vertical mullion. The window is about 18" high and allowed observers stationed inside the blockhouse to watch engine tests in Building 202. The blockhouse was equipped with an intercom system, emergency communications, and a telephone system to allow two - way contact with test stand engineers. The blockhouse also had a small switch panel with an "abort" button positioned below the observation window.

While there is photographic evidence that a closed-circuit television system was installed in the test cell as early as 1957, observers in the blockhouse were still needed to supplement electronic and video data. In 1972, however, RETF staff installed an additional closed-circuit television camera on top of the blockhouse. Additional lights installed in Building 202 enabled viewers in the RETF Building 100 control room to observe tests on a monitor. These modifications reduced the need to station observers in the blockhouse. As sensors, instrumentation, and computerized data reduction became more sophisticated, the information that could be provided by observers in a protected area was limited, and use of the blockhouse became increasingly rare.

Constructed in 1968, Building 206 was part of the gas distribution system for the Rocket Engine Test Facility (RETF). This building housed a liquid nitrogen vaporizer and a gaseous nitrogen compressor. This building covers 597 square feet and is sheathed in corrugated metal panels. Ventilation was an important consideration in the design of the building, so a vent was incorporated into the roof along the full length of the ridgeline. Louvered vents on the gable end of the building provided additional ventilation. A rolling shutter door about 16' wide on the building's gable end allowed access to the interior and machinery. An isolated control room featured a small window through which operators monitored the machinery bay. The control room had a switchboard of 12 explosion-proof switches for controlling motors and fans in the building. The building was also equipped with explosion-proof wiring, telephones, and lighting.

A nitrogen vaporizer essentially functions as a heat exchanger. Liquid nitrogen flowed through a network of pipes, the external surfaces of which were largely exposed. Fans drew ambient air over the exterior surface of this piping. The liquid nitrogen in the tubes then warmed and boiled to form gaseous nitrogen, which was then pressurized to 6,000 psi and piped throughout the RETF complex.



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DELINEATED BY: Hardlines Design Company, 2003

NASA ROCKET ENGINE TEST FACILITY
BUILDINGS 205, 206 AND OBSERVATION BLOCKHOUSE

ROCKET ENGINE TEST FACILITY
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, LEWIS RESEARCH CENTER
CLEVELAND CUYAHOGA COUNTY OHIO

HISTORIC AMERICAN ENGINEERING RECORD
OH-124-D
SHEET 12 of 12