



**General**

The Operations/Storage Building provides office space for range personnel and stores supplies, spare parts and tools. Target maintenance is also accomplished in the facility. There is one offices at 180 sq feet and a storage area of 1620 sq feet for a combined total building size of 1800 square feet (167.23 square meters). The occupant load factor is 100 net sq. feet (9.3 net sq. meters) per person based on a business use. See NFPA 101 table 7.3.1.2.

**Site Adaptation**

This standard definitive design should be adapted to local conditions such as climate, available construction materials and techniques, topography, seismic zone and the existing character of surrounding buildings. These factors may affect plans, elevations, and building systems. The building foundation must be designed based on the results of a geotechnical investigation.

**Reference Criteria**

The design and construction must comply with applicable codes and standards including: technical instruction TI 800-01, "Design Criteria" Departments of the Army regulations, technical manuals, handbooks, standards, and specifications.

**Functional Requirements**

All dimensions not labeled are in millimeters. Windows are double hung to meet functional requirements providing natural lighting and ventilation. Windows have forced entry resistant metal frames and are provided with insect screens. Provide polycarbonate security glazing in windows and doors. Gutters, downspouts and splash blocks should be provided where maintenance. Extend 150mm (6") beyond edge of unit on three sides. Covered entries and ice guards may be necessary in northern climates. The office area should be provided with a finished ceiling. The Operations/Storage Building is accessed only by able-bodied personnel and does not require ADA compliance unless by local criteria.

**Mechanical**

The Mechanical Equipment shall be selected and sized based on site requirements, local weather design criteria, available energy sources, and building construction materials. The HVAC system must maintain an equipment operating temperature of 74 F +/- 4 F in rooms containing range communication equipment. Obtain range communication equipment heat release from the User or targetry supplier for HVAC load calculations and equipment sizing. HVAC design for personnel comfort shall be in accordance with UFC 3-410-01FA. U-Factor requirements are based on the local climatic conditions in accordance with TI 880-1.

**Electrical**

The Operations/Storage building shall be served by 120/240V, 1 phase, 3-wire secondary power. Provide Surge Protective Device (SPD) for incoming service. Rigid Steel conduit shall extend a minimum of 5' (1524mm) outside the building for power and communication circuits entering and leaving the building. Voltage drop shall comply with NEC standards and Army technical manuals. Grounding will be installed in accordance with NFPA 70 and other applicable standards.

The panelboard shall be 120/240V single phase, mounted inside the building and shall be recessed mounted in finished areas. Receptacles shall be general purpose, 120V, 20A Duplex mounted 18" (450mm) above the finish floor. All outlets receptacles and conduit shall be recess mounted. Provide 120/240V power the HVAC unit. Illumination levels will be designed in accordance with IES. Exterior lighting shall be provided with separate switching located near points of egress. Provide additional fixtures with red lamps next to all exterior fixtures and in all rooms with doors or windows that open to the training area for ranges where training will occur at night. Red lights shall be switched separate from white lights and there shall be provisions to prevent accidental illumination of white lights while red lights are in use.

The emergency electrical system shall comply with NFPA 70 and NFPA 101. Exit signs will be provided in accordance with NFPA 101. Emergency lighting shall be provided to ensure adequate illuminations to egress building in the event of a power outage.

Perform lightning protection risk assessment in accordance with NFPA 780 to determine the need for lightning protection.

**Telephone**

Telephone service is not a requirement for range operations. However should be provided to the Ops/Stg Building if it is available in the area.

**Fire Protection**

Fire protection is not required per fire codes for this building. The fire alarm shall be a local audible alarm. Fire extinguishers and cabinets are required per NFPA. Consult local Fire Marshall for compliance with local requirements. Provide a Mass Notification system per UFC.

Rev.	Date	Description

Designed by:	Date:	Rev.
Drawn by:	Design file no.:	
Reviewed by:	Drawing code:	
Submitted by:	File name:	Plot name:

U. S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE HUNTSVILLE, ALABAMA  
MARCH 2011

RANGE AND TRAINING LAND PROGRAM  
STANDARD DESIGN MANUAL  
OPERATIONS / STORAGE BUILDING - LARGE



