



# BLEACHER ENCLOSURE



## Purpose

The Bleacher Enclosure provides an area with protection from the weather for troop instruction before and after training events. It also provides an area for troop staging, a place for observing training events, and an assembly area for personnel during lightning events. The standard sized facility is included in the standard set of buildings for most ranges, see matrix for specifics.

## Design Requirements

See the standard drawings in the RDG for details of construction not included in this document.

### General

The standard design must be site adapted to local conditions such as climate, typical construction materials and methods, and the installation design guide. Design the facility in accordance with the design codes and criteria of the specific location, geotechnical information, structural loads, mechanical design criteria, etc.

Unless specifically requested by the installation, the facility requires access by able-bodied personnel only and does not require ADA compliance.

### Siting

Site the facility to provide views of the firing line and downrange areas as appropriate. Ensure that it does not block the view from the Control Tower. On small arms ranges, keep the enclosure at least 15 meters behind the firing line. On mounted maneuver ranges, locate the enclosure at least 50 meters behind the baseline to avoid damage from main gun blast pressures and to reduce noise levels. Consider access and circulation between other ROCA facilities keeping separation between trainees and the areas used by maintenance personnel.

### Architectural

The size of the standard is 33 feet wide and 22 feet deep (10.06 meters by 6.71 meters). It has 2 sets of 10-row bleachers, each 15 feet wide (4.57 meters); enough to seat 160 soldiers in full gear. For Service Schools that require seating for 240 soldiers, add an additional bay and set of bleachers. Installations should consider reducing the size of the Bleacher Enclosure to one bay on ranges that are normally used by 80 soldiers or less.

Specify the bleachers by length of the rows rather than the capacity. Industry standard for bleacher capacity is 18 inches; soldiers with full gear require more space. Permanently install bleachers if they are MILCON funded.

Provide louvers in the rear wall for ventilation. To improve ventilation in hot climates, some installations prefer that the walls not reach all the way to the ground or delete the walls entirely. Another option used by some installations is to include sliding, barn type doors in the rear wall. Provide access to area under bleachers for cleaning.

Coordinate building styles and material choices with the user and the installation design guide. The standard design depicts a pre-engineered metal building version. Concrete Masonry Unit

(CMU) construction is also commonly used. Floors are typically a concrete slab that is sloped to drain. Consider providing bird netting or screen to keep birds from nesting inside the enclosure.

## **Mechanical**

There are no range specific mechanical requirements for this building.

## **Electrical**

### **Power Distribution**

Primary distribution service may be overhead or underground. Consider the type of tactical vehicles used in the Range Operations and Control Area, proximity of building to Ammunition Supply/Breakdown/Distribution points, and local utility requirements for determining the routing of primary power to the facility. Provide 120/240V, single-phase, 3-wire secondary power. Provide this facility with a panelboard supplied with main circuit breaker that serves separate circuits for the lighting and convenience outlets.

### **General Power Requirements**

Provide two GFCI, general purpose 120V, 20A duplex convenience receptacles; mounted 18” (450mm) above the finished floor. Locate one on each side near the front.

### **Lightning Protection and Grounding**

Grounding and lightning protection systems are required for safety. Building electrical system grounding will consist of one or more ground rods connected to the service panel in accordance with NFPA 70.

RTLTP standards require lightning protection for the Bleacher Enclosure regardless of NFPA 780 Risk Assessment. The lightning protection system may be provided as a mast-style system or air terminals located on the building structure. Use exothermic welds for cable connections and connections to the ground rods and structural steel. Follow local installation requirements for lightning protection systems where they are more stringent than the requirements defined in the Range Design Guide.

Bond the metal bleachers to the lightning protection system as required by NFPA 70.

### **Lighting**

Design illumination levels in accordance with the IES. Provide red lenses or red lamps in addition to standard lighting on ranges where training will occur at night. See Night Operations Lighting paragraph for more information. Provide Emergency and Exit lighting in accordance with NFPA 101 and NFPA 70.

### **Night Operations Lighting**

To prevent interference with specialized equipment used during night operations, provide separate fixtures with red lenses or red lamps in addition to standard lighting on ranges used for night training where the lights will be visible from training and/or staging areas. Include the following areas as a minimum

- exterior lighting visible from the training area

- rooms where ROCA building has windows that are facing the training area and cannot be covered
- rooms where the building has a doors that opens to the training area

Provide separate switching for the standard and red lighting. Clearly label switches and provide covers over white lights, or similar protective measures, to deter turning on white lights while red lights are in use. Locate switches near points of egress. Provide a means to turn off all exterior white lights including an over-ride for lights controlled by a photocell.



### Common User Cable Systems

The Bleacher Enclosure does not require telephone connection.

### Special Considerations

Fire protection is not normally required for this facility, though installation requirements may control. Consult the installation Fire Marshal for local requirements. Provide fire extinguishers and brackets per NFPA and UFC 3-600-01.

