

3.0 TRAINING SUPPORT CENTER (TSC)<VER>(REV 1.0 – 31 OCT 2012)</VER>

3.1. GENERAL REQUIREMENTS

A. The design must comply with the standards for the facility type. The Criteria for The Training Support Center (TSC) is provided in Attachment A.

B. Coordination at all stages of design development of TSC new construction projects is required with the Installation DPW (facilities engineer), IMCOM Center of Expertise, Army Training Support Center (ATSC) and Installation DPTMS.

3.1.1. FACILITY DESCRIPTION

A. Per DA PAM 415-28: A building that is used to fabricate, maintain, store, and issue training devices including Multiple Integrated Laser Engagement System (MILES); it also provides the administrative space for the training support division management staff. Common training device used to establish requirement for facility is the authorized Brigade Sets of MILES equipment.

B. This facility includes primarily warehouse space for storage, issue and maintenance of training devices and components. The facility may include: warehousing space, shipping/receiving areas, device fabrication (woodworking and plastics), general item repair, general purpose administrative space, sensitive item storage (arms vaults) multi purpose classrooms/work centers, break areas, and latrines. This is a general purpose facility intended for use by installation Directorate of Plans and Training (DPTM).

3.1.2. FACILITY RELATIONSHIPS

Training Support Centers are a training magnet of functional space and provides increasing opportunity for simulator training. Direct access for troops is the priority for proximity. Consideration must be made for large vehicle and Material Handling Equipment (MHE) access. The TSC should be located near the post's BCTC, Virtual Simulator Facility and other similar Training Facilities to allow for easier connectivity.

3.1.3. ACCESSIBILITY REQUIREMENTS

A. GENERAL: Training Support Centers shall comply with the Architectural Barriers Act (ABA) accessibility Standard for DOD facilities as currently amended.

B. SITE PLAN DESIGN AND CONSTRUCTION: Accessible Parking Spaces shall be provided for those visitors and non-military employees with disabilities. The required number of spaces is prescribed by the accessibility guidelines. Such spaces are required to be located so as to provide convenient access to the building entrance.

C. FACILITY DESIGN AND CONSTRUCTION: Building shall be handicap accessible and designed per applicable codes. Provide ABA clearances for door accesses throughout the facility. Provide handicap accessible drinking fountains and public toilets per applicable codes.

3.1.4. BUILDING AREAS – NOT USED

3.1.5. ADAPT BUILD MODEL – NOT USED

3.2. FUNCTIONAL AND OPERATIONAL REQUIREMENTS

3.2.1. FUNCTIONAL SPACES

A. GENERAL: The Training Support Center consists of four primary functional areas, the Warehouse and Storage, Administrative, Classroom, Training Space/Classrooms, and Special Function and Support Spaces. These functional areas will be calculated based on the TSC Standard Facility Criteria.

B. PRIMARY SPACES:

- 1) **Warehouse and Storage:** The General purpose warehouse and storage area is based on the installations inventory of MILES, and other Training devices and components from the Official Army Inventory held by ATSC. Space for 3 to 4 tier racks and material handling equipment will be provided. Also, included in the warehouse is the shipping and receiving loading dock, device fabrication room and the maintenance and repair area.
- 2) **Administrative:** The Administrative Area of the facility includes space for building operations, scheduling, customer waiting area and technical support. It is based on the number of employees in the facility and the amount of customers expected.
- 3) **Training Space/Classroom:** General instruction rooms are space that includes primarily classroom space for multipurpose training instruction. These general purpose rooms are intended for use by organizations which serve a large population for classroom and device simulation instruction. Training Spaces are based on the simulators they are required to house.
- 4) **Special Function/Support Space:** Spaces included in this area are Break Areas, Secure Operations and Storage, Retail Device Storage, Latrines and Mechanical and Electrical spaces.

3.3. SITE FUNCTIONAL REQUIREMENTS

- A. The Training Support Center (TSC) must be easily accessible to military personnel. The site shall be designed so that there is sufficient parking and access drives for privately owned vehicles and service vehicles.
- B. Site The TSC is located in close proximity to other training facilities; classroom and simulations. Components of land requirements are: primary facility; site egress and ingress; utility access; POV parking; and force protection stand-off distances. Future expansion needs should factor a minimum of 50 percent expansion of the facility.
- C. Organize the site to be compatible with the site planning and style of adjacent existing structures. Locate the building to reflect local climatic conditions. For example, provide protection from prevailing winds, snow load, glare, and orient operable windows to take advantage of summer breezes. Locate the building to take advantage of passive solar heating and day lighting.
- D. Parking and Access Drives: Provide adequate parking based on the guidance in Attachment A. Locate parking areas so they do not dominate the main entrance and public image of the facility. Comply with UFC 4-010-01 DOD Minimum Antiterrorist Standards for Buildings.

3.4. SITE AND LANDSCAPE REQUIREMENTS

- A. **ENVIRONMENTAL:** Develop the facility site to result in the minimal disturbance to the existing topography, vegetation and drainage patterns and reduce negative impact on the environment.
- B. **SOIL TESTING:** Retain a qualified geo-technical engineer, licensed in the state of the location for the TSC, to take borings on the site, perform necessary soils testing and to recommend adequate foundation and pavement systems for site specific environmental, soil, rock and water conditions. Document any problematic surface or subsurface conditions such as soil, water, wind, manmade features, or seismic conditions that may affect the design and construction of the TSC in the resultant soils analysis report.
- C. **GROUNDWATER AND RUNOFF:** The control of water flow around the site, site runoff and below grade ground water is critical to ensuring proper long term drainage around the building(s) and the parking areas. The minimum recommended requirements for most soil conditions involve the incorporation of foundation drains. Consideration should include minimizing roof runoff onto grade. Certain soil types may require the piping of roof and site runoff into a controlled storm drainage system.
- D. **LANDSCAPE DESIGN:** Use sustainable landscape features where possible. Utilize plant material to improve the physical appearance of the TSC site and the surrounding community. Where possible preserve trees and planting to enhance the overall visual quality of the facility and the installation. Submit landscape plans to ensure quality and promote design consistency with the architectural theme of the building.

E. STORM WATER MANAGEMENT: Site storm water management may require controls on the peak flow that can be discharged. Installations are required to have a storm water pollution prevention plan. Implement the applicable portions of this plan using best management practices. Segregate drainage from areas likely to be contaminated (e.g., fueling area). Provide treatment for contaminated water prior to its discharge. Maintenance should not be performed outside the primary facility.

3.5. ARCHITECTURAL REQUIREMENTS

A. ARCHITECTURAL THEME: Utilize the architectural style, materials and colors indigenous to the region. Consider historical and cultural influences of the installation and region.

B. ARCHITECTURAL PLANNING: The architectural plan shall accommodate the functional and spatial relationships required for a functionally efficient TSC. Building layouts shall recognize the contrasting operational, administrative and shipping functional requirements and the facility will be designed for the appropriate accomplishment of each function.

C. CIRCULATION DESIGN CONSIDERATIONS: The interior functional arrangement shall allow for ease of circulation and movement and shall consider the safety, health and operational efficiency of the occupants.

D. BUILDING EXTERIOR: Select exterior materials to be attractive, economical, and durable and low maintenance. Pre-engineered metal building systems are preferred for their factory finished metal siding and roof panels. Masonry walls are preferred at the ground floor level.

1) The TSC shall present a cohesive architectural image. Comply with Command and Installation architectural standards. Also, consider the local geographical and cultural environment. Use durable and low-maintenance exterior finishes.

2) Ensure that the main entrance is clearly identifiable to discourage visitors from entering the facility Warehouse and Storage area. Where needed, provide a canopy (or a recess) at required egress doors to ensure that doors can completely open without obstruction from snow and ice. Comply with NFPA 80.

E. WAREHOUSE DOORS: Provide electrically operated doors with provision for manual chain operation.

F. LOCKING: Provide overhead doors that are operable from the interior only. Coordinate door locking requirements with the using service.

G. SERVICABILITY: Design doors to meet heavy duty loads and high frequency of operation. Conduct testing of deflection and operation of the doors prior to acceptance during construction. Doors shall be provided and installed by a commercial door company having not less than five years of experience in manufacturing, installing, and servicing the size and type of doors provided.

H. INSULATED DOORS: Preference will be given to proposals that include insulated doors for thermal resistance and noise control.

I. PERSONNEL DOORS: Provide exterior personnel doors in the ends of central corridor maintenance areas and in the circulation bays as shown in the functional area adjacency diagram in Attachment A. Provide steel doors with vision panels, except at storage, janitorial, and latrine areas. Minimum size for personnel doors is 3 feet wide by 7 feet high.

J. SPECIAL ACOUSTICAL REQUIREMENTS: Typical STC ratings range from 45 to 62 STC depending on the space and its intended use. During design, special consideration should be given by the design team to achieving the minimum required STC values by treating wall surfaces, wall openings, and the structure with sound attenuating materials. Due to the noise generated by the simulators in the Classrooms the minimum rating for all Classrooms shall be an STC of 62.

3.5.1. FINISHES AND INTERIOR SPECIALITIES

A. GENERAL: Construction and finishes (walls, floor, and ceiling) shall support the cohesive image and theme of the facility.

B. **DURABILITY:** This is extremely important when specifying materials for interior construction and finishes. Heavy equipment is regularly handled throughout the facility. These conditions will lead to greater interior damage being incurred compared to many other facility types.

1) **Casework:** Provide counters, casework, and cabinets of high-quality and durable construction with Premium finishes in accordance with current AWI Quality Standards. At a minimum use plastic laminate doors, drawers, and casework faces. Where no water source is present, countertops shall be plastic laminate as a minimum. Where a water source is present, countertops shall be solid surface/solid composite plastics only.

2) **Interior Finishes:** Finishes must take into account the intended uses, be highly durable, and meet the requirements listed in NFPA 101.

C. **NATURAL LIGHTING:** Provide as much natural lighting as feasibly possible throughout the building. Natural lighting must be capable of being totally blocked from the Simulation Classrooms.

D. **PAINT:** All paints used shall be listed on the "Approved product list" of the Master Painters Institute, (MPI). Application criteria shall be as recommended by Master Painters Institute (MPI) guide specifications for the substrate to be painted and the environmental conditions existing at the project site. Except factory pre-finished material, provide surfaces receiving paint with a minimum of one prime coat and two finish coats. Paints having a lead content over 0.06 percent by weight of nonvolatile content are unacceptable. Paints containing zinc-chromate, strontium-chromate, mercury or mercury compounds, confirmed or suspected human carcinogens shall not be used on this project.

1) **Exterior surfaces:** Exterior paints and coating products shall be classified as containing low volatile organic compounds (VOCs) in accordance with MPI criteria. Application criteria shall be as recommended by MPI guide specifications. Provide an MPI Gloss Level 5 Finish (Semi-gloss), unless otherwise specified.

2) **Interior surfaces:** Interior paints and coating products shall contain a maximum level of 150 g/l (grams per liter) of volatile organic compounds (VOCs) for non-flat coatings and 50 g/l of VOCs for flat coatings. Provide an MPI Gloss Level 5 Finish (Semi-gloss) in wet areas and a flat finish in all other areas.

E. **MINIMUM INTERIOR FINISHES:** Designers are not limited to finishes listed in this section and are encouraged to offer higher quality finishes.

1) Wall, ceiling and floor finishes and movable partitions shall conform to the requirements of the IBC, NFPA and UFC 3-600-01. Where code requirements conflict, the most stringent code requirement shall apply.

2) Resilient and ceramic flooring are preferred. If selected, vinyl composition tile (VCT) shall be a minimum 1/8 inch thick, conforming to ASTM F 1066, Class 2, through-pattern tile, Composition 1, asbestos free, with color and pattern uniformly distributed throughout the thickness of the tile.

3) Walls: All wall finish shall be painted gypsum board, except where stated otherwise. Use impact resistant gypsum board in corridors.

4) All ceiling finishes shall be either painted gypsum board or acoustical ceiling tile depending on the functionality of the space.

5) Floors: Provide highly durable and easily maintained flooring in the warehousing area, fabrication area, device maintenance/repair area, mechanical, electrical and storage areas. As a minimum provide resilient flooring in other areas.

F. **CHALKBOARD/MARKER BOARDS:** Required in all classrooms selection of either chalkboard or marker board shall be at user discretion.

3.6. SEE PARAGRAPH 5.5 STRUCTURAL REQUIREMENTS – NOT USED

3.7. SEE PARAGRAPH 6.7 THERMAL PERFORMANCE – NOT USED

3.8. PLUMBING REQUIREMENTS

Provide facilities with a fully functional plumbing system that complies with the International Plumbing Code (IPC). Provide hose bibs or wall hydrants for the facility. A Philadelphia (one pipe), air admittance valve system, engineered vent system, or a so vent (aerator) type system will not be permitted.

3.9. COMMUNICATIONS AND SECURITY SYSTEMS

- A. GENERAL: Provide all telecommunications in accordance with the Technical Guide for Installation Information Infrastructure Architecture (I3A). Telecommunications provide access to post voice and data systems. Interior telecommunications provided voice and data services, wireless (as needed) and primary facility intercom system connectivity. See Paragraph 6 for possible additional requirements.
- B. SERVICE: Coordinate service with local NEC personnel.
- C. SYSTEM: Provide a fully operational system from the demarcation point to each outlet. In addition to the requirements of the I3A, provide a telecommunications outlet, with a minimum of one voice jack and one data jack, at the left rear of each classroom.
- D. OUTSIDE PLANT TELECOMMUNICATIONS: Provide outside plant cabling and support facilities as required by the local DOIM.
- E. CABLE TV (CATV): Install CATV outlets in waiting, break, conference room and director's office. All CATV outlet boxes, connectors, cabling, and cabinets shall conform to the I3A Technical Guide unless noted otherwise. All horizontal cabling shall be homerun from the CATV outlet to the nearest telecommunications room.
- F. MASS NOTIFICATION SYSTEMS: Provide a Mass Notification System (MNS) in accordance with UFC 4-021-01 that interfaces with the installation MNS to provide emergency notifications of an area, regional or national nature. The MNS may be combined with the Fire Alarm System to prevent duplication of devices and maintenance depending on the Authority Having Jurisdiction (AHJ) at the installation.
- G. ELECTRONIC SECURITY SYSTEM (ESS): An Intrusion Detection System (IDS) is required for the arms secure storage room and shall comply with Army Regulation 190-11, Physical Security of Arms, Ammunition, and Explosives. Provide dedicated infrastructure, power and communication within the appropriate regulatory conveyance inside of the protected area with connectivity to the central security monitoring station.

3.10. ELECTRICAL REQUIREMENTS

- A. GENERAL POWER: Electrical power, lighting and telecommunications shall be provided to the facilities and downrange area as specified below; all IEEE Standards (including Recommended Practice) where the scope is applicable to this design effort; all UL Standards where the UL scope is applicable to this design effort and where itemized in the combined interdisciplinary areas cited.
- 1) Perform a short circuit study as an integral part of selecting and sizing electrical distribution components (all equipment shall be fully rated; that is, do not use series-combination rated equipment).
 - 2) Perform a coordination study to ensure that protective device settings are appropriate for the expected range of conditions (depending on the design and construction schedule, it is acceptable to design adequate protective devices with adjustable features, followed by a coordination study required during construction to specify the correct settings.)
 - 3) Circuit breakers, disconnect switches, and other devices that meet the OSHA definition of energy-isolating device must be lockable.
 - 4) Do not exceed 5 percent combined voltage drop on feeders and branch circuits if the transformer providing service is located within the facility. If the transformer is located exterior to the facility, limit the combined voltage drop for service conductors, feeders, and branch circuits to 5 percent. Individual voltage drop on branch circuits should not exceed 3 percent. Branch circuits supplying sensitive circuits should be limited to 1 percent voltage drop.
 - 5) In general, to minimize sound transmission, do not install "back-to-back" outlet boxes.
 - 6) Locate electrical distribution equipment installed within the facility, including dry-type transformers and electrical panels, within dedicated electrical rooms/closets.

B. INTERIOR ELECTRICAL POWER: When facility electrical design includes a 480/277V power distribution system, mechanical systems and lighting systems shall generally be fed from the available 480/277V power distribution system.

C. RECEPTACLE PLACEMENT: In accordance with applicable codes, standards, referenced UFCs, and the attachments to this section. In general, provide wall duplex outlets, not less than 10 feet on center. Provide not less than one duplex outlet per wall on walls less than 9 feet long. Locate outlets to eliminate the need for extension cords. Above counter receptacles shall be mounted in the vertical wall space above the counter-top. Data, CATV, and CCTV outlets shall each be provided with an associated duplex receptacle.

D. MOUNTING HEIGHT: In accordance with applicable codes, standards, referenced UFCs, and the attachments to this section. Unless indicated otherwise, mount general use receptacles 18 inches above finished floor.

E. SIMULATION CLASSROOMS POWER REQUIREMENTS: Each Simulation Classroom will be provided with dedicated circuits to support the number of Engagement Skills Trainer (EST) subsystems required. It is possible that one, two, or three 5-lane EST subsystems will be required in a simulation classroom.

1) Each CONUS/60 Hz EST subsystem requires: One dedicated 120V, 60 Hz, 15 Amp circuit with duplex receptacle located within 20 ft of the Instructor/Operator Station (IOS). One dedicated 120V, 60 Hz, 20 Amp circuit with duplex receptacle located within 8 feet of EST subsystem air compressor.

2) Each EST subsystem in OCONUS location with 50 Hz power distribution requires: One dedicated 220V, 50 Hz, 7.5 Amp circuit with duplex receptacle located within 20 feet of the Instructor/Operator Station (IOS). One dedicated 220V, 50 Hz, 10 Amp circuit with duplex receptacle located within 8 feet of EST subsystem air compressor.

F. GENERAL LIGHTING: In accordance with applicable codes, standards, referenced UFCs, and the attachments to this section. Lighting design shall consider ease of facility maintenance and minimize the lamp types and wattages used throughout the facility. Provide emergency lighting in all areas required by NFPA 101. Whenever possible, unless otherwise noted, incorporate the emergency lighting into the normally provided lighting fixtures. When natural lighting is provided in a space, the artificial lighting design shall consider and use day lighting control systems whenever it is feasible to reduce energy usage when the natural lighting is available.

G. DIMMING AND SWITCHING: In accordance with applicable codes, standards, referenced UFCs, and the attachments to this section. Where dimmer controls are used, provide lighting fixtures that do not oscillate visibly at low intensities. Provide Three-Way/ Four-Way Switching for rooms/areas with more than one entrance.

H. SIMULATION CLASSROOMS LIGHTING REQUIREMENTS: Provide zoned lighting schemes. Two lighting schemes are required for this classroom. First lighting scheme provides lighting for the space to be used for training with the Engagement Skills Trainer. Second lighting scheme provides lighting for the space to be used as a multipurpose classroom

1) Lighting when used for training with Engagement Skills Trainer (EST): All natural lighting must be blocked/blacked out for training with EST. Provide lighting over firing line only. Provide fully dimmable lighting over the firing line from 0 to 30 fc. Lighting over the firing line shall be designed so that it is not directed at and does not interfere with the EST projection screen(s).

2) Lighting when used for multipurpose classroom: Natural lighting is allowed. Provide fully dimmable general space ambient lighting from 0 to 50 fc. Assure fixture selected minimizes possible interference with use of the room for training with EST (for example, because of the lasers used during training open type specular reflectors or highly reflective exposed surfaces would not be appropriate). Fixtures shall be mounted so that bottom of fixture is no less than 8 feet above finished floor.

I. EXTERIOR LIGHTING: Provide exterior area lighting systems for facility aprons, open storage areas, and parking areas. Provide illumination levels of 50 lux for areas adjacent to the primary facility and 5 lux for parking areas.

J. PERIMETER SECURITY LIGHTING: Provide protective lighting systems in response to project specific requirements to deter trespassers. Conform levels of exterior lighting for protected areas to the requirements in the IES Lighting Handbook. Control lighting with a photoelectric cell with manual override

3.11. HEATING VENTILATING AND AIR CONDITIONING (HVAC) REQUIREMENTS

Provide facilities with a HVAC system that is automatically controlled by a Building Automation System (BAS). Air conditioning is prohibited in the warehouse and storage areas; however, these spaces are to be heated.

3.12. SEE PARAGRAPHS 5.10 AND 6.14 ENERGY CONSERVATION REQUIREMENTS – NOT USED

3.13. FIRE PROTECTION REQUIREMENTS

A. **GENERAL:** Requirements are based on NFPA 101 Life Safety Code for Assembly and the respective occupancy, where applicable. Provide fire detection and sprinklers throughout the entire facility. Refer to Paragraph 6 of this section for installation requirements.

B. **FIRE SUPPRESSION SYSTEMS:** System shall be provided in accordance with NFPA 13 (Standard for the Installation of Sprinkler Systems) and UFC 3-600-01 (Fire Protection Engineering for Facilities)

C. **FIRE DETECTION AND ALARM SYSTEMS:**

1) **General:** Provide a complete addressable Fire Alarm System for the facility in accordance with UFC 3-600-01. Coordinate all design and installation with the local fire department. See Paragraph 6 for possible additional requirements.

2) **System:** The system should be combined with MNS and may incorporate the PA system to reduce device and maintenance costs. This system shall consist of a control panel, a communications device, initiating devices, notification devices and associated wiring and pathways. Provide a Class A addressable system in accordance with UFC 3-600-01.

3.14. SEE PARAGRAPHS 6.14 SUSTAINABLE DESIGN – NOT USED

3.15. SEE PARAGRAPH 6.15 ENVIRONMENTAL – NOT USED

3.16. SEE PARAGRAPH 6.16 PERMITS – NOT USED

3.17. SEE PARAGRAPH 6.17 DEMOLITION – NOT USED

3.18. SEE PARAGRAPH 6.18 ADDITIONAL FACILITIES – NOT USED

3.19. EQUIPMENT AND FURNITURE REQUIREMENTS

3.19.1. FURNISHINGS

Coordinate all furnishings with the user to define requirements for furniture systems, movable furniture, and existing items to be re-used. Early coordination of furniture schedule is required so the facility is complete and usable at turnover.

3.19.2. EQUIPMENT

All equipment shall be coordinated with user prior to selection and installation.

3.20. FACILITY SPECIFIC REFERENCES

Attachment A – Training Support Center (TSC), Army Criteria Tracking System Standard Information, Category Code 14129