

D/B/B Design Criteria for GENERAL INSTRUCTION BUILDING (GIB), ARMY CONTINUING EDUCATION SYSTEM (ACES) FACILITY, and AUTOMATION-AIDED

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3.1. GENERAL REQUIREMENTS

3.1.1. FACILITY DESCRIPTION: A General Instruction Building (GIB) is a facility that includes primarily classroom space for multipurpose training and instruction typically conducted by school/training center facilities. These facilities may include other functional spaces such as auditorium, library, learning resource centers, and administrative support space. This is a general purpose facility intended for use by Total Army School (TASS) schools, schools/training centers of the active and reserve components, combined arms training center in major training areas, and other sites that serve a large population for basic lecture, conference, and/or seminar instruction. For NCO Academies, use the NCO Academy (NCOA) specifically developed for a facility that delivers the NCOES curriculum to students within the controlled campus environment of an NCO Academy. General Instruction Buildings may also include elements of Automation-Aided Instruction (catcode 17136, aka "Classroom XX1) which include dedicated digital training resources accommodation and other special infrastructure requirements

This document is applicable as either a stand-alone criteria document or as an insert to a statement of Work (SOW) or Request for Proposal (RFP) solicitation. When used within a RFP, a completed program of spaces, conceptual plans and/or adjacency matrix may also be provided but do not in any way preclude the requirements of this criteria document. The criteria contained in this document establish the baseline levels of features, spaces and finishes to be provided in these facilities. The designer must allow for and be sensitive to the differences in space requirements for students, instructors, administrators, and general instruction and applied instruction requirements

3.1.2. FACILITY RELATIONSHIPS: There are many first time users in education and training facilities. Students must be able to easily identify their entrance when approaching the site. Once in the building, the Registration/Information desk must be obvious. Students should be able to find counselors, classrooms, and building facilities easily. Zones should be established for the various users of the facility. Instructor's spaces should be closely related to the classrooms while administrators are more remote. Applied Instruction areas often require the use of temporary equipment and therefore must be easily accessible from vehicular circulation on the exterior of the building.

3.1.3. ACCESSIBILITY REQUIREMENTS

A. GENERAL: As of 31 October 2008, all areas and facilities required to be accessible to physically disabled persons shall conform to the ABA Accessibility Standard for Department of Defense Facilities. This standard is composed of ABA scoping chapters 1 and 2 and the technical chapters 3 through 10. This is a publication of the U.S. Access Board and is available at: <https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-aba-standards/aba-standards>

B. SITE PLAN DESIGN AND CONSTRUCTION:

1) 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. Typically a minimum of 1 accessible spaces is required for every increment of 25 spaces up to 100 parking spaces, thereafter increasing 1 additional space for every 50 spaces up to 200. Additionally, one of every 6 accessible spaces, or fraction thereof, must be "van-accessible". Refer to the accessibility guidelines.

C. FACIILTY DESIGN AND CONSTRUCTION:

1) Accessible desks and chairs shall be handled by the installation based on specific needs. Accessible desks are not required in each classroom. In Auditoriums access to permanent stages and wheel chair space in the audience shall be provided in accordance with ABA standards.

2) The following areas are not required to be handicapped accessible: mechanical, electrical, and communications equipment rooms; storage space; hazardous waste/materials storage space; loading docks. All other spaces are required to be accessible unless specifically exempted by the Accessibility Standard.

3.1.4. **BUILDING AREAS:** Building area is established and shall include a combination of applicable educational spaces (identified in paragraphs below) and may include (as required) administrative, special functional use, and support space. The Completed programming worksheet will provide the allocation of square footage required for both program and building support spaces. Note that mechanical and electrical building support spaces in the worksheet may be based on a planning algorithm and requires verification during design. Program spaces should not be reduced by more than 5%.

General Instruction Buildings are Business Group B occupancy classification under the International Building Code. The IBC generally allows assembly accessory occupancies such as Assembly A-3 (auditoriums or large lecture halls) to remain non-separated in the predominant 'B' occupancy. One of the following strategies is commonly followed: (a) if the aggregated accessory use areas do not exceed 10% of their respective building floor area, then the uses may remain unseparated, or (b) Regardless of its proportion of the total building area, uses may remain unseparated provided that the building's area and height limitations are based on the most restrictive use group. In both of these non-separated use strategies, IBC chapter 403 for the most restrictive use applies to the building as a whole. Refer to the IBC for other requirements. Storage requirements may also include Storage Group S occupancy classification. GIBs are occupancy type "Primary Gathering" for purposes of UFC 4-010-01. The allowable occupant load for life safety is based on the requirements of UFC 1-200-01 Design: General Building Requirements, which references both NFPA 101 and IBC depending upon the intended application of the occupancy calculation (i.e. NFPA for egress, IBC for others).

A. **GROSS AREA:** Gross area shall be calculated in accordance with ANSI/BOMA Z65.3 *Gross Areas of a Building: Standard Methods of Measurement*.

B. **NET AREA:** Net area shall follow the definition in UFC 1-200-01. Net area for programmed spaces is included in this document. If net area requirements are not specified, the space shall be sized to: accommodate the required function; and comply with code, overall gross area limitations and other requirements. Examples of spaces without net areas defined are corridors, stairs, restrooms, and mechanical and electrical rooms. Provided net areas and room sizes are guidance that may be adjusted for specific situations such as special functional requirements, construction efficiency, or adaptation for existing facilities.

3.1.5. ADAPT BUILD MODEL – NOT USED

Due to variability in GIBs, a standard design adapt-build model is not available.

3.2. FUNCTIONAL AND OPERATIONAL REQUIREMENTS

A. **FUNCTIONAL SPACES:** The space requirements of each facility are based on the needs of the school mission and the program of Instruction (POI) facility requirements. The criteria here state the area requirements in terms of Net Area (NA) or Gross Area (GA). Space requirements for the various uses are expressed in terms of NA. GA is determined by adding all NA spaces plus an estimated area for building construction (including wall thickness, chase space, structural enclosure, circulation, etc.) and half scope areas such as entry canopies. Gross area in the programming worksheet (appendix) is based on a sliding scale net to gross factor of the net area required by building functions. This gross area factor is intended to cover the area of walls, partitions, structure, mechanical/electrical rooms, chases, restrooms and corridor/hallway circulation. The factor does not include network/server rooms, storage, break area or service spaces, which are identified in net areas. In some cases the net to gross factor may not be appropriate such as for very small facilities where it would be inadequate or very large facilities where it may be excessive. A concise description of each space follows in paragraph:

- Hours of Operation: Generally operation for a GIB is normal duty hours Monday through Friday. When ACES functions are included, the hours of operation extend to approximately 2230 plus weekends. Some installations have developed agreements with state or regional education systems to share installation GIB/ACES facilities as a means of expanding the education programs offered to military personnel

- Deviation from square footages: classrooms may be enlarged to accommodate special equipment related to the instruction for instance in a combined general/applied instruction situation. Do not reduce a classroom by more than 5% from stated target square footages.
- Classroom shape and layout considerations: For optimal arrangement of furniture and sightlines, ensure a classroom length to width ratio of no more than 3 to 2. In most cases, a classroom shape approximating a square in plan is optimal. The space description includes recommended F/F/E for each classroom. The designer shall verify requirements with the user and coordinate specific sizes, arrangements and finishes. Any F/F/E that are Government Furnished Government Installed (GFGI) are provided by the government but the contractor must plan for it (provide space, power, cooling, etc.) and fit the furniture to the space. Detailed furniture data and specifications are available from the COS upon request.

B. Classroom Types

General Purpose Classrooms may generally be characterized by one of 5 technology levels established by TRADOC, each level reflecting increasing levels of embedded technology, and increasing levels of cost. An assessment of the course Program of Instruction (POI) is critical for establishing appropriate the technology level. Typical equipment listed below for each technology should be verified with the training proponent.

C. PRIMARY SPACES: EDUCATIONAL SPACES

1) General Purpose (Enterprise) Classroom. (Category Code 17120). This classroom space is intended to have the flexibility to accommodate teaching in the traditional lecture mode, as well as to perform computer instruction at each desk, and to use projection and interactive media. Seats are typically arranged in rows facing the front of the room, with varying flexibility for reconfiguration of desks for other modes of instruction. This classroom accommodates the use of school-issued student laptop computers, providing for a more flexible classroom. The laptops may be stored in the classroom in a storage cabinet or carried by students. Power and network connections are provided to each computer. The use of laptops requires less desk surface than desktops and permits better sightlines for students. Desks with CRT monitors located below a transparent desktop is an option for ACES classrooms but not for GIBs as they are less flexible. General purpose classrooms are set up for various sizes in accordance with instructor/student ratios. This classroom type can accommodate technology features (legacy Classroom XXI level 3) such as enhanced facilitation tools, automated instruction aides, interactive capabilities, etc. in coordination with TRADOC's Enterprise Classrooms Program. The supporting infrastructure requirements described below are general and robust enough to accommodate a wide spectrum of technology and tools. However, designer must consult TRADOC ECP through the COS no later than the 35% design level to validate and obtain written approval that the design adequately supports the requirements of the POI.

a) **Function:** Instruction of students through lecture, projected images, computer presentation and written information on an interactive and/or white board.

b) **Occupancy:**

- (1) 16 students, 1 instructor
- (2) 24 students, 1 instructor
- (3) 32 students, 1 instructor
- (4) 40 students, 2 instructors
- (5) 48 students, 2 instructors
- (6) 56 students, 2 instructors
- (7) 64 students, 2 instructors
- (8) 72 students, 2+ instructors

c) **Adjacency Reqmnts:** Classrooms should be clustered and have student break, vending and restrooms nearby. Classrooms shall be easily accessed from the public entrance. Instructors' offices should be close to the classrooms.

d) **Space requirement:** Total net area is based upon the 2014 GIB Army Standard. These target square foot allocations listed below assume compliance with the maximum 3:2 room shape guideline. However, since optimum classroom proportions are not always achievable – especially in renovations – these may be increased by up to 5% for 32PN classrooms and larger, and by up to 10% for the smaller classrooms.

- (1) 16 student classroom (34 s.f./Student): 550 s.f.
- (2) 24 student classroom (32 s.f./Student): 760 s.f.
- (3) 32 student classroom (32 s.f./Student): 1,020 s.f.
- (4) 40 student classroom (30 s.f./Student): 1,200 s.f.
- (5) 48 student classroom (30 s.f./Student): 1,440 s.f.
- (6) 56 student classroom (28 s.f./Student): 1,570 s.f.
- (7) 64 student classroom (28 s.f./Student): 1,790 s.f.
- (8) 72 student classroom (28 s.f./Student): 2,000 s.f.

e) **Mechanical:** Mechanical system shall be designed to accommodate partial to full occupancy with temperature control separate from other portions of the building. Equipment and airflow shall be quiet to meet noise level requirement. Each classroom must have individual temperature control¹.

f) **Electrical/Lighting:** Day lighting is preferred and shall be controlled and provide between 40 to 50 foot-candles at desk level in accordance with IESS recommendations and provide a color rendition of 5000K. Each Classroom shall have individual lighting control that switches off automatically when the room is not in use¹¹ However, it is important to correctly specify occupancy sensors: in the past, they have inadvertently turned out the lights in occupied classrooms (as during test-taking for example, or other low-activity classes). Lights may be parabolic or volumetric and mix of indirect/direct to eliminate glare, facial shadows, and shall not washout projection surfaces. 2x4 lighting fixtures is typical and should be oriented lengthwise along the student rows, however, 2x2 lights are preferable. Lighting may be zoned but is generally not mandatory in smaller classrooms of TRADOC schools. Dimmable capabilities may be considered, though not necessary if using high lumen output projection media such as those provided by TRADOC schools.. Each 2PN student station shall have a minimum of six receptacles outlets, and instructor shall have a minimum of 8 outlets on a dedicated 20A circuit to accommodate transformer and wall adaptor power supplies. No more than 3 student stations on a single 20A circuit. The AV/media cabinet location as well as the printer/peripherals location will each have a dedicated circuit. Smartboards shall also have a dedicated circuit. Power to student positions may be distributed by one or a combination of: floor boxes at tables, raised floor systems, flush-mounted raceways integrated into the floor systems, or desking raceway (below desk level) systems with plug-and-play floor infeed modules with or without wall whips. Consider the flexibility required for desk reconfiguration. Provide a duplex receptacle for accreditor and/or visitor desk. ***“Power poles” in classrooms are not allowed in MILCON projects.***

g) **Communications:** Instructor shall have data and power receptacles. Room shall have NIPR data and power receptacle for use by every student which may be accommodated in accordance with power distribution described above. Typically 4pair, cat6 cable is used and is home-run back to the TR from each student position, and network cabling also runs from table to table. A data outlet is generally not required for the accreditation/visitor desk. Due to the noise, generated heat load, and security concerns associated with network equipment, it is preferable that communication racks serving classrooms be consolidated in the TR rather than placed within the classroom. A separate AV/media cabinet associated with and adjacent to the interactive whiteboard (if applicable) will be fed with control wiring and conduit from both the instructor position as well as whiteboard to facilitate instructor control of classroom media devices, lighting, etc..Classrooms should be wired for future wireless access (WiFi) if budget allows. In that case, a wireless access point (box and associated cat 6 cables) should be termination back to the TR in anticipation of future connection of wireless routers.

1 This is an Army Standard for GIB

h) **Furniture/Fixtures** Provide map rail, white board, tack board, and coat hooks. Government furnished equipment includes computers, printer, student desks, chairs, two 65 or 84 inch interactive white boards (with or without short-throw projection capabilities) an AV/media cabinet, and instructor's integrated podium or workstation. Some schools may still require one or two ceiling mounted projectors and projection screens, although there have been sustainment concerns with these. Interactive whiteboards may be used as projection surfaces as well as be equipped with projection capabilities. Regular whiteboards provide additional instruction flexibility and should be provided liberally. 2PN Student desks and instructor desk will typically be either 24" x 60", or 30" x 72". (Refer to AR415-15)

i) **Finishes:** See the Finish Schedule for standard finishes.

j) **Other Requirements:** A storage space, typically about 36 s.f. is required in each classroom. Large classrooms may require more. Ceiling heights are a function of classroom size; Classrooms with less than 20 students shall have a minimum of 9 feet high ceilings. Classrooms with greater than about 5 rows of seating (i.e., 48 students or more) should have higher ceilings (11 feet) to allow better viewing of the screen at the front of the room. Most classrooms should have 10 foot ceilings, which also provides for more flexibility such as when dividable classrooms are opened up to make a larger classroom. Ensure that the classroom has an unobstructed 'presentation' wall space – free of structural projections, fire alarm pulls/strobes and other appurtenances - of approximately 30 feet to accommodate dual screens which may be up to 10 wide each, separated by approximately 2 feet in between.

k) **Acoustics:** If the classroom is to be used broadcasting in a traditional distance learning environment, then STC 50 walls are required. Otherwise, STC 45 is required. Ceiling NRC shall be minimum 0.70, but 0.90 is preferred. Provide minimum NRC .25 floor finishes.

3) **Seminar Model Classroom.** (Category Code 17120) These spaces are often used for higher levels of education such as the master's program at the War College, and other PME type courses. This learning model is based upon a learning transaction that is more interactive in nature and described in the TRADOC Army Learning Model (ALM) 2015 as being discussion-based and student-centric. There are two basic classroom configurations: Students and instructors may be arranged in either an open "U-shape" configuration, or else in a closed conference room style configuration. In either case, depending on the institution, the model consists of either one or two rooms which together accommodate generally smaller classes (24 students or less).

For most PME courses that don't need to break out into smaller classes for significant amounts of time, a single room accommodates a class of 16 - 24 students and 2 instructors in a seminar fashion. In most cases, instructors and students are arranged in moveable tables in a U-shape configuration.

For courses – such as in the Army War College – that typically break-out into smaller groups for significant amounts of time, a smaller adjoining classroom (about 500 s.f.) may be provided to accommodate two simultaneous group sessions that team to solve problems and prepare research prior to re-joining the group. These courses may have from 1 to 4 instructors. However, a supplemental classroom is justified only if utilization of other classrooms prohibits shared use.

a) **Function:** Instruction of students through lecture, interactive work groups, projected images, computer presentation and written information on the board.

b) **Occupancy:** 16 to 24 students, up to 4 instructors

c) **Adjacency Reqmnts:** Rooms required for this function should be near each other. Instructors' offices and classroom storage should be close to the classrooms.

d) **Space requirement:** Total net area is based upon the 2014 GIB Army Standard. These target square foot allocations listed below assume optimal room configurations. However, since optimum classroom proportions are not always achievable – especially in renovations – these may be increased by up to 5% for the U-shape configuration:

(1) 16 student classroom – conference room style seating (40 s.f./Student): 640 s.f. + 2nd Instructor space

(2) 24 student classroom - conference room style seating (32 s.f./Student): 760 s.f. + 2nd instructor space

- (3) 16 student classroom - U-shape seating: 960 s.f.
- (4) 24 student classroom - U-shape seating: 1,400 s.f.
- (5) Supplemental conference classroom (if justified): 550 s.f.

e) **Mechanical:** Mechanical system shall be designed to accommodate partial to full occupancy with temperature control separate from other portions of the building. Equipment and airflow shall be quiet to meet noise level requirement. The larger of the two rooms must have individual temperature control¹.

f) **Electrical/Lighting:** Day lighting is preferred and shall be controlled. Electric lighting shall be switched to allow variable lighting levels. Each Classroom shall have individual lighting control that switches off automatically when the room is not in use¹.

g) **Communications:** Room shall have data and power receptacle for each computer workstation. This shall be by recessed floor or wall-mounted raceway (below desk level) or raised access flooring.

h) **F/F/E:** Provide map rail, white board, tack board, and coat hooks. Government furnished equipment includes computers, printer, student desks, chairs, two 65 or 84 inch interactive white boards (with or without short-throw projection capabilities), instructor's integrated podium workstation. Some schools may still require one or two ceiling mounted projectors and screens, although in some classrooms the interactive whiteboard may be used as a projection surface and the screen and whiteboard may be deleted. 2PN Student desks will typically be either 24" x 60", or 30" x 72". (Refer to AR415-15. A method for flexible data and power distribution and reconfiguration shall be considered such as access flooring (see paragraph 3-5.6.4 for options)).

i) **Finishes:** See the Finish Schedule for standard finishes.

j) **Other Requirements:** A storage cabinet is required in each space. Access flooring shall be considered in this space.

4) **Consolidated Training Configuration (CTC) Space.** (Category Code 17120) The space is specifically used by the Defense Language Institute (DLI) but could be useful in other intense training situations. It uses a cluster of 3 small classrooms for 10 students and 2 instructors each, 2 instructor rooms with 3 work stations each. Pairs of these clusters will share a common space break room that includes 2 storage areas. Each of the classrooms is 300 – 350 s.f. for a total net area of 1750 NSF prior to adding a shared 350 s.f. break area. Instructors use lectures, projected images, written information on the board and a great deal of verbal interaction. Power and network connections shall be provided to each moveable desktop. Classes shall have a single projector and interactive whiteboard at the front of the class. Instructor rooms are offices with 3 workstations and a desk, 4-shelf bookcase, shared white board/tack board, and coat rack. The break rooms usually have a coffee bar and are furnished based on the course requirements

Demountable or moveable wall panel partitions are desirable within the CTC.

a) **Function:** Instruction of students through lecture, projected images, computer presentation, written information on the board, and discussion.

b) **Occupancy:** 30 students, 6 instructors.

c) **Adjacency Reqmnts:** CTC should be clustered in classroom area.

d) **Space requirement:** Total net area is 1,750 s.f. plus break area

e) **Mechanical:** Mechanical system shall be designed to accommodate partial to full occupancy with temperature control separate from other portions of the building. Equipment and airflow shall be quiet to meet noise level requirement. Each CTC must have one or more zones for individual temperature control.

f) **Electrical/Lighting:** Day lighting is preferred and shall be controlled. Electric lighting shall be switched to allow variable lighting levels. Each Classroom shall have individual lighting control that switches off automatically when the room is not in use¹.

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g) **Communications:** Room shall have data and power receptacle for every student and instructor space. This shall be by recessed floor or wall-mounted raceway (below desk level) or raised access flooring.

h) **F/F/E:** Provide tack board, white board, and coat hooks. Government furnished equipment includes one ceiling mounted projector, interactive whiteboard, computers, printer, student desks, chairs, and two instructor's workstation. Student desk shall be approximately 3 ft. wide by 30 inches deep for each student. Instructor's workstation must be able to secure the computer and files.

i) **Finishes:** See the Finish Schedule for standard finishes.

j) **Other Requirements:** A storage space, typically about 36 s.f. is required in each classroom. A method for flexible data and power distribution and reconfiguration shall be considered such as access flooring (see paragraph 3-5.6.4 for options).

5) **Video-Tele Training Classroom.** (Category Code 17120) The spaces have full distance learning capabilities with 2-way audio-video communication. The room is served through the Network Operations Center and remote communication closets. Each desk has a full size desktop computer. Risers or a high ceiling are very desirable in the larger classroom for better sight lines. Distance learning shall be compatible with the Total Army Distance Learning Program (TADLP). It shall include connectivity to the DOD Satellite Education Network (SEN) and Teletraining Network (TNET).

A communication rack is required for the VTT function in each classroom. For renovations, the rack is often in an alcove leading into the room while in new construction it is usually in a closet within the room.

a) **Function:** Instruction of students through teletraining, lecture, projected images, and computer presentation. In some cases the instructor may be remotely located. The space may also be used as a lecture classroom on occasion

b) **Occupancy:**

(1) 15 students, 1 instructor

(2) 30 students, 1 instructor

c) **Adjacency Reqmnts:** Classrooms should be clustered and have student break, vending and restrooms nearby. Classrooms shall be easily accessed from the public entrance. Instructor's offices and classroom storage should be close to the classrooms as well.

d) **Space requirement:** Total net area.

(1) 15 students- approximately 975 s.f.

(2) 30 students- approximately 1,600 s.f.

e) **Acoustics:** Partitions shall comply with the acoustic paragraphs of this criteria. Ceilings shall be absorptive, NRC .70 minimum

f) **Mechanical:** Mechanical system shall be designed to accommodate partial to full occupancy with temperature control separate from other portions of the building. Equipment and airflow shall be quiet to meet noise level requirement. Each classroom must have individual temperature control

g) **Electrical/Lighting:** Day lighting shall be controlled. Electric lighting shall be switched to allow variable lighting levels. Each Classroom shall have individual lighting control that switches off automatically when the room is not in use¹.

h) **Communications:** Provide a power and data connection for each instructor and student. This shall be by raised access flooring. Full functional capability requires the following communication components:

(1) Connectivity from the site/installation to the wide area network (DISN);

(2) Connectivity from the building switch to the installation back-bone;

(3) Connectivity from the building switch to the classroom switch, and

(4) Connectivity from the classroom switch to each workstation and peripheral in the classroom.

i) **F/F/E:** Provide white board, cameras, microphones, and speaker system. Government furnished equipment includes two ceiling mounted projectors and screens (one each in the smaller rooms), interactive whiteboard (if used as a non-VTT classroom also), instructor's workstation, document camera, computers, printer, student desks, and chairs. Student desk shall be approximately 3 ft. wide by 30 inches deep for each student.

j) **Finishes:** See the Finish Schedule for standard finishes. Low contrast between materials is important for better camera function. A blue color scheme is recommended because it provides a technically correct broadcast quality VTT background.

k) **Other Requirements:** A storage space, typically about 36 s.f. is required in each classroom. A method for flexible data and power distribution and reconfiguration shall be considered such as access flooring (see paragraph 3-5.6.4 for options).

6) **Noncommissioned Officer (NCO) Academy Training Space.** (Category Code 17120) The space is used to present lectures, projected images and written information on the board, and is based upon the Seminar model classroom (see above), except that instructors are typically located within the classroom footprint. Instructors are traditionally military. This type of classroom is planned for 16 students arranged in a "U-shaped" desk configuration. These spaces have the flexibility to teach in the traditional lecture mode, use projection media, present hand held material, and work on group projects that may require moving furniture to create an open area. Power and network connections shall be provided to each instructor and student desk. Classes shall have a single or double projector, an interactive whiteboard and white board at the front of the class. In the past, small open offices have been remotely provided for instructors but it has been found that they are not often used. Refer to the Seminar Model classroom for requirements.

Refer to the NCOA Standard.

7) **Digital Training Access Center (DTAC).** (Category Code 13115) The DTAC is directly associated with digital classrooms, however, it is seldom used anymore due to world-wide-web access provided through the Installation NEC. Where it is still used, it provides closed network training-on-demand to the student's desktop or the instructor's equipment based on an educational network LAN, allowing students to access the same or different courseware simultaneously. It allows the use of high bandwidth over the Local Area Network (LAN)..

The DTAC electronically stores and distributes the digital proponent record copy of approved training and other materials. It is the proponent's portion of the Reimer Digital Library. It interfaces with the Automated Systems Approach to Training (ASAT) to receive completed training materials.

The DTAC is also considered a large communications area and its configuration is dependent on the engineering solution for the systems architecture. The DTAC includes an area for 4-12 servers housed in 2 communication racks usually, 2 workstations for technical support personnel, and an uninterrupted power source (UPS). Shelving storage is required for software. If an overhead raceway is not feasible, a sub-floor system with a complete utility supply and cable management system (raised flooring) is acceptable.

Review with the school proponent to determine whether this space is required.

- a) **Function:** Information storage and distribution.
- b) **Occupancy:** 2 System Administrators.
- c) **Adjacency Reqmnts:** The DTAC is centrally located for the GIB but may be remote if necessary.
- d) **Space requirement:** Refer to the 2014 GIB Army Standard for IT support square footage allocations.
- e) **Mechanical:** A dedicated air conditioning system shall be provided for year round air conditioning. The unit shall maintain room temperature and humidity to meet criteria for computer/server rooms.
- f) **Electrical/Lighting:** Day lighting is not desirable. A raised floor or overhead cable raceway system is required.
- g) **Communications:** The space is a large network room or a communications area. Provide power and communications infrastructure for computers, servers, switches, hubs, UPS, communication racks, and workstations.

h) **F/F/E:** Government furnished equipment includes computers, servers, switches, hubs, UPS, communication racks, shelves, workstations, software.

i) **Finishes:** A ceiling height of 8 ft to 9 ft is required.

8) **Resource Center.** (Category Code 17120) The Resource Center is sometimes called a Learning Center and is intended to eventually replace the paper/book library found in many GIBs. It includes the Military Occupational Specialty (MOS) library which is required to be digital in future facilities. It provides LAN and commercial Internet access to students and staff for research. It is not intended to be a group instruction space. In certain education facilities such as the US Army War College or the US Army Sergeant Major Academy the requirements of a Resource Center may still include a large Library (Category Code 61065).

A Common access card may be required for students to use computers in the center. This space may either be a single centralized space, or else distributed throughout the facility.

a) **Function:** Access to digital and printed information.

b) **Occupancy:**

(1) 10 students, 1 administrator (small);

(2) 30+ students, 2 administrators (large)

c) **Adjacency Reqmnts:** Student areas.

d) **Space requirement:** Allowable area is based upon the 2014 GIB Army Standard

e) **Mechanical:** Mechanical system shall be designed to accommodate partial to full occupancy with temperature control separate from other portions of the building. Each classroom shall have individual temperature control.

f) **Electrical/Lighting:** Day lighting is not desirable. Use indirect or parabolic lighting fixtures to reduce glare on video display terminals (VDTs). Each Classroom shall have individual lighting control that switches off automatically when the room is not in use1.

g) **Communications:** Include on corridor public address system. Room shall have data and power receptacle for every student and instructor/administrator space. This shall be by recessed floor or wall-mounted raceway (below desk level) or raised access flooring.

h) **F/F/E:** Provide coat hooks. Government shall provide shelving, cabinets, study carrel type computer stations, staff work stations, telephones, computers, printers, and copier.

i) **Finishes:** See the Finish Schedule for standard finishes.

j) **Other Requirements:** A method for flexible data and power distribution and reconfiguration shall be considered such as access flooring (see paragraph 3-5.6.4 for options).

9) **Information/Reception.** Students wait to see counselors or college representatives (mostly an ACES function). The functional size, furnishings, seating and staff is based on the needs for a GIB. If the facility is also co-used as an ACES facility, the space should be keyed to peak registration simultaneous load data. Staff is located behind a service counter where they use computers and files to access records and standard forms and coordinate appointments for counselors. Students wait in a seating area for processing by someone who can assist them. This space must be easy to find by visitors and have clear signage and information displays.

a) **Function:** Waiting area for students and administrative space for staff.

b) **Occupancy:** 15-30 students, 2 staff

1 This is an Army Standard for GIB

- c) **Adjacency Reqmnts:** Near and observable from building entrance, convenient access to restrooms.
- d) **Space requirement:** Allowable area is based upon the 2014 GIB Army Standard. However, a net area of 540 s.f. is generally recommended to provide space for 2 receptionists, built-in counter, and seating space for up to maximum of 30 simultaneous visitors.
- e) **Mechanical:** Mechanical system shall be designed to accommodate partial to full occupancy with temperature control separate from other portions of the building.
- f) **Electrical/Lighting:** Day lighting is encouraged.
- g) **Communications:** Cable television connection, network and telephone for staff. Public address system is required in larger spaces to contact waiting students. Space shall have telephone and LAN receptacles per the 13A technical criteria.
- h) **F/F/E:** Government shall provide seating, workstations for staff, file cabinets, shelving, large screen televisions, computers, and printers. A service counter shall be built-in or provided as part of the GFGI systems furniture. Provide a directory, bulletin board, and signage.
- i) **Finishes:** See the Finish Schedule for standard finishes.

10) **Instructors Offices.** (Category Code 17120) Offices required near classrooms for senior, permanent, transient instructors. In many cases the grouping of offices into a larger space with individual desk/work stations is desirable. Where offices are grouped, provisions for confidential counseling must be accommodated. Some situations require the instructor store additional materials in the office in which case additional room size is justified in accordance with Army Regulation 405-70. Some instruction facilities have senior level instructors that require larger offices due to grade (such as the Army War College or Sergeant Major Academy). These offices may be increased in size in accordance Army Regulation 405-70. Planners shall modify the room size on the worksheet as appropriate for these special situations. Facilities that support mainly ACES activities should consider grouping instructor cubicles into space allocated for resident colleges rather than place them adjacent to particular classrooms. Since all college instructors who do not double as college advisors are by nature transient the space requirement could be smaller, possibly 65 s.f..

- a) **Function:** Office.
- b) **Occupancy:** 2 students, 1 instructor
- c) **Adjacency Reqmnts:** Near classrooms.
- d) **Space requirement:** Within the allocations of the 2014 Army Standard which targets an overall administrative space (people space + special space) allowance of 155 s.f per Full time staff. Instructors are generally allotted 64 s.f. which assumes that closed private counseling spaces are conveniently located and available to serve the mandatory academic counseling function.
- e) **Mechanical:** Space shall provide heating, cooling, and ventilation
- f) **Electrical/Lighting:** Day lighting is desirable, but not necessary and should be controlled when used.
- g) **Communications:** Space shall have telephone and LAN connections.
- h) **F/F/E:** Provide coat hooks. Government furnished equipment includes workstations or desks approximately 5 ft wide, seating (for instructor plus 2 students/guest), 4-shelf bookcase, telephone, computer, and printer.
- i) **Finishes:** See the Finish Schedule for standard finishes.

11) **Director's Office.** (Category Code 17120) Office space for the director who oversees the program operation. The office includes a small meeting space.

- a) **Function:** Office.
- b) **Occupancy:** 1 staff, 2 guests.
- c) **Adjacency Reqmnts:** Administrative area.

- d) **Space requirement:** Within the allocations of the 2014 Army Standard which targets an overall administrative space (people space + special space) allowance of 155 s.f per Full time staff. Generally the Director's office is approximately 200 s.f.
- e) **Mechanical:** Space shall provide heating, cooling, and ventilation. The room shall have individual temperature control.
- f) **Electrical/Lighting:** Day lighting is desirable, but not necessary and should be controlled when used.
- g) **Communications:** Space shall have telephone and LAN connections.
- h) **F/F/E:** Provide coat hooks. Government furnished equipment includes workstation, seating (for director plus 2 guests), small meeting table with seating, file cabinet, shelving, telephone, computer, and printer.
- i) **Finishes:** See the Finish Schedule for standard finishes.

12) **Administration Office.** (Category Code 17120) Space for building operations, budget, program and training administration. In addition to handling the on-site training, GIB administrators often schedule and arrange off-site training for Installation forces.

- a) **Function:** Office.
- b) **Occupancy:** 1 staff, 2 guests.
- c) **Adjacency Reqmnts:** Director's office.
- d) **Space requirement:** Within the allocations of the 2014 Army Standard which targets an overall administrative space (people space + special space) allowance of 155 s.f per Full time staff.
- e) **Mechanical:** Space shall provide heating, cooling, and ventilation.
- f) **Electrical/Lighting:** Day lighting is desirable, but not necessary and should be controlled when used.
- g) **Communications:** Space shall have telephone and LAN connections.
- h) **F/F/E:** Provide coat hooks. Government furnished equipment includes workstation, seating (for administrator plus 2 guests), file cabinet, shelving, telephone, computer, and printer.
- i) **Finishes:** See the Finish Schedule for standard finishes.

13) **Building Manager's Office.** (Category Code 17120) Required for controlling the use of the classrooms. Space for copying and media storage is required. Serves as security office and has monitors for the security cameras that are located throughout the facility.

- a) **Function:** Office space for building administration and security.
- b) **Occupancy:** 3 staff, 2 guests
- c) **Adjacency Reqmnts:** Near building entrance.
- d) **Space requirement:** Within the allocations of the 2014 Army Standard which targets an overall administrative space (people space + special space) allowance of 155 s.f per Full time staff
- e) **Mechanical:** Space shall provide heating, cooling, and ventilation.
- f) **Electrical/Lighting:** Day lighting is desirable, but not necessary and should be controlled when used.
- g) **Communications:** Space shall have telephone and LAN system including data and cable television.
- h) **F/F/E:** Provide coat hooks, tack board, and white board. Government furnished equipment includes 3 workstations, seating, shelving, copier, storage cabinets, computers, fax and printers.
- i) **Finishes:** See the Finish Schedule for standard finishes.

j) **Other Requirements:** Security camera and monitor requirements shall be coordinated with the local Installation Security Office. In most cases two monitors are required with the ability to switch cameras or have multiple views displayed.

14) **Conference Room.** (Category Code 61050) The conference room shall provide comfortable seating and meeting space. Furniture system shall provide for a variety of seating arrangements.

a) **Function:** Staff and administrative meetings.

b) **Occupancy:**

(1) 20 staff

(2) 30 staff

(3) 50 staff

c) **Adjacency Reqmnts:** Near administrative area.

d) **Space requirement:** Within the allocations of the 2014 Army Standard which targets an overall administrative space (people space + special space) allowance of 155 s.f per Full time staff. In the past, the following conference room spaces have worked well:

(1) 20 staff- 480 s.f.

(2) 30 staff-720 s.f.

(3) 50 staff- 1,200 s.f.

e) **Acoustics:** Walls shall have acoustic wall panels.

f) **Plumbing:** Restrooms and drinking fountains shall be located nearby.

g) **Mechanical:** Mechanical system shall be designed to accommodate partial to full occupancy with temperature control separate from other portions of the building. Equipment and airflow shall be quiet to meet noise level requirement. Each room shall have individual temperature control.

h) **Electrical/Lighting:** Day lighting is not desirable or, if provided, should be controlled. Lighting shall be controlled to allow variable light levels. Each room shall have individual lighting control that switches off automatically when the room is not in use.¹

i) **Communications:** Space shall have telephone and LAN system including data and cable television. Flush data and power receptacles shall be located below probable table locations to avoid exposed wiring during meetings. A clock outlet shall be provided on the rear wall.

j) **Adjacency Reqmnts:** Near the building administration unless shared as a training room.

k) **F/F/E:** Government furnished equipment includes conference tables (reconfigurable table is preferred), seating, and credenza. Provide in the large rooms a speaker system. Government shall provide an interactive lectern and "smart" board system that shall be placed at one end of the room. Government shall provide a ceiling mounted projector in all size rooms. Consider coat/cap closet or rack for ½ of the occupants.

l) **Finishes:** See the Finish Schedule for standard finishes.

15) **Network Operations Center (NOC).** (Category Code 13131) The NOC is also considered a large communications area and its configuration is dependent on the engineering solution for the systems architecture. For the GIB, the NOC is the intelligent connection to the Communications room, serving as the distribution point for VTT (Teletraining Network known as TNET and the Satellite Education Network known as SEN), internet/intranet, cable television, telephone, and data distribution. The NOC electronically stores and distributes digital training material and other materials. The GIB NOC may contain the DTAC required for legacy Classroom XXI (now called Digital, or Enterprise Classrooms). It will serve VTT classrooms as well as all network functions in the building. Depending on the size of the facility, the NOC may serve sub-communication closets or serve directly to the desktop.

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The NOC includes area for servers, switches, and uninterruptible power supplies, housed in racks. In large facilities, provide two workstations for technical support personnel and administrator.

A cable management system (raised flooring) is necessary. Where the raised floor is not feasible, an overhead raceway is acceptable.

- a) **Function:** Information storage and distribution.
- b) **Occupancy:** 2 staff.
- c) **Adjacency Reqmnts:** Near classrooms.
- d) **Space requirement:** Within the allocations of the 2014 Army Standard which provides square footage allocations for supporting facilities.
- e) **Mechanical:** A separate cooling system capable of year-round cooling operation shall be provided. The system shall control and maintain room temperature and humidity to meet criteria for computer/server rooms. Provide slight positive pressure with respect to adjacent spaces.
- f) **Electrical/Lighting:** Day lighting is not desirable.
- g) **Communications:** Space shall have TNET, SEN, telephone, Internet/intranet and LAN system including data and cable television. Provide power and communications infrastructure for computers, servers, switches, hubs, UPS, communication racks, and workstations.
- h) **F/F/E:** Government/school furnished equipment includes workstations, seating, shelving, storage cabinets, racks, servers, switches, computers, and printers.
- i) **Finishes:** See the Finish Schedule for standard finishes. Avoid materials that generate or hold static charges.
- j) **Other Requirements:** The space shall also be connected to and supply information to the Army's Satellite Education Network (SEN). While this broadcast/receiver system is not as reliable as other hardwire methods, the technology is necessary for remote distribution of information. TRADOC does use it in some of their programs. Broadcast through a SEN is important to commands such as those in Germany who will set up field training facilities in remote locations with broadcast coming from the local instruction facility. This function is often related to the optional Broadcast Studio space. A method for flexible data and power distribution and reconfiguration shall be considered such as access flooring (see paragraph 3-5.6.4 for options).

16) **Computer Maintenance Area.** (Category Code 13115) For computer setup, storage, maintenance serving classrooms and administrative requirements in large GIBs (usually over 3716 m² [40,000 s.f.]). For smaller GIBs that require computer maintenance areas, calculate the requirement based upon AR 405-70 Space allowances or established industry space planning standards.

- a) **Function:** Computer service.
- b) **Occupancy:** 2 staff.
- c) **Space requirement:** Within the allocations of the 2014 Army Standard which provides square footage allocations for supporting facilities.
- d) **Mechanical:** Space shall provide heating, cooling, and ventilation.
- e) **Electrical/Lighting:** Electrical and lighting shall be arranged for flexible use of a space as a maintenance bay.
- f) **Communications:** Space shall have telephone and LAN system including data and cable television.
- g) **F/F/E:** Government/school furnished equipment includes 2 workstations, seating, shelving, copier, storage cabinets, workbenches, computers, fax and printers.
- h) **Finishes:** See the Finish Schedule for standard finishes.

17) **Transient Storage**. (Category Code 17120) Secure storage for transient programs near the Loading Dock is required. Transient programs will use the GIB for temporary training needs. They bring materials and equipment packed in crates. The material and equipment is moved to the classroom and the crates must be stored for return transport. This space is sometimes needed for installations that have an ACES that support a large amount of special short-term training.

- a) **Function:** Short term storage of crates and teaching materials for visiting instructors.
- b) **Occupancy:** 1 staff
- c) **Adjacency Reqmnts:** Near Loading Dock
- d) **Space requirement:** Within the allocations of the 2014 Army Standard which provides square footage allocations for supporting facilities.
- e) **Mechanical:** Space shall be heated and ventilated.
- f) **Electrical/Lighting:** Day lighting is not desirable. Each room shall have individual lighting control that switches off automatically when the room is not in use¹.
- g) **Communications:** Space shall have telephone and LAN connection.
- h) **F/F/E:** GFGI storage cabinet, desk and chair.
- i) **Finishes:** See the Finish Schedule for standard finishes.

18) **Record Storage**. (Category Code 17120) Storage is required for student records held for 7 years. These files are currently in the form of paper files stored in file cabinets.

- a) **Function:** Storage space for files.
- b) **Adjacency Reqmnts:** Near administrative area.
- c) **Space requirement:** Within the allocations of the 2014 Army Standard which provides square footage allocations for supporting facilities. In the past, a storage room of 120 s.f. has worked well
- d) **Mechanical:** Space shall be heated, cooled, and ventilated.
- e) **Electrical/Lighting:** Day lighting is not desirable. Provide convenience power receptacles.
- f) **Communications:** Provide telephone and LAN receptacles.
- g) **F/F/E:** GFGI desk, storage cabinet, and file cabinets.
- h) **Finishes:** See the Finish Schedule for standard finishes.

19) **Copy Room**. (Category Code 17120) Central reproduction room is for printing/copying documents, collating, binding and sometimes sending facsimiles. This space is required on each floor. Some facilities may find it unacceptable to share these functions between staff and students, in which case separate and probably smaller spaces would be provided.

- a) **Function:** Open area for administrative, faculty, and student use.
- b) **Adjacency Reqmnts:** Near administrative area.
- c) **Space requirement:** Within the allocations of the 2014 Army Standard which targets an overall administrative space (people space + special space) allowance of 155 s.f per Full time staff. In the past, a 200 s.f. space has worked well in order to fit copy equipment and work counters.
- d) **Acoustics:** Partitions shall be used to reduce noise transmission into other areas.
- e) **Mechanical:** Space shall be heated, cooled, and ventilated.
- f) **Electrical/Lighting:** Day lighting is not desirable. Provide power receptacles for printing/copying equipment.

g) **Communications:** Space shall have telephone and LAN connections.

h) **F/F/E:** Provide a built-in 34 inches high counter approximately 10 ft long with wall cabinet above and drawer base cabinet below. Cabinets shall have cam locks. Government/school furnished equipment includes shelving, copiers, storage cabinets, computer, fax and printers as well as paper and office supplies.

i) **Finishes:** See the Finish Schedule for standard finishes

20) **Supply Storage.** (Category Code 17120) Storage is required for paper and office supplies. In multi-story buildings, the space shall be divided among each floor or area.

- a) **Function:** Storage space for administrative materials.
- b) **Adjacency Reqmnts:** Near administrative area.
- c) **Space requirement:** Within the allocations of the 2014 Army Standard which provides square footage allocations for supporting facilities.
- d) **Mechanical:** Space shall be heated, cooled, and ventilated.
- e) **Electrical/Lighting:** Day lighting is not desirable. Provide convenience power receptacle. Rooms shall have individual lighting control that switches off automatically when the room is not in use1.
- f) **F/F/E:** Provide 406 mm [16 inch] deep shelving full height on 2 walls for paper storage.
- g) **Finishes:** See the Finish Schedule for standard finishes.
- h) **Communications:** Space shall have telephone receptacle.

21) **Small Arms Training Room.** (Category Code 17131) A small arms training room has the same requirements as a classroom with a few exceptions. Because units bring in their own weapons for training, the room should be located near a delivery area for processing weapons and equipment in and out. An Arms Vault is required for storage of the weapons; in fact, use of the Arms Vault is part of the training. The vault is to have convenient access from the classroom. Cleaning agents are used with the weapons, therefore special consideration shall be given to ventilation, room and furniture finishes. Worktables should be provided. Provide accomodations for arms cleaning when required.

- a) **Function:** Weapons training.
- b) **Occupancy:** 32 students, 2 instructors.
- c) **Adjacency Reqmnts:** Near delivery area, on first floor.
- d) **Space requirement:** Total net area of 1,125 s.f.
- e) **Acoustics:** Partitions shall be STC 45 minimum.
- f) **Mechanical:** Mechanical system shall be designed to accommodate partial to full occupancy with temperature control separate from other portions of the building. Equipment and airflow shall be quiet. A separate exhaust system is required. Return air shall not be mixed with adjacent rooms.
- g) **Electrical/Lighting:** Day lighting is desirable but should be controlled. Electrical lighting and power is same as typical classrooms. Each room shall have individual lighting control that switches off automatically when the room is not in use1.
- h) **Communications:** Classroom shall be wired like multipurpose classroom for power and data connections at each seat.
- i) **F/F/E:** Government provided projector, interactive white board, instructor's lectern, display table for mounting weapons, 1524 mm [5 ft] by 610-mm [2 ft] worktables at stool height with 2 student stools (vinyl finish), two instructor's workstations, chairs, computers, and printers. Provide a ceiling mounted projector mounting and white board.

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j) **Finishes:** See the Finish Schedule for standard finishes. Finishes are required to be more durable than typical classrooms due to the use and movement of equipment. Floor should be light to medium darkness without patterns so that small items can more easily be found.

k) **Other Requirements:** Compressed air stations may be required for cleaning the weapons; the minimum number of compressed air stations shall be such that each compressed air station serves a maximum of two occupants at full occupancy. See Arms Vault manufacturer's data for additional considerations..

22) **Arms Vault.** (Category Code 44223) Provide one per weapons training classroom. Minimum dimensions shall be 13 ft x 23 ft. Provide GSA approved Class 5 vault door with day gate between Vault and classroom. Walls and ceiling of Vault shall be reinforced concrete masonry or concrete. Floor shall be reinforced concrete. Rack anchor rings shall be provided. Design shall be in compliance with TI 800-01 Design Criteria and AR 190-11 Physical Security of Arms, Ammunition, and Explosives.

- a) **Function:** Secure storage of weapons used for instruction. Ammunition is not to be stored in the vault.
- b) **Adjacency Reqmnts:** Access from the Small Arms Training Room.
- c) **Space requirement:** Total net area of 300 s.f.
- d) **Mechanical:** Space shall be heated and cooled as part of the Small Arms Training classroom.
- e) **Electrical/Lighting:** Day lighting is not allowed.
- f) **Communications:** Provide telephone and LAN receptacles. Provide an empty conduit system with pull wires for the government installed intrusion detection system.
- g) **F/F/E:** Government shall provide intrusion detection system, racks, shelving, and clearing barrel.
- h) **Finishes:** See the Finish Schedule for standard finishes. Finishes are required to be more durable than typical classrooms due to the use and movement of equipment.

23) **Fixed Seat Auditorium.** (Category Code 17120) The auditorium may not be a required space in every facility, and requires justification by proponent. Often the Installation has satisfactory spaces for addressing large groups near instruction buildings. When a fixed seat auditorium is required (and there are no other on post facilities that can reasonably accommodate this requirement) it will be sized from the 151 or more person capacity. Requirements for smaller auditorium sizes will be accommodated with existing on post facilities, the multi-purpose auditorium, or a multi-purpose classroom. The size of the auditorium is based on the number of anticipated users at one time. ACTS has a formula for calculating this. This criteria uses 1.2 m² [13 s.f.] per seat for net area including related spaces. Auditoriums should include spaces such as a vestibule, main seating area, stage, storage and sound room. Projection rooms are not usually required since most presentations are computer based.

Project equipment should include a lectern (with proper lighting/audio/visual controls), two electric projection screens or a wide screen, two projectors, wireless microphones, theater quality audio system, theater seating with writing tablets.

A sloped floor is very desirable. Where it can be accommodated, curved or fan shaped rows of seating are preferred to straight rows. Seating should focus on and provide a good viewing of the speaker and projection screens. Seating should have upholstered seats and backs to soften acoustics but solid bottoms and rear panels for durability. Fixed seating should not create maintenance and repair problem for auditorium floor, consider swivel type fixed seating so that floor mounts do not unduly damage flooring surface.

- a) **Function:** A presentation and learning space for large groups including graduation ceremonies.
- b) **Adjacency Reqmnts:** Near the building entrance and restrooms
- c) **Occupancy:** Based on need
- d) **Space requirement:** Total net area including support spaces shall be number of seats x 13 s.f. net.
- e) **Acoustics:** Partitions shall be STC 45 minimum. Rear wall and floor should have an absorptive NRC of 25 minimum while the ceiling, front and sidewalls shall be reflective.
- f) **Plumbing:** Restrooms and drinking fountains shall be located nearby.

- g) **Mechanical:** Mechanical system shall be designed to accommodate partial to full occupancy with temperature control separate from other portions of the building. Equipment and airflow shall be quiet to meet noise level requirement. Each auditorium shall be divided into reasonable number of zones for appropriate thermal control.
- h) **Electrical/Lighting:** Day lighting is not desirable or should be controlled. Lighting shall be zoned and dimmable with controls at the speaker's podium and rear wall.
- i) **Communications:** Audio, video, cable television systems are required. A clock shall be provided on the rear wall. Provide telephone and LAN receptacles serving the podiums and stage areas; additional wall outlets will be evenly spaced around the room's perimeter at the rate on one per 500 SF of auditorium area.
- j) **F/F/E:** Provide auditorium seating, projector mounting, a/v/ system rack, and audio system and projection screens. Government furnished equipment includes projectors, lectern, computers, freestanding tables and chairs as required for special functions.
- k) **Finishes:** See the Finish Schedule for standard finishes.
- l) **Other Requirements:** See code requirements for Assembly occupancies.

24) **Large Group Lecture.** (Category Code 17120) The multipurpose lecture space is meant for larger classes and diverse functions and may be used as a multi-purpose space (i.e., in-processing, out-processing, etc.). It may not be a required space in every facility and can often be shared between GIBs. The multipurpose auditorium is intended to seat from 71 up to 150 people using stackable. It requires storage space for the chairs. It is to have a raised podium/stage sized for the functions of the particular installation. The stage and seating area must accommodate persons with disabilities. A vestibule space and sound/projection room is not required.

Project equipment should include a lectern (with proper lighting/audio/visual controls), two electric projection screens, two projectors, audio system, wireless microphone, and stackable seating. A sloped floor is not acceptable in this multi-use space. Seating should focus on and provide good viewing of the speaker and projection screens.

- a) **Function:** A multi-use gathering, presentation and learning space for large groups including graduation ceremonies.
- b) **Adjacency Reqmnts:** Near the building entrance and restrooms
- c) **Occupancy:** 71 – 150 people.
- d) **Space requirement:** Total net area including support spaces shall be sized according to maximum of 25 s.f. per student, and minimum of 22 s.f. per student.
- e) **Acoustics:** Partitions shall be STC 45 minimum. Rear wall and floor should have an absorptive NRC of 25 minimum while the ceiling, front and sidewalls shall be reflective.
- f) **Plumbing:** Restrooms and drinking fountains shall be located nearby.
- g) **Mechanical:** Mechanical system shall be designed to accommodate partial to full occupancy with temperature control separate from other portions of the building. Equipment and airflow shall be quiet to meet noise level requirement. Each auditorium shall be divided into reasonable number of zones for appropriate thermal control.
- h) **Electrical/Lighting:** Day lighting is not desirable or if provided, should be controlled. Lighting shall be dimmable with controls at the speaker's podium and rear wall.
- i) **Communications:** Provide telephone and LAN receptacles serving the podiums and stage areas; additional wall outlets will be evenly spaced around the room's perimeter at the rate on one per 500 SF of auditorium area. Audio, video, and cable television systems are required. A clock shall be provided on the rear wall
- j) **F/F/E:** Provide projector mounting, a/v/ system rack, audio system, and projection screens. Government furnished equipment includes projectors, lectern, computers, freestanding tables and chairs as required for planned functions.
- k) **Finishes:** See the Finish Schedule for standard finishes.
- l) **Other Requirements:** See code requirements for Assembly occupancies.

<ACES>

25) **Army Continuing Education System (ACES) Classrooms and Support Space.** (Category Code 74025)

These spaces often operate until late at night. Consider sharing classrooms with daytime general instruction space, but program as ACES facility so adequate support space is provided. See GIB classroom and office administration descriptions for selection of appropriate spaces. Include Information/Reception, College Offices, Counselor Offices, and Testing facilities listed below as required by the ACES function. For ACES, Instructor offices should be located near college offices and administration space instead of near classrooms; this provides more flexibility to change use of the space as requirements change. Sizing of ACES functional areas should be based maximum student load usually occurring in the early spring or late fall. Information/Reception Area is often located near the Break Area for overflow during peak registration times.

26) **College Office.** (Category Code 74025) This is a function of the ACES. The Army provides offices for those colleges serving their ACES. Each office varies in size based on the needs at the particular Installation. Provisions are usually made for shared offices by those colleges who do not provide full time staff on site.

- a) **Function:** Office space for administrative and counseling support to students.
- b) **Occupancy:** 2 students, 1 counselor.
- c) **Adjacency Reqmnts:** Near administrative area and reception area.
- d) **Space requirement:** Total net area at an average of 120 s.f. full time staff person.
- e) **Acoustics:** Partitions shall be STC 45 minimum.
- f) **Mechanical:** Space shall be heated, cooled, and ventilated.
- g) **Electrical/Lighting:** Day lighting is desirable, but not necessary and should be controlled when used.
- h) **Communications:** Space shall have telephone and LAN system including data and cable television.
- i) **F/F/E:** Government/school furnished equipment includes workstations, seating, shelving, copier, storage cabinets, computers, fax and printers.
- j) **Finishes:** See the Finish Schedule for standard finishes.

27) **Counselors.** (Category Code 74025) Counselors assist students in planning their education and registering or changing class schedules. The functional size, furnishings, seating and staff is based on the needs for an ACES facility. The requirement should be adjusted appropriately based on Installation needs. In some facilities, counselors will also require administrative assistance. Space for assistants would be programmed as a counselor office function at a ratio of approximately one per five counselors.

Some situations require the counselor store additional materials in the office in which case additional room size is justified in accordance with Army Regulation 405-70. Some counselors have larger groups to counsel in which case it is preferable to use common meeting/conference space. Planners shall adjust the room size on the worksheet as appropriate for these special situations.

- a) **Function:** Private office for counseling.
- b) **Occupancy:** One counselor, 2 students.
- c) **Adjacency Reqmnts:** Near administrative area and reception area.
- d) **Space requirement:** Total net area of 120 s.f. per counselor.
- e) **Acoustics:** Partitions shall be STC 45 minimum.
- f) **Mechanical:** Space shall be heated, cooled, and ventilated.
- g) **Electrical/Lighting:** Day lighting is desirable, but not necessary and should be controlled when used.
- h) **Communications:** Space shall have telephone and LAN connections.
- i) **F/F/E:** Government furnished equipment includes workstations, seating (for counselor plus 2 students), shelving, bulletin/white board, telephone, computer, and printer.

j) **Finishes:** See the Finish Schedule for standard finishes.

28) **Testing Room.** (Category Code 74025) Testing is generally a requirement of ACES. The space shall also be useable as a Multi-Purpose Classroom. Testing requires space for traditional (paper) and computer testing as well as administration, observation and storage space. One proctor is required for each 15 students; testing rooms are normally set up for 15 or 30 students. The testing room and process shall comply with AR 611-5 Personnel and Classification Testing and DANDES Exam Program Handbook.

The space shall be sized for 30 students but dividable as two rooms for testing 15 on each side. The moveable partition shall provide an STC rating equal to the requirement for fixed wall construction. An intercom system shall be used between the Control Room and each side of the Testing Room. A minimum of 4 speakers and microphones shall be used for each 15-student area.

a) **Function:** Student testing.

b) **Occupancy:** 30 students, 2 instructors

c) **Adjacency Reqmnts:** Testing Control Room and within a quiet area of the facility.

d) **Space requirement:** STC 48.

e) **Mechanical:** Mechanical system shall be designed to accommodate partial to full occupancy with temperature control separate from other portions of the building. Each classroom shall have individual temperature control.

f) **Electrical/Lighting:** Day lighting is not necessary. Electric lighting shall be switched to allow variable lighting levels.

g) **Communications:** Room shall be wired like multi-purpose classroom for power and data connections at each seat. The standard intercom addressing all classrooms shall not be used in the Testing Room.

h) **F/F/E:** Government shall provide desk approximately 2 ft deep by 3 ft wide for use with or without computers and seating. Desks that have transparent tops with a computer monitor below are a desirable feature to allow computer based testing and paper testing without changing room arrangement. Provide wall clock, marker board, and tack board.

i) **Finishes:** See the Finish Schedule for standard finishes.

29) **Testing Control Room.** (Category Code 74025) Certain testing must be observed from an adjacent space. The Control Room shall comply with AR 611-5 Personnel and Classification Testing and DANDES Exam Program Handbook. A large observation window shall be used with one-way glass. The Testing Control Room is approximately 150 s.f. and included with the Testing Room because it is an integral requirement. With proper layout, a single Testing Control Room could serve two 30-person rooms. The space also requires approximately 70 s.f. of miscellaneous Storage (furniture, materials and computers) and approximately 70 s.f. of Secure Storage connected to the Testing Control Room. All of these spaces are included in the Testing Room net area. Some facilities may have two personnel assigned to this space, requiring separate computers and a test scanner. Students will not have access to the test control room.

a) **Function:** Observe testing, store test.

b) **Occupancy:** 1 - 2 instructor(s).

c) **Adjacency Reqmnts:** Testing rooms.

d) **Space requirement:** Total net area of 290 s.f..

e) **Acoustics:** STC 48.

f) **Mechanical:** Space shall be heated and cooled as part of the Test Room.

g) **Electrical/Lighting:** Day lighting is not desirable. Lighting shall be dimmable to enhance use of one-way glass.

h) **Communications:** Public address going to other classrooms shall be included in the Test Control Room. Provide an intercom to the Test Room. Space shall have telephone and LAN connections.

- i) **F/F/E:** Government shall provide safe, files, shelves, seating, computer, test scanner, and printer. Provide built-in counter, observation window with one-way glass, window blind, coat hooks, and tack board.
- j) **Finishes:** See the Finish Schedule for standard finishes.

30) **Testing Administrator.** (Category Code 74025) An office space for a test administrator is required in some facilities but is often combined with the Testing Control room in ACES facilities.

- a) **Function:** Office.
- b) **Occupancy:** 2 students, 1 administrator
- c) **Adjacency Reqmnts:** Near Testing Rooms.
- d) **Space requirement:** Total net area of 110 s.f.
- e) **Mechanical:** Space shall be heated, cooled, and ventilated.
- f) **Electrical/Lighting:** Day lighting is desirable, but not necessary and should be controlled when used.
- g) **Communications:** Space shall have telephone and LAN connections.
- h) **F/F/E:** Government furnished equipment includes workstations, seating (for administrator plus 2 students), shelving, file cabinet, telephone, computer, and printer.
- i) **Finishes:** See the Finish Schedule for standard finishes.

</ACES>

31) **Broadcast Studio.** (Category Code 13175) The space is used to record and send out instructor information. The digital information may be produced, copied and distributed from the space to the Network Operations Center. From there it may be broadcast on the SEN.

- a) **Function:** Digital recording of video and audio information.
- b) **Occupancy:** 2 staff.
- c) **Adjacency Reqmnts:** Quiet, remote location away from mechanical equipment.
- d) **Space requirement:** Total net area 450 s.f.
- e) **Acoustics:** Partitions shall be STC 52 minimum. Rear wall and floor should have an absorptive NRC of 25 minimum while the ceiling, front and sidewalls shall be reflective.
- f) **Mechanical:** Space shall be heated, cooled, and ventilated with individual temperature control. System shall be quiet to meet noise level requirement.
- g) **Electrical/Lighting:** Day lighting is not desirable. Consider use of studio lighting to eliminate facial shadows.
- h) **F/F/E:** Government furnished equipment includes audio/visual recording and broadcast equipment, workstations, seating, shelving, storage cabinets, computers, printer, studio lighting and recording equipment.
- i) **Finishes:** See the Finish Schedule for standard finishes. Low contrast between materials is important for better camera function. A blue color scheme is recommended because it provides a technically correct broadcast quality VTT background.

32) **Applied Instruction Building Module.** (Category Code is dependent on actual use) This document does not include specific criteria for Applied Instruction spaces but does allow the planner/designer to input requirements in the GIB programming worksheet. Installation specific requirements must be evaluated and input to the programming and design documents. Refer to the latest Real Property Planning and Analysis System (RPLANS) and Facility Planning System (FPS) reports for category codes 1713x for various types of applied instruction facilities.

Applied Instruction often includes special equipment such as vehicle lifts, pneumatic tools, high bay work/training areas, special electricity, large quantities of water or cooling, special supply and disposal requirements, and unique ventilation. Examples of applied instruction training facilities are vehicle maintenance, helicopter maintenance, dive tanks, ordnance, large weapons, and equipment instruction.

- a) **Function:** Instruction for specific hands-on applications often involving military equipment.
- b) **Occupancy:** Student and instructor load is based on the particular requirements of the Applied Instruction and must be programmed on an individual basis.
- c) **Adjacency Reqmnts:** Applied Instruction often requires bringing in equipment, therefore facilities must be located near delivery.
- d) **Space requirement:** Total net area is based on the particular requirements of the Applied Instruction and must be programmed on an individual basis.
- e) **Acoustics:** Consider appropriate acoustic treatments to separate from classroom and administrative spaces. Partitions shall be STC 45 minimum.
- f) **F/F/E:** F/F/E requirements are specific to the instruction being taught.
- g) **Finishes:** Finishes are generally more industrial in durability and appearance than used for General Instruction spaces.
- h) **Communications:** Provide telephone and LAN receptacles.

33) **Student Break and Vending Area.** (Category Code 17120) Separate instructors and students break areas required. Student Break area works well as an open "food court" style space in coordination with the Vending Area, offering flexibility in types of seating and gathering. A variety of machines/food selection is necessary. The installation shall determine the number and type of machines to be used. Acoustic separation from classrooms is important. In two story facilities, a Break/Vending area may be required on each floor. In ACES facilities it is advantageous to locate this near the Reception area for over flow during class registration.

Designers shall coordinate with the installation AAFES on number and size of vending machines to be provided so the result will be a designed/coordinated space for the actual government provided equipment.

- a) **Function:** Serves as a snack vending and break area for students and workers.
- b) **Adjacency Reqmnts:** Adjacent to corridor and vertical circulation. Restrooms and drinking fountains shall be located nearby. Relationship to outdoor areas is desirable.
- c) **Space requirement:** Total net area is calculated as a function of the student load.
- d) **Acoustics:** Determined by surrounding spaces.
- e) **Plumbing:** Include an electric water cooler nearby. Plumbing as required for vending machines (coffee).
- f) **Mechanical:** Space shall be heated, cooled, and ventilated. Heat Load of the vending machines shall be included in cooling load calculations.
- g) **Electrical/Lighting:** Provide receptacles for vending machines, refrigerator, coffee maker and microwave oven.
- h) **Communications:** Include speaker for corridor PA system. Provide wall (Installation access only) telephone receptacles. Consider providing two pay phones. (Verify phone requirements with Installation).
- i) **F/F/E:** Government shall provide trash/recycle receptacles, seating and tables. AAFES will provide vending machines. Provide tack boards.
- j) **Finishes:** See the Finish Schedule for standard finishes. Casework with durable finishes.
- k) **Other Requirements:** Exterior windows are desirable. Provide casework with lockable storage below. Plan for restocking of vending machines.

34) **Staff Break Area.** (Category Code 17120) Separate administrative staff and students break areas are required. Distributed staff break areas may be required for instructors in multi-story facilities, otherwise it is usually in a centralized location. Generally staff will share the student vending machine. In facilities with less than 30 staff, a staff break area is not required, but may still be provided. The staff space shall be an enclosed space. Acoustic separation from classrooms is important. Provide for handicapped accessibility.

- a) **Function:** Serves as a snack and break area for staff.
- b) **Occupancy:** varies.
- c) **Adjacency Reqmnts:** Adjacent to corridor and vertical circulation, near Administration areas.
- d) **Space requirement:** Total net area is calculated as a function of the number of total staff and instructors serving the building, in accordance with the Army Standard.
- e) **Acoustics:** Partitions shall be STC 45 minimum.
- f) **Plumbing:** Plumbing connections for a refrigerator ice maker and coffee maker. Provide a single bowl polished stainless steel sink and instantaneous hot water dispenser.
- g) **Mechanical:** Space shall be heated, cooled, and ventilated.
- h) **Electrical/Lighting:** Provide convenience receptacles as well as receptacles for refrigerator and counter top appliances.
- i) **Communications:** Provide telephone and LAN receptacles. Include speaker for corridor PA system.
- j) **F/F/E:** Government shall provide trash/recycle receptacles, vending machines (if not provided elsewhere), refrigerator, coffee maker, microwave oven, seating and tables. Provide wall and base cabinets, and tack boards.
- k) **Finishes:** See the Finish Schedule for standard finishes. Casework with durable finishes.
- l) **Other Requirements:** Exterior windows are desirable. Provide casework with lockable storage below.

D. COMMON AREAS: - Building Support Spaces

1) **Vestibule.** (Category Code 17120) A vestibule or air lock shall be provided at the main entrance.

- a) **Function:** Reduce drafts and improve energy efficiency.
- b) **Adjacency Reqmnts:** Exterior and Lobby
- c) **Space requirement:** Total net area of 80 s.f.. The net area is part of the gross area factor calculation.
- d) **Mechanical:** Space may be heated in cool climates.
- e) **Finishes:** See the Finish Schedule for standard finishes. Use durable materials and take the opportunity to continue exterior material palette into the building.
- f) **Other Requirements:** Provide a recessed entrance floor mat. Exterior glazing should be insulated.

2) **Loading Dock.** (Category Code 17120) A loading dock is important for new standalone facilities. It should be remote from the student entrance, and have storage and vertical circulation. In large facilities (over 3716 m² [40,000 s.f.]), where delivery of supplies or instruction material is received daily, loading docks are usually required. The dock shall be raised with a platform height at 1097 mm [3 ft-6 inches] above lowered truck area. Dock shall include a roof, dock leveler and stairs.

- a) **Function:** Receiving area.
- b) **Adjacency Reqmnts:** Near Material Storage and Service Elevator. Remote from student entrance.
- c) **Space requirement:** Total net area 160 s.f... Gross area impact for this space is calculated at 50% and equals 80 s.f...
- d) **Acoustics:** Isolate from Classrooms and Testing.
- e) **Plumbing:** Drain truck pit.
- f) **Electrical/Lighting:** Provide lighting and outdoor weatherproof receptacles.

g) **Communications:** Space shall have an intercom to the Facility Manager's Office.

h) **Finishes:** See the Finish Schedule for standard finishes.

3) **Restrooms.** Plan on proper male/female ratio and for surges when classes break. Currently, many installations have a greater male instruction program than female and this must be considered when determining fixture counts. In facilities with more than 30 staff, separate administrative restrooms from student restrooms. Minimum number of fixtures shall be as required by International Plumbing Code (Business occupancy). Consider additional fixtures to handle surge of students. Arrange entrance to provide visual privacy.

a) **Function:** Restrooms for occupants. Include accessible fixtures as required by code.

b) **Adjacency Reqmnts:** Adjacent to corridor, near classrooms, student break and vending areas, staff break areas and administrative area.

c) **Space requirement:** The area is part of the gross area factor calculation. Total net area is calculated at approximately 4% of gross area subtotal.

d) **Plumbing:** Efficiently locate fixtures. Toilets, urinals, and lavatories shall have automatic valves. Installation shall determine if the valves are battery or hardwired. Provide a minimum of one floor drain with Trap Seal Primer connection; locate floor drain outside of traffic areas.

e) **Mechanical:** Space shall be heated, cooled, and ventilated.

f) **Electrical/Lighting:** Provide GFI-protected convenience receptacles. Provide occupancy sensors for automatic control of lighting.

g) **Communications:** Include speaker for corridor PA system.

h) **F/F/E:** Provide countertop-mounted lavatories, floor mounted toilets, and wall-hung urinals. Countertops shall be solid surfacing materials. Provide toilet partitions at each toilet, and urinal partitions between urinals. Partitions shall be solid polymer plastic, overhead-braced type. Provide the following toilet accessories: one continuous mirror full width of countertop at countertop mounted lavatories; full length mirror; one paper towel dispenser/waste receptacle per three toilet fixtures; one soap dispenser per lavatory; one toilet tissue dispenser per toilet; one robe hook on each toilet partition door. In addition, for Women's room provide one sanitary napkin disposal per toilet and consider one sanitary napkin/tampon vending machine. Toilet accessories shall be fabricated from stainless steel, provide semi-recessed units where possible. Government shall provide trash receptacles.

i) **Finishes:** See the Finish Schedule for standard finishes.

j) **Other Requirements:** Consider the need for showers and locker rooms on a per project basis. Actual need must be compared to available facilities (building location relative to other facilities such as housing and physical fitness centers).

4) **Janitor Closet.** Provide one at each group of toilets on each floor of the building. Minimum area: 4.5 m^2 [48 s.f.]. Room shall be accessed from the corridor. Provide one floor mounted mop sink and mop rack for three mops. One Janitor's Closet is required on each floor minimum.

a) **Function:** Sink and storage of cleaning supplies, soap, paper products, floor buffer, and wet vacuum.

b) **Adjacency Reqmnts:** Near toilets.

c) **Space requirement:** Total net area of 4.5 m^2 [48 s.f.] The net area is a part of the gross area factor calculation.

d) **Plumbing:** Faucet shall be designed to support a bucket and have a threaded end to receive a hose. Provide vacuum breaker for faucet.

e) **Mechanical:** Space shall be ventilated.

f) **Electrical/Lighting:** Provide a GFCI protected receptacle near the shelving wall.

g) **F/F/E:** Provide shelving.

h) **Finishes:** See the Finish Schedule for standard finishes.

5) **Mechanical Room.** Provide dedicated interior spaces and exterior areas for plumbing, fire protection, and HVAC equipment. Size and locate rooms (including doorways) to allow equipment removal and maintenance. Provide floor openings and vertical shaft spaces as necessary.

- a) **Function:** Mechanical support spaces for the building.
- b) **Adjacency Reqmnts:** Locate main mechanical room on ground floor with doors opening to exterior. Mechanical support spaces shall not be used for storage or other purposes; access to mechanical spaces will be limited to authorized personnel. Locate exterior mechanical equipment and air intake and openings in exterior walls to comply with force protection standards.
- c) **Space requirement:** The area is part of the gross area factor calculation. Total net area equal to 5% of the gross building area subtotal for planning purposes. Actual required area shall be determined during programming based on Installations and environmental requirements.
- d) **Plumbing:** Provide plumbing as required for functions of the space.
- e) **Mechanical:** Space shall be heated independently from the remainder of the building. Space shall be ventilated.
- f) **Electrical/Lighting:** Provide convenience receptacles as well as requirements for equipment.
- g) **Communications:** Provide telephone service for energy management system and maintenance use.
- h) **Finishes:** See the Finish Schedule for standard finishes.
- i) **Other Requirements:** Locate air intake and exhaust openings to provide optimum indoor air quality. Locate air intakes to meet AT/FP requirements.

6) **Electrical Room.** Provide dedicated interior spaces and exterior areas for electrical equipment. Size and locate rooms (including doorways) to allow equipment removal and maintenance. Provide floor openings and vertical shaft spaces as necessary. Provide minimum of one electrical room per floor.

- a) **Function:** Electrical support spaces for the building.
- b) **Adjacency Reqmnts:** Locate main electrical equipment room on ground floor. Electrical rooms on upper floors should be located to allow efficient distribution. Size and locate rooms to allow equipment removal and maintenance. Electrical rooms shall not be used for storage or other purposes; access to electrical rooms will be limited to authorized personnel. Locate exterior electrical equipment to comply with force protection standards.
- c) **Space requirement:** The area is part of the gross area factor calculation. Total net area equal to 1.5% of the gross building area subtotal for planning purposes. Actual required area shall be determined during programming based on Installations and environmental requirements.
- d) **Plumbing:** Do not run plumbing over electrical panels.
- e) **Mechanical:** Space shall be ventilated. Shall be cooled as necessary to keep the electrical equipment functioning properly.
- f) **Electrical/Lighting:** Provide convenience receptacles.
- g) **Communications:** Provide telephone service for fire alarm and security systems and maintenance use. Finishes: See the Finish Schedule for standard finishes.
- h) **Other Requirements:** Electrical service to the building shall be underground. Provide masonry screen walls with lockable metal access gates around outdoor equipment. Coordinate with requirements of Installation Design Guide. It is preferable to locate transformer within the screened mechanical equipment area. Comply with AT/FP standards.

7) **Communications (Comm) Room.** A Communications Room is required to manage building connection to telephone, fiber optic, cable television, and other infrastructure. For GIBs larger than 10,000 square feet, multiple Communications Rooms are required and are to be arranged in accordance with the I3A Technical Criteria. The room shall not be located remote from the Network Operations Center (NOC) or classrooms for the purpose of being located near Department of Public Works managed spaces such as Mechanical or Electrical Rooms. The Communications Room shall serve the NOC, which is the primary means of distributing information/communications systems through the facility to desktops. Provide additional communications closets as required to meet the I3A Technical Criteria.

- a) **Function:** Communications service to the building.
- b) **Adjacency Reqmnts:** Within service distance to NOC.

c) **Space requirement:** The area is part of the gross area factor calculation. Total net area of communications room(s) to be 1.1% of the Gross square footage of the building. Communications rooms must be a minimum dimension of 10x8 feet.

d) **Mechanical:** A dedicated system shall be provided for year round air conditioning. The unit shall control and maintain room temperature and humidity to meet criteria for Comm. Room. Provide positive pressure with respect to adjacent spaces.

e) **Electrical/Lighting:** Provide convenience receptacles and power connections and lighting in accordance with I3A criteria.

f) **Communications:** Provide telephone and LAN receptacles in accordance with I3A criteria.

g) **F/F/E:** GFGI distribution hardware, switches, servers, etc. Provide backboards and racks.

h) **Finishes:** See the Finish Schedule for standard finishes.

i) **Other Requirements:** Communications service to the building shall be underground.

8) **Corridors.** Provide as required for circulation; minimum corridor width shall be as required by applicable codes, but not less than 7 ft for student classroom corridors, while 8 to 12 ft is appropriate in large facilities, and 5 ft for administrative areas. Provide glazed aluminum (or other material as required by the Installation Design Guide) storefront doors at public entrances. Provide abuse-resistant wall material/finish in the corridors to applicable height. Provide insulated hollow metal doors and frames for exterior service areas.

a) **Function:** Circulation and egress; movement of equipment and people throughout

b) **Adjacency Reqmnts:** Adjacent to stairs, elevator, exterior entrances and classrooms, and other core areas.

c) **Space requirement:** Total net area as required by design. The net area of corridors is part of the gross area factor calculation.

d) **Acoustics:** See requirements for adjacent rooms

e) **Mechanical:** Space shall be heated and cooled.

f) **Electrical/Lighting:** Provide convenience receptacles (15 m [50 ft] o.c. minimum).

g) **Communications:** Provide wall telephone and LAN receptacles as required for safety and security. Public address system shall be provided in the corridors and public areas.

h) **F/F/E:** Provide room identification signage at doors to each room.

i) **Finishes:** See the Finish Schedule for standard finishes.

j) **Other Requirements:** Overhang or recess at exterior doors is desirable for weather protection. Provide vestibules at secondary entrances as required by the Installation. Coordinate user requirements for access control of exterior corridor doors. Where equipment on carts or dollies is regularly moved through corridors, add requirement for wall guard and corner guard protection

9) **Stairs.** Provide as required for circulation and egress in multi-story buildings. Interior stairs are preferable in most climates. A stair shall be conveniently located near the Lobby/Elevator/Public Entrance to the building. Minimum stair width shall be as required by applicable codes, but not less than 1118 mm [44 inches.] The main student use stair should be at least four feet wide. Provide exit signage. Stair doors shall have glazed panels (comply with code requirements for fire ratings and safety glazing). Exterior stairs shall be cast-in-place concrete construction. Interior stairs shall be cast-in-place concrete or steel construction with concrete-filled treads. Open risers and metal grating treads are prohibited.

a) **Function:** Circulation and egress, movement of equipment and people between floors.

b) **Adjacency Reqmnts:** Adjacent to corridors, exterior entrances. Main stair should be located close to public main entrance.

c) **Space requirement:** Total net area is part of the gross area factor calculation.

d) **Mechanical:** Fire stairs shall be heated in cool climates. The main stair shall be cooled and heated.

e) **Finishes:** See the Finish Schedule for standard finishes.

10) **Elevator**. Provide at least one hydraulic passenger elevator in each multi-story building. Some facilities will require an additional passenger and freight elevator but the designer should focus on convenient stair design and locations to minimize the need for elevators. Passenger elevator: 1134 kg [2,500 lb] capacity, minimum 22860 mm [75 feet] per minute speed; center opening doors. Elevator is required for handicapped accessibility to floors not on ground level.

- a) **Function:** Vertical conveyance of people, equipment and furniture.
- b) **Adjacency Reqmnts:** Adjacent to corridor, near main entry for public use. The freight elevator shall be located near the receiving and computer maintenance areas.
- c) **Space requirement:** Total net area is part of the gross area factor calculation.
- d) **Acoustics:** STC 48 for both the elevator shaft and the equipment room.
- e) **Plumbing:** Elevator pit shall have a sump as required by code.
- f) **Mechanical:** Equipment room shall be ventilated.
- g) **Electrical/Lighting:** Lighting in passenger elevators shall be recessed down lights
- h) **Communications:** As required by Elevator Code.
- i) **Finishes:** See the Finish Schedule for standard finishes. Car door and front: satin finish stainless steel. Hoist way entrance doors and frame: satin finish stainless steel.
- j) **Other Requirements:** Provide one elevator machine room in each multi-story building adjacent to elevator and corridor. Consider locating the machine room door on the exterior of the building to reduce noise in the building. Size to comply with equipment and code requirements.

11) **General Storage**. Storage is required for furniture, computers, etc. when rearranging classroom layout.

- a) **Function:** Storage space for furniture and equipment.
- b) **Adjacency Reqmnts:** Near classroom and receiving areas.
- c) **Space requirement:** The net area is part of the gross area factor calculation. Total net area equal to 2% of the gross building area subtotal.
- d) **Mechanical:** Space may be heated, cooled, and ventilated as determined by the storage requirement.
- e) **Electrical/Lighting:** Day lighting is not desirable. Provide convenience power receptacle. Each room shall have individual lighting control that switches off automatically when the room is not in use1.
- f) **Finishes:** See the Finish Schedule for standard finishes.

12) **Lactation Room**. Lactation room is a mandatory space in accordance with Army Policy. Design Criteria shall be in accordance with the American Institute of Architects (AIA) *Lactation Room Design*, and the following;

- a) **Function:** Provide secure, quiet, single user, dedicated space for lactation..
- b) **Adjacency Reqmnts:** convenient location for staff and student use.
- c) **Space requirement** Total net area of 100 s.f..
- d) **Mechanical:** Space shall be heated, cooled, and ventilated in accordance with use. Use sound attenuated ducts. Provide individual temperature control.
- e) **Electrical/Lighting:** . Provide convenience power receptacle for lactation equipment. Room shall have individual lighting control that switches off automatically when the room is not in use. Lighting shall be anti-glare, and appropriately warm color rendition.
- f) **Communications:** Provide telephone and data.
- g) **Finishes:** See the Finish Schedule for standard finishes. Finishes should be a neutral palette to support a quiet environment. Décor shall be minimal.
- h) **Other Requirements:** Base cabinets and storage.

3.3. SITE FUNCTIONAL REQUIREMENTS

A. **GENERAL:** The Site shall accommodate parking and vehicular access, maintenance, equipment yards, trash removal, outdoor storage, break areas, etc., See also 3.4 Site and Landscape Requirements for expanded technical requirements and criteria:

B. **PARKING:** Comply with the requirements of Technical Instructions 804-11 Design for Non-Organizational or Privately Owned Vehicle (POV) Site Circulation and Parking and Technical Instructions 800-01 Design Criteria, Chapter 3 Site Planning and Design Criteria. Special consideration is required for number of parking spaces when an ACES function is included in the project. ACES's may include off base students that will increase the parking requirement. ACES requires parking for 50% of the ACES classroom seats. Where located adjacent to existing activities, consider shared parking areas.

- 1) **Function:** Parking for staff and students.
- 2) **Adjacency Reqmnts:** Near entrances, accessible from roads, and in compliance with ATFP standards.
- 3) **Electrical/Lighting:** Provide lighting in compliance with the Installation Design Guide.
- 4) **F/F/E:** Comply with the Installation Design Guide.
- 5) **Finishes:** Comply with the Installation Design Guide for signage, lighting and furnishings.

C. **OUTDOOR BREAK AREA:** This space is desirable in appropriate climates but do not locate where it will disturb classes. Assure this space is not located near mechanical fresh air intakes or noisy equipment.

- 1) **Function:** Near Break/Vending Area for staff and students.
- 2) **Occupancy:** 30 students.
- 3) **Adjacency Reqmnts:** Convenient to vending, away from main building entrance. Away from mechanical fresh air intake louvers.
- 4) **Space requirement:** Outdoor Break Area is not a part of the calculated area unless it is a covered space in which case the gross area is calculated at 50% of net. This would be programmed for the individual needs of the Installation.
- 5) **Acoustics:** Avoid conflicts with Classrooms.
- 6) **Plumbing:** Assure area is properly drained.
- 7) **Electrical/Lighting:** Provide area lighting for nighttime use.
- 8) **Communications:** Include area on the public address system.
- 9) **F/F/E:** GFGI appropriate seating and ash/trash/recycle receptacles as desired by the Installation. Comply with the Installation Design Guide.
- 10) **Finishes:** Low maintenance outdoor finishes. Comply with the Installation Design Guide.
- 11) **Other Requirements:** Assure surfaces are well drained.

D. **EQUIPMENT YARD:** Equipment yards shall be provided in compliance with ATFP and the Installation Design Guide to house and screen mechanical and electrical equipment, satellite antennas, emergency generators, etc. Access to the yards shall be provided for maintenance; consider the use of turf pavers for vehicle access.

- 1) **Function:** To enclose and screen equipment from view.
- 2) **Adjacency Reqmnts:** Place out of the main pedestrian and vehicular flow but in a location that can be accessed for repair work and convenient for utility lines to the mechanical/electrical rooms. Comply with ATFP setback from buildings.
- 3) **Finishes:** Comply with the Installation Design Guide.
- 4) **Electrical/Lighting:** Provide outdoor weatherproof receptacle outlets for maintenance purposes.

5) **Other Requirements:** Provide masonry screen walls. Coordinate with requirements of Installation Design Guide.

E. **DUMPSTER ENCLOSURE:** If a dumpster is provided, provide an enclosure. Consider accommodating recycling in the same enclosure.

1) **Function:** To enclose dumpsters and screen from view.

2) **Adjacency Reqmnts:** Place out of the main pedestrian and vehicular flow but in a location that can be accessed by truck for emptying the dumpster. Comply with AT/FP required setback from buildings.

3) **F/F/E:** Provide bollards on the exterior to protect from vehicles. Provide bollards on the interior to prevent dumpsters from bumping the rear wall.

4) **Finishes:** Comply with the Installation Design Guide.

5) **Other Requirements:** Provide size, gates and landscape in accordance with the Installation Design Guide. Assure the height is adequate for the dumpsters to be used. Provide a reinforced concrete apron for the front tires of the truck to bear on. Use landscape screening.

F. **OUTDOOR STORAGE:** Storage facility for outdoor equipment such as lawn maintenance equipment may be considered. The structure must be consistent with Installation Design Guide and same architectural theme and color scheme as the GIB.

1) **Function:** To store equipment away from the building.

2) **Adjacency Reqmnts:** Place out of the main pedestrian and vehicular flow but in a location that can be accessed by lawn maintenance equipment. Comply with AT/FP required setback from buildings.

3) **Space requirement:** Net area of approximately 11.1 m^2 [120 s.f.] is required. Confirm with Installation.

4) **Finishes:** Comply with the Installation Design Guide.

5) **Other Requirements:** Use landscape screening.

3.4. SITE AND LANDSCAPE REQUIREMENTS

A. **GENERAL:** Site Planning Objective. Provide a functional layout of buildings and site elements. The site plan should place emphasis on creating a safe work environment. Arrange vehicular circulation to minimize conflict with pedestrian circulation. Pavement marking and signage shall clearly delineate traffic patterns, especially important to first time visitors at the site. Integrate sustainable design principles by retaining and using existing topography to advantage; preserve environmentally sensitive areas and reduce overall project impact on the site.

B. **SITE DESIGN:** Site planning is an essential aspect of the facility design. The art of site planning requires the interdisciplinary involvement of the community planner, architect, landscape architect, civil, mechanical, electrical, and communication engineers. The facility must be located in relation to other functional areas such as temporary duty housing, transportation facilities, an auditorium, and library, ACES facility, dining facilities and housing where the facility is a consolidated GIB/ACES facility. Siting should consider shared use parking based on the time that adjacent facilities are in use. The design of vehicular paths, pedestrian paths and landscape design can define the functional campus yet enhance the flow into and out of the area. Provide appropriate buffer areas to separate and visually isolate the facility from adjacent areas. Consider providing landscaping or other screening between incompatible land uses.

C. **VEHICLE TRAFFIC:** Site the facility so it is clearly visible to pedestrians, cars and delivery vehicles. Separate service/delivery access from the student/staff access and circulation. Plan for daily deliveries to the loading area in larger facilities. Control vehicular access within UFC 4-010-01 standoff distances for the building.

D. **PARKING AND VEHICULAR CIRCULATION:** Comply with UFC 3-210-02 Privately Owned Vehicles (POV) Site Circulation and Parking. Coordinate parking and vehicular circulation with AT/FP standards. A site traffic impact study should be done to determine the traffic patterns and impact on the local roads and circulation patterns. Access requirements for fire equipment, trash/recycling removal, and service vehicles on site should be considered. Consider shared use parking with adjacent sites. Design entrance and exit drives for safe and controlled traffic flow. Consider pavement maintenance and snow removal (if applicable) in the design. Consider the use of alternate

materials such as turf pavers for service vehicle access to mechanical rooms. Provide concrete paved parking for motorcycles. Pavement for organizational vehicle parking should be designed for the heaviest vehicle at the installation. Provide handicap-parking areas when required.

E. WALKWAYS: Connect the building to public walkway system and to parking with pedestrian walkways. Primary building entrances shall be at least 2438 mm [8 ft] wide. The minimum width of a sidewalk shall be 1524 mm [5 ft]. Place handicapped curb cuts in convenient locations while not creating obstacles for walkers. Depress curbs for handicapped access where possible instead of creating ramps. Consider brick or concrete pavers or patterned concrete to identify significant entrances. Provide well-lighted walkways since the facility is often used in the evening (especially if it is to be used as an ACES).

F. OUTDOOR FURNISHINGS: Provide outdoor furnishings including trash and recycling receptacles, seating, bicycle racks, lighting standards, bollards in coordination with the Installation Design Guide. Where the climate is acceptable, provide outdoor break areas with tables, seating and shading devices.

G. SIGNAGE: Plan site identification signage in coordination with site approach, landscape, and lighting. Comply with the Installation Design Guide and the Army Installation Design Standards. Provide traffic control signage as well as "No Parking" signs at service drives. Provide informational signs to direct students to appropriate entries.

H. SITE LIGHTING: Site lighting is an integral part of the design. Comply with the requirements of the Installation Design Guide. Provide lighting to ensure safe movement through outdoor areas. Consider the color rendition of outdoor lighting. Use bollards or variations in lighting to articulate entrances and public areas. Design lighting levels in accordance with the *Illuminating Engineering Society (IES) Lighting Handbook* illumination levels. Use photocells, motion detectors and timers to control lighting and conserve energy.

I. LANDSCAPING/HARDSCAPING: Coordinate the landscape design with AT/FP and Installation requirements. Preserve natural landscape features including existing topography, trees, and vegetation. Provide windbreaks and shading where appropriate. Consider earth berms to screen parking and roadways. Where berms or swales are used use gradual slopes no greater than 1:5 to allow use of mowing equipment. Screen service area and outdoor equipment. Shade parking areas to reduce heat developed by exposed pavement. Landscaping shall be in accordance with requirements of the Installation. Where appropriate, provide a variety of plants with seasonal change, color, texture, fragrance, and interpretive value. Always use local, durable, native species to help ensure survivability. The use of native plants will also minimize the requirement for chemical pesticides, herbicides and watering. Choose plant materials on the basis of plant hardiness, climate, soil conditions, low maintenance, and quality. Selected plant materials shall be easily maintained and tolerant of the specific site conditions. Incorporate sustainable design principles into the selection of plants. Planting or seeding shall occur only during periods when beneficial results can be obtained. Plant varieties shall be nursery grown or plantation grown stock. They shall be grown under climatic conditions similar to those in the locality of the project. Plants shall be furnished that have heavy, well developed, and balanced top with vigorous well developed root system, and shall be furnished in containers.

J. CAPILLARY WATER BARRIER: A capillary water barrier is required for all interior slabs on grade, including storage, loading dock, mechanical and electrical spaces.

K. TERMITE TREATMENT: Preventive methods for subterranean termites shall be applied in accordance with local regulations.

L. RADON TESTING: Test shall be performed for potential radon exposure to occupants in accordance with UFC 3-490-04A. Provide Radon protection in accordance with applicable requirements.

3.5. ARCHITECTURAL REQUIREMENTS

A. GOALS AND OBJECTIVES: Overall architectural goals for the facility are to provide a functional, visually appealing facility that is a source of pride for facility users, and the installation, instilling attitudes of a high level of achievement and environmental awareness. Provide coherent, architecturally compatible design consistent with the Installation's architectural theme. Design buildings to enhance the visual environment of the installation.

- 1) Exterior materials, roof forms, and detailing shall comply with the Installation Design Guide to the extent permissible by MILCON Business Process (formerly MILCON Transformation), and shall be compatible with the immediate local context. Configure building massing and use exterior elements such as entry focal points and material detailing to provide human scale, especially at public areas. Use durable, low-maintenance materials and furnishings that can be easily maintained and replaced. Materials, such as flooring, storefront, hardware, etc., shall be exceptionally durable for high use
- 2) Arrange spaces in an efficient, functional manner with simple circulation schemes that allow easy way finding within buildings. Vestibules, corridors, stairs, elevators and common spaces shall be linked in obvious ways to make circulation convenient and clear.
- 3) Provide flexibility to interior functional layouts where functional changes are normal operation and to allow maximum flexibility for potential future modifications. Changes may routinely take place in courses being taught, the materials required by the course, teaching techniques, and student load.
- 4) Use interior surfaces that are light in color; avoid trendy or bright color schemes. Use materials in circulation areas that will control and reduce noise. Interior design shall consider creation of spaces, circulation, and functional use as well as materials and colors that complement the instructional and learning experience. Multipurpose use should be considered in design of floor loads, ceiling heights and floor systems. Maximize use of day lighting and operable windows.
- 5) Provisions for and location of adequate storage space is important, as is the capability of adapting environmental services for changing requirements.
- 6) Low and mid-rise facilities shall not rely on elevators as the primary source of circulation. Stairs shall be located for convenience as well as life safety. Building entrances for the public shall be identifiable and sheltered from harsh weather.. Entrances shall be accessible to handicapped. Entrances should offer a transparency for recognizing activity in the building. Service entrances shall be screened. Consider alarming egress doors that are not desirable for building access; this will improve security and deter theft

B. **BUILDING ELEMENTS:** Systems and materials shall meet the requirements of the criteria. The criterion includes a range of specificity: some material requirements are specific (no option); other material requirements allow a range of options. The criteria requirements establish a minimum quality level. Consider efficient yet durable building systems that compliment flexibility; for example, Interior load bearing partitions often deter future re-design for changing needs:

C. **WALLS**

- 1) **Non-combustible construction** is preferable, even where combustible materials are allowed by code. A better level of materials is required for GIBs to reinforce the desired level of professionalism and achievement the Army is pursuing in the education of the military force. Painted gypsum board or plaster shall be the standard, although designs should consider using reconfigurable partitions for future room change requirements. Moveable partitions should also be considered to allow similar room types to be expanded on occasion. When reconfigurable or moveable partitions are used, other requirements such as acoustic ratings and equipment locations must be considered. Metal studs for interior partitions shall not be lighter than 20ga. Use chair rails in small rooms with moveable furniture.
- 2) **Room Dividers.** Where multiple classrooms are located adjacent to one another, moveable partitions (panel type) shall be used in at least one location to allow classrooms to be opened into a larger instruction space. Consider the stacking requirement for the partition. See acoustic requirements in paragraph 3-5.6.22.

D. **FLOORS:**

- 1) A capillary water barrier is required for all interior slabs on grade, including storage, loading dock, mechanical and electrical spaces.
- 2) Consider the requirements for durability in areas that will receive more traffic and areas that have high abuse. Porcelain tile is identified for traffic areas but other durable products such as terrazzo may be considered. Consider using a water proofing membrane and mortar bed for thick setting materials. Coordinate Installation requirements that may require recessed structure. Carpet is not to be used in high traffic areas such as stairs, corridors, and typical classrooms. Where carpet is used consider carpet tile in a multi-color pattern. In Communication and NOC Rooms provide non-static flooring. Carpet static control shall be provided to permanently

control static buildup to less than 3.5 kv when tested at 20% relative humidity and 70 degrees F in accordance with AATCC 134.

3) **Raised Access Floors.** Raised access floor has sometimes been found to meet life cycle requirements allowing for quick reconfiguration of electrical and communication systems to serve the changing needs for technology through less disruption to the permanently fixed floors and walls. Projects in the planning phase shall consider programming raised access floor (or some flexible system of providing power and data) throughout the education, communication and electrical areas of the building or in individual areas. Raised floor is not necessary for mechanical, administrative, service and support areas. When considering access flooring in optional areas, designers shall perform an economic analysis relative to anticipated use. Other alternatives should also be considered such as wall or floor raceways, recessed duct banks, and redundant floor or wall receptacles. "Tombstone" type floor receptacles are not acceptable.

4) Laminate or tile floor finish is desirable in high traffic areas. Where a plenum is used below the floor for mechanical requirements, additional space and fire stopping is required. Low profile 102 – 127 mm [4” – 5”] access flooring may be used in areas with minor cable requirements. Level 3 Digital Classrooms typically requires access floor and the low profile floor system (6 inches) has been successful.

E. OPENINGS:

1) **Windows.** Windows in classrooms should be placed high on the wall for small classes in order to preserve more useable wall space for projection screens and white boards. All exterior windows in occupied spaces shall have blinds to control sunlight. Windows in this facility type must satisfy the requirements of UFC 4010-01 Design: Minimum Antiterrorism Standards for Buildings.

2) **Interior Doors and Frames.** Provide hollow metal frames and solid core wood doors generally. Hollow metal doors are acceptable at service areas. Where equipment will be moved in and out often such as transient classrooms, consider double doors. Doors at classrooms, counselors, and conference rooms shall have a small glazed vision.

3) **Door Finish Hardware.** Locks shall be series 1000 mortised locks. Classrooms shall be locked and opened by the Building Manager's office when needed for classes. Integrate with the Installation locking system where possible. Use programmable electronic card access locks ¹ ..

F. CEILINGS:

1) **Ceilings and Ceiling Heights.** Ceilings are identified in the finish schedule generically. Where acoustic tile is used, gypsum board or plaster may be incorporated to add interest such as bulkheads, soffits or other patterns. In acoustically rated spaces the wall/partition shall penetrate the ceiling. The acoustic rating shall include the entire envelope, therefore requiring partitions to extend to the structure above or treatment of the ceiling to prevent sound from transmitting over the partition.

2) Refer to the Finish Schedule for minimum ceiling heights. Any room with a ceiling mounted projector must have a ceiling at least 2.7 m [9 ft] high. Larger Classrooms, and classrooms with tiered seating, requires 3658 mm [12'] high ceilings. This is sometimes impossible in renovation projects. In difficult situations, if a 3048 mm [10'] foot ceiling cannot be provided for these classrooms, than alternative spaces should be investigated. Classrooms and conference rooms with forty (40) or more people should have at least 3048 mm [10'] ceilings. Classrooms and conference rooms with sixty (60) or more people should have at least 3353 [11'] ceilings.

G. ACOUSTICAL REQUIREMENTS:

1) **Design.** Designers and planners must consider environmental as well as functional noise when locating and designing instruction facilities. Where possible avoid background noise from traffic, airfields, outdoor activities and mechanical equipment. Work within the building to acoustically separate classrooms from student gathering areas, mechanical equipment, restrooms, etc. Extend acoustically rated partitions to the horizontal acoustic element such as the roof deck or floor slab above (acoustic ceilings do not effectively stop sound transmission over partitions). Use acoustic doors in sound rated partitions. Consider acoustic windows in exterior walls. Separate and seal penetrations in rated partitions. Locate mechanical equipment in less sensitive areas such as over corridors. Use low noise ballasts in light fixtures. Realize the use of operable partitions increases noise levels.

2) **Reverberation.** Effective learning requires students be able to hear. The Signal Noise Ratio (SNR) and Reverberation Time are key factors for intelligible hearing. A successful SNR is 15 decibels (dB) or more. For

instance, an instructor's voice should be approximately 50 decibels average weighted (dBA) at the rear of the classroom. To achieve a SNR 15 the ambient noise in the room cannot be greater than 35 dBA. Likewise the reverberation time or length of time it takes a sound to decay should not exceed 0.6 – 0.7 seconds to avoid build-up of noise and degradation of speech.

3) **Space Requirements.**

a) Classrooms and large meeting spaces (which we will define as 15 students or more) with a volume less than 283 cubic meters [10,000 cubic feet] should have background noise levels of 35dBA or less and a reverberation time of no more than 0.6 seconds.

b) Classroom and large meeting spaces with a volume between 283 cubic meters [10,000 cubic feet] and 566 cubic meters [20,000 cubic feet] should have background noise levels of 35dBA or less and a reverberation time of no more than 0.7 seconds.

c) Classrooms and large meeting spaces with a volume of 566 cubic meters [20,000 cubic feet] or more should have background noise levels of 40dBA. An acoustic designer should determine the reverberation time in compliance with ANSI S12.60.

4) **STC/IIC/NRC.** To achieve these sound levels and reverberation limits walls/partitions, floors, and ceilings must have certain Sound Transmission Class (STC), Impact Insulation Class (IIC) and Noise Reduction Coefficient (NRC) ratings. The STC rating is a measure of the isolation provided between adjacent surfaces for noises in the range of common speech. The IIC rating is similar but measures the isolation of impact noise between a space and the space below it. The higher the STC or IIC number the greater the isolation. The NRC is a measure of a materials ability to absorb the sound within a space when the sound waves hit it. The NRC is described in hundredths using a decimal point such as .65 NRC.

a) This standard will use the following minimum wall STC ratings for classrooms and meeting spaces for 15 or more students-

(1) STC-45 adjacent to circulation spaces, offices, and conference rooms.

(2) STC-50 adjacent to other classrooms/meeting spaces or outdoors.

(3) STC-53 adjacent to restrooms.

(4) STC-60 adjacent to mechanical room and student gathering areas.

(5) STC-47 for moveable partitions.

b) This standard will require STC-30 or higher ratings for classrooms/meeting space doors.

c) This standard will use an IIC of 50 (recommended) and 45 (minimum) for spaces above classrooms/meeting spaces in new construction.

d) Classrooms/meeting spaces should have a ceiling with a NRC of 0.70 or higher

H. **MISCELLANEOUS BUILDING ELEMENTS:**

1) **Elevators.** Consider service use of the elevators when making material selections. The elevator shall have the same level of design as other portions of the building in terms of quality of materials. Stainless steel doors and entrances are preferred. Carpeted floors are acceptable in low service use elevators since it is easily replaced.

2) **Signage.** Comply with applicable Accessibility Standards. Provide interior signage that conforms to UFC 3-120-01 Air Force Sign Standards (applies to Army projects) for all rooms. Coordinate all signage requirements, including message content, room numbering, and placement with User and COR. Provide interior room identification signage. Provide gloss or matte finish plaques with slots in base laminate for insertion of changeable message strips. Auditoriums and conference room signage shall have an "In Use" feature. Provide a building directory at the public entrance. In large complex facilities provide a graphic directory indicating orientation of the building from the location the directory is placed.

3.5.1. **FINISHES AND INTERIOR SPECIALTIES**

A. **GENERAL:** Provide durable and appropriately professional finishes typical of a corporate educational training center. Provide finish color and pattern selections that help hide soiling. Examples of soiling include, but

are not limited to: - boot marks and tracked in dirt on floors - marks and fingerprints on doors and door frames, systems furniture panels, overheads and tack boards, etc

B. **FINISHES:** A finish schedule is provided to establish minimum levels of acceptance. The designer in conjunction with the Installation should determine the requirements for the specific project in compliance with Army Standards. Ceiling heights are minimum recommended. See room descriptions for higher ceilings in large spaces. It is understood some renovation projects may not be able to achieve the higher ceiling heights.

Space Name	Floor	Base	Walls	Ceiling	Ctg Hgt Min
EDUCATION SPACES					
Multi-Purpose Classroom	Vinyl Tile	Resilient	Paint,-	Susp Acou	3048 mm[9/10 ft]
Seminar-Model Classroom	Vinyl Tile	Resilient	Paint-	Susp Acou	2743 mm[9 ft]
CTC	Vinyl Tile	Resilient	Paint	Susp Acou	2743 mm[9 ft]
Video-Tele-Training	Carpet	Resilient	Paint	Susp Acou	2743 mm[9 ft]
 ADMINISTRATION SPACES					
Information/Reception	Tile	Resilient	Paint	Susp Acou	3048 mm[10 ft]
Instructors-Offices	Carpet	Resilient	Paint	Susp Acou	2743 mm[9 ft]
Director's-Office	Carpet	Resilient	Paint	Susp Acou	2743 mm[9 ft]
Administration Office	Carpet	Resilient	Paint	Susp Acou	2743 mm[9 ft]
Building-Manager	Carpet	Resilient	Paint	Susp Acou	2743 mm[9 ft]
Conference Room	Carpet	Resilient	Paint/pan	Susp Acou	2743 mm[9 ft]
NOC	Vinyl Tile	Resilient	Paint	Susp Acou	2743 mm[9 ft]
Computer Maintenance	Vinyl Tile	Resilient	Paint	Susp Acou	2743 mm[9 ft]
Loading Dock	Concrete	NA	E-Wall	Plaster	3048 mm[10 ft]
Transient Storage	Concrete	Resilient	Paint	Open Struct	3048 mm[10 ft]
Record Storage	Vinyl Tile	Resilient	Paint	Susp Acou	2743 mm[9 ft]
Copy Room	Vinyl Tile	Resilient	Paint	Susp Acou	2743 mm[9 ft]
Supply Storage	Vinyl Tile	Resilient	Paint	Paint Gyp	2743 mm[9 ft]
 SPECIAL FUNCTIONAL USE AREAS					

Small Arms Training	Vinyl Tile	Resilient	Paint	Susp Acou	3048 mm[10 ft]
Arms Vault	Concrete	Resilient	Paint	Concrete	2438 mm[8 ft]
Fixed Seat Auditorium	Vinyl Tile	Resilient	Paint	Susp Acou	Varies
Multipurpose Auditorium	Vinyl Tile	Resilient	Paint	Susp Acou	3048 mm[10 ft]

<ACES>

College Office	Carpet	Resilient	Paint	Susp Acou	2743 mm[9 ft]
Counselors	Carpet	Resilient	Paint	Susp Acou	2743 mm[9 ft]
Testing Rooms	Vinyl Tile	Resilient	Paint	Susp Acou	2743 mm[9 ft]
Testing Control Room	Carpet	Resilient	Paint	Susp Acou	2743 mm[9 ft]
Testing-Administrator	Carpet	Resilient	Paint	Susp Acou	2743 mm[9 ft]

</ACES>

Broadcast Studio	Carpet	Resilient	Paint	Susp Acou	3048 mm[10 ft]
AIB Module	Varies	Resilient	Paint	Susp Acou	Varies

SUPPORT SPACE

Vestibule	Tile	Tile	Paint	Susp Acou	2743 mm [9 ft]
Student Break/Vending	Tile	Tile ->	Paint	Susp Acou	2743 mm [9 ft]
Staff Break Area	Tile	Tile	Paint	Susp Acou	2743 mm [9 ft]
Restrooms	Ceramic	Ceramic	Paint	Susp Acou	2438 mm [8 ft]
Janitor Closet	Ceramic	Ceramic	Paint	Paint Gyp	2438 mm [8 ft]
Mechanical-Room	Concrete	NA	Paint	Open Struc	NA
Electrical Room	Concrete	NA	Paint	Open Struc	NA
Comm Room	Vinyl Tile	Resilient	Paint	Susp Acou	2743 mm [9 ft]
Corridors	Tile	Tile	Paint	Susp Acou	2743 mm [9 ft]
Lobby Stair-	Tile	Tile	Paint	Susp Acou	2743 mm [9 ft]
Stairs	Vinyl Tile	Resilient	Paint	Susp Acou	2438 mm [8 ft]
Elevator	Carpet	Laminate	Laminate	Metal	2235 mm [7ft 4"]
General Storage	Vinyl Tile	Resilient	Paint	Susp Acou	2743 mm [9 ft]
Lactation Room	Carpet	Resilient	Paint	Susp Acou	2743 mm [8 ft]

Abbreviations:

Ceramic	Ceramic Tile
Concrete	Sealed Concrete
E Wall	Exterior Wall Construction
Lamin	Laminate Panels
NA	Not Applicable
Susp Acou	Suspended Acoustic Tile
Paint Gyp	Painted gypsum bd
Pan	Acoustical wall panels
Conc	Concrete
Tile	Large Porcelain or Ceramic Tile

C. INTERIOR SPECIALTIES: Refer to other portions of the RFP.

3.6. STRUCTURAL REQUIREMENTS

A. STRUCTURAL LOADS (including dead, live, hydrodynamic, earth, vehicular, snow, wind, seismic loads and AT/FP) and design shall be in accordance with UFC 1-200-01 Design: General Building Requirements and all codes referenced therein. Verify code required loadings for raised access flooring

3.7. SEE PARAGRAPH 6.7 THERMAL PERFORMANCE

3.8. PLUMBING REQUIREMENTS: REFER TO PARAGRAPH 3.11

3.9. COMMUNICATIONS AND SECURITY SYSTEMS

A. GENERAL: Refer to other portions of the RFP for additional requirements.

B. TELECOMMUNICATION SYSTEMS: Information systems will consist of a complete end-to-end voice, data, and telemetry cable based functional design accomplished IAW the US Army Installation Information Infrastructure Architecture (I3A) Technical Criteria. Information system equipment provided to satisfy the service requirements of this design will meet the technical specifications and planning guidance found in ANSI/TIA/EIA-568-B and 569A, as appropriate. Functional requirements will be developed and implemented based upon the I3A criteria to satisfy both the near-term as well as the growth potential of this US Army facility. The I3A standard dual jack voice/data outlet will be used throughout this facility with the following exceptions: wall telephone outlets will be single jack configuration, classroom computer jacks will be data only (dual jacks) to serve the computers planned for each classroom; however, the classroom instructor's administrative telephone outlet will be a standard dual-jack voice/data outlet. System provisions will be compliant with the requirements of the Americans with Disabilities Act (ADA), as directed for the facility.

C. VOICE SYSTEMS: The telephone/voice system provided in this project will meet all US Army I3A objectives using standard state-of-the-art equipment and installation practices. The telephone/voice system provided with this facility will receive dial tone from a US government controlled telephone switching system. Special requirements for telephone circuits receiving dial tone from other sources, i.e., pay-telephone, etc., will be coordinated with installation's local commercial provider -- see NEC for contact information. The telecommunications cross-connect scheme for this project will utilize a combination of 110punch down blocks and category rated patch panels as shown in the I3A Criteria; this is not a "small facility" for cross-connect purposes. Coordinate minimum essential service requirements with the NEC; use these requirements in conjunction with the I3A Criteria to develop the design based upon planned functional usage of the various spaces. Plan for wall telephone outlets to satisfy an intelligent design based upon safety, courtesy, and convenience: as a minimum, wall telephone outlets will be provided in all equipment rooms (electrical room, HVAC room, telecommunications room, CATV/CCTV/surveillance room, etc.); in all "break" areas and at all entry areas; and along corridors and hallways using a density of four wall telephones per 10,000 square feet of gross building space.

D. **DATA SYSTEMS**: Data jacks will be terminated on patch panels located on racks in the telecommunications rooms(s). Classroom data jacks will be terminated on patch panels located in classroom equipment rack. Each classroom area, i.e., including those established by folding partitions, will have its own equipment. The classroom data network will be contained in a communication closet within the classroom, with its own data switch (provided by TRADOC). Each classroom will be provisioned with twelve strands of fiber optic cable (six single mode and six multimode) to the nearest serving Network Operations Center in the building. Coordinate with the NEC for special data requirements. Provide a dedicated 20 amp circuit for each classroom communication closet.

1) **Wireless Technology**. The use of wireless technology for data transfer must be in accordance with Army Regulation 25-1 Army Information Management found at http://www.army.mil/usapa/epubs/25_Series_Collection_1.html as well as the latest memorandum and letters regarding this quickly evolving issue.

E. **INFORMATION SYSTEM EQUIPMENT**: All equipment provided for the GIB will meet the functional standards found in the I3A criteria. The building's interior copper cabling will be TIA/EIA 568A Category 6. Installation will be in accordance with (IAW) applicable UFGSs.

F. **MASS NOTIFICATION SYSTEMS**: Provide a mass notification system conforming to UFC 4-010-01 and UFC 4-021-01 for the purpose of providing real-time announcements in the immediate vicinity of the building during emergency situations. Coordinate specific system requirements with the User and Installation.

G. **OUTSIDE CABLE PLAN INFRASTRUCTURE**: Extend the information system infrastructure from the nearest existing information system node having sufficient capacity to satisfy the facilities requirements -- coordinate with the NEC on this location. New underground conduits will be multiple concrete encased 100-mm [4-inch] PVC ducts (or equivalent) and will be sized, designed and installed in the underground manhole and duct system IAW the installation's current approved I3A Plan to ensure maximum flexibility for future growth. Place outside plant information systems cabling, both copper cable(s) and fiber optic cable(s), from the servicing nodes into the new facility; extend and terminate the OSP information system cabling on the building's entrance facility per applicable fire and safety code.

H. **PREMISES DISTRIBUTION SYSTEM (PDS) INFRASTRUCTURE**: Design the PDS in accordance with (IAW) the I3A Technical Criteria to develop the functional information system features required along with the preferred technical implementation. Ensure that all PDS cable distribution and telecommunications requirements comply with the I3A (for design and allocations) and with the latest versions of TIA/EIA 568A (for technical implementation).

Follow requirements of ANSI/TIA/EIA-569-A for telecommunications paths and equipment room spaces. Provide dedicated PDS raceway space and equipment room space for the purpose of future fiber optic cable installation to each outlet location initially served only by copper cable(s). Provide space for future data and communication cabling. Provide I3A standard dual-jack voice/data outlets throughout core areas, the supply/administration areas, and the classroom's instructor's podiums/desk; use I3A functional area outlet-densities to determine the outlet quantities. Provide data outlets for all planned computer equipped classroom desktops; voice outlets are not appropriate for classroom desktops. Use of multiple-jack outlets to serve classroom desktop locations, (i.e., up to four RJ-45 jacks) is typical. Terminate classroom data outlets on patch panel(s) mounted in a classroom-based cabinet. This cabinet will also contain any LAN networking equipment needed within the classroom. Provide fiber optic cable from this rack (six single mode and six multimode) to the nearest building telecommunications closet.

I. **CABLES AND JACKS**: Provide in accordance with the I3A Criteria using the latest technical standards in TIA/EIA-568-B. Connect all information system (voice/data) outlets from the equipment room's equipment rack with two 4-pair, Category 6, unshielded twisted pair (UTP) solid copper station cable terminated on 8-position IDC type connectors and extended to the servicing equipment room's equipment rack. Connect all single 8-position type walls, special purpose, and pay telephone outlets with one 4-pair, Category 6, unshielded twisted pair (UTP) solid copper station cable terminated on 8-position IDC type connectors and extended to the servicing equipment room's equipment rack. For specialized circuits, such as pay phones, coordinate with the local telephone company for electrical requirements and Americans with Disabilities Act (ADA) design features. When systems furniture is installed as part of the construction contract, insure that systems furniture specifications include ANSI/TIA/EIA-568-B and ANSI/TIA/EIA-569-A cabling and raceway standards. Use a combination of multimode and single mode fiber optic cable (12 strands of each) for backbone data service, unless expanding an existing site where other backbone

cable types are required or requested by user. Refer to the "Installation Information Infrastructure Architecture (I3A) Technical Criteria".

J. **PAGING SYSTEMS:** A paging system will be provided for the entire building with the microphone located in the Building Manager's Office. Provide a system that allows paging individually or grouped in classrooms, administration and public areas. Outdoor spaces such as break areas shall be on the public area system.

K. **CATHODIC PROTECTION:** Cathodic Protection (CP) is mandatory on buried ferrous metallic structures. Design of cathodic protection systems shall be in accordance with UFC-3570-02N.

L. **ELECTRONIC SECURITY SYSTEM (ESS):** Coordinate the requirement for any security system including provisions for the CCTV system with the User and the Installation local security authority. Design of security systems shall also be coordinated with the Mandatory Center of Expertise (MCX) Electronic Security Center, US Army Installation Support Center, Huntsville, Alabama.

M. **CCTV:** For large facilities, an alarm and CCTV system shall be provided. Alarm monitoring will be performed in the Building Manager's Office at a console where the public cannot view the alarm and CCTV monitors. Every exterior door shall have at a door position switch. CCTV camera shall be installed in corridors, public spaces, and the loading dock. Facilities shall have their alarms reported to the Installation security office.

N. **CLOCK SYSTEMS:** Clocks shall be provided in classrooms and public spaces. When requested by the Activity, this requirement may be met by providing an integrated clock system that provides adjustment of all clocks from one central point.

O. **MASS NOTIFICATION SYSTEM:** Provide a mass notification system conforming to UFC 4-010-01 and UFC 4-021-01 for the purpose of providing real-time announcements in the immediate vicinity of the building during emergency situations. Coordinate specific system requirements with the User and Installation.

3.10. ELECTRICAL REQUIREMENTS

A. **GENERAL:** The electrical design for all facilities shall be in accordance with the current editions of the National Electrical Code and the National Electrical Safety Code, and any other applicable criteria. Lighting design shall conform to the Illuminating Engineers Society of North America (IESNA) Lighting Handbook and recommended practices.

1) **Facility Energy Conservation Requirements.** The entire facility design, including interior and exterior lighting and power systems shall be in compliance with UFC 1-200-02 *High Performance and Sustainable Building Requirements*

2) **Design Calculations.** Provide analysis throughout the design to document selection of equipment and wiring in accordance with applicable criteria. Calculations as a minimum shall include load analysis, voltage drop, fault, device coordination, interior and exterior lighting.

3) **Space Requirements.** Provide electrical space for all electrical equipment. Space shall provide clearances and working areas as required by the National Electrical Code. Coordinate location to consider factors such as aesthetics, ease of maintenance, proximity to loads being served, and accessibility.

4) **Materials and Equipment.** All materials and equipment shall be the standard catalogued products of manufacturers regularly engaged in the production of such equipment and material, and shall be the manufacturer's latest design. All equipment and material shall conform to the requirements of American National Standards Institute (ANSI), American Society of Testing and Materials (ASTM), National Electrical Manufacturer's Association (NEMA), National Fire Protection Association (NFPA) or other national trade association as applicable. Where standards exist, materials and equipment shall bear the label and be listed by Underwriters Laboratories, Inc. (UL) or other recognized testing organization

B. **POWER:** Power service to the buildings will be fed underground from the base electrical distribution system via a pad-mounted transformer located near the primary building. Power service to buildings will be fed underground from the transformer to building service entrance equipment located in the electrical equipment room.

1) **Special Power Requirements.** Electrical power outlets for special power shall be coordinated with the requirements in Chapter 2, Space Design Criteria.

2) **Grounding.** Each building will have in addition to the grounding requirements of the National Electrical Code a ground grid or counterpoise around the building perimeter for connection to incoming service, building steel, telephone service, piping, and internal grounding requirements.

3) **Lightning Protection.** Facilities shall be protected from lightning in accordance with the National Electrical Code. Where recommended by the Standard for installation of Lightning Protection Systems, NFPA 780, Annex L, the facility shall be protected by a building lightning protection system.

C. **LIGHTING LEVELS, FIXTURES AND CONTROL:** Interior and exterior lighting design shall conform to the recommendations of the IESNA Handbook, RP-1-93, Office Lighting and RP-3-00, Guide for Educational Facilities Lighting, UFC 3-530-01 *Interior and Exterior Lighting Systems and Controls* (except for color rendition which should be 5,000K for classrooms spaces) and UFC 1-200-2 *Sustainable and High Performance Building Requirements*. Computer friendly lighting systems such as indirect and parabolic systems shall be used in spaces where Video Display Terminals are used extensively. Provide variable/multilevel switching and/or dimming systems in interior spaces as indicated in Chapter 2, Space Design Criteria. Provide occupancy sensors in spaces where use is intermittent; conference rooms, corridors, restrooms, and storage spaces. Note that UFC 3-530-01 prohibits use of incandescent fixtures except where alternatives are unavailable.

3.11. HEATING VENTILATING AND AIR CONDITIONING (HVAC) REQUIREMENTS

A. **GENERAL:** Design Standards and Codes. The mechanical design for all facilities shall be in accordance with the current versions of Army Design Guides, UFC, International Mechanical codes, and applicable codes and standards. The building including the building envelope, HVAC systems, service water heating, power, and lighting systems shall meet the requirements of UFC 1-200-02 *High Performance and Sustainable Building Requirements*.

1) Design all building systems and elements to meet the minimum requirements of ANSI/ASHRAE/IESNA 90.1. Design the building, including the building envelope, HVAC systems, service water heating, power, and lighting systems to achieve an energy consumption that is at least 40% below the consumption of a baseline building meeting the minimum requirements of ANSI/ASHRAE/IESNA Standards 90.1. Energy calculation methodologies used for this documentation and analysis shall follow the guidelines set forth in Appendix G of ASHRAE 90.1, with the exception that receptacle and process loads may be omitted from the calculation.

The equipment shall be Energy Star or FEMP designated products. The term "Energy Star" means a product that is rated for energy efficiency under an Energy Star program. The term "FEMP designated product" means a product that is designated under the Federal Energy Management Program of the Department of Energy as being among the highest 25 percent equivalent products for energy efficiency. When selecting integral sized electric motors, chose NEMA PREMIUM type motors that conform to NEMA MG 1, minimum Class F insulation system. Motors with efficiencies lower than the NEMA PREMIUM standard may only be used in unique application that require a high constant torque speed ratio (e.g., inverter duty or vector duty type motors that conform to NEMA MG 1, Part 30 or Part 31).

2) Acoustics: Comply with LEED v4 NC acoustical requirements, all ANSI A12.60 (latest edition) recommendations, and the following: Mechanical equipment, systems, and components shall be carefully selected to insure a maximum noise level of 40dBA in all learning, study, and 'quiet' spaces, except that noise levels in corridors and support spaces may not exceed 45 dBA. When full compliance with the prescriptive requirements and recommendations of these requirements cannot be met, than an Acoustic Consultant shall be retained and shall design a system of noise control that meets the acoustical performance requirements. Of special concern in educational facilities is Speech intelligibility/Privacy (open plan spaces), noise transmission (eg through walls and ceilings), vibration (from mechanical equipment), and ambient noise (eg from ductwork).

3) Do not locate Roof-top mechanical units directly over classrooms.

4) To the extent possible, do not locate VAV boxes in classroom ceilings. These are best located in corridor ceilings.

5) **Design Calculations.** Heat loss and heat gain calculations. Heating and cooling loads shall be in accordance with the current edition of the ASHRAE Handbook of Fundamentals, International Mechanical Code and UFC 3-410-01FA – Design: Heating, Ventilating, and Air Conditioning. Computer-generated load calculations shall be provided, and shall include complete input and output summaries. Equipment may be oversized to no more than 115 percent of the computer-generated load. Design shall be based on weather data from UFC 3-400-02, Engineering Weather Data; from ASHRAE Handbook of Fundamentals; or from other recognized and authoritative

sources of weather data. Values for internal cooling loads shall be included in the computerized load calculations in accordance with ASHRAE recommendations. Minimum space heating and ventilation shall be provided in spaces normally unoccupied, such as storage and equipment rooms. Any industrial ventilation requirement, other than that required per human occupant, may be considered process load when selecting supplemental heating equipment for the bay area.

- a) **Load Design Criteria**. Internal loads shall be included for each space. Lights shall be included for the actual quantity provided. Any additional equipment furnished or planned under the design shall also be included in the appropriate space.
- b) **Ventilation Air Calculations**. Calculations determining minimum outside ventilation air shall be provided for each building space. Ventilation rates shall be in accordance with the current edition of the International Mechanical Code, and the current ASHRAE Standard 62.1. Outside air quantities will be sufficient to meet ventilation requirements and maintain a positive pressure relative to the outdoors.
- c) **Exhaust Air Calculations**. Calculations determining minimum exhaust shall be provided for each exhaust system. Exhaust rates shall be in accordance with the current edition of the International Mechanical Code and the current ASHRAE 62.1.
- d) **Piping Calculations**. Calculations shall be provided for pressure drop calculations for all piping systems, including head loss calculations for all pumps.
- e) **Duct Calculations**. Calculations shall be provided for sizing all duct systems, including static pressure drop calculations for all fans. Ductwork layout drawings shall also be provided to indicate all fittings and devices to substantiate calculations.
- f) **Acoustic Calculations**. System shall be modelled and simulated across full sound spectrum to ascertain compliance with the acoustic requirements.

B. HVAC DESIGN CRITERIA:

- 1) **Mechanical Systems**. Each building core area shall be provided with a central heating and air conditioning system. Systems shall be designed, installed, balanced, and adjusted to distribute heat and cooling in proportion to the calculated load requirements of these spaces. A detailed investigation of the treatment of outdoor ventilation air shall be provided. Classroom spaces, auditoriums, training spaces, conference rooms, and multipurpose spaces are typically occupied by a relatively high number of people. The correspondingly high amount of outdoor air required is often beyond the capability of office or classroom type systems, leading to potential problems with mold, mildew, and high humidity situations. Special problems requiring special solutions occur when the outdoor air is at a high relative humidity condition and/or the spaces are only partially occupied or unoccupied. Systems such as a dedicated VAV outdoor air handling unit and carbon dioxide sensing controls (Demand Ventilation) shall be investigated and considered. Provide means for determining when rooms are partially occupied or unoccupied to modulate outdoor air supply. Each space shall be provided with a separate system with occupancy sensors and/or other override to change status from unoccupied to occupied. The Designer in close coordination with the installation shall determine the allowable system types and fuel options to be used. Also coordinate unit locations with Installation facilities engineering personnel (DPW). Consider systems utilizing energy efficient equipment, providing additional space in the mechanical room, and other features, which contribute to ease of system operation and maintenance. Consider the high people and computer load that may require cooling in some areas while heat is needed in others at the same time.

- a) **Air Distribution Systems**. Provide duct systems conforming to the recommendations of the SMACNA Duct Construction Standards including seal class requirements. Fire dampers shall be provided where required by NFPA 90A. Balancing dampers shall be provided at all branch takeoffs and for all supply outlets. Permanent access to dampers shall be provided. Air intakes shall be placed at least 10 feet above ground to meet the requirements of UFC 4-010-01 – DoD Minimum Antiterrorism Standards for Buildings. Intakes shall be covered with screens to prevent insects and foreign objects from entering.
- b) **Humid Air Design**. Where applicable, the special criteria for humid areas in UFC 3-410-01FA – Design: Heating, Ventilating, and Air Conditioning shall be used
- c) **Building Automation System**. Provide a building Automation System consisting of a building control network, and integrate the building network into the existing base wide EMCS/UMSC (if present).

C. TEMPERATURE CONTROLS:

1) The building control network shall be a single complete non-proprietary Direct Digital Control (DDC) system for control of the heating, ventilating, and air conditioning (HVAC) systems. The building control network shall be an Open implementation of LonWorks® technologies using ANSI/EIA 709.1B as the only communications protocol and use only LonMark Standard Network Variable Types (SNVTs), as defined in the LonMark® Resource files, for communication between DDC hardware devices to allow multi-vendor interoperability. The building automation system shall be open in that it is designed and installed such that the Government or its agents are able to perform repair, replacement, upgrades, and expansions of the system without further dependence on the original contractor.

2) Perform all necessary actions needed to integrate the building DDC system into the base wide EMCS/UMCS. These actions shall include but are not limited to: configure M&C Software functionality including: graphical pages for System Graphic Displays including overrides, alarm handling, scheduling, trends for critical values needing long-term or permanent monitoring via trends, and demand limiting. Install IP routers or ANSI/CEA-852 routers as needed to connect the building network to the EMCS/UMCS IP network. Routers shall be capable of configuration via DHCP and use of an ANSI/CEA-852 configuration server but shall not rely on these services for configuration. All communication between the EMCS/UMCS and building networks shall be via the ANSI/CEA-709.1B protocol over the IP network in accordance with ANSI/CEA-852.

3) Provide air distribution emergency shutoff switch as required by UFC 4-010-01

3.12. SEE PARAGRAPH 6.12 ENERGY CONSERVATION REQUIREMENTS

3.13. FIRE PROTECTION REQUIREMENTS

A. **GENERAL**: The fire protection design for all facilities shall be in accordance with the current versions of the Unified Facilities Criteria 3-600-01 Design: Fire Protection Engineering for Facilities, International Building Code and the National Fire Protection Association (NFPA) standards and codes

B. **FIRE SUPPRESSION SYSTEMS**:

1) **Sprinkler System**. Provide a wet and/or dry type sprinkler as required by the project. Design shall be provided by a qualified Fire Protection Engineer as defined in UFC 3-600-01 and shall be in compliance with UFC 3-600-01 and NFPA 13, Standard for the Installation of Sprinkler Systems.

2) **Loading Docks**. Covered loading docks shall be fully sprinkled by a suitable sprinkler system.

3) **Hydrant Flow Data**: A hydrant flow test shall be performed in the early stages of design indicating Date and Location of Test, Static Pressure, Flow, and Residual Pressure. Provide preliminary hydraulic calculations to determine whether there is sufficient water supply and pressure to meet the flow demands of the sprinkler systems within the facility and the fire department hose stream requirements from the fire hydrants.

4) **Fire Pump**. When a pump is required, type of pump shall be in accordance with Unified Facilities Criteria 3-600-01 Design: Fire Protection Engineering for Facilities. Provide electric driven fire pump and controllers in accordance with NFPA 20. .

5) **Fire Extinguishers and Cabinets**. Provide portable fire extinguishers in accordance with NFPA 10. Provide bracket-mounted extinguishers in service areas. Provide semi-recessed aluminum fire extinguisher cabinets with clear view panel in public areas. Provide fire-rated cabinets in fire-rated wall assemblies.

6) **Interior Wall and Ceiling Finishes**. Wall and ceiling finishes and movable partitions shall conform to the requirements of the IBC and NFPA 101, except as follows:

Interior finish for exits, and exit passageways shall be Class A only. Flame spread (FS) and smoke development (SD) shall be tested in accordance with IBC requirements. Class C materials shall only be permitted in fully sprinklered buildings.

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

1) **Fire Alarm**. Provide an addressable fire alarm system conforming to requirements of NFPA 72 and NFPA 101. Fire alarm system shall consist of pull stations, audiovisual devices, control/annunciation panel and tamper and/or flow connection/supervision to the sprinkler system. Provide supervision of fire pump where fire pump is provided. Fire alarm system shall tie into the base-wide system in accordance with base requirements. Consult with Fire Department regarding the number of zones they require. Note that at many installations 8 zones are required.

3.14. SEE PARAGRAPHS 5.12 AND 6.14 SUSTAINABLE DESIGN

3.15. SEE PARAGRAPH 6.15 ENVIRONMENTAL

3.16. SEE PARAGRAPH 6.16 PERMITS

3.17. SEE PARAGRAPH 6.17 DEMOLITION

3.18. SEE PARAGRAPH 6.18 ADDITIONAL FACILITIES

3.19. EQUIPMENT AND FURNITURE REQUIREMENTS

3.19.1. FURNISHINGS

A. GENERAL:

1) Classroom Desk and chairs for students and staff shall be heavy duty, ergonomic designs for high use. The use of keyboard trays will be up to the local school based on their teaching situation (classes that seldom use computers but require maps and books on the desk will prefer keyboard trays). In digital classrooms, key board trays should not be used. Desk that has keyboards on the top should be 686 mm [27"] high for proper typing ergonomics. Consider desk with recessed computer monitors for ACES classrooms where a variety of classes are taught for short durations (looking through the desktop at a monitor for a long period of time is not ergonomic). Student desk shall be modular and have appropriate wire management to allow easy reconfiguration of spaces. Where desktop computers are used, consider flat screen monitors to use less desk space and provide better sight lines to the front of the class.

a) Desks should be steel frame based using at least 18-gauge steel with high-density particleboard or plywood to minimize lifecycle costs. Student desk should be approximately 914 mm [3 feet] wide by 762 mm [30 inches] deep. This may vary based on the subject being taught and the inclusion of applied instruction. Where students work in pairs, a singlewide desk may be required. Where use of equipment or printed maps/drawings is taught, a deeper and occasionally wider desk may be required. In the case of applied instruction such as the operation and repair of radios, special desk are required to support and power equipment. These things should be considered in the planning process.

2) Administrative spaces: Use systems furniture where possible and should include integral cabling and task lighting. Desktops shall have medium to low reflectivity durable surfaces. Conference room tables shall be modular to allow for reconfiguration and removal from the room. Common area furniture such as in Lounges shall be durable, comfortable and reconfigurable. Systems furniture shall incorporate removable panels, hinges, or other means of convenient access to wall electrical outlets and communication jacks.

a) Provide caster chairs with appropriate floor casters

b) Provide Keyboard trays

c) Provide lockable desks and workstations, filing cabinets and storage. Key all locks within a one person office the same; key all one person offices within a building differently. If an office or open office area has more than one workstation, key all the workstations differently, but key all locks within an individual workstation the same

3) Auditorium Seating: Fixed auditorium seating should consider riser mounting to keep the floor open. Consider the need for writing tablets, data and power connections in special situations

4) Classroom Coat Storage: Consider project specific requirements for coat storage. This usually takes place inside of classrooms. Storage in corridors is not acceptable. Typically a wall space of the classroom is devoted to coat hooks within an entrance 'alcove' or recess of the classroom.

3.19.2. EQUIPMENT

A. GENERAL: Coordinate User's required equipment needs and provide matrix of responsibilities for all equipment and furniture.

B. AUDIO/VISUAL EQUIPMENT:

1) **Interactive Whiteboard**. Interactive Whiteboards are typically wall mounted in coordination with other equipment in the room. Installation is usually by the Proponent Command (TRADOC, USAR ARMD, etc.). Therefore designer needs to provide power/data and supporting infrastructure in coordination with Proponent. Early coordination is essential. Small classrooms and meeting rooms often use the white board as a projection surface. The board is used to write and edit notes to work in projected and non-projected modes. The board is able to capture notes and save them to a digital file. The system shall be fully integrated into the classroom with concealed power and data. TRADOC normally determines the size of the boards based on current models and room requirements. Units ordered are typically self-contained with all operating software included with each board. Do not provide wall recesses, since the final board size may change during the design in response to the availability of more desirable larger models.

LCD panels located at lecterns or instructor's workstation and provide the same functions as interactive whiteboards may be used to replace the white boards. This is often done in smaller classrooms where space is more limited. This will allow instructors to work without turning their backs to students or blocking the information.

2) **Whiteboard/Marker board**. Marker board shall have a porcelain enamel writing surface (on a steel backing) and chalk tray. It shall be a factory assembled unit complete in one piece, without joints whenever possible. Marker board shall include a map rail with a tackable insert and shall have map hooks with clips for holding sheets of paper. Dry erase markings shall be removable with a felt eraser or dry cloth without ghosting. Unit shall come complete with accessories. Installations shall determine the size of the boards based on current models and room requirements.

3) **Tack board**. Tack board should have fabric wall covering laminated to cork, insulation board or fiberboard and framed to match other specialties in the space. In offices, tack board and whiteboard may be a combination unit. Installations shall determine the size of the boards based on current models and room requirements.

4) **Projection Screen**. Ceiling mounted motorized projection screen should be motor operated in large rooms, such as auditoriums. Installation is usually by the Proponent Command (TRADOC, USAR ARMD, etc.). Therefore designer needs to provide power/data and supporting infrastructure in coordination with Proponent. Early coordination is essential. Screens are motorized with 3-position control switching to stop or reverse screen at any point. Accommodate recessed ceiling mounted case. Coordinate with TRADOC on exact size. Screens are typically at least 72" high x 84" wide or larger as appropriate for room size. Bottom of screen should be no lower than 36". Proponent will usually provide controls and wiring that integrate with the interactive lectern/instructor's workstation in rooms where they are required.

5) **Projectors and Brackets**. Provide sufficient blocking and structure to accommodate ceiling mounted projectors and bracket supports with concealed power and control wiring. Fixed brackets are typically used. Models are selected based on individual classroom requirements, and early coordination with the proponent is essential in order to define the loading requirements and locations.

6) **Lectern**. Due to its connection to the AV equipment controls, the Interactive Lecterns are often provided by the proponent. These are normally enclosed metal or wood cabinets manufactured specifically as a lectern. They integrate control of room lights, projector, and sound system in large classrooms (50 or more students), large conference rooms (50 or more people), and auditoriums. It also includes a sloped reading surface, reading light, sound system, and wireless microphone, clock with countdown feature, and space/connectivity for a computer. The lectern shall be coordinated with building electrical power and lighting and LAN. Cabling shall be concealed. As indicated in the space narratives, instructor's desk with the same functions should be used for VTT and digital classrooms in lieu of a lectern. Lectern requirements shall be coordinated for each project to address special needs such as rack-mounted computer. Some large auditoriums may require 2 lecterns. All control wiring for classroom A/V equipment is usually provided by proponent.

C. **WINDOW TREATMENTS:**

1) **Classrooms:** Provide commercial grade treatments for all windows. Preferred system is fabric roller shade. Typically a classroom will require shades with no greater than 3 percent openness factor. Shades shall be designed to adequately mitigate glare for both student computers as well as wash-out of the presentation wall/screen.

2) **Non-Classrooms:** Provide window treatment at exterior interior windows where privacy is required, such as an office.

3.20. FACILITY SPECIFIC REFERENCES - NOT USED