

SECTION 01 10 00.000x
TASK ORDER STATEMENT OF WORK

1.0 PROJECT OBJECTIVES

1.1. SECTION ORGANIZATION

2.0 SCOPE

2.1. Starship Barracks

2.2. SITE

2.3. GOVERNMENT-FURNISHED GOVERNMENT INSTALL EQUIPMENT (GFGI)

2.4. FURNITURE REQUIREMENTS

3.0 Starship Barracks

3.1. GENERAL REQUIREMENTS

3.2. FUNCTIONAL AND AREA REQUIREMENTS

4.0 APPLICABLE CRITERIA

4.1. INDUSTRY CRITERIA

4.2. MILITARY CRITERIA

4.3. PRECEDENCE

5.0 GENERAL TECHNICAL REQUIREMENTS

5.1. SITE PLANNING AND DESIGN

5.2. SITE ENGINEERING

5.3. ARCHITECTURE AND INTERIOR DESIGN

5.4. STRUCTURAL DESIGN

5.5. THERMAL PERFORMANCE

5.6. PLUMBING

5.7. ELECTRICAL AND TELECOMMUNICATIONS SYSTEMS

5.8. HEATING, VENTILATING AND AIR CONDITIONING

5.9. ENERGY CONSERVATION

5.10. FIRE PROTECTION

5.11. SUSTAINABLE DESIGN

5.12. CONSTRUCTION AND DEMOLITION (C&D) WASTE MANAGEMENT

5.13. SECURITY (ANTI-TERRORISM STANDARDS)

6.0 PROJECT SPECIFIC REQUIREMENTS

6.1. GENERAL

6.2. APPROVED DEVIATIONS

6.3. SITE PLANNING AND DESIGN

6.4. SITE ENGINEERING

6.5. ARCHITECTURE

6.6. STRUCTURAL DESIGN

6.7. THERMAL PERFORMANCE

6.8. PLUMBING

6.9. SITE ELECTRICAL AND TELECOMMUNICATIONS SYSTEMS

6.10. FACILITY ELECTRICAL AND TELECOMMUNICATIONS SYSTEMS

6.11. HEATING, VENTILATING AND AIR CONDITIONING

6.12. ENERGY CONSERVATION

6.13. FIRE PROTECTION

6.14. SUSTAINABLE DESIGN

6.15. ENVIRONMENTAL

6.16. PERMITS

6.17. DEMOLITION

6.18. ADDITIONAL FACILITIES

1.0 PROJECT OBJECTIVES

The project objective is to design and construct facilities for the military that are consistent with the design and construction practices used for civilian sector projects that perform similar functions to the military projects. For example, a Company Operations Facility has the similar function as an office/warehouse in the civilian sector; therefore the design and construction practices for a company operations facility should be consistent with the design and construction of an office/warehouse building.

Comparison of Military Facilities to Civilian Facilities

Military Facility	Civilian Facility
Starship Barracks	Basic Training Facility for Law Enforcement

It is the Army's objective that these buildings will have a 25-year useful design life before a possible re-use/re-purpose or renovation requirement, to include normal sustainment, restoration, modernization activities and a 50-year building replacement life. Therefore, the design and construction should provide an appropriate level of quality to ensure the continued use of the facility over that time period with the application of reasonable preventive maintenance and repairs that would be industry-acceptable to a major civilian sector project OWNER. The site infrastructure will have at least a 50-year life expectancy with industry-accepted maintenance and repair cycles.

The project site should be developed for efficiency and to convey a sense of unity or connectivity with the adjacent buildings and with the Installation as a whole.

Requirements stated in this contract are minimums. Innovative, creative, and life cycle cost effective solutions, which meet or exceed these requirements are encouraged. Further, the OFFEROR is encouraged to seek solutions that will expedite construction (panelization, pre-engineered, etc.) and shorten the schedule. **The intent of the Government is to emphasize the placement of funds into functional/operational requirements. Materials and methods should reflect this by choosing the lowest Type of Construction allowed by code for this occupancy/project allowing the funding to be reflected in the quality of interior/exterior finishes and systems selected.**

1.1. SECTION ORGANIZATION

This Section is organized under 6 major "paragraphs".

- (1) Paragraph 1 is intended to define the project objectives and to provide a comparison between the military facility(ies) and comparable "civilian" type buildings.
- (2) Paragraph 2 describes the scope of the project.
- (3) Paragraph 3 provides the functional, operational and facility specific design criteria for the specific facility type(s) included in this contract or task order.
- (4) Paragraph 4 lists applicable industry and government design criteria, generally applicable to all facility types, unless otherwise indicated in the Section. It is not intended to be all-inclusive. Other industry and government standards may also be used, where necessary to produce professional designs, unless they conflict with those listed.
- (5) Paragraph 5 contains Army Standard Design Criteria, generally applicable to all facility types, unless otherwise indicated in the Section.
- (6) Paragraph 6 contains installation and project specific criteria supplementing the other 5 paragraphs.

2.0 SCOPE

2.1. INITIAL ENTRY TRAINING FACILITIES RENOVATION

Provide design and construction services to renovate and expand the existing BNHQ Administration area, renovation of Organizational Classrooms and convert the existing Dining Facilities to Training Classrooms in the first floor spaces of building 4420. Starship renovation work is comprised of: Company Operations Facilities (COF), Covered Training Areas, Laundry rooms, Sleeping Bays, Cadre Support Spaces and other miscellaneous spaces within the facility.

Provide design and construction services for improvements at the 1-13th, CPL Levi Jackson running track.

Exterior items include options for standing seam metal roofs and replacing of existing exterior walls with new Exterior Insulation Finish System wall system in lieu of upgrading of existing exterior walls with an interior insulation wall system.

2.2. SITE:

Provide all site improvements necessary to support the new building facilities. Refer to Paragraph 6.

Approximate area available 8.00 acres

2.3. GOVERNMENT-FURNISHED GOVERNMENT-INSTALLED EQUIPMENT (GFGI)

Coordinate with Government on GFGI item requirements and provide suitable structural support, brackets for projectors/VCRs/TVs, all utility connections and space with required clearances for all GFGI items. Fire extinguishers are GF/GI personal property, while fire extinguisher brackets and cabinets are Contractor furnished and installed CF/CI. All Computers and related hardware, copiers, faxes, printers, video projectors, VCRs and TVs are GFGI.

The following are also GFGI items: Projectors, TVs, Computers, copiers, printers, SIPRnet, IDS...

2.4. FURNITURE REQUIREMENTS

Provide furniture design for all spaces listed in Chapter 3 and including any existing furniture and equipment to be re-used. Coordinate with the user to define requirements for furniture systems, movable furniture, storage systems, equipment, any existing items to be reused, etc. Early coordination of furniture design is required for a complete and usable facility.

The procurement and installation of furniture is NOT included in this contract. Furniture will be provided and installed under a separate furniture vendor/installer contract. The general contractor shall accommodate that effort with allowance for entry of the furniture vendor/installer onto this project site at the appropriate time to permit completion of the furniture installation for a complete and usable facility to coincide with the Beneficial Occupancy Date (BOD) of this project. The furniture vendor/installer contract will include all electrical pre-wiring and the whips for final connection to the building electrical systems however; the general contractor shall make the final connections to the building electrical systems under this contract. Furthermore, the general contractor shall provide all Information/Technology (IT) wiring (i.e. LAN, phone, etc.) up to and including the face plate of all freestanding and/or systems furniture desk tops as applicable, the services to install the cable and face plates in the furniture, the coordination with the furniture vendor/installer to accomplish the installation at the appropriate time, and all the final IT connections to the building systems under this contract.

The Government reserves the right to change the method for procurement of and installation of furniture to Contractor Furnished/Contractor Installed (CF/CI). CF/CI furniture will require competitive open market procurement by the Contractor using the Furniture, Fixtures and Equipment (FF&E) package.

2.5. NOT USED

3.0. STARSHIP RENOVATION**3.1. GENERAL**

IET Barracks, “Starships”, are required by the Army to encompass living, training, and administrative/command operations. The Starship renovations shall be comprised of: Dining Facility (DFAC) to Classroom conversion, BNHQ Classroom renovation and BNHQ Administration area RENOVATION AND EXPANSION. The facility renovation shall also include upgrading building systems such as mechanical, electrical, and structural as required to meet current codes and regulations as defined in Section 3.4. Improvements at the 1-13th, CPL Levi Jackson running track, as shown in Appendix DD shall be constructed as part of this project.

3.1.1. Adapt-Build Model Standard Drawings, As-Builts, As-Constructed Drawings, and “For Information Only” (FIO) Design Documents

The Adapt-Build design / Standard Design to be adopted and developed into a complete design suitable for the conversion/renovation of B-4420 will be delivered on electronic media. There are files and references to “Ft Benning” in this package; this is understood, and is not an error. The D-B Contractor must understand this information is to be handled as FIO. The FIO design information provided was developed for Ft Benning Starship projects and that this information will specifically be adapted to the B-4420 design at Ft Jackson, SC.

The Adapt-Build Model design package is to be adopted by the Contractor and used as the basis of a complete design solution suitable for this conversion/renovation project.

As-Builts (originals scanned) for building 4420 are provided to aid the Contractor in the conversion/renovation design. All information provided must be verified by the contractor. As-builts will be delivered on electronic media.

Physical Fitness and Running Track design information is provided in Appendix DD.

3.1.2. Accessibility

Battalion Headquarters 3.2.4 shall comply with the Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities as currently amended. In all other portions of the facility are for able-bodied soldiers who occupy and manage the Starship facility. The Architectural Barriers Act (ABA) requirements do not apply to the entire Starship facility.

3.1.3. Definitions

Normal population for each classroom is 60 Trainees; “Surge” population for each classroom is 72 Trainees for calculation purposes.

AT/FP Standards to follow from UFC 4-010-01 (8 Oct 2003, including change 1, 22 Jan 2007):

- Standard 1. Standoff Distances
- Standard 2. Unobstructed Space
- Standard 3. Drive-Up/Drop-Off Areas
- Standard 4. Access Roads
- Standard 9. Exterior Masonry Walls - Apply to all new exterior masonry
- Standard 10. Windows and Skylights
- Standard 11. Building Entrance Layout

- Standard 12. Exterior Doors
- Standard 14. Roof Access
- Standard 15. Overhead Mounted Architectural Features
- Standard 16. Air Intakes - New Buildings
- Standard 18. Emergency Air Distribution Shutoff
- Standard 20. Equipment Bracing
- Standard 21. Under Building Access
- Standard 22. Mass Notification

3.1.4. Facility Specific Approved Deviations

The following are approved deviations from the requirements stated in Paragraph 5 and 6 that only apply to this project.

- (a) LEED SILVER Reference 01 10 00, Paragraph 5.11
- (b) Thermal Performance reference 01 10 00, Paragraph 5.5.2
- (c) In any case of conflicts between Paragraph 3 and the Adapt-Build Model Design with requirements of Paragraph 6, Paragraph 3 and the Adapt-Build Model Design will apply to this project.

Note: If Option Items are not awarded, the following specific requirements do not apply to the renovation described in 3.2.2, 3.2.3, 3.2.4.

3.1.5. Continued Occupancy – Not USED

3.2. FUNCTIONAL AND AREA REQUIREMENTS

3.2.1 Areas to be Renovated (Area calculations are approximate)

BUILDING 4420 - Base Contract (PN 77418)

3.2.3 BNHQ CLASSROOMS RENOVATION	9,730 SF Repair Work
3.2.4 BNHQ RENOVATION AND EXPANSION	1,232 SF Repair Work
3.2.7 COMPANY OPS AND COVERED TRAINING AREA	21,100 SF Repair Work
3.2.8 LAUNDRY ROOM RENOVATION	10,550 SF Repair Work
3.2.9 SLEEPING BAY AREA RENOVATION	168,960 SF Repair Work
3.2.10 CADRE SUPPORT SPACES RENOVATION	<u>11,300 SF</u> Repair Work
	222,872 SF

BUILDING 4420 - Base Contract (PN 69417)

3.2.2 DFAC AREA CONVERSION TO CLASSROOMS	24,000 SF New Work
3.2.4 BNHQ RENOVATION AND EXPANSION	<u>7,828 SF</u> New Work
	31,828 SF

254,700 SF Total Building

3.2.2. DFAC Area Conversion to Classrooms

3.2.2.1. Functional Space Requirements

- (a) Demolish and remove all kitchen equipment. Renovate the entire kitchen area to be converted into classroom space for training. All equipment, in the area of work for this project that is in place at the time of contract award becomes property of the contractor
- (b) In structural prototypes that do not use load-bearing walls: Demolish all non-load bearing partitions within the limits of construction indicated.

In structural prototypes that use load-bearing walls: Shore or demolish the existing roof structure within the limits of construction indicated, demolish load-bearing and non-load-bearing walls, and construct a new roof, or construct a new structural system to support the existing roof, that accommodate the new floor plan requirements.

- (c) Classrooms – Starship operational mission requires classroom space for 1,200 trainees, in minimum 60-student classroom configuration. This is considered optimal circumstances under ideal conditions. Given that these buildings are existing and structural framing cannot be changed without major disruption, some classrooms may be larger; however, the minimum 60-student classroom configuration shall be maintained where feasible. Provide large class rooms with movable motorized partitions where possible to divide into smaller 60-student minimum sections. The dividers shall be structure hung, moveable partitions. Partitions shall have a minimum STC rating of 45 and include all structural requirements. Each subdivided classroom must have two separate exits in compliance with applicable codes. Each subdivided classroom space shall have 48 inches high dry-eraser marker boards along entire length of all new permanent walls. Each classroom shall have a minimum 40 square feet of lockable storage area. See Standard design for added information.
- (d) Classroom Toilets - Provide an adequate amount of toilet fixtures to accommodate the functional occupancy. See Standard design for additional design information.

3.2.3. BNHQ CLASSROOMS RENOVATION

3.2.3.1. Functional Space Requirements

- (a) Classrooms: Provide two (2) centralized classrooms as shown in Standard Design. Each classroom space shall have 48 inches high dry-eraser marker boards along entire length of front and side walls.

Provide two power operated 10'-0" x 8'-0" ceiling flush structure mounted projection screens at the front of the classroom. Projection screens shall be flame retardant, mildew resistant, and white matte with black masking borders. Furnish and install a low profile ceiling mounted projector mount system with each projection screen. Ceiling mount shall consist of a steel ball joint and universal projector bracket. Mount shall project a maximum 6 inches below finished ceiling height, and shall securely attach to ceiling and structure above with steel mounting plate. Steel ball joint attaches to the universal projector bracket with twist-lock engagement. Mount shall provide up to 30° roll or pitch adjustment and 360° yaw adjustment at ball joint. Two setscrews lock ball joint in position. Projector mount shall be capable of supporting a 26 pound projector load. Furnish and install concealed electrical wiring, connections and accessories necessary for projector operation.

- (b) Classroom Storage: Each classroom shall have a lockable storage room as shown in the Standard Design.

3.2.4. BNHQ Renovation and Expansion

Provide BNHQ Administration area. This space is to house administrative and command operations comprised with command operations, special functions, and storage. The floor plans are provided in the Standard Design.

3.2.4.1. Functional Space Requirements

The following spaces are required to be designed within the BNHQ Area as part of the BNHQ RENOVATION AND EXPANSION:

- (a) Vestibules: Provide an enclosed transition space between the exterior and interior of the building, at the primary and secondary entry points.
- (b) Lobby: Provide a reception area adjacent to the primary entry vestibule, to receive the general public and serve the battalion business functions.
- (c) CQ /Reception Desk: Provide a reception desk area. The area and built-in desk shall be high quality design and construction, reflective of the professionalism in training preformed in this facility. Particular attention to materials, texture and lighting design should be considered.
- (d) SIPRNET: Provide secure communication room with design and construction in accordance with AR 380-5, Chapter 7, Section III, Department of the Army Information Security Program.
- (e) Copy Center: Provide an enclosed office space for media reproduction.
- (f) Command Suite: Provide a command suite with private offices for the Battalion Commander (BN CO), Executive Officer (XO), Command Sergeant Major (CSM), and a reception/waiting area. The Battalion Commander's office shall have a built-in closet with clothes shelf and rod. Provide one Command Suite bathroom with shower stall, sink and toilet.
- (g) Command Conference Room: Provide conference room with a seating capacity for approximately 30 persons (Conference table sized and arranged to seat 20) with kitchenette complete with cabinetry with sink with space for microwave, coffee makers, and small size under counter refrigerator.

Furnish and install a low profile ceiling mounted projector mount system with each projection screen. Ceiling mount shall consist of a steel ball joint and universal projector bracket. Mount shall project a maximum 6 inches below finished ceiling height, and shall securely attach to ceiling and structure above with steel mounting plate. Steel ball joint attaches to the universal projector bracket with twist-lock engagement. Mount shall provide up to 30° roll or pitch adjustment and 360° yaw adjustment at ball joint. Two setscrews lock ball joint in position. Projector mount shall be capable of supporting a 26 pound load. Furnish and install concealed electrical wiring, connections and accessories necessary for projector operation.

- (h) Operations Center (S2/S3): Provide an open operations administration area to accommodate four work stations, one office and storage room.
- (i) Administration (S1): Provide a private S1 office. Provide an open S1 – PAC office to accommodate eight work stations. Provide a message center (Mail Room at Ft Benning) for distributing mail and directives. A built-in lockable counter with laminated sliding glass

window shall be integrated with a rolling shutter door between the message center and the corridor. Counter opening shall be 36 inches wide by 42 inches high minimum.

- (j) Supply and Logistics (S4): Provide a Supply and Logistics open administration office to accommodate eight work stations and Storage room.
- (k) Unit Ministry Team (UMT): Locate UMT to minimize interruption and immediate contact with the command function. Provide a private Chaplain's office. Provide space for an Assistant Chaplain with a contiguous waiting area.
- (l) Corridors: As shown.
- (m) Men's Toilet/Shower: Provide one shower stall and toilet facilities to serve the administrative personnel assigned to battalion. Provide a dressing area with a built-in wooden bench adjacent to the shower area as shown in the plans.
- (n) Women's Toilet/Shower: Provide one shower stall and toilet facilities to serve the administrative personnel assigned to battalion. Provide a dressing area with a built-in wooden bench adjacent to the shower area.
- (o) Janitor: Provide one janitor closet. Janitor's closet shall have a 10 inch deep floor mounted stainless steel mop sink, with hot and cold service faucet, a four holder mop rack and 18 inch deep heavy duty stainless steel shelves for storage of cleaning supplies. Janitor's closet shall have space for storage of buckets and vacuum.
- (p) Vending: Vending area shall be sized to accommodate three full-size GFGI vending machines kitchenette complete with cabinetry with sink with space for microwave, coffee maker, and under counter refrigerator.
- (q) Mechanical, Electrical, and Telecommunications Rooms: Mechanical rooms shall accommodate space for equipment maintenance/repair access without having to remove other equipment. Mechanical, electrical and telecommunications rooms shall be keyed separately for access by Installation maintenance personnel. First floor exterior access is required for centralized mechanical. All telecommunications rooms shall be conditioned space. Refer to Mechanical, Electrical and Telecommunications Sections for additional information.
- (r) Table and Chair Storage: Provide a general area to store tables and chairs accessible from interior corridor area.

3.2.5. Not Used.

3.2.6. Not Used.

3.2.7. Company Operations and Covered Training Area Renovation

3.2.7.1. Functional Space Requirements

- (a) Entry Vestibule: Entry vestibule for the sleeping bays above shall be at the primary stairwell on each sleeping bay floor and is located within each Company Operations area.
- (b) Covered Training Area: Covered training areas are located under the sleeping bays. Renovate existing outdoor training areas as required to facilitate the total renovation requirements. Note that the entire existing soffit area must be replaced since insulation will

be required below Sleeping Bay. Covered Training Area floors shall be cleaned and repaired.

- (c) Stair: Existing Stair shall be renovated to comply with code requirements for existing buildings.
- (d) Corridors: as designed
- (e) Luggage Storage: as designed
- (f) Company Administration: Provide a pair of main entrance storefront entry doors into the Company Administration reception and CQ desk. The Company Administration area consists of the following required spaces:

Company Administration Reception
CQ Desk
Men's Bathroom
Women's Bathroom

Battery Commander's Office
1st Sgt Office
Operations Sgt. Office
Conference / Training room

- (g) Company Supply Area: Provide storage space for company supplies and equipment, weapons, and consumable supplies. Shipping and receiving functions are performed from company supply area. Infrastructure for the Intrusion Detection System (IDS) such as JSIDS shall be installed as part of this project as required.

The Company Supply Area shall be designed as Secure Storage (Level II): Secure storage structures standards shall comply with AR 190-51 Security of Unclassified Army Property (Sensitive and Non-sensitive) Appendix B, Storage Structure Security, Risk level I. The entry/Issue door shall incorporate a steel dutch-door type day-gate with a steel issue shelf built into the lower leaf of the day-gate.

Issue Room: Provide an Issue Room with built-in issue counter with a laminated sliding glass window shall be integrated with a lockable rolling shutter door between this room and the queuing corridor. Issue counter opening shall be 36 inches wide and 42 inches high minimum.

Supply Room: Provide space for one workstation in the Supply Room area for a Supply NCO.

Arms Room: Arms storage for storage of arms, ammunition, and explosives shall comply with AR 190-11, Physical Security of Arms, Ammunition, and Explosives for Category II, and AR 190-51 Security of Unclassified Army Property (Sensitive and Non-sensitive) 3-6. Communications and electronics equipment and night vision devices, Risk level I. Provide a new Arms vault door which shall incorporate a steel dutch-door type day-gate with a steel issue shelf built into the lower leaf of the day-gate.

- (h) Janitor: Provide janitor's closets in the central core area to be shared by the five Company Operations and classroom areas. Janitor's closet shall have a 10 inch deep floor mounted stainless steel mop sink, with hot and cold service faucet, a four holder mop rack and two 18 inch deep heavy duty stainless steel shelves for storage of cleaning supplies. Janitor's closet shall have space for storage of buckets and vacuum. *Note: if space is deemed*

available, the contractor will be required to provide and additional janitor sink and mop racks in a partitioned area in each of the Company Operations Restrooms.

- (i) Mechanical, Electrical, and Telecommunications Rooms: Mechanical rooms shall accommodate space for equipment maintenance/repair access without having to remove other equipment. Mechanical, electrical and telecommunications rooms shall be keyed separately for access by Installation maintenance personnel. First floor exterior access is required for centralized mechanical. All telecommunications rooms shall be conditioned space. Refer to Mechanical, Electrical Telecommunications Sections for additional information.

3.2.8. Laundry Room Renovation

3.2.8.1. Functional Space Requirements

- (a) Laundry: Laundry rooms are located on the first floor below the toilet/shower/dressing area of each of the second floor sleeping bays. Each laundry room shall accommodate a total of eighteen (18) heavy-duty, extra capacity, commercial washers and twenty-four (24) heavy-duty, extra capacity, stacked commercial dryers. Contractor furnished and installed fixed heavy gauge stainless steel clothes folding/hanging tables measuring 2 feet deep by 5 feet wide, and one stainless steel laundry tray and sink are required features of each laundry room. Provide power receptacles, natural gas connection (where gas is available to site) and vent connections for all dryers. Dryers shall be exhausted to the exterior. Do not manifold dryer exhaust vents. All washers and dryers (GFGI) shall be placed on a new 4" high concrete equipment pad (CFCI). The existing TA-50 cleaning table shall be removed.
- (b) Boot Wash: Outdoor area for soldiers to rinse mud from field gear, boots and clothing. Boot Wash station shall be provided at five (5) locations at each of the Company building wings. Each boot wash station shall consist of fifteen (15) freeze-proof hydrants with spray nozzle on a 60 inch long flexible hose located adjacent to a grated drain assembly complete with sand interceptor constructed on a new concrete sidewalk sloped to drain. Provide a heavy duty hook at each hydrant for hanging TA-50 gear while cleaning adjacent to each boot wash-station .
- (c) Stair Vestibule: Stair vestibule shall be the secondary entry into each sleeping bay above and is located at the fire exit stairwell located adjacent to each laundry at the rear of each training area.
- (d) Luggage Storage Room: Construct per Standard Design.

3.2.9. Sleeping Bay Area Renovation

3.2.9.1. Functional Space Requirements

- (a) Stair Vestibule: Stair vestibule shall be the secondary entry into each sleeping bay and shall be located at the fire exit stairwell located with the bathroom and laundry at the rear of each sleeping bay.
- (b) Sleeping Bay: Each sleeping bay shall be designed to accommodate sixty (60) trainees in an open bay dormitory layout (72 Surge). Sleeping bays must be of equal size and able to accommodate one bunk 84 inches long by 42 inches wide and one wardrobe 42 inches wide x 24 inches deep for each trainee, with adequate circulation. The mandated layout is for all single level of beds due to mechanical duct requirements for return air; see Mechanical requirements. Surge capacity requirements for seventy-two (72) trainees will be met by

using double bunks at some locations. A minimum ceiling height of 7'-11" feet is required. Ceilings shall be designed for durability and against tampering. A "hard" ceiling assembly consisting of 5/8-inch high impact gypsum ceiling board on metal furring or acceptable alternate design as offered. No lay-in acoustical ceiling shall be allowed in sleeping areas. Lighting shall be recessed if hard ceiling is used. All furniture listed is GFGL. All Exit doors from Sleeping bay shall be panic hardware.

- (c) Toilet/Shower/Dressing: Trainees shall use shower/toilet/dressing rooms in not more than 4 shifts, so that 60 persons on each bay will need an optimal number of fixtures as follows: 15 showers, 15 toilets and 15 lavatories. Contractor shall provide this number of fixtures to the extent possible given that the minimum number of beds shall be maintained in the sleeping bays. Each toilet/shower/dressing room shall have a dressing area. Urinals shall not be substituted for water closets. Dressing area shall be furnished with continuous hardwood benches and mirrors. Benches shall be mounted on powder-coated steel pedestals permanently anchored to the floor. Benches shall run the entire length of the two longest walls of the dressing area. Furnish and install four full length wall mirrors each 16 to 24 inches by 72 inches, spaced evenly on one short wall of each dressing area. Furnish and install thirty wall mounted clothes hooks spaced evenly along the walls of each dressing area above the wood benches. Lavatories shall be provided in a continuous solid surface material vanity top. Each lavatory shall be furnished with a combination stainless steel framed mirror and stainless steel shelf. Mirror shall be minimum 18 inches wide by 24 inches high. Stainless steel shelf length shall be full width of mirror and minimum 5 inches deep. Extend ceramic tile shower surround to ceiling. Provide tamper resistant showerheads.
- (d) Stair: Existing Stair to be renovated to comply with code requirements.
- (e) Not Used.
- (f) Drill Sergeant (DI) Office: Provide an administrative office adjacent to each sleeping bay on each floor. Each DI Office shall be designed to accommodate three work stations or as shown in floor plan.
- (g) DI Toilet/Shower: Provide a toilet and shower adjacent to the DI Office and accessible from the DI Office only. Furnish and install two single tier solid surface lockers in each DI toilet/shower. Each locker shall be 18 inches wide by 18 inches deep by 78 inches high, and shall be lockable.

3.2.10. Cadre Support Spaces Renovation

Provide renovation of the twenty (20) individual apartment style rooms as CADRE SUPPORT SPACES as shown in the Standard Design.

3.2.10.1. Functional Space Requirements

On the second and third floors above the BNHQ Area the Cadre Support Spaces shall be renovated to the following spaces:

- (a) Exterior corridor: Repair floor and drains as required making them functional and aesthetically acceptable with no cracked or spalled concrete visible. Provide barrier between exterior corridor and roof above first floor.
- (b) Cadre Rooms: On each floor provide four (4) Cadre Support rooms with a floor live load capacity of min 50 PSF (plus 15 PSF partition load) and designed in accordance with the Standard Design. Each room shall have built in upper and lower cabinets with single

stainless steel bowl sink, space for microwave (NIC), coffee maker (NIC) and an under counter refrigerator (NIC). Each room will be wired for CATV, LAN drops, along with typical administrative electrical and mechanical loads sized for eight (8) personnel. Life safety and fire code requirement should designate the rooms as living/sleeping, since they may be used for that purpose. Cadre Room corridors to the stair towers shall have a live load capacity of 80 PSF.

- (c) Cadre Toilet / Shower / Locker rooms: Provide two (2) Toilet/Shower Locker rooms per floor as shown in Standard Design, with a floor live load capacity of min 75 PSF.
- (d) Mechanical / Electrical / Miscellaneous Spaces: Contractor must provide design and construction of required spaces for Cadre floors. The Standard Design shall be developed into a full design including miscellaneous spaces that may be required by the project.

3.3. ARCHITECTURAL REQUIREMENTS

3.3.1. Hardware

- 3.3.1.1. Non-Destructive Emergency Access System (NDEAS) "Key Lock-Box": Provide recessed mounted, high security, non-destructive emergency access key box suitable for moist conditions. The housing have a minimum 1/4" fully welded steel housing. The lock must be UL Listed with double-action rotating tumblers and hardened steel pins accessed by a biased cut key. Key Lock-Boxes must include a tamper switch that will be monitored by the facility fire alarm control panel.

A total of six (6) Key Lock-Boxes are required; one at the entrance to BNHQ area and one at each Company Administration Area (if Options are awarded).

- 3.3.1.2. Finish Hardware: All hardware shall be consistent and shall conform to ANSI/BMHA standards for Grade 1. All requirements for hardware keying shall be coordinated with the Contracting Officer. Hardware finish shall conform to ANSI/BHMA A156 18. Extension of the existing installation keying system shall be provided. Installation keying system is Best Locks Locksets shall have interchangeable cores. Cores shall have no fewer than seven pins. Cores for locksets other than those for mechanical, electrical, and telecommunications rooms shall be manufactured by Best Lock Corporation. Locksets for mechanical, electrical and telecommunications rooms only shall be keyed to the existing Installation utilities master keying system. Deadbolt locks shall be installed on mechanical, electrical and telecommunications rooms keyed to the Installation keying system. Disassembly of knob or lockset shall not be required to remove core from lockset. All locksets and exit devices shall accept same interchangeable cores. Plastic cores are unacceptable. Door hardware and security requirements must be coordinated with the functional requirements, the room-by room criteria, and the electrical security/alarm system requirements of this document. Provide all hardware necessary to meet the requirements of applicable codes for fire doors and exit doors. Provide closers for all doors opening to corridors and as required by codes. Provide CDX-09 hardware for all SIPRNET room doors.

3.3.2. Special Acoustical Requirements

- 3.3.2.1. Exterior walls and roof/floor/ceiling assemblies, doors, windows and interior partitions shall be designed to provide for attenuation of external noise sources such as airfields in accordance with applicable criteria. Provide sound insulation to meet a minimum rating of STC 49 at walls and floor/ceiling assemblies. At interior doors provide solid core wood doors in metal frame with sound insulation to meet a minimum rating of STC 25.

- 3.3.2.2. Sound conditions and levels for interior spaces, due to the operation of mechanical and electrical systems and devices, shall not exceed levels as recommended by ASHRAE handbook criteria. Provide acoustical treatment for drain lines and other utilities to prevent noise transmission into the interior of sleeping spaces.

3.3.3. Exterior Design Objectives

Provide durable and easily maintainable materials. Do not use exterior materials that require periodic repainting or similar refinishing processes. Material exposed to weather shall be factory pre-finished, integrally colored or provided with intrinsic weathering finish.

- 3.3.3.1. Exterior Walls: Provide durable materials. Existing exterior walls shall be maintained as much as possible; walls shall be restored, cleaned or repaired as needed.

New exterior walls shall blend well with existing walls.

Option Item 2 Contractor shall design and construct new exterior walls as Standard design option indicates. The new wall system will completely replace all existing exterior walls above the first floor areas with an Exterior Insulation and Finish System as indicated on Standard Design Option Drawings A-331.

- 3.3.3.2. Roof:

(a) Roof shall be modified to support renovation. Roof framing reinforcing or the removal of existing roofing may be required to accommodate roof over-build framing. The removal and replacement of roof framing may be required in the DFAC-to-Classroom conversion.

(a) Roof Mounted Equipment: For roof mounted equipment, provide permanent access walkways and platforms to protect roof. Roof mounted equipment on pitched roof systems is unacceptable.

(a) Roof access from building exterior is prohibited.

(b) Provide new roofing at BNHQ expansion as shown in the Standard Design .

(c) Provide new Standing Seam Metal Roof over sleeping bay wings and Cadre Support Spaces as shown in Standard Design (**Option Item 1**). Gutter and downspout system shall be required for roofs that will discharge to any exterior ground. Refer to Paragraph 6 for roof storm water discharge management.

- 3.3.3.3. Trim and Flashing (if required by design): Gutters, downspouts, and fascias shall be factory pre-finished metal and shall comply with SMACNA Architectural Sheet Metal Manual.

- 3.3.3.4. Bird Habitat Mitigation: Not Applicable

- 3.3.3.5. Exterior Doors and Frames:

All doors in within the limits of construction shall be new.

(a) Main Entrance Doors: Aluminum storefront doors and frames with Architectural Class 1 anodized finish, fully glazed, with medium or wide stile for entry into lobbies or corridors. Provide doors complete with frames, framing members, sub-frames, transoms, sidelights, trim, applied muntins, and accessories. Framing systems shall have thermal-break design. Storefront systems shall comply with wind-load requirements of applicable codes and criteria including UFC 4-010-01.

(b) Exterior Non-entrance Doors: Exterior doors and frames opening to spaces other than corridors or lobbies shall be galvanized insulated hollow metal and comply with ANSI/SDI A250.8. Door and frame installation shall comply with all applicable codes and criteria including UFC 4-010-01. Refer to Adapt-Build model files for specification (08 11 13) and door schedule.

3.3.3.6. Exterior Windows: All existing windows shall be replaced unless otherwise stated elsewhere in this RFP. Provide insulated, high efficiency window systems, non-operable, with thermally broken frames complying with applicable codes and criteria including UFC 4-010-01. Curtain wall systems shall be capable of withstanding area wind loads, thermal and structural movement required by location and project requirements, and shall comply with applicable codes and criteria including UFC 4-010-01. Window sills shall be designed to discourage bird nesting.

3.3.3.7. Exterior Louvers (if required by design): Exterior louvers shall have bird screens and shall be designed to exclude wind-driven rain. Exterior louvers shall be made to withstand wind loads in accordance with the applicable codes. Wall louvers shall bear the Air Movement & Control Association (AMCA) International certified ratings program seal for air performance and water penetration in accordance with AMCA 500-D and AMCA 511. Louver finish shall be factory applied. All existing exterior lovers shall be replaced unless otherwise stated elsewhere in this RFP.

3.3.4. INTERIOR DESIGN OBJECTIVES

Provide durable materials and furnishings that are easily maintained and replaced. Provide interior surfaces that are easy to clean and light in color.

3.3.4.1. Signage: Provide room number sign with changeable two-line message strip signage. Changeable message strip signs shall be of same construction as standard room signs to include a clear sleeve that will accept a paper or plastic insert with identifying changeable text. The insert shall be prepared typeset message photographically enlarged to size and mounted on paper card stock.

3.3.4.2. Bulletin Boards: provide a total of eighteen (18) bulletin boards in the classroom area and two in each sleeping bay and four in the BNHQ area. Bulletin boards shall be 4 feet high and 6 feet wide. Bulletin boards shall have a header panel and shall have lockable, glazed doors.

3.3.4.3. Corner Guards: Provide surface mounted, high impact resistant, integral color, snap-on type resilient corner guards, extending from floor to ceiling for wall/column outside corners in high traffic areas. Factory fabricated end closure caps shall be furnished for top and bottom of surface mounted corner guards.

3.3.4.4. Chair Rail: Chair rails shall be installed in areas prone to hi-impact use, such as corridors, classrooms and lobby seating areas.

3.3.4.5. Casework: Provide cabinets complying with AWI Quality Standards (Custom Grade). Countertops shall have waterfall front edge and integral coved backsplash.

3.3.4.6. Fire Extinguisher Cabinets and Fire Extinguishers: Furnish and install fire extinguisher cabinets and fire extinguishers as required by applicable codes and criteria. Furnish a list of installed fire extinguishers (including location, size and type) to the Contracting Office Representative.

3.3.4.7. Interior Doors and Frames:

(a) Provide hollow metal doors, or flush solid core wood doors as required. All door frames shall be hollow metal.

- (b) Wood Doors: Provide flush solid core wood doors conforming to WDMA I.S.-1A. Stile edges shall be non-finger jointed hardwood compatible with face veneer. Provide Architectural Woodwork Institute (AWI) Grade A hardwood face veneer for transparent finished doors.
 - (c) Insulated Hollow Metal Doors: Comply with ANSI/SDI A250.8. Doors shall be minimum Level 2, physical performance Level B, Model 2; factory primed. Refer to Adapt-Build model files for specification (08 11 13) and or door schedule.
 - (d) Hollow Metal Frames: Comply with ANSI/SDI A250.8. Frames shall be minimum Level 2, 16 gauge, with continuously welded mitered corners and seamless face joints; factory primed. Refer to Adapt-Build model files for specification (08 11 13) and or door schedule.
 - (e) Fire-rated and Smoke Control Doors and Frames: Comply with applicable codes, criteria and requirements of labeling authority.
 - (f) STC ratings shall be of the sound classification required and shall include the entire door and frame assembly.
- 3.3.4.8. Window Treatment: Treatment shall be provided in all exterior windows. Uniformity of window covering color and material shall be maintained to the maximum extent possible throughout each building. Window stools shall be minimum ½ inch thick cast 100 percent acrylic polymer solid surfacing material.
- 3.3.4.9. Toilet Accessories: Furnish and install the items listed below and all other toilet accessories necessary for a complete and usable facility. All toilet accessories shall be Type 304 stainless steel with satin finish. Toilet accessories shall include the following:
- (1) Glass Mirror/Shelf – 18 inch by 24 inch glass mirror on stainless steel frame with shelf at each lavatory
 - (2) Hands free liquid soap dispenser – at each lavatory
 - (3) Hands free paper-towel dispenser
 - (4) Waste receptacle – recessed mounted at each lavatory/toilet area
 - (5) Sanitary napkin disposal at each female toilet
 - (6) Toilet paper dispenser – lockable multiple roll at each toilet
 - (7) Sanitary toilet seat cover dispenser – at each toilet stall
 - (8) Shower curtain rod, extra heavy duty – at each shower stall
 - (9) Shower curtain, white anti-bacterial nylon/vinyl fabric shower curtain – at each shower stall
 - (10) Soap dish – in shower
 - (11) Double robe hook – adjacent to shower enclosure entry
 - (12) Grab bars – as required by ADA

3.3.5. Finishes

3.3.5.1. Paint

- (a) All paints used shall be listed on the "Approved Product List" of the Master Painters Institute (MPI). Application criteria shall be as recommended by MPI guide specifications for the substrate to be painted and the environmental conditions existing at the project site.
- (b) Exterior surfaces, except factory pre-finished material or exterior surfaces receiving other finishes shall be painted a minimum of one prime coat and two finish coats. Paints having a lead content over 0.06 percent by weight of nonvolatile content are unacceptable. Paints containing zinc-chromate, strontium-chromate, mercury or mercury compounds, confirmed or suspected human carcinogens shall not be used on this project. Exterior paints and coating products shall be classified as containing low volatile organic compounds (VOCs) in accordance with MPI criteria. Application criteria shall be as recommended by MPI guide specifications. Provide an MPI Gloss Level 5 Finish (semi-gloss), unless otherwise specified.
- (c) Interior surfaces, except factory pre-finished material or interior surfaces receiving other finishes, shall be painted a minimum of one prime coat and two finish coats. Paints having a lead content over 0.06 percent by weight of nonvolatile content are unacceptable. Paints containing zinc-chromate, strontium-chromate, mercury or mercury compounds, confirmed or suspected human carcinogens shall not be used on this project. Interior paints and coating products shall contain a maximum level of 150 grams per liter (g/l) of VOCs for non-flat coatings and 50 g/l of VOCs for flat coatings. Provide an MPI Gloss Level 5 Finish (semi-gloss) in wet areas and a flat finish in all other areas.

3.3.5.2. Minimum Interior Finishes-General

- (a) Designers are not limited to finishes listed in the following INTERIOR FINISHES table(s) and are encouraged to offer higher quality finishes.
- (b) Wall, ceiling and floor finishes and movable partitions shall conform to the requirements of the IBC, NFPA and UFC 3600-01 Fire Protection Engineering for Facilities. Where code requirements conflict, the most stringent code requirement shall apply.
- (c) Carpet shall be minimum of 2 yarn ply, modular tile conforming to ISO 2551, ASTM D 418, ASTM D 5793, ASTM D 5848, solution dyed, tufted, cut and loop pile, commercial 100% branded (federally registered trademark) nylon continuous filament. Vinyl composition tile (VCT) shall be minimum 1/8 inch thick, conforming to ASTM F 1066, Class 2, through pattern tile, Composition 1, asbestos free, with color and pattern uniformly distributed throughout the thickness of the tile.
- (d) All walls shall be minimum 5/8" painted gypsum board, except where stated otherwise. Gypsum board shall be mold inhibiting gypsum board. Use high impact resistant gypsum board in vestibules, corridors, vending areas, sleeping bays and storage areas.
- (e) All ceiling finishes shall be minimum 5/8" painted gypsum board, except where stated otherwise. Gypsum board shall be mold inhibiting gypsum board.

3.4. STRUCTURAL REQUIREMENTS

3.4.1. General

Provide new fireproofing for structural steel framing members as required per code.

Structural modifications may be required to accommodate reconfiguration of mechanical and electrical equipment; ensure all modifications meet code requirements.

In addition to gravity, seismic, and lateral loads, design ancillary building items, e.g. doors, window jambs and connections, overhead architectural features, equipment bracing, for the requirements of UFC 4-010-01, DOD Minimum Antiterrorism Standards for Buildings. Ensure and document that the design of glazed items includes, but is not limited to, the following items under the design loads prescribed in UFC 4-010-01:

- (a) Supporting members of glazed elements, e.g. window jamb, sill, header.
- (b) Connections of glazed element to supporting members, e.g. window to header.
- (c) Connections of supporting members to each other, e.g. header to jamb.
- (d) Connections of supporting members to structural system, e.g. jamb to foundation.

All pieces of floor mounted mechanical/electrical equipment shall be installed on a 6-inch thick concrete equipment pad. Provide pad 6 inches larger than equipment footprint on all sides. Install dowel pins into floor slab prior to pouring equipment pad. For areas without a slab, all pieces of floor mounted mechanical equipment shall be installed on a 4-inch thick housekeeping pad. Provide pad 6 inches larger than equipment footprint on all sides. Anchor the pad to the floor.

3.4.2. Applicable Standards, Codes and Criteria

The structural design shall fully comply with the following listed criteria in addition to the provisions provided in paragraph 4 Section 01 10 00 References. Use the latest edition of the International Building Code (IBC) for design guidance, and coordinate design with UFC 4-010-01, UFC 3-310-01, Structural Load Data,

3.4.3. Project Specific Design Loads

(All other loads shall be per the stricter of IBC and UFC 3-310-01 Structural Load Data.):

3.4.3.1. Live Loads:

- (a) Elevated slabs – Cadre Area for Partitions 50 pounds per square foot (psf) minimum and 15 psf
- (b) Elevated slabs - Cadre Area Corridors 80 psf
- (c) Elevated slabs - Cadre Toilet/Shower/Locker 75 psf
- (d) Slab on grade 150 psf minimum

3.4.3.2 Antiterrorism/Force Protection loads and minimum requirements are per UFC 4-010-01. For design of structural components subjected to dynamic loads, the U.S. Army Corps of Engineers Protective Design Center (PDC) developed SBEDS, Single-Degree-of-Freedom Blast Effects Design Spreadsheets (SBEDS). SBEDS is available at the software tab of the PDC website, <https://pdc.usace.army.mil/>.

- 3.4.3.3 Occupancy Categories:
- | | | |
|----|-----------------|-----|
| a) | Classroom Areas | III |
| b) | All other Areas | II |

3.4.4. Foundation

The foundation is site specific and must be designed upon known geotechnical considerations by an engineer knowledgeable of the local conditions, e.g. highly expansive soils, groundwater levels. The foundations shall be designed as recommended by the geotechnical investigation. Coordinate the need for a vapor barrier with the architectural floor finishes and requirements of the geotechnical report.

3.4.4.1. Slabs-on-grade

Slabs-on-grade shall be reinforced and have a minimum thickness of 5 inches. Floor slab thickness and reinforcing shall be designed for the loads associated with the function of the specific area considered, but not less than 5 inches. Provide vapor barrier under all interior floor slabs. The minimum thickness for vapor barriers shall be 10 mil. Provide capillary water barrier under the vapor barrier when directed by the geotechnical report.

3.4.5. Construction Materials

All design, manufacture, fabrication, and assembly of construction materials to be used in structural systems shall conform to the applicable design standards and meet specific industry standards as required for each subject material or as noted herein.

3.4.5.1. Concrete

All concrete shall be a minimum of 3,000 psi and shall be reinforced.

3.4.5.2. Concrete Materials

- (a) Cement: ASTM C 150, Type I-II Portland cement
- (b) Fly Ash: ASTM C 618, Class "F"
- (c) Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 120
- (d) Fine Aggregate: ASTM C 33
- (e) Coarse Aggregate: ASTM C 33
- (f) Air-Entraining Admixture: ASTM C 260
- (g) Accelerating, retarding and water-reducing admixtures: ASTM C 494
- (h) Flowing Concrete Admixture: ASTM C 1017, Type 1 or 2
- (i) Calcium Chloride shall not be permitted

3.4.6. Design Analysis

Computer generated calculations must identify the program name, source, and version. Provide input data, including loads, loading diagrams, node diagrams, and adequate documentation to illustrate the design. The schematic models used for input must show, as a minimum, nodes/joints, element/members, materials/properties, and all loadings, induced

settlements/deflections, etc., and a list of load combinations. Results must include an output listing for maximum/minimum stresses/forces and deflections for each element and the reactions for each loading case and combination. Provide trace model for loading and energy calculations. Also provide an Envelope Compliance Certificate. All calculations shall be performed by a registered engineer and checked by an engineer other than the design engineer.

3.4.7 **Structural Components of Renovation**

3.4.7.1 DFAC Area Conversion to Classrooms

Some existing DFAC structural prototypes rely on interior load bearing walls in combination with a space frame system of beams and columns, while other prototypes rely entirely on a space frame system, without load-bearing walls, for the support of gravity loads. Additionally, some structural prototypes use the load-bearing and non-load-bearing masonry walls as shear walls for the resistance of lateral loads, while other prototypes rely on the moment-resisting capacity of monolithically cast concrete moment frames for lateral force resistance. In most cases, the arrangement of load-bearing and non-load-bearing walls and the columns of the space frame system are not compatible with the proposed new open classroom area. The successful proposer shall revise the existing structural system in this area to accommodate the proposed column-free classroom spaces. This accommodation may or may not include the complete removal of the existing roof framing, supporting structures, and slab-on-grade, followed by the construction of a new roof framing system with supports located to accommodate the revised architecture. Other accommodations may be considered that involve retaining the existing roof framing but revising the support structure. The new or revised structural system shall replace the lateral force resisting capacity of any lateral-force-resisting elements that are removed in the remodel and that provide lateral force resistance to existing portions of the building that will remain. A lateral force-resisting system shall be provided for new framing systems.

In-fill the existing courtyards to the rear of the existing kitchen area (between the existing DFAC and the Company module to the rear of the facility) with concrete slabs-on-grade and infill roof framing over the existing courtyard roof openings.

3.4.7.2 BNHQ Classrooms Renovation

Provide infill slabs-on-grade and infill roof framing at courtyard roof opening on each side of the existing Classrooms.

3.4.7.3 BNHQ Renovation and Expansion

Provide a single-story steel-frame system with moment resisting frames or braced frames, supported by an appropriate shallow or deep foundation system, for the BNHQ expansion.

3.4.7.4 Cadre Support Spaces Renovation (Option 1)

Reinforce the existing floor framing if (or as) required to meet the change-of-use floor loading requirements.

3.5. MECHANICAL REQUIREMENTS

3.5.1. Plumbing

Lavatory faucets shall be water conserving type with a maximum flow rate not to exceed 2.0 gpm, except where the maximum flow to achieve the minimum LEED Silver baseline requires a lower maximum flow.

The domestic hot water system shall generate and store the domestic hot water at 140° F. A tempering valve shall be provided downstream of the storage tank for the delivery of 110°F (adjustable) domestic hot water to points of use. Piping shall be copper type L above ground. Below ground piping shall be ductile iron or copper, type K. Pipes shall be sized such that required minimum pressures at the fixtures are maintained.

Sizing of domestic hot water boilers shall be based on a peak morning water use rate of 20 gallons of 110F hot water per soldier (at surge) over a 30 minute period. The system shall be designed for all trainee soldiers in the facility to shower during this period as well as a diversified percentage of non-trainee soldiers. During this peak period, there are no other simultaneous non-latrine based hot water uses (such as laundry rooms)

The Domestic Water Heating Boilers shall be gas fired high efficiency condensing type, unless otherwise defined in 01 10 00 paragraph 6. The Domestic Hot Water Storage Tank(s) shall be sized to handle normal daily needs, other than heavy shower use. The tank(s) shall be sized such that it(they) can be brought into the building during re-construction with no building demolition required.

A Solar study for this building in on file with the COS shows Solar Hot Water heating is not feasible; therefore no Solar Study is required for this project.

3.5.2. Heating, Ventilating and Air-Conditioning (HVAC)

3.5.2.1. Outside Air Systems:

3.5.2.1.1. The HVAC systems shall be designed to provide outside air quantities conforming to Ventilation Rate Procedure of ASHRAE 62.1-2004. Dedicated Outside Air Units (DOAU's) shall be used to provide dehumidified and reheated air to the building for all the outside air requirements. All ventilation air shall be dehumidified to a dew point of 48F. The DOAU's shall have DX cooling and gas heating. Dehumidification shall be through enthalpy and desiccant wheels. Heating and reheat may be natural gas or condenser hot gas.

3.5.2.1.2. DOAU's serving the sleeping bays and associated company headquarters shall be split systems with the air handling unit located on the roof and the condensing unit mounted on a structural frame on the roof of the classroom/DFAC area. These DOAU's shall supply cold air to one side of a double duct VAV box to share part of the baseline cooling load. The dual duct VAV box shall have a heating coil downstream. The limited floor space does not allow for 2 completely separate duct systems to be routed in the limited ceiling space. The ceiling space also does not allow full size trunk ducts to cross. Therefore, this shared load concept was created. To help address the humidity loads that originate in the toilet area, a single duct VAV box shall supply a portion of the dehumidified air directly to the toilets. The toilet exhaust quantity shall remain constant throughout the day. Although the occupancy of the sleeping bay is variable throughout the day, the DOAU's shall be constant volume in order to make up the toilet exhaust and provide building pressurization. The VAV boxes shall not vary the amount of outside air. They shall serve as the interface between the DOAU air and the AHU air. Also, the quantity of outside air can be determined through the HVAC control system. The DOAU units serving the sleeping bay wings shall have supply air temperature reset, controlled by the various zone demands, to help to keep from overcooling the spaces in the mid seasons.

- 3.5.2.1.3. The DOAU's serving the classroom areas shall be rooftop air handling units with remote condensing units. Both shall be located on the classroom/ DFAC roof on a structural frame, as the existing roof is not capable of directly supporting these. Due to the highly variable occupancy of the classroom areas, the DOAU's for those spaces shall be capable of demand control ventilation by using VAV terminals with CO2 demand control to deliver the appropriate quantity of outdoor air to the classrooms and to allow the outdoor air to be significantly reduced during periods where any individual classroom is un-occupied. These DOAU's shall recover energy from the toilet exhaust as well as the over-pressurization as a result of the quantity of outside air required for the occupant load. In the classrooms, the VAV terminals shall be double duct VAV with a heating coil downstream. Each of the VAV air valves shall operate completely independently. One of the air valves shall carry only the air from the DOAU. This valve shall have a minimum position of outside air to serve the greater of the ASHRAE 62 area ventilation or the air required for building pressurization. The valve shall then modulate up to the full ASHRAE 62 ventilation air flow based on CO2 demand. The other air valve shall provide cooling air from the main air handling unit serving that area. For cooling, that air valve shall modulate from full flow down to zero. For heating that same air valve shall modulate in sequence with the heating coil modulating from zero up to the maximum design heating air flow.
- 3.5.2.1.4. The DOAU serving the BNHQ shall be a split system with the air handling unit located in the first floor mechanical room to the left of the BNHQ area and the condensing unit mounted on a structural frame on the roof of the classroom/DFAC area. This DOAU shall supply neutral air directly to each space. The DOAU shall be constant volume in order to make up the toilet exhaust and to maintain building pressurization. This DOAU shall include heat recovery for the exhaust air from the toilets.
- 3.5.2.2. HVAC Air Systems:
- 3.5.2.2.1. In general, all normally occupied areas of the building will be served by Chilled Water Variable Air Volume Air Handling Units. Air handling units will have double wall insulated casing, chilled water coils, filter sections with MERV 8 filters, and fan sections. The AHU's will not require heating coils, as all ventilation air is supplied by DOAU's and space heating will be accomplished at the VAV box.
- 3.5.2.2.2. For the sleeping bay wings, the AHU's will be located in mechanical room(s) located near the sleeping bay wings and ducted to serve the sleeping bays. The Company offices on the first floor will be served by its own air handling unit. Minimum outside air will be from a DOAU. Due to spatial limitations, the DOAU will also supply cold air to carry a portion of the baseline cooling load. While the DOAU air flow will be constant volume, the air from the AHU will be variable down to zero air flow. The air handling units will not have economizer as the economizer would not be able to be activated until the dew point of the outside air was below 48F. An analysis indicated that there were virtually no hours during the year that there was a cooling load in excess of the capability of the DOAU when the outside air dew point was below 48. The VAV boxes will be dual duct. Although the AHU air valve will modulate to zero air flow, the air valve will modulate to a heating air flow when additional heating capacity is required. Some of the spaces in the Company offices also require supplemental baseboard heat. The baseboard heat will be controlled in conjunction with the VAV heating coil and air flow.
- 3.5.2.2.3. For the classrooms, the AHU's will be located in the mechanical rooms between the sleeping bay wings. In order to maximize the available area inside the sleeping bay, the ductwork is exterior on the backside of the sleeping bay tower and through the classroom roof. Ventilation air is provided directly to the spaces. Since all of the classroom spaces have only a roof load, they will require cooling under most outside conditions. Therefore the AHU will have economizer capability. The economizer will not be engaged until the outside air temperature is

below 48 degrees dew point. Economizer relief will be through roof hoods with motorized and barometric dampers on the roof of the classroom area. The VAV boxes will all be dual duct with downstream heating coils. The outside air valve will modulate based on demand controlled ventilation, with the minimum being set by ASHRAE 62 minimums and building pressurization. The AHU air valve will modulate to fully closed. The AHU air valve will modulate to a heating air flow to satisfy heating loads.

3.5.2.2.4. For the BNHQ area, the AHU will be located in the existing mechanical room to the left of the BNHQ. This air system will use single duct VAV boxes. In areas that have high heating loads, series fan powered boxes will be used to provide additional air flow for additional heating capacity. An economizer is not used for this air system.

3.5.2.3. Other HVAC Air Systems:

3.5.2.3.1. The laundry rooms will have a dedicated outdoor air unit for ventilation to provide ventilation and space pressurization. The rooms will also have heating and cooling fan coil units. The laundry rooms are unused during most of the day. The DOAU will provide space pressurization and ventilation during that time and the fan coils will provide supplemental heating and cooling. When many of the dryers are being used, the space will become negative and additional outside air will be drawn in. Once the dryers usage drops, the space will again become positive and the dry air from the DOAU will purge the moisture from the space.

Decoupling of Exhaust and Supply Ventilation Systems for Laundry Rooms: To reduce unneeded energy use for heating and cooling of the make-up air and for air transportation of supply and exhausted air from the dryers, laundry exhaust and supply systems are separated from the rest of the building exhaust and supply systems. Laundry exhaust system and corresponding clothes dryer make-up systems operate at full capacity when dryers are operating and in a reduced capacity/flow mode at other times to provide and maintain a mold free and dry laundry space. Laundry makeup air shall be tempered (heated) to provide adequate min. space temperatures. Laundry room must be supplied by the DOAU, see Mechanical requirements.

3.5.2.3.2. The Communication rooms requiring cooling will be served by dedicated DX ductless mini split air conditioning units. Units will utilize R410A refrigerant to reduce ozone depletion.

3.5.2.3.3. Electrical and mechanical rooms will be ventilated. Rooms that have sufficient outside wall, will use wall mounted propeller exhaust fans mounted behind discharge louvers and intake louvers. All the louvers will have motorized dampers. Rooms that have either insufficient outside wall, or no outside wall will use roof mounted intakes and exhaust fans.

3.5.2.3.4. Mechanical rooms on the first floor will be heated with hydronic unit heaters.

3.5.2.3.5. The central stair towers between the sleeping bays will become fully enclosed. These stair towers will be a primary circulation path and will conditioned with heating cooling fan coil units.

3.5.2.3.6. The fire stairs at the ends of the sleeping bays are a secondary circulation path. These will be heated only using hydronic cabinet heaters located on the first and third floors.

3.5.2.3.7. The existing crawl space will be ventilated using a roof mounted intake and a roof mounted exhaust fan. Control of the exhaust fan will be by comparing the dewpoint of the crawl space air and the outside air. The exhaust fan will only operate when the dewpoint of the outside air is lower than the dewpoint of the crawl space air.

3.5.2.4. Hydronic Systems.

- 3.5.2.4.1. Chilled Water Systems: All HVAC systems must be converted to 4 pipes to allow the capabilities to provide cooling year round. IF Chilled water is provided from a CEP, the systems shall be designed for the plant chilled water system. If chilled water is to be obtained from the central plant new tertiary chilled water pumps will be installed for this building in the mechanical room.
- 3.5.2.4.2. Heating Water Systems: The heating water system will consist of high efficiency condensing type, gas fired boilers located the existing mechanical room to the right of the BNHQ. Flues will be routed up the backside of the sleeping bay tower. Heating water will be used for building heat through VAV boxes. The heating water pumping system will utilize primary-secondary pumping with variable speed secondary. The heating secondary heating water pumps will be two 50-50 parallel operation pumps. The heating water system will be designed to provide 140 to 150 degree supply water temperatures and maximum temperature differentials to achieve higher energy efficiencies from the boiler and lower pumping costs.
- 3.5.2.5. COMPLIANCE WITH THE ENERGY POLICY ACT OF 2005 (EPACT 2005)
- 3.5.2.5.1. EPACT 2005 REQUIREMENT
- Although EPACT 2005 only applies to new facilities, this facility shall be designed as if EPACT 2005 fully applied to it. The building, including the building envelope, HVAC systems, service water heating, power, and lighting systems shall be designed to achieve an energy consumption that is at least 30% below the consumption of a baseline building meeting the minimum requirements of ANSI/ASHRAE/IESNA Standard 90.1-2004 (see paragraph 5.9 Energy Conservation)
- 3.5.2.5.2. TARGET ENERGY CONSUMPTION BUDGET
- The target energy consumption budget (excluding plug loads) for this facility located in Climate 3A is 50 kBTU per ft2 per year or less. The use of the Prescriptive Technology Solution Set, shown below, shall result in an annual energy consumption less than or equal to the target energy budget figure.
- 3.5.2.5.3. PRESCRIPTIVE PATH (USE OF TECHNOLOGY SOLUTION SET)
- The technology solution set shown in the table below achieves the above energy performance and life cycle cost effectiveness requirements for an IET Barracks facility in the indicated DOE climatic zone. This table is required only if the prescriptive path is taken. IF prescriptive path is not followed, then it is required by UFC-3-400-01 section 2-4.1 that a Energy Compliance Analysis (ECA) must be completed to verify that the 30% reduction in energy consumption from 90.1 values has been met. This analysis can be performed using a Trace model or equivalent. The analysis must set up a baseline values from ASHRAE 90.1 and then compared to the new 30% energy reduction design.

Climate Zone 3A, Prescriptive Technology Solution Table

Item	Component	Baseline ⁽¹⁾	30% Solution
Roof	roof deck	R-30	R-40
	Surface reflectance	0.08	0.27
Walls	Light Weight Construction	R-13	R-20
Exposed Floors	Mass	R-4.2 c.i.	R-10 c.i.
Slabs	Unheated	NR ⁽²⁾	NR ⁽²⁾
Doors	Swinging	U-0.70	U-0.70
	Non-Swinging	U-1.45	U-1.45
Infiltration		0.4 cfm/ft ² @ 75 Pa	0.3 cfm/ft ² @ 75 Pa ⁽³⁾
Vertical Glazing	Window to Wall Ratio (WWR)	10% - 20%	10% - 20%
	Thermal transmittance	U-0.57	U-0.45
	Solar heat gain coefficient (SHGC)	0.37	0.31
Interior Lighting	Lighting Power Density (LPD)	1.1 W/ft ²	0.9 W/ft ²
	Ballast		Electronic ballast
HVAC	Air Conditioner	PSZ-AC 12.0 SEER (3.05 COP)	4-Pipe Fan Coil with central chiller and boiler plus DOAS ⁽⁴⁾ with 14.0 SEER DX coil (3.52 COP) and HHW coil on central boiler SAT control 55°F – 62°F with OAT 75° – 54°F
	Gas Furnace	80% E _t	none
	ERV	yes	70 to 75 % sensible effectiveness
Economizer		no	no
Ventilation	Outdoor Air Damper	Motorized control	Motorized control
	Demand Control	NR	NR
			⁽⁵⁾
Ducts	Friction Rate		0.08 in. w.c./100 feet
	Sealing		Seal class B
	Location		Interior only
	Insulation level		R-6 ⁽⁶⁾
Service Water Heating	Gas storage	80% E _t	90% E _t
	Drain Water Heat Recovery	None	none ₇

1. Baseline requirements are from ANSI/ASHRAE/IESNA Standard 90.1-2004.
2. NR means there is no requirement or recommendation for a component in this climate.
3. Increased Building Air tightness. Building air leakage (measured in cfm/ft²) is the average volume of air(measured in cubic feet per minute) that passes through a unit area of the *building envelope* (measured in square feet) when the building is maintained at a specified internal pressure (measured in Pascals). Testing requirements are specified in Chapter 5..
4. Dedicated Outdoor Air System. A central dedicated outdoor air system (DOAS) providing the following:
 - a. Outside air for building indoor air quality and humidity control.
 - b. Make-up air for bathroom.
 - c. Building pressurization to prevent infiltration which allows for reduction of heating/cooling and moisture loads on the system.
 - d. Must have exhaust heat recovery from the bathroom.

NOTE: The Central DOAS does not provide sensible heating or cooling. Sensible loads are provided by a complementing heating and cooling system. DOAS units are required for classrooms. Admin areas- Do not require DOAS but must meet the following:

- DOAS must run 24 hours a day to maintain humidity level.
- Ventilation air requirements must go through main unit.
- Damper system required air intake working with main unit.
- Unit must have exhaust heat recovery, condenser reheat.
- Units must be designed with more coils (increase surface area) to remove more humidity in peak conditions.
- Reheat required after coils to bring temp to desired conditions.

5. The duct and pipe insulation values are from the ASHRAE Advanced Energy Design Guide for Small Offices.

All design features of this EPACT 2005 compliant IET Barracks not described above shall be in accordance with the minimum requirements of ANSI/ASHRAE/IESNA Standard 90.1-2004,n including conformance with paragraph 5.9.2, which requires purchase of Energy Star and FEMP designated products

- 3.5.2.6. Provide air barrier system to allow attainment of building air leakage rate of no more than 0.30 cfm/sf @ 75 Pa when tested in accordance with ASTM E-2178. At the completion of construction, the building or portion thereof shall be tested to show compliance. Insure the piping/plumbing chase from the building crawl space in the Mechanical room and dining areas and at each floor level and at the attic/roof level is properly sealed against air leakage, heat loss and vapor transmission.
- 3.5.2.7. All major mechanical equipment such as Air Handling Units, pumps, water heaters, heat exchangers, shall be located in mechanical equipment rooms Major mechanical equipment access shall be via a door with minimum dimensions of 72" wide x 80" tall or deep. Mechanical rooms shall be sized for ease of service and maintenance of equipment. Air filters shall be located in duct or unit mounted filter boxes within the mechanical room. DOAS and other mechanical equipment can be located on the roof above the classrooms.

- 3.5.2.8. Use 1.5" closed cell flexible elastomeric insulation for all cold piping (any piping that shall be at 60° F or less in any operating mode) to prevent the formation of condensation and mold/mildew on the exterior.
- 3.5.2.9. Design the thermal envelope for the wall to meet the project requirements of Table A. Condensation and moisture analysis shall be performed to show that primary water vapor barrier is exterior to the insulation layer. Insulation in the prescriptive tables is required for the roof deck and walls. Spray foam can be used to meet this requirement. Use winter/summer and inside design conditions as indicated in paragraph 3.5.5.
- 3.5.2.10. HVAC design loads must include plug loads of 3 watts/sf in classrooms. HVAC design loads must also account for surge population in classrooms.
- 3.5.2.11. Heating, mechanical ventilation and air-conditioning shall be in accordance with Department of the Army criteria noted above and ASHRAE Standard 62. Continuous ventilation air (24/7 for all areas) must be provided throughout each building for indoor air quality, building pressurization, and makeup of exhausted air. Exhaust airflows and people ventilation shall be provided as required by ASHRAE Standard 62. The overall building shall be positively pressurized by approximately 10 Pa to exclude unplanned infiltration. All ventilation air shall be provided using one or more dedicated outdoor air units.
- Recirculation and filtering of air from the Toilet/Shower/Dressing areas at the Sleeping Bays is prohibited.
- 3.5.2.12. Special requirements for trainee sleeping bays are: Supply air shall be designed to ensure even distribution of air over the entire sleeping bay with no velocities in the occupied zone (up to 6 feet or higher above finished floor) exceeding 40 feet per minute. Additionally for the each company "platoon" living/sleeping barracks area, air distribution design shall prevent short-circuiting of supply air; also, return or exhaust air shall be located to preclude sweeping of room air over multiple (more than one) rows of bunks. Elimination of pulling return or exhaust air across multiple healthy soldiers is mandatory to decrease the likelihood of infection and has been mandate by the US Army Medical Command for trainee barracks. A final consideration is that the army shall at time stack or double bunk trainees during surge population periods, so air distribution has to take that fact into account also.
- 3.5.2.13. Meet LEED Silver requirements if Options are awarded.

3.5.3. HVAC Automation and Controls

The Building Automation System (BAS) shall be a single complete non-proprietary Direct Digital Control (DDC) system for control of the heating, ventilating and air conditioning (HVAC) and other building systems. The BAS shall be based on an Open implementation of LonWorks® technology using ANSI/CEA 709.1B as the communications protocol and use only LonMark Standard Network Variable Types, as defined in the LonMark® Resource Files, for communication between DDC Hardware devices to allow multi-vendor interoperability. The building BAS shall be capable of integration to a future base wide supervisory monitoring and control (M&C) system (often referred to as a Utility Monitoring and Control System – UMCS). 3 Monitoring and Control hardware and software requirements are listed below. Each list is provisional and shall depend on selected HVAC systems for actual points being monitored and controlled and applicable software:

- (a) Standard Input/Output (I/O) points, to be connected and integrated for monitoring and control shall need alarm limits, etc. as appropriate for all I/O:

Outside Temperature (F)

Outside Humidity (%)
 Boiler Safeties (All)
 Chiller Safeties (All)
 Air Handler Safeties (Freezestats, Firestats, etc.)
 Air Flow Monitor (normal/low)
 Start/Stop Monitor (normal/low)
 Air Handler Hot Deck (F) .
 Air Handler Cold Deck (F)
 Return Air Temperature (F)
 Mixed Air Temperature (F)
 Supply Temperature for each Zone or Main Supply Temp(F),etc.
 Room Air Temperature for each Zone (F)
 Humidity for each Zone (%)

Chilled Water Supply (F)
 Chilled Water Return (F)
 Chilled Water Flow (GPM)
 Chiller Start/Stop Control and Load Limiting Input/
 Tower Fan Status (on/off)
 Condenser Water Supply & Return Temps (F)
 Chilled Water Pump Status (on/off)
 Economizer Control
 Hot Water Pump Status (on/off)
 Hot Water Supply & Return Temperatures (F)
 Hot Water Flow (GPM)
 Filter Media Differential Pressure Alarms
 Motor Run Time (elapsed)
 Moisture Alarms in Raised Floor Areas
 Enable/Disable
 Start/Stop
 Run-longer user interface (usually 2 hours) to delay unoccupied modes

(b) Standard Monitoring and Control Software that shall be provided, both at the building or be integrated into or used at the existing UMCS are:

High and low temperature limit alarming
 High and low humidity limit alarming
 Equipment runtime and status (on/off, enabled, etc.)
 Scheduled and optimum start/stop
 Duty cycling
 Demand limiting (motor start/stop restrictions, motor size, etc.)
 Occupied/Unoccupied
 Time Scheduling
 Day/Night Setback
 Economizer
 Ventilation and Recirculation, Vent Delay, etc.
 Hot and Cold deck reset
 Reheat coil reset
 Boiler plant – boiler optimization
 Chiller plant - chiller optimization
 Heating water supply temperature reset
 Chilled water supply temperature reset
 Condenser water reset
 Post-wide demand limiting

3.6. ELECTRICAL AND TELECOMMUNICATIONS REQUIREMENTS**3.6.1. Power**

3.6.1.1. General

All electrical conduits and outlet boxes located in normally occupied spaces shall be recessed into walls. Power shall be provided for all installed equipment requiring power including all Government Furnished Contractor Installed equipment and all GFGI equipment. Power shall be connected to the existing building electrical system. The existing electrical system shall be modified to accommodate all new construction including the relocation, if necessary, of the service transformer to comply with AT/FP requirements. Provide a power distribution system that is safe, efficient, economical and based upon the size and types of loads to be served. Use distribution and utilization voltages of the highest level that is practical for the load to be served. The effect of nonlinear loads such as computers, other electronic equipment and electronic ballasts shall be considered and accommodated as necessary. Voltage drop shall not exceed the maximum allowed per ASHRAE 90.1. Transient voltage surge protection shall be provided on the service equipment and in all panels serving computer and other electronic equipment. Power poles are not allowed. All circuits routed through areas not being renovated must be clearly labeled, with permanent type letter/color identification signage along the entire length of the new installation. The identification signage must clearly identify the type of service and that the associated item was part of a recent renovation.

- 3.6.1.1.1. Provide 125-volt duplex receptacles per NFPA 70 and in conjunction with the proposed equipment and furniture layouts.
- 3.6.1.1.2. In addition to receptacles required elsewhere in the scope of work provide one duplex receptacle per wall in all normally occupied spaces unless otherwise noted.
- 3.6.1.1.3. For housekeeping purposes provide a minimum of one 125-volt duplex receptacle per corridor. No point along corridor wall at 18 inches above finished floor (AFF) shall be more than 25 feet from a receptacle. Provide 125-volt duplex receptacles within lobbies and reception areas such that no point within the lobby or reception floor shall be more than 25 feet from a receptacle.
- 3.6.1.1.4. Provide 125-volt GFI duplex receptacles mounted adjacent to lavatories. A minimum of one for every two adjacent lavatories shall be provided. Where toilet has only one lavatory, provide a receptacle.
- 3.6.1.1.5. Reconnect existing power connections to all equipment, receptacles and devices that are impacted by construction. All existing equipment, receptacle and devices impacted by construction shall be functional upon completion of construction.
- 3.6.1.1.6. A minimum of two 125-volt duplex receptacles shall be provided in each mechanical room in addition to NFPA 70 requirements and one in each electrical room.
- 3.6.1.2. DFAC Area Conversion to Classrooms
 - 3.6.1.2.1. Provide 125-volt duplex receptacles along walls such that no point 18 inches AFF is more than 12 feet from a receptacle. The additional requirement in paragraph 3.6.1.1.2 does not apply to these rooms.
 - 3.6.1.2.2. Provide ten (10) evenly spaced 125-volt duplex receptacles on the back wall of one classroom for personal computers. Receptacles shall be located adjacent to the data outlets specified in paragraph 3.6.3.2.3.
- 3.6.1.3. BNHQ Classrooms Renovation

- 3.6.1.3.1. Provide 125-volt duplex receptacles along walls such that no point 18 inches AFF is more than 12 feet from a receptacle. The additional requirement in paragraph 3.6.1.1.2 does not apply to these rooms.
- 3.6.1.3.2. Provide a 125-volt duplex receptacle next to each VTC connectivity outlet. These receptacles are in addition to those required in paragraph 3.6.1.3.1.
- 3.6.1.4. BNHQ Renovation and Expansion
 - 3.6.1.4.1. Provide a minimum of one 125-volt GFI duplex receptacle above counter tops containing sinks (excluding those in toilets). No point along back of counter top shall be more than 4 feet from a receptacle.
 - 3.6.1.4.2. Provide six (6) recessed floor mounted 125-volt duplex receptacles centered underneath conference table.
 - 3.6.1.4.3. Provide a minimum of seven (7) 125-volt duplex receptacles spaced evenly along conference room perimeter walls.
 - 3.6.1.4.4. Provide a 125-volt duplex receptacle next to each VTC connectivity outlet. These receptacles are in addition to those required in paragraph 3.6.1.4.3.
- 3.6.1.5. Company Operations and Covered Training Area Renovation
 - 3.6.1.5.1. For housekeeping purposes provide 125-volt duplex receptacles in the covered training area such that no point along wall at 18 inches above finished grade shall be more than 25 feet from a receptacle.
 - 3.6.1.5.2. Provide a minimum of one 125-volt GFI duplex receptacle above counter tops containing sinks (excluding those in toilets). No point along back of counter top shall be more than 4 feet from a receptacle.
- 3.6.1.6. Laundry Room Renovation

In addition to outlets required for washers and dryers provide 125-volt duplex convenience receptacles spaced a maximum of 12 feet apart around perimeter of room mounted at 48" AFF.
- 3.6.1.7. Sleeping Bay Area Renovation
 - 3.6.1.7.1. Provide six (6) 125-volt duplex receptacles spaced evenly along exterior walls in each sleeping bay and two evenly spaced along each end wall. The additional requirement in paragraph 3.6.1.1.2 does not apply to these rooms.
 - 3.6.1.7.2. Provide 125-volt duplex receptacles in the Drill Sergeant office such that no point along wall at 18 inches AFF is more than 6 feet from a receptacle. The additional requirement in paragraph 3.6.1.1.2 does not apply to these rooms.
 - 3.6.1.7.3. Provide a 125-volt duplex receptacle adjacent to data outlet. This receptacle is in addition to the two required along end walls per paragraph 3.6.1.7.1.
- 3.6.1.8. Cadre Support Spaces Renovation
 - 3.6.1.8.1. Provide 125-volt duplex receptacles such that no point along wall at 18 inches AFF is more than 6 feet from a receptacle. The additional requirement in paragraph 3.6.1.1.2 does not apply to these rooms.

- 3.6.1.8.2. Provide a minimum of one 125-volt duplex receptacle above counter tops containing sinks (excluding those in toilets). No point along counter shall be more than 4 feet from a receptacle.

3.6.2. Lighting

3.6.2.1. General

All lighting circuits to include conduits and outlet boxes located in normally occupied spaces shall be recessed into walls. Lighting shall comply with the recommendations of the Illumination Engineering Society of North America (IESNA) unless otherwise specified. Lighting controls shall be provided in accordance with ASHRAE 90.1. Provide lighting as specified below in addition to the requirements of Paragraph 5.0 GENERAL TECHNICAL REQUIREMENTS. Lighting illumination level (FC) design shall be based upon the functional purpose of the space. Compact fluorescent lamps of 12 watts or less shall not be used. Lighting levels provided shall be within +/- 10% of required levels. Reconnect existing lighting circuits to all fixtures that are impacted by construction. Existing lighting impacted by construction shall be functional upon completion of construction.

3.6.2.2. DFAC Area Conversion to Classrooms

Storage rooms shall be illuminated to a level of 10 foot-candles.

3.6.2.3. BNHQ Classrooms Renovation

Storage rooms shall be illuminated to a level of 10-foot-candles.

3.6.2.4. BNHQ Renovation and Expansion

- 3.6.2.4.1. Local manual controls shall supplement automatic controls in offices, conference rooms, and large open work spaces.

- 3.6.2.4.2. CQ area, mechanical rooms, electrical rooms and storage rooms shall be illuminated to a level of 30 foot-candles.

- 3.6.2.4.3. Lobby shall be illuminated to a level of 20 foot-candles.

- 3.6.2.4.4. Provide exterior lighting at main entrance. Lighting shall be controlled by a photocell or time clock.

3.6.2.5. Company Operations and Covered Training Area Renovation

- 3.6.2.5.1. Local manual controls shall supplement automatic controls in offices, conference rooms, and large open work spaces.

- 3.6.2.5.2. CQ area, supply room with desk, electrical room, mechanical room and arms vault shall be illuminated to a level of 30 foot-candles.

- 3.6.2.5.3. Covered training areas, supply room without desk and issue room shall be illuminated to a level of 15 FC's.

- 3.6.2.5.4. An un-switched vandal-resistant fixture with emergency ballast shall be provided at the entrance to each arms vault.

- 3.6.2.5.5. Lighting fixtures in covered training areas shall be recessed mounted.

3.6.2.5.6. Reception area shall be illuminated to a level of 20 foot-candles.

3.6.2.6. Laundry Room Renovation

Illuminate to a level of 30 foot-candles. Lighting shall have automatic motion detection switching.

3.6.2.7. Sleeping Bay Area Renovation

3.6.2.7.1. Local manual controls shall supplement automatic controls in sleeping bays.

3.6.2.7.2. Illuminate sleeping-bays to a level of 15 foot-candles.

3.6.2.7.3. Illuminate Drill Sergeant office to a level of 30 foot-candles.

3.6.2.8. Cadre Support Spaces Renovation

Illuminate to a level of 30 foot-candles.

3.6.3. Telecommunications

3.6.3.1. General

All telecommunications conduits and outlet boxes located in normally occupied spaces shall be recessed into walls. Provide telecommunications outlets per the Technical Criteria for the I3A based on functional purpose of the space and in accordance with the proposed equipment and furniture layouts and other provisions of this RFP.

3.6.3.2. DFAC Area Conversion to Classrooms

3.6.3.2.1. Provide a dual (voice and data) 8-pin modular jack outlet at the front of each partitioned area in each classroom and on the sides at the midpoint of the classroom. Telecommunications system shall connect to existing telecommunication systems within the building.

3.6.3.2.2. Provide an outlet that has both a fiber optic jack and an 8-pin modular jack to provide video teleconferencing connectivity in each partitioned area in each classroom.

3.6.3.2.3. Provide ten (10) evenly spaced dual (both for data) 8-pin modular jack outlets on the back wall of one classroom for personal computers.

3.6.3.2. BNHQ Classrooms Renovation

3.6.3.3.1. Provide a dual (voice and data) 8-pin modular jack outlet at the front of each partitioned area in each classroom and on the sides at the midpoint of the classroom. Telecommunications system shall connect to existing telecommunication systems within the buildings.

3.6.3.3.2. Provide an outlet that has both a fiber optic jack and an 8-pin modular jack to provide video teleconferencing connectivity near each screen in each classroom.

3.6.3.4. BNHQ Renovation and Expansion

3.6.3.4.1. In offices provide number of outlets required per the Technical Criteria for the I3A or one outlet per number of desks/workstations whichever is greater.

- 3.6.3.4.2. All horizontal cabling shall be terminated within the telecommunications room within the BNHQ area.
- 3.6.3.4.3. Space shall be provided in the form of a six foot by six foot room for future Secret Internet Protocol Router Network (SIPRNET) connectivity to include secure video teleconferencing. The SIPRNET room shall be designed and constructed in accordance with AR 380-5, Department of the Army Information Security Program. Provide the same power, lighting, and telecommunications design features within the SIPRNET room as required for telecommunications rooms per the Technical Criteria for the I3A with the exception of the cable tray. In addition, provide a 2 inch conduit between SIPRNET room and main telecommunications room.
- 3.6.3.4.4. Provide an outlet that has both a fiber optic jack and an 8-pin modular jack to provide video teleconferencing connectivity in the conference room.
- 3.6.3.4.5. Provide two wall mounted dual 8-pin modular jack outlets and one floor mounted recessed box with six (6) dual 8-pin modular jack outlets centered underneath conference table.
- 3.6.3.5. Company Operations and Covered Training Area Renovation
 - 3.6.3.5.1. In offices provide number of outlets required per the Technical Criteria for the I3A or one outlet per number of desks/workstations whichever is greater.
 - 3.6.3.5.2. All horizontal cabling shall be terminated within the telecommunications room within the BNHQ area.
 - 3.6.3.5.3. Connectivity shall be reestablished for pay phones within the covered training areas per local telephone company requirements.
 - 3.6.3.5.4. Provide an outlet that has both a fiber optic jack and an 8-pin modular jack to provide video teleconferencing connectivity in the conference room.
- 3.6.3.6. Laundry Room Renovation
 - None required.
- 3.6.3.7. Sleeping Bay Area Renovation
 - 3.6.3.7.1. Provide a single (data) 8-pin modular jack outlet in each sleeping bay centered on wall outside Drill Sergeant Office.
 - 3.6.3.7.2. Provide three (3) dual 8-pin modular jack outlets in Drill Sergeant office.
- 3.6.3.8. Cadre Support Spaces Renovation
 - Provide six (6) dual 8-pin modular jack outlets per room.

3.6.4. CATV

3.6.4.1. General

All CATV conduits and outlet boxes located in normally occupied spaces shall be recessed into walls. All CATV outlet boxes, connectors, cabling, and cabinets shall conform to the Technical Criteria for the I3A unless noted otherwise. All horizontal cabling shall be homerun from the CATV outlet to the nearest telecommunications room unless noted otherwise. The contractor

shall coordinate all CATV work with CATV privatized utility. If demarcation point is relocated as a result of renovation all affected service within the entire building shall be reestablished.

3.6.4.2. DFAC Area Conversion to Classrooms

Provide connectivity at the front of each area classroom or partitioned area.

3.6.4.3. BNHQ Classrooms Renovation

Provide connectivity at the front of each classroom and at the midpoint on the sides of the classroom.

3.6.4.4. BNHQ Renovation and Expansion

Provide connectivity in the conference room and private offices.

3.6.4.5. Company Operations and Covered Training Area Renovation

Provide connectivity in the conference room and private offices.

3.6.4.6. Laundry Room Renovation

None required.

3.6.4.7. Sleeping Bay Area Renovation

Provide connectivity in the Drill Sergeant office.

3.6.5. Paging System

A zoned paging system shall be provided throughout the renovated area and integrated with the telephone system. System may utilize mass notification amplifiers and speakers, but shall be overridden by the mass notification system if mass notification system is activated while the paging system is being utilized. System shall have six (6) zones to include each company operations area, the BNHQ area, and an all call.

3.6.6. Door Status/Alarm Monitoring Systems

Door monitoring systems (one per company) consisting of a door status/alarm panel and door balanced magnetic switches shall be provided. Each monitoring system shall provide door status/alarms on all doors leading into and within the sleeping bay in order to accommodate gender segregation. System shall allow each door alarm to be individually activated or deactivated. Door status/alarm panels shall be located in the Company Admin CQ Desk and also in the BNHQ reception desk. Panels shall provide both an audio and visual signal when alarm is activated. The alarm will remain on until reset at panel.

3.6.7. Intrusion Detection System (IDS)

Infrastructure for IDS shall be provided for each arms vault. Infrastructure shall consist of conduit, pull wire and outlet boxes. Outlet boxes are required for a control panel, balanced magnetic switch, motion sensor and duress switch unless specified otherwise in Paragraph 6.10.

3.6.8. CCTV System

3.6.8.1. A conduit system shall be provided and installed to support CCTV at all doors leading into the BNHQ area. The conduit system shall include, but not be limited to, conduits, pull boxes and

pull wires. All conduits for CCTV signals shall be routed back to the telecommunications room or designated monitoring room.

- 3.6.8.2. A conduit system shall be provided and installed to support CCTV to monitor the arms vault doors on the outside of the vault. The conduit system shall include, but not be limited to, conduits, pull boxes and pull wires. All conduits for CCTV signals shall be routed back to the telecommunications room or designated monitoring room.

3.6.9. Grounding

Grounding shall be provided in accordance with NFPA 70 and the Technical Guide for the I3A.

3.7 NOT USED

3.8 FIRE PROTECTION

3.8.1. General Requirements

- 3.8.1.1. The applicable design standards shall include the following:
- Unified Facilities Criteria (UFC) 1-200-01 20 June 2005
 - Unified Facilities Criteria (UFC) 3-600-01 26 September 2006
 - Unified Facilities Criteria (UFC) 4-010-01 22 January 2007
 - Unified Facilities Criteria (UFC) 4-021-01 04, 9 April 2008
 - International Building Code, 2006 Edition
 - NFPA 10: *Standard for Portable Fire Extinguishers*, 2010 Edition
 - NFPA 13: *Standard for the Installation of Sprinkler Systems*, 2010 Edition
 - NFPA 14: *Standard for the Installation of Standpipes and Hose Systems*, 2010 Edition
 - NFPA 20: *Standard for the Installation of Stationary Pumps for Fire Protection*, 2010 Edition
 - NFPA 24: *Standard for the Installation of Private Fire Service Mains and Their Appurtenances*, 2010 Edition
 - NFPA 70: *National Electrical Code*, 2008 Edition
 - NFPA 72: *National Fire Alarm Code*, 2010 Edition
 - NFPA 90A: *Standard for Installation of Air Conditioning and Ventilating Systems*, 2009 Edition
 - NFPA 101: *Life Safety Code*, 2009 Edition
- 3.8.1.2. A Qualified Fire Protection Engineer (P.E.) as defined by UFC 3-600-01, Section 1-5 shall be involved in every aspect of the project as it relates to fire protection. This includes, but is not limited to, building code analysis, life safety code analysis, design and acceptance testing of automatic detection and suppression systems, water supply analysis, and a multi-discipline review of the entire project.

3.8.2. Fire Sprinkler

- 3.8.2.1. Provide a dedicated fire service lead-in to the Starship Facility from the existing public water distribution system. The underground water distribution system and the lead-in shall be designed and installed in accordance with NFPA 24.
- 3.8.2.1. Provide a wet-pipe sprinkler system throughout the Starship Facility. The design, installation and testing of the sprinkler system shall be performed in accordance with NFPA 13.
- 3.8.2.2. Provide a dry-pipe or antifreeze sprinkler system as required in areas subject to freezing. The design, installation and testing of the sprinkler system shall be performed in accordance with NFPA 13.

- 3.8.2.3. Provide standpipes and fire department connections (FDC) as required by the AHJ and the responding fire department. The standpipe system shall be designed, installed and tested in accordance with NFPA 14.
- 3.8.2.4. If required based on the results of fire hydrant flow tests, provide a fire pump in accordance with NFPA 20. If a fire pump is required the fire pump shall be designed, installed and tested in accordance with NFPA 20.
- 3.8.2.5. The Qualified Fire Protection Engineer shall perform or witness the fire hydrant flow testing. A water quality analysis shall be performed in accordance with UFC 3-600-01, Section 4-2.3.2 to determine if schedule 10 pipe is permitted to be used.

3.8.3. Fire Alarm / Mass Notification

- 3.8.3.1. Provide a combination addressable fire alarm/mass notification system consisting of an integrated fire alarm and mass notification control panel, communication equipment connecting the system to a central monitoring station, initiating devices and notification appliances. Separate fire alarm and mass notification systems will not be accepted. The combination fire alarm/mass notification system shall be designed, installed and tested in accordance with NFPA 72, UFC 3-600-01, and UFC 4-021-01.
- 3.8.3.2. Provide smoke detection in all sleeping areas. All smoke detection shall be monitored by the fire alarm/mass notification system. Smoke detection shall be designed, installed and tested in accordance with NFPA 72.
- 3.8.3.3. Provide manual pull stations at all required exits in accordance with NFPA 72. Provide additional manual pull stations as required by the AHJ.
- 3.8.3.4. Provide visual fire alarm notification throughout common areas of the Starship Facility in accordance with the Uniform Federal Accessibility Standard (UFAS) and Americans with Disabilities Act Accessibility Guidelines (ADAAG). Provide visual mass notification appliances at locations required to have visual fire alarm notification.
- 3.8.3.5. All software, software locks, special tools and any other proprietary equipment required to maintain, add devices to or delete devices from the system, or test the fire alarm system shall become property of the Government and be furnished to the Contracting Officer's Representative prior to final inspection of the system.

(End of Section)

4.0 APPLICABLE CRITERIA

Unless a specific document version or date is indicated, use criteria from the most current references as of the date of issue of the contract or task order, including any applicable addenda, unless otherwise stated in the task order. In the event of conflict between References and/or Applicable Military Criteria, apply the most stringent requirement, unless otherwise specifically noted in the contract or task order.

4.1. INDUSTRY CRITERIA

Applicable design and construction criteria references are listed in Table 1 below. This list is not intended to include all criteria that may apply or to restrict design and construction to only those references listed. See also Paragraph 3 for additional facility-specific applicable criteria.

Table 1: Industry Criteria

Air Conditioning and Refrigeration Institute (ARI)	
ARI 310/380	Packaged Terminal Air-Conditioners and Heat Pumps
ARI 440	Room Fan-Coil and Unit Ventilator
ANSI/ARI 430-99	Central Station Air Handling Units
ARI 445	Room Air-Induction Units
ARI 880	Air Terminals
Air Movement and Control Association (AMCA)	
AMCA 210	Laboratory Methods of Testing Fans for Rating
American Architectural Manufacturers Association (AAMA)	
AAMA 605	Voluntary Specification Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels
AAMA 607.1	Voluntary Guide Specifications and Inspection Methods for Clear Anodic Finishes for Architectural Aluminum
AAMA 1503	Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors, and Glazed Wall Sections
American Association of State Highway and Transportation Officials (AASHTO)	
	Roadside Design Guide [guardrails, roadside safety devices]
	Standard Specifications for Transportation Materials and Methods of Sampling and Testing [Road Construction Materials]

	Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals
	Guide for Design of Pavement Structures, Volumes 1 and 2 [pavement design guide]
	A Policy of Geometric Design of Highways and Streets
American Bearing Manufacturers Association (AFBMA)	
AFBMA Std. 9	Load Ratings and Fatigue Life for Ball Bearings
AFBMA Std. 11	Load Ratings and Fatigue Life for Roller Bearings
American Boiler Manufacturers Association (ABMA)	
ABMA ISEI	Industry Standards and Engineering Information
American Concrete Institute	
ACI 302.2R	Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials
ACI 318	Building Code Requirements for Structural Concrete
ACI SP-66	ACI Detailing Manual
ACI 530	Building Code Requirements for Masonry Structures
ADA Standards for Accessible Design	
See US Access Board	ADA and ABA Accessibility Guidelines for Buildings and Facilities, Chapters 3-10.
American Institute of Steel Construction (AISC)	
	Manual of Steel Construction – 13 th Edition (or latest version)
American Iron and Steel Institute	
AISI S100	North American Specification for the Design of Cold-Formed Steel Structural Members
American National Standards Institute 11 (ANSI)	

ANSI Z21.10.1	Gas Water Heaters Vol. 1, Storage water Heaters with Input Ratings of 75,000 Btu per Hour or less
ANSI Z124.3	American National Standard for Plastic Lavatories
ANSI Z124.6	Plastic Sinks
ANSI Z21.45	Flexible Connectors of Other Than All-Metal Construction for Gas Appliances
ANSI/IEEE C2-2007	National Electrical Safety Code
ANSI/AF&PA NDS-2001	National Design Specification for Wood Construction
American Society of Civil Engineers (ASCE)	
ASCE 7	Minimum Design Loads for Buildings and Other Structures
ASCE 37	Design and Construction of Sanitary and Storm Sewers, Manuals and Reports on Engineering Practice [sanitary sewer and storm drain design criteria]
ASCE/SEI 31-03	Seismic Evaluation of Existing Buildings [Existing Building Alteration/Renovation]
ASCE/SEI 41-06	Seismic Rehabilitation of Existing Buildings [Existing Building Alteration/Renovation]
American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)	
ASHRAE 90.1	ANSI/ASHRAE/IESNA 90.1, Energy Standard for Buildings Except Low-Rise Residential Buildings
ASHRAE Guideline 0	The Commissioning Process
ASHRAE Guideline 1.1	The HVAC Commissioning Process
ASHRAE Handbooks	Fundamentals, HVAC Applications, Systems and Equipment, Refrigeration (Applicable, except as otherwise specified)
ASHRAE Standard 15	Safety Standard for Refrigeration Systems
ASHRAE Standard 62.1	Ventilation for Acceptable Indoor Air Quality
ASHRAE Standard 55	Thermal Environmental Conditions for Human Occupancy

American Society of Mechanical Engineers International (ASME)	
ASME BPVC SEC VII	Boiler and Pressure Vessel Code: Section VII Recommended Guidelines for the Care of Power Boilers
ASME A17.1	Safety Code for Elevators and Escalators
ASME B 31 (Series)	Piping Codes
American Water Works Association (AWWA)	
	Standards [standards for water line materials and construction]
American Welding Society	
	Welding Handbook
	Welding Codes and Specifications (as applicable to application, see International Building Code for example)
Architectural Woodwork Institute (AWI)	
Version 1.2	AWI Quality Standards 7th Edition
Associated Air Balance Council (AABC)	
AABC MN-1	National Standards for Testing and Balancing Heating, Ventilating, and Air Conditioning Systems
	AABC Associated Air Balance Council Testing and Balance Procedures
ASTM International	
ASTM C1060-90(1997)	Standard Practice for Thermographic Inspection of Insulation Installations in Envelope Cavities of Frame Buildings
ASTM E 779 (2003)	Standard Test Method for Determining Air Leakage Rate by Fan Pressurization
ASTM E1827-96(2002)	Standard Test Methods for Determining Airtightness of Buildings Using an Orifice Blower Door
Builders Hardware Manufacturers Association (BHMA)	
ANSI/BHMA	American National Standards for Builders Hardware

Building Industry Consulting Service International	
	Telecommunications Distribution Methods Manual (TDMM)
	Customer-Owned Outside Plant Design Manual (CO-OSP)
Code of Federal Regulations (CFR)	
49 CFR 192	Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards
10 CFR 430	Energy Conservation Program for Consumer Products
Consumer Electronics Association	
CEA 709.1B	Control Network Protocol Specification
CEA 709.3	Free-Topology Twisted-Pair Channel Specification
CEA 852	Tunneling Component Network Protocols Over Internet Protocol Channels
Electronic Industries Association (EIA)	
ANSI/EIA/TIA 568	Structured Cabling Series
ANSI/EIA/TIA 569	Commercial Building Standard for Telecommunications Pathways and Spaces (includes ADDENDA)
ANSI/TIA/EIA-606	Administrative Standard for the Telecommunications Infrastructure of Commercial Buildings
J-STD EIA/TIA 607	Commercial Building Grounding and Bonding Requirements for Telecommunications
Federal Highway Administration (FHWA)	
	Manual on Uniform Traffic Control Devices for Streets and Highways [signage and pavement markings for streets and highways]
FHWA-NHI-01-021	Hydraulic Engineering Circular No. 22, Second Edition, URBAN DRAINAGE DESIGN MANUAL
Illuminating Engineering Society of North America (IESNA)	
IESNA RP-1	Office Lighting

IESNA RP-8	Roadway Lighting
IESNA Lighting Handbook	Reference and Application
Institute of Electrical and Electronics Engineers Inc. (IEEE)	
	Standard for Use of the International System of Units (SI): the Modern Metric System
Standard 1100	Recommended Practice for Powering and Grounding Sensitive Electronic Equipment
International Code Council (ICC)	
IBC	International Building Code Note: All references in the International Building Code to the International Electrical Code shall be considered to be references to NFPA 70. All references in the International Building Code to the International Fuel Gas Code shall be considered to be references to NFPA 54 and NFPA 58. All references in the International Building Code to the International Fire Code and Chapter 9 shall be considered to be references to Unified Facilities Criteria (UFC) 3-600-01.
IMC	International Mechanical Code – Note: For all references to “HEATING AND COOLING LOAD CALCULATIONS”, follow ASHRAE 90.1 Note: For all references to “VENTILATION”, follow ASHRAE 62.1
IRC	International Residential Code
IPC	International Plumbing Code
IEC	Energy Conservation Code (IEC) –Applicable only to the extent specifically referenced herein. Refer to Paragraph 5, ENERGY CONSERVATION requirements.
IGC	International Gas Code - not applicable. Follow NFPA 54, National Fuel Gas Code and NFPA 58, Liquefied Petroleum Gas Code.
International Organization for Standardization (ISO)	
ISO 6781:1983	Qualitative detection of thermal irregularities in building envelopes –

	infrared method
LonMark International (LonMark)	
LonMark Interoperability Guidelines	(available at www.lonmark.org), including: Application Layer Guidelines, Layer 1-6 Guidelines, and External Interface File (XIF) Reference Guide
LonMark Resource Files	(available at www.lonmark.org), including Standard Network Variable Type (SNVT) definitions
Metal Building Manufacturers Association (MBMA)	
	Metal Building Systems Manual
Midwest Insulation Contractors Association (MICA)	
	National Commercial and Industrial Insulation Standards Manual
National Association of Corrosion Engineers International (NACE)	
NACE RP0169	Control of External Corrosion on Underground or Submerged Metallic Piping Systems
NACE RP0185	Extruded, Polyolefin Resin Coating Systems with Adhesives for Underground or Submerged Pipe
NACE RP0285	Corrosion Control of Underground Storage Tank Systems by Cathodic Protection
NACE RP0286	Electrical Isolation of Cathodically Protected Pipelines
National Electrical Manufacturers Association (NEMA)	
National Environmental Balancing Bureau (NEBB)	
	Procedural Standards Procedural Standards for Testing Adjusting Balancing of Environmental Systems
National Fire Protection Association (NFPA)	
NFPA 10	Standard for Portable Fire Extinguishers
NFPA 13	Installation of Sprinkler Systems
NFPA 13R	Residential Occupancies up to and Including Four Stories in Height Sprinkler Systems

NFPA 14	Standard for the Installation of Standpipes and Hose Systems
NFPA 20	Installation of Centrifugal Fire Pumps
NFPA 24 NFPA 25	Standard for the Installation of Private Fire Service Mains and Their Appurtenances [underground fire protection system design] Inspection, Testing And Maintenance Of Water-Based Fire Protection Systems
NFPA 30	Flammable and Combustible Liquids Code
NFPA 30A	Motor Fuel Dispensing Facilities and Repair Garages
NFPA 31	Installation of Oil Burning Equipment
NFPA 54	National Fuel Gas Code
NFPA 58	Liquefied Petroleum Gas Code
NFPA 70	National Electrical Code
NFPA 72	National Fire Alarm Code
NFPA 76	Fire Protection of Telecommunications Facilities
NFPA 80	Standard for Fire Doors and Fire Windows
NFPA 90a	Installation of Air Conditioning and Ventilating Systems
NFPA 96	Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations
NFPA 101	Life Safety Code
NFPA 780	Standard for the Installation of Lightning Protection Systems
National Roofing Contractor's Association (NRCA)	
	Roofing and Waterproofing Manual
National Sanitation Foundation, International	
NSF/ANSI Std. 2, 3, 4, 5, 6, 7, 8, 12, 13, 18, 20, 21, 25, 29, 35, 36, 37, 51, 52, 59,	Food Equipment Standards

169	
ANSI/UL Std. 73, 197, 471, 621, 763	Food Equipment Standards
CSA Std. C22.2 No. 109, 120, 195	Food Equipment Standards
Occupational Safety and Health Administration (OSHA)	
Title 29, Part 1926	OSHA Construction Industry Standards, Title 29, Code of Federal Regulations, Part 1926, Safety and Health Regulations for Construction
Plumbing and Drainage Institute (PDI)	
PDI G 101	Testing and Rating Procedure for Grease Interceptors with Appendix of Sizing and Installation Data
PDI WH201	Water Hammer Arrestors
Precast Concrete Institute	
PCI Design Handbook	Precast and Prestressed Concrete
Sheet Metal and Air Conditioning Contractor's National Association (SMACNA)	
SMACNA HVAC Duct Construction Standards	HVAC Duct Construction Standards - Metal and Flexible
SMACNA Architectural Manual	Architectural Sheet Metal Manual
SMACNA HVAC TAB	HVAC Systems - Testing, Adjusting and Balancing
State/Local Regulations	
	State Department of Transportation Standard Specifications for Highway and Bridge Construction
	Sedimentation and Erosion Control Design Requirements
	Environmental Control Requirements
	Storm Water Management Requirements
Steel Door Institute (SDI)	

ANSI A250.8/SDI 100	Standard Steel Doors and Frames
Steel Deck Institute	
	SDI Diaphragm Design Manual
Steel Joist Institute	
	Catalog of Standard Specifications and Load Tables for Steel Joists and Joist Girders
Underwriters Laboratories (UL)	
UL 96A	Installation Requirements for Lightning Protection Systems
UL 300	Standard for Safety for Fire Testing of Fire Extinguishing Systems for Protection of Restaurant Cooking Areas
UNITED STATES ACCESS BOARD: U.S. ARCHITECTURAL AND TRANSPORTATION BARRIERS COMPLIANCE BOARD	
ADA and ABA Accessibility Guidelines for Buildings and Facilities	<p>ABA Accessibility Standard for DoD Facilities</p> <p>Derived from the ADA and ABA Accessibility Guidelines: Specifically includes: ABA Chapters 1 and 2 and Chapters 3 through 10.</p> <p>Use this reference in lieu of IBC Chapter 11.</p> <p>Excluded are:</p> <p>(a) Facilities, or portions of facilities, on a military installation that are designed and constructed for use exclusively by able-bodied military personnel (See Paragraph 3 for any reference to this exclusion).</p> <p>(b) Reserve and National Guard facilities, or portions of such facilities, owned by or under the control of the Department of Defense, that are designed and constructed for use exclusively by able-bodied military personnel. (See paragraph 3 for any reference to this exclusion).</p>
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES	
	FDA National Food Code
U.S. GREEN BUILDING COUNCIL (USGBC)	
LEED-NC	Green Building Rating System for New Construction & Major Renovations
	Application Guide for Multiple Buildings and On-Campus Building Projects

4.2. MILITARY CRITERIA

The project shall conform to the following criteria. Certain design impacts and features due to these criteria are noted for the benefit of the offeror. However, all requirements of the referenced criteria will be applicable, whether noted or not, unless otherwise specified herein.

- 4.2.1. Energy Policy Act of 2005 (Public Law 109-58) (applies only to the extent specifically implemented in the contract, which may or may not directly cite or reference EPACT)
- 4.2.2. Executive Order 12770: Metric Usage In Federal Government
- (a) Metric design and construction is required except when it increases construction cost. Offeror to determine most cost efficient system of measurement to be used for the project.
- 4.2.3. TB MED 530: Occupational and Environmental Health Food Sanitation
- 4.2.4. Unified Facilities Criteria (UFC) 3-410-01FA: Heating, Ventilating, and Air Conditioning - applicable only to the extent specified in paragraph 5, herein.
- 4.2.5. Deleted.
- 4.2.6. UFC 3-600-01 Design: Fire Protection Engineering for Facilities. Use the latest edition of the IBC in coordination with this UFC. Use Chapters 3, 6, 7, 33 and UFC 3-600-01. If any conflict occurs between these Chapters and UFC 3-600-01, the requirements of UFC 3-600-01 take precedence. Use UFC 3-600-01 in lieu of IBC Chapters 4, 8,9,10.
- 4.2.7. UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings
- 4.2.8. UFC 4-023-03 Design of Buildings to Resist Progressive Collapse (Use most recent version, regardless of references thereto in other publications)
- (a) Note the option to use tie force method or alternate path design for Occupancy Category II.
- 4.2.9. UFC 4-021-01 Design and O&M: Mass Notification Systems
- 4.2.10. Technical Criteria for Installation Information Infrastructure Architecture (I3A)
- (a) Email: DetrickSECI3Aguide@conus.army.mil
- 4.2.11. U.S. Army Information Systems Engineering Command (USAISEC) TG for the Integration of SECRET Internet Protocol (IP) Router Network (SIPRNET). See Paragraph 3 for applicability to specific facility type. May not apply to every facility. This is mandatory criteria for those facilities with SIPRNET.

5.0 GENERAL TECHNICAL REQUIREMENTS

This paragraph contains general technical requirements. See also Paragraph 3 for facility-specific technical requirements. Residential or similar grade finishes and materials are not acceptable for inclusion in these buildings, unless otherwise specifically allowed.

5.1. SITE PLANNING AND DESIGN

5.1.1. STANDARDS AND CODES: The site planning and design shall conform to APPLICABLE CRITERIA and to paragraph 6, PROJECT SPECIFIC REQUIREMENTS.

5.1.2. SITE PLANNING OBJECTIVES: Group buildings in configurations that create a sense of community and promote pedestrian use. See paragraph 3 for additional site planning requirements relating to building functions.

5.1.2.1. Provide enclosures and or visual screening devices for Outdoor Utility such as dumpsters, emergency generators, transformers, heating, ventilation, and air conditioning units from streetscape and courtyard views to limit visual impact. Enclosures shall be compatible with the building they serve and accessible by vehicle. The location of dumpsters can have a significant visual impact and should be addressed as part of an overall building design and incorporated in site planning.

5.1.2.2. Where included in the project, dumpster pads shall be concrete (minimum of 8 inches thick on 4 inch base course, unless site conditions dictate more conservative requirements) and directly accessible by way of a paved service drive or parking lot with adequate overhead clearance for collection vehicles. Provide space at dumpster areas for recycling receptacles. Coordinate with Installation on recycling receptacle types, sizes and access requirements and provide space at dumpster areas to accommodate them.

5.1.2.3. Vehicular Circulation. Apply design vehicle templates provided by the American Association of State Highway and Transportation Officials (AASHTO) to the site design. The passenger car class includes passenger cars and light trucks, such as vans and pick-ups. The passenger car template is equivalent to the non-organizational – privately owned vehicle (POV). The truck class template includes single-unit trucks, recreation vehicles, buses, truck tractor-semi-trailer combinations, and trucks or truck tractors with semi-trailers in combination with full trailers. Provide vehicle clearances required to meet traffic safety for emergency vehicles, service vehicles, and moving vans. Provide required traffic control signage Site entrances and site drive aisles shall maximize spacing between drives, incorporate right-angle turns, and limit points of conflict between traffic. Design Services Drives to restrict access to unauthorized vehicles by removable bollards, gates, or other barriers to meet Anti-Terrorism/Force Protection (ATFP) requirements. Orient service drives to building entrances other than the primary pedestrian entry at the front of the building.

5.1.2.4. Provide Emergency Vehicle Access around the facility and shall be in accordance with AT/FP requirements. Maintain a 33-foot clear zone buffer for emergency vehicles, designed to prevent other vehicles from entering the AT/FP standoff to the building.

5.1.2.5. Clear and grub all trees and vegetation necessary for construction; but, save as many trees as possible. Protect trees to be saved during the construction process from equipment.

5.1.2.6. Stormwater Management. Employ design and construction strategies (Best Management Practices) that reduce stormwater runoff, reduce discharges of polluted water offsite and maintain or restore predevelopment hydrology with respect to temperature, rate, volume and duration of flow to the maximum extent practicable. See paragraph 6, PROJECT SPECIFIC requirements for additional information.

5.1.3. EXTERIOR SIGNAGE: Provide exterior signage in accordance with Appendix H, Exterior Signage. Provide exterior NO SMOKING signage that conveys building and grounds smoking policy.

5.1.4. EXISTING UTILITIES: Base utilities maps and capacities for this site are included as part of this RFP. See paragraph 6 for more detailed information.

5.2. SITE ENGINEERING

5.2.1. STANDARDS AND CODES: The site engineering shall conform to APPLICABLE CRITERIA.

5.2.2. SOILS:

5.2.2.1. A report has been prepared to characterize the subsurface conditions at the project site and is **appended to these specifications**. The report provides a general overview of the soil and geologic conditions with detailed descriptions at discrete boring locations. The Contractor's team shall include a licensed geotechnical engineer to interpret the report and develop earthwork and foundation recommendations and design parameters in which to base the contractor's design. If any additional subsurface investigation or laboratory analysis is required to better characterize the site or develop the final design, the Contractor shall perform it under the direction of a licensed geotechnical engineer. There will be no separate payment for the cost of additional tests. If differences between the Contractor's additional subsurface investigation and the government provided soils report or the reasonably expected conditions require material revisions in the design, an equitable adjustment may be made, in accordance with the provisions of the Differing Site Conditions clause. The basis for the adjustment would be the design and construction appropriate for the conditions described in the Government furnished report or the reasonably expected conditions, in comparison with any changes required by material differences in the actual conditions encountered, in accordance with the terms of contract clause Differing Site Conditions.

5.2.2.2. The contractor's licensed geotechnical engineer shall prepare a final geotechnical evaluation report, to be submitted along with the first foundation design submittal, as described in Section 01 33 16, *Design After Award*.

5.2.3. VEHICLE PAVEMENTS: (as applicable to the project)

5.2.3.1. Design procedures and materials shall conform to one of the following: 1) the USACE Pavement Transportation Computer Assisted Structural Engineering (PCASE) program, 2) American Association of State Highway and Transportation Officials (AASHTO) or, 3) the applicable state Department of Transportation standards in which the project is located. See paragraph 5.2.2.2 and Section 01 33 16 for required information for the Contractor's geotechnical evaluation report. The minimum flexible pavement section shall consist of 2 inches of asphalt and 6 inches of base or as required by the pavement design, whichever is greater, unless specifically identified by the Government to be a gravel road. Design roads and parking areas for a life expectancy of 25 years with normal maintenance. Parking area for tactical vehicles (as applicable to the project) shall be Portland Cement Concrete (PCC) rigid pavement design. For concrete pavements, submit joint layout plan for review and concurrence. Design pavements for military tracked vehicles (as applicable to the project) IAW USACE PCASE. Traffic estimates for each roadway area will be as shown on the drawings or listed in Section 01 10 00 Paragraph 6.4.4. Pavement markings and traffic signage shall comply with the Installation requirements and with the Manual on Uniform Traffic Control Devices.

5.2.3.2. Parking Requirements.

- (a) All handicap POV parking lots (where applicable in the facility specific requirements) shall meet the ADA and ABA Accessibility Guidelines for accessible parking spaces.
- (b) Design POV parking spaces for the type of vehicles anticipated, but shall be a minimum of 9 ft by 18 ft for POVs, except for two wheel vehicles.

5.2.3.3. Sidewalks. Design the network of walks throughout the complex (where applicable) to facilitate pedestrian traffic among facilities, and minimize the need to use vehicles. Incorporate sidewalks to enhance the appearance of the site development, while creating a sense of entry at the primary patron entrances to the buildings. Minimum sidewalk requirements are in Paragraph 3, where applicable.

5.2.4. CATHODIC PROTECTION: Provide cathodic protection systems for all underground metallic systems and metallic fittings/portions of non-metallic, underground systems, both inside and outside the building 5 foot line that are subject to corrosion. Coordinate final solutions with the installation to insure an approach that is consistent with installation cathodic protection programs.

5.2.5. UTILITIES: See paragraph 6.4.6 for specific information on ownership of utilities and utility requirements. Meter all utilities (gas, water, and electric, as applicable) to each facility. For Government owned utilities, install meters that are wireless data transmission capable as well as have a continuous manual reading option. All meters will be capable of at least hourly data logging and transmission and provide consumption data for gas, water, and electricity. Gas and electric meters will also provide demand readings based on consumption over a maximum of

any 15 minute period. Configure all meters to transmit at least daily even if no receiver for the data is currently available at the time of project acceptance. For privatized utilities, coordinate with the privatization utility(ies) for the proper meter base and meter installation.

5.2.6. PERMITS: The CONTRACTOR shall be responsible for obtaining all permits (local, state and federal) required for design and construction of all site features and utilities.

5.2.7. IRRIGATION. Landscape irrigation systems, if provided, shall comply with the following:

5.2.7.1. Irrigation Potable Water Use Reduction. Reduce irrigation potable water use by 100 percent using LEED credit WE1.1 baseline (no potable water used for irrigation), except where precluded by other project requirements.

5.2.8. EPA WaterSense Products and Contractors. Except where precluded by other project requirements, use EPA WaterSense labeled products and irrigation contractors that are certified through a WaterSense labeled program where available.

5.3. ARCHITECTURE AND INTERIOR DESIGN:

This element will be evaluated per APPLICABLE CRITERIA under the quality focus.

5.3.1. STANDARDS AND CODES: The architecture and interior design shall conform to APPLICABLE CRITERIA.

5.3.2. GENERAL: Overall architectural goal is to provide a functional, quality, visually appealing facility that is a source of pride for the installation and delivered within the available budget and schedule.

5.3.3. COMPUTATION OF AREAS: See APPENDIX Q for how to compute gross and net areas of the facility(ies).

5.3.4. BUILDING EXTERIOR: Design buildings to enhance or compliment the visual environment of the Installation. Where appropriate, reflect a human scale to the facility. Building entrance should be architecturally defined and easily seen. When practical, exterior materials, roof forms, and detailing shall be compatible with the surrounding development and adjacent buildings on the Installation and follow locally established architectural themes. Use durable materials that are easy to maintain. Exterior colors shall conform to the Installation requirements. See paragraph 6.

5.3.4.1. Building Numbers: Each building shall have exterior signage permanently attached on two faces of the building indicating the assigned building number or address. Building number signage details and locations shall conform to Appendix H, Exterior Signage.

5.3.5. BUILDING INTERIOR

5.3.5.1. Space Configuration: Arrange spaces in an efficient and functional manner in accordance with area adjacency matrices.

5.3.5.2. Surfaces: Appearance retention is the top priority for building and furniture related finishes. Provide low maintenance, easily cleaned room finishes that are commercially standard for the facility occupancy specified, unless noted otherwise.

5.3.5.3. Color: The color, texture and pattern selections for the finishes of the building shall provide an aesthetically pleasing, comfortable, easily maintainable and functional environment for the occupants. Coordination of the building colors and finishes is necessary for a cohesive design. Color selections shall be appropriate for the building type. The use of color, texture and pattern shall be used to path or way find through the building. Trendy colors that will become dated shall be limited to non-permanent finishes such as carpet and paint. Finishes should be selected with regards to aesthetics, maintenance, durability, life safety and image. Limit the number of similar colors for each material. Color of Ceramic and porcelain tile grout shall be medium range color to help hide soiling. Plastic laminate and solid surface materials shall have patterns that are mottled, flecked or speckled. Finish colors of fire extinguisher cabinets, receptacle bodies and plates, fire alarms / warning lights, emergency lighting, and other miscellaneous items shall be coordinated with the building interior. Color of equipment items on ceilings (speakers, smoke detectors, grills, etc.) shall match the ceiling color.

5.3.5.4. Circulation: Circulation schemes must support easy way finding within the building.

5.3.5.5. Signage: Provide interior signage for overall way finding and life safety requirements. A comprehensive interior plan shall be from one manufacturer. Include the following sign types: (1) Lobby Directory, (2) Directional Signs; (3) Room Identification Signs; (4) Building Service Signs; (5) Regulatory Signs; (6) Official and Unofficial Signs (7) Visual Communication Boards (8) NO SMOKING signage that conveys building smoking policy. Use of emblems or logos may also be incorporated into the signage plan.

5.3.5.6. Window Treatment: Interior window treatments with adjustable control shall be provided in all exterior window locations for control of day light coming in windows or privacy at night. Uniformity of treatment color and material shall be maintained to the maximum extent possible within a building.

5.3.6. COMPREHENSIVE INTERIOR DESIGN

5.3.6.1. Comprehensive Interior Design includes the integration of a Structural Interior Design (SID) and a Furniture, Fixtures and Equipment (FF&E) design and package. SID requires the design, selection and coordination of interior finish materials that are integral to or attached to the building structure. Completion of a SID involves the selection and specification of applied finishes for the building's interior features including, but not limited to, walls, floors, ceilings, trims, doors, windows, window treatments, built-in furnishings and installed equipment, lighting, and signage. The SID package includes finish schedules, finish samples and any supporting interior elevations, details or plans necessary to communicate the building finish design and build out. The SID also provides basic space planning for the anticipated FF&E requirements in conjunction with the functional layout of the building and design issues such as life safety, privacy, acoustics, lighting, ventilation, and accessibility. See Section 01 33 16 for SID design procedures.

The FF&E design and package includes the design, selection, color coordination and of the required furnishing items necessary to meet the functional, operational, sustainability, and aesthetic needs of the facility coordinated with the interior finish materials in the SID. The FF&E package includes the specification, procurement documentation, placement plans, ordering and finish information on all freestanding furnishings and accessories, and a cost estimate. Coordinate the selection of furniture style, function and configuration with the defined requirements. Examples of FF&E items include, but are not limited to workstations, seating, files, tables, beds, wardrobes, draperies and accessories as well as marker boards, tack boards, and presentation screens. Criteria for furniture selection include function and ergonomics, maintenance, durability, sustainability, comfort and cost. See Section 01 33 16 for FFE design procedures.

5.4. STRUCTURAL DESIGN

5.4.1. STANDARDS AND CODES: The structural design shall conform to APPLICABLE CRITERIA.

5.4.2. GENERAL: The structural system needs to be compatible with the intended functions and components that allows for future flexibility and reconfigurations of the interior space. Select an economical structural system based upon facility size, projected load requirements and local availability of materials and labor. Base the structural design on accurate, site specific geotechnical information and anticipated loads for the building types and geographical location. When modular units or other pre-fabricated construction is used or combined with stick-built construction, fully coordinate and integrate the overall structural design between the two different or interfacing construction types. If the state that the project is located in requires separate, specific licensing for structural engineers (for instance, such as in Florida, California and others), then the structural engineer designer of record must be registered in that state.

5.4.3. LOADS: See paragraph 3 for facility specific (if applicable) and paragraph 6 for site and project specific structural loading criteria. Unless otherwise specified in paragraph 6, use Exposure Category C for wind. If not specified, use Category C unless the Designer of Record can satisfactorily justify another Exposure Category in its design analysis based on the facility Master Plan. Submit such exceptions for approval as early as possible and prior to the Interim Design Submittal in Section "Design After Award"

5.4.4. TERMITE TREATMENT: (Except Alaska) Provide termite prevention treatment in accordance with Installation and local building code requirements, using licensed chemicals and licensed applicator firm.

5.5. THERMAL PERFORMANCE

5.5.1. STANDARDS AND CODES: Building construction and thermal insulation for mechanical systems shall conform to APPLICABLE CRITERIA.

5.5.2. BUILDING ENVELOPE SEALING PERFORMANCE REQUIREMENT. Design and construct the building envelope for office buildings, office portions of mixed office and open space (e.g., company operations facilities), dining, barracks and instructional/training facilities with a continuous air barrier to control air leakage into, or out of, the conditioned space. Clearly identify all air barrier components of each envelope assembly on construction documents and detail the joints, interconnections and penetrations of the air barrier components. Clearly identify the boundary limits of the building air barriers, and of the zone or zones to be tested for building air tightness on the drawings.

5.5.2.1. Trace a continuous plane of air-tightness throughout the building envelope and make flexible and seal all moving joints.

5.5.2.2. The air barrier material(s) must have an air permeance not to exceed 0.004 cfm / sf at 0.3" wg (0.02 L/s.m² @ 75 Pa) when tested in accordance with ASTM E 2178

5.5.2.3. Join and seal the air barrier material of each assembly in a flexible manner to the air barrier material of adjacent assemblies, allowing for the relative movement of these assemblies and components.

5.5.2.4. Support the air barrier so as to withstand the maximum positive and negative air pressure to be placed on the building without displacement, or damage, and transfer the load to the structure.

5.5.2.5. Seal all penetrations of the air barrier. If any unavoidable penetrations of the air barrier by electrical boxes, plumbing fixture boxes, and other assemblies are not airtight, make them airtight by sealing the assembly and the interface between the assembly and the air barrier or by extending the air barrier over the assembly.

5.5.2.6. The air barrier must be durable to last the anticipated service life of the assembly.

5.5.2.7. Do not install lighting fixtures with ventilation holes through the air barrier

5.5.2.8. Provide a motorized damper in the closed position and connected to the fire alarm system to open on call and fail in the open position for any fixed open louvers such as at elevator shafts.

5.5.2.9. Damper and control to close all ventilation or make-up air intakes and exhausts, atrium smoke exhausts and intakes, etc when leakage can occur during inactive periods.

5.5.2.10. Compartmentalize garages under buildings by providing air-tight vestibules at building access points.

5.5.2.11. Compartmentalize spaces under negative pressure such as boiler rooms and provide make-up air for combustion.

5.5.2.12. Performance Criteria and Substantiation: Submit the qualifications and experience of the testing entity for approval. Demonstrate performance of the continuous air barrier for the opaque building envelope by the following tests:

(a) Test the completed building and demonstrate that the air leakage rate of the building envelope does not exceed 0.25cfm/ft² at a pressure differential of 0.3" w.g.(75 Pa) in accordance with ASTM's E 779 (2003) or E-1827-96 (2002). Accomplish tests using either pressurization or depressurization or both. Divide the volume of air leakage in cfm @ 0.3" w.g. (L/s @ 75 Pa) by the area of the pressure boundary of the building, including roof or ceiling, walls and floor to produce the air leakage rate in cfm/ft² @ 0.3" w.g. (L/s.m² @ 75 Pa). Do not test the building until verifying that the continuous air barrier is in place and installed without failures in accordance with installation instructions so that repairs to the continuous air barrier, if needed to comply with the required air leakage rate, can be done in a timely manner.

(b) Test the completed building using Infrared Thermography testing. Use infrared cameras with a resolution of 0.1deg C or better. Perform testing on the building envelope in accordance with ISO 6781:1983 and ASTM C1060-90(1997). Determine air leakage pathways using ASTM E 1186-03 Standard Practices for Air Leakage Site

Detection in Building Envelopes and Air Barrier Systems, and perform corrective work as necessary to achieve the whole building air leakage rate specified in (a) above.

(c) Notify the Government at least three working days prior to the tests to provide the Government the opportunity to witness the tests. Provide the Government written test results confirming the results of all tests.

5.6. PLUMBING

5.6.1. STANDARDS AND CODES: The plumbing system shall conform to APPLICABLE CRITERIA.

5.6.2. PRECAUTIONS FOR EXPANSIVE SOILS: Where expansive soils are present, the design for underslab piping systems and underground piping serving chillers, cooling towers, etc, shall include features to control forces resulting from soil heave. Some possible solutions include, but are not necessarily limited to, features such as flexible expansion joints, slip joints, horizontal offsets with ball joints, or multiple bell and spigot gasketed fittings. For structurally supported slabs, piping should be suspended from the structure with adequate space provided below the pipe for the anticipated soil movement.

5.6.3. HOT WATER SYSTEMS: For Hot Water heating and supply, provide a minimum temp of 140 Deg F in the storage tank and a maximum of 110 Deg F at the fixture, unless specific appliances or equipment specifically require higher temperature water supply.

5.6.4. SIZING HOT WATER SYSTEMS: Unless otherwise specified or directed in paragraph 3, design in accordance with ASHRAE Handbook Series (appropriate Chapters), ASHRAE Standard 90.1, and the energy conservation requirements of the contract. Size and place equipment so that it is easily accessible and removable for repair or replacement.

5.6.5. JANITOR CLOSETS: In janitor spaces/room/closets, provide at minimum, a service sink with heavy duty shelf and wall hung mop and broom rack(s).

5.6.6. FLOOR DRAINS: As a minimum, provide floor drains in mechanical rooms and areas, janitor spaces/rooms/closets and any other area that requires drainage from fixtures or equipment, drain downs, condensate, as necessary.

5.6.7. URINALS: Urinals shall be vitreous china, wall-mounted, wall outlet, non-water using, with integral drain line connection, and with sealed replaceable cartridge or integral liquid seal trap. Either type shall use a biodegradable liquid to provide the seal and maintain a sanitary and odor-free environment. Install, test and maintain in accordance with manufacturer's recommendations. Slope the sanitary sewer branch line for non-water use urinals a minimum of 1/4 inch per foot. Do not use copper tube or pipe for drain lines that connect to the urinal. Manufacturer shall provide an operating manual and on-site training to installation operations personnel for the proper care and maintenance of the urinal. For complexes, non-water using urinals are not required for barracks type spaces.

5.6.8. BUILDING WATER USE REDUCTION. Reduce building potable water use in each building 30 percent using IPC fixture performance requirements baseline.

5.6.9. Do not use engineered vent or Sovent® type drainage systems.

5.6.10. Where the seasonal design temperature of the cold water entering a building is below the seasonal design dew point of the indoor ambient air, and where condensate drip will cause damage or create a hazard, insulate plumbing piping with a vapor barrier type of insulation to prevent condensation. Do not locate water or drainage piping over electrical wiring or equipment unless adequate protection against water (including condensation) damage is provided. Insulation alone is not adequate protection against condensation. Follow ASHRAE Fundamentals Chapter 23, Insulation for Mechanical Systems, IMC paragraph 1107 and International Energy Conservation Code for pipe insulation requirements.

5.7. ELECTRICAL AND TELECOMMUNICATIONS SYSTEMS

5.7.1. STANDARDS AND CODES: The electrical systems for all facilities shall conform to APPLICABLE CRITERIA.

5.7.2. **MATERIALS AND EQUIPMENT:** Materials, equipment and devices shall, as a minimum, meet the requirements of Underwriters Laboratories (UL) where UL standards are established for those items. Wiring for branch circuits shall be copper. Motors larger than one-half horsepower shall be three phase. All electrical systems shall be pre-wired and fully operational unless otherwise indicated. Wall mounted electrical devices (power receptacles, communication outlets and CATV outlets) shall have matching colors, mounting heights and faceplates.

5.7.3. **POWER SERVICE:** Primary service from the base electrical distribution system to the pad-mounted transformer and secondary service from the transformer to the building service electrical equipment room shall be underground. See paragraph 6 for additional site electrical requirements.

5.7.3.1. **Spare Capacity:** Provide 10% space for future circuit breakers in all panelboards serving residential areas of buildings and 15% spaces in all other panelboards.

5.7.4. **TELECOMMUNICATION SERVICE:** The project's facilities must connect to the Installation telecommunications (voice and data) system through the outside plant (OSP) telecommunications underground infrastructure cabling system per the I3A Criteria. Connect to the OSP cabling system from each facility main cross connect located in the telecommunications room.

5.7.5. **LIGHTING:** Comply with the recommendations of the Illumination Engineering Society of North America (IESNA), the National Energy Policy Act and Energy Star requirements for lighting products..

5.7.5.1. **Interior Lighting:**

(a) **Reflective Surfaces:** Coordinate interior architectural space surfaces and colors with the lighting systems to provide the most energy-efficient workable combinations.

(b) **High Efficiency Fluorescent Lighting:** Utilize NEMA premium electronic ballasts and energy efficient fluorescent lamps with a Correlated Color Temperature (CCT) of 4100K. Linear fluorescent and compact fluorescent fixtures shall have a Color Rendering Index of (CRI) of 87 or higher. Fluorescent lamps shall be the low mercury type qualifying as non-hazardous waste upon disposal. Do not use surface mounted fixtures on acoustical tile ceilings. Provide an un-switched fixture with emergency ballast shall be provided at each entrance to the building.

(c) **Solid State Lighting:** Fixtures shall provide lighting with a minimum Correlated Color Temperature (CCT) of 4100K and shall have a Color Rendering Index of (CRI) of 75 or higher. Verify performance of the light producing solid state components by a test report in compliance with the requirements of IESNA LM 80. Verify performance of the solid state light fixtures by a test report in compliance with the requirements of IESNA LM 79. Provide lab results by a NVLAP certified laboratory. The light producing solid state components and drivers shall have a life expectancy of 50,000 operating hours while maintaining at least 70% of original illumination level. Provide a complete five year warranty for fixtures.

(d) **Metal Halide Lighting (where applicable):** Metal Halide lamp fixtures in the range of 150-500 Watts shall be pulse start type and have a minimum efficiency rating of 88%.

(e) **Lighting Controls:** ANSI/ASHRAE/IESNA 90.1 has specific lighting controls requirements. Provide a high level of lighting system control by individual occupants or by specific groups in multi-occupant spaces (classrooms, conference rooms) to promote the productivity, comfort and well being of the building occupants. In office spaces, the preferred lighting should be a 30 FC ambient lighting level with occupancy sensor controlled task lighting in the work spaces to provide a composite lighting level of 50 FC on the working surfaces. Consider incorporating daylighting techniques for the benefit of reducing lighting energy requirements while improving the quality of the indoor spaces. If daylight strategies are used, additional coordination is required with the architect and mechanical engineer. Additionally, incorporate electric lighting controls to take advantage of the potential energy savings.

(f) **Exterior Lighting:** See paragraph 6.9 for site specific information, if any, on exterior lighting systems. Minimize light pollution and light trespass by not over lighting and use cutoff type exterior luminaries.

5.7.6. **TELECOMMUNICATION SYSTEM:** All building telecommunications cabling systems (BCS) and OSP telecommunications cabling system shall conform to APPLICABLE CRITERIA to include I3A Technical Criteria. An acceptable BCS encompasses, but is not limited to, copper and fiber optic (FO) entrance cable, termination equipment, copper and fiber backbone cable, copper and fiber horizontal distribution cable, workstation outlets, racks, cable management, patch panels, cable tray, cable ladder, conduits, grounding, and labeling.. Items included

under OSP infrastructure encompass, but are not limited to, manhole and duct infrastructure, copper cable, fiber optic cable, cross connects, terminations, cable vaults, and copper and FO entrance cable.

5.7.6.1. Design, install, label and test all telecommunications systems in accordance with the I3A Criteria and ANSI/TIA/EIA 568, 569, and 606 standards. A Building Industry Consulting Services International (BICSI) Registered Communications Distribution Designer (RCDD) with at least 2 yrs related experience shall develop and stamp telecommunications design, and prepare the test plan. See paragraph 5.8.2.5 for design of environmental systems for Telecommunications Rooms.

5.7.6.2. The installers assigned to the installation of the telecommunications system or any of its components shall be regularly and professionally engaged in the business of the application, installation and testing of the specified telecommunications systems and equipment. Key personnel; i.e., supervisors and lead installers assigned to the installation of this system or any of its components shall be BICSI Registered Cabling Installers, Technician Level. Submit documentation of current BICSI certification for each of the key personnel. In lieu of BICSI certification, supervisors and installers shall have a minimum of 5 years experience in the installation of the specified copper and fiber optic cable and components. They shall have factory or factory approved certification from each equipment manufacturer indicating that they are qualified to install and test the provided products.

5.7.6.3. Perform a comprehensive end to end test of all circuits to include all copper and fiber optic cables upon completion of the BCS and prior to acceptance of the facility. The BCS circuits include but are not limited to all copper and fiber optic(FO) entrance cables, termination equipment, copper and fiber backbone cable, copper and fiber horizontal distribution cable, and workstation outlets. Test in accordance with ANSI/EIA/TIA 568 standards. Use test instrumentation that meets or exceeds the standard. Submit the official test report to include test procedures, parameters tested, values, discrepancies and corrective actions in electronic format. Test and accomplish all necessary corrective actions to ensure that the government receives a fully operational, standards based, code compliant telecommunications system.

5.7.7. LIGHTNING PROTECTION SYSTEM: Provide a lightning protection system where recommended by the Lightning Risk Assessment of NFPA 780, Annex L.

5.8. HEATING, VENTILATING, AND AIR CONDITIONING

5.8.1. STANDARDS AND CODES: The HVAC system shall conform to APPLICABLE CRITERIA.

5.8.2. DESIGN CONDITIONS.

5.8.2.1. Outdoor and indoor design conditions shall be in accordance with UFC 3-410-01FA. Outdoor air and exhaust ventilation requirements for indoor air quality shall be in accordance with ASHRAE 62.1. All Buildings with minimum LEED Silver requirement (or better) will earn LEED Credit EQ 7.1, Thermal Comfort-Design.

5.8.2.2. Design systems in geographical areas that meet the definition for high humidity in UFC 3-410-01FA in accordance with the special criteria for humid areas therein.

5.8.2.3. Cooling equipment may be oversized by up to 15 percent to account for recovery from night setback. Heating equipment may be oversized by up to 30 percent to account for recovery from night setback. Design single zone systems and multi-zone systems to maintain an indoor design condition of 50% relative humidity for cooling only. For heating only where the indoor relative humidity is expected to fall below 20% for extended periods, add humidification to increase the indoor relative humidity to 30%. Provide ventilation air from a separate dedicated air handling unit (DOAU) for facilities using multiple single zone fan-coil type HVAC systems. Do not condition outside air through fan coil units. Avoid the use of direct expansion cooling coils in air handling units with constant running fans that handle outside air.

5.8.2.4. Locate all equipment so that service, adjustment and replacement of controls or internal components are readily accessible for easy maintenance.

5.8.2.5. Environmental Requirements for Telecommunications Rooms,(including SIPRNET ROOMS, where applicable for specific facility type). Comply with ANSI/EIA/TIA 569 and the I3A.

5.8.2.6. Fire dampers: dynamic type with a dynamic rating suitable for the maximum air velocity and pressure differential to which the damper is subjected. Test each fire damper with the air handling and distribution system running.

5.8.3. BUILDING AUTOMATION SYSTEM. Provide a Building Automation System consisting of a building control network , and integrate the building control network into the UMCS as specified.

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 as specified herein. The building control network shall be an Open implementation of LONWORKS® technology 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.

5.8.3.1. 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. This includes, but is not limited to the following:

- (a) Install hardware such that individual control equipment can be replaced by similar control equipment from other equipment manufacturers with no loss of system functionality.
- (b) Necessary documentation (including rights to documentation and data), configuration information, configuration tools, programs, drivers, and other software shall be licensed to and otherwise remain with the Government such that the Government or its agents are able to perform repair, replacement, upgrades, and expansions of the system without subsequent or future dependence on the Contractor.

5.8.3.2. All DDC Hardware shall:

- (a) Be connected to a TP/FT-10 ANSI/EIA 709.3 control network.
- (b) Communicate over the control network via ANSI/EIA 709.1B exclusively.
- (c) Communicate with other DDC hardware using only SNVTs
- (d) Conform to the LonMark® Interoperability Guidelines.
- (e) Be locally powered; link power (over the control network) is not acceptable.
- (f) Be fully configurable via standard or user-defined configuration parameter types (SCPT or UCPT), standard network variable type (SNVT) network configuration inputs (*nci*), or hardware settings on the controller itself to support the application. All settings and parameters used by the application shall be configurable via standard or user-defined configuration parameter types (SCPT or UCPT), standard network variable type (SNVT) network configuration inputs (*nci*), or hardware settings on the controller itself
- (g) Provide input and output SNVTs required to support monitoring and control (including but not limited to scheduling, alarming, trending and overrides) of the application. Required SNVTs include but are not limited to: SNVT outputs for all hardware I/O, SNVT outputs for all setpoints and SNVT inputs for override of setpoints.
- (h) To the greatest extent practical, not rely on the control network to perform the application..

5.8.3.3. Controllers shall be Application Specific Controllers whenever an ASC suitable for the application exists. When an ASC suitable for the application does not exist use programmable controllers or multiple application specific controllers.

5.8.3.4. Application Specific Controllers shall be LonMark Certified whenever a LonMark Certified ASC suitable for the application exists. For example, VAV controllers must be LonMark certified.

5.8.3.5. Application Specific Controllers (ASCs) shall be configurable via an LNS plug-in whenever t an ASC with an LNS plug-in suitable for the application exists.

5.8.3.6. Each scheduled system shall accept a network variable of type SNVT_occupancy and shall use this network variable to determine the occupancy mode. If the system has not received a value to this network variable for more than 60 minutes it shall default to a configured occupancy schedule.

5.8.3.7. Gateways may be used provided that each gateway communicates with and performs protocol translation for control hardware controlling one and only one package unit.

5.8.3.8. Not Used

5.8.3.9. Perform all necessary actions needed to fully integrate the building control system. These actions 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 control network to the 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 UMCS and building networks shall be via the ANSI/CEA-709.1B protocol over the IP network in accordance with ANSI/CEA-852.

5.8.3.10. Provide the following to the Government for review prior to acceptance of the system:

- The latest version of all software and user manuals required to program, configure and operate the system.
- Points Schedule drawing that shows every DDC Hardware device. The Points Schedule shall contain the following information as a minimum:
 - Device address and NodeID.
 - Input and Output SNVTs including SNVT Name, Type and Description.
 - Hardware I/O, including Type (AI, AO, BI, BO) and Description.
 - Alarm information including alarm limits and SNVT information.
 - Supervisory control information including SNVTs for trending and overrides.
 - Configuration parameters (for devices without LNS plug-ins) Example Points Schedules are available at <https://eko.usace.army.mil/fa/besc/>
- Riser diagram of the network showing all network cabling and hardware. Label hardware with ANSI.CEA-709.1 addresses, IP addresses, and network names.
- Control System Schematic diagram and Sequence of Operation for each HVAC system.
- Operation and Maintenance Instructions including procedures for system start-up, operation and shut-down, a routine maintenance checklist, and a qualified service organization list.
- LONWORKS® Network Services (LNS®) database for the completed system.
- Quality Control (QC) checklist (below) completed by the Contractor's Chief Quality Control (QC) Representative

Table 5-1: QC Checklist

Instructions: Initial each item, sign and date verifying that the requirements have been met.		
#	Description	Initials
1	All DDC Hardware is installed on a TP/FT-10 local control bus.	
2	Communication between DDC Hardware is only via EIA 709.1B using SNVTs. Other protocols and network variables other than SNVTs have not been used.	
3	All sequences are performed using DDC Hardware.	
4	LNS Database is up-to-date and accurately represents the final installed system	
5	All software has been licensed to the Government	
6	M&C software monitoring displays have been created for all building systems, including all override and display points indicated on Points Schedule drawings.	
7	Final As-built Drawings accurately represent the final installed system.	
8	O&M Instructions have been completed and submitted.	
9	Connections between the UMCS IP network and ANSI/CEA-709.1B building networks are through ANSI/CEA-852 Routers.	
By signing below I verify that all requirements of the contract, including but not limited to the above, been met.		
Signature: _____ Date: _____		

5.8.3.11. Perform a Performance Verification Test (PVT) under Government supervision prior to system acceptance. During the PVT demonstrate that the system performs as specified, including but not limited to demonstrating that the system is Open and correctly performs the Sequences of Operation.

5.8.3.12. Provide a 1 year unconditional warranty on the installed system and on all service call work. The warranty shall include labor and material necessary to restore the equipment involved in the initial service call to a fully operable condition.

5.8.3.13. Provide training at the project site on the installed building system. Upon completion of this training each student, using appropriate documentation, should be able to start the system, operate the system, recover the system after a failure, perform routine maintenance and describe the specific hardware, architecture and operation of the system.

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5.8.4. TESTING, ADJUSTING AND BALANCING. Test and balance air and hydronic systems, using a firm certified for testing and balancing by the Associated Air Balance Council (AABC), National Environmental Balancing Bureau (NEBB), or the Testing Adjusting, and Balancing Bureau (TABB). The prime contractor shall hire the TAB firm directly, not through a subcontractor. Perform TAB in accordance with the requirements of the standard under which the TAB Firm's qualifications are approved, i.e., AABC MN-1, NEBB TABES, or SMACNA HVACTAB unless otherwise specified herein. All recommendations and suggested practices contained in the TAB Standard shall be considered mandatory. Use the provisions of the TAB Standard, including checklists, report forms, etc., as nearly as practicable to satisfy the Contract requirements. Use the TAB Standard for all aspects of TAB, including qualifications for the TAB Firm and Specialist and calibration of TAB instruments. Where the instrument manufacturer calibration recommendations are more stringent than those listed in the TAB Standard, adhere to the manufacturer's recommendations. All quality assurance provisions of the TAB Standard such as performance guarantees shall be part of this contract. For systems or system components not covered in the TAB Standard, the TAB Specialist shall develop TAB procedures. Where new procedures, requirements, etc., applicable to the Contract requirements have been published or adopted by the body responsible for the TAB Standard used (AABC, NEBB, or TABB), the requirements and recommendations contained in these procedures and requirements are mandatory.

5.8.5. COMMISSIONING: Commission all HVAC systems and equipment, including controls, and all systems requiring commissioning for LEED Enhanced commissioning, in accordance with ASHRAE Guideline 1.1, ASHRAE Guideline 0 and LEED. Do not use the sampling techniques discussed in ASHRAE Guideline 1.1 and in ASHRAE Guideline 0. Commission 100% of the HVAC controls and equipment. Hire the Commissioning Authority (CA), certified as a CA by AABC, NEBB, or TABB, as described in Guideline 1.1. The CA will be an independent subcontractor to the contractor and not an employee or subcontractor of any other subcontractor on this project. The CA will not have business connections with any other party on the project. The CA will not have any other role or responsibilities outside of commissioning activities. The CA will communicate and report directly to the Government in the execution of the commissioning activities. The Contracting Officer's Representative will act as the Owner's representative in performance of duties spelled out under OWNER in Annex F of ASHRAE Guideline 0. All buildings with Minimum LEED Silver (or better) requirement will earn LEED Credit EA3 Enhanced Commissioning.

5.9. ENERGY CONSERVATION

5.9.1. The building including the building envelope, HVAC systems, service water heating, power, and lighting systems shall meet the Mandatory Provisions and the Prescriptive Path requirements of ASHRAE 90.1. Substantiation requirements are defined in Section 01 33 16, Design After Award.

5.9.2. Design all building systems and elements to meet the minimum requirements of ANSI/ASHRAE/IESNA 90.1. Design the buildings, 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 Standard 90.1. Energy calculation methodologies and substantiation requirements are defined in Section 01 33 16, Design After Award.

5.9.3. Purchase Energy Star products, except use FEMP designated products where FEMP is applicable to the type product. The term "Energy Star product" 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 of equivalent products for energy efficiency. When selecting integral sized electric motors, choose 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 applications 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).

5.9.4. Solar Hot Water Heating. Provide at least 30% of the domestic hot water requirements through solar heating methodologies, unless the results of a Life Cycle Cost Analysis (LCCA) developed utilizing the Building Life Cycle Cost Program (BLCC) which demonstrates that the solar hot water system is not life cycle cost effective in comparison with other hot water heating systems. The type of system will be established during the contract or task order competition and award phase, including submission of an LCCA for government evaluation to justify non-selection of solar hot water heating. The LCCA uses a study period of 25 years and the Appendix K utility cost information. The LCCA shall include life cycle cost comparisons to a baseline system to provide domestic hot water without solar components, analyzing at least three different methodologies for providing solar hot water to compare against the baseline system.

5.9.5. Process Water Conservation. When potable water is used to improve a building's energy efficiency, employ lifecycle cost effective water conservation measures, except where precluded by other project requirements.

5.9.6. Renewable Energy Features. The Government's goal is to implement on-site renewable energy generation for Government use when lifecycle cost effective. See Paragraph 6, PROJECT SPECIFIC REQUIREMENTS for renewable energy requirements for this project.

5.10. FIRE PROTECTION

5.10.1. STANDARDS AND CODES Provide the fire protection system conforming to APPLICABLE CRITERIA.

5.10.2. Inspect and test all fire suppression equipment and systems, fire pumps, fire alarm and detection systems and mass notification systems in accordance with the applicable NFPA standards. The fire protection engineer of record shall witness final tests. The fire protection engineer of record shall certify that the equipment and systems are fully operational and meet the contract requirements. Two weeks prior to each final test, the contractor shall notify, in writing, the installation fire department and the installation public work representative of the test and invite them to witness the test.

5.10.3. Fire Extinguisher Cabinets: Provide fire extinguisher cabinets and locations for hanging portable fire extinguishers in accordance with NFPA 10 Standard for Portable Fire Extinguishers.

5.10.4. Fire alarm and detection system: Required fire alarm and detection systems shall be the addressable type. Fire alarm initiating devices, such as smoke detectors, heat detectors and manual pull stations shall be addressable. When the system is in alarm condition, the system shall annunciate the type and location of each alarm initiating device. Sprinkler water flow alarms shall be zoned by building and by floor. Supervisory alarm initiating devices, such as valve supervisory switches, fire pump running alarm, low-air pressure on dry sprinkler system, etc. shall be zoned by type and by room location.

5.10.5. Fire Protection Engineer Qualifications: In accordance with UFC 3-600-01, FIRE PROTECTION ENGINEERING FOR FACILITIES, the fire protection engineer of record shall be a registered professional engineer (P.E.) who has passed the fire protection engineering written examination administered by the National Council of Examiners for Engineering and Surveys (NCEES), or a registered P.E. in a related engineering discipline with a minimum of 5 years experience, dedicated to fire protection engineering that can be verified with documentation.

5.11. SUSTAINABLE DESIGN

5.11.1. STANDARDS AND CODES: Sustainable design shall conform to APPLICABLE CRITERIA. See paragraph 6, PROJECT-SPECIFIC REQUIREMENTS for which version of LEED applies to this project. The LEED-NC Application Guide for Multiple Buildings and On-Campus Building Projects (AGMBC) applies to all projects. Averaging may be used for LEED compliance as permitted by the AGMBC but is restricted to only those buildings included in this project. Each building must individually comply with the requirements of paragraphs ENERGY CONSERVATION and BUILDING WATER USE REDUCTION.

5.11.2. LEED RATING, REGISTRATION, VALIDATION AND CERTIFICATION: See Paragraph PROJECT-SPECIFIC REQUIREMENTS for project minimum LEED rating/achievement level, for facilities that are exempt from the minimum LEED rating, for LEED registration and LEED certification requirements and for other project-specific information and requirements.

5.11.2.1. Innovation and Design Credits. LEED Innovation and Design (ID) credits are acceptable only if they are supported by formal written approval by GBCI (either published in USGBC Innovation and Design Credit Catalog or accompanied by a formal ruling from GBCI). LEED ID credits that require any Owner actions or commitments are acceptable only when Owner commitment is indicated in paragraph PROJECT-SPECIFIC REQUIREMENTS or Appendix LEED Project Credit Guidance

5.11.3. OPTIMIZE ENERGY PERFORMANCE. : Project must earn, as a minimum, the points associated with compliance with paragraph ENERGY CONSERVATION. LEED documentation differs from documentation requirements for paragraph ENERGY CONSERVATION and both must be provided. For LEED-NC v2.2 projects you may substitute ASHRAE 90.1 2007 Appendix G in its entirety for ASHRAE 90.1 2004 in accordance with USGBC Credit Interpretation Ruling dated 4/23/2008.

5.11.4. COMMISSIONING. See paragraph 5.8.5 COMMISSIONING for commissioning requirements. USACE templates for the required Basis of Design document and Commissioning Plan documents are available at <http://en.sas.usace.army.mil> (click on Engineering Criteria) and may be used at Contractor's option.

5.11.5. DAYLIGHTING. Except where precluded by other project requirements, do the following in at least 75 percent of all spaces occupied for critical visual tasks: achieve a 2 percent glazing factor (calculated in accordance with LEED credit EQ8.1) OR earn LEED Daylighting credit, provide appropriate glare control and provide either automatic dimming controls or occupant-accessible manual lighting controls.

5.11.6. LOW-EMITTING MATERIALS. Except where precluded by other project requirements, use materials with low pollutant emissions, including but not limited to composite wood products, adhesives, sealants, interior paints and finishes, carpet systems and furnishings,

5.11.7. CONSTRUCTION INDOOR AIR QUALITY MANAGEMENT. Except where precluded by other project requirements, earn LEED credit EQ 3.1 Construction IAQ Management Plan, During Construction and credit EQ 3.2 Construction IAQ Management Plan, Before Occupancy.

5.11.8. RECYCLED CONTENT. In addition to complying with section RECYCLED/RECOVERED MATERIALS, earn LEED credit MR4.1, Recycled Content, 10 percent except where precluded by other project requirements.

5.11.9. BIOBASED AND ENVIRONMENTALLY PREFERABLE PRODUCTS. Except where precluded by other project requirements, use materials with biobased content, materials with rapidly renewable content, FSC certified wood products and products that have a lesser or reduced effect on human health and the environment over their lifecycle to the maximum extent practicable.

5.11.10. FEDERAL BIOBASED PRODUCTS PREFERRED PROCUREMENT PROGRAM (FB4P). The Farm Security and Rural Investment Act (FSRIA) of 2002 required the U.S. Department of Agriculture (USDA) to create procurement preferences for biobased products that are applicable to all federal procurement (to designate products for biobased content). For all designated products that are used in this project, meet USDA biobased content rules for them except use of a designated product with USDA biobased content is not required if the biobased product (a) is not available within a reasonable time, (b) fails to meet performance standard or (c) is available only at an unreasonable price. For biobased content product designations, see <http://www.biopreferred.gov/ProposedAndFinalItemDesignations.aspx>.

5.12. CONSTRUCTION AND DEMOLITION (C&D) WASTE MANAGEMENT: Achievement of 50% diversion, by weight, of all non-hazardous C&D waste debris is required. Reuse of excess soils, recycling of vegetation, alternative daily cover, and wood to energy are not considered diversion in this context, however the Contractor must track and report it. A waste management plan and waste diversion reports are required, as detailed in Section 01 57 20.00 10, ENVIRONMENTAL PROTECTION.

5.13. SECURITY (ANTI-TERRORISM STANDARDS): Unless otherwise specified in Project Specific Requirements, only the minimum protective measures as specified by the current Department of Defense Minimum

Antiterrorism Standards for Buildings, UFC 4-010-01, are required for this project. The element of those standards that has the most significant impact on project planning is providing protection against explosives effects. That protection can either be achieved using conventional construction (including specific window requirements) in conjunction with establishing relatively large standoff distances to parking, roadways, and installation perimeters or through building hardening, which will allow lesser standoff distances. Even with the latter, the minimum standoff distances cannot be encroached upon. These setbacks will establish the maximum buildable area. All standards in Appendix B of UFC 4-010-01 must be followed and as many of the recommendations in Appendix C that can reasonably be accommodated should be included. The facility requirements listed in these specifications assume that the minimum standoff distances can be met, permitting conventional construction. Lesser standoff distances (with specific minimums) are not desired, however can be provided, but will require structural hardening for the building. See Project Specific Requirements for project specific siting constraints. The following list highlights the major points but the detailed requirements as presented in Appendix B of UFC 4-010-01 must be followed.

- (a) Standoff distance from roads, parking and installation perimeter; and/or structural blast mitigation
- (b) Blast resistant windows and skylights, including glazing, frames, anchors, and supports
- (c) Progressive collapse resistance for all facilities 3 stories or higher
- (d) Mass notification system (shall also conform to UFC 4-021-01, Mass Notification Systems)
- (e) For facilities with mailrooms (see paragraph 3 for applicability) – mailrooms have separate HVAC systems and are sealed from rest of building

6.0 PROJECT SPECIFIC REQUIREMENTS

6.1. GENERAL

The requirements of this paragraph augment the requirements indicated in Paragraphs 3 through 5.

6.2. APPROVED DEVIATIONS

The following are approved deviations from the requirements stated in Paragraphs 3 through 5 that only apply to this project.

NOT USED

6.3. SITE PLANNING AND DESIGN

6.3.1. General:

The project involves renovating an existing building and improvements at an existing running track.

6.3.2. Site Structures and Amenities

NOT USED

6.3.3. Site Functional Requirements:

6.3.3.1. Stormwater Management (SWM) Systems.

Existing roof drains are piped to the storm drain system. If the option for the new standing seam metal roof is awarded, all new downspouts shall be piped to the existing storm drain system. Provide all boots, connections and piping necessary to connect system.

6.3.3.2. Erosion and Sediment Control

NOT USED

6.3.3.3. Vehicular Circulation.

NOT USED

6.4. SITE ENGINEERING

6.4.1. Existing Topographical Conditions

A topographic survey for the running track improvements is provided in Appendix DD.

6.4.2. Existing Geotechnical conditions: See Appendix A for a preliminary geotechnical report.

NOT USED

6.4.3. Fire Flow Tests See Appendix D for results of fire flow tests to use for basis of design for fire flow and domestic water supply requirements.

NOT USED

6.4.4. Pavement Engineering and Traffic Estimates:

NOT USED

6.4.5. Traffic Signage and Pavement Markings

NOT USED

6.4.6. Base Utility Information

6.4.6.1 General: Utility Information will be coordinated and planned with Ft. Jackson Department of Public Works (DPW), the Contracting Officer's Representative (COR), and Palmetto State Utility Services, Inc. (PSUS), the privatized water utility service provider for Ft. Jackson. Prior to the start of construction, the D/B Contractor shall conduct utility coordination meetings with those listed above. The Site Layout and Utility Plan in the appendix provides utility main routing and general orientation for points of connection. The D/B Contractor is responsible for connecting into these utilities and to provide service to the facility. Dave Wiman, PSUS Utility Manager, at (803) 790-7288, is the point of contact for water and sanitary sewer requirements/information.

6.4.6.2 Utility Design and Construction: Prior to final design, the D/B Contractor shall coordinate location of utility services with PSUS. All utility meters shall be provided and installed as noted below. Utility connections will be made available to proposed building.

6.4.6.3 Refer to Heating, Ventilation and Air Conditioning section of Chapter 6 for information on chilled water and heating water service.

6.4.6.4 Coordination: The Contractor shall be responsible for coordination with the Government and PSUS for design requirement and utility connection locations. The D/B Contractor shall coordinate with Fort Jackson DPW, adjacent contractors' utility shut-offs and road closure.

6.4.6.5 Temporary Utilities: Temporary utilities will be available for the D/B Contractor's use as described in par. 6.4.4.1. All utilities shall be metered. The following are the temporary utility rates during construction: Elect \$0.10kwh, Natural Gas \$11.21dth, Water \$2.548kgal, Sewer >\$2.24kgal.

Site Electrical Utility: The existing primary power distribution system at Fort Jackson is an 8320/4800V, three phase, four wire, grounded wye system. The primary system is owned, managed, and maintained by the Fort Jackson DPW. Contractor shall provide primary service and secondary service from connection point to the facility. Power for buildings will be provided from distribution transformers. Contractor shall be responsible for designing and installing the primary feeder from the connection point to the transformer, distribution pad-mounted transformer, transformer pad and secondary feeder from the transformer to the facility. The Contractor shall coordinate closely with the DPW and the COR. Contact George Dib, DPW at (803) 751-3823, for electric requirements. See paragraph entitled SITE ELECTRICAL and TELECOMMUNICATIONS SYSTEMS for more information.

The D/B Contractor is responsible for providing potable water and fire water distribution from the service connection point to the facility. Fort Jackson's water system is a combined system. PSUS shall provide a domestic water main with a reduced pressure backflow preventer located in a DPW approved location outside the building 5 foot line. Provide a PIV and Fire Department Connection (FDC) at the building. A minimum pressure of 60 PSIG shall be provided to the building for fire protection. The design and installation of the water system shall be per PSUS and Fort Jackson's requirements. The D/B Contractor shall obtain the services of the PSUS system operator to inspect and approve the entire waterline installation. These services shall be included as a separate line item in the Contractor's bid and shall include inspection services as well as connection fees required by PSUS.

Sewer is treated off-post by the City of Columbia Waste Water Treatment Plant (WWTP). Adequate capacity is to be assumed by the designer.

Natural gas service, including meter and regulator, shall be provided by the D/B Contractor. D/B Contractor shall coordinate and provide gas flow and pressure (if different from standard pressure) building requirements to Ft. Jackson DPW. Gas may be used if required for clothes dryers, hydronic heating boilers, and domestic water heating. The D/B Contractor shall verify availability of adequate supply in their design.

Site Telecommunications Utility: Design and construction of ANY TELECOMMUNICATION systems shall be provided by the Contractor in coordination with Fort Jackson's Network Enterprise Center (NEC). The D/B Contractor shall be responsible for conduit and cable routing from the service connection point to the facility. Conduit and cabling from this connection point into the facility's main telecommunication room shall be designed and installed by the Contractor. The telecommunications design shall be coordinated with and approved by the U.S. Signal Network Enterprise Center (NEC) Quality Assurance Officer prior to construction. The contractor shall coordinate closely with NEC, DPW and the COR. Contact Eric Gibeaut, NEC at (803) 751-6543, for telecommunications requirements. See paragraph entitled SITE ELECTRICAL and TELECOMMUNICATIONS SYSTEMS for more information.

Site Cable TV (CATV) Utility: CATV is privatized and will be provided by Time Warner. Design and service to the Starships will be provided by Time Warner after contract completion. Contractor shall provide empty 4-inch conduit with pull wire from the main telecommunications room to point of connection manhole. Time Warner will provide the cable from the specified manhole to the point of demarcation in the main telecommunications room. All exterior CATV work shall be coordinated with Ft. Jackson DPW, NEC and Time Warner.

6.4.7. Cut and Fill

NOT USED

6.4.8. Borrow Material

NOT USED

6.4.9. Haul Routes and Staging Areas

See Appendix HH. Starship 4420 will use same Haul Routes as the Quad DFAC.

6.4.10. Clearing and Grubbing:

NOT USED

6.4.11. Landscaping:

NOT USED

6.4.12. Turf:

NOT USED

6.5. ARCHITECTURE

6.5.1. General: To the maximum extent possible within the contract cost limitation, the buildings shall conform to the look and feel of the architectural style and shall use the same colors as adjacent facilities as expressed herein. The Government will evaluate the extent to which the proposal is compatible with the architectural theme expressed in the RFP during the contract or task order competition. The first priority in order of importance is that the design provides comparable building mass, size, height, and configuration compared to the architectural theme expressed herein. The second priority is that design is providing compatible exterior skin appearance based upon façade, architectural character (period or style), exterior detailing, matching nearby and installation material/color pallets, as described herein.

6.5.2. Design

6.5.2.1. Appendix F is provided "For Information Only", to establish the desired site and architectural themes for the area. Appendix F identifies the desired project look and feel based on Fort Jackson's Installation Architectural Theme from existing and proposed adjacent building forms; i.e. building exterior skin, roof lines, delineation of entrances, proportions of fenestration in relation to elevations, shade and shadow effects, materials, textures, exterior color schemes, and organizational layout.

6.5.2.2. The design should address Fort Jackson's identified preferences. Implement these preferences considering the following:

- (a) Achievable within the Construction Contract Cost Limitation (CCL)
- (b) Meets Milestones within Maximum Performance Duration.
- (c) Achieves Full Scope identified in this Solicitation
- (d) Best Life-Cycle Cost Design
- (e) Meets the Specified Sustainable Design and LEED requirements
- (f) Complies with Energy Conservation Requirements Specified in this RFP.

6.5.2.3. Priority #1. Visual Compatibility: Facility Massing (Size, Height, Spacing, Architectural Theme, etc.) Exterior Aesthetic Considerations: The buildings massing, exterior functional aesthetics, and character shall create a comprehensive and harmonious blend of design features that are sympathetic to the style and context of the Installation. The Installation's intent for this area is:

to follow the Fort Jackson Installation Design Guide and provide similar design features to other Starship type barracks.

6.5.2.4. Priority #2. Architectural Compatibility: Exterior Design Elements (Materials, Style, Construction Details, etc.) Roofs, Exterior Skin, and Windows & Door Fenestrations should promote a visually appealing compatibility with the desired character while not sacrificing the integrity and technical competency of building systems.

6.5.2.5. See Appendix F for exterior colors that apply to Architectural character at Fort Jackson. The manufacturers and materials referenced are intended to establish color only, and are not intended to limit manufacturers and material selections.

6.5.2.6. Additional architectural requirements:

- (a) Install fall protection anchor points on all roofs with a slope greater than 2:12

b. Remove existing joint sealant and provide new joint sealant at all masonry and concrete walls. This applies to the outside face of all walls. Joint sealant shall be ultra-low modulus, Class 100/50, silicone compliant with ASTM C290. Provide new backer-rod as needed to comply with sealant manufacturer's application requirements. Color shall match pre-cast panel finish color. This shall only be required if Option Item 2 is not awarded.

- c. Provide panic hardware on all doors from platoon sleeping bays to stairs, corridors and balconies.

6.5.3. Programmable Electronic Key Card Access Systems:

Provide locks and access as required by paragraph 3, 5 and the COS Standard Design issued with this RFP.

6.5.4. INTERIOR DESIGN

Provide as required by paragraph 3, 5, Attachments and the COS Standard Design issued with this RFP.

Interior building signage requirements:

Provide as required by paragraph 3, 5 Attachments and the COS Standard Design issued with this RFP.

6.6. STRUCTURAL DESIGN

6.6.1 REF 3.4.6, 3.5.2, 3.5.8, 3.5.8.4, All interim and final design reviews will include supporting Structural Engineering calculations to support all depicted structural information indicated on the drawings, and shall have been checked prior to submittal for review.

6.6.2 REF 1.2, 5.4.2, Professional Engineering Licensure in the state of construction is required in accordance with applicable state codes of laws. Note that all interim and final design reviews must bear Professional Engineering stamps on both drawings and calculations.

6.6.3 REF 5.4.3, All Structural Engineering design loads will be listed on the Structural Engineering Drawings in accordance with the International Building Codes §106 and §1603, to include all design criteria required by DOD Minimum Antiterrorism Standards for Buildings. Note that all Structural Engineering design loads are required, not simply the loads or load combinations which controlled the structural design.

6.6.4 REF 5.4.3, All Structural Systems (to include Mechanical and Architectural items requiring anchorages to resist applied loads) which require Special Inspection or Structural Observation in accordance with International Building Codes §1709 shall be listed with the Structural Engineering design loads.

6.6.5 REF 5.4.3, Structural Engineering systems providing support to other components (such as masonry veneers) shall incorporate the relative rigidities/deflection limitations required by that component in accordance with the International Building Codes §1604.4.

6.7. THERMAL PERFORMANCE

Provide as required by paragraphs in 3, 5, 6.11, 6.12 and the COS Standard Design issued with this RFP.

6.8. PLUMBING

Procure the services of Palmetto State Utility Services, Inc. (PSUS), the privatized water utility service provider for Ft. Jackson for domestic water and sanitary drainage systems as noted below.

Utility Connections: The D/B Contractor is responsible for providing potable water and fire water distribution from the service connection point to the facility. The utility shall be connected as described in Paragraph 6.4.6.2 of this section and as shown on the site drawings in the appendix.

Cross Connection Control: All local site specific requirements for cross connection control / backflow prevention shall be followed. PSUS shall provide a domestic water main with a reduced pressure backflow preventer located in a DPW approved location outside the building 5 foot line. The D/B Contractor shall be responsible for connection at the 5 foot line from the building. Additionally, domestic water systems shall be protected from contamination from hydronic water systems and other HVAC systems via a reduced pressure zone backflow preventer.

Domestic Water Heating: In lieu of condensing hot water heaters as specified in 3.5.2.4.2, medium temperature heating water from Central Energy Plant (CEP) 2 shall be used for domestic water heating. The medium temperature hot water (MHW) supplied by CEP 2 is approximately 220 degrees F.

Water Service Utility Provider (WSUP) Coordination: The D/B contractor shall connect to the meter to provide domestic water service to the facility.

Sanitary sewer connections will be required as shown on the drawings. Specific points of connection for building utilities shall be coordinated with the privatized sanitary provider.

Local Post plumbing systems are as follows:

Sewer is treated off-post by the City of Columbia Waste Water Treatment Plant (WWTP). Adequate capacity is to be assumed by the designer.

Natural gas piping is black steel. PVC shall not used.

Per the International Plumbing Code, two-way sanitary cleanouts shall be provided 5 feet outside of the building perimeter for all sewer mains exiting any building.

Buildings are typically metered separately. All utilities shall be metered and interface with the building and Post TAC control systems. Meters shall provide controls systems with up to date consumption for gas, domestic water, etc.

6.9. SITE ELECTRICAL AND TELECOMMUNICATIONS SYSTEMS

6.9.1 Electrical Service: The contractor shall demolish existing secondary service, pad-mounted transformer and primary service back to nearest sectionalizing switch servicing the facility and provide new to serve the newly renovated facility.

(a) General: All electrical systems shall comply with the base Installation Design Guide or the base's designated standards. Concrete filled steel bollards shall be provided to protect exposed site electrical equipment.

(b) Primary: The contractor shall provide new primary conductors, and primary ductbank as required from point of connection to a new 8320/4800-480/277 delta-wye pad-mounted transformer including new utility meter, transformer grounding and transformer pad if necessary. The new transformer may be located within 33 feet of the building as long as the transformer provides no opportunity for concealment of explosive devices as allowed by UFC 4-010-01. The existing transformer pad and primary ductbank may be reused if possible.

(c) Secondary: Provide new secondary ductbank, secondary conductors, and service metering. Electric metering shall be located at the service entrance. Provide 25% spare underground conduits in the ductbank from the secondary of the transformer to the facility. Secondary service shall be direct-burial, thick wall type except concrete encasement shall be provided in areas subject to vehicular traffic. Transitions from below-grade to above-grade shall be galvanized rigid steel. Fittings for steel shall be steel threaded or compression type. The secondary cables shall be of sufficient length to facilitate their connection to the secondary lugs of the transformer. Installation of the cable terminators and connection to the transformer shall be done by the contractor. The contractor shall coordinate transformer sizes and locations and shall obtain transformer impedances and perform electrical calculations. Provide a 1-inch conduit from utility meter at the transformer to a data collection point located inside the building main telecommunications room.

6.9.2 Site Lighting: Site exterior lighting for parking areas, roadways and walkways, within the designated construction area, shall be designed and installed by the contractor. Light poles should be placed on a concrete base and height should be such that maintenance can be done using standard equipment. Exterior lighting shall provide a uniform appearance with the surrounding buildings.

6.9.3 Site Telecommunications: The contractor shall demolish the existing telephone, data and CATV telecommunications services back to nearest point of connection manhole or pedestal and provide new to serve the newly renovated facility. A minimum of 4 weeks advance notification shall be provided to NEC via the COR prior to any demolition of communications lines or equipment.

(a) Provide new telecommunications direct buried schedule 40 PVC ductlines as required from the point of connection into the new main telecommunications room in the facility. Provide one spare 4-inch conduit for each pair of populated conduit with a minimum of one spare conduit per run. All new ductlines shall include one 4-inch duct with three runs of 3-way Maxcell innerduct and include tracer wire.

(b) Provide new 200 pair voice grade copper cabling for telephone service from the point of connection into the new main telecommunications room in the facility and terminate.

(c) Provide new 24 strand singlemode fiber and three sets of 12 strand singlemode fiber for data service from the point of connection into the new main telecommunications room in the facility and provide any data cabling/fiber elements required within the facility. Provide service entrance termination hardware.

6.10. FACILITY ELECTRICAL AND TELECOMMUNICATIONS SYSTEMS

General Interior Power Requirements:

Design and construct the interior electrical distribution system to fully support all facility loads plus 15% spare capacity. The interior electrical distribution system will be 480Y/277 volts, 3-phase 4-wire system. A main distribution switchboard shall be provided. The switchboard shall be equipped with a distribution section containing

molded case circuit breakers, a main and metering section.

All mechanical and lighting loads will utilize 480/277V system. Step down 480 -208/120V transformers shall be provided to support receptacle and other small power loads. Transformers serving non-linear loads shall be rated for a "K" factor of 13. Step down dry-type transformers shall be of a highly efficient design with an energy star rating to ensure low power losses during no and full load conditions. Panel boards serving 208Y/120 volt harmonic loads shall have 200% rated neutral buses. Motors shall not be connected to the same power source as nonlinear loads. The designer shall use the switchboard or additional panel boards to provide power to all mechanical equipment loads.

Power Quality Systems: The facility shall be protected with a Transient Voltage Surge Suppression (TVSS) system. The service shall be provided with TVSS protection and supplemental or cascaded protection throughout the facility at critical load panels and major separately derived system distribution equipment. Each distribution panel board shall be provided with integral TVSS. TVSS shall be provided where exterior power, security, control and telecommunication system cables enter the facility. Power factor (PF) correction capacitors shall be provided on all single motors of 20 HP or greater utilizing magnetic controllers to correct the inductive circuit to 95% PF when in use. Isolation drive transformers shall be supplied with large VFDs to isolate or correct the harmonics created by silicon controlled rectifiers (SCRs) or insulated gated bipolar transistors (IGBTs).

Provide branch circuits, disconnect switches, magnetic starters, and all other related electrical equipment and material for all architectural, mechanical equipment and environmental equipment to be installed in the project (includes the facility and site). Contractor shall coordinate this electrical requirement with the architectural and mechanical requirements.

(a) Provide wiring for automated plumbing fixtures where required by architectural design.

(b) Provide and coordinate electrical circuits dedicated to provide power for telecommunications equipment. A NEMA 5-20R duplex receptacle within 6" of every telephone outlet shall be provided.

(d) Provide and coordinate all electrical power requirements for new mechanical equipment. See Mechanical Section for actual requirements.

(f) Provide connection to base Energy Monitoring and Control System (EMCS). This is to include the HVAC DDC Control System and the Electric KWH/KW Meter.

Receptacles shall be provided in accordance with NFPA 70. Duplex receptacles for general-purpose applications shall be 20 amp, 125 volt grounding type. A maximum of six duplex receptacles may be connected to a receptacle circuit. All circuits serving receptacle outlets shall be provided with a dedicated neutral conductor. Receptacle circuits shall not supply lighting loads. Lighting and receptacle outlets shall be on separate branch circuits. General-purpose duplex receptacles shall be located in the facility as follows:

Provide a duplex receptacle for each electric water cooler.

Provide dedicated duplex receptacles for the government furnished and government installed copier and fax machines.

The allowable voltage drop shall be 3% maximum from panel to "end-of-line" device or equipment and 5% from the "end-of-line" device or equipment to the transformer supplying that panel.

The electrical design shall be such that accessibility to equipment for maintenance and repair and for any possible extensions, modifications, or alterations to the systems is provided in accordance with the recommendations of the equipment manufacturer and the National Electrical Code.

Provide separate electrical and communication rooms for the equipment installed in these rooms, providing required clearances, as well as the maintenance thereof, all meeting NFPA 70 requirements. It is the designer's responsibility to determine the size of the electrical and communication rooms, based upon design requirements. The Electrical Room shall be provided for the installation of panel boards and other electrical equipment. These areas shall be dedicated solely for their purposes. No HVAC ducts or plumbing shall be routed through the dedicated electrical space or over electrical equipment. Environmental control shall be provided as needed to meet the equipment environmental requirements.

A transformer and building grounding system shall be provided. The grounding system shall consist of ground rods and a ground ring encircling the building. The communications and electrical rooms ground shall be bonded to the building ground at the main panel board. Provide ground bus system in each electrical room. Separate grounding electrode systems shall be provided for power, lightning protection, signal, etc. Provide a ground bar encircling the communications rooms. Ground bar shall be bonded to the main electrical ground. All grounding electrode systems shall have a maximum resistance to ground of 25 ohms and shall be interconnected at a single point.

Wherever empty conduits are provided, drawings shall note to be labeled with source and destination at both ends and at each pull box. Empty conduits shall require a nylon pull rope provided with 10 additional feet of pull rope coiled at each end.

Lighting:

(a) Location of light switches shall be coordinated with the floor plan and furniture layout to ensure that they are easily accessible and convenient. Location shall be coordinated with the User. All entry points into a room will require switch control for the lighting. Provide 3 and 4 way switching for rooms that have multiple entry points.

(b) The electrical sustainable design features (LEED certification) targeted for this project include light pollution reduction and energy efficient lighting and controls.

(c) Occupancy sensors and daylight dimming techniques shall be utilized wherever feasible as an energy conservation means to reduce overall electrical energy consumption. Sensors are to be infrared type where possible.

(d) Provide lighting for maintenance purposes for all areas in which mechanical equipment is located including the outdoor mechanical and electrical equipment areas.

Fluorescent fixtures used in Telecommunication Room shall use ballasts that have appropriate filtering to reduce RFI and EMI emission so as not to interfere with electronic equipment.

(e) Emergency and exit lights shall be provided throughout the facility to obtain the required foot-candle levels as outlined in the NFPA and IES standards for emergency egress illumination. Exit fixtures shall be of the LED type and shall incorporate a flasher circuit connected to the fire alarm system. The LED color shall be red with battery backup.

(f) All light fixtures, exit signs, egress light fixtures, etc., shall be of the heavy commercial grade.

IDS:

The contractor shall remove the existing arms vault IDS and turn over to Ft. Jackson Physical Security for storage during construction. The contractor shall reinstall the existing IDS in the new arms vault. The removal and reinstallation of the existing IDS shall be under the supervision of Ft. Jackson Physical Security. The existing arms vault IDS is manufactured by DAQ Electronics, Inc. and shall be removed, reinstalled and tested by a DAQ Electronics, Inc. certified technician. The removal and reinstallation of the existing IDS shall be under the supervision of Ft. Jackson Physical Security. The IDS for the arms vaults shall be installed in accordance with the Ft. Jackson ICIDS III migration project documents and phasing plan. Contact COR for the POC for these requirements. In addition, the Contractor shall provide a dedicated communication line from the nearest telecommunications room to each vault for connection by others and provide a dedicated power branch circuit to each IDS control panel.

Security Infrastructure:

The security infrastructure shall be installed to support Government furnished equipment including cameras, door alarms, and motion sensors. These devices will be utilized at all entrances into the Battalion Headquarters area of the building with the exception of utility room entrances. Infrastructure shall consist of conduit, pull wire and outlet boxes per specified user locations in the vicinity of the doors. Conduits shall be run to another j-box located above ceiling in an accessible location for ease of future cable pulling by others.

Telecommunications:

(a) Contractor shall coordinate all communications requirements with the User, and the Fort Jackson Network Enterprise Center (NEC). Design shall conform to the requirements noted herein. The scope of work covered under this statement of work shall consist of the contractor furnishing all necessary engineering, labor, material, equipment, and testing to provide voice and data communication for support of information systems of the facility. The contractor shall be responsible for installation of all cable and connection hardware. Telecommunication designer shall be a Registered Communications Distribution Designer (RCDD). The contractor will provide cabling and conduit from the nearest manhole into the building Tele-communication Entrance Facility and terminate in accordance with I3A Technical Guide and EIA/TIA 569 Standard.

(b) Contractor shall provide a complete structured cabling and pathway interior distribution for POWER, CATV, voice, PA, and LAN systems. Cabling includes cable and the fittings, connectors, terminal strips, patch panels and similar devices needed to install cable. Pathways include conduit, tubing, junction, outlet boxes, raceway, Network equipment racks and/or lockable Network equipment cabinets, ductwork, and riser system associated with the distribution of telecommunications and information systems. These systems will be made ready for the installation of Government Furnished and Government Installed (GFGI) equipment. All fiber optic connectors shall be ST type connectors. Provide separate patch panels for voice and data.

(c) Telecommunications Systems labeling shall be provided in accordance with EIA/TIA 606.

(d) The Telecommunications Room shall be sized IAW EIA/TIA 569 Commercial Building standard to provide the necessary space for all the telecommunications equipment. Carpet should not be installed in closets. Provide tile or sealed concrete floors that will protect equipment from static electricity and dust. This room will be temperature controlled for equipment cooling purposes. It will also have a locked access door with the standard Ft. Jackson communications lockset installed-key # GMF 3.

The major components of the building electrical system shall not be co-located in the telecommunications room. Closet space should be dedicated to serving telecommunication needs only. Electrical installations supporting telecommunication functions only should be located in the closet.

Provide communications channel ladder in Telecommunications Room to provide means to route cabling to racks and wall mounted termination facilities.

6.11. HEATING, VENTILATING, AND AIR CONDITIONING

6.11.1 The following provides clarification of the design intent for HVAC stated in Paragraph 3.5.2.1.2.

DOAU's serving the sleeping bays and associated company headquarters shall be split systems with the air handling unit located on the roof and the condensing unit mounted on a structural frame on the roof of the classroom/DFAC area. Split system DOAU's are used so that conditions for pre-conditioned outside air can be maintained at independent of other HVAC systems/equipment.

There is insufficient clearance to allow for separate supply and pre-conditioned outside air ducts to be routed in the ceiling space in the sleeping bays. The restricted ceiling space is also insufficient to allow full size trunk ducts to cross. A dual duct VAV box / shared load concept is used to address both these limitations.

Provide a single variable air volume (VAV) air handling unit (AHU) mounted in the existing mechanical room to serve two adjacent sleeping bays on each floor. The AHU shall supply conditioned air to one side of two dual-duct VAV boxes, one for each sleeping bay. The DOUA's shall supply cold, pre-conditioned outside air to other side of each dual duct VAV box to provide ventilation and share a portion of the baseline cooling load. Each dual duct VAV box shall have a heating coil downstream.

To help address the humidity loads that originate in the toilet area, a single duct VAV box shall supply a portion of the pre-conditioned outside air directly to the toilet spaces. The toilet exhaust quantity shall remain constant throughout the day.

Although the occupancy of the sleeping bay is variable throughout the day, the DOAU's shall be constant volume in order to make up the toilet exhaust and provide building pressurization. The VAV boxes shall not vary the amount of pre-conditioned outside air. The VAV boxes shall serve as the interface between the DOAU air and the AHU air. The quantity of pre-conditioned outside air can be controlled through the HVAC control system. The DOAU's serving the sleeping bay wings shall have supply air temperature reset, controlled by the various zone demands, to help avoid overcooling the spaces in the mid seasons.

6.11.2 Medium temperature heating water from Central Energy Plant (CEP) 2 shall be used for hydronic hot water heating. The medium temperature hot water (MHW) supplied by CEP 2 is approximately 220 degrees F. For best efficiency and control, design the building HVAC systems to operate on a hot water temperature of 140 degrees F.

6.11.3 Chilled water from CEP 2 shall be used for cooling.

6.11.4 The building UMCS shall communicate with the base UMCS via wireless transceiver. Building systems shall be fully integrated with existing base UMCS including provision of complete front-end graphics.

6.11.5 The point of contact for the UMCS is Mr. Dan Silvey, e-mail: danny.silvey@us.army.mil

Integrate the control system to the installation's existing UMCS. The existing UMCS is Lonworks

6.12. ENERGY CONSERVATION

6.12.1. General

See paragraphs 3 and 5.

6.12.2. Inclusion of Renewable Energy Features. The following renewable energy features have been determined lifecycle cost effective, are included in the project budget and shall be provided:

None required.

6.13. FIRE PROTECTION

6.13.1 Fire Protection Site Design

(a) All new and existing fire hydrants on the site will be painted as follows: all barrels are to be painted chrome yellow. The tops (bonnet) of the hydrants are to be painted with the coordinated capacity indicating color scheme as per NFPA 291 Chapter 5 (coordinate with PSUS and COR).

(b) Fire department access for roads/gates shall have an unobstructed width of not less than 20 ft. and 13 ft. 6 in. for vertical clearance IAW NFPA 1. AFTP gates must open at least 20 feet wide.

6.13.2 Fire Alarm Control Panel / Devices / Miscellaneous

Provide a new addressable Edwards Systems Technology or equal fire alarm system as prescribed by the most current version of UFC 3-600-01, NFPA 101 and installed IAW NFPA 72 to include a Mass Notification System per UFC 4-021-01- Mass Notification Systems. The Authority Having Jurisdiction (AHJ) requires the following to meet the local requirements for installation of fire alarm systems:

(a) Mass Notification: Mass notification system (MNS) shall be compatible and integrated into the Installation's existing Giant Voice system. Existing Giant Voice is a radio system consisting of both Wheelock and ATI components. New system shall be trunking capable. The MNS shall be equipped with Local Operating Consoles (LOC) and shall be design IAW the latest version of UFC 4-021-01. Provide a Local Operator Console in the CQ area for each of the five companies, one in the Battalion Headquarters, and one in each sleeping bay area in a readily accessible location. Locations shall be finalized during the design phase.

(b) Fire Alarm System: Existing local receiving system is the Monaco BT-X with narrow band technology. Provide an addressable Fire Alarm Control Panel (FACP). The fire alarm system shall meet Fort Jackson's 911 Center configuration requirements for interconnection to the fire alarm receiver. Equipment supplied shall be fully compatible with the central facility equipment. Provide ductwork smoke detectors, self resetting type and for use in high humidity, and labeled for easy location with remote test indicator at each detector. The Contractor shall specify maintenance accessibility for initiating devices to include duct detectors that is acceptable to the local fire alarm technician. No fire alarm remote annunciator is required. All conduit shall be painted with a red stripe every 10 feet or provide conduit that is solid red, as determined by the AHJ. The FACP shall be located in a conditioned space with direct access to the outside, as determined by the AHJ. All devices shall be labeled by FACP address. Locking devices shall be red. Mount FACP panel and Monaco BT-X side by side with the top of the enclosures no higher than 5'-8". Lockable circuit breakers shall be provided for the FACP and transmitter. Fire alarm zoning must also be done in accordance with local AHJ guidance and coordinated with the Fire Marshal. Provide training to Fort Jackson fire department personnel and to the local fire alarm technician on the FACP. Training shall be conducted at Fort Jackson. Provide lockable circuit breakers for the FACP.

(c) Fire Alarm System: There shall be one complete fire alarm system for each building. This system shall consist of a fire alarm panel, a RF transceiver, initiating devices and notification devices. Pull stations shall be single-action, non-glass rod type. Provide pull station covers to all pull stations to reduce accidental alarms, as determined by the AHJ. No audible horn is required on the covers. Class A addressable systems shall be installed. Provide 10% replacement initiating devices for the alarm system. The fire alarm system shall be designed by a professional Fire Protection Engineer. The installation of the fire alarm system shall be managed by a NICET Level III fire alarm system qualified technician. The technician shall be factory trained and certified for fire alarm system installation and emergency communications system installation of the specific type and brand of system and who are acceptable to the AHJ. Technician shall comply with the requirements of UFC 3-600-01.

(d) Coordinate with Fort Jackson's Directorate of Emergency Services for specific Fire Alarm System Installation requirements. POC Information: Assistant Chief Scott Dollman (803) 751-1614 HYPERLINK "mailto:scott.dollman@us.army.mil"scott.dollman@us.army.mil <blockedmailto:scott.dollman@us.army.mil> , Inspector Peter Hines (803) 751-1611 HYPERLINK "mailto:peter.hines@us.army.mil"peter.hines@us.army.mil, Inspector Jamal Black (803) 751-5239 HYPERLINK "mailto:jamal.black@us.army.mil"jamal.black@us.army.mil, or Inspector Gino Sita (803) 751-1610 HYPERLINK "mailto:aniello.sita@us.army.mil"aniello.sita@us.army.mil.

(e) Provide necessary documentation (including rights to documentation and data), configuration information, configuration tools, programs, drivers, equipment specific interfacing cable and other software shall be licensed to and otherwise remain with the Government such that the Government or its agents are able to perform repair, replacement, upgrades, and expansions of the system without subsequent or future dependence on the Contractor.

(f) Provide a full sized set of the fire alarm system 'as-built plans' directly to the local fire alarm technician.

(g) The RF transceiver shall be compatible with the fire department's receiving system, operating on a RF frequency and shall be coordinated with the fire department POC.

(h) Provide Knox Box with tamper switch that is monitored by the FACP. Ordering information and forms are available from the Fort Jackson Fire Department.

6.13.3 Fire Extinguishers

Fire extinguishers are GFGI. Provide recessed cabinets to accommodate GFGI extinguishers. Cabinets will not require breaking glass to access the fire extinguishers.

6.13.4 Fire Suppression Systems

- (a) Provide a complete automatic sprinkler system in accordance with NFPA 13, NFPA 101, and UFC 3-600-01.
- (b) Provide a wet/dry standpipe for each wing of the starship.

6.13.5 OS&Y Valves- Any valve on fire protection water back flow preventer which can act as a control valve shall be secured and monitored via the fire alarm panel so that the Fire Department is notified if the water supply to the building is secured.

6.14. SUSTAINABLE DESIGN

6.14.1. LEED Rating Tool Version. This project shall be executed using LEED-NC Version 3.

6.14.2. The minimum requirement for this project is to achieve LEED Silver level. Each non-exempt facility (building plus sitework) must achieve this level. In addition to any facilities indicated as exempt in paragraph 3, the following facilities are exempt from the minimum LEED achievement requirement: None.

6.14.3. Credit Validation: LEED registration, compiling of documentation at LEED OnLine and use of the LEED Letter Templates is required. Registration and payment of registration fees will be by the Contractor. Administration/team management of the online project will be by the Contractor. Validation of credits will be accomplished by the Government. LEED certification of the project by the Contractor is not required. The Government may choose to seek LEED certification of the project, in which case the Government will pay certification fees and coordinate with the GBCI and the Contractor will furnish audit data as requested at no additional cost.

6.14.4. Commissioning: See Appendix M for Owner's Project Requirements document(s).

6.14.5. LEED Credits Coordination. The following information is provided relative to Sustainable Sites and other credits.

SS Credit 1 Site Selection:

Project site IS NOT considered prime farmland.

Project site is five feet or more above 100-year flood elevation.

Project site contains no habitat for threatened or endangered species.

No portion of project site lies within 100 feet of any water, wetlands or areas of special concern.

Project site WAS NOT previously used as public parkland.

SS Credit 2 Development Density & Community Connectivity.

Project site DOES NOT meet the criteria for this credit.

SS Credit 3 Brownfield Redevelopment.

Project site DOES NOT meet the criteria for this credit.

SS Credit 4.1 Public Transportation Access.

Project site DOES NOT meets the criteria for this credit.

EA Credit 6 Green Power.

35% of the project's electricity WILL NOT will be provided through an Installation renewable energy contract. Do not purchase Renewable Energy Credits (REC's) to earn this credit.

MR Credit 2 Construction Waste Management.

The Installation does not have an on-post recycling facility available for Contractor's use.

Regional Priority Credits (Version 3 only)

The project zip code is 29207.

6.14.6. LEED Credit Preferences, Guidance and Resources. See Appendix L LEED Project Credit Guidance for supplemental information relating to individual credits.

6.14.7. Not Used

6.14.8. Additional Information

Not used.

6.15. ENVIRONMENTAL

Asbestos abatement is required. See Appendix E-Environmental. Asbestos survey is provided. Lead Based paint survey is also provided. See also Environmental Protection Specification Section 01 57 20.00.

6.16. PERMITS

6.16.1 General. Obtaining permits shall be the responsibility of the Contractor. The Contractor shall be responsible for obtaining all applicable permits (local, state, and federal) as part of the design process and shall secure all permits necessary for construction of this project within the designated building area limits. The Government will not obtain any permits for this project. All permit preparers must be registered/qualified in the state of South Carolina. The Contractor is required to pay all permitting fees associated with this project, at no additional expense to the Government. The Contractor shall prepare all permits, providing all required information and supporting documentation in a form ready for signature by the Owner and submittal to the applicable agency. Should the permitting agency require additional clarification or information during the permit review process, the Contractor shall provide all necessary assistance to resolve the outstanding issue. The Contractor is responsible for complying with all local, State and Federal regulatory requirements.

6.16.2 Air Permits.

The Contractor shall be responsible for coordinating with Fort Jackson's Environmental Management Division (EMD) staff in obtaining all required and applicable permits as part of the design process and shall secure all permits necessary for construction of this project. Fort Jackson operates under a Title V Air Permit for air quality requirements, and the contractor is required to perform a regulatory review of all air sources in the project and submit for approval to the EMD. Each Congressional Appropriation is defined as one project. Additionally, new sources must be reviewed for NESHAP (National Emissions Standards for Hazardous Air Pollutants) applicability. Contractor is required to develop required air permit application(s) and/or coordinate with EMD on any on-going permit applications. Contractor is responsible for all air permitting fees and all required permits shall be obtained prior to construction of any new sources. Contractor is responsible for complying with all State regulatory requirements for boilers fired by either natural gas or distillate oil, and insuring that the boiler(s) is included in the Installation's Title V Air Permit. New boilers with an input greater than 10 million btu/hr shall meet 40 CFR Part 60, New Source Performance Standards. All new boilers shall include low NOx burners. The Contractor is required to have an air permit for each type of material (i.e. concrete, rock crushing, asphalt batch plants) that will produce dust

and other harmful particulates within the boundaries of the installation. The Installation's Title V Air Permit cannot be changed unilaterally by the Contractor, and the Contractor shall coordinate any and all changes/modifications through the designated EMD staff.

6.16.2.1 Air Permit Submittal Requirements (Boilers and Domestic Water Heaters).

Pursuant to satisfying requirements under the Clean Air Act, at or before the 60 percent design stage, the D/B Contractor shall submit the following to the installation's environmental office:

- (1) A listing of boilers and domestic hot water heaters that will be fired by natural gas, propane, and/or fuel oil
- (2) The fuel or fuels (primary and backup, if applicable) that will be utilized for each piece of equipment
- (3) The quantity of each particular size
- (4) The respective input firing rate. The document shall also provide a point of contact and an alternate point of contact, should the environmental office require additional information from the designer of record during the permitting process. Furthermore, two copies of the document shall also be sent to the Savannah District, one to the Project Manager for placement in Central Files, and another to the Mechanical Section.
- (5) This document shall not be sent prematurely, since any increase in boiler sizing subsequent to submission of the document will require revision to the permitting process. In any event, if there is a change in equipment sizing during refinement of the design process, an updated copy of said document shall be submitted per the guidance above.
- (6) Additionally, the D/B Contractor is responsible for incorporating into the design the equipment accessories required for compliance with the governing environmental laws. This includes, but is not limited to, determining the need for individual metering and the level of emissions monitoring required. The D/B Contractor's concept design narrative shall specifically address those features that will be incorporated into the boiler system design to assure compliance with the applicable environmental laws of the State.
- (7) Prior to the submission of form DD 1354 Acceptance of Real Property, the Contractor shall submit to EMD copies of all required Federal and/or State certifications associated with emission units, i.e. visible emissions certifications. The dates that the certifications are turned into EMD shall be noted in the remarks section of form DD 1354.

Proposers shall be aware that, normally, for fast track design-build contracts, the construction permit will not have been obtained prior to award of the design-build contract. No construction associated with the building(s) housing the boiler(s) or other source(s) of contaminant can be done prior to obtaining the required permit. Generally, only the following things can be done prior to possession of the permit: clearing and grading, access roads, driveways, parking lots, underground utilities up to the 5- foot line of the buildings, and ancillary structures (structures not associated with housing the sources of contaminants).

6.16.3 Notice of Intent (NOI) Requirements.

The NOI for Stormwater Runoff from Construction Activities, and all fees required, shall be filed by the Barracks' Contractor prior to construction start. The D/B Contractor shall be responsible for coordinating all requirements of the permit with the Barracks' Contractor, to include signing the NOI as a Co-Permittee.

6.16.4 Dust Permit.

Contractor is required to prepare and follow a Fugitive Dust Control Plan (FDCP). The FDCP shall include dust suppression techniques, such as wetting exposed soil, to prevent the generation of dust.

6.16.5 Soil Erosion.

NOT USED

6.16.6 An Installation digging permit is required.

6.16.7 NPDES Construction Permit is required.

6.16.8 No diesel generators are permitted.

6.17. DEMOLITION

Demolition required for this project includes all work necessary to complete the renovation and addition work on Building 4420. Demolition required in this project also includes all work necessary to complete the work on the running track.

Salvage to the Corp of Engineers all fire extinguishers, drinking fountains, DFAC kitchen equipment, fire alarm and other equipment as indicated by Corps of Engineers. Protect salvaged items from damage related to construction activities and storage. Contractor is responsible for verifying all material for salvage with the Corps of Engineers.

6.18. ADDITIONAL FACILITIES

Additional facilities include the running track.

End of Section 01 10 00.000x

**SECTION 01 33 00.000x
SUBMITTAL PROCEDURES
(DESIGN-BUILD TASK ORDERS)**

1.0 GENERAL

- 1.13. GOVERNMENT APPROVED OR CONCURRED WITH SUBMITTALS
- 1.14. INFORMATION ONLY SUBMITTALS

1.0 GENERAL

1.1.1. This section contains requirements specifically applicable to this task order. The requirements of Base ID/IQ contract Section 01 33 30 apply to this task order, except as otherwise specified herein.

1.13. GOVERNMENT APPROVED OR CONCURRED WITH SUBMITTALS

Upon completion of review of submittals requiring Government approval or concurrence, the Government will stamp and date the submittals as approved or concurred. The Government will retain zero(0) copies of the submittal and return zero(0) copy(ies) of the submittal.

1.14. INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Approval of the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe. The Government will retain zero(0) copies of information only submittals.

End of Section 01 33 00.000x

**SECTION 01 33 16
DESIGN AFTER AWARD**

1.0 GENERAL INFORMATION

1.1. INTRODUCTION

1.2. DESIGNER OF RECORD

2.0 PRODUCTS (Not Applicable)

3.0 EXECUTION

3.1. PRE-WORK ACTIVITIES & CONFERENCES

3.1.1. Design Quality Control Plan

3.1.2. Post Award Conference

3.1.3. Partnering & Project Progress Processes

3.1.4. Initial Design Conference

3.1.5. Pre-Construction Conference

3.2. STAGES OF DESIGN SUBMITTALS AND OVER THE SHOULDER PROGRESS REVIEWS

3.2.1. Site/Utilities

3.2.2. Interim Design Submittals

3.2.3. Over-the-Shoulder Progress Reviews

3.2.4. Final Design Submissions

3.2.5. Design Complete Submittals

3.2.6. Holiday Periods for Government Review or Actions

3.2.7. Late Submittals and Reviews

3.3. DESIGN CONFIGURATION MANAGEMENT

3.3.1. Procedures

3.3.2. Tracking Design Review Comments

3.3.3. Design and Code Checklists

3.4. INTERIM DESIGN REVIEWS AND CONFERENCES

3.4.1. General

3.4.2. Procedures

3.4.3. Conference Documentation

- 3.5. INTERIM DESIGN REQUIREMENTS
 - 3.5.1. Drawings
 - 3.5.2. Design Analyses
 - 3.5.3. Geotechnical Investigations and Reports
 - 3.5.4. LEED Documentation
 - 3.5.5. Energy Conservation
 - 3.5.6. Specifications
 - 3.5.7. Building Rendering
 - 3.5.8. Interim Building Design Contents
- 3.6. FINAL DESIGN REVIEWS AND CONFERENCES
- 3.7. FINAL DESIGN REQUIREMENTS
 - 3.7.1. Drawings
 - 3.7.2. Design Analysis
 - 3.7.3. Specifications
 - 3.7.4. Submittal Register
 - 3.7.5. Preparation of DD Form 1354 (Transfer of Real Property)
 - 3.7.6. Acceptance and Release for Construction
- 3.8. DESIGN COMPLETE CONSTRUCTION DOCUMENT REQUIREMENTS
- 3.9. SUBMITTAL DISTRIBUTION, MEDIA AND QUANTITIES
 - 3.9.1. Submittal Distribution and Quantities
 - 3.9.2. Web based Design Submittals
 - 3.9.3. Mailing of Design Submittals
- 3.10. AS-BUILT DOCUMENTS

ATTACHMENT A STRUCTURAL INTERIOR DESIGN (SID) REQUIREMENTS

ATTACHMENT B FURNITURE, FIXTURES AND EQUIPMENT REQUIREMENTS

ATTACHMENT C TRACKING COMMENTS IN DRCHECKS

ATTACHMENT D SAMPLE FIRE PROTECTION AND LIFE SAFETY CODE REVIEW

ATTACHMENT E LEED SUBMITTALS

ATTACHMENT F BUILDING INFORMATION MODELING REQUIREMENTS

ATTACHMENT G DESIGN SUBMITTAL DIRECTORY AND SUBDIRECTORY FILE ARRANGEMENT

1.0 GENERAL INFORMATION

1.1. INTRODUCTION

1.1.1. The information contained in this section applies to the design required after award. After award, the Contractor will develop the accepted proposal into the completed design, as described herein.

1.1.2. The Contractor may elect to fast track the design and construction that is, proceed with construction of parts of the sitework and facilities prior to completion of the overall design. To facilitate fast tracking, the Contractor may elect to divide the design into no more than ten (10) design packages per major facility type and no more than three (3) design packages for site and associated work. Designate how it will package the design, consistent with its overall plan for permitting (where applicable) and construction of the project. See Sections 01 33 00 SUBMITTAL PROCEDURES and 01 32 01.00 10 PROJECT SCHEDULE for requirements for identifying and scheduling the design packaging plan in the submittal register and project schedule. See also Sections 01 10 00 STATEMENT OF WORK and 01 57 20.00 10 ENVIRONMENTAL PROTECTION for any specified permit requirements. If early procurement of long-lead item construction materials or installed equipment, prior to completion of the associated design package, is necessary to facilitate the project schedule, also identify those long-lead items and how it will assure design integrity of the associated design package to meet the contract requirements (The Contract consists of the Solicitation requirements and the accepted proposal). Once the Government is satisfied that the long-lead items meet the contract requirements, the Contracting Officer will allow the Contractor to procure the items at its own risk.

1.1.3. The Contractor may proceed with the construction work included in a separate design package after the Government has reviewed the final (100%) design submission for that package, review comments have been addressed and resolved to the Government's satisfaction and the Contracting Officer (or the Administrative Contracting Officer) has agreed that the design package may be released for construction.

1.1.4. **INTEGRATED DESIGN.** To the maximum extent permitted for this project, use a collaborative, integrated design process for all stages of project delivery with comprehensive performance goals for siting, energy, water, materials and indoor environmental quality and ensures incorporation of these goals. Consider all stages of the building lifecycle, including deconstruction.

1.2. DESIGNER OF RECORD

Identify, for approval, the Designer of Record ("DOR") that will be responsible for each area of design. One DOR may be responsible for more than one area. Listed, Professional Registered, DOR(s) shall account for all areas of design disciplines shall be accounted for by a listed. The DOR's shall stamp, sign, and date each design drawing and other design deliverables under their responsible discipline at each design submittal stage (see contract clause Registration of Designers). If the deliverables are not ready for release for construction, identify them as "preliminary" or "not for release for construction" or by using some other appropriate designation. The DOR(s) shall also be responsible for maintaining the integrity of the design and for compliance with the contract requirements through construction and documentation of the as-built condition by coordination, review and approval of extensions of design, material, equipment and other construction submittals, review and approval or disapproval of requested deviations to the accepted design or to the contract, coordination with the Government of the above activities, and by performing other typical professional designer responsibilities.

2.0 PRODUCTS (Not Applicable)

3.0 EXECUTION

3.1. PRE-WORK ACTIVITIES & CONFERENCES

3.1.1. Design Quality Control Plan

Submit for Government acceptance, a Design Quality Control Plan in accordance with Section 01 45 04.00 10 CONTRACTOR QUALITY CONTROL before design may proceed.

3.1.2. Post Award Conference

3.1.2.1. The government will conduct a post award contract administration conference at the project site, as soon as possible after contract award. This will be coordinated with issuance of the contract notice to proceed (NTP). The Contractor and major sub-contractor representatives shall participate. All designers need not attend this first meeting. Government representatives will include COE project delivery team members, facility users, facility command representatives, and installation representatives. The Government will provide an agenda, meeting goals, meeting place, and meeting time to participants prior to the meeting.

3.1.2.2. The post award conference shall include determination and introduction of contact persons, their authorities, contract administration requirements, discussion of expected project progress processes, and coordination of subsequent meetings for quality control (see Section 01 45 04.00 10 CONTRACTOR QUALITY CONTROL), Partnering (see below and SCR: Partnering), and the initial design conference (see below).

3.1.2.3. The government will introduce COE project delivery team members, facility users, facility command representatives, and installation representatives. The DB Contractor shall introduce major subcontractors, and other needed staff. Expectations and duties of each person shall be defined for all participants. A meeting roster shall be developed and distributed by the government with complete contact information including name, office, project role, phone, mailing and physical address, and email address.

3.1.3. Partnering & Project Progress Processes

3.1.3.1. The initial Partnering conference may be scheduled and conducted at any time with or following the post award conference. The Government proposes to form a partnership with the DB Contractor to develop a cohesive building team. This partnership will involve the COE project delivery team members, facility users, facility command representatives, installation representatives, Designers of Record, major subcontractors, contractor quality control staff, and contractor construction management staff. This partnership will strive to develop a cooperative management team drawing on the strengths of each team member in an effort to achieve a quality project within budget and on schedule. This partnership will be bilateral in membership and participation will be totally voluntary. All costs, excluding labor and travel expenses, shall be shared equally between the Government and the Contractor. The Contractor and Government shall be responsible for their own labor and travel costs. Normally, partnering meetings will be held at or in the vicinity of the project installation.

3.1.3.2. As part of the partnering process, the Government and Contractor shall develop, establish, and agree to comprehensive design development processes including conduct of conferences, expectations of design development at conferences, fast-tracking, design acceptance, Structural Interior Design (SID)/ Furniture, Fixtures & Equipment (FF&E) design approval, project closeout, etc. The government will explain contract requirements and the DB Contractor shall review their proposed project schedule and suggest ways to streamline processes.

3.1.4. Initial Design Conference

The initial design conference may be scheduled and conducted at the project installation any time after the post award conference, although it is recommended that the partnering process be initiated with or before the initial design conference. Any design work conducted after award and prior to this conference should be limited to site and is discouraged for other items. All Designers of Record shall participate in the conference. The purpose of the meeting is to introduce everyone and to make sure any needs the contractor has are assigned and due dates established as well as who will get the information. See also Attachment F, BUILDING INFORMATION MODELING REQUIREMENTS for discussion concerning the BIM Implementation Plan demonstration at this meeting. The DB Contractor shall conduct the initial design conference.

3.1.5. Pre-Construction Conference

Before starting construction activities, the Contractor and Government will jointly conduct a pre-construction administrative conference to discuss any outstanding requirements and to review local installation requirements for start of construction. It is possible there will be multiple Pre-Construction Conferences based on the content of the design packages selected by the Contractor. The Government will provide minutes of this meeting to all participants.

3.2. STAGES OF DESIGN SUBMITTALS AND OVER THE SHOULDER PROGRESS REVIEWS

The stages of design submittals described below define Government expectations with respect to process and content. The Contractor shall determine how to best plan and execute the design and review process for this project, within the parameters listed below. As a minimum, the Government expects to see at least one interim design submittal, at least one final design submittal before construction of a design package may proceed and at least one Design Complete submittal that documents the accepted design. The Contractor may sub-divide the design into separate packages for each stage of design and may proceed with construction of a package after the Government accepts the final design for that package. See discussion on waivers to submission of one or more intermediate design packages where the parties partner during the design process. See also Attachment F, BUILDING INFORMATION MODELING REQUIREMENTS for discussion concerning BIM and the various stages of design submittals and over-the-shoulder progress reviews.

3.2.1. Site/Utilities

To facilitate fast-track design-construction activities the contractor may submit a final (100%) site and utility design as the first design submittal or it may elect to submit interim and final site and utility design submittals as explained below. Following review, resolution, and incorporation of all Government comments, and submittal of a satisfactory set of site/utility design documents, after completing all other pre-construction requirements in this contract and after the pre-construction meeting, the Government will allow the Contractor to proceed with site development activities, including demolition where applicable, within the parameters set forth in the accepted design submittal. For the first site and utility design submission, whether an interim or final, the submittal review, comment, and resolution times from this specification apply, except that the Contractor shall allow the Government a 14 calendar day review period, exclusive of mailing time. No on-site construction activities shall begin prior to written Government clearance to proceed.

3.2.2. Interim Design Submittals

The Contractor may submit either a single interim design for review, representing a complete package with all design disciplines, or split the interim design into smaller, individual design packages as it deems necessary for fast-track construction purposes. As required in Section 01 32 01.00 10 PROJECT SCHEDULE, the Contractor shall schedule its design and construction packaging plan to meet the contract completion period. This submission is the Government's primary opportunity to review the design for conformance to the solicitation and to the accepted contract proposal and to the Building Codes at a point where required revisions may be still made, while minimizing lost design effort to keep the design on track with the contract requirements. The requirements for the interim design review submittals and review conferences are described hereinafter. This is not necessarily a hold point for the design process; the Contractor may designate the interim design submittal(s) as a snapshot and proceed with design development at its own risk. See below for a waiver, where the parties establish an effective over-the-shoulder progress review procedure through the partnering process that would eliminate the need for or expedite a formal intermediate design review on one or more individual design packages.

3.2.3. Over-the-Shoulder Progress Reviews

To facilitate a streamlined design-build process, the Government and the Contractor may agree to one-on-one reviewer or small group reviews, electronically, on-line (if available within the Contractor's standard design practices) or at the Contractor's design offices or other agreed location, when practicable to the parties. The Government and Contractor will coordinate such reviews to minimize or eliminate disruptions to the design process. Any data required for these reviews shall normally be provided in electronic format, rather than in hard copy. If the Government and Contractor establish and implement an effective, mutually agreeable partnering procedure for regular (e.g., weekly) over-the-shoulder review procedures that allow the Government reviewers the opportunity to keep fully informed of the progress, contents, design intent, design documentation, etc. of the design package, the Government will agree to waive or to expedite the formal intermediate design review period for that package. The Contractor shall still be required to submit the required intermediate design documentation, however the parties may agree to how that material will be provided, in lieu of a formal consolidated submission of the package. It should be noted that Government funding is extremely limited for non-local travel by design reviewers, so the maximum use of virtual teaming methods must be used. Some possible examples include electronic file sharing, interactive software with on-line or telephonic conferencing, televideo conferencing, etc. The Government must still perform its Code and Contract conformance reviews, so the Contractor is encouraged to partner with the reviewers to find ways to facilitate this process and to facilitate meeting or bettering the design-build schedule. The Contractor shall maintain a fully functional configuration management system as described herein to track design revisions, regardless of whether or not there is a need for a formal intermediate design review. The formal intermediate

review procedures shall form the contractual basis for the official schedule, in the event that the partnering process determines that the formal intermediate review process to be best suited for efficient project execution. However, the Government pledges to support and promote the partnering process to work with the Contractor to find ways to better the design schedule.

3.2.4. Final Design Submissions

This submittal is required for each design package prior to Government acceptance of that design package for construction. The requirements for the final design submittal review conferences and the Government's acceptance for start of construction are described herein after.

3.2.5. Design Complete Submittals

After the final design submission and review conference for a design package, revise the design package to incorporate the comments generated and resolved in the final review conferences, perform and document a back-check review and submit the final, design complete documents, which shall represent released for construction documents. The requirements for the design complete submittals are described hereinafter.

3.2.6. Holiday Periods for Government Review or Actions

Do not schedule meetings, Government reviews or responses during the last two weeks of December or other designated Government Holidays (including Friday after Thanksgiving). Exclude such dates and periods from any durations specified herein for Government actions.

3.2.7. Late Submittals and Reviews

If the Contractor cannot meet its scheduled submittal date for a design package, it must revise the proposed submittal date and notify the government in writing, at least one (1) week prior to the submittal, in order to accommodate the Government reviewers' other scheduled activities. If a design submittal is over one (1) day late in accordance with the latest revised design schedule, or if notification of a proposed design schedule change is less than seven (7) days from the anticipated design submission receipt date, the Government review period may be extended up to seven (7) days due to reviewers' schedule conflicts. If the Government is late in meeting its review commitment and the delay increases the Contractor's cost or delays completion of the project, the Suspension of Work and Defaults clauses provide the respective remedy or relief for the delay.

3.3. DESIGN CONFIGURATION MANAGEMENT

3.3.1. Procedures

Develop and maintain effective, acceptable design configuration management (DCM) procedures to control and track all revisions to the design documents after the Interim Design Submission through submission of the As-Built documents. During the design process, this will facilitate and help streamline the design and review schedule. After the final design is accepted, this process provides control of and documents revisions to the accepted design (See Special Contract Requirement: Deviating From the Accepted Design). The system shall include appropriate authorities and concurrences to authorize revisions, including documentation as to why the revision must be made. The DCM data shall be available to the Government reviewers at all times. The Contractor may use its own internal system with interactive Government concurrences, where necessary or may use the Government's "DrChecks Design Review and Checking System" (see below and Attachment C).

3.3.2. Tracking Design Review Comments

Although the Contractor may use its own internal system for overall design configuration management, the Government and the Contractor shall use the DrChecks Design Review and Checking System to initiate, respond to, resolve and track Government design compliance review comments. This system may be useful for other data which needs to be interactive or otherwise available for shared use and retrieval. See Attachment C for details on how to establish an account and set-up the DrChecks system for use on the project.

3.3.3. Design and Code Checklists

Develop and complete various discipline-specific checklists to be used during the design and quality control of each submittal. Submit these completed checklists with each design submittal, as applicable, as part of the project documentation. See Section 01 45 04.00 10 Contractor Quality Control, Attachment D for a Sample Fire Protection and Life Safety Code review checklist and Attachment E for LEED SUBMITTALS.

3.4. INTERIM DESIGN REVIEWS AND CONFERENCES

3.4.1. General

At least one interim design submittal, review and review conference is required for each design package (except that, per paragraph 3.2.1, the Contractor may skip the interim design submission and proceed directly to final design on the sitework and utilities package). The DB Contractor may include additional interim design conferences or over-the-shoulder reviews, as needed, to assure continued government concurrence with the design work. Include the interim submittal review periods and conferences in the project schedule and indicate what part of the design work is at what percentage of completion. The required interim design conferences shall be held when interim design requirements are reached as described below. See also Paragraph: **Over-the-Shoulder Progress Reviews** for a waiver to the formal interim design review.

3.4.2. Procedures

After receipt of an Interim Design submission, allow the Government fourteen (14) calendar days after receipt of the submission to review and comment on the interim design submittal. For smaller design packages, especially those that involve only one or a few separate design disciplines, the parties may agree on a shorter review period or alternative review methods (e.g., over-the-shoulder or electronic file sharing), through the partnering process. For each interim design review submittal, the COR will furnish, to the Contractor, a single consolidated, validated listing of all comments from the various design sections and from other concerned agencies involved in the review process using the DrChecks Design Review and Checking System. The review will be for conformance with the technical requirements of the solicitation and the Contractor's RFP proposal. If the Contractor disagrees technically with any comment or comments and does not intend to comply with the comment, he/she must clearly outline, with ample justification, the reasons for noncompliance within five (5) days after receipt of these comments in order that the comment can be resolved. Furnish disposition of all comments, in writing, through DrChecks. The Contractor is cautioned that if it believes the action required by any comment exceeds the requirements of this contract, that it should take no action and notify the COR in writing immediately. The Interim Review conference will be held for each design submittal at the installation. Bring the personnel that developed the design submittal to the review conference. The conference will take place the week after the receipt of the comments by the Contractor. For smaller fast-track packages that involve only a few reviewers, the parties may agree to alternative conferencing methods, such as teleconferencing, or televideo, where available, as determined through Partnering.

3.4.3. Conference Documentation

3.4.3.1. In order to facilitate and accelerate the Government code and contract conformance reviews, identify, track resolution of and maintain all comments and action items generated during the design process and make this available to the designers and reviewers prior to the Interim and subsequent design reviews.

3.4.3.2. The DB Contractor shall prepare meeting minutes and enter final resolution of all comments into DrChecks. Copies of comments, annotated with comment action agreed on, will be made available to all parties before the conference adjourns. Unresolved problems will be resolved by immediate follow-on action at the end of conferences. Incorporate valid comments. The Government reserves the right to reject design document submittals if comments are significant. Participants shall determine if any comments are critical enough to require further design development prior to government concurrence. Participants shall also determine how to proceed in order to obtain government concurrence with the design work presented.

3.5. INTERIM DESIGN REQUIREMENTS

Interim design deliverables shall include drawings, specifications, and design analysis for the part of design that the Contractor considers ready for review.

3.5.1. Drawings

Include comments from any previous design conferences incorporated into the documents to provide an interim design for the "part" submitted.

3.5.2. Design Analyses

3.5.2.1. The designers of record shall prepare and present design analyses with calculations necessary to substantiate and support all design documents submitted. Address design substantiation required by the applicable codes and references and pay particular attention to the following listed items:

3.5.2.2. For parts including sitework, include site specific civil calculations.

3.5.2.3. For parts including structural work, include structural calculations.

- (a) Identify all loads to be used for design.
- (b) Describe the method of providing lateral stability for the structural system to meet seismic and wind load requirements. Include sufficient calculations to verify the adequacy of the method.
- (c) Provide calculations for all principal roof, floor, and foundation members and bracing and secondary members.
- (d) Provide complete seismic analyses for all building structural, mechanical, electrical, architectural, and building features as dictated by the seismic zone for which the facility is being constructed.
- (e) Computer generated calculations must identify the program name, source, and version. Provide input data, including loads, loading diagrams, node diagrams, and adequate documentation to illustrate the design. The schematic models used for input must show, as a minimum, nodes/joints, element/members, materials/properties, and all loadings, induced settlements/deflections, etc., and a list of load combinations. Include an output listing for maximum/minimum stresses/forces and deflections for each element and the reactions for each loading case and combination.
- (f) See also the Security (Anti-Terrorism) requirements below for members subject to Anti-Terrorist Force Protection (ATFP) and Progressive Collapse requirements.
- (g) Fully coordinate and integrate the overall structural design between two different or interfacing construction types, such as modular and stick-built or multistory, stacked modular construction. Provide substantiation of structural, consolidation/settlement analysis, etc., as applicable, through the interfaces.

3.5.2.4. For Security (Anti-Terrorism): Provide a design narrative and calculations where applicable, demonstrating compliance with each of the 22 standards in UFC 4-010-01, which includes Design of Buildings to Resist Progressive Collapse (use the most recent version of UFC 4-023-03, regardless of references to any specific version in UFC 4-010-01). Where sufficient standoff distance is not being provided, show calculations for blast resistance of the structural system and building envelope. Show complete calculations for members subjected to ATFP loads, e.g., support members of glazed items (jamb, headers, sills) connections of windows to support members and connections of support members to the rest of the structure. For 3 story and higher buildings, provide calculations to demonstrate compliance with progressive collapse requirements.

3.5.2.5. For parts including architectural work, include building floor area analysis.

3.5.2.6. For parts including mechanical work, include HVAC analysis and calculations. Include complete design calculations for mechanical systems. Include computations for sizing equipment, compressed air systems, air duct design, and U-factors for ceilings, roofs and exterior walls and floors. Contractor shall employ commercially available energy analysis techniques to determine the energy performance of all passive systems and features. Use of hourly energy load computer simulation is required (see paragraph 3.5.5.2 for list of acceptable software). Based on the results of calculations, provide a complete list of the materials and equipment proposed with the manufacturer's published cataloged product installation specifications and roughing-in data.

3.5.2.7. For parts including life safety, include building code analysis and sprinkler and other suppression systems. Notwithstanding the requirements of the Codes, address the following:

- (a) A registered fire protection engineer (FPE) must perform all fire protection analyses. Provide the fire protection engineer's qualifications. See Section 01 10 00, paragraph 5 for qualifications.

- (b) Provide all references used in the design including Government design documents and industry standards used to generate the fire protection analysis.
- (c) Provide classification of each building in accordance with fire zone, building floor areas and height and number of stories.
- (d) Provide discussion and description of required fire protection requirements including extinguishing equipment, detection equipment, alarm equipment and water supply. Alarm and detection equipment shall interface to requirements of Electronic Systems.
- (e) Provide hydraulic calculations based on water flow test for each sprinkler system to insure that flow and pressure requirements can be met with current water supply. Include copies of Contractor's water flow testing done to certify the available water source.

3.5.2.8. For parts including plumbing systems:

- (a) List all references used in the design.
- (b) Provide justification and brief description of the types of plumbing fixtures, piping materials and equipment proposed for use.
- (c) Detail calculations for systems such as sizing of domestic hot water heater and piping; natural gas piping; LP gas piping and tanks, fuel oil piping and tanks, etc., as applicable.
- (d) When the geotechnical report indicates expansive soils are present, indicate in the first piping design submittal how piping systems will be protected against damage or backfall/backflow due to soil heave (from penetration of slab to the 5 foot building line).

3.5.2.9. For elevator systems:

- (a) List all criteria codes, documents and design conditions used.
- (b) List any required permits and registrations for construction of items of special mechanical systems and equipment.

3.5.2.10. For parts including electrical work, include lighting calculations to determine maintained foot-candle levels, electrical load analysis and calculations, electrical short circuit and protective device coordination analysis and calculations and arc fault calculations.

3.5.2.11. For parts including telecommunications voice/data (including SIPRNET, where applicable), include analysis for determining the number and placement of outlets

3.5.2.12. For Cathodic Protection Systems, provide the following stamped report by the licensed corrosion engineer or NACE specialist with the first design submission. The designer must be qualified to engage in the practice of corrosion control of buried or submerged metallic surfaces. He/she must be accredited or certified by the National Association of Corrosion Engineers (NACE) as a NACE Accredited Corrosion Specialist or a NACE certified Cathodic Protection Specialist, or must be a registered professional engineer with a minimum of five years experience in corrosion control and cathodic protection, Clearly describe structures, systems or components in soil or water to be protected. Describe methods proposed for protection of each.

3.5.3. Geotechnical Investigations and Reports:

3.5.3.1. The contractor's licensed geotechnical engineer shall prepare a final geotechnical evaluation report, to be submitted along with the first foundation design submittal. Make this information available as early as possible during the over-the-shoulder progress review process. Summarize the subsurface conditions and provide recommendations for the design of appropriate utilities, foundations, floor slabs, retaining walls, embankments, and pavements. Include compaction requirements for fill and backfill under buildings, sidewalks, other structures and open areas. Recommend foundation systems to be used, allowable bearing pressures for footings, lateral load resistance capacities for foundation systems, elevations for footings, grade beams, slabs, etc. Provide an assessment of post-construction settlement potential including total and differential. Provide recommendations regarding lateral earth pressures (active, at-rest, passive) to be used in the design of retaining walls. Include the recommended spectral accelerations and Site Class for seismic design along with an evaluation of any seismic hazards and recommendations for mitigation, if required. Include calculations to support the recommendations for bearing capacity, settlement, and pavement sections. Include supporting documentation for all recommended

design parameters such as Site Class, shear strength, earth pressure coefficients, friction factors, subgrade modulus, California Bearing Ratio (CBR), etc. Provide earthwork recommendations, expected frost penetration, expected groundwater levels, recommendations for dewatering and groundwater control and the possible presence of any surface or subsurface features that may affect the construction of the project such as sinkholes, boulders, shallow rock, old fill, old structures, soft areas, or unusual soil conditions. Include pH tests, salinity tests, resistivity measurements, etc., required to design corrosion control and grounding systems. Include the raw field data. Arrange a meeting with the Government subsequent to completion and evaluation of the site specific geotechnical exploration to outline any differences encountered that are inconsistent with the Government provided preliminary soils information. Clearly outline differences which require changes in the foundation type, or pavement and earthwork requirements from that possible and contemplated using the Government furnished preliminary soils investigation, which result in a change to the design or construction. Any equitable adjustment is subject to the provisions of the contract's Differing Site Conditions Clause.

3.5.3.2. Vehicle Pavements: The Contractor's geotechnical report shall contain flexible and rigid pavement designs, as applicable for the project, including design CBR and modulus of subgrade reaction and the required compaction effort for subgrades and pavement layers. Provide Information on the types of base course materials available in the area and design strengths.

3.5.3.3. The Contractor and the professional geotechnical engineer consultant shall certify in writing that the design of the project has been developed consistent with the Contractor's final geotechnical report. The certification shall be stamped by the consulting professional geotechnical engineer and shall be submitted with the first design submission. If revisions are made to the initial design submission, a new certification shall be provided with the final design submission.

3.5.4. LEED Documentation:

Assign a LEED Accredited Professional, responsible to track LEED planning, performance and documentation for each LEED credit through construction closeout. Incorporate LEED credits in the plans, specifications and design analyses. Develop LEED supporting documentation as a separable portion of the Design Analysis and provide with each required design submittal. Include the LEED Project checklist for each non-exempt facility (one checklist may be provided for multiple facilities in accordance with the LEED-NC Application Guide for Multiple Buildings and On-Campus Building Projects and the LEED SUBMITTALS (Attachment E, herein) with each submittal. Final design submittal for each portion of the work must include all required design documentation relating to that portion of work (example - all site credit design documents with final site design). Submittal requirements are as indicated in Attachment E, LEED SUBMITTALS. Submit all documentation indicated on Attachment E as due at final design at final design submittal (for fast-track projects with multiple final design submittals, this shall be at the last scheduled final design submittal). All project documentation related to LEED shall conform to USGBC requirements for both content and format, including audit requirements and be separate from other design analyses. Maintain and update the LEED documentation throughout project progress to construction closeout and shall compile product data, receipts, calculations and other data necessary to substantiate and support all credits claimed. The Government may audit any or all individual credits. Audit documentation is not required to be submitted unless requested. These requirements apply to all projects. If the project requires the Contractor to obtain USGBC certification, the Contractor shall also be responsible for obtaining USGBC certification and shall provide written evidence of certification with the construction closeout LEED documentation submittal. Install the USGBC building plaque at the location indicated by the Government upon receipt. If Contractor obtains USGBC interim design review, submit the USGBC review to the Government within 30 days of receipt for information only.

3.5.4.1. LEED Documentation for Technology Solution Set. If the Solicitation provides a Prescriptive Technology Solution Set, use of the Technology Solution set has no effect on LEED documentation requirements. Provide all required LEED documentation, including energy analysis, in accordance with LEED requirements when using the Technology Solution Set.

3.5.5. Energy Conservation:

3.5.5.1. Refer to Section 01 10 00, Paragraph 5. Interim and Final Design submittals shall demonstrate that each building including the building envelope, HVAC systems, service water heating, power, and lighting systems meet the Mandatory Provisions and the Prescriptive Path requirements of ASHRAE 90.1. Use Compliance Documentation forms available from ASHRAE and included in the ASHRAE 90.1 User's Manual for this purpose. The Architectural Section of the Design Analysis shall include completed forms titled "Building Envelope

Compliance Documentation Parts I and II". The Heating Ventilating and Air Conditioning (HVAC) Section of the Design Analysis shall include a completed form titled "HVAC Simplified Approach Option - Part I" if this approach is allowed by the Standard. Otherwise, the HVAC Section of the Design Analysis shall include completed forms titled "HVAC Mandatory Provisions - Part II" and "HVAC Prescriptive Requirements - Part III". The Plumbing Section of the Design Analysis shall include a completed form titled "Service Water Heating Compliance Documentation". The Electrical Section of the Design Analysis shall include an explanatory statement on how the requirements of ASHRAE 90.1-2004 Chapter 8 Power were met. The Electrical Section of the Design Analysis shall also include a completed form titled "Lighting Compliance Documentation".

3.5.5.2. Interim and Final Design submittals which address energy consuming systems, (heating, cooling, service hot water, lighting, power, etc.) must also include calculations in a separate Energy Conservation Section of the Design Analysis which demonstrate and document (a) the baseline energy consumption for the facility or facilities under contract, that would meet the requirements of ANSI/ASHRAE/IESNA Standard 90.1 and (b) the energy consumption of the facility or facilities under contract utilizing the materials and methods required by this construction contract. Use the USGBC Energy and Atmosphere (EA) Credit 1 compliance template / form or an equivalently detailed form for documenting compliance with the energy reduction requirements. This template / form is titled PERFORMANCE RATING METHOD and is available when the project is registered for LEED. The calculation methodology used for this documentation and analysis shall follow the guidelines set forth in Appendix G of ASHRAE 90.1, with two exceptions: a) receptacle and process loads may be omitted from the calculation; and b) the definition of the terms in the formula for Percentage Improvement found in paragraph G1.2 are modified as follows: Baseline Building Performance shall mean the annual energy consumption calculated for a building design intended for use as a baseline for rating above standard design meeting the minimum requirements of the energy standard, and Proposed Building Performance shall mean annual energy consumption calculated for the proposed building design intended for construction. This calculation shall address all energy consuming systems in a single integrated methodology. Include laboratory fume hoods and kitchen ventilation loads in the energy calculation. They are not considered process loads. Individual calculations for heating, cooling, power, lighting, power, etc. systems will not be acceptable. The following building simulation software is acceptable for use in calculating building energy consumption: Hourly Analysis Program (HAP) by Carrier Corp., TRACE 700 by Trane Corp., DOE-2 by US Department of Energy, EnergyPlus by DOD/DOE.

3.5.6. Specifications

Specifications may be any one of the major, well known master guide specification sources (use only one source) such as MASTERSPEC from the American Institute of Architects, SPECTEXT from Construction Specification Institute or Unified Facility Guide Specifications (UFGS using MASTERFORMAT 2004 numbering system), etc. (including specifications from these sources). Manufacturers' product specifications, utilizing CSI's Manu-Spec, three part format may be used in conjunction with the selected specifications. The designers of record shall edit and expand the appropriate Specifications to insure that all project design requirements, current code requirements, and regulatory requirements are met. Specifications shall clearly identify, where appropriate, specific products chosen to meet the contract requirements (i.e., manufacturers' brand names and model numbers or similar product information).

3.5.7. Building Rendering

Present and provide a draft color computer, artist, or hand drawn rendering with the conceptual design submittal of the building exterior. Perspective renderings shall include a slightly overhead view of the entire building to encompass elevations and the roof configuration of the building. After Government review and acceptance, provide a final rendering, including the following:

Three (3) 18" x 24" color prints, framed and matted behind glass with project title underneath the print.

One (1) Image file (high resolution) in JPG format on CD for those in the submittal distribution list.

3.5.8. Interim Building Design Contents

The following list represents what the Government considers should be included in the overall completed design for a facility or project. It is not intended to limit the contractor from providing different or additional information as needed to support the design presented, including the require design analyses discussed above. As the Contractor develops individual design packages and submits them for Interim review, include as much of the applicable

information for an individual design package as is developed at the Interim design level for review purposes. These pieces shall be developed as the design progresses toward the design complete stage.

3.5.8.1. Lawn and Landscaping Irrigation System

3.5.8.2. Landscape, Planting and Turfing

3.5.8.3. Architectural

- (a) Design Narrative
- (b) Architectural Floor Plans, Typical Wall and Roof Sections, Elevations
- (c) Finish schedule
- (d) All required equipment
- (e) Special graphics requirements
- (f) Door and Window Schedules
- (g) Hardware sets using BHMA designations
- (h) Composite floor plan showing all pre-wired workstations
- (i) Structural Interior Design (SID) package: See ATTACHMENT A for specific requirements
- (j) Furniture, Fixtures & Equipment (FF&E) design package: See ATTACHMENT B for specific requirements

3.5.8.4. Structural Systems. Include:

- (a) Drawings showing principal members for roof and floor framing plans as applicable
- (b) Foundation plan showing main foundation elements where applicable
- (c) Typical sections for roof, floor, and foundation conditions

3.5.8.5. Plumbing Systems

- (a) Show locations and general arrangement of plumbing fixtures and major equipment
- (b) Plan and isometric riser diagrams of all areas including hot water, cold water, waste and vent piping. Include natural gas (and meter as required), (natural gas and meter as required), (LP gas), (fuel oil) and other specialty systems as applicable.
- (c) Include equipment and fixture connection schedules with descriptions, capacities, locations, connection sizes and other information as required

3.5.8.6. HVAC Systems

- (a) Mechanical Floor Plans: The floor plans shall show all principle architectural features of the building which will affect the mechanical design. The floor plans shall also show the following:
 - (1) Room designations.
 - (2) Mechanical legend and applicable notes.
 - (3) Location and size of all ductwork and piping.
 - (4) Location and capacity of all terminal units (i.e., registers, diffusers, grilles, hydronic baseboards).
 - (5) Pre-Fabricated Paint Spray Booth (where applicable to project scope)
 - (6) Paint Preparation Area (where applicable to project scope)
 - (7) Exhaust fans and specialized exhaust systems.
 - (8) Thermostat location.
 - (9) Location of heating/cooling plant (i.e., boiler, chiller, cooling tower, etc).
 - (10) Location of all air handling equipment.

- (11) Air balancing information.
- (12) Flue size and location.
- (13) Piping diagram for forced hot water system (if used).
- (b) Equipment Schedule: Provide complete equipment schedules. Include:
 - (1) Capacity
 - (2) Electrical characteristics
 - (3) Efficiency (if applicable)
 - (4) Manufacturer's name
 - (5) Optional features to be provided
 - (6) Physical size
 - (7) Minimum maintenance clearances
- (a) Details: Provide construction details, sections, elevations, etc., only where required for clarification of methods and materials of design.
- (b) HVAC Controls: Submit complete HVAC controls equipment schedules, sequences of operation, wiring and logic diagrams, Input/Output Tables, equipment schedules, and all associated information. See the Statement of Work for additional specific requirements.

3.5.8.7. Fire Protection and Life Safety.

- (a) Provide plan for each floor of each building that presents a compendium of the total fire protection features being incorporated into the design. Include the following types of information:
 - (1) The location and rating of any fire-resistive construction such as occupancy separations, area separations, exterior walls, shaft enclosures, corridors, stair enclosures, exit passageways, etc.
 - (2) The location and coverage of any fire detection systems
 - (3) The location and coverage of any fire suppression systems (sprinkler risers, standpipes, etc.)
 - (4) The location of any other major fire protection equipment
 - (5) Indicate any hazardous areas and their classification
 - (6) Schedule describing the internal systems with the following information: fire hazard and occupancy classifications, building construction type, GPM/square foot sprinkler density, area of operation and other as required
- (b) Working plans and all other materials submitted shall meet NFPA 13 requirements, with respect to required minimum level of detail.

3.5.8.8. Elevators. Provide:

- (a) Description of the proposed control system
- (b) Description, approximate capacity and location of any special mechanical equipment for elevators.

3.5.8.9. Electrical Systems.

- (a) Electrical Floor Plan(s): Show all principle architectural features of the building which will affect the electrical design. Show the following:
 - (1) Room designations.
 - (2) Electrical legend and applicable notes.
 - (3) Lighting fixtures, properly identified.
 - (4) Switches for control of lighting.
 - (5) Receptacles.

- (6) Location and designation of panelboards. Clearly indicate type of mounting required (flush or surface) and reflect accordingly in specifications.
- (7) Service entrance (conduit and main disconnect).
- (8) Location, designation and rating of motors and/or equipment which requires electrical service. Show method of termination and/or connection to motors and/or equipment. Show necessary junction boxes, disconnects, controllers (approximate only), conduit stubs, and receptacles required to serve the motor and/or equipment.
- (b) Building Riser Diagram(s) (from pad-mounted transformer to unit load center panelboard): Indicate the types and sizes of electrical equipment and wiring. Include grounding and metering requirements.
- (c) Load Center Panelboard Schedule(s): Indicate the following information:
 - (1) Panelboard Characteristics (Panel Designation, Voltage, Phase, Wires, Main Breaker Rating and Mounting.
 - (2) Branch Circuit Designations.
 - (3) Load Designations.
 - (4) Circuit Breaker Characteristics. (Number of Poles, Trip Rating, AIC Rating)
 - (5) Branch Circuit Connected Loads (AMPS).
 - (6) Special Features
- (d) Lighting Fixture Schedule(s): Indicate the following information:
 - (1) Fixture Designation.
 - (2) General Fixture Description.
 - (3) Number and Type of Lamp(s).
 - (4) Type of Mounting.
 - (5) Special Features.
- (e) Details: Provide construction details, sections, elevations, etc. only where required for clarification of methods and materials of design.

3.5.8.10. Electronic Systems including the following responsibilities:

- (a) Fire Detection and Alarm System. Design shall include layout drawings for all devices and a riser diagram showing the control panel, annunciator panel, all zones, radio transmitter and interfaces to other systems (HVAC, sprinkler, etc.)
- (b) Fire Suppression System Control. Specify all components of the Fire Suppression (FS) System in the FS section of the specifications. Clearly describe how the system will operate and interact with other systems such as the fire alarm system. Include a riser diagram on the drawings showing principal components and interconnections with other systems. Include FS system components on drawing legend. Designate all components shown on floor plans "FS system components" (as opposed to "Fire Alarm components"). Show location of FS control panels, HVAC control devices, sensors, and 120V power panel connections on floor plans. Indicate zoning of areas by numbers (1, 2, 3) and detectors sub-zoned for cross zoning by letter designations (A and B). Differentiate between ceiling mounted and under floor detectors with distinct symbols and indicate sub-zone of each.
- (c) Public Address System
- (d) Special Grounding Systems. Completely reflect all design requirements in the specifications and drawings. Specifications shall require field tests (in the construction phase), witnessed by the Government, to determine the effectiveness of the grounding system. Include drawings showing existing construction, if any.
- (e) Cathodic Protection.
- (f) Intrusion Detection, Card Access System
- (g) Central Control and Monitoring System
- (h) Mass Notification System
- (i) Electrical Power Distribution Systems

3.5.8.11. Information Systems including the following responsibilities:

- (a) Telecommunications Cabling
- (b) Supporting Infrastructure
- (a) Outside Plant (OSP) Cabling - Campus or Site Plans - Exterior Pathways and Inter-Building Backbones
 - (a) Include a layout of the voice/data outlets (including voice only wall & pay phones) on telecommunication floor plan drawing, location of SIPRNET data outlets (where applicable), and a legend and symbol definition to indicate height above finished floor. Show size of conduit and cable type and size on Riser Diagram. Do not show conduit runs between backboard and outlets on the floor plans. Show underground distribution conduit and cable with sizing from point of presence to entrance facility of building.
 - (b) Layout of complete building per floor - Serving Zone Boundaries, Backbone Systems, and Horizontal Pathways including Serving Zones Drawings - Drop Locations and Cable ID's
 - (c) Communication Equipment Rooms - Plan Views - Tech and AMEP/Elevations - Racks and Walls. Elevations with a detailed look at all telecomm rooms. Indicate technology layout (racks, ladder-racks, etc.), mechanical/electrical layout, rack elevation and backboard elevation. They may also be an enlargement of a congested area of T1 or T2 series drawing.

3.6. FINAL DESIGN REVIEWS AND CONFERENCES

A final design review and review conference will be held upon completion of final design at the project installation, or – where equipment is available - by video teleconference or a combination thereof, for any design package to receive Government acceptance to allow release of the design package for construction. For smaller separate design packages, the parties may agree on alternative reviews and conferences (e.g., conference calls and electronic file sharing, etc.) through the Partnering process. Include the final design conference in the project schedule and shall indicate what part of the design work is at 100% completion. The final design conference will be held after the Government has had seven (7) calendar days after receipt of the submission to review the final design package and supporting data. For smaller packages, especially those involving only one or a few design disciplines the parties may agree on a shorter period.

3.7. FINAL DESIGN REQUIREMENTS

Final design deliverables for a design package shall consist of 100% complete drawings, specifications, submittal register and design analyses for Government review and acceptance. The 100% design submission shall consist of drawings, specifications, updated design analyses and any permits required by the contract for each package submitted. In order to expedite the final design review, prior to the conference, ensure that the design configuration management data and all review comment resolutions are up-to-date. Include the 100% SID and 100% FF&E binders for government approval. The Contractor shall have performed independent technical reviews (ITR's) and back-checks of previous comment resolutions, as required by Section 01 45 04.00 10 CONTRACTOR QUALITY CONTROL, including providing documentation thereof.

3.7.1. Drawings

3.7.1.1. Submit drawings complete with all contract requirements incorporated into the documents to provide a 100% design for each package submitted.

3.7.1.2. Prepare all drawings with the Computer-Aided Design and Drafting (CADD)/Computer-Aided Design (CAD) system, organized and easily referenced electronically, presenting complete construction information.

3.7.1.3. Drawings shall be complete. The Contractor is encouraged to utilize graphics, views, notes, and details which make the drawings easier to review or to construct but is also encouraged to keep such materials to those that are necessary.

3.7.1.4. Provide detail drawings that illustrate conformance with the contract. Include room finish schedules, corresponding color/finish/special items schedules, and exterior finish schedules that agree with the submitted SID binders.

3.7.1.5. The design documents shall be in compliance with the latest version of the A/E/C CADD Standard, available at <https://caddim.usace.army.mil/CAD>. Use the approved vertical Corps of Engineers title blocks and borders on all drawings with the appropriate firm name included within the title block area.

3.7.1.6. CAD System and Building Information Modeling (BIM) (NOTE: If this is a Single Award or Multiple Award, Indefinite Delivery/Indefinite Quantity Contract, this information will be provided for each task order.)

All CAD files shall be fully compatible with MicroStation V8 or higher. Save all design CAD files as MicroStation V8 or higher files. All submitted BIM Models and associated Facility Data shall be fully compatible with Bentley BIM file format and the USACE Bentley BIM v8 Workspace.

(a) CAD Data Final File Format: During the design development capture geo-referenced coordinates of all changes made to the existing site (facility footprint, utility line installations and alterations, roads, parking areas, etc) as a result of this contract. There is no mandatory methodology for how the geo-referenced coordinates will be captured, however, Engineering and Construction Bulletin No. 2006-15, Subject: Standardizing Computer Aided Design (CAD) and Geographic Information Systems (GIS) Deliverables for all Military Design and Construction Projects identifies the format for final as-built drawings and data sets to be delivered to the government. Close-out requirements at the as-built stage; require final geo-referenced GIS Database of the new facility along with all exterior modifications. The Government will incorporate this data set into the Installation's GIS Masterplan or Enterprise GIS System. See also, Section 01 78 02.00 10 Closeout Submittals.

(b) Electronic Drawing Files: In addition to the native CAD design files, provide separate electronic drawing files (in editable CAD format and Adobe Acrobat PDF version 7.0 or higher) for each project drawing.

(c) Each file (both CAD and PDF) shall represent one complete drawing from the drawing set, including the date, submittal phase, and border. Each drawing file shall be completely independent of any data in any other file, including fonts and shapes not included with the basic CAD software program utilized. Drawing files with external references or special fonts are not acceptable. All displayed graphic elements on all levels of the drawing files shall be part of the project drawing image. The drawing files shall not contain any graphic element that is not part of the drawing image.

(d) Deliver BIM Model and associated Facility Data files in their native format. At a minimum, BIM files shall address major architecture design elements, major structural components, mechanical systems and electrical/communication distribution and elements as defined in Attachment F. See Attachment F for additional BIM requirements.

(e) Drawing Index: Provide an index of drawings sheet in CAD as part of the drawing set, and an electronic list in Microsoft Excel of all drawings on the CD. Include the electronic file name, the sheet reference number, the sheet number, and the sheet title, containing the data for each drawing.

(f) Hard Copies: Plot submitted hard copy drawings directly from the "electronic drawing files" and copy for quantities and sizes indicated in the distribution list at the end of this specification section. The Designers of Record shall stamp, sign and date original hard copy sheets as Released For Construction, and provide copies for distribution from this set.

3.7.2. Design Analyses

3.7.2.1. The designers of record shall update, finalize and present design analyses with calculations necessary to substantiate and support all design documents submitted.

3.7.2.2. The responsible DOR shall stamp, sign and date the design analysis. Identify the software used where, applicable (name, version, vendor). Generally, provide design analyses, individually, in an original (file copy) and one copy for the assigned government reviewer.

3.7.2.3. All disciplines review the LEED design analysis in conjunction with their discipline-specific design analysis; include a copy of the separable LEED design analysis in all design analysis submittals.

3.7.2.4. Do not combine multi-disciplined volumes of design-analysis, unless multiple copies are provided to facilitate multiple reviewers (one copy per each separate design analysis included in a volume).

3.7.3. Specifications

Specifications shall be 100% complete and in final form.

3.7.4. Submittal Register

Prepare and update the Submittal Register and submit it with the 100% design specifications (see Specification Section 01 33 00, SUBMITTAL PROCEDURES) with each design package. Include the required submittals for each specification section in a design package in the submittal register.

3.7.5. Preparation of DD Form 1354 (Transfer of Real Property)

This form itemizes the types, quantities and costs of various equipment and systems that comprise the project, for the purpose of transferring the new construction project from the Corps Construction Division to the Installation's inventory of real property. The Government will furnish the DB Contractor's design manager a DD Form 1354 checklist to use to produce a draft Form 1354. Submit the completed checklist and prepared draft Form DD 1354 with the 100% design in the Design Analysis. The Corps will use these documents to complete the final DD 1354 upon completion of construction.

3.7.6. Acceptance and Release for Construction

3.7.6.1. At the conclusion of the Final Design Review (after resolutions to the comments have been agreed upon between DOR and Government reviewers), the Contracting Officer or the ACO will accept the Final Design Submission for the design package in writing and allow construction to start for that design package. The Government may withhold acceptance until all major corrections have been made or if the final design submission requires so many corrections, even though minor, that it isn't considered acceptably complete.

3.7.6.2. Government review and acceptance of design submittals is for contract conformance only and shall not relieve the Contractor from responsibility to fully adhere to the requirements of the contract, including the Contractor's accepted contract proposal, or limit the Contractor's responsibility of design as prescribed under Special Contract Requirement: "Responsibility of the Contractor for Design" or limit the Government's rights under the terms of the contract. The Government reserves the right to rescind inadvertent acceptance of design submittals containing contract deviations not separately and expressly identified in the submittal for Government consideration and approval.

3.8. DESIGN COMPLETE CONSTRUCTION DOCUMENT REQUIREMENTS

After the Final Design Submission and Review Conference and after Government acceptance of the Final Design submission, revise the design documents for the design package to incorporate the comments generated and resolved in the final review conference, perform and document a back-check review and submit the final, design complete documents. Label the final design complete documents "FOR CONSTRUCTION" or use similar language. In addition to the final drawings and specifications, the following deliverables are required for distribution and field use. The deliverable includes all documentation and supporting design analysis in final form, as well as the final review comments, disposition and the back-check. As part of the quality assurance process, the Government may perform a back-check of the released for construction documentation. Promptly correct any errors or omissions found during the Government back-check. The Government may withhold retainage from progress payments for work or materials associated with a final design package until this submittal has been received and the Government determines that it is complete.

3.9. SUBMITTAL DISTRIBUTION, MEDIA AND QUANTITIES

3.9.1. Submittal Distribution and Quantities

General: The documents which the Contractor shall submit to the Government for each submittal are listed and generally described in preceding paragraphs in this Section. Provide copies of each design submittal and design substantiation as follows (NOTE: If this is a Single Award or Multiple Award, Indefinite Delivery/Indefinite Quantity Contract, this information will be provided for each task order):

Activity and Address	Drawing Size (Full Size) ANSI D Full Sets/ *Partial Sets	Design Analyses & Specs Full Sets/ *Partial Sets	Drawing Size (Half Size) Half Size Full Sets/ *Partial Sets	Non-BIM Data CD-ROM or DVD as Necessary (PDF & .dgn)	Furniture Submittal (FFE)	Structural Interior Design Submittal	BIM Data DVD (Per Attachment F)
Commander, U.S. Army Engineer District Charleston	1/1	2/2	5/5	3	1	1	1
Commander, U.S. Army Engineer District, Center of Standardization Fort Worth	0/0	5/0	5/0	5	1	1	2
Installation	0/0	0/0	0/0	0	0	0	0
U.S. Army Corps of Engineers Construction Area Office	3/3	10/10	12/12	5	3	3	3
Information Systems Engineering Command (ISEC)	0/0	0/1	0/0	1	1 (Electronic only)	N/A	1
Other Offices	1/1	1/1	2/2	2	1	1	10

***NOTE: For partial sets of drawings, specifications and design analyses, see paragraph 3.9.3.3, below.**

****NOTE: When specified below in 3.9.2, furnish Installation copies of Drawings as paper copies, in lieu of the option to provide secure web-based submittals.**

3.9.2. Web based Design Submittals

Except for full or half-sized drawings for Installation personnel, as designated in the Table above, Web based design submittals will be acceptable as an alternative to the paper copies listed in the Table above, provided a single hard-copy PDF based record set is provided to the Contracting Officer for record purposes. Where the contract requires the Contractor to submit documents to permitting authorities, still provide those authorities paper copies (or in an alternate format where required by the authority). Web based design submittal information shall be provided with adequate security and availability to allow unlimited access those specifically authorized to Government reviewers while preventing unauthorized access or modification. File sizes must be of manageable size for reviewers to quickly download or open on their computers. As a minimum, drawings shall be full scale on American National Standards Institute (ANSI) D sheets (34" x 22"). In addition to the optional website, provide the BIM data submission on DVD to each activity and address noted above in paragraph 3.9.1 for each BIM submission required in Attachment F.

3.9.3. Mailing of Design Submittals

3.9.3.1. Mail all design submittals to the Government during design and construction, using an overnight mailing service. The Government will furnish the Contractor addresses where each copy shall be mailed to after award of the contract (or individual task order if this is an indefinite delivery/indefinite quantity, task order contract). Mail the submittals to zero (0) different addresses. Assemble drawing sheets, specs, design analyses, etc. into individual sets; do not combine duplicate pages from individual sets so that the government has to assemble a set.

3.9.3.2. Each design submittal shall have a transmittal letter accompanying it indicating the date, design percentage, type of submittal, list of items submitted, transmittal number and point of contact with telephone number.

3.9.3.3. Provide partial sets of drawings, specifications, design analyses, etc., as designated in the Table in paragraph 3.9.1, to those reviewers who only need to review their applicable portions of the design, such as the various utilities. The details of which office receives what portion of the design documentation will be worked out after award.

3.10. AS-BUILT DOCUMENTS

Provide as-built drawings and specifications in accordance with Section 01 78 02.00 10, CLOSEOUT SUBMITTALS. Update LEED design phase documentation during construction as needed to reflect construction changes and advancing project completion status (example - Commissioning Plan updates during construction phase) and include updated LEED documentation in construction closeout submittal.

ATTACHMENT A STRUCTURAL INTERIOR DESIGN (SID) REQUIREMENTS

1.0 GENERAL INFORMATION

Structural Interior Design includes all building related elements and components generally part of the building itself, such as wall finishes, ceilings finishes, floor coverings, marker/bulletin boards, blinds, signage and built in casework. Develop the SID in conjunction with the furniture footprint.

2.0 STRUCTURAL INTERIOR DESIGN (SID) REQUIREMENTS FOR THE INTERIM AND FINAL DESIGN SUBMITTALS

2.1. FORMAT AND SCHEDULE

Prepare and submit for approval an interior and exterior building finishes scheme for an interim design submittal. The DOR shall meet with and discuss the finish schemes with the appropriate Government officials prior to preparation of the schemes to be presented. Present original sets of the schemes to reviewers at an interim design conference.

At the conclusion of the interim phase, after resolutions to the comments have been agreed upon between DOR and Government reviewers, the Contractor may proceed to final design with the interior finishes scheme presented.

The SID information and samples are to be submitted in 8 ½" x 11" format using three ring binders with pockets on the inside of the cover. When there are numerous pages with thick samples, use more than one binder. Large D-ring binders are preferred to O-ring binders. Use page protectors that are strong enough to keep pages from tearing out. Anchor large or heavy samples with mechanical fasteners, Velcro, or double-faced foam tape rather than rubber cement or glue. Fold out items must have a maximum spread of 25 ½". Provide cover and spine inserts sheets identifying the document as "Structural Interior Design" package. Include the project title and location, project number, Contractor/A/E name and phone number(s), submittal stage and date.

Design submittal requirements include, but are not limited to:

2.1.1. Narrative of the Structural Interior Design Objectives

The SID shall include a narrative that discusses the building related finishes. Include topics that relate to base standards, life safety, sustainable design issues, aesthetics, durability and maintainability, discuss the development and features as they relate to the occupants requirements and the building design.

2.1.2. Interior Color Boards

Identify and key each item on the color boards to the contract documents to provide a clear indication of how and where each item will be used. Arrange finish samples to the maximum extent possible by room type in order to illustrate room color coordination. Label all samples on the color boards with the manufacturer's name, patterns and colors name and number. Key or code samples to match key code system used on contract drawings.

Material and finish samples shall indicate true pattern, color and texture. Provide photographs or colored photocopies of materials or fabrics to show large overall patterns in conjunction with actual samples to show the actual colors. Finish samples must be large enough to show a complete pattern or design where practical.

Color boards shall include but not be limited to original color samples of the following:

All walls finishes and ceiling finishes, including corner guards, acrylic wainscoting and wall guards/chair rail finishes

All tile information, including tile grout color and tile patterns.

- All flooring finishes, including patterns.
- All door, door frame finishes and door hardware finishes
- All signage, wall base, toilet partitions, locker finishes and operable/folding partitions and trim

- All millwork materials and finishes (cabinets, counter tops, etc.)
- All window frame finishes and window treatments (sills, blinds, etc.)

Color board samples shall reflect all actual finish textures, patterns and colors required as specified. Patterned samples shall be of sufficient size to adequately show pattern and its repeat if a repeat occurs.

2.1.3. Exterior Color Boards

Prepare exterior finishes color boards in similar format as the interior finishes color boards, for presentation to the reviewers during an interim design conference. Provide original color samples of all exterior finishes including but not limited to the following:

- All Roof Finishes
- All Brick and Cast Stone Samples
- All Exterior Insulation and Finish Samples
- All Glass Color Samples
- All Exterior Metals Finishes
- All Window & Door Frame Finishes
- All Specialty Item Finishes, including trim

Identify each item on the exterior finishes color boards and key to the building elevations to provide a clear indication of how and where each item will be used.

2.2. STRUCTURAL INTERIOR DESIGN DOCUMENTS

2.2.1. General

Structural interior design related drawings must indicate the placement of extents of SID material, finishes and colors and must be sufficiently detailed to define all interior work. The following is a list of minimum requirements:

2.2.2. Finish Color Schedule

Provide finish color schedule(s) in the contract documents. Provide a finish code, material type, manufacturer, series, and color designations. Key the finish code to the color board samples and drawings.

2.2.3. Interior Finish Plans

Indicate wall and floor patterns and color placement, material transitions and extents of interior finishes.

2.2.4. Furniture Footprint Plans

Provide furniture footprint plans showing the outline of all freestanding and systems furniture for coordination of all other disciplines.

2.2.5. Interior Signage

Include interior signage plans or schedules showing location and quantities of all interior signage. Key each interior sign to a quantitative list indicating size, quantity of each type and signage text.

2.2.6. Interior Elevations, Sections and Details

Indicate material, color and finish placement.

**ATTACHMENT B
FURNITURE, FIXTURES & EQUIPMENT (FF&E) REQUIREMENTS**

1.0 FF&E REQUIREMENTS FOR THE INTERIM AND FINAL DESIGN SUBMITTALS

1.1. FORMAT AND SCHEDULE

Prepare and submit for approval a comprehensive FF&E scheme for an interim design submittal. The Contractor's interior designer, not a furniture dealer, shall develop the design. FF&E is the selection, layout, specification and documentation of furniture includes but is not limited to workstations, seating, tables, storage and shelving, filing, trash receptacles, clocks, framed artwork, artificial plants, and other accessories. Contract documentation is required to facilitate pricing, procurement and installation. The FF&E package is based on the furniture footprint developed in the Structural Interior Design (SID) portion of the interior design. Develop the FF&E package concurrently with the building design to ensure that there is coordination between the electrical outlets, switches, J-boxes, communication outlets and connections, and lighting as appropriate. In addition, coordinate layout with other building features such as architectural elements, thermostats, location of TV's, GF/GI equipment (for example computers, printers, copiers, shredders, faxes), etc. Locate furniture in front of windows only if the top of the item falls below the window and unless otherwise noted, do not attach furniture including furniture systems to the building. If project has SIPRNET and/or NIPRNET, coordinate furniture layout with SIPRNET and NIPRNET separation requirements. Verify that access required by DOIM for SIPRNET box and conduit is provided. The DOR shall interview appropriate Government personnel to determine FF&E requirements for furniture and furnishings prior to preparation of the scheme to be presented. Determine FFE items and quantities by, but not limited to: (1) the number of personnel to occupy the building, (2) job functions and related furniture/office equipment to support the job function, (3) room functions, (4) rank and grade. Present original sets of the scheme to reviewers at an interim design conference upon completion of the interim architectural submittal or three months prior to the submittal of the final FF&E package (whichever comes first).

Design may proceed to final with the FF&E scheme presented at the conclusion of the interim phase, after resolutions to the comments have been agreed upon between DOR and Government reviewers.

Provide six copies of the electronic versions of all documents upon completion of the final architectural submittal or ten months prior to the contract completion date (whichever comes first), to ensure adequate time for furniture acquisition. Provide unbound, electronic drawings in CAD and BIM. Provide all files needed to view complete drawings. Submit all text documents in Microsoft Word or Excel..

Submit three copies of the final and complete FF&E information and samples in 8 ½" x 11" format using three ring binders with pockets on the inside of the cover upon completion of the final architectural submittal or ten months prior to the contract completion date (whichever comes first). Use more than one binder when there are numerous pages with thick samples. Large D-ring binders are preferred to O-ring binders. Use page protectors that are strong enough to keep pages from tearing out for upholstery and finish boards. Anchor large or heavy samples with mechanical fasteners, Velcro, or double-faced foam tape rather than rubber cement or glue. Fold out items must have a maximum spread of 25 ½". Provide cover and spine inserts sheets identifying the document as "Furniture, Fixtures & Equipment" package and include the project title and location, project number, Contractor/A/E name and phone number(s), submittal stage and date.

Provide electronic copies of all documents upon completion of the final architectural submittal or ten months prior to the contract completion date (whichever comes first), to ensure adequate time for furniture acquisition. Provide six compact disks with all drawings files needed to view the complete drawings unbound and in the latest version AutoCAD. Provide six additional compact disks of all text documents in Microsoft Word or Excel.

Design submittal requirements include, but are not limited to:

1.1.1. Narrative of Interior Design Objectives

Provide a narrative description of the furniture, to include functional, safety and ergonomic considerations, durability, sustainability, aesthetics, and compatibility with the building design.

1.1.2. Furniture Order Form

Prepare one Furnishings Order Form for each item specified in the design. This form identifies all information required to order each individual item. In addition to the project name and location, project number, and submittal phase, the order form must include:

- (a) Furniture item illustration and code
- (b) Furniture item name
- (c) Job name, location, and date
- (d) General Services Administration (GSA) FSC Group, part, and section
- (e) Manufacturer, Product name and Product model number or National Stock Number (NSN)
- (f) Finish name and number (code to finish samples)
- (g) Fabric name and number, minimum Wyzenbeek Abrasion Test double rubs (code to fabric samples)
- (h) Dimensions
- (i) Item location by room number and room name
- (j) Quantity per room
- (k) Total quantity
- (l) Special instructions for procurement ordering and/or installation (if applicable)
- (m) Written Product Description: include a non-proprietary paragraph listing the salient features of the item to include but not limited to:
 - (1) required features and characteristics
 - (2) ergonomic requirements
 - (3) functional requirements
 - (4) testing requirements
 - (5) furniture style
 - (6) construction materials
 - (7) minimum warranty

The following is an example for "m" features and characteristics, ergonomic requirements and functional requirements:

Chair Description:

- (1) Mid-Back Ergonomic Task Chair
- (2) Pneumatic Gaslift; Five Star Base
- (3) Mesh Back; Upholstered Seat
- (4) Height and Width Adjustable Task Arms:
 - a. Arm Height: 6" - 11" (+-1/2")
 - b. Arm Width: 2" - 4" adjustment
- (5) Height Adjustable Lumbar Support
- (6) Adjustable Seat Height 16"-21" (+- 1")
- (7) Sliding Seat Depth Adjustment 15"-18" (+-1")
- (8) Standard Hard Casters (for carpeted areas)
- (9) Overall Measurements:
 - a. Overall width: 25" - 27"
 - b. Overall depth: 25" - 28"

- (10) Must have a minimum of the following adjustments (In addition to the above):
- a. 360 Degree Swivel
 - b. Knee-Tilt with Tilt Tension
 - c. Back angle
 - d. Forward Tilt
 - e. Forward Tilt and Upright Tilt Lock

For projects with systems furniture, also provide a written description of the following minimum requirements:

- (1) Type furniture systems (panel, stacking panels, spine wall, desk based system, or a combination)
- (2) Minimum noise reduction coefficient (NRC)
- (3) Minimum sound transfer coefficient (STC)
- (4) Minimum flame spread and smoke development
- (5) UL testing for task lighting and electrical system
- (6) Panel widths and heights and their locations (this may be done on the drawings) Worksurface types and sizes (this may be done on the drawings)
- (7) Worksurface edge type
- (8) Varying panel/cover finish materials and locations (locations may be shown on the drawings)
- (9) Storage requirements
- (10) Keyboard requirements
- (11) Lock and keying requirements
- (12) Accessory components (examples: tack boards, marker boards, paper management)
- (13) Electrical and communication raceway requirement; type, capacity and location (base, beltline, below and/or above beltline)
- (14) Locations of communication cables (base, beltline, below and/or above beltline, top channel)
- (15) Types of electrical outlets
- (16) Types of communication jacks; provided and installed by others
- (17) Locations of electrical outlets and communication jacks (this may be done on the drawings)
- (18) Type of cable (examples: Cat. 5, Cat. 6, fiber optic; UTP or STP, etc.) system needs to support; provided and installed by others

1.1.3. Alternate Manufacturer List

Provide a table consisting of major furniture items that lists the manufacturers products specified on the Order Form and two alternate manufacturers. Major furniture items include, but are not limited to, casegoods, furniture systems, seating, and tables. Organize matrix by item code and item name. Supply alternates that are available on GSA Schedule and meet the requirements of the Furniture Order Form. One of the two alternates must be from UNICOR if possible. Provide manufacturer name address, telephone number, product series and product name for each alternate manufacturer.

1.1.4. FF&E Procurement List

Provide a table that lists all FF&E furniture, mission unique equipment and building Contractor Furnished/Contractor Installed (CF/CI) items. Give each item a code and name and designate whether item will be procured as part of the FF&E furniture, mission unique equipment or the building construction contract. Use the item code to key all FF&E documents including location plans, color boards, data sheets, cost estimate, etc.

1.1.5. Points of Contact (POCs)

Provide a comprehensive list of POCs needed to implement the FF&E package. This would include but not be limited to appropriate project team members, using activity contacts, interior design representatives, construction contractors and installers involved in the project. In addition to name, address, phone, fax and email, include each contact's job function. Divide the FF&E package into different sections based on this listing, applies to order forms and cost estimates.

1.1.6. Color Boards

Provide color boards for all finishes and fabrics for all FF&E items. Finishes to be included but not limited to paint, laminate, wood finish, fabric, etc.

1.1.7. Itemized Furniture Cost Estimate

Provide an itemized cost estimate of furnishings keyed to the plans and specifications of products included in the package. This cost estimate should be based on GSA price schedules. The cost estimate must include separate line items for general contingency, installation, electrical hook-up for systems furniture or other furniture requiring hardwiring by a licensed electrician, freight charges and any other related costs. Installation and freight quotes from vendors should be use in lieu of a percentage allowance when available. Include a written statement that the pricing is based on GSA schedules. An estimate developed by a furniture dealership may be provided as support information for the estimate, but must be separate from the contractor provided estimate.

1.2. INTERIOR DESIGN DOCUMENTS

1.2.1. Overall Furniture and Area Plans

Provide floor Plans showing locations and quantities of all freestanding, and workstation furniture proposed for each floor of the building. Key each room to a large scale Furniture Placement Plan showing the furniture configuration, of all furniture. Provide enlarged area plans with a key plan identifying the area in which the building is located. Key all the items on the drawings by furniture item code. Do not provide manufacturer specific information such as product names and numbers on drawings, Drawings shall be non-proprietary. This is typical for FFE on all plans, including those mentioned below.

1.2.2. Workstation Plans

Show each typical workstation configuration in plan view, elevations or isometric view. Drawings shall illustrate panels and all major components for each typical workstation configuration. Identify workstations using the same numbering system as shown on the project drawings. Key components to a legend on each sheet which identifies and describes the components along with dimensions. Provide the plan, elevations and isometric of each typical workstation together on the same drawing sheet.

1.2.3. Panel Plans

Show panel locations and critical dimensions from finished face of walls, columns, panels including clearances and aisle widths. Key panel assemblies to a legend which shall include width, height, configuration of frames, panel fabric and finishes (if there are different selections existing within a project), powered or non-powered panel and wall mount locations.

1.2.4. Desk Plans

Provide typical free standing desk configurations in plan view, elevation or isometric view and identify components to clearly represent each desk configuration.

1.2.5. Reflected Ceiling Plans

Provide typical plans showing ceiling finishes and heights, lighting fixtures, heating ventilation and air conditioning supply and return, and sprinkler head placement for coordination of furniture.

1.2.6. Electrical and Telecommunication Plans

Show power provisions including type and locations of feeder components, activated outlets and other electrical components. Show locations and quantities of outlets for workstations. Clearly identify different outlets, i.e. electrical, LAN and telecommunication receptacles indicating each type proposed. Show wiring configuration, (circuiting, switching, internal and external connections) and provide as applicable.

1.2.7. Artwork Placement Plans

Provide an Artwork Placement Plan to show location of artwork, assign an artwork item code to each piece of artwork. As an alternative, artwork can be located on the Furniture Plans. Provide a schedule that identifies each piece by room name and number. Provide installation instructions; include mounting height.

1.2.8. Window Drapery Plans

Provide Interior Window Drapery Plans. Key each drapery treatment to a schedule showing color, pattern, material, drapery size and type, draw direction, location and quantities.

1.3. FURNITURE SELECTION

1.3.1. Select furniture from the GSA Schedules. Specify furniture available open market when an item is not available on the GSA Schedules. Provide justification for items not available on the GSA Schedules.

1.3.2. To the greatest extent possible when specifying furniture work within a manufacturer's family of furniture for selections, example: Steelcase, Turnstone, Brayton International, Metro, and Vecta are all Steelcase companies. Each alternate should also be specified from a manufacturer's family of furniture, example: first set of alternates would be specified from Knoll's family of furniture and the second from Herman Miller family of furniture. It may be necessary to make some selections from other than a manufacturer's family of furniture if costs are not reasonable for particular items, some items are not available or appropriate for the facility or the items are not on GSA Schedule. If this occurs, consider specifying product from an open line that is accessible by numerous dealerships. Select office furniture including case goods, tables, storage, seating, etc. that is compatible in style, finish and color. Select furniture that complies with ANSI/BIFMA and from manufacturer's standard product line as shown in the most recent published price list and/or amendment and not custom product.

1.4. CONSTRUCTION

1.4.1. Provide knee space at workstations and tables that is not obstructed by panels/legs that interfere with knee space of seated person and provide desks, storage and tables with leveling devices to compensate for uneven floors.

1.4.2. Provide worksurface tops constructed to prevent warpage. Provide user friendly features such as radius edges. Do not use sharp edges and exposed connections and ensure the underside of desks, tables and worksurfaces are completely and smoothly finished. Provide abutting worksurfaces that mate closely and are of equal heights when used in side-by-side configurations in order to provide a continuous and level worksurface.

1.4.3. Drawers shall stay securely closed when in the closed position and protect wires from damage during drawer operation. Include a safety catch to prevent accidental removal when fully open

1.4.4. Unless otherwise noted, specify lockable desks and workstations and storage of steel construction. Use tempered glass glazing when glazing is required.

1.5. FINISHES AND UPHOLSTERY

1.5.1. Specify neutral colors for casegoods, furniture systems, storage and tables. Specify desk worksurfaces and table tops that are not too light or too dark in color and have a pattern to help hide soiling. Accent colors are allowed in break and lounge areas. Keep placement of furniture systems panel fabric accent colors to a minimum. All finishes shall be cleanable with ordinary household cleaning solutions.

1.5.2. Use manufacturer's standard fabrics; including textile manufacturers fabrics that have been graded into the furniture manufacturers fabric grades and are available through their GSA Schedule. Customers Own Material

(COM) can be used in headquarter buildings in command suites with executive furniture. Coordinate specific locations with Corps of Engineers Interior Designer.

1.5.3. Specify seating upholstery that meets Wyzenbeek Abrasion Test, 55,000 minimum rubs. Specify a soil retardant finish for woven fabrics if Crypton or vinyl upholstery is not provided for seating in dining areas. Use manufacturer's standard fabrics. This includes textile manufacturers fabrics that have been graded into the furniture manufactures fabric grades and are available through their GSA Schedule. Specify upholstery and finish colors and patterns that help hide soiling. Specify finishes that can be cleaned with ordinary household cleaning solutions.

1.6. ACCESSORIES

1.6.1. Specify all accessories required for completely finished furniture installation. Provide filing cabinets and storage for office supplies. Provide tack surfaces at workstations with overhead storage. Provide tackable surfaces at workstations with overhead storage.

1.6.2. Not Used.

1.6.3. Workstations are to be equipped with stable keyboard trays that have height adjustability, tilting capability, including negative tilt, have a mouse pad at same height as the keyboard tray that can accommodate both left and right handed users, and retractable under worksurface.

1.7. MISSION UNIQUE EQUIPMENT

Funding for FF&E furniture items and mission unique equipment (MUE) items are from two different sources. Separate the designs and procurement documentation for FFE items and MUE. MUE includes, but is not limited to, items such as industrial shelving, workbenches, appliances, fitness equipment, IT equipment and supporting carts. The User will purchase and install mission unique equipment items, unless otherwise noted. Identify locations of known MUE items such as industrial shelving, workbenches, appliances, etc. for space planning purposes.

1.8. SUSTAINABILITY

1.8.1. For all designs provided regardless of facility type, make every effort to implement all aspects of sustainability to the greatest extent possible for all the selections made in the FF&E package. This includes but is not limited to the selection of products that consider: **Material Chemistry and Safety of Inputs** (What chemicals are used in the construction of the selections?); **Recyclability** (Do the selections contain recycled content?); **Disassembly** (Can the selections be disassembled at the end of their useful life to recycle their materials?).

1.8.2. Make selections to the greatest extent possible of products that possess current McDonough Braungart Design Chemistry ([MBDC](#)) certification or other "third-party" certified Cradle to Cradle program, Forest Stewardship Council (FSC) certification, GREENGAURD certification or similar "third-party" certified products consisting of low-emitting materials.

1.9. FURNITURE SYSTEMS

1.9.1. General.

Where appropriate, design furniture systems in open office areas. Coordinate style and color of furniture systems with other storage, seating, etc. in open office areas. Minimize the number of workstation typicals and the parts and pieces required for the design to assist in future reconfiguration and inventorying.

1.9.2. Connector Systems.

Specify a connector system that allows removal of a single panel or spine wall within a typical workstation configuration without requiring disassembly of the workstation or removal of adjacent panels. Specify connector system with tight connections and continuous visual seals. When Acoustical panels are used, provide connector system with continuous acoustical seals. Specify concealed clips, screws, and other construction elements, where possible.

1.9.3. Panels and Spine Walls

Specify panels and spine walls with hinged or removable covers that permit easy access to the raceway when required but are securely mounted and cannot be accidentally dislodged under normal conditions. Panels shall be capable of structurally supporting more than 1 fully loaded component per panel per side. Raceways are to be an integral part of the panel and must be able to support lay-in cabling and have a large capacity for electrical and IT. Do not thread cables through the frame.

1.9.4. Electrical And Information/Technology (IT)

Design furniture with electrical systems that meets requirements of UL 1286 when powered panels are required and UL approved task lights that meet requirements of NFPA 70. Dependent on user requirements and Section 01 10 00, paragraph 3 requirements, it is recommended that workstation electrical and IT wiring entry come from the building walls to eliminate the use of power poles and access at the floor. Design electrical and IT systems that are easily accessed in the spine wall and panels without having to move return panels and components. Electrical and IT management will be easily accessible by removable wall covers which can be removed while workstation components are still attached. Specify connector system that has continuation of electrical and IT wiring within workstations and workstation to workstation.

1.9.5. Pedestals

Specify pedestals that are interchangeable from left to right, and right to left, and retain pedestal locking system capability.

1.10. EXECUTIVE FURNITURE

1.10.1. Design for executive furniture in command areas, coordinate specific locations with Corps of Engineers Interior Designer. Use upgraded furniture, upholsteries and finishes in command suites. This includes but is not limited to wood casegoods, seating and tables. Select executive furniture casegoods from a single manufacturer and style line, to include workstations, credenzas, filing, and storage, etc.

1.10.2. Specify furniture with wood veneer finish (except worksurfaces) with mitered solid wood edge of same wood type. Provide worksurface plastic laminate that closely matches adjacent wood veneer. Other executive office furniture such as seating, tables, executive conference room furniture, etc. shall be compatible in style, finish and color with executive furniture casegoods.

1.11. SEATING

1.11.1. General

Specify appropriate chair casters and glides for the floor finish where the seating is located. Universal casters that are appropriate for both hard surface flooring and carpet are preferred. All seating shall support up to a minimum of 250 lbs.

1.11.2. Desk and Guest Seating

Select ergonomic desk chairs with casters, non-upholstered adjustable arms, waterfall front, swivel, tilt, variable back lock, adjustable back height or adjustable lumbar support, pneumatic seat height adjustment, and padded, contoured upholstered seat and back. Desk and guest chair backs may be other than upholstered such as mesh fabric if it is ergonomically designed, forms to back and is comfortable. Depending on scale of desk chair provide seat pan forward and back adjustment to increase or decrease depth of seat pan. All desk chairs shall have an adjustable seat height range of 4 1/2", range to include 16 1/2"-20". Select guest chairs that are compatible in style, finish and color with the desk chairs.

1.11.3. Conference Room Seating

At tables, select ergonomic conference seating with casters, non-upholstered arms, waterfall front, swivel, tilt, pneumatic seat height adjustment, and padded, contoured seat and back, unless otherwise noted. Select arm height and/or design that allows seating to be moved up closely to the table top. Conference chair backs may be other than upholstered such as mesh fabric if it is ergonomically designed, forms to back and is comfortable. Perimeter conference chairs shall be compatible in style, finish and color with conference seating at the tables.

1.11.4. Lounge, Waiting and Reception Area Seating

Select seating with arms and cushioned, upholstered seat and back. In heavy use areas, arms shall be easily cleaned such as non-upholstered arms or upholstered arms with wood arm caps unless otherwise noted.

1.11.5. Break Room Seating

Select stackable seating that is easily cleaned. Seating shall be appropriate for table and counter heights as applicable with non-upholstered arms if arms are required. Chairs shall have metal legs and composite materials for seats.

1.11.6. Lounge, Waiting and Reception Furniture.

Design for end and coffee tables with plastic laminate tops that are compatible in style finish and color with the seating.

1.12. FILING AND STORAGE.

Select storage and shelving units that meet customer's functional load requirements for stored items. Specify counterweights for filing cabinets when required by the manufacturer for stability. File drawers shall allow only one drawer to be opened at a time. Provide heavy duty storage and shelving if information is not available.

1.13. TRAINING TABLES.

Don't use plastic laminate self edge. Training tables shall be reconfigurable, moveable and storable; lighter weight folding with dollies or casters as necessary. Specify dollies if required.

1.14. FURNITURE WARRANTIES.

Specify manufacturer's performance guarantees or warranties that include parts, labor and transportation as follows:

Furniture System, unless otherwise noted – 10 year minimum
 Furniture System Task Lights – 2 year minimum, excluding bulbs
 Furniture System Fabric – 3 year minimum
 Desks - 10 year minimum
 Seating, unless otherwise noted - 10 year minimum
 Seating Mechanisms and Pneumatic Cylinders - 10 years
 Fabric - 3 years minimum
 Filing and Storage - 10 year minimum
 Tables, unless otherwise noted - 10 year minimum
 Table Mechanisms – 5 year
 Table Ganging Device - 1 year
 Items not listed above - 1 year minimum

ATTACHMENT C TRACKING COMMENTS IN DRCHECKS

1.0 General

The Government and DB Contractor shall set up the project in Dr Checks. Throughout the design process, the parties shall enter, track, and back-check comments using the DrChecks system. Government reviewers enter design review comments into DrChecks. Designers of Record shall annotate comments timely and specifically to indicate exactly what action will be taken or why the action is not required. Comments considered critical by the conference participants shall be flagged as such.

2.0 DrChecks Review Comments

The Contractor and the Government shall monitor DrChecks to assure all comments are annotated and agreed to by the designers and reviewers prior to the next submittal. The DrChecks comments and responses shall be printed and included in the design analysis for record.

2.1. Conference participants (reviewers) will expect coordination between Design Analysis calculations and the submitted design. Reviewers will also focus on the design submittal's satisfaction of the contract requirements.

2.2. The Designers of Record shall answer each comment in DrChecks with a formal response prior to the next submittal, clearly indicating what action will be taken and what drawing/spec will change. Designers of Record are encouraged to directly contact reviewers to discuss and agree to the formal comment responses rather than relying only on DrChecks and review meetings to discuss comments. With the next design conference, reviewers will back-check answers to the comments against the submittal, in addition to reviewing additional design work.

2.3. Comments that, in the DB Contractor's opinion, require effort outside the scope of the contract shall be clearly indicated as such in DrChecks. The DB Contractor shall not proceed with work outside the contract until a modification to the contract is properly executed, if one is necessary.

3.0 DrChecks Initial Account Set-Up

To initialize an office's use of DrChecks, choose a contact person within the office to call the DrChecks Help Desk at 800-428-HELP, M-F, 8AM-5PM, Central time. This POC will be given an office password to distribute to others in the office. Individuals can then go to the hyperlink at <http://www.projnet.org> and register as a first time user. Upon registration, each user will be given a personal password to the DrChecks system.

3.1. Once the office and individuals are registered, the COE's project manager or lead reviewer will assign the individuals and/or offices to the specific project for review. At this point, persons assigned can make comments, annotate comments, and close comments, depending on their particular assignment.

4.0 DrChecks Reviewer Role

The Contractor is the technical reviewer and the Government is the compliance reviewer of the DB designers design documents. Each reviewer enters their own comments into the Dr Checks system. To enter comments:

4.1. Log into DrChecks.

4.2. Click on the appropriate project.

4.3. Click on the appropriate review conference. An Add comment screen will appear.

4.4. Select or fill out the appropriate sections (particularly comment discipline and type of document for sorting) of the comment form and enter the comment in the space provided.

4.5. Click the Add Comment button. The comment will be added to the database and a fresh screen will appear for the next comment you have.

4.6. Once comments are all entered, exit DrChecks by choosing "My Account" and then Logout.

5.0 DrChecks Comment Evaluation

The role of the designers of record is to evaluate and respond to the comments entered by the Government reviewers and by the DB Contractor. To respond to comments:

5.1. Log into DrChecks.

5.2. Click on the appropriate project.

5.3. Under "Evaluate" click on the number under "Pending".

5.4. Locate the comments that require your evaluation. (Note: If you know the comment number you can use the Quick Pick window on your home page in DrChecks; enter the number and click on go.)

5.5. Select the appropriate evaluation (concur, non-concur, for information only, or check and resolve) and add the response.

5.6. Click on the Add button. The evaluation will be added to the database and a fresh screen will appear with the next comment.

5.7. Once evaluations are all entered, exit DrChecks by choosing "My Account" and then Logout.

6.0 DrChecks Back-check

At the following design conference, participants will back-check comment annotations against newly presented documents to verify that the designers' responses are acceptable and completed. The Contractor and Government reviewers shall either enter additional back-check comments, as necessary or close those that are resolved as a result of the design conferences:

6.1. Log into DrChecks.

6.2. Click on the appropriate project.

6.3. Under "My Backcheck" click on the number under "Pending".

6.4. If you agree with the designer's response select "Close Comment" and add a closing response if desired.

6.5. If you do not agree with the designer's response or the submittal does not reflect the response given, select "Issue Open", enter additional information.

6.6. Click on the Add button. The back-check will be added to the database and a fresh screen will appear with the next comment.

6.7. Once back-checks are all entered, exit DrChecks by choosing "My Account" and then Logout. The design is completed and final when there are no pending comments to be evaluated and there are no pending or open comments under back-check.

ATTACHMENT D
SAMPLE FIRE PROTECTION AND LIFE SAFETY CODE REVIEW

Instructions: Use the information outlined in this document to provide the minimum requirement for development of Fire Protection and Life Safety Code submittals for all building projects. Additional and supplemental information may be used to further develop the code review. Insert N/A after criteria, which may be "not applicable".

1.0 SAMPLE FIRE PROTECTION AND LIFE SAFETY CODE REVIEW

- 1.1. Project Name (insert name and location)
- 1.2. Applicable Codes and Standards
 - 1.2.1. Unified Facilities Criteria (UFC): 3-600-01, Design: Fire Protection Engineering For Facilities
 - 1.2.2. International Building Code (IBC) for fire resistance requirements, allowable floor area, building height limitations and building separation distance requirements, except as modified by UFC 3-600-01.
 - 1.2.3. National Fire Protection Association (NFPA) 101 Life Safety Code (latest edition), for building egress and life safety and applicable criteria in UFC 3-600-01.
 - 1.2.4. ADA and ABA Accessiblity Guidelines. For Buildings and Facilities See Section 01 10 00, Paragraph 3 for facility specific criteria.
- 1.3. Occupancy Classification
IBC chapters 3 and 4
- 1.4. Construction Type
IBC chapter 6
- 1.5. Area Limitations
IBC chapter 5, table 503
- 1.6. Allowable Floor Areas
IBC section 503, 505
- 1.7. Allowable area increases
IBC section 506, 507
- 1.8. Maximum Height of Buildings
IBC section 504
- 1.9. Fire-resistive substitution
- 1.10. Occupancy Separations
IBC table 302.3.2
- 1.11. Fire Resistive Requirements
 - 1.11.1. Exterior Walls - [] hour rating, IBC table 601, 602
 - 1.11.2. Interior Bearing walls - [] hour rating
 - 1.11.3. Structural frame - [] hour rating
 - 1.11.4. Permanent partitions - [] hour rating

- 1.11.5. Shaft enclosures - [] hour rating
- 1.11.6. Floors & Floor-Ceilings - [] hour rating
- 1.11.7. Roofs and Roof Ceilings - [] hour rating
- 1.12. Automatic Sprinklers and others used to determine the need for automatic Extinguishing Equipment, Extinguishing Systems, Foam Systems, Standpipe
 - 1.12.1. UFC 3-600-01, chapters 4 and 6 systems, wet chemical systems, etc. State which systems are required and to what criteria they will be designed.
 - 1.12.2. UFC 3-600-01, Appendix B Occupancy Classification. Note the classification for each room. This may be accomplished by classifying the entire building and noting exceptions for rooms that differ (E.g. The entire building is Light Hazard except boiler room and storage rooms which are [], etc.)
 - 1.12.3. UFC 3-600-01, Chapter 3 Sprinkler Design Density, Sprinkler Design Area, Water Demand for Hose Streams (supply pressure and source requirements).
 - 1.12.4. UFC 3-600-01, Chapter 4 Coverage per sprinkler head. Extended coverage sprinkler heads are not permitted.
 - 1.12.5. Available Water Supply. Provide the results of the water flow tests showing the available water supply static pressure and residual pressure at flow. Based on this data and the estimated flow and pressure required for the sprinkler system, determine the need for a fire pump.
 - 1.12.6. NFPA 13, Para. 8.16.4.6.1. Provide backflow preventer valves as required by the local municipality, authority, or water purveyor. Provide a test valve located downstream of the backflow preventer for flow testing the backflow preventer at full system demand flow. Route the discharge to an appropriate location outside the building.
- 1.13. Kitchen Cooking Exhaust Equipment
Describe when kitchen cooking exhaust equipment is provided for the project. Type of extinguishing systems for the equipment should be provided. per NFPA 96. Show all interlocks with manual release switches, fuel shutoff valves, electrical shunt trips, exhaust fans, and building alarms.
- 1.14. Portable Fire Extinguishers, fire classification and travel distance. per NFPA 10
- 1.15. Enclosure Protection and Penetration Requirements. - Opening Protectives and Through Penetrations
 - 1.15.1. IBC Section 712, 715 and Table 715.3. Mechanical rooms, exit stairways, storage rooms, janitor [] hour rating. IBC Table 302.1.1
 - 1.15.2. Fire Blocks, Draft Stops, Through Penetrations and Opening Protectives
- 1.16. Fire Dampers. Describe where fire dampers and smoke dampers are to be used (IBC Section 716 and NFPA 90A). State whether isolation smoke dampers are required at the air handler.
- 1.17. Detection Alarm and Communication. UFC 3-600-01, (Chapter 5); NFPA 101 para. 3.4 (chapters 12-42); NFPA 72
- 1.18. Mass Notification. Describe building/facility mass notification system (UFC 4-021-01) type and type of base-wide mass notification/communication system. State whether the visible notification appliances will be combined with the fire alarm system or kept separate. (Note: Navy has taken position to combine visible notification appliances with fire alarm).
- 1.19. Interior Finishes (classification). NFPA 101.10.2.3 and NFPA 101.7.1.4
- 1.20. Means of Egress

- 1.20.1. Separation of Means of Egress, NFPA 101 chapters 7 and 12-42; NFPA101.7.1.3
- 1.20.2. Occupant Load, NFPA101.7.3.1 and chapters 12-42.
- 1.20.3. Egress Capacity (stairs, corridors, ramps and doors) NFPA101.7.3.3
- 1.20.4. Number of Means of Egress, NFPA101.7.4 and chapters 12-42.
- 1.20.5. Dead end limits and Common Path of Travel, NFPA 101.7.5.1.6 and chapters 12-42.
- 1.20.6. Accessible Means of Egress (for accessible buildings), NFPA101.7.5.4
- 1.20.7. Measurement of Travel Distance to Exits, NFPA101.7.6 and chapters 12-42.
- 1.20.8. Discharge from Exits, NFPA101.7.7.2
- 1.20.9. Illumination of Means of Egress, NFPA101.7.8
- 1.20.10. Emergency Lighting, NFPA101.7.9
- 1.20.11. Marking of Means of Egress, NFPA101.7.10
- 1.21. Elevators, UFC 3-600-01, Chapter 6; IBC and ASME A17.1 - 2000,(Safety Code for Elevators and Escalators)
- 1.22. Accessibility Requirements, ADA and ABA Accessibility Guidelines for Buildings and Facilities
- 1.23. Certification of Fire Protection and Life Safety Code Requirements. (Note: Edit the Fire team membership if necessary). Preparers of this document certify the accuracy and completeness of the Fire Protection and Life Safety features for this project in accordance with the attached completed form(s).
- 1.24. Designer of Record. Certification of Fire protection and Life Safety Code Requirements. (Note: Edit the Fire team members if necessary). Preparers of this document certify the accuracy and completeness of the Fire Protection and Life Safety features of this project.

Fire Protection Engineer of Record:

Signature and Stamp

Date

OR

Architect of Record:

Signature and Stamp

Date

Mechanical Engineer of Record:

Signature and Stamp

Date

Electrical Engineer of Record:

Signature/Date

**ATTACHMENT E
LEED SUBMITTALS**

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	LEED-NC v3 Submittals (OCT09)	Provide for Credit Audit Only	REQUIRED DOCUMENTATION	Date Submitted (to be filled in by Contractor)	Government Reviewer's Use
PAR		FEATURE	DUE AT		DATE	REV
GENERAL						
		GENERAL - All calculations shall be in accordance with LEED 2009 Reference Guide.				
		GENERAL: Obtain excel version of this spreadsheet at http://en.sas.usace.army.mil/enWeb , "Engineering Criteria".				
		GENERAL - For all credits, narrative/comments may be added to describe special circumstances or considerations regarding the project's credit approach.				
		GENERAL - Include all required LEED drawings indicated below in contract drawings with applicable discipline drawings, labeled For Reference Only.				
		NOTE: Each submittal indicated with "****" differs from LEED certified project submittals by either having a different due date or being an added submittal not required by GBCI.				
		NOTE: Projects seeking LEED certification need only submit to GBCI whatever documentation is acceptable to GBCI (for example, licensed professional certifications). This checklist identifies what must be submitted to the Government for internal review purposes. Government review of LEED documentation in no way supercedes or modifies the requirements and rulings of GBCI for purposes of compliance with project requirement to obtain LEED certification.				
		GENERAL - Audit documentation may include but is not limited to what is indicated in this table.				
			Closeout	List of all Final Design submittals revised after final design to reflect actual closeout conditions. Revised Final Design submittals. - OR - Statement confirming that no changes have been made since final design that effect final design submittal documents.		Proj Engr (PE)
CATEGORY 1 - SUSTAINABLE SITES						
SSPR1		Construction Activity Pollution Prevention (PREREQUISITE)	**Final Design	List of drawings and specifications that address the erosion control, particulate/dust control and sedimentation control measures to be implemented.		CIV
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			**Final Design	Narrative that indicates which compliance path was used (NPDES or Local standards) and describes the measures to be implemented on the project. If a local standard was followed, provide specific information to demonstrate that the local standard is equal to or more stringent than the NPDES program.		CIV
SS1		Site Selection	Final Design	Statement confirming that project does not meet any of the prohibited criteria.		CIV
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design	X LEED Site plan drawing that shows all proposed development, line depicting boundary of all bodies of water and/or wetlands within 100 feet of project boundary and a line depicting 5' elevation above 100 year flood line that falls within project boundary. Not required if neither condition applies.		CIV
SS2		Development Density & Community Connectivity	Final Design	Option 1: LEED Site vicinity plan showing project site and surrounding development. Show density boundary or note drawing scale.		CIV
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design	Option 1: Table indicating, for project site and all surrounding sites within density radius (keyed to site vicinity plan), site area and building area. Project development density calculation. Density radius calculation. Development density calculation within density radius.		CIV
			Final Design	Option 2: LEED Site vicinity plan showing project site, the 1/2 mile community radius, pedestrian walkways and the locations of the residential development(s) and Basic Services surrounding the project site.		CIV
			Final Design	Option 2: List (including business name and type) of all Basic Services facilities within the 1/2 mile radius, keyed to site vicinity plan.		CIV
SS3		Brownfield Redevelopment	Final Design	Narrative describing contamination and the remediation activities included in project. Include statement indicating how site was determined to be a brownfield.		CIV
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
SS4.1		Alternative Transportation: Public Transportation Access	Final Design	Statement indicating which option for compliance applies. State whether public transportation is existing or proposed and, if proposed, cite source of this information.		CIV
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design	Option 1: LEED Site vicinity plan showing project site, mass transit stops and pedestrian path to them with path distance noted.		CIV
			Final Design	Option 2: LEED Site vicinity plan showing project site, bus stops and pedestrian path to them with path distance noted.		CIV
SS4.2		Alternative Transportation: Bicycle Storage & Changing Rooms	Final Design	FTE calculation. Bicycle storage spaces calculation. Shower/changing facilities calculation.		CIV
			Final Design	List of drawings that show the location(s) of bicycle storage areas. Statement indicating distance from building entrance.		CIV
			Final Design	List of drawings that show the location(s) of shower/changing facilities and, if located outside the building, statement indicating distance from building entrance.		CIV

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	LEED-NC v3 Submittals (OCT09)	Provide for Credit Audit Only	REQUIRED DOCUMENTATION	Date Submitted (to be filled in by Contractor)	Government Reviewer's Use
PAR		FEATURE	DUE AT		DATE	REV
SS4.3		Alternative Transportation: Low Emitting & Fuel Efficient Vehicles	Final Design	Statement indicating which option for compliance applies. FTE calculation. Statement indicating total parking capacity of site.		CIV
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design	Option 1: Low-emission & fuel-efficient vehicle calculation.		CIV
			Final Design	Option 1: List of drawings and specification references that show location and number of preferred parking spaces for low-emission & fuel-efficient vehicles and signage.		CIV
			Final Design	Option 1: Statement indicating quantity, make, model and manufacturer of low-emission & fuel-efficient vehicles to be provided. Statement confirming vehicles are zero-emission or indicating ACEEE vehicle scores.		CIV
			Final Design	Option 2: Low-emission & fuel-efficient vehicle parking calculation.		CIV
			Final Design	Option 2: List of drawings and specification references that show location and number of preferred parking spaces and signage.		CIV
			Final Design	Option 3: Low-emission & fuel-efficient vehicle refueling station calculation.		CIV
			Final Design	Option 3: List of drawings and specifications indicating location and number of refueling stations, fuel type and fueling capacity for each station for an 8-hour period.		CIV
			Closeout	X Option 3: Construction product submittals indicating what was provided and confirming compliance with respect to fuel type and fueling capacity for each station for an 8-hour period.		CIV
SS4.4		Alternative Transportation: Parking Capacity	Final Design	Statement indicating which option for compliance applies.		CIV
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design	Option 1: Preferred parking calculation including number of spaces required, total provided, preferred spaces provided and percentage.		CIV
			Final Design	Option 2: FTE calculation. Preferred parking calculation including number of spaces provided, preferred spaces provided and percentage.		CIV
			Final Design	Options 1 and 2: List of drawings and specification references that show location and number of preferred parking spaces and signage.		CIV
			Final Design	Option 3: Narrative indicating number of spaces required and provided and describing infrastructure and support programs with description of project features to support them.		CIV
SS5.1		Site Development: Protect or Restore Habitat	**Final Design	Option 1: List of drawing and specification references that convey site disturbance limits.		CIV
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			**Final Design	Option 2: LEED site plan drawing that delineates boundaries of each preserved and restored habitat area with area (sf) noted for each.		CIV
			**Final Design	Option 2: Percentage calculation of restored/preserved habitat to total site area. List of drawings and specification references that convey restoration planting requirements.		CIV
SS5.2		Site Development: Maximize Open Space	Final Design	Option 2: LEED site plan drawing delineating boundary of vegetated open space adjacent to building with areas of building footprint and designated open space noted.		CIV
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
SS6.1		Stormwater Design: Quantity Control	Final Design	Statement indicating which option for compliance applies.		CIV
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design	Option 1: Indicate pre-development and post-development runoff rate(cfs) and runoff quantity (cf) -OR - Narrative describing site conditions, measures and controls to be implemented to prevent excessive stream velocities and erosion.		CIV
			Final Design	Option 2: Indicate pre-development and post-development runoff rate(cfs) and runoff quantity (cf). Indicate percent reduction in each.		CIV
SS6.2		Stormwater Design: Quality Control	Final Design	For non-structural controls, list all BMPs used and, for each, describe the function of the BMP and indicate the percent annual rainfall treated. List all structural controls and, for each, describe the pollutant removal and indicate the percent annual rainfall treated.		CIV
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
SS7.1		Heat Island Effect: Non-Roof	**Final Design	LEED site plan drawing indicating locations and quantities of each paving type, including areas of shaded pavement. Percentage calculation indicating percentage of reflective/shaded/open grid area.		CIV
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV

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SS7.2		Heat Island Effect: Roof	Final Design	Option 1: Percentage calculation indicating percentage of SRI compliant roof area. List of drawings and specification references that convey SRI requirements and roof slopes.		ARC
			Final Design	Option 1: List of specified roof materials indicating, for each, type, manufacturer, product name and identification if known, SRI value and roof slope.		ARC
			**Closeout	Option 1: List of installed roof materials indicating, for each, manufacturer, product name and identification, SRI value and roof slope.		PE
			Closeout	X Option 1: Manufacturer published product data or certification confirming SRI		PE
			Final Design	Option 2: Percentage calculation indicating percentage of vegetated roof area.		ARC
			Final Design	Option 3: Combined reflective and green roof calculation.		ARC
			Final Design	Option 3: List of specified roof materials indicating, for each, type, manufacturer, product name and identification if known, SRI value and roof slope.		ARC
			**Closeout	Option 3: List of installed roof materials indicating, for each, manufacturer, product name and identification, SRI value and roof slope.		PE
			Closeout	X Option 3: Manufacturer published product data or certification confirming SRI		PE
SS8		Light Pollution Reduction	Final Design	Interior Lighting: List of drawings and specification references that convey interior lighting requirements (location and type of all installed interior lighting, location of non-opaque exterior envelope surfaces, allowing confirmation that maximum candela value from interior fixtures does not intersect non-opaque building envelope surfaces). - OR - List of drawings and specification references that show automatic lighting controls compliance with credit requirement.		ELEC
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		ELEC
			Final Design	Exterior Lighting: List of drawings and specification references that convey exterior lighting requirements (location and type of all site lighting and building facade/landscape lighting).		ELEC
			Final Design	Exterior Site Lighting Power Density (LPD): Tabulation for exterior site lighting indicating, for each location identification or description, units of measure, area or distance of the location, actual LPD using units consistent with ASHRAE 90.1, and the ASHRAE allowable LPD for that type of location. Percentage calculation of actual versus allowable LPD for all site lighting.		ELEC
			Final Design	Exterior Building Facade/Landscape Lighting Power Density (LPD): Tabulation for exterior building facade/landscape lighting indicating, for each location identification or description, units of measure, area or distance of the location, actual LPD using units consistent with ASHRAE 90.1, and the ASHRAE allowable LPD for that type of location. Percentage calculation of actual versus allowable LPD for all building facade/landscape lighting.		ELEC
			Final Design	Exterior Lighting IESNA Zone: Indicate which IESNA zone is applicable to the project.		ELEC
			Final Design	Exterior Lighting Site Lumen table indicating, for each fixture type, quantity installed, initial lamp lumens per luminaire, initial lamp lumens above 90 degrees from Nadir, total lamp lumens and total lamp lumens above 90 degrees. Percentage of site lamp lumens above 90 degrees from nadir to total lamp lumens.		ELEC
			Final Design	Exterior Lighting Narrative describing analysis used for addressing requirements for light trespass at site boundary and beyond.		ELEC
CATEGORY 2 – WATER EFFICIENCY						
WEPR1		Water Use Reduction: 20% Reduction	Final Design	Statement confirming which occupancy breakdown applies (default or special). For special occupancy breakdown, indicate source and explanation for ratio.		MEC
			Final Design	Occupancy calculation including male/female numbers for FTEs, visitors, students, customers, residential and other type occupants/users		MEC
			Final Design	Statement indicating percent of male restrooms with urinals. Statement indicating annual days of operation.		MEC

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				Baseline flush fixture calculation spreadsheet indicating, for each fixture type, gender, flush rate, daily uses per person for each occupant type identified in occupancy calculation and annual baseline flush fixture water usage.		MEC
				Design case flush fixture calculation spreadsheet indicating, for each fixture type, gender, fixture manufacturer, fixture model number, flush rate, percent of occupants using this fixture type, daily uses per person for each occupant type identified in occupancy calculation and annual design case flush fixture water usage.		MEC
			Closeout	X Manufacturer published product data or certification confirming fixture water usage.		PE
WE1.1		Water Efficient Landscaping: Reduce by 50%	Final Design	Statement indicating which option for compliance applies.		CIV
			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design	Calculation indicating, for baseline and design case, total water applied, total potable water applied, total non-potable water applied. Design case percent potable water reduction. If nonpotable water is used, indicate source of nonpotable water.		CIV
			Final Design	List of landscape plan drawings.		CIV
			Final Design	Narrative describing landscaping and irrigation design strategies, including water use calculation methodology used to determine savings and, if non-potable water is used, specific information about source and available quantity.		CIV
WE1.2		Water Efficient Landscaping: No Potable Water Use or No Irrigation	Same as WE1.1	Same as WE1.1		CIV
WE2		Innovative Wastewater Technologies	Final Design	Statement confirming which option for compliance applies.		MEC
			Final Design	Statement confirming which occupancy breakdown applies (default or special). For special occupancy breakdown, indicate source and explanation for ratio.		MEC
			Final Design	Occupancy calculation including male/female numbers for FTEs, visitors, students, customers, residential and other type occupants/users		MEC
			Final Design	Statement indicating percent of male restrooms with urinals. Statement indicating annual days of operation.		MEC
			Final Design	Baseline flush fixture calculation spreadsheet indicating, for each fixture type, gender, flush rate, daily uses per person for each occupant type identified in occupancy calculation and annual baseline flush fixture water usage.		MEC
			Final Design	Design case flush fixture calculation spreadsheet indicating, for each fixture type, gender, fixture manufacturer, fixture model number, flush rate, percent of occupants using this fixture type, daily uses per person for each occupant type identified in occupancy calculation and annual design case flush fixture water usage.		MEC
			Final Design	Option 1: If onsite non-potable water is used, identify source(s), indicate annual quantity from each source and indicate total annual quantity from all onsite non-potable water sources.		MEC
			Final Design	Option 1: Summary calculation indicating baseline annual water consumption, design case annual water consumption, non-potable annual water consumption and total percentage annual water savings.		MEC
			Final Design	Option 2: Statement confirming on-site treatment of all generated wastewater to tertiary standards and all treated wastewater is either infiltrated or used on-site.		MEC
			Final Design	Option 2: List of drawing and specification references that convey design of on-site wastewater treatment features.		CIV
			Final Design	Option 2: On-site water treatment quantity calculation indicating all on-site wastewater source(s), annual quantity treated, annual quantity infiltrated and annual quantity re-used on site from each source and totals for annual quantity treated, annual quantity infiltrated and annual quantity re-used on site from all sources.		CIV
			Final Design	Option 2: Wastewater summary calculation indicating design case annual flush fixture water usage, annual on-site water treatment and percentage sewage conveyance reduction.		MEC
			Final Design	Narrative describing project strategy for reduction of potable water use for sewage conveyance, including specific information on reclaimed water usage and treated wastewater usage.		MEC
WE3		Water Use Reduction: 30% - 40% Reduction	Same as WEPR1	Same as WEPR1		MEC

CATEGORY 3 – ENERGY AND ATMOSPHERE

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EAPR1		Fundamental Commissioning of the Building Energy Systems (PREREQUISITE)	**Final Design	**Owner's Project Requirements document				ALL MEC, ELEC
			**Final Design	**Basis of Design document for commissioned systems				MEC, ELEC
			**Final Design	**Commissioning Plan				MEC, ELEC
			Closeout	Statement confirming all commissioning requirements have been incorporated into construction documents.				PE
			Closeout	Commissioning Report				PE
EAPR2		Minimum Energy Performance (PREREQUISITE)	Final Design	Statement listing the mandatory provisions of ASHRAE 90.1 that project meets relative to compliance with this prerequisite and indicating which compliance path was used.				MEC ELEC ARC
			Final Design	Statement indicating which compliance path option applies.				MEC
			Final Design	Option 1: Statement confirming simulation software capabilities and confirming assumptions and methodology.				MEC
			Final Design	Option 1: General information including simulation program, principal heating source, percent new construction and renovation, weather file, climate zone and Energy Star Target Finder score.				MEC
			Final Design	Option 1: Space summary listing, for each building use, the conditioned area, unconditioned area and total area and include total area for each category				MEC
			Final Design	Option 1: List of all simulation output advisory message data and show difference between baseline and proposed design				MEC
			Final Design	Option 1: Comparison summary for energy model inputs including description of baseline and design case energy model inputs, showing both by element type				MEC
			Final Design	Option 1: Energy type summary listing, for each energy type, utility rate description, units of energy and units of demand				MEC
			Final Design	Option 1: Statement indicating whether project uses on-site renewable energy. If yes, list all sources and indicate, for each source, backup energy type, annual energy generated, rated capacity and renewable energy cost				MEC
			Final Design	Option 1: If analysis includes exceptional calculation methods, statement describing how exceptional calculation measure cost savings is determined				MEC
			Final Design	Option 1: If analysis includes exceptional calculation methods, for each exceptional calculation method indicate energy types and, for each energy type, annual energy savings, annual cost savings, and brief descriptive narrative				MEC
			Final Design	Option 1: Baseline performance rating compliance report table indicating, for each energy end use, whether it is a process load, energy type, annual and peak energy demand for all four orientations. For each orientation indicate total annual energy use for each orientation and total annual process energy use.				MEC
			Final Design	Option 1: Baseline energy cost table indicating, for each energy type, annual cost for all four orientations and building total energy cost.				MEC
			Final Design	Option 1: Proposed Design performance rating compliance report table indicating, for each energy end use, whether it is a process load, energy type, annual and peak energy demand, baseline annual and peak energy demand and percent savings. Indicate total annual energy use and total annual process energy use for both proposed design and baseline and percent savings.				MEC
			Final Design	Option 1: Proposed Design energy cost table indicating, for each energy type, annual cost for all four orientations and building total energy cost.				MEC
			Final Design	Option 1: Energy cost and consumption by energy type report indicating, for each energy type, proposed design and baseline annual use and annual cost, percent savings annual use and annual cost. Indicate for renewable energy annual energy generated and annual cost. Indicate exceptional calculations annual energy savings and annual cost savings. Indicate building total annual energy use, annual energy cost for proposed design and baseline and indicate percent savings annual energy use and annual energy cost.				MEC

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			Final Design	Option 1: Compliance summaries from energy simulation software. If software does not produce compliance summaries provide output summaries and example input summaries for baseline and proposed design supporting data in the tables. Output summaries must include simulated energy consumption by end use and total energy use and cost by energy type. Example input summaries should represent most common systems and must include occupancy, use pattern, assumed envelope component sizes and descriptive features and assumed mechanical equipment types and descriptive features		MEC
			Final Design	Option 1: Energy rate tariff from project energy providers (only if not using LEED Reference Guide default rates)		MEC
EAPR3		Fundamental Refrigerant Management (PREREQUISITE)	Final Design	Statement indicating which option for compliance applies.		MEC
			Final Design	Option 2: Narrative describing phase out plan, including specific information on phase out dates and refrigerant quantities.		MEC
EA1		Optimize Energy Performance	Final Design	Statement indicating which compliance path option applies.		MEC
			Final Design	Option 1: Statement confirming simulation software capabilities and confirming assumptions and methodology.		MEC
			Final Design	Option 1: General information including simulation program, principal heating source, percent new construction and renovation, weather file, climate zone and Energy Star Target Finder score.		MEC
			Final Design	Option 1: Space summary listing, for each building use, the conditioned area, unconditioned area and total area and include total area for each category		MEC
			Final Design	Option 1: List of all simulation output advisory message data and show difference between baseline and proposed design		MEC
			Final Design	Option 1: Comparison summary for energy model inputs including description of baseline and design case energy model inputs, showing both by element type		MEC
			Final Design	Option 1: Energy type summary listing, for each energy type, utility rate description, units of energy and units of demand		MEC
			Final Design	Option 1: Statement indicating whether project uses on-site renewable energy. If yes, list all sources and indicate, for each source, backup energy type, annual energy generated, rated capacity and renewable energy cost		MEC
			Final Design	Option 1: If analysis includes exceptional calculation methods, statement describing how exceptional calculation measure cost savings is determined		MEC
			Final Design	Option 1: If analysis includes exceptional calculation methods, for each exceptional calculation method indicate energy types and, for each energy type, annual energy savings, annual cost savings, and brief descriptive narrative		MEC
			Final Design	Option 1: Baseline performance rating compliance report table indicating, for each energy end use, whether it is a process load, energy type, annual and peak energy demand for all four orientations. For each orientation indicate total annual energy use for each orientation and total annual process energy use.		MEC
			Final Design	Option 1: Baseline energy cost table indicating, for each energy type, annual cost for all four orientations and building total energy cost.		MEC
			Final Design	Option 1: Proposed Design performance rating compliance report table indicating, for each energy end use, whether it is a process load, energy type, annual and peak energy demand, baseline annual and peak energy demand and percent savings. Indicate total annual energy use and total annual process energy use for both proposed design and baseline and percent savings.		MEC
			Final Design	Option 1: Proposed Design energy cost table indicating, for each energy type, annual cost for all four orientations and building total energy cost.		MEC
			Final Design	Option 1: Energy cost and consumption by energy type report indicating, for each energy type, proposed design and baseline annual use and annual cost, percent savings annual use and annual cost. Indicate for renewable energy annual energy generated and annual cost. Indicate exceptional calculations annual energy savings and annual cost savings. Indicate building total annual energy use, annual energy cost for proposed design and baseline and indicate percent savings annual energy use and annual energy cost.		MEC

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			Final Design	Option 1: Compliance summaries from energy simulation software. If software does not produce compliance summaries provide output summaries and example input summaries for baseline and proposed design supporting data in the tables. Output summaries must include simulated energy consumption by end use and total energy use and cost by energy type. Example input summaries should represent most common systems and must include occupancy, use pattern, assumed envelope component sizes and descriptive features and assumed mechanical equipment types and descriptive features		MEC
			Final Design	Option 1: Energy rate tariff from project energy providers (only if not using LEED Reference Guide default rates)		MEC
EA2.1		On-Site Renewable Energy	Final Design	Statement indicating which compliance path option applies.		ELEC
			Final Design	List all on-site renewable energy sources and indicate, for each source, backup energy type, annual energy generated, rated capacity and renewable energy cost. Indicate total annual energy use (all sources), total annual energy cost (all sources) and percent renewable energy cost.		ELEC MEC
			Final Design	Option 1: Indicate, for renewable energy, proposed design total annual energy generated and annual cost.		ELEC MEC
			Final Design	Option 2: Indicate CBECS building type and building gross area. Provide the following CBECS data: median annual electrical intensity, median annual non-electrical fuel intensity, average electric energy cost, average non-electric fuel cost, annual electric energy use and cost, annual non-electric fuel use and cost.		ELEC MEC
			Final Design	Option 2: Narrative describing renewable systems and explaining calculation method used to estimate annual energy generated, including factors influencing performance.		ELEC MEC
EA2.2		On-Site Renewable Energy	Same as EA2.1	Same as EA2.1		ELEC MEC
EA2.3		On-Site Renewable Energy	Same as EA2.1	Same as EA2.1		ELEC MEC
EA3		Enhanced Commissioning	**Final Design	**Owner's Project Requirements document (OPR)		ALL
			**Final Design	**Basis of Design document for commissioned systems (BOD)		ELEC MEC
			**Final Design	**Commissioning Plan		ELEC MEC
			Closeout	Statement confirming all commissioning requirements have been incorporated into construction documents.		PE
			Closeout	**Commissioning Report		PE
			**Final Design	Statement by CxA confirming Commissioning Design Review		
			Closeout	Statement by CxA confirming review of Contractor submittals for compliance with OPR and BOD		PE
			Closeout	**Systems Manual		PE
			Closeout	Statement by CxA confirming completion of O&M staff and occupant training		PE
			Closeout	**Scope of work for post-occupancy review of building operation, including plan for resolution of outstanding issues		PE
			**Predesign	Statement confirming CxA qualifications and contractual relationships relative to work on this project, demonstrating that CxA is an independent third party.		MEC
EA4		Enhanced Refrigerant Management	Final Design	Refrigerant impact calculation table with all building data and calculation values as shown in LEED 2009 Reference Guide Example Calculations		MEC
			Final Design	Narrative describing any special circumstances or explanatory remarks		
			Closeout	X Cut sheets highlighting refrigerant data for all HVAC components.		PE
EA5		Measurement & Verification	Closeout	Statement indicating which compliance path option applies.		PE
			Closeout	Measurement and Verification Plan including Corrective Action Plan		PE
			Closeout	**Scope of work for post-occupancy implementation of M&V plan including corrective action plan.		PE
EA6		Green Power	Closeout	Statement indicating which compliance path option applies.		PE
			Closeout	Option 1: Indicate proposed design total annual electric energy usage		PE
			Closeout	Option 2: Indicate actual total annual electric energy usage		PE
			Closeout	Option 3: Calculation indicating building type, total gross area, median electrical intensity and annual electric energy use		PE

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			Closeout	Green power provider summary table indicating, for each purchase type, provider name, annual quantity green power purchased and contract term. Indicate total annual green power use and indicate percent green power		PE
			Closeout	Narrative describing how Green Power or Green Tags are purchased		PE
CATEGORY 4 – MATERIALS AND RESOURCES						
MRPR1		Storage & Collection of Recyclables (PREREQUISITE)	Final Design	Statement confirming that recycling area will accommodate recycling of plastic, metal, paper, cardboard and glass. Narrative indicating any other materials addressed and coordination with pickup.		ARC
MR1.1		Building Reuse: Maintain 55% of Existing Walls, Floors & Roof	**Final Design	If project includes a building addition, confirm that area of building addition does not exceed 2x the area of the existing building.		ARC
			**Final Design	Spreadsheet listing, for each building structural/envelope element, the existing area and reused area. Total percent reused.		ARC
MR1.2		Building Reuse: Maintain 75% of Existing Walls, Floors & Roof	Same as MR1.1	Same as MR1.1		ARC
MR1.3		Building Reuse: Maintain 95% of Existing Walls, Floors & Roof	Same as MR1.1	Same as MR1.1		ARC
MR1.4		Building Reuse: Maintain 50% of Interior Non-Structural Elements	**Final Design	If project includes a building addition, confirm that area of building addition does not exceed 2x the area of the existing building.		ARC
			**Final Design	Spreadsheet listing, for each building interior non-structural element, the existing area and reused area. Total percent reused.		ARC
MR2.1		Construction Waste Management: Divert 50% From Disposal	**Preconstruction	Waste Management Plan		PE
			**Construction Quarterly and Closeout	Spreadsheet calculations indicating material description, disposal/diversion location (or recycling hauler), weight, total waste generated, total waste diverted, diversion percentage		PE
			**Construction Quarterly and Closeout	Receipts/tickets for all items on spreadsheet		PE
MR2.2		Construction Waste Management: Divert 75% From Disposal	Same as MR2.1	Same as MR2.1		PE
MR3.1		Materials Reuse: 5%	Closeout	Statement indicating total materials value and whether default or actual.		PE
			Closeout	Spreadsheet calculations indicating, for each reused/salvaged material, material description, source or vendor, cost. Total reused/salvaged materials percentage.		PE
MR3.2		Materials Reuse: 10%	Same as MR3.1	Same as MR3.1		PE
MR4.1		Recycled Content: 10% (post-consumer + 1/2 pre-consumer)	Closeout	Statement indicating total materials value and whether default or actual.		PE
			Closeout	Spreadsheet calculations indicating, for each recycled content material, material name/description, manufacturer, cost, post-consumer recycled content percent, pre-consumer recycled content percent, source of recycled content data. Total post-consumer content materials cost, total pre-consumer content materials cost, total combined recycled content materials cost, recycled content materials percentage.		PE
			Final Design or NLT Preconstruction	**Purchasing Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal.		PE
			Closeout	Manufacturer published product data or certification, confirming recycled content percentages in spreadsheet		PE
MR4.2		Recycled Content: 20% (post-consumer + 1/2 pre-consumer)	Same as MR4.1	Same as MR4.1		PE
MR5.1		Regional Materials: 10% Extracted, Processed & Manufactured Regionally	Closeout	Statement indicating total materials value and whether default or actual.		PE
			Closeout	Spreadsheet calculations indicating, for each regional material, material name/description, manufacturer, cost, percent compliant, harvest distance, manufacture distance, source of manufacture and harvest location data. Total regional materials cost, regional materials percentage.		PE
			Preconstruction	**Purchasing Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal.		PE
			Closeout	Manufacturer published product data or certification confirming regional material percentages in spreadsheet		PE

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MR5.2		Regional Materials:20% Extracted, Processed & Manufactured Regionally	Same as MR5.1	Same as MR5.1		PE
MR6		Rapidly Renewable Materials	Closeout	Statement indicating total materials value and whether default or actual.		PE
			Closeout	Spreadsheet calculations indicating, for each rapidly renewable material, material name/description, manufacturer, cost, rapidly renewable content percent, rapidly renewable product value. Total rapidly renewable product value, rapidly renewable materials percentage.		PE
			Final Design	**Purchasing Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal.		ARC
			Closeout	X Manufacturer published product data or certification confirming rapidly renewable material percentages in spreadsheet		PE
MR7		Certified Wood	Closeout	Statement indicating total materials value and whether default or actual.		PE
			Closeout	Spreadsheet calculations indicating, for each certified wood material, material name/description, vendor, cost, wood component percent, certified wood percent of wood component, FSC chain of custody certificate number. Total certified wood product value, certified wood materials percentage.		PE
			Final Design or NLT Preconstruction	**Purchasing Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal.		PE
			Closeout	X Vendor invoices, FSC chain of custody certificates and manufacturer published product data or certification confirming all certified wood materials percentages in spreadsheet.		PE
INDOOR ENVIRONMENTAL QUALITY						
EQPR1		Minimum IAQ Performance (PREREQUISITE)	Final Design	Statement indicating which option for compliance applies, stating applicable criteria/requirement, and confirming that project has been designed to meet the applicable requirements.		MEC
			Final Design	Narrative describing the project's ventilation design, including specifics about fresh air intake volumes and special considerations.		MEC
EQPR2		Environmental Tobacco Smoke (ETS) Control (PREREQUISITE)	Final Design	Statement indicating which option for compliance applies, stating applicable criteria/requirement, and confirming that project has been designed to meet the applicable requirements.		ARC
			Final Design	List of drawing and specification references that convey conformance to applicable requirements (signage, exhaust system, room separation details, etc).		ARC
EQ1		Outdoor Air Delivery Monitoring	Final Design	Statement indicating which option for compliance applies and confirming that project has been designed to meet the applicable requirements.		MEC
			Final Design	List of drawing and specification references that convey conformance to applicable requirements.		MEC
			Final Design	Narrative describing the project's ventilation design and CO2 monitoring system, including specifics about monitors, operational parameters and setpoints.		MEC
			Closeout	X Cut sheets for CO2 monitoring system.		PE
EQ2		Increased Ventilation	Final Design	Statement indicating which option for compliance applies and confirming that project has been designed to meet the applicable requirements.		MEC
			Final Design	Narrative describing the project's ventilation design, including specifics about zone fresh air intake volumes and demonstrating compliance.		MEC
			Final Design	Option 2: Narrative describing design method used for determining natural ventilation design, including calculation methodology/model results and demonstrating compliance.		MEC
			Final Design	List of drawing and specification references that convey conformance to applicable requirements.		MEC
EQ3.1		Construction IAQ Management Plan: During Construction	**Preconstruction	Construction IAQ Management Plan		PE
			Closeout	Statement confirming whether air handling units were operated during construction		PE
			Closeout	Dated jobsite photos showing examples of IAQ management plan practices being implemented. Label photos to indicate which practice they demonstrate. Minimum one photo of each practice at each building.		PE

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			Closeout	Spreadsheet indicating, for each filter installed during construction, the manufacturer, model number, MERV rating, location installed, and if it was replaced immediately prior to occupancy.		PE
EQ3.2		Construction IAQ Management Plan: Before Occupancy	**Preconstruction	Construction IAQ Management Plan		PE
			Closeout	Statement indicating which option for compliance applies and confirming that required activities have occurred that meet the applicable requirements.		PE
			Closeout	Option 1a: Narrative describing the project's flushout process, including specifics about temperature, airflow and duration, special considerations (if any) and demonstrating compliance.		PE
			Closeout	Option 1b: Narrative describing the project's pre-occupancy and post-occupancy flushout processes, including specifics about temperature, airflow and duration, special considerations (if any) and demonstrating compliance.		PE
			Closeout	Option 2: Narrative describing the project's IAQ testing process, including specifics about contaminants tested for, locations, remaining work at time of test, retest parameters and special considerations (if any).		PE
			Closeout	Option 2: IAQ testing report demonstrating compliance.		PE
EQ4.1		Low Emitting Materials: Adhesives & Sealants	Closeout	Spreadsheet indicating, for each applicable indoor adhesive, sealant and sealant primer used, the manufacturer, product name/model number, VOC content, LEED VOC limit, and source of VOC data.		PE
			Closeout	Spreadsheet indicating, for each applicable indoor aerosol adhesive, the manufacturer, product name/model number, VOC content, LEED VOC limit, and source of VOC data - OR - Statement confirming no indoor aerosol adhesives were used for the project.		PE
			Closeout	Manufacturer published product data or certification confirming material VOCs in spreadsheet	X	PE
EQ4.2		Low Emitting Materials: Paints & Coatings	Closeout	Spreadsheet indicating, for each applicable indoor paint and coating used, the manufacturer, product name/model number, VOC content, LEED VOC limit, and source of VOC data.		PE
			Closeout	Spreadsheet indicating, for each applicable indoor anti-corrosive/anti-rust paint and coating used, the manufacturer, product name/model number, VOC content, LEED VOC limit, and source of VOC data - OR - Statement confirming no indoor anti-corrosive/anti-rust paints were used for the project .		PE
			Closeout	Manufacturer published product data or certification confirming material VOCs in spreadsheet	X	PE
EQ4.3		Low Emitting Materials: Flooring Systems	Closeout	Spreadsheet indicating, for each indoor flooring system used, the manufacturer, product name/model number, if it meets LEED requirement (yes/no) and source of LEED compliance data.		PE
			Closeout	Spreadsheet indicating, for each indoor carpet cushion used, the manufacturer, product name/model number, if it meets LEED requirement (yes/no) and source of LEED compliance data - OR - Statement confirming no indoor carpet cushion was used for the project.		PE
			Closeout	Manufacturer published product data or certification confirming material compliance label in spreadsheet	X	PE
EQ4.4		Low Emitting Materials: Composite Wood & Agrifiber Products	Closeout	Spreadsheet indicating, for each indoor composite wood and agrifiber product used, the manufacturer, product name/model number, if it contains added urea formaldehyde (yes/no) and source of LEED compliance data.		PE
			Closeout	Manufacturer published product data or certification confirming material urea formaldehyde in spreadsheet	X	PE
EQ5		Indoor Chemical & Pollutant Source Control	Closeout	Spreadsheet indicating, for each permanent entryway system used, the manufacturer, product name/model number and description of system.		PE
			Final Design	List of drawing and specification references that convey locations and installation methods for entryway systems.		ARC
			Final Design	Spreadsheet indicating, for each chemical use area, the room number, room name, description of room separation features (walls, floor/ceilings, openings) and pressure differential from surrounding spaces with doors closed - OR - Statement confirming that project includes no chemical use areas and that no hazardous cleaning materials are needed for building maintenance.		ARC MEC
			Final Design	If project includes chemical use areas: List of drawing and specification references that convey locations of chemical use areas, room separation features and exhaust system.		ARC

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	LEED-NC v3 Submittals (OCT09)	Provide for Credit Audit Only	REQUIRED DOCUMENTATION	DATE	REV	Date Submitted (to be filled in by Contractor)	Government Reviewer's Use
PAR		FEATURE	DUE AT					
			Final Design	If project includes places where water and chemical concentrate mixing occurs: List of drawing and specification references that convey provisions for containment of hazardous liquid wastes OR - Statement confirming that project includes no places where water and chemical concentrate mixing occurs.				ARC MEC
			Closeout	If project includes chemical use areas: Spreadsheet indicating, for AHUs/mechanical ventilation equipment serving occupied areas, the manufacturer, model number, MERV rating, location installed, and if it was replaced immediately prior to occupancy (yes/no) - OR - Statement confirming that project does not use mechanical equipment for ventilation of occupied areas.				PE
EQ6.1		Controllability of Systems: Lighting	Final Design	Calculation indicating total number of individual workstations, number of workstations with individual lighting controls and the percentage of workstations with individual lighting controls.				ELEC
			Final Design	For each shared multi-occupant space, provide a brief description of lighting controls.				ELEC
			Final Design	Narrative describing lighting control strategy, including type and location of individual controls and type and location of controls in shared multi-occupant spaces.				ELEC
EQ6.2		Controllability of Systems: Thermal Comfort	Final Design	Calculation indicating total number of individual workstations, number of workstations with individual thermal comfort controls and the percentage of workstations with individual thermal comfort controls.				MEC
			Final Design	For each shared multi-occupant space, provide a brief description of thermal comfort controls.				MEC
			Final Design	Narrative describing thermal comfort control strategy, including type and location of individual and shared multi-occupant controls.				MEC
EQ7.1		Thermal Comfort: Design	Final Design	Design criteria spreadsheet indicating, for spring, summer, fall and winter, maximum indoor space design temperature, minimum indoor space design temperature and maximum indoor space design humidity.				MEC
			Final Design	Narrative describing method used to establish thermal comfort control conditions and how systems design addresses the design criteria, including compliance with the referenced standard.				MEC
EQ7.2		Thermal Comfort: Verification	Final Design	Narrative describing the scope of work for the thermal comfort survey, including corrective action plan development				MEC
			Final Design	List of drawing and specification references that convey permanent monitoring system.				MEC
EQ8.1		Daylight & Views: Daylight 75% of Spaces	Final Design	Option 2: Table indicating all regularly occupied spaces with space area and space area with compliant daylight zone. Sum of regularly occupied areas and regularly occupied areas with compliant daylight zone. Percentage calculation of areas with compliant daylight zone to total regularly occupied areas.				ARC
			Final Design	Option 1: Simulation model method, software and output data				ELEC
			Final Design	Option 1: Table indicating all regularly occupied spaces with space area, space area with minimum 25 footcandles daylighting illumination, and method of providing glare control. Sum of regularly occupied areas and regularly occupied areas with 25 fc daylighting. Percentage calculation of areas with 25 fc daylighting to total regularly occupied areas.				ELEC
			Final Design	For all occupied spaces excluded from the calculation, provide narrative indicating reasons for excluding the space.				ARC
			Final Design	List of drawing and specification references that convey exterior glazed opening head and sill heights, glazing performance properties and glare control/sunlight redirection devices.				ARC
			Closeout	X Manufacturer published product data or certification confirming glazing Tvis in spreadsheet				PE
EQ8.2		Daylight & Views: Views for 90% of Spaces	Final Design	Table indicating all regularly occupied spaces with space area and space area with access to views. Sum of regularly occupied areas and regularly occupied areas with access to views. Percentage calculation of areas with views to total regularly occupied areas.				ARC
			Final Design	For all occupied spaces excluded from the calculation, provide narrative indicating reasons for excluding the space.				ARC
			Final Design	LEED Floor plan drawings showing line of sight diagramming of views areas in each regularly occupied space. List of drawing/specification references that convey exterior glazed opening head and sill heights.				ARC

INNOVATION & DESIGN PROCESS

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed		Provide for Credit Audit Only		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use
PAR		FEATURE	DUE AT	REQUIRED DOCUMENTATION	DATE	REV
		LEED-NC v3 Submittals (OCT09)				
IDc1.1		Innovation in Design	Final Design	Narrative describing intent, requirement for credit, project approach to the credit. List of drawings and specification references that convey implementation of credit. All other documentation that validates claimed credit.		
IDc1.2		Innovation in Design	Final Design			
IDc1.3		Innovation in Design	Final Design			
IDc1.4		Innovation in Design	Final Design			
IDc2		LEED Accredited Professional	Final Design	Narrative indicating name of LEED AP, company name of LEED AP, description of LEED AP's role and responsibilities in the project.		ARC

ATTACHMENT F
Version 02-03-2010**BUILDING INFORMATION MODELING REQUIREMENTS****1.0 Section 1 - Submittal Format**

1.1. Design Deliverables. Develop all designs using Building Information Modeling (BIM) and Computer Aided Design (CAD) software. Design submittal drawings shall be ANSI D size, suitable for half-size scaled reproduction.

2.0 Section 2 – Design Requirements

2.1. BIM Model and Facility Data. Contractor shall use BIM application(s) and software(s) to develop project designs. "Facility Data" is defined as associated intelligent attribute data. The "Model" is defined as 3D graphics that includes Facility Data and output as described in the paragraph 'Output' below. Contractors will use the Model to produce accurate Construction Documents. For each Center of Standardization (CoS) facility type included in this project, all BIM Models and associated Facility Data shall be submitted in Bentley Systems BIM XM with associated USACE Bentley BIM Workspace (which includes specific standard BIM libraries and definitions). This Workspace can be downloaded from the CAD/BIM Technology Center. [Where available, the workspace will be specific to this CoS Facility Standard Design. The Contractor will be provided a baseline multi-discipline BIM Project Model for the CoS Facility Standard Design type, where such a model exists (for the purposes of site adaptation).] The USACE Bentley BIM Workspace is dependent on specific versions of the Bentley BIM suite of products and only the versions of the software that are listed in the Contractor instructions included with the USACE BIM Workspace are permitted to be used.

2.1.1. Reference. Refer to ERDC TR-06-10, "U.S. Army Corps of Engineers Building Information Modeling Road Map" from the CAD/BIM Technology Center website for more information on the USACE BIM implementation goals.

2.2. Drawings. Deliver CAD files used for the creation of the Construction Documents Drawings per requirements in Section 01 33 16, the criteria of the USACE Charleston District, and as noted herein. Specification of a CAD file format for these Drawings does not limit which BIM application(s) or software(s) may be used for project development and execution.

2.2.1. IFC Support. The Contractor's selected BIM application(s) and software(s) must support the IFC (Industry Foundation Class - see www.iai-tech.org). Submit any deviations from or additions to the IFC property sets for any new spaces, systems, and equipment for Government approval.

2.2.2. Submittal Requirements. BIM submittals shall be fully interoperable, compatible, and editable with the Bentley BIM tools. Use the specified version of the USACE Bentley BIM Workspace and conform to the requirements of **Sections 3 and 4 below**.

2.2.3. BIM Project Execution Plan.

2.2.3.1. Develop a BIM Project Execution Plan ("Plan" or "PxP") documenting the BIM and analysis technologies selected for the Project Model (integrated with the AEC CAD Standard) from concept development through As-Builts as a design, production, coordination, construction, and documentation tool and the collaborative process by which it shall be executed. See Section 7 for additional guidance on developing the Plan.

2.2.4. BIM Requirements..

2.2.4.1. Facility Data. Develop the Facility Data consisting of a set of intelligent elements for the Model (e.g., doors, air handlers, electrical panels). This Facility Data shall include all material definitions and attributes that are necessary for the Project facility design and construction. Additional data in support of Section 6 Contractor Electives is encouraged.

2.2.4.2. Model Content. The Model and Facility Data shall include, at a minimum, the requirements of Section 4 below.

2.2.4.3. Model Granularity. Models may vary in level of detail for individual elements within a model, but at a minimum must include all features that would be included on a quarter inch (1/4" = 1'0") scaled drawing (e.g. at least 1/16th, 1/8th and 1/4th), or appropriately scaled civil drawings.

2.2.4.4. Output. Submitted CAD drawings (e.g., plans, elevations, sections, schedules, details, etc.) shall be derived (commonly known as extractions, views or sheets) and maintained from the submitted Model and Facility Data.

2.3. Quality Control. Implement quality control (QC) parameters for the Model, including:

2.3.1. Model Standards Checks. QC validation used to ensure that the Project Facility Data set has no undefined, incorrectly defined or duplicated elements. Report non-compliant elements and corrective action plan to correct non-compliant elements. Provide the government with detailed justification and request government approval for any non-compliant element which the contractor proposes to be allowed to remain in the Model.

2.3.2. CAD Standards Checks. QC checking performed to ensure that the fonts, dimensions, line styles, levels and other construction document formatting issues are followed per the A/E/C CADD Standard.

2.3.3. Other Parameters. Develop such other QC parameters as Contractor deems appropriate for the Project and provide to the Government for concurrence.

2.4. Design and Construction Reviews. Perform design and construction reviews at each submittal stage under Section 3 to test the Model, including:

2.4.1. Visual Checks. Checking to ensure the design intent has been followed and that there are no unintended elements in the Model.

2.4.2. Interference Management Checks. Locate conflicting spatial data in the Model where two elements are occupying the same space. Log hard interferences (e.g., mechanical vs. structural or mechanical vs. mechanical overlaps in the same location) and soft interferences, (e.g., conflicts regarding equipment clearance, service access, fireproofing, insulation) in a written report and resolve.

2.4.3. IFC Coordination View. Provide an IFC Coordination View in IFC Express format for all deliverables. Provide exported property set data for all IFC supported named building elements.

2.4.4. Other Parameters. Develop such other Review parameters as the Contractor deems appropriate for the Project and provide to the Government for concurrence..

3.0 Section 3 – Design Stage Submittal Requirements

3.1. General Submittal Requirements.

3.1.1. Provide submittals in compliance with BIM Project Execution Plan deliverables at stages as described hereinafter.

3.1.2. At each Stage in Paragraphs 3.3 through 3.6, provide a Contractor-certified written report confirming that consistency checks as identified in Paragraphs 2.3 and 2.4 have been completed. This report shall be discussed as part of the review process and shall address cross-discipline interferences, if any.

3.1.3. At each Stage in Paragraphs 3.3 through 3.6, provide the Government with:

- The Model, Facility Data, Workspace and CAD Data files in native Bentley BIM/CAD.

- A 3-D interactive review format of the Model in Bentley Navigator, Autodesk Navisworks, Adobe 3D PDF 7.0 (or later), Google Earth KMZ or other format per Plan requirements. The file format for reviews can change between submittals.

- A list of all submitted files. The list should include a description, directory, and file name for each file submitted. For all CAD sheets, include the sheet title and sheet number. Identify files that have been produced from the submitted Model and Facility Data.

3.2. Initial Design Conference Submittal.

3.2.1. Submit a digital copy of the Plan where, in addition to Paragraph 3.1.4, the USACE Geographic District BIM Manager will coordinate with the USACE CoS BIM Manager to confirm acceptability of the Plan or advise as to additional processes or activities necessary to be incorporated.

3.2.2. Within thirty (30) days after the approval of the Plan, conduct a demonstration to review the Plan for clarification, and to verify the functionality of Model technology workflow and processes. If modifications are required, the Contractor shall complete the modifications and resubmit the Plan and perform subsequent demonstration for Government acceptance. There will be no payment for design or construction until the Plan is acceptable to the Government. The Government may also withhold payment for design and construction for unacceptable performance in executing the approved Plan.

3.3. Interim Design Submittals.

3.3.1. BIM and CAD Data. The Model shall include the requirements identified in Paragraph 2.2.4 as applicable to the Interim Design package(s).

3.4. Final Design Submissions and Design Complete Submittals.

3.4.1. BIM and CAD Data. The Model shall include the requirements identified in Paragraph 2.2.4. Acceptance according to Paragraph 3.1.4 is required before commencement of construction, as described in Paragraph 3.7.6 of Section 01 33 16.

3.5. Construction Submittals – Over-The-Shoulder Progress Reviews. Periodic quality control meetings or construction progress review meetings shall include quality control reviews on the implementation and use of the Model, including interference management and design change tracking information.

3.6. Final As-Built BIM and CAD Data Submittal. Submit the final Model, Facility Data, and CAD files reflecting as-built conditions for Government Approval, as specified in Section 01 78 02.00 10, PROJECT CLOSEOUT.

4.0 Section 4 – BIM Model Minimum Requirements and Output

4.1. General Provisions. The deliverable Model shall be developed to include the systems described below as they would be built and the processes of installing them, and to reflect final as-built conditions. The deliverable model at the interim design stage and at the final design stage (“released for construction”) shall be developed to include as many of the systems described below as are necessary and appropriate at that design stage.

4.2. Architectural/Interior Design. The Architectural systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing. Additional minimum Model requirements include:

4.2.1. Spaces. The Model shall include spaces defining accurate net square footage and net volume, and holding data for the room finish schedule for including room names and numbers. Include Programmatic Information provided by the Government or validated program to verify design space against programmed space, using this information to validate area quantities.

4.2.2. Walls and Curtain Walls. Each wall shall be depicted to the exact height, length, width and ratings (thermal, acoustic, fire) to properly reflect wall types. The Model shall include all walls, both interior and exterior, and the necessary intelligence to produce accurate plans, sections and elevations depicting these design elements.

4.2.3. Doors, Windows and Louvers. Doors, windows and louvers shall be depicted to represent their actual size, type and location. Doors and windows shall be modeled with the necessary intelligence to produce accurate window and door schedules.

4.2.4. Roof. The Model shall include the roof configuration, drainage system, penetrations, specialties, and the necessary intelligence to produce accurate plans, building sections and generic wall sections where roof design elements are depicted.

4.2.5. Floors. The floor slab shall be developed in the structural Model and then referenced by the architectural Model for each floor of the Project building.

4.2.6. Ceilings. All heights and other dimensions of ceilings, including soffits, ceiling materials, or other special conditions shall be depicted in the Model with the necessary intelligence to produce accurate plans, building sections and generic wall sections where ceiling design elements are depicted.

4.2.7. Vertical Circulation. All continuous vertical components (i.e., non-structural shafts, architectural stairs, handrails and guardrails) shall be accurately depicted and shall include the necessary intelligence to produce accurate plans, elevations and sections in which such design elements are referenced.

4.2.8. Architectural Specialties and Woodwork. All architectural specialties (i.e., toilet room accessories, toilet partitions, grab bars, lockers, and display cases) and woodwork (i.e., cabinetry and counters) shall be accurately depicted with the necessary intelligence to produce accurate plans, elevations and sections in which such design elements are referenced.

4.2.9. Signage. The Model shall include all signage and the necessary intelligence to produce accurate plans and schedules.

4.2.10. Schedules. Provide door, window, hardware sets using BHMA designations, flooring, wall finish, and signage schedules from the Model, indicating the type, materials and finishes used in the design.

4.3. Furniture. The furniture systems Model may vary in level of detail for individual elements within a Model, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing, and have necessary intelligence to produce accurate plans. Representation of furniture elements is to be 2D. Contractor may provide a minimal number of 3D representations as examples. Examples of furniture include, but are not limited to, desks, furniture systems, seating, tables, and office storage.

4.3.1. Furniture Coordination. Furniture that makes use of electrical, data or other features shall include the necessary intelligence to produce coordinated documents and data.

4.4. Equipment. The Model may vary in level of detail for individual elements within a Model. Equipment shall be depicted to meet layout requirements with the necessary intelligence to produce accurate plans and minimum schedules depicting their configuration. Examples of equipment include but are not limited to copiers, printers, refrigerators, ice machines and microwaves.

4.4.1. Schedules. Provide furniture and equipment schedules from the model indicating the materials, finishes, mechanical, and electrical requirements.

4.5. Structural. The structural systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Additional minimum Model requirements include:

4.5.1. Foundations. All necessary foundation and/or footing elements, with necessary intelligence to produce accurate plans and elevations

4.5.2. Floor Slabs. Structural floor slabs shall be depicted, including all necessary recesses, curbs, pads, closure pours, and major penetrations accurately depicted.

4.5.3. Structural Steel. All steel columns, primary and secondary framing members, and steel bracing for the roof and floor systems (including decks), including all necessary intelligence to produce accurate structural steel framing plans and related building/wall sections.

4.5.4. Cast-in-Place Concrete. All walls, columns, and beams, including necessary intelligence to produce accurate plans and building/wall sections depicting cast-in-place concrete elements.

- 4.5.5. Expansion/Contraction Joints. Joints shall be accurately depicted.
- 4.5.6. Stairs. The structural Model shall include all necessary openings and framing members for stair systems, including necessary intelligence to produce accurate plans and building/wall sections depicting stair design elements.
- 4.5.7. Shafts and Pits. The structural Model shall include all necessary shafts, pits, and openings, including necessary intelligence to produce accurate plans and building/wall sections depicting these design elements.
- 4.6. Mechanical. The mechanical systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Small diameter (less than 1-1/2" NPS) field-routed piping is not required in the model. Additional minimum Model requirements include:
- 4.6.1. HVAC. All necessary heating, ventilating, air-conditioning and specialty equipment, including air distribution ducts for supply, return, and ventilation and exhaust ducts, including control system, registers, diffusers, grills and hydronic baseboards with necessary intelligence to produce accurate plans, elevations, building/wall sections and schedules.
- 4.6.1.1. Mechanical Piping. All necessary piping and fixture layouts, and related equipment, including necessary intelligence to produce accurate plans, elevations, building/wall sections, and schedules.
- 4.6.2. Plumbing. All necessary plumbing piping and fixture layouts, floor and area drains, and related equipment, including necessary intelligence to produce accurate plans, elevations, building/wall sections, riser diagrams, and schedules.
- 4.6.3. Equipment Clearances. All HVAC and Plumbing equipment clearances shall be modeled for use in interference management and maintenance access requirements.
- 4.6.4. Elevator Equipment. The Model shall include the necessary equipment and control system, including necessary intelligence to produce accurate plans, sections and elevations depicting these design elements.
- 4.7. Electrical/Telecommunications. The electrical systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Small diameter (less than 1-1/2"Ø) field-routed conduit is not required in the model. Additional minimum Model requirements include:
- 4.7.1. Interior Electrical Power and Lighting. All necessary interior electrical components (i.e., lighting, receptacles, special and general purpose power receptacles, lighting fixtures, panelboards, cable trays and control systems), including necessary intelligence to produce accurate plans, details and schedules. Lighting and power built into furniture/equipment shall be modeled.
- 4.7.2. Special Electrical Systems. All necessary special electrical components (i.e., security, Mass Notification, Public Address, nurse call and other special occupancies, and control systems), including necessary intelligence to produce accurate plans, details and schedules.
- 4.7.3. Grounding Systems. Grounding Systems. All necessary grounding components (i.e., lightning protection systems, static grounding systems, communications grounding systems, bonding), including necessary intelligence to produce accurate plans, details and schedules.
- 4.7.4. Communications. All existing and new communications service controls and connections, both above ground and underground with necessary intelligence to produce accurate plans, details and schedules. Cable tray routing shall be modeled without detail of cable contents.
- 4.7.5. Exterior Building Lighting. All necessary exterior lighting with necessary intelligence to produce accurate plans, elevations and schedules. The exterior building lighting Model shall include all necessary lighting, relevant existing and proposed support utility lines and equipment required with necessary intelligence to produce accurate plans, details and schedules.

4.7.6. Equipment Clearances. The model shall incorporate and define all electrical and communications working spaces, clearances, and required access

4.8. Fire Protection. The fire protection system Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Additional minimum Model requirements include:

4.8.1. Fire Protection System. All relevant fire protection components (i.e., branch piping, sprinkler heads, fittings, drains, pumps, tanks, sensors, control panels) with necessary intelligence to produce accurate plans, elevations, building/wall sections, riser diagrams, and schedules. All fire protection piping shall be modeled.

4.8.2. Fire Alarms. Fire alarm/mass notification devices and detection system shall be indicated with necessary intelligence to produce accurate plans depicting them.

4.9. Civil. The civil Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a one inch (1"=100') scaled drawing. Additional minimum Model requirements include:

4.9.1. Terrain (DTM). All relevant site conditions and proposed grading, including necessary intelligence to produce accurate Project site topographical plans and cross sections.

4.9.2. Drainage. All existing and new drainage piping, including upgrades thereto, including necessary intelligence to produce accurate plans and profiles for the Project site.

4.9.3. Storm Water and Sanitary Sewers. All existing and new sewer structures and piping, including upgrades thereto, on the Project site with necessary connections to mains or other distribution points as appropriate, including necessary intelligence to produce accurate plans and profiles for the Project site.

4.9.4. Utilities. All necessary new utilities connections from the Project building(s) to the existing or newly-created utilities, and all existing above ground and underground utility conduits, including necessary intelligence to produce accurate plans and site-sections.

4.9.5. Roads and Parking. All necessary roadways and parking lots or parking structures, including necessary intelligence to produce accurate plans, profiles and cross-sections.

5.0 Section 5 - Ownership and Rights in Data

5.1. Ownership. The Government has ownership of and rights at the date of Closeout Submittal to all CAD files, BIM Model, and Facility Data developed for the Project in accordance with FAR Part 27, clauses incorporated in Section 00 72 00, Contract Clauses and Special Contract Requirement 1.14 GOVERNMENT RE-USE OF DESIGN (Section 00 73 00). The Government may make use of this data following any deliverable.

6.0 Section 6 – Contractor Electives

6.1. Applicable Criteria. If the Contractor elected to include one or more of the following features as an elective in its accepted contract proposal for additional credit during the source selection, as described in the proposal submission requirements and evaluation criteria, the following criteria are requirements, as applicable to those elective feature(s).

6.2. COBIE Compliance. The Model and Facility Data for the Project shall fulfill Construction Operations Building Information Exchange (COBIE) requirements as defined by the Whole Building Design Guide organization, including all requirements for the indexing and submission of Portable Document Format (PDF) and other appropriate file formats that would otherwise be printed and submitted in compliance with Project operations and maintenance handover requirements.

6.3. Project Scheduling using the Model. In the BIM Execution Plan and during the Preliminary BIM Execution Plan Review, provide an overview of the use of BIM in the development and support of the project construction schedule.

6.3.1. Submittal Requirements. During the Submittal stages, the Contractor shall deliver the construction schedule with information derived from the Model.

6.3.1.1. Construction Submittals – Over-The-Shoulder Progress Reviews. Periodic quality control meetings or construction progress review meetings shall include quality control reviews on the implementation and use of the Model for project scheduling.

6.4. Cost Estimating. In the BIM Execution Plan and during the Preliminary BIM Execution Plan Review, provide an overview of the use of BIM in the development and support of cost estimating requirements, or other applications such as cost analysis and estimate validation.

6.4.1. Submittal Requirements. During the Submittal stages, the Contractor shall deliver cost estimating information derived from the Model.

6.4.2. Project completion. At project completion, the Contractor shall provide an MII (Micro Computer Aided Cost Estimating System Generation II) Cost Estimate which follows the USACE Cost Engineering Military Work Breakdown System (WBS), a modified Uniformat, to at least the sub-systems level and uses quantity information supplied directly from BIM output to the maximum extent possible, though other "Gap" quantity information will be included as necessary for a complete and accurate cost estimate.

6.4.2.1. Sub system level extracted quantities from the BIM for use within the estimate shall be provided according to how detailed line items or tasks should be installed/built so that accurate costs can be developed and/or reflected. Therefore, when developing a BIM, the designer shall be cognizant of what tasks need to be separated appropriately at the beginning stages of model development, such as tasks done on the first floor versus the same task on higher floors that will be more labor intensive and therefore need to have a separate quantity and be priced differently. Tasks and their extracted quantities from the BIM shall be broken down by their location (proximity in the structure) as well as the complexity of its installation.

6.4.2.2. At all design stages it shall be understood that BIM output as described in this document will not generate all quantities that are necessary in order to develop a complete and accurate cost estimate of the project based on the design. An example of this would be plumbing that is less than 1.5" diameter and therefore not expected to be modeled due to granularity; this information is commonly referred to as The Gap. Quantities from The Gap and their associated costs shall be included in the final project actual cost estimates as well.

6.5. Other Analyses and Reports. Structural, energy and efficiency, EPACT 2005 & EISA 2007, lighting design, daylighting, electrical power, psychrometric processing, shading, programming, LEED, fire protection, code compliance, Life Cycle Cost, acoustic, plumbing.

7.0 Section 7 – BIM Project Execution Plan Template

7.1. Contractors will utilize the latest version of the USACE BIM PROJECT EXECUTION PLAN (USACE PxP) Template to develop an acceptable Plan. The template can be downloaded from the CAD/BIM Technology Center website.

ATTACHMENT G**DESIGN SUBMITTAL DIRECTORY AND SUBDIRECTORY FILE ARRANGEMENT**

Organize electronic design submittal files in a subdirectory/file structure in accordance with the following table. The Contractor may suggest a slightly different structure, subject to the discretion of the government.

Design Submittal Directory and Subdirectory File Arrangement.

Directory	Sub-Directory	Sub-Directory or Files	Files
Submittal/Package Name	Narratives	PDF file or files with updated design narrative for each applicable design discipline	
	Drawings	PDF (subdirectory)	Single PDF file with all applicable drawing sheets - bookmarked by sheet number and name
		BIM (subdirectory) See Attachment F.	BIM project folder (with files) per the USACE Workspace. Include an Excel drawing index file with each drawing sheet listed by sheet #, name and corresponding dgn file name (Final Design & Design Complete only)
	Design Analysis & Calculations	Individual PDF files containing design analysis and calculations for each discipline applicable to the submittal	
		PDF file with Fire Protection and Life Safety Code Review checklist	
	LEED	PDF file with updated Leed Check List	
		PDF file or files with LEED Templates for each point with applicable documentation included in each file.	
		LEED SUBMITTALS	
	Energy Analysis	PDF with baseline energy consumption analysis	
		PDF with actual building energy consumption analysis	
	Specifications	Single PDF file with table of contents and all applicable specifications sections.	
		Submittal Register (Final Design & Design Complete submittal only)	
	Design Quality Control	PDF file or files with DQC checklist(s) and/or statements	
	Building Rendering(s)	PDF file of rendering for each building type included in contract (Final Design & Design Complete).	

**SECTION 01 45 04.00 10
CONTRACTOR QUALITY CONTROL**

1.0 GENERAL

1.1. REFERENCES

1.2. PAYMENT

2.0 PRODUCTS (NOT APPLICABLE)

3.0 EXECUTION

3.1. GENERAL REQUIREMENTS

3.2. QUALITY CONTROL PLAN

3.3. COORDINATION MEETING

3.4. QUALITY CONTROL ORGANIZATION

3.5. SUBMITTALS AND DELIVERABLES

3.6. CONTROL

3.7. TESTS

3.8. COMPLETION INSPECTION

3.9. DOCUMENTATION

3.10. NOTIFICATION OF NONCOMPLIANCE

1.0 GENERAL

1.1. REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only. Refer to the latest edition, as of the date of the contract solicitation.

- ASTM INTERNATIONAL (ASTM)
- ASTM D 3740 Minimum Requirements for Agencies
Engaged in the Testing and/or Inspection
of Soil and Rock as Used in Engineering
Design and Construction
- ASTM E 329 Agencies Engaged in the Testing
and/or Inspection of Materials Used in
Construction
- U.S. ARMY CORPS OF ENGINEERS (USACE)
ER 1110-1-12 Quality Management

1.2. PAYMENT

There will be no separate payment for providing and maintaining an effective Quality Control program. Include all costs associated therewith in the applicable unit prices or lump-sum prices contained in the Contract Line Item Schedule.

2.0 PRODUCTS (Not Applicable)

3.0 EXECUTION

3.1. GENERAL REQUIREMENTS

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause titled "Inspection of Construction." The quality control system shall consist of plans, procedures, and organization necessary to produce an end product, which complies with the contract requirements. The system shall cover all design and construction operations, both onsite and offsite, and shall be keyed to the proposed design and construction sequence. The site project superintendent is responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the contract. The site project superintendent in this context shall be the highest level manager responsible for the overall construction activities at the site, including quality and production. The site project superintendent shall maintain a physical presence at the site at all times, except as otherwise acceptable to the Contracting Officer, and shall be responsible for all construction and construction related activities at the site.

3.2. QUALITY CONTROL PLAN

Furnish for Government review, not later than 30 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction." The plan shall identify personnel, procedures, control, instructions, tests, records, and forms to be used. The Government will consider an interim plan for the first 30 days of operation. Design and construction may begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. The Government will not permit work outside of the features of work included in an accepted interim plan to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started. Where the applicable Code issued by the International Code Council calls for an inspection by the Building Official, the Contractor shall include the inspections in the Quality Control Plan and shall perform the inspections. The Designer of Record shall develop a program for any special inspections required by the applicable International Codes and the Contractor shall perform these inspections, using qualified inspectors. Include the special inspection plan in the QC Plan.

3.2.1. Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all design and construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents subcontractors, designers of record, consultants, architect/engineers (AE), fabricators, suppliers, and purchasing agents:

3.2.1.1. A description of the quality control organization. Include a chart showing lines of authority and an acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. A CQC System Manager shall report to the project superintendent or someone higher in the contractor's organization.

3.2.1.2. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function. Also include those responsible for performing and documenting the inspections required by the International Codes and the special inspection program developed by the designer of record.

3.2.1.3. A copy of the letter to the CQC System Manager, signed by an authorized official of the firm, which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Furnish copies of these letters.

3.2.1.4. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents subcontractors, designers of record, consultants, architect engineers (AE), offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

3.2.1.5. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. Use only Government approved Laboratory facilities.

3.2.1.6. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

3.2.1.7. Procedures for tracking design and construction deficiencies from identification through acceptable corrective action. These procedures shall establish verification that identified deficiencies have been corrected.

3.2.1.8. Reporting procedures, including proposed reporting formats.

3.2.1.9. A list of the definable features of work. A definable feature of work is a task, which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable feature under a particular section. This list will be agreed upon during the coordination meeting.

3.2.1.10. A list of all inspections required by the International Codes and the special inspection program required by the code and this contract.

3.2.2. Additional Requirements for Design Quality Control (DQC) Plan

The following additional requirements apply to the Design Quality Control (DQC) plan:

3.2.2.1. The Contractor's QCP Plan shall provide and maintain a Design Quality Control (DQC) Plan as an effective quality control program which will assure that all services required by this design-build contract are performed and provided in a manner that meets professional architectural and engineering quality standards. As a minimum, competent, independent reviewers identified in the DQC Plan shall review all documents. Use personnel who were not involved in the design effort to produce the design to perform the independent technical review (ITR). The ITR is intended as a quality control check of the design. Include, at least, but not necessarily limited to, a review of the contract requirements (the accepted contract or task order proposal and amended RFP), the basis of design, design calculations, the design configuration management documentation and check the design documents for

errors, omissions, and for coordination and design integration. The ITR team is not required to examine, compare or comment concerning alternate design solutions but should concentrate on ensuring that the design meets the contract requirements. Correct errors and deficiencies in the design documents prior to submitting them to the Government.

3.2.2.2. Include in the DQC Plan the discipline-specific checklists to be used during the design and quality control of each submittal. Submit these completed checklists at each design phase as part of the project documentation.

3.2.2.3. A Design Quality Control Manager, who has the responsibility of being cognizant of and assuring that all documents on the project have been coordinated, shall implement the DQC Plan. This individual shall be a person who has verifiable engineering or architectural design experience and is a registered professional engineer or architect. Notify the Government, in writing, of the name of the individual, and the name of an alternate person assigned to the position.

3.2.3. Acceptance of Plan

Government acceptance of the Contractor's plan is required prior to the start of design and construction. Acceptance is conditional and will be predicated on satisfactory performance during the design and construction. The Government reserves the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.4. Notification of Changes

After acceptance of the CQC Plan, notify the Government in writing of any proposed change. Proposed changes are subject to Government acceptance.

3.3. COORDINATION MEETING

After the Postaward Conference, before start of design or construction, and prior to acceptance by the Government of the CQC Plan, the Contractor and the Government shall meet and discuss the Contractor's quality control system. Submit the CQC Plan for review a minimum of 7 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, design activities, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. The Government will prepare minutes of the meeting for signature by both parties. . The minutes shall become a part of the contract file. There may be occasions when either party will call for subsequent conferences to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4. QUALITY CONTROL ORGANIZATION

3.4.1. Personnel Requirements

The requirements for the CQC organization are a CQC System Manager, a Design Quality Manager, and sufficient number of additional qualified personnel to ensure contract compliance. The CQC organization shall also include personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly. The Contractor's CQC staff shall maintain a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure contract compliance. The CQC staff shall be subject to acceptance by the Contracting Officer. Provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Promptly furnish complete records of all letters, material submittals, shop drawing submittals, schedules and all other project documentation to the CQC organization. The CQC organization shall be responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

3.4.2. CQC System Manager

Identify as CQC System Manager an individual within the onsite work organization who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System

Manager shall be a graduate engineer, graduate architect, or a BA/BS graduate of an ACCE accredited construction management college program. The CQC system Manager may alternately be an engineering technician with at least 2 years of college and an ICC certification as a Commercial Building Inspector (Residential Building Inspector certification will be required for Military Family Housing projects). In addition, the CQC system manager shall have a minimum of 5 years construction experience on construction similar to this contract. The CQC System Manager shall be on the site at all times during construction and shall be employed by the prime Contractor. Assign the CQC System Manager no other duties (except may also serve as Safety and Health Officer, if qualified and if allowed by Section 00 73 00). Identify an alternate for the CQC System Manager in the plan to serve in the event of the System Manager's absence. The requirements for the alternate shall be the same as for the designated CQC System Manager but the alternate may have other duties in addition to serving in a temporary capacity as the acting QC manager.

3.4.3. CQC Personnel

3.4.3.1. In addition to CQC personnel specified elsewhere in the contract provide specialized CQC personnel to assist the CQC System Manager in accordance with paragraph titled Area Qualifications.

3.4.3.2. These individuals may be employees of the prime or subcontractor; be responsible to the CQC System Manager; **are not intended to be full time, but must be physically present at the construction site during work on their areas of responsibility**; have the necessary education and/or experience in accordance with the experience matrix listed herein. These individuals may perform other duties but must be allowed sufficient time to perform their assigned quality control duties as described in the Quality Control Plan. **One person may cover more than one area, provided that they are qualified to perform QC activities for the designated areas below and provided that they have adequate time to perform their duties:**

3.4.4. Experience Matrix

3.4.4.1. Area Qualifications

3.4.4.1.1. Civil - Graduate Civil Engineer or (BA/BS) graduate in construction management with 4 years experience in the type of work being performed on this project or engineering technician with 5 yrs related experience.

3.4.4.1.2. Mechanical - Graduate Mechanical Engineer or (BA/BS) graduate in construction management with 4 yrs related experience or engineering technician with an ICC certification as a Commercial Mechanical Inspector with 5 yrs related experience.

3.4.4.1.3. Electrical - Graduate Electrical Engineer or (BA/BS) graduate in construction management with 4 yrs related experience or engineering technician with an ICC certification as a Commercial Electrical Inspector with 5 yrs related experience.

3.4.4.1.4. Structural - Graduate Structural Engineer or (BA/BS) graduate in construction management with 4 yrs related experience or person with an ICC certification as a Reinforced Concrete Special Inspector and Structural Steel and Bolting Special Inspector (as applicable to the type of construction involved) with 5 yrs related experience.

3.4.4.1.5. Plumbing - Graduate Mechanical Engineer or (BA/BS) graduate in construction management with 4 yrs related experience, or person with an ICC certification as a Commercial Plumbing Inspector with 5 yrs related experience.

3.4.4.1.6. Concrete, Pavements and Soils Materials Technician (present while performing tests) with 2 yrs experience for the appropriate area

3.4.4.1.7. Testing, Adjusting and Balancing Specialist must be a member (TAB) Personnel of AABC or an experienced technician of the firm certified by the NEBB (present while testing, adjusting, balancing).

3.4.4.1.8. Design Quality Control Manager Registered Architect or Professional Engineer (not required on the construction site)

3.4.4.1.9. Registered Fire Protection Engineer with 4 years related experience or engineering technician with 5 yrs related experience (but see requirements for Fire Protection Engineer of Record to witness final testing in Section 01 10 00, paragraph 5.10, Fire Protection).

3.4.4.1.10. QC personnel assigned to the installation of the telecommunication system or any of its components shall be Building Industry Consulting Services International (BICSI) Registered Cabling Installers, Technician Level. Submit documentation of current BICSI certification. In lieu of BICSI certification, QC personnel shall have a minimum of 5 years experience in the installation of the specified copper and fiber optic cable and components. They shall have factory or factory approved certification from each equipment manufacturer indicating that they are qualified to install and test the provided products. QC personnel shall witness and certify the testing of telecommunications cabling and equipment.

3.4.5. Additional Requirement

In addition to the above experience and/or education requirements the CQC System Manager shall have completed the course entitled "Construction Quality Management for Contractors". This course is periodically offered at [Not Supplied - ConstructionReqQC : COURSE_LOCATION]. Inquire of the District or Division sponsoring the course for fees and other expenses involved, if any, for attendance at this course.

3.4.6. Organizational Changes

When it is necessary to make changes to the CQC staff, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5. SUBMITTALS AND DELIVERABLES

Make submittals as specified in Section 01 33 00 **SUBMITTAL PROCEDURES**. The CQC organization shall certify that all submittals and deliverables are in compliance with the contract requirements.

3.6. CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. The CQC organization shall conduct at least three phases of control for each definable feature of the construction work as follows:

3.6.1. Preparatory Phase

Perform this phase prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase shall include:

3.6.1.1. A review of each paragraph of applicable specifications, reference codes, and standards. Make a copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field at the preparatory inspection. Maintain these copies in the field, available for use by Government personnel until final acceptance of the work.

3.6.1.2. A review of the contract drawings.

3.6.1.3. A check to assure that all materials and/or equipment have been tested, submitted, and approved.

3.6.1.4. Review of provisions that have been made to provide required control inspection and testing.

3.6.1.5. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.

3.6.1.6. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

3.6.1.7. A review of the appropriate activity hazard analysis to assure safety requirements are met.

3.6.1.8. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.

3.6.1.9. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.

3.6.1.10. Discussion of the initial control phase.

3.6.1.11. Notify the Government at least 24 hours in advance of beginning the preparatory control phase. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. Document the results of the preparatory phase actions by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2. Initial Phase

Accomplish this phase at the beginning of a definable feature of work. Include the following actions:

3.6.2.1. Check work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.

3.6.2.2. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.

3.6.2.3. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.

3.6.2.4. Resolve all differences.

3.6.2.5. Check safety to include compliance with and upgrading of the Accident Prevention plan and activity hazard analysis. Review the activity analysis with each worker.

3.6.2.6. Notify the Government at least 24 hours in advance of beginning the initial phase. The CQC System Manager shall prepare and attach to the daily CQC report separate minutes of this phase. Indicate exact location of initial phase for future reference and comparison with follow-up phases.

3.6.2.7. Repeat the initial phase any time acceptable specified quality standards are not being met.

3.6.3. Follow-up Phase

Perform daily checks to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Conduct final follow-up checks and correct deficiencies prior to the start of additional features of work which may be affected by the deficient work. Do not build upon nor conceal non-conforming work.

3.6.4. Additional Preparatory and Initial Phases

Conduct additional preparatory and initial phases on the same definable features of work if: the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.7. TESTS

3.7.1. Testing Procedure

Perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements and project design documents. Upon request, furnish to the Government

duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of a Corps of Engineers approved testing laboratory, or establish an approved testing laboratory at the project site. The Contractor may elect to use a laboratory certified and accredited by the Concrete and cement Reference Laboratory (CCRL) or by AASHTO Materials Reference Laboratory (AMRL) for testing procedures that those organizations certify. The Contractor shall perform the following activities and record and provide the following data:

3.7.1.1. Verify that testing procedures comply with contract requirements and project design documents.

3.7.1.2. Verify that facilities and testing equipment are available and comply with testing standards.

3.7.1.3. Check test instrument calibration data against certified standards.

3.7.1.4. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

3.7.1.5. Include results of all tests taken, both passing and failing tests, recorded on the CQC report for the date taken. Include specification paragraph reference, location where tests were taken, and the sequential control number identifying the test. If approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. Provide an information copy of tests performed by an offsite or commercial test facility directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.7.2. Testing Laboratories

3.7.2.1. Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in ASTM D 3740 and ASTM E 329.

3.7.2.2. Capability Recheck

If the selected laboratory fails the capability check, the Government will assess the Contractor a charge of \$1,375 to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

3.7.3. Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests, and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.7.4. Furnishing or Transportation of Samples for Government Quality Assurance Testing

The Contractor is responsible for costs incidental to the transportation of samples or materials. Deliver samples of materials for test verification and acceptance testing by the Government to the Corps of Engineers Laboratory, f.o.b., at the following address:

- For delivery by mail:
 - [Not Supplied - ConstructionReqQC : LAB_NAME]
 - [Not Supplied - ConstructionReqQC : LAB_ATTEN]
 - [Not Supplied - ConstructionReqQC : LAB_MAIL]
 - [Not Supplied - ConstructionReqQC : LAB_STATE]
- For other deliveries:
 - [Not Supplied - ConstructionReqQC : LAB_NAME_OTHER]

[Not Supplied - ConstructionReqQC : LAB_ATTEN_OTHER]

[Not Supplied - ConstructionReqQC : LAB_MAIL_OTHER]

[Not Supplied - ConstructionReqQC : LAB_STATE_OTHER]

The area or resident office will coordinate, exact delivery location, and dates for each specific test.

3.8. COMPLETION INSPECTION

3.8.1. Punch-Out Inspection

Near the end of the work, or any increment of the work established by a time stated in the SPECIAL CONTRACT REQUIREMENTS Clause, "Commencement, Prosecution, and Completion of Work", or by the specifications, the CQC Manager shall conduct an inspection of the work. Prepare a punch list of items which do not conform to the approved drawings and specifications and include in the CQC documentation, as required by paragraph DOCUMENTATION. The list of deficiencies shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government Pre-Final inspection.

3.8.2. Pre-Final Inspection

As soon as practicable after the notification above, the Government will perform the pre-final inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. The Contractor's CQC System Manager shall ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Correct any items noted on the Pre-Final inspection in a timely manner. Accomplish these inspections and any deficiency corrections required by this paragraph within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

3.8.3. Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative shall attend the final acceptance inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups and major commands may also attend. The Government will formally schedule the final acceptance inspection based upon results of the Pre-Final inspection. Provide notice to the Government at least 14 days prior to the final acceptance inspection and include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause titled "Inspection of Construction".

3.9. DOCUMENTATION

3.9.1. Maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers using government-provided software, QCS (see Section 01 45 01.10). The report includes, as a minimum, the following information:

3.9.1.1. Contractor/subcontractor and their area of responsibility.

3.9.1.2. Operating plant/equipment with hours worked, idle, or down for repair.

3.9.1.3. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.

- 3.9.1.4. Test and/or control activities performed with results and references to specifications/drawings requirements. Identify the applicable control phase (Preparatory, Initial, Follow-up). List deficiencies noted, along with corrective action.
- 3.9.1.5. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.
- 3.9.1.6. Submittals and deliverables reviewed, with contract reference, by whom, and action taken.
- 3.9.1.7. Offsite surveillance activities, including actions taken.
- 3.9.1.8. Job safety evaluations stating what was checked, results, and instructions or corrective actions.
- 3.9.1.9. Instructions given/received and conflicts in plans and/or specifications.
- 3.9.1.10. Provide documentation of design quality control activities. For independent design reviews, provide, as a minimum, identity of the ITR team, the ITR review comments, responses and the record of resolution of the comments.
- 3.9.2. Contractor's verification statement.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. Furnish the original and one copy of these records in report form to the Government daily within 24 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, submit one report for every 7 days of no work and on the last day of a no work period. Account for all calendar days throughout the life of the contract. The first report following a day of no work shall be for that day only. The CQC System Manager shall sign and date reports. The report shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel. The Contractor may submit these forms electronically, in lieu of hard copy.

3.10. NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

End of Section 01 45 04.00 10

SECTION 01 50 02.000x
TEMPORARY CONSTRUCTION FACILITIES

1.0 OVERVIEW

1.1. GENERAL REQUIREMENTS

1.3. BULLETIN BOARD, PROJECT SIGN, AND PROJECT SAFETY SIGN

1.6. GOVERNMENT FIELD OFFICE

1.0 OVERVIEW

1.1. GENERAL REQUIREMENTS

1.1.1. This section contains requirements specifically applicable to this task order. The requirements of Base ID/IQ contract Section 01 50 02 apply to this task order, except as otherwise specified herein.

1.3. BULLETIN BOARD, PROJECT SIGN, AND PROJECT SAFETY SIGN

1.3.1. Bulletin Board (As Specified in Base contract)

1.3.2. Project and Safety Signs (Added to Stress standardization of signs, in the event that the Base ID/IQ Section 01 50 02 does not contain this information)

Erect a project sign and a site safety sign with informational details as provided by the Government at the Post award conference, within 15 days prior to any work activity on project site. Update the safety sign data daily, with light colored metallic or non-metallic numerals. Remove the signs from the site upon completion of the project. Engineer Pamphlet EP 310-1-6a contains the standardized layout and construction details for the signs. It can be found through a GOOGLE Search or try <http://www.usace.army.mil/publications/eng-pamphlets/ep310-1-6a/s-16.pdf>.

1.6. GOVERNMENT FIELD OFFICE

1.6.1. Resident Engineer's Office

Provide the Government Resident Engineer with an office, approximately 1,400 square feet in floor area, co-located on the project site with the Contractor's office and providing space heat, air conditioning, electric light and power, power and communications outlets and toilet facilities consisting of at least one lavatory and at least one water closet complete with connections to water and sewer mains. Provide a mail slot in the door or a lockable mail box mounted on the surface of the door. Provide outlets for 5 government phones and same number of LAN connections for Government computers. Coordinate with the Resident Engineer for locations. Provide a conference room with space large enough for 12 personnel to hold meetings. Provide a minimum of two outlets per government work station and at least one outlet per 10 feet of wall space for other government equipment. Provide at least twice weekly janitorial service. Remove the office facilities upon completion of the work and restore those areas. Connect and disconnect utilities in accordance with local codes and to the satisfaction of the Contracting Officer.

1.6.2. Trailer-Type Mobile Office

The Contractor may, at its option, furnish and maintain a trailer-type mobile office acceptable to the Contracting Officer and providing as a minimum the facilities specified above. Securely anchor the trailer to the ground at all four corners to guard against movement during high winds, per EM 385-1-1.

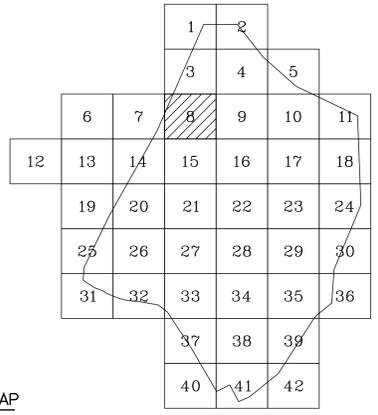
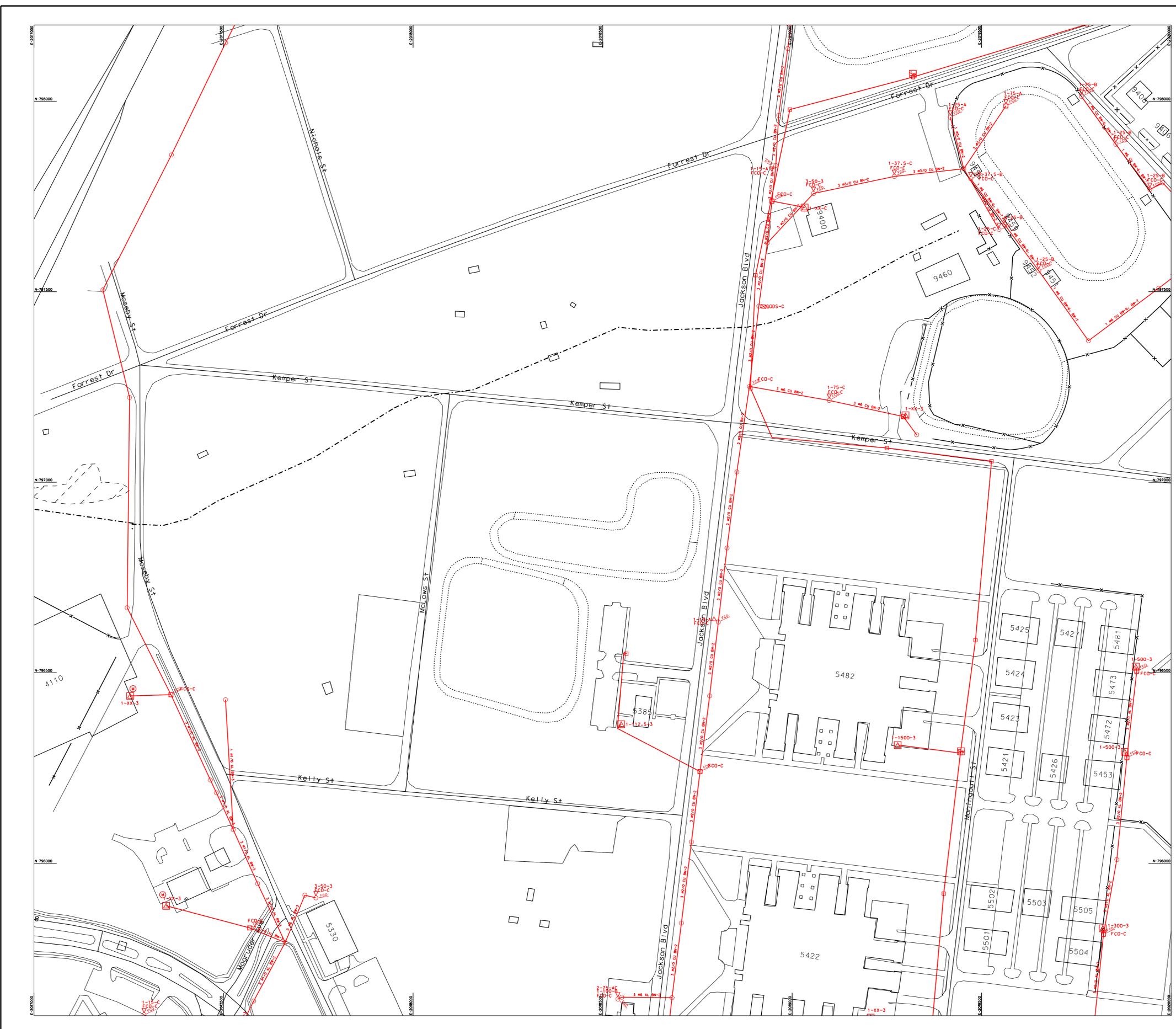
End of Section 01 50 02.000x

APPENDIX A
Geotechnical Information

Not Used

APPENDIX B
List of Drawings

Not Used

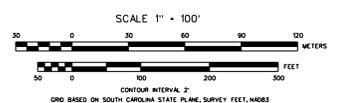


KEY MAP

LEGEND

- | | | |
|----------------------------|--|----------------------------------|
| | EXISTING | PROPOSED |
| PRIMARY AERIAL | NO. AND SIZE OF NEUTRAL CONDUCTORS
3 #4, 1 #4 | MATERIAL
ACSR |
| SECONDARY UNDERGROUND | NO. AND SIZE OF NEUTRAL CONDUCTORS
3 #1, 0.1 #1/0 | MATERIAL
AL UC |
| DUCT | AW
3 SPARE | |
| MANHOLE: HANDHOLE | CAPACITY, KVA
QUANTITY PHASES
1-50-3 | |
| TRANSFORMER POLE MOUNTED | CAPACITY, KVA
QUANTITY PHASES
1-50-3 | |
| TRANSFORMER PAD MOUNTED | SWITCH TYPE
NORMAL POSITION
GDD NO
FCO NO | |
| SWITCHES | | |
| CAPACITOR: RISER POLE | | |
| JUNCTION BOX: SPLICE | | |
| METER: VOLTAGE REGULATOR | | |
| EMERGENCY GENERATOR | | |
| ABBREVIATIONS: | | |
| SWITCH TYPES AND CONDITION | FCO FUSE CUT OUT | SBD SOLID BLADE DISCONNECT |
| | GDD GANG OPERATED DISCONNECT | NC NORMALLY CLOSED |
| | OS OIL SWITCH | NO NORMALLY OPEN |
| | REC RECLOSURE | TBD TO BE DETERMINED |
| CABLE MATERIAL | AL ANODIZED ALUMINUM | CU COPPER CLAD STEEL |
| | ACSR ALUMINUM CABLE STEEL REINFORCED | PLC PAPER INSULATED LEAD COVERED |
| | AL ALUMINUM | WP WEATHERPROOF INSULATION |
| | C COPPER | TBD TO BE DETERMINED |
| TYPE INSTALLATION | BUR BURIED | UC UNDERGROUND |
| | DB DIRECT BURIED | TBD TO BE DETERMINED |
| NOTES: | | |

- GENERAL NOTES:
- Map data was compiled from various sources including CADD, GIS, and as-builts. This data is provided for information and planning purposes only.
 - Point data for electrical, natural gas, water, and wastewater that were visible were located using HAMMER GPS (sub-meter) devices provided by the US Army Corps of Engineers, ERDC-CERL.
 - Non-visible utility features such as pipes and cables were shifted to match GPS data where appropriate.
 - Planimetric data was shifted to "best fit" 2002 aerial photography provided by the installation.

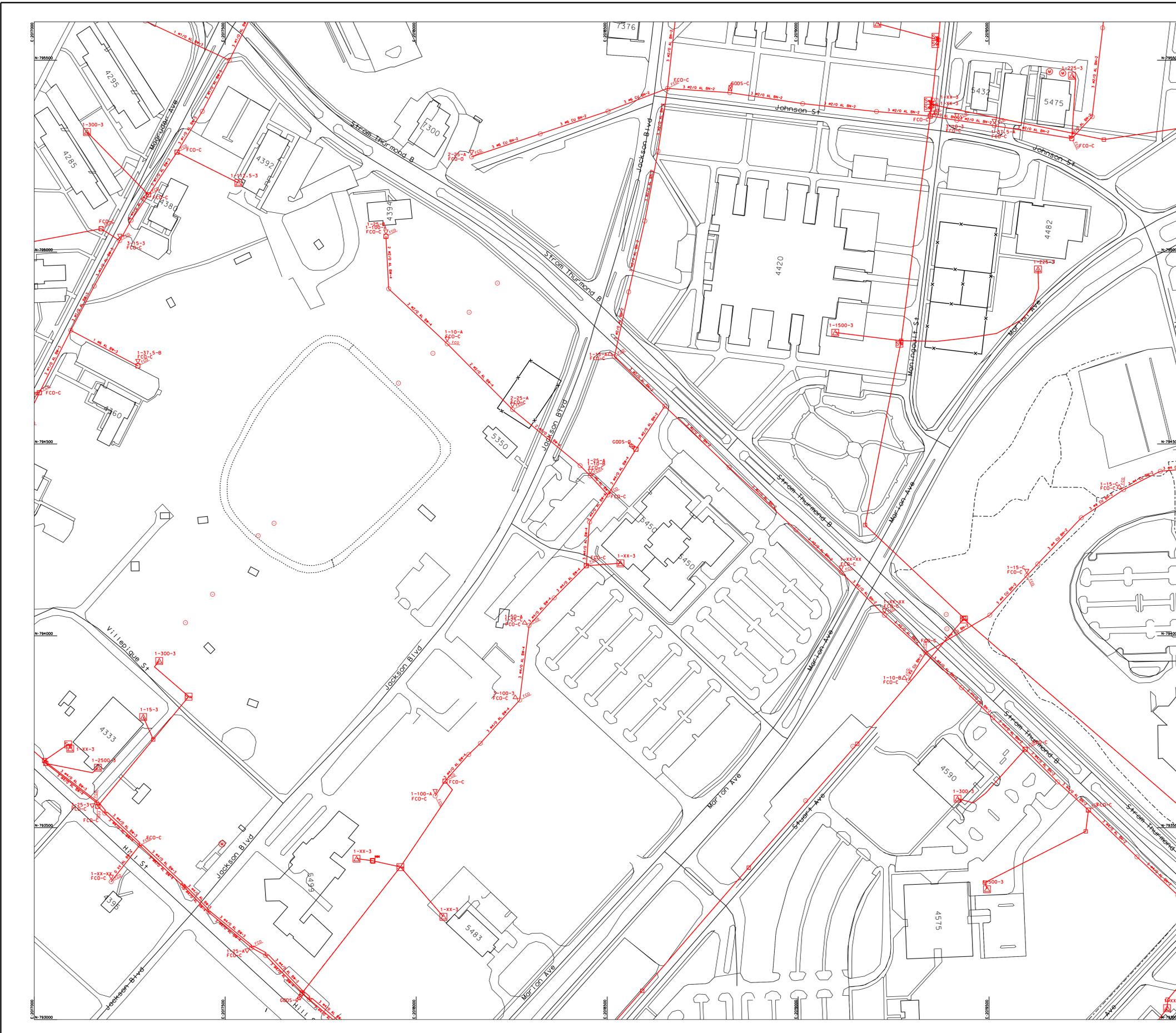


FORT JACKSON
COLUMBIA, SOUTH CAROLINA

DIRECTORATE OF LOGISTICS AND ENGINEERING FORT JACKSON, SC 29207	MASTER PLANNING BRANCH BLDG #2562 CADD CENTER
--	---

MASTER PLAN
ELECTRICAL SYSTEM

RECOMMENDED BY THE INSTALLATION PLANNED: [] FOR APPROVAL: []	DATE 06-28-06	DRAWING NO.
DATE: []	REVISION NO.	FILE NO.
APPROVED BY MAJOR ARMY COMMAND: []	SHEET NO. 8	
DATE: []		



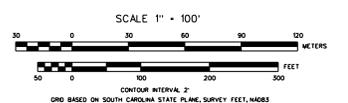
	1	2				
	3	4	5			
6	7	8	9	10	11	
12	13	14	15	16	17	18
19	20	21	22	23	24	
25	26	27	28	29	30	
31	32	33	34	35	36	
		37	38	39		
		40	41	42		

KEY MAP

LEGEND

	EXISTING	PROPOSED
PRIMARY AERIAL	NO. AND SIZE OF NEUTRAL CONDUCTORS 3 #4, 1#4	MATERIAL ACSR
SECONDARY UNDERGROUND	NO. AND SIZE OF NEUTRAL CONDUCTORS 3 #1/0, 1#1/0	MATERIAL AL UC
DUCT	AW 3 SPARE	
MANHOLE: HANDHOLE	CAPACITY, KVA QUANTITY PHASES 1-50-3	
TRANSFORMER POLE MOUNTED	CAPACITY, KVA QUANTITY PHASES 1-50-3	
TRANSFORMER PAD MOUNTED	SWITCH TYPE POSITION GDD NO. FCO NO.	
SWITCHES		
CAPACITOR: RISER POLE		
JUNCTION BOX: SPLICE		
METER: VOLTAGE REGULATOR		
EMERGENCY GENERATOR		
ABBREVIATIONS:		
SWITCH TYPES AND CONDITION		SBD SOLID BLADE DISCONNECT
FCO FUSE CUT OUT		NC NORMALLY CLOSED
GDD GANG OPERATED DISCONNECT		NO NORMALLY OPEN
OS OIL SWITCH		TBD TO BE DETERMINED
REC RECLOSURE		
CABLE MATERIAL		CU COPPER CLAD STEEL
AL ANODIZED ALUMINUM		PLC PAPER INSULATED LEAD COVERED
ACSR ALUMINUM CABLE STEEL REINFORCED		WP WEATHERPROOF INSULATION
AL ALUMINUM		TBD TO BE DETERMINED
C COPPER		
TYPE INSTALLATION		UC UNDERGROUND
BUR BURIED		DB DIRECT BURIED
DB DIRECT BURIED		TBD TO BE DETERMINED
NOTES:		

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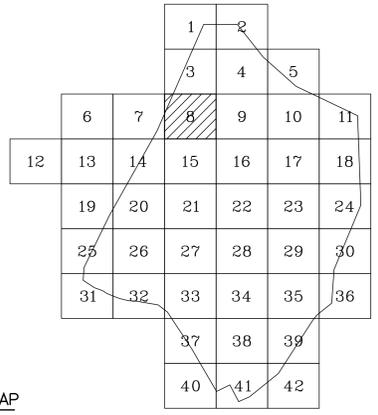
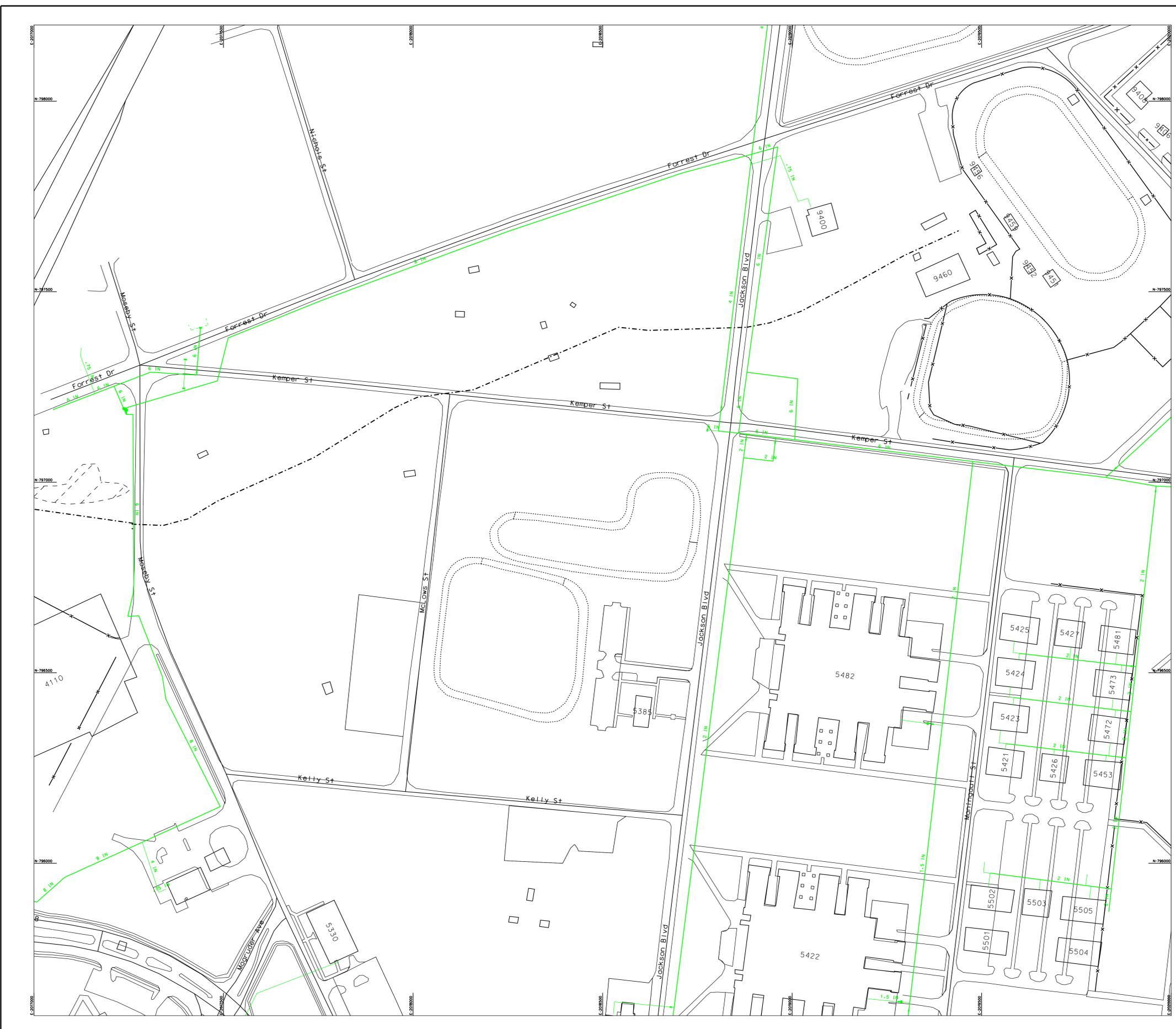
FORT JACKSON
COLUMBIA, SOUTH CAROLINA

DIRECTORATE OF LOGISTICS AND ENGINEERING
FORT JACKSON, SC 29207

MASTER PLANNING BRANCH
BLDG #2562
CADD CENTER

MASTER PLAN
ELECTRICAL SYSTEM

RECOMMENDED BY THE INSTALLATION PLANNED: [] DATE: []	DATE 06-28-06	DRAWING NO.
APPROVED BY MAJOR ARMY CORPORAL: [] DATE: []	REVISION NO.	FILE NO.
	SHEET NO. 15	



KEY MAP

LEGEND

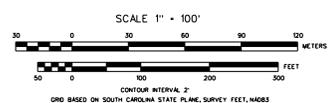
	EXISTING	PROPOSED
GAS MAIN	4 S	4 S
INACTIVE MAIN	4 S	
BUILDING SERVICE	2 S	
INACTIVE BUILDING SERVICE	2 S	
CAP/PLUG MAIN: SERVICE	TYPE 1	TYPE 2
VALVE MAIN: SERVICE	2	2
MANHOLE: REGULATOR	R	R
METER: REDUCER	M	M
VENT PIPE: FILL POINT	V	V
REGULATOR IN MANHOLE	R	R
WATER SEPARATOR	S	S
PUMP STATION	PS	PS
TANK	T	T

ABBREVIATIONS:

PIPE MATERIALS		
TBD	TO BE DETERMINED	GI GALVANIZED IRON
ABS	ACRYLONITRILE BUTADIENE STYRENE	GS GALVANIZED STEEL
BI	BLACK IRON	PE POLYETHYLENE
CI	CAST IRON	PVC POLYVINYLCHLORIDE
CWS	COATED AND WRAPPED STEEL	S STEEL
DI	DUCTILE IRON	

VALVE TYPES							
1	TO BE DETERMINED	5	ANGLE	9	BALL	30	OTHER
2	BUTTERFLY	6	CHECK	10	PLUG		
3	GATE	7	STOP	11	PRESSURE RELIEF		
4	GLOBE	8	NEEDLE	12	REGULATING		

- NOTES:
- GENERAL NOTES:
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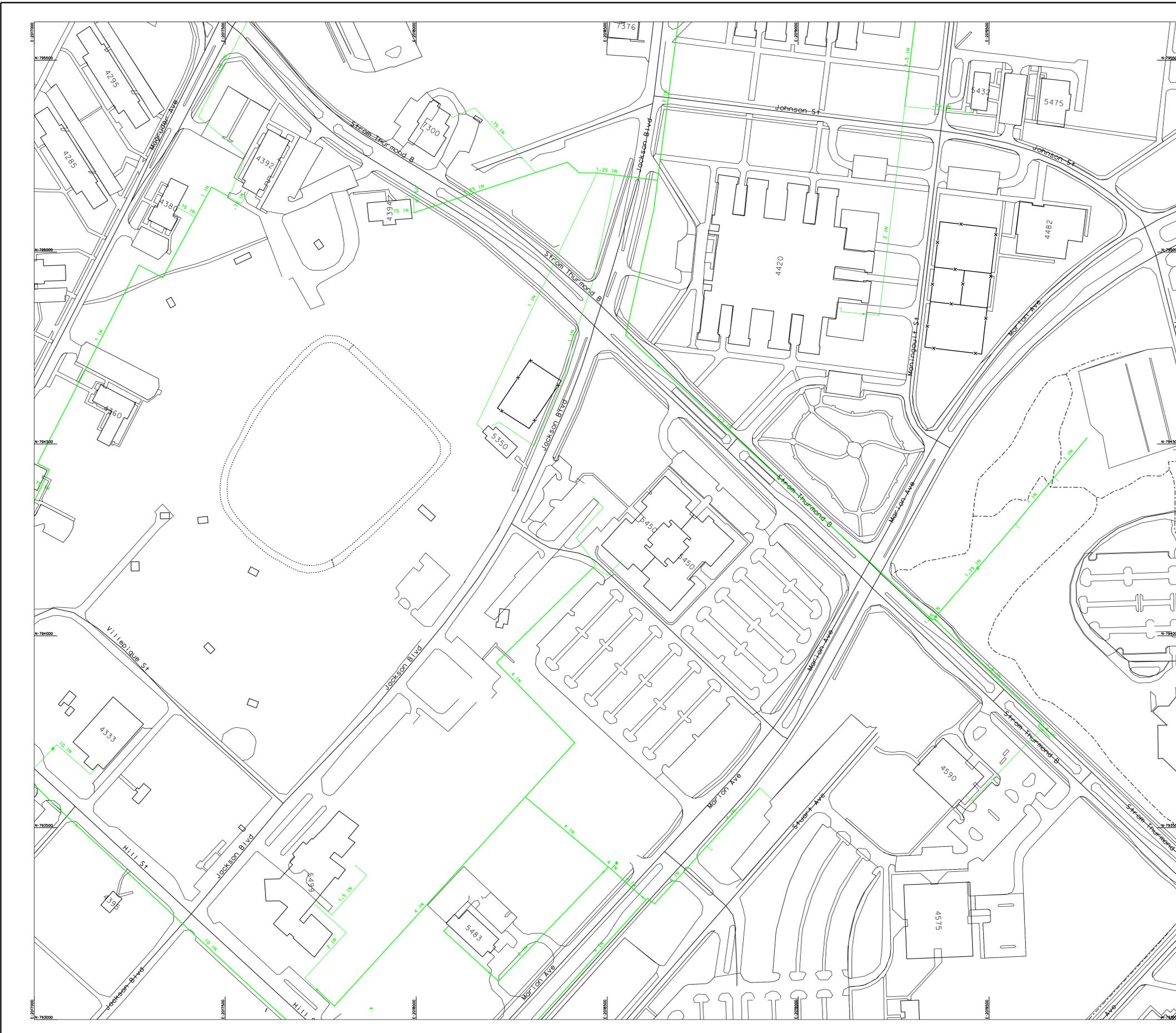


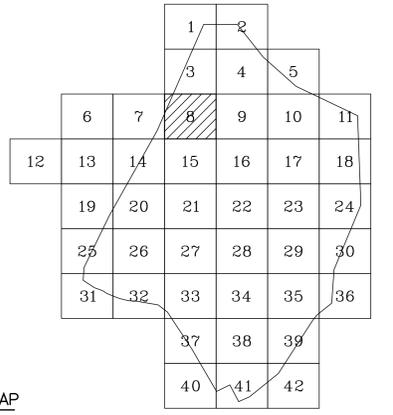
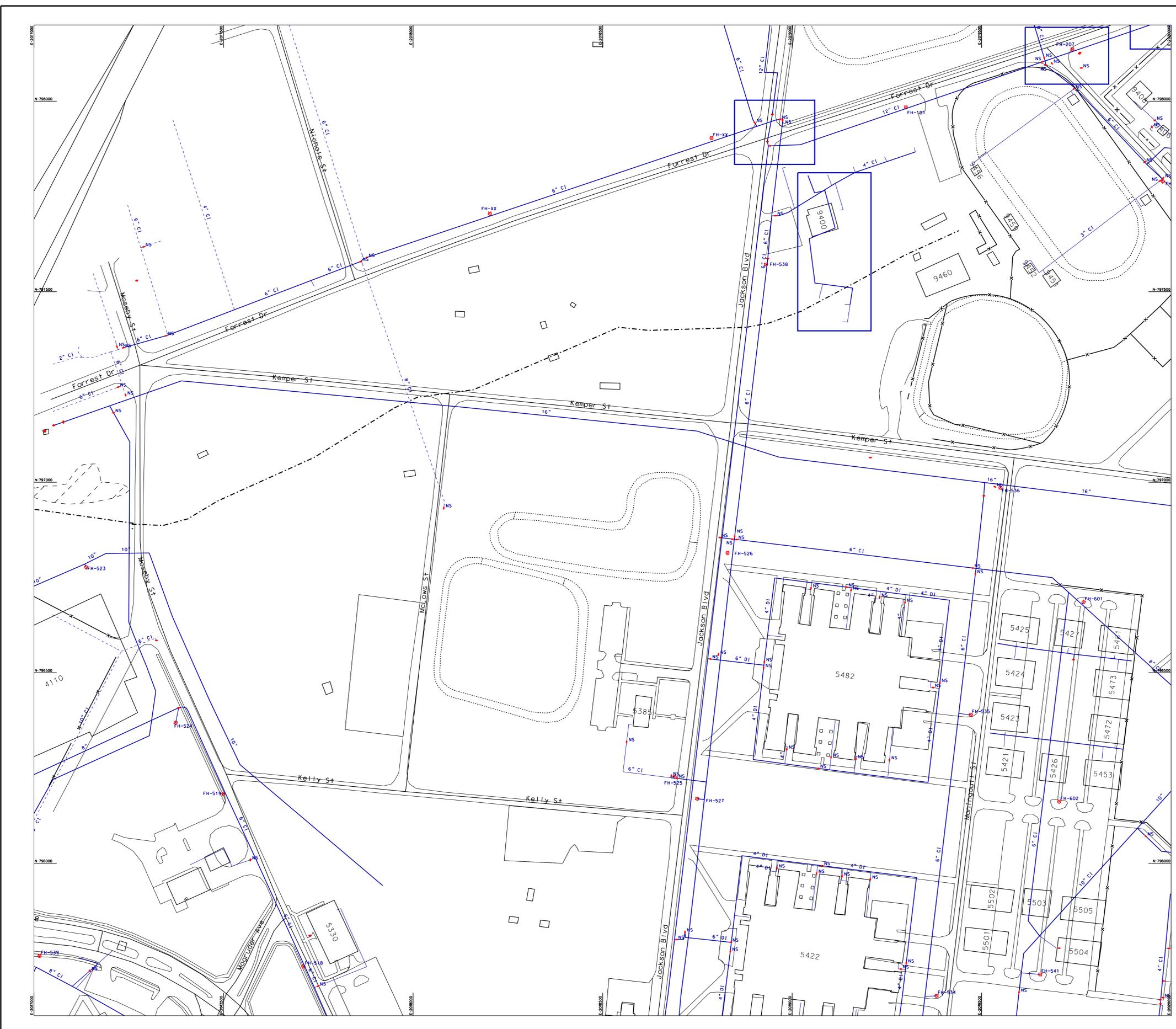
FORT JACKSON
COLUMBIA, SOUTH CAROLINA

DIRECTORATE OF LOGISTICS AND ENGINEERING FORT JACKSON, SC 29207	MASTER PLANNING BRANCH BLDG #2562 CADD CENTER
--	---

MASTER PLAN
NATURAL GAS SYSTEM

RECOMMENDED BY: [] PLANNED: [] DATE: []	DATE 06-28-06	DRAWING NO.
APPROVED BY: [] DATE: []	REVISION NO.	FILE NO.
	SHEET NO. 8	





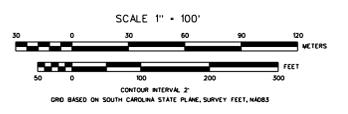
KEY MAP

LEGEND

	EXISTING	PROPOSED	
WATER MAIN	8" CI	8" CI	
INACTIVE MAIN	8" CI		
BUILDING SERVICE	2" CI		
INACTIVE BUILDING SERVICE	2" CI		
CAP/PLUG MAIN: SERVICE	TYPE 1	TYPE 2	
VALVE MAIN: SERVICE	M	M	
HYDRANT: METER	M	M	
POST INDICATOR VALVE: WELL	W	W	
VALVE PIT: BOOSTER PUMP	B	B	
AIR VENT: FAUCET	F	F	
REGULATOR: REDUCER	R	R	
MANHOLE: FIRE DEPT CONNECTION	FC	FC	
WATER TANK	STYLE	CAPACITY	
ABBREVIATIONS:			
PIPE MATERIALS			
TBD TO BE DETERMINED	GI GALVANIZED IRON		
ABS ACRYLONITRILE BUTADIENE STYRENE	GS GALVANIZED STEEL		
AC ASBESTOS CEMENT	PVC POLYVINYLCHLORIDE		
C CONCRETE	RC REINFORCED CONCRETE		
CI CAST IRON	VC VITRIFIED CLAY		
CU COPPER	WD WOOD		
DI DUCTILE IRON	WI WROUGHT IRON		
VALVE TYPES			
1 TO BE DETERMINED	5 ANGLE	9 BALL	30 OTHER
2 BUTTERFLY	6 CHECK	10 PLUG	
3 GATE	7 STOP	11 PRESSURE RELIEF	
4 GLOBE	8 NEEDLE	12 REGULATING	
TANK STYLE			
AG ABOVE GROUND/NOT ELEVATED	UG UNDERGROUND		
EL ELEVATED	TBD TO BE DETERMINED		

GENERAL NOTES:

- Map data was compiled from various sources including CADD, GIS, and as-builts. This data is provided for information and planning purposes only.
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- Planimetric data was shifted to "best fit" 2002 aerial photography provided by the installation.



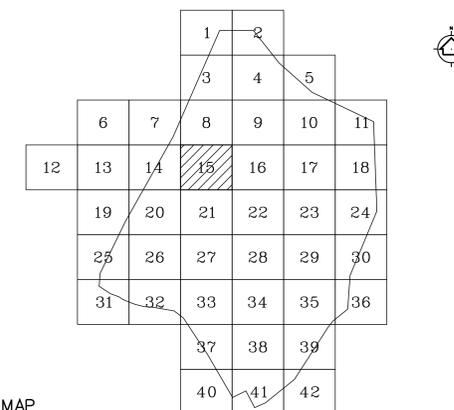
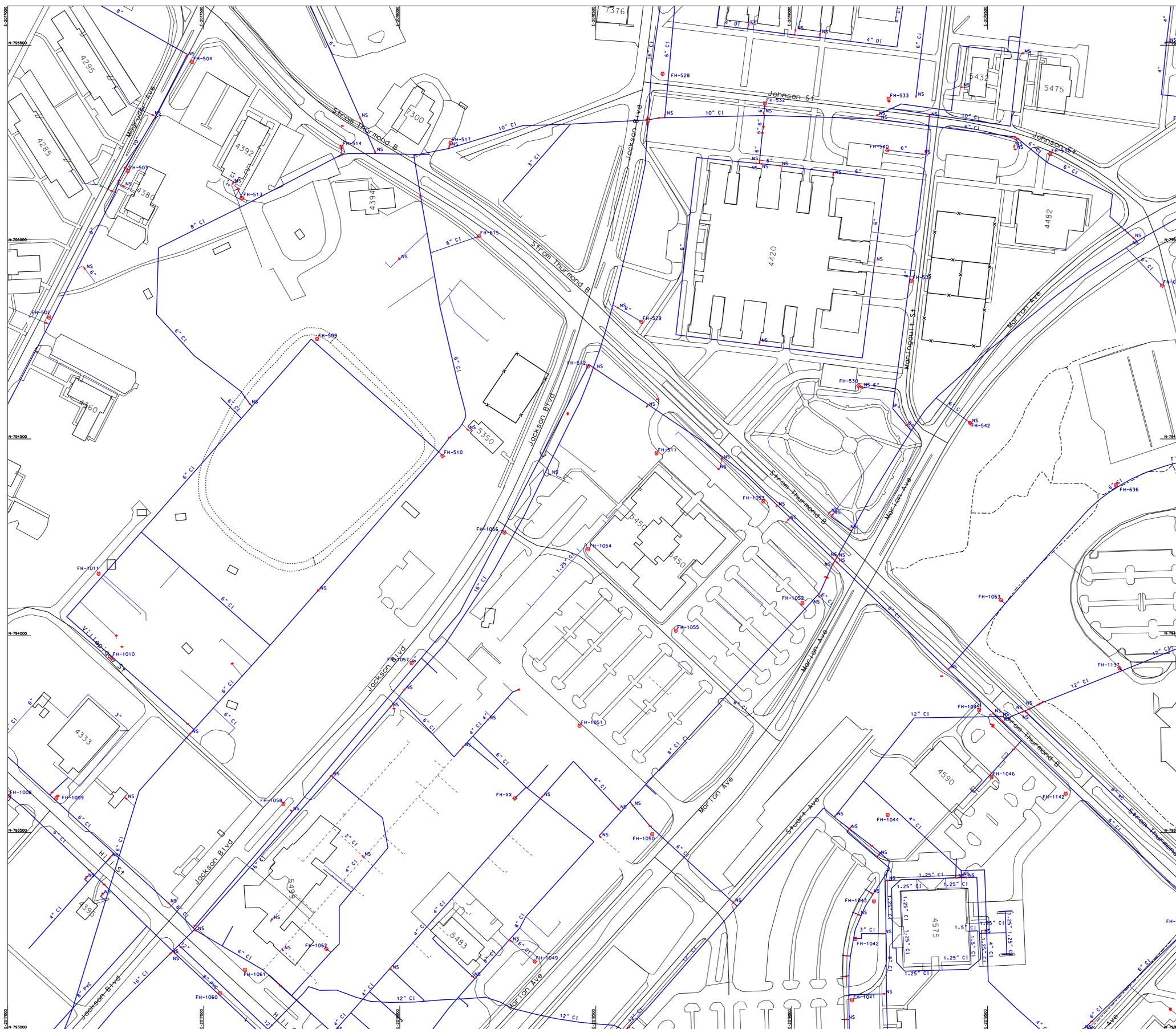
FORT JACKSON
COLUMBIA, SOUTH CAROLINA

DIRECTORATE OF LOGISTICS AND ENGINEERING
FORT JACKSON, SC 29207

MASTER PLANNING BRANCH
BLDG #2562
CADD CENTER

MASTER PLAN
WATER SYSTEM

RECOMMENDED BY THE INSTALLATION PLANNED: (DATE FOR APPROVAL):	DATE 06-28-06	DRAWING NO.
DATE:	REVISION NO.	FILE NO.
APPROVED BY MAJOR ARMY COMMAND:	SHEET NO. 8	
DATE:		

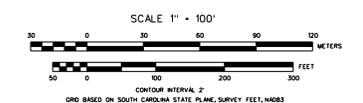


KEY MAP

LEGEND

	EXISTING	PROPOSED	
WATER MAIN	8" CI	8" CI	
INACTIVE MAIN	8" CI	8" CI	
BUILDING SERVICE	2" CI	2" CI	
INACTIVE BUILDING SERVICE	2" CI	2" CI	
CAP/PLUG MAIN SERVICE	TYPE 1	TYPE 2	
VALVE MAIN SERVICE	2" CI	2" CI	
HYDRANT: METER	M	M	
POST INDICATOR VALVE: WELL	W	W	
VALVE PIT: BOOSTER PUMP	B	B	
AIR VENT: FAUCET	F	F	
REGULATOR: REDUCER	R	R	
MANHOLE: FIRE DEPT CONNECTION	FC	FC	
WATER TANK	STYLE CAPACITY	STYLE CAPACITY	
ABBREVIATIONS:			
PIPE MATERIALS:			
TBD TO BE DETERMINED	GI GALVANIZED IRON	GS GALVANIZED STEEL	
ABS ACRYLONITRILE BUTADIENE STYRENE	PVC POLYVINYLCHLORIDE	RC REINFORCED CONCRETE	
AC ASBESTOS CEMENT	VC VITRIFIED CLAY	WD WOOD	
C CONCRETE	WI WROUGHT IRON		
CI CAST IRON			
CU COPPER			
DI DUCTILE IRON			
VALVE TYPES:			
1 TO BE DETERMINED	5 ANGLE	9 BALL	30 OTHER
2 BUTTERFLY	6 CHECK	10 PLUG	
3 GATE	7 STOP	11 PRESSURE RELIEF	
4 GLOBE	8 NEEDLE	12 REGULATING	
TANK STYLE			
AG ABOVE GROUND/NOT ELEVATED	UG UNDERGROUND	TBD TO BE DETERMINED	
EL ELEVATED			
NOTES:			

GENERAL NOTES:
 1. Map data was compiled from various sources including CADD, GIS, and as-builts. This data is provided for information and planning purposes only.
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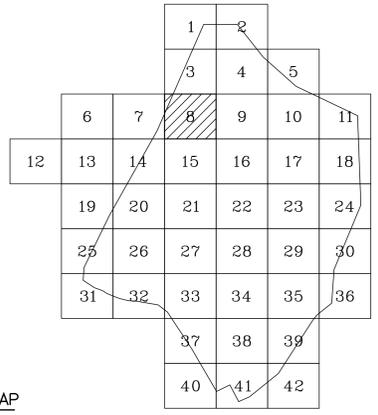
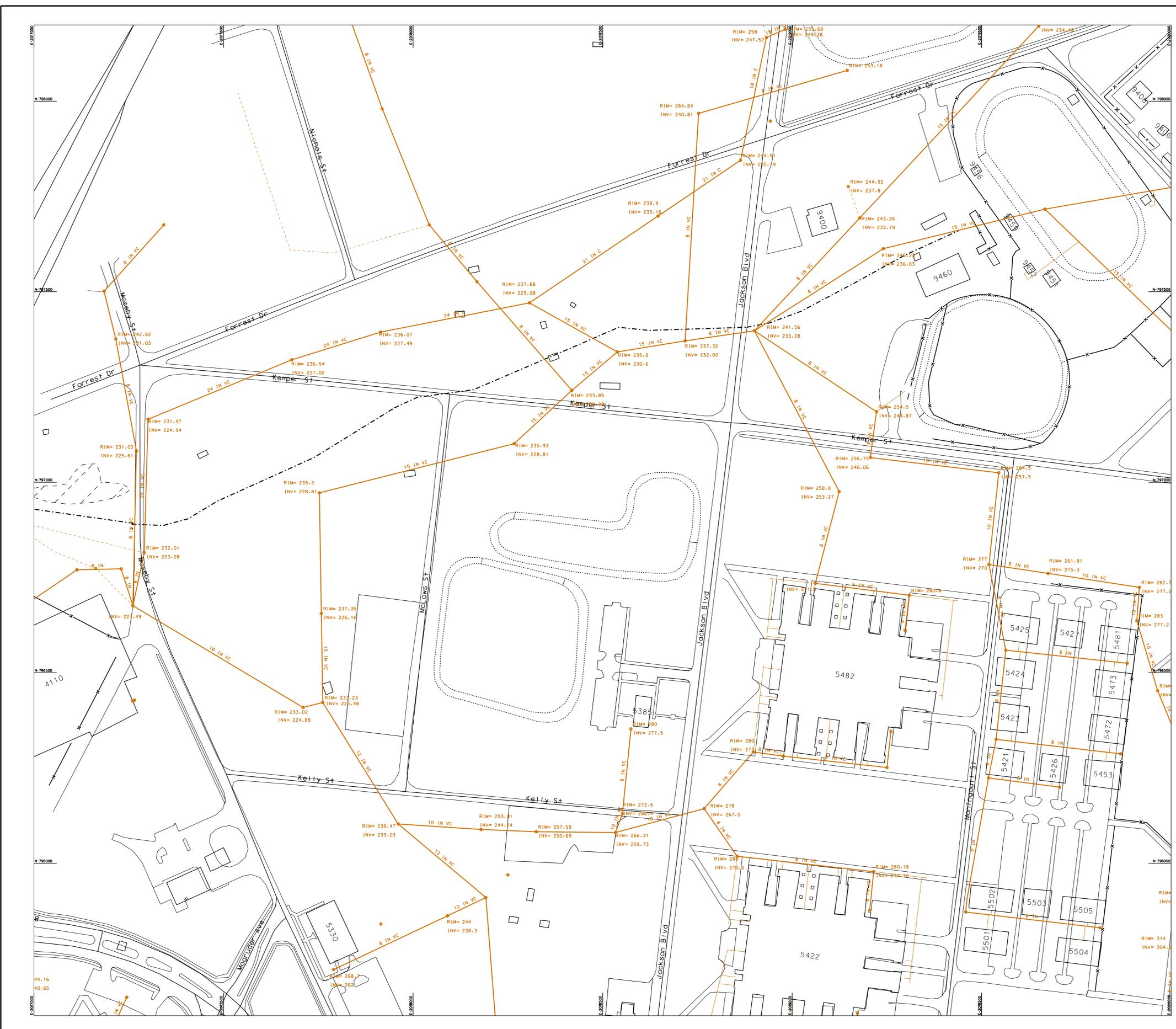


FORT JACKSON
 COLUMBIA, SOUTH CAROLINA

DIRECTORATE OF LOGISTICS AND ENGINEERING FORT JACKSON, SC 29207	MASTER PLANNING BRANCH BLDG #2562 CADD CENTER
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MASTER PLAN
 WATER SYSTEM

RECOMMENDED BY THE INSTALLATION PLANNED: SUBMIT FOR APPROVAL:	DATE 06-28-06	DRAWING NO.
DATE:	REVISION NO.	FILE NO.
APPROVED BY MAJOR ARMY COMMAND:	SHEET NO. 15	
DATE:		



KEY MAP

LEGEND

	EXISTING	PROPOSED
SANITARY MAIN	24 C	24 C
INACTIVE MAIN	24 C	
BUILDING SERVICE	6 C	
INACTIVE BUILDING SERVICE	6 C	
CAP/PLUG MAIN SERVICE	— —	
VALVE MAIN SERVICE	— —	
MANHOLE; LIFT STATION	— —	
SEPARATOR; CLEANOUT	— —	
GRIT CHAMBER; EJECTOR	— —	
TREATMENT FACILITY	— —	
SEPTIC TANK	— —	

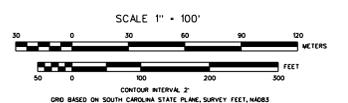
ABBREVIATIONS:

PIPE MATERIALS		
TBD	TO BE DETERMINED	DI DUCTILE IRON
AC	ASBESTOS CEMENT	GI GALVANIZED IRON
BR	BRICK	GS GALVANIZED STEEL
C	CONCRETE	PVC POLYVINYLCHLORIDE
CI	CAST IRON	RC REINFORCED CONCRETE
CM	CORRUGATED METAL	S STEEL
CU	COPPER	TC TERRA COTTA
CWS	COATED AND WRAPPED STEEL	VC VITRIFIED CLAY
		WI WROUGHT IRON

NOTES:

GENERAL NOTES:

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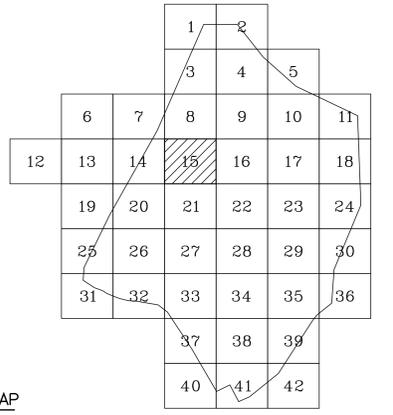
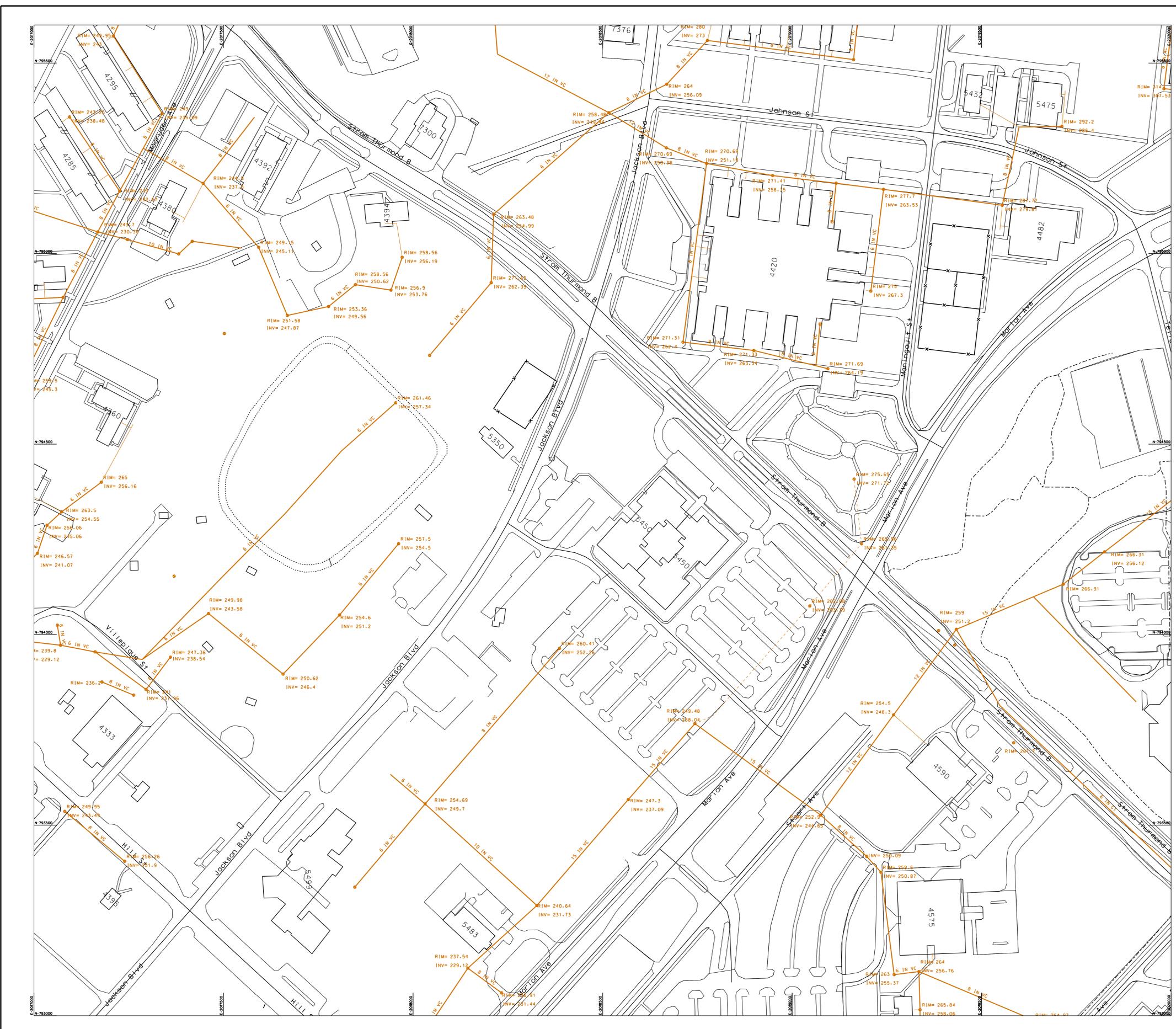


FORT JACKSON
COLUMBIA, SOUTH CAROLINA

DIRECTORATE OF LOGISTICS AND ENGINEERING FORT JACKSON, SC 29207	MASTER PLANNING BRANCH BLDG #2562 CADD CENTER
--	---

MASTER PLAN
WASTEWATER SYSTEM

RECOMMENDED BY THE INSTALLATION PLANNED, SIGNED FOR APPROVAL:	DATE 06-28-06	DRAWING NO.
DATE:	REVISION NO.	FILE NO.
APPROVED BY MAJOR HWY COMMAND:	SHEET NO. 8	
DATE:		



KEY MAP

LEGEND

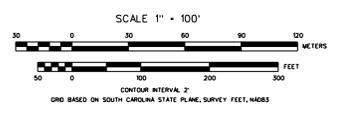
	EXISTING	PROPOSED
SANITARY MAIN	24 C	24 C
INACTIVE MAIN	24 C	
BUILDING SERVICE	6 C	6 C
INACTIVE BUILDING SERVICE	6 C	
CAP/PLUG MAIN: SERVICE	— —	— —
VALVE MAIN: SERVICE	—+—	—+—
MANHOLE: LIFT STATION	—●—	—●—
SEPARATOR: CLEANOUT	—S—	—S—
GRIT CHAMBER: EJECTOR	—G—	—G—
TREATMENT FACILITY	—T—	—T—
SEPTIC TANK	—S—	—S—

ABBREVIATIONS:

PIPE MATERIALS	DI DUCTILE IRON
TBD TO BE DETERMINED	GI GALVANIZED IRON
AC ASBESTOS CEMENT	GS GALVANIZED STEEL
BR BRICK	CS GALVANIZED STEEL
C CONCRETE	PVC POLYVINYLCHLORIDE
CI CAST IRON	RC REINFORCED CONCRETE
CM CORRUGATED METAL	S STEEL
CU COPPER	TC TERRA COTTA
CWS COATED AND WRAPPED STEEL	VC VITRIFIED CLAY
	WI WROUGHT IRON

NOTES:

- GENERAL NOTES:
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FORT JACKSON
COLUMBIA, SOUTH CAROLINA

DIRECTORATE OF LOGISTICS AND ENGINEERING FORT JACKSON, SC 29207	MASTER PLANNING BRANCH BLDG #2562 CADD CENTER
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MASTER PLAN
WASTEWATER SYSTEM

RECOMMENDED BY THE INSTALLATION PLANNED: [] DATE: []	DATE 06-28-06	DRAWING NO.
APPROVED BY MAJOR HWY COMMAND: [] DATE: []	REVISION NO.	FILE NO.
	SHEET NO. 15	

APPENDIX D
Results of Fire Flow Tests

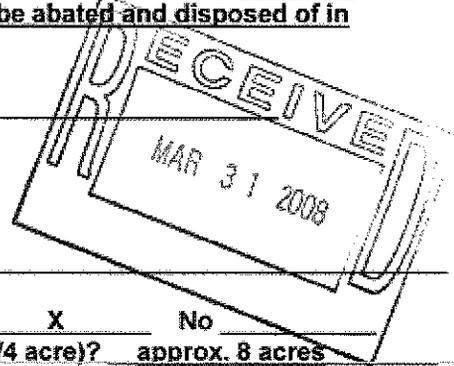
Not Used

08-0139

Date Received: _____
Project #: _____

RECORD OF ENVIRONMENTAL CONSIDERATION (REC)
Directorate of Logistics and Engineering, Environmental and Natural Resources Division (ENRD)

1. Project title: Training Barracks Consolidated Dining Facility (PN 69417)
2. Brief description of Project: Construct a consolidated, 5,200 person capacity, 124,780 sf, stand-alone Dining Facility (DFAC) for four existing, one-battalion size, Basic Combat Trainee (BTC) barracks complexes. Convert existing, undersized dining facility space inside each of these four (4) barracks to Organizational Classroom space. The existing Battalion Headquarters located inside each of the four (4) barracks will be renovated and expanded. All hazardous materials identified in the conversion and renovation of the interior space (asbestos, lead-based paint, etc) will be abated and disposed of in accordance with current laws and regulations.
3. Proponent: Fort Jackson/USACE
4. Name, address, and phone number of proponent POC:
Nancy Hamilton, 2562 Essayons Way, 751-6016
5. Current land use of project site: Grassed/Asphalt/Relocatables
6. Will there be any soil disturbance or fill material required? Yes No
7. If yes, how many acres will be disturbed or filled (to the nearest 1/4 acre)? approx. 8 acres
8. Will there be any tree removal or pruning? Yes No
9. If yes, how many trees will be removed? unknown How many will be pruned? unknown
10. Provide 3 copies of a general map of the project area that shows the location relative to a prominent landmark such as a road or building.
11. If trees are to be removed or pruned, provide 3 copies of a site specific map denoting the affected area and specifying the dimensions of the area of removal or pruning.
12. Approximate date when proposed action/project will be initiated: (month/year) _____
13. Anticipated completion date and/or duration of proposed action: (month/year) _____
14. Approval of REC required by date: (month/year) 4/08



PROPONENT SIGNATURE: //s// Nancy Hamilton Date: 3/25/08

Three copies of completed REC and 3 copies of each map must be submitted.
If you have any questions, please call the Environmental and Natural Resources Division at 751-5011.

===== TO BE COMPLETED BY THE ENRD =====

15. Reason for using Record of Environmental Consideration (choose one):
 - a. The proposed project is adequately covered in an EA/EIS entitled Adendum to the FJMPEA and dated July 2008. The EA/EIS may be reviewed at _____
 - OR
 - b. The proposed project is categorically excluded under the provisions of CX _____, AR 200-2, Appendix B, because _____

16. Project Approved by DPTM: Yes No N/A Signature _____ Date _____

17. Signature: [Signature] Date: 24 April 09
National Environmental Policy Act Coordinator, Environmental Management Office

18. Concurrence: [Signature] Date: 30 Apr 09
Team Leader, Environmental Management Office

19. Needs to be reviewed by: WO FO EMO Review suspense date: _____

IMSE-JAC-PWE-E (200-1)

24 April 2009

MEMORANDUM FOR Record

SUBJECT: Construction Site Selection Survey (CSSS) for a Training Barracks Consolidated Dining Facility

1. The proposed site of the Training Barracks Consolidated Dining Facility is located off of Mangault Street between starship building 5422 and 5500.
2. A review of the following documents and reports did not reveal evidence that the proposed construction sites are contaminated or that there was a release of hazardous material on the sites. The information in this CSSS for site "1" was initially covered in a CSSS dated 8 October 2008 for a Training Barracks Consolidated Dining Facility proposed for that site.
 - a. Update of the Initial Installation Assessment of Fort Jackson, S.C. (USATHAMA, April 1988).
 - b. Installation Assessment Relook Program, EPIC (USATHAMA, December 1985).
 - c. Underground Storage Tank (UST) Disposition File, Fort Jackson Environmental Management Office.
 - d. Numerical Listing of Facilities, Fort Jackson Real Property Office, July 1975.
 - e. Building Information Schedule, Fort Jackson Real Property Office, September 1981.
 - f. Cantonment maps, 1945, 1971, 1990, and 2004.
 - g. Aerial photos, taken in 1945, 1947, 1959, 1970, 1974, 1980, 1989, and 1999.
 - h. Fort Jackson SWMU Map, ENV GIS Office, August 2008
3. The proposed building site was part of the World War II cantonment area. The area consisted of a mess hall, supply and administration buildings. All buildings were demolished by 1947. A parking lot was established by 1980 on the site. In the 1990's, relocatable buildings were built on the site and remain there throughout present day.
4. The DPW Environmental Management Branch does not have a record indicating possible contamination from underground storage tanks (USTs) in the project site. Records do not indicate the presence of USTs ever on this site.
5. There are no Solid Waste Management Units (SWMUs) or other Installation Restoration Program (IRP) related sites on or near the project site.
6. Site surface inspections conducted on 8 October 2008 did not reveal visual evidence of environmental contamination.

(continued on reverse side)

IMSE-JAC-PWE-E (200-1)

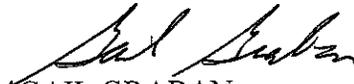
SUBJECT: Construction Site Selection Survey (CSSS) for Training Barracks Consolidated Dining Facility

7. According to AR 415-15, Army Military Construction Program Development and Execution, as referenced in DA PAM 200-1, Section 15-11, proposed construction sites must be evaluated for potential site contamination and classified in one of three categories. The project building site is a Category I site: There is no known contamination and historical usage of the site gives no reason to suspect contamination.

8. The POC is the undersigned at (803) 751-4231/5011.



JAMES C. MCCRACKEN
NEPA Coordinator
Environmental Division



GAIL GRABAN
Chief,
Environmental Management Branch
Environmental Division, DPW



LAHIRI ESTABA, P.G.
Environmental Restoration Program Manager
Environmental Division

IMSE-JAC-PWE-E (200-2)

30 April 2009

MEMORANDUM FOR U. S. Army Corps of Engineers, 2562 Essayons Way; ATTN: Nancy Hamilton

SUBJECT: Memorandum of Environmental Consideration (MOEC) for Training Barracks Consolidated Dining Facility (08-0139)

1. The Environmental Division (ENV) has reviewed the subject project. The project must be completed as described in the signed Record of Environmental Consideration (REC) (encl 1) and as shown on the map (encl 2.).

2. This MOEC is not an approval to begin the project; it outlines environmental and natural resource requirements only, as follows:

a. **Buildings 4420, 5422, 5482, and 5500 were surveyed in March of 2008. The results indicate that the floor tile and floor tile mastic material is positive for ASBESTOS. Disturbing ACM is a violation subject to fines and penalties. No DoD Civilian, Military or Contractor shall engage in any asbestos abatement activity unless they have completed the required asbestos training through an EPA Accredited provider and been licensed by DHEC. The scope of this project requires coordination through the Environmental Branch prior to any renovation activities. For additional information, contact LaVaughn Berry, ENV, at 751-3838.**

b. In the construction and renovation portions of this project, the contractor should pay close attention to all replacement materials i.e. insulation, fire proofing products, acoustical ceiling tiles, floor coverings, joint compound, and adhesives. These materials must not contain any form of asbestos. Asbestos is still being manufactured and used by some companies and manufacturers. When purchasing any materials used in construction and renovation activities, please check the manufacturer's material safety data sheet (MSDS) for material content. For more information contact LaVaughn Berry at 751-3838.

c. All construction, renovation, and demolition projects require 50% minimum diversion of construction and demolition (C&D) waste, by weight, from landfill disposal. Contract specifications must include submission of a contractor's C&D Waste Management Plan. This plan must be approved by ENV prior to the start of site clearance. For additional information, contact Barbara Williams, ENV, at 751-6858.

d. Materials with recycled content must be used as much as possible. The U.S. Environmental Protection Agency web site (www.epa.gov/cpg/about.htm) has the latest product list and specific recycled content requirements for each product. For additional information, contact Barbara Williams, ENV, at 751-6858.

(continued on reverse side)

IMSE-JAC-PWE-E (200-2)

SUBJECT: Memorandum of Environmental Consideration (MOEC) for Training Barracks Consolidated Dining Facility (08-0139)

e. The contractor is responsible for managing hazardous substances IAW Federal, State, local, and military regulations. The Fort Jackson Hazardous Material and Waste Management (HMWM) Plan, dated August 2007, may be used for guidance. The HMWM Plan is located at <http://www.jackson.army.mil/ENRD/emb/HW%20F/HMWM.pdf>. The contractor is responsible for hazardous substance spill prevention, training, clean up, and reporting, and must comply with the Fort Jackson Spill Response Plan (page 15 of the HMWM Plan). For additional information, contact Barbara Williams, ENV, at 751-6858.

f. Yard trash and land-clearing debris must be disposed at a compost or wood chipping facility. For additional information, contact Barbara Williams, ENV, at 751-6858.

g. If the proposed project includes the addition/modification of an air emission source, a Construction Permit or Permit Exemption may be required from the DHEC Bureau of Air Quality. The permitting process may require up to 180 days. For additional information, contact Sean Bragan, ENV, at 751-6192.

h. The proposed project area has a low probability for containing significant resources and no further action is required. The South Carolina State Historic Preservation Office concurs. If artifacts are discovered at any time before or during construction, cease work in the subject area and contact ENV archeologist, Chan Funk, at 751-7153. Artifacts are Federal property and should not be collected, removed, or disturbed.

i. The proposed project is located in the Fort Jackson cantonment area, which is an area that will not be managed for the Red-cockaded woodpecker (RCW). The project will not adversely affect any known threatened/endangered animal species, including the RCW. For additional information, contact Stanley Rikard, Wildlife Branch, at 751-5376.

j. A Storm Water Permit is required. For specific requirements, contact Doyle Allen, ENRD, at 751-7232 or doyle.allen1@us.army.mil.

k. A Construction Site Selection Survey, completed on 8 October 2008, did not reveal any evidence of contamination. The site is therefore a Category 1 site, as defined in DA PAM 200-1, Section 15-11. If contamination is discovered during site preparation or construction, it may be necessary to realign the planned construction. Work must cease until the site is investigated. For additional information, contact Lahiri Estaba, ENV, at 751-7332.

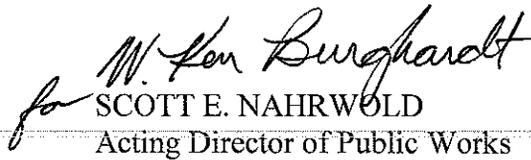
3. The proposed project has been reviewed as required by the National Environmental Policy Act (NEPA) and AR 200-2. The Environmental Assessment of the Master Plan and Ongoing Mission (EAMP) Addendum dated July 2008 environmentally assessed the construction of Quad Dining Facility. Requirements listed above must be followed to ensure compliance with applicable Federal and State environmental laws and regulations.

IMSE-JAC-PWE-E (200-2)

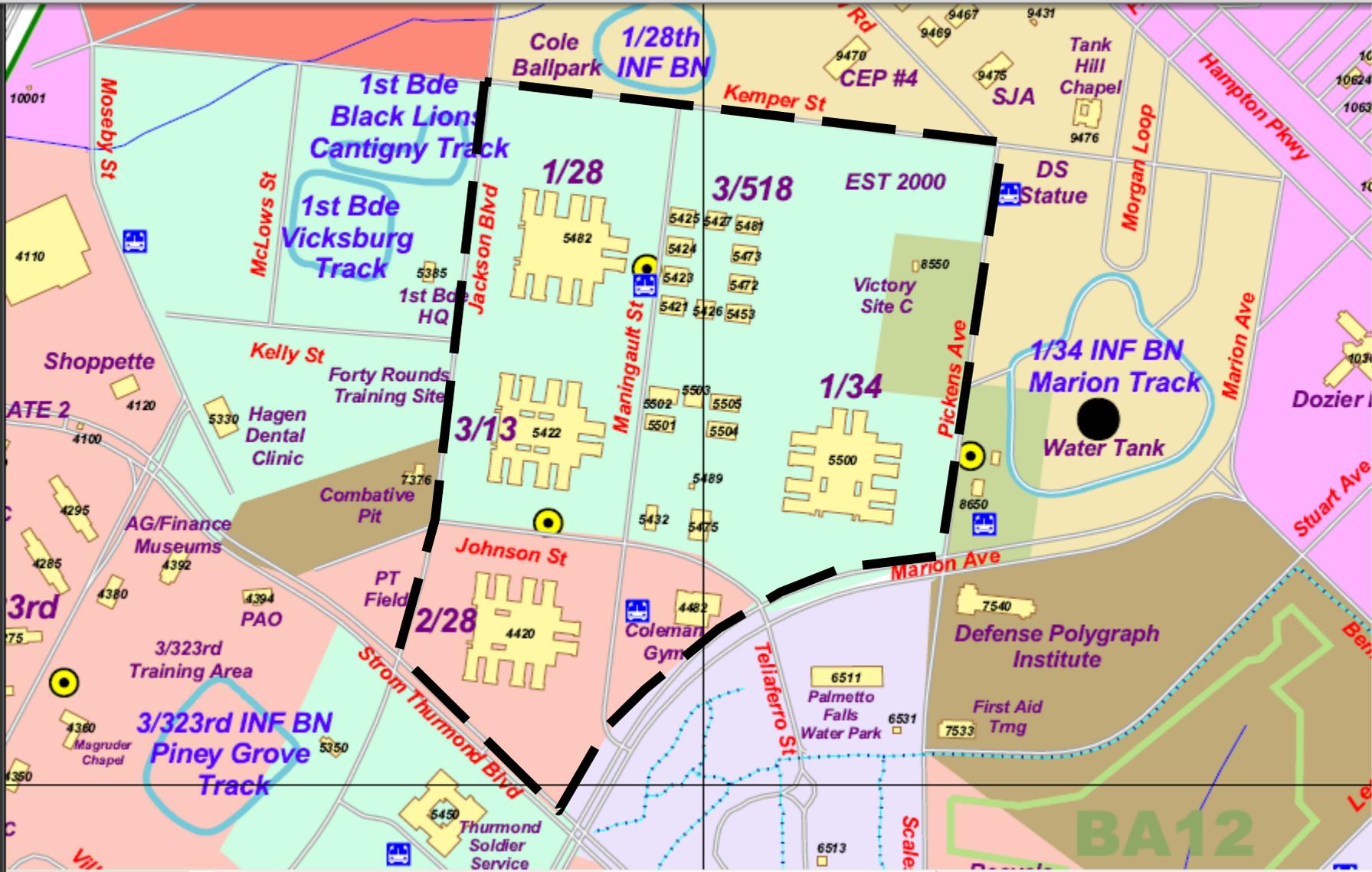
SUBJECT: Memorandum of Environmental Consideration (MOEC) for Training Barracks Consolidated Dining Facility (08-0139)

4. A new REC must be submitted if this project is modified or expanded in a manner that was not considered in this review or if the project has not been initiated within one year.
5. The DPW Master Planning Division (MPD) must issue an approved Construction Permit for all construction, demolition, or renovation projects prior to commencement of the project. For additional information, contact Nancy Ferguson, MPD, at 751-7898.
6. For additional information, contact Patrick Metts, ENV, at 751-4078 or william.p.metts@us.army.mil.

2 Encls


SCOTT E. NAHRWOLD
Acting Director of Public Works

CF: Nancy Ferguson, DPW, MPD
Doyle Allen, DPW, ENV
Sean Bragan, DPW, ENV



REC # 10-0077

1. Project Title

Running Track Projects, Fort Jackson, SC - Amended

2. Proponent/Organization/POC (Name, address, phone number, and email address)

Fort Jackson/DPW/Nancy Hamilton (USACE), 2562 Essayons Way, 803-751-6016, nancy.e.hamilton@usace.army.mil

3. How is this project being executed?

DPW In House U.S. Army Corps of Engineers

Contractor Self Help Project

Other

4. Approximate date of when proposed action/project will be initiated: (Month/Year): Feb 8, 2010

5. Anticipated completion date and/or duration of proposed action: (Month/Year): Jun 1, 2010

6. Approval of REC required by date: (Month/Year) Feb 11, 2010

7. Routine Repair/Maintenance & Small Construction Activities (Check all that apply):

Tree Removal/Pruning? If so, how many trees to be removed: 25-30

New Construction

Interior building improvements (Renovations, demo walls, painting) Building and Room #

Replacement of Utilities

Roofing Materials Disturbance

Removing carpet

Replacing Tile

Soil/Land Disturbance

Disturbance of Ground Cover/Vegetation, Other Landscaping (plants, shrubs, adding gravel, etc.

If so, how many acres? est. 3.5 acres

RECORD OF ENVIRONMENTAL CONSIDERATION (REC)
CANTONMENT AREA PROJECTS
Directorate of Public Works, Environmental Division (ENV)

8. Detailed description, Scope of Work (SOW) (Please explain any checked boxes):

Please SOW for description of work to be done on each individual track.

Location maps and scope of work recommendations prepared by DPW (Gary Bowling) will be emailed to you separately. The timeline for this work is extremely short and the Deputy Garrison Commander (Mr. Nahrwold) has indicated that this is a high priority project requested by the CG. Consequently, an expedited turnaround on this REC is needed. Thank you.

9. Provide a site specific map of the project area that shows the location relative to a prominent landmark such as a road or building.

PROPONENT
SIGNATURE

HAMILTON.NANCY.E.1229617342

Digitally signed by HAMILTON.NANCY.E.1229617342
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=HAMILTON.NANCY.E.1229617342
Date: 2010.02.05 13:24:02 -05'00'

Submit

TO BE COMPLETED BY THE ENV DIVISION

REC # 10-0077

Needs to be reviewed by: WB FB EMB

Date Received Feb 5, 2010

Review Suspense Date Feb 10, 2010

Date REC Complete

12. Reason for using Record of Environmental Consideration (choose one):

a. The proposed project is adequately covered in an EA/EIS entitled:

[Empty text box for EA/EIS title]

b. The proposed project is categorically excluded under the provisions of CX 9(1), 32 CFR Part 651, because:

it is routine repair and maintenance of grounds.

13. Project approved by DPTMS: YES NO NA

Signature
Director, DPTMS

[Empty signature box]

RECORD OF ENVIRONMENTAL CONSIDERATION (REC)
CANTONMENT AREA PROJECTS
Directorate of Public Works, Environmental Division (ENV)

Signature: National Environmental
Policy Act Coordinator,
Environmental Management Branch

BURGHARDT.WALLACE.
K.1060863543
Digitally signed by BURGHARDT.WALLACE.K.1060863543
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA,
cn=BURGHARDT.WALLACE.K.1060863543
Date: 2010.02.25 18:45:49 -05'00'

Signature: Branch Chief,
Environmental Management Branch

BURGHARDT.WALLACE.
K.1060863543
Digitally signed by BURGHARDT.WALLACE.K.1060863543
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA,
cn=BURGHARDT.WALLACE.K.1060863543
Date: 2010.02.23 10:14:26 -05'00'

IMSE-JAC-PWE-E (200-2)

18 March 2010

MEMORANDUM FOR United States Corps of Engineers; ATTN: Nancy Hamilton

SUBJECT: Amendment to Memorandum of Environmental Consideration (MOEC) Running Tracks Upgrade Project

1. Reference: Memorandum, IMSE-JAC-PWE-E (200-2), 23 February 2010, Subject: Memorandum of Environmental Consideration (MOEC) for Running Tracks Upgrade Project

2. This MOEC supersedes MOEC (10-0077) (reference 1 above). The MOEC is being amended to include tree removal at the 3-13th 40 Rounds Track and the 1-13th Hurtigen Forest Track. The project has been reevaluated by the Environmental Division (ENV). The project must be completed as described in the original Record of Environmental Consideration (REC) (encl 1) and herein.

a. A Storm Water Permit is required. For specific requirements, contact Matt Holstein at 751-9504 or matthew.holstein@us.army.mil.

b. The proposed project area has been previously surveyed and contains no historic properties. The South Carolina State Historic Preservation Office concurs. If artifacts are discovered prior to or during construction, cease work in the subject area and contact Chan Funk, ENV, (803) 751-7153. Artifacts are Federal property and should not be collected or disturbed.

c. The proponent is responsible for spill prevention, response, and reporting IAW the Fort Jackson Hazardous Material and Waste Management (HMWM) Plan, dated August 2007. The HMWM Plan is located at <http://www.jackson.army.mil/ENV/emb/HW%20F/HMWM.pdf>. For additional information, contact Barbara Williams, ENV, at 751-6858.

d. Materials with recycled content must be used as much as possible. The U.S. Environmental Protection Agency web site (www.epa.gov/cpg/about.htm) has the latest product list and specific recycled content requirements for each product. For additional information, contact Barbara Williams, ENV, at 751-6858.

e. Yard trash and land-clearing debris must be disposed at a compost or wood chipping facility. For additional information, contact Barbara Williams, ENV, at 751-6858.

f. The project will not adversely affect any known threatened/endangered plant or animal species, including the Red-cockaded woodpecker (RCW). Cantonment areas are excluded from the RCW Habitat Management Unit. There are also no wetlands issues for this project. For additional information, contact Stanley Rikard, Wildlife Branch, at (803) 751-5376.

g. At least 60 days prior to tree removal, mark the clearing limits of the construction site and contact John Maitland, ENV, at 751-4622, so that arrangements can be made to harvest any merchantable timber. Tops, limbs, and small trees are the responsibility of the proponent, and must be disposed of in a mulch site. Merchantable timber remains the property of the Army.

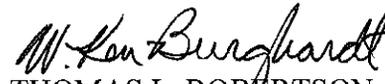
IMSE-JAC-PWE-E (200-2)

SUBJECT: Amendment to Memorandum of Environmental Consideration (MOEC) Running Tracks Upgrade Project

3. The proposed project meets the screening criteria of AR 200-2 (32 CFR Part 651) and is categorically excluded under the provisions of AR 200-2, Appendix B, CX (g)(1). Requirements listed above must be followed to ensure compliance with applicable Federal and state environmental laws and regulations.
4. A new REC must be submitted if this project is modified or expanded in a manner that was not considered in this review or if the project has not been initiated within one year.
5. The DPW Master Planning Division (MPD) must issue a Construction Permit for all construction, demolition, or renovation projects prior to commencement of the project. For additional information, contact Nancy Ferguson, MPD, at 751-7898.
7. For additional information, contact Patrick Metts, ENV, at 751-4078 or william.p.metts@us.army.mil.

2 Encls

for


THOMAS L. ROBERTSON
Director of Public Works

Appendix ___ - Environmental / Hazardous Materials Report



AAA ENVIRONMENTAL

"building a better environment"

February 6, 2009

Mr. Don Loper
HSMM
6201 Fairview Road, Suite 400
Charlotte, North Carolina 28210

Re: Lead-based Paint Inspection Assessment Report
Fort Jackson
Buildings #4420, #5422, #5482, and #5500
AAA Project Number: 10465-IL

Dear Mr. Loper:

AAA Environmental completed a lead-based paint inspection at Fort Jackson in Columbia, South Carolina on January 22, 2009. The inspection included limited areas on the first floor level of Buildings #4420, #5422, #5482, and #5500. The inspection was performed prior to renovation of the Buildings, and was performed in accordance with South Carolina Department of Health and Environmental Control (SCDHEC) and the Environmental Protection Agency (EPA) requirements. The details and findings of the assessment are described below.

Paint chip samples were collected following the South Carolina Department of Health and Environmental Control's (SC-DHEC) protocol for the determination of proper disposal for painted construction and demolition debris. According to SC-DHEC Regulation 61-107.11, demolition debris that is painted with paint containing less than or equal to 0.06% lead may be disposed of in a Construction, Demolition and Land-Clearing Debris (C&D) Landfill versus a Municipal Solid Waste (MSW) Landfill. Of the six (6) paint samples collected from the interior and exterior building components, none tested greater than the 0.06% limit; however, **detectable levels of lead were identified in the light blue paint on the window frames of Building #5482. Where worker protection is concerned, OSHA does not specify a lead content in paint chips. The OSHA standard (Lead in Construction Interim Final Rule, 29 CFR 1926.62), which must be applied if any detectable levels of lead are identified, indicates that if airborne lead levels exceed the Action Level (AL is 30ug/mm³) from a potential disturbance, then an employee exposure assessment would be required.** If the lead-based paint is

P.O. Box 5605
Spartanburg, SC 29304
Phone 864-582-1222 / Fax 864-583-0709
1-888-296-3803

Tuesday, July 06, 2010

Mr. Don Loper
Lead-Based Paint Inspection Report
Fort Jackson, Buildings #4420, #5422, #5482, & #5500
AAA Environmental Project #10456-IL

February 6, 2009

Page 2

scraped off of the surface for abatement purposes, TCLP analysis must be performed on the paint chips prior to disposal.

Attachment I includes a lead-based paint summary table with descriptions, results, and sample locations of the suspect materials. Attachment II includes a copy of the analytical results from the laboratory for the lead-based paint chip samples. Attachment III includes sketches of the sample locations.

This document has been prepared by AAA Environmental, at the request of and for the exclusive use of the HSMM. Any discussion or recommendations contained in this report represent our professional opinions. These recommendations are based on currently available information and were arrived at in accordance with currently accepted industrial hygiene practices at the current time and specific location of the inspection. Other than this, no warranty is implied or intended.

AAA Environmental appreciates the opportunity to provide HSMM with our consultative services. Should you have any questions or need additional information, please do not hesitate to contact us.

Sincerely,



Kay H. Horton
Consulting Department Manager



Stanley Berry
Licensed Inspector

KHH:jal

Attachments – (4)

ATTACHMENT I
LEAD-BASED PAINT SUMMARY TABLE



AAA ENVIRONMENTAL
 300 HENRY PLACE
 SPARTANBURG, SC 29306
 (864) 582-1222
 www.aaenvironmental.com

Section:

LEAD INSPECTION TABLE

REPORT DATE: February 6, 2009

AAA ENVIRONMENTAL LEAD INSPECTION REPORT				AAA PROJECT #: 10456-IL	
LOCATION: Fort Jackson - Building 4420					
CLIENT: HSMM			DATE: January 22, 2009		
Homogeneous Area (HA)/ Category	Material Type	Sample Number	% Lead	C&D MSW	Location
01	Cream Color Paint	00063	<0.01%	C&D	Located on the window frames, kitchen doors, and walls in the dining area.
02	Sky Blue Paint	00064	<0.01%	C&D	Located on the walls in the small dining room, and the door trim and ceiling of the dining room.
03	Light Sky Blue Paint	00065	<0.01%	C&D	Located on the wall of the dining room.
04	Yellow Paint	00066	<0.01%	C&D	Located in the serving line area of the kitchen, and kitchen prep.
05	Brown Paint	00067	<0.01%	C&D	Located on the door frames and doors in the kitchen and offices.
06	Beige Paint	00068	<0.01%	C&D	Located in the serving line area and in the kitchen.
C&D refers to Construction and Demolition and Land Clearing Debris Landfill (no liners and no groundwater monitoring). MSW refers to Municipal Solid Waste Landfill (synthetic liner and leachate collection system). The South Carolina Department of Health and Environmental Control's maximum allowable lead content is 600 parts per million lead by weight or 0.06 percent lead by weight for waste disposal at a C&D Landfill.					

Inspector: Stanley Berry

Signature: 



AAA ENVIRONMENTAL
 300 HENRY PLACE
 SPARTANBURG, SC 29306
 (864) 582-1222
 www.aaenvironmental.com

Section:

LEAD INSPECTION TABLE

REPORT DATE: February 6, 2009

AAA ENVIRONMENTAL LEAD INSPECTION REPORT				AAA PROJECT #: 10456-IL	
LOCATION: Fort Jackson - Building 5422					
CLIENT: HSMM			DATE: January 22, 2009		
Homogeneous Area (HA)/ Category	Material Type	Sample Number	% Lead	C&D MSW	Location
01	White Paint	00059	<0.01%	C&D	Located on the wood rails and window frames.
02	Light Cream Color Paint	00060	<0.01%	C&D	Located on the walls and ceiling in the dining room, and in the kitchen area on the trim and office walls.
03	Off-White Paint	00061	<0.01%	C&D	Located in the kitchen serving and food prep areas.
04	Dark Sky Blue Paint	00062	<0.01%	C&D	Located on the restroom walls.
C&D refers to Construction and Demolition and Land Clearing Debris Landfill (no liners and no groundwater monitoring). MSW refers to Municipal Solid Waste Landfill (synthetic liner and leachate collection system). The South Carolina Department of Health and Environmental Control's maximum allowable lead content is 600 parts per million lead by weight or 0.06 percent lead by weight for waste disposal at a C&D Landfill.					

Inspector: Stanley Berry

Signature: *Stanley Berry*



AAA ENVIRONMENTAL
 300 HENRY PLACE
 SPARTANBURG, SC 29306
 (864) 582-1222
 www.aaenvironmental.com

Section:

LEAD INSPECTION TABLE

REPORT DATE: February 6, 2009

AAA ENVIRONMENTAL LEAD INSPECTION REPORT				AAA PROJECT #: 10456-IL	
LOCATION: Fort Jackson - Building 5482					
CLIENT: HSMM			DATE: January 22, 2009		
Homogeneous Area (HA)/ Category	Material Type	Sample Number	% Lead	C&D MSW	Location
01	Dark Blue Paint	00045	<0.01%	C&D	Located on the handrails, doors, trim, and the brick below the serving lines.
02	Light Blue Paint	00046	0.02%	C&D	Located on the window frames.
03	Sky Blue Paint	00047	<0.01%	C&D	Located on the walls in the dining area.
04	Beige Paint	00048	<0.01%	C&D	Located in the kitchen serving area on the walls and ceiling.
05	Brown Paint	00049	<0.01%	C&D	Located on the doors and window frames in the kitchen offices.
06	Light Blue Paint	00050	<0.01%	C&D	Located on the walls in the kitchen prep area.
07	Gray/Blue Paint	00051	<0.01%	C&D	Located on the ceiling in the dining room and back area of the kitchen.
C&D refers to Construction and Demolition and Land Clearing Debris Landfill (no liners and no groundwater monitoring). MSW refers to Municipal Solid Waste Landfill (synthetic liner and leachate collection system). The South Carolina Department of Health and Environmental Control's maximum allowable lead content is 600 parts per million lead by weight or 0.06 percent lead by weight for waste disposal at a C&D Landfill.					

Inspector: Stanley Berry

Signature: 



AAA ENVIRONMENTAL
 300 HENRY PLACE
 SPARTANBURG, SC 29306
 (864) 582-1222
 www.aaenvironmental.com

Section:

LEAD INSPECTION TABLE

REPORT DATE: February 6, 2009

AAA ENVIRONMENTAL LEAD INSPECTION REPORT				AAA PROJECT #: 10456-IL	
LOCATION: Fort Jackson - Building 5500					
CLIENT: HSMM			DATE: January 22, 2009		
Homogeneous Area (HA)/ Category	Material Type	Sample Number	% Lead	C&D MSW	Location
01	Light Blue Paint	00052	<0.01%	C&D	Located on the handrails and walls of the dining room.
02	Brown Paint	00053	<0.01%	C&D	Located on the doors.
03	Sky Blue Paint	00054	<0.01%	C&D	Located on the kitchen walls.
04	White Paint	00055	<0.01%	C&D	Located on the walls.
05	Off-White Paint	00056	<0.01%	C&D	Located on the ceiling.
06	Dark Sky Blue Paint	00057	<0.01%	C&D	Located on the ceiling.
07	Cream Color Paint	00058	<0.01%	C&D	Located on the wall and ceiling in the office.
C&D refers to Construction and Demolition and Land Clearing Debris Landfill (no liners and no groundwater monitoring). MSW refers to Municipal Solid Waste Landfill (synthetic liner and leachate collection system). The South Carolina Department of Health and Environmental Control's maximum allowable lead content is 600 parts per million lead by weight or 0.06 percent lead by weight for waste disposal at a C&D Landfill.					

Inspector: Stanley Berry

Signature: 

**ATTACHMENT II
LABORATORY REPORTS**



Analysis for Lead Concentration in Paint Chips

by Flame Atomic Absorption Spectroscopy
EPA SW-846 3rd Ed. Method No. 3050B/Method No. 7420



Customer: AAA Environmental
PO Box 5605
Spartanburg SC 29304

Attn: Kay Horton

Lab Order ID: 900493

Analysis ID: 900493_PBP

Date Received: 1/23/2009

Project: 10465-IL BLDG 4420

Date Reported: 1/23/2009

Sample ID	Description	Mass	Analytical Sensitivity	Concentration
<i>Lab Sample ID</i>	<i>Lab Notes</i>	(g)	(% by weight)	(% by weight)
00063	Cream color paint	0.0794	0.001%	<0.01%
900493PBP_1				
00064	Sky blue paint	0.0818	0.001%	<0.01%
900493PBP_2				
00065	Lt sky blue	0.144	0.0008%	<0.01%
900493PBP_3				
00066	Yellow paint	0.0684	0.002%	<0.01%
900493PBP_4				
00067	Brown paint	0.0927	0.001%	<0.01%
900493PBP_5				
00068	Beige ceiling paint	0.1231	0.001%	<0.01%
900493PBP_6				

Scientific Analytical Institute successfully participates in the AIHA ELPAT for Lead program. ELPAT Laboratory ID: 173190 (R.L. = 0.01 wt.%)
The quality control samples run with the samples in this report have passed all AIHA required specifications unless otherwise noted.

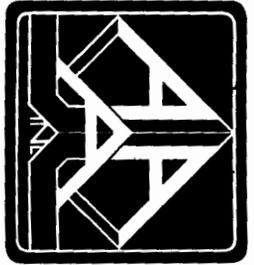
Kristie Armstrong, Ph.D. (6)

Analyst

Scientific Analytical Institute, Inc. 302-L Pomona Dr. Greensboro, NC 27407 (336) 292-3888

Approved Signatory

Tuesday, July 06, 2010
Page 1 of 1



Tuesday, July 06, 2010

980493

TYPE
A = Air
C = Chip
H = Water
W = Wipes

Collected by: STAN BERRY
Analyzed by: _____

Project #: 10465-ITC Date: 1/22/09
Client: HLSMM
Project Name: BLOC 4430
Site: _____ Day: _____

PPE:

Disposable Suite _____ SCBA _____ Other _____
Boots _____ Type C Resp. _____
Hood _____ PAPP _____ Full Face Filter Resp. _____

Lead Sampling Form

Sample #	Type	Pump#	Location or Name / SSN	Remarks	AIR DATA				RESULTS					
					Start Time	Stop Time	Total Min.	FR (LPM)	Volume	A ug/m ³	C % by wgt.	H PPB	W ug/ft ²	
00063	C		STAN BERRY'S DINING AREA	4 SPIN AREA										
00064	C		DRY BLUE PAINT - DINING RM											
00065	C		DRY BLUE PAINT - DINING RM											
00066	C		YELLOW PAINT - SERVING LINE AREA OF KITCHEN											
00067	C		BROWN PAINT - DOOR FRAMES & DOORS KITCHEN											
00068	C		BEIGE CEILING PAINT - SERVING LINE AREA KITCHEN											

Guidance Levels:
AIR in ug/m³ per 8 hr TWA: 1. AL = 30 2. PEL = 50 (OSHA 29 CFR 1910.1025 and 1926.62)
CHIPS by weight: 1. 0.5% (HUD) 2. 0.06% (CPSC) WATER: 15 Parts per billion (EPA 40 CFR 141.80)
WIPES in ug/ft²: 200 = Floors, 500 = Window Walls, 800 = Window Sills (HUD Guidelines) WASTE: 5 ug/1 TCIP (EPA 40 CFR 261)
ug = micrograms ft = ft AL = Action Level PEL = Permissible Exposure Limit m = meters

SAMPLE CHAIN OF CUSTODY

Signature & Date of Handlers
Relinquished By: Stan Berry 1/22/09
Relinquished By: _____
Relinquished By: _____

Submitted To: SAI

Date Sent: 1/22/09
Received By: EBBY 5652 2236 9675
Received By: EBBY 123 900
Received By: _____

Accepted Rejected

24HR TURN AROUND



Analysis for Lead Concentration in Paint Chips

by Flame Atomic Absorption Spectroscopy
EPA SW-846 3rd Ed. Method No. 3050B/Method No. 7420



Customer: AAA Environmental
PO Box 5605
Spartanburg SC 29304

Attn: Kay Horton

Lab Order ID: 900497

Analysis ID: 900497_PBP

Date Received: 1/23/2009

Project: 10465-IL BLDG 5422

Date Reported: 1/23/2009

Sample ID	Description	Mass	Analytical Sensitivity	Concentration
<i>Lab Sample ID</i>	<i>Lab Notes</i>	(g)	(% by weight)	(% by weight)
00059	White paint	0.0855	0.001%	<0.01%
900497PBP_1				
00060	Lt cream color paint	0.0704	0.002%	<0.01%
900497PBP_2				
00061	Off white paint	0.109	0.001%	<0.01%
900497PBP_3				
00062	Dk sky blue paint	0.0941	0.001%	<0.01%
900497PBP_4				

Scientific Analytical Institute successfully participates in the AIHA ELPAT for Lead program. ELPAT Laboratory ID: 173190 (R.L. = 0.01 wt.%)
The quality control samples run with the samples in this report have passed all AIHA required specifications unless otherwise noted.

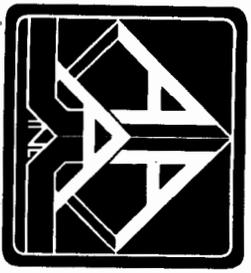
Kristie Armstrong, Ph.D. (4)

Analyst

Scientific Analytical Institute, Inc. 302-L Pomona Dr. Greensboro, NC 27407 (336) 292-3888

Approved Signatory

Tuesday, July 06, 2010
Page 1 of 1



Lead Sampling Form

TYPE
 A = Air
 C = Chip
 H = Water
 W = Wipes

Collected by: Tom Berry
 Analyzed by: _____

Tuesday, July 06, 2010

Project #: 10465-76 Date: 7/22/09
 Client: 1758 BK
 Project Name: BLDG 5422
 Site: _____ Day: _____

PPE:

Disposable Suite _____ SCBA _____
 Boots _____ Type C Resp. _____
 Hood _____ PAPER _____

Half Face Filter Resp. _____
 Full Face Filter Resp. _____

Other _____

Sample #	Type	Pump#	Location or Name / SSN	Remarks	Start Time	Stop Time	Total Min.	FR (LPM)	Volume	RESULTS					
										A ug/m ³	C % by wgt.	H PPB	W ug/ft ²		
00059	C		WHITE PAINT - WOOD RAIS & WINDOW FRAMES					450 IN AREA							
00060	C		STORING COLOR PAINT - SCYLING DINING ROOM & KITCHEN AREA												
00061	C		OFF WHITE PAINT SERVING AREA												
00062	C		OR SAT BLUE PAINT REST ROOM WALLS												

Guidance Levels:
 AIR in ug/m³ per 8 hr TWA: 1. AL = 30 2. PEL = 50 (OSHA 29 CFR 1910.1025 and 1926.62)
 CHIPS by weight: 1. 0.5% (HUD) 2. 0.06% (CPSC) WATER: 15 Parts per billion (EPA 40 CFR 141.80)
 WIPES in ug/ft²: 200 = Floors, 500 = Window Wells, 800 = Window Sills (HUD Guidelines) WASTE: 5 ug/1 TCLP (EPA 40 CFR 261)
 ug = micrograms ft = ft AL = Action Level PEL = Permissible Exposure Limit m = meters

SAMPLE CHAIN OF CUSTODY
Signature & Date of Handlers

Relinquished By: _____
 Relinquished By: Tom Berry 7/22/09
 Relinquished By: _____

Submitted To: SAI

Accepted Rejected

Date Sent: 7/22/09
 Received By: Feb 25 08652-22369675
 Received By: _____
 Received By: 123 9:00

241R TORNHAROUND

9600497



Analysis for Lead Concentration in Paint Chips

by Flame Atomic Absorption Spectroscopy
EPA SW-846 3rd Ed. Method No. 3050B/Method No. 7420



Customer: AAA Environmental
PO Box 5605
Spartanburg SC 29304

Attn: Kay Horton

Lab Order ID: 900495

Analysis ID: 900495_PBP

Date Received: 1/23/2009

Project: 10465- IL BLDG 5482

Date Reported: 1/23/2009

Sample ID	Description	Mass	Analytical Sensitivity	Concentration
<i>Lab Sample ID</i>	<i>Lab Notes</i>	(g)	(% by weight)	(% by weight)
00045	Dk blue paint	0.0597	0.002%	<0.01%
900495PBP_1				
00046	Lt blue paint	0.0881	0.001%	0.02%
900495PBP_2				
00047	Sky blue paint	0.0981	0.001%	<0.01%
900495PBP_3				
00048	Beige paint	0.0566	0.002%	<0.01%
900495PBP_4				
00049	Brown paint	0.0748	0.002%	<0.01%
900495PBP_5				
00050	Lt blue paint	0.0817	0.001%	<0.01%
900495PBP_6				
00051	Gray/blue paint	0.0717	0.002%	<0.01%
900495PBP_7				

Scientific Analytical Institute successfully participates in the AIHA ELPAT for Lead program. ELPAT Laboratory ID: 173190 (R.L. = 0.01 wt.%)
The quality control samples run with the samples in this report have passed all AIHA required specifications unless otherwise noted.

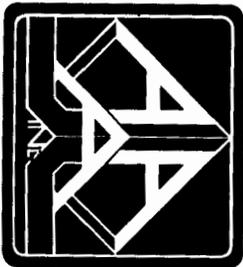
Kristie Armstrong, Ph.D. (7)

Analyst

Scientific Analytical Institute, Inc. 302-L Pomona Dr. Greensboro, NC 27407 (336) 292-3888

Approved Signatory

Tuesday, July 06, 2010
Page 1 of 1



Lead Sampling Form

Tuesday, July 06, 2010

9002695

TYPE
 A = Air
 C = Chip
 H = Water
 W = Wipes

Collected by: STUN BERRY
 Analyzed by: _____

Project #: 10465-IL Date: 1/22/09
 Client: L151MM
 Project Name: BLDG 5482
 Site: _____ Day: _____

PPE: Disposable Sulfite _____ SCBA _____
 Boots _____ Type C Resp. _____
 Hood _____ PAPP _____
 Half Face Filter Resp. _____
 Full Face Filter Resp. _____
 Other _____

Sample #	Type	Pump#	Location or Name / SSN	Remarks	AIR DATA			RESULTS							
					Start Time	Stop Time	Total Min.	FR (LPM)	Volume	A ug/m ³	C % by wgt.	H PPB	W ug/ft ²		
00045	C		DK BLUE PAINT - HAND RAILS	TRIM, BRICK BEADSEALING LINES											
00046	C		LT. BLUE PAINT - WINDOW FRAMES												
00047	C		SKY BLUE PAINT - WALLS - DINING AREA												
00048	C		SKY BLUE PAINT - KITCHEN - SCREEN	AREA WALLS SCHEILING											
00049	C		BROWN PAINT - DOOR DOOR DOOR FRAMES	BROWN KITCHEN OFFICES											
00050	C		SKY BLUE PAINT - KITCHEN PREP AREA	(WALLS)											
00051	C		SKY/BLUE COOKING	PAINT - DINING ROOM BACK AREA OF KITCHEN											

Guidance Levels:
 AIR in ug/m³ per 8 hr TWA: 1. AL = 30 2. PEL = 50 (OSHA 29 CFR 1910.1025 and 1926.62)
 CHIPS by weight: 1. 0.5% (HUD) 2. 0.06% (CPSC) WATER: 15 Parts per billion (EPA 40 CFR 141.80)
 WIPES in ug/ft²: 200 = Floors, 500 = Window Wells, 800 = Window Sills (HUD Guidelines) WASTE: 5 ug/1 TCLP (EPA 40 CFR 261)
 ug = micrograms ft = ft AL = Action Level PEL = Permissible Exposure Limit m = meters

24HR TURN AROUND

Accepted
 Rejected

SAMPLE CHAIN OF CUSTODY
 Signature & Date of Handlers
 Relinquished By: Stun Berry 1/22/09
 Relinquished By: _____
 Relinquished By: _____
 Submitted To: SAI
 Date Sent: 1/22/09
 Received By: HENDERX 8652 2236 9695
 Received By: _____
 Received By: _____



Analysis for Lead Concentration in Paint Chips

by Flame Atomic Absorption Spectroscopy
EPA SW-846 3rd Ed. Method No. 3050B/Method No. 7420



Customer: AAA Environmental
PO Box 5605
Spartanburg SC 29304

Attn: Kay Horton

Lab Order ID: 900499

Analysis ID: 900499_PBP

Date Received: 1/23/2009

Project: 10465-IL BLDG 5500

Date Reported: 1/23/2009

Sample ID	Description	Mass	Analytical Sensitivity	Concentration
<i>Lab Sample ID</i>	<i>Lab Notes</i>	(g)	(% by weight)	(% by weight)
00052	Lt blue paint	0.0656	0.002%	<0.01%
900499PBP_1				
00053	Brown paint	0.0894	0.001%	<0.01%
900499PBP_2				
00054	Sky blue paint	0.0736	0.002%	<0.01%
900499PBP_3				
00055	White paint	0.0923	0.001%	<0.01%
900499PBP_4				
00056	Off white ceiling paint	0.0933	0.001%	<0.01%
900499PBP_5				
00057	Dk sky blue ceiling paint	0.1304	0.0009%	<0.01%
900499PBP_6				
00058	Cream color wall & ceiling	0.0661	0.002%	<0.01%
900499PBP_7				

Scientific Analytical Institute successfully participates in the AIHA ELPAT for Lead program. ELPAT Laboratory ID: 173190 (R.L. = 0.01 wt.%)
The quality control samples run with the samples in this report have passed all AIHA required specifications unless otherwise noted.

Kristie Armstrong, Ph.D. (7)

Analyst

Scientific Analytical Institute, Inc. 302-L Pomona Dr. Greensboro, NC 27407 (336) 292-3888

Approved Signatory

Tuesday, July 06, 2010
Page 1 of 1



Lead Sampling Form

TYPE
 A = Air
 C = Chip
 H = Water
 W = Wipes

Collected by: STAN BERRY
 Analyzed by: _____

Disposable Suite _____
 SCBA _____
 Boots _____
 Type C Resp. _____
 Hood _____
 PAPP _____

Project #: 10465-IL Date: 11/22/09
 Client: HSMMA
 Project Name: BLDG 5500
 Site: _____ Day: _____

Half Face Filter Resp. _____
 Full Face Filter Resp. _____
 Other _____

Tuesday, June 2, 2010

980499

Sample #	Type	Pump#	Location or Name / SSN	Remarks	Start Time	Stop Time	AIR DATA		RESULTS			
							Total Min.	FR (LPM)	A ug/m ³	C % by wgt.	H PPB	W ug/ft ²
00052	C		LT BLUE PAINT - HANDRAILS OF DINING RM		4:50	IN AREA						
00053	C		BROWN PAINT - DOORS									
00054	C		SKY BLUE PAINT - WALLS KITCHEN									
00055	C		WHITE PAINT - WALLS									
00056	C		OFF WHITE CEILING PAINT									
00057	C		DK SKY BLUE CEILING PAINT									
00058	C		CREAM COLOR WALL PAPERING - OFFICE									

Guidance Levels:
 AIR in ug/m³ per 8 hr TWA: 1. AL = 30 2. PEL = 50 (OSHA 29 CFR 1910.1025 and 1926.62)
 CHIPS by weight: 1. 0.5% (HUD) 2. 0.06% (CPSC) WATER: 15 Parts per billion (EPA 40 CFR 141.80)
 WIPES in ug/ft²: 200 = Floors, 500 = Window Wells, 800 = Window Sills (HUD Guidelines) WASTE: 5 ug/1 TCLP (EPA 40 CFR 261)
 ug = micrograms ft = ft AL = Action Level PEL = Permissible Exposure Limit m = meters

SAMPLE CHAIN OF CUSTODY

Signature & Date of Handlers

Relinquished By: _____
 Relinquished By: Stan Berry 11/22/09
 Relinquished By: _____

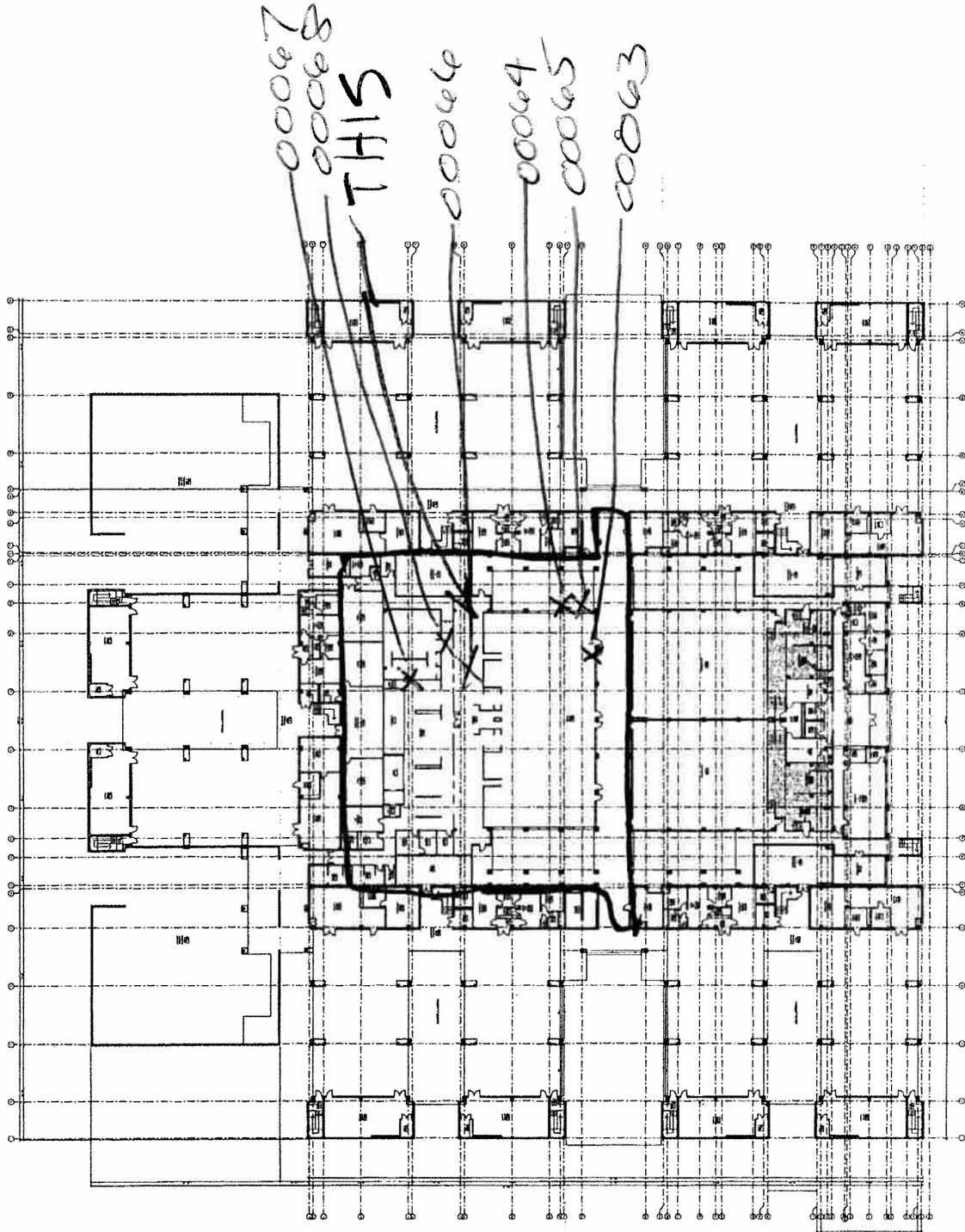
Submitted To: SAI
 Date Sent: 11/22/09
 Received By: TEDEX 3652 2256 9675
 Received By: _____
 Received By: _____

24 HOUR TURNAROUND

Accepted Rejected

**ATTACHMENT III
SAMPLE LOCATION SKETCHES**

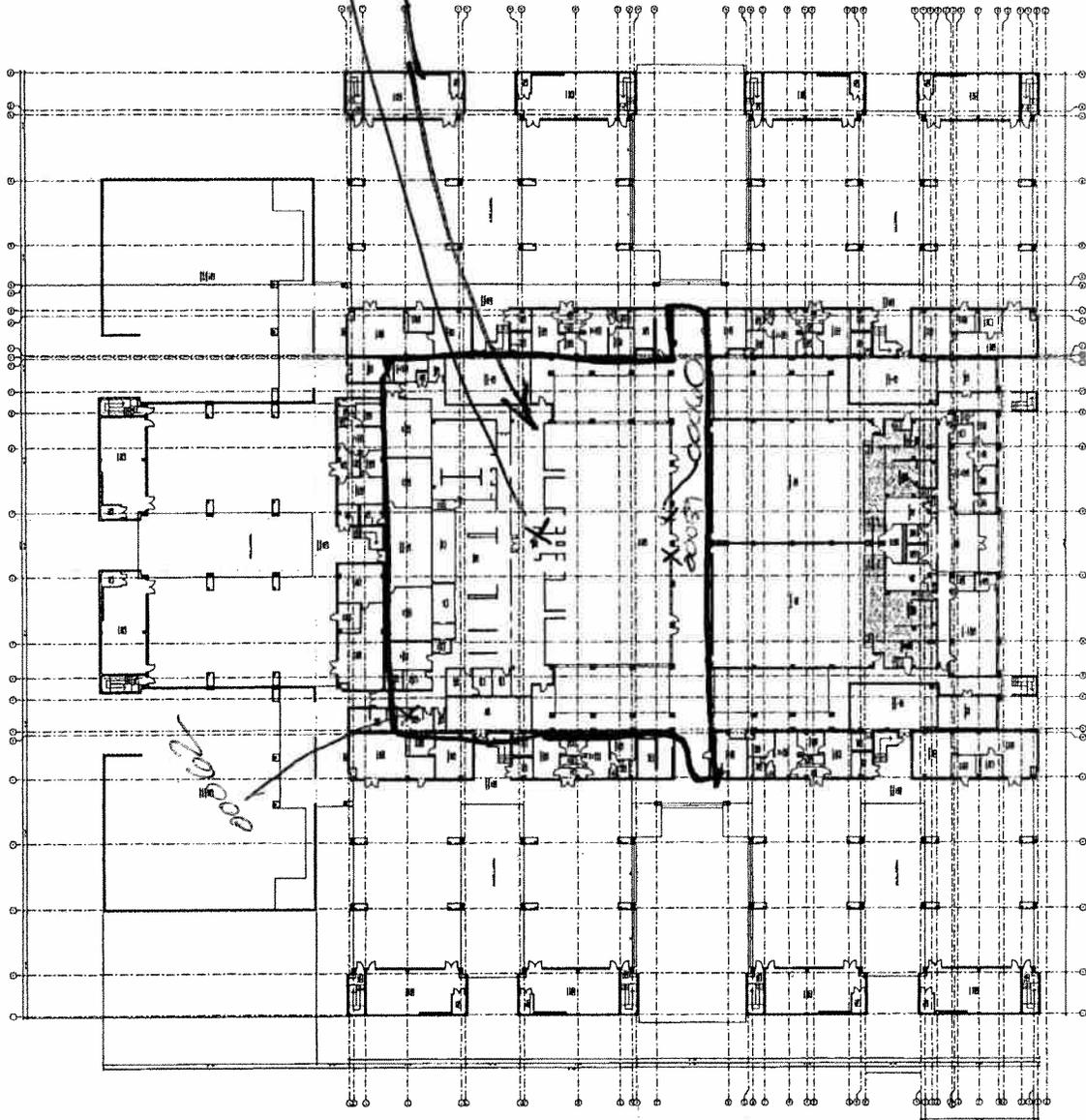
Section:



1-22-09
SKETCH # 1
10465 IL

BLDG
4420

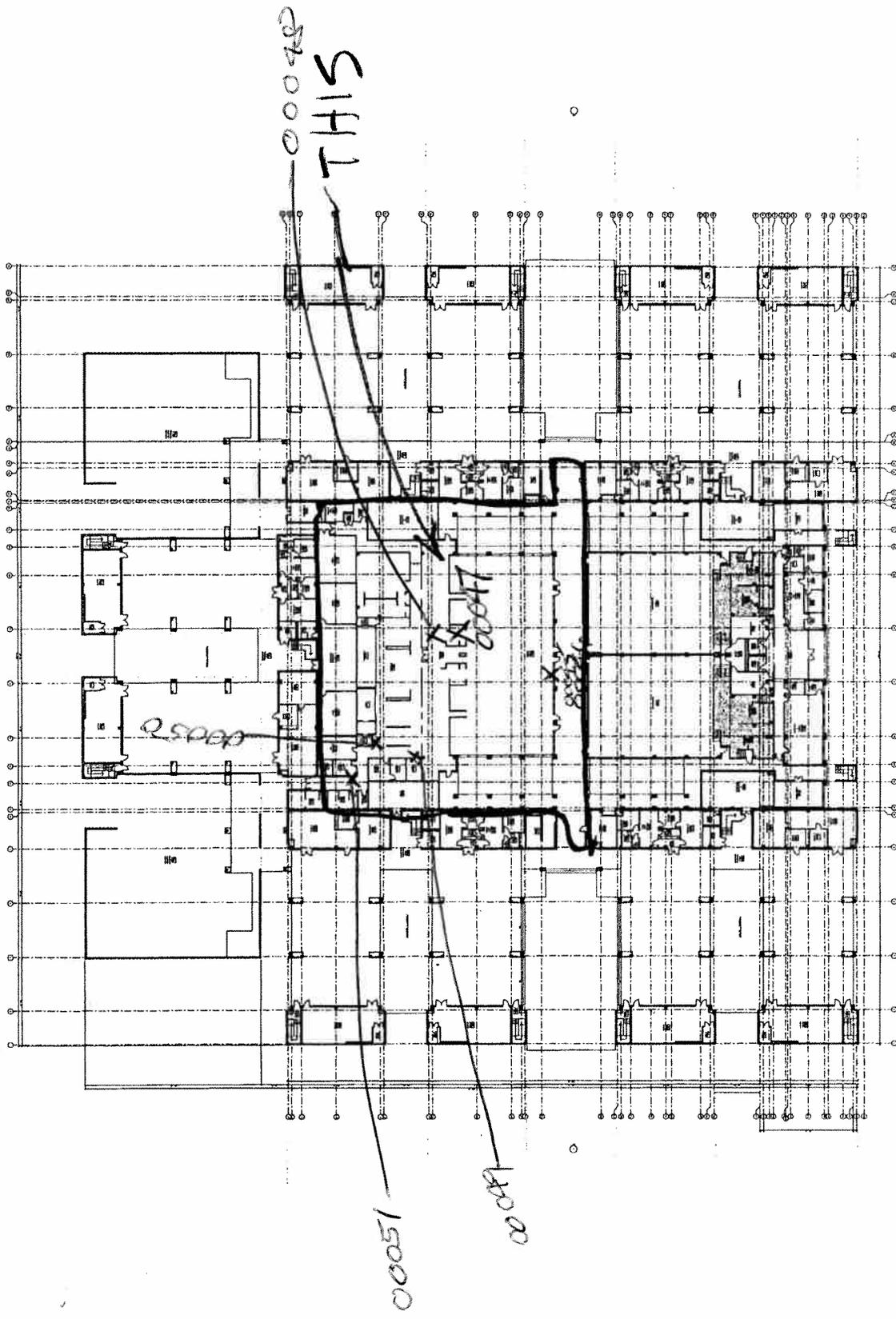
Section:



1-22-09
SKETCH # 2
10465 IL

BLOG 5422

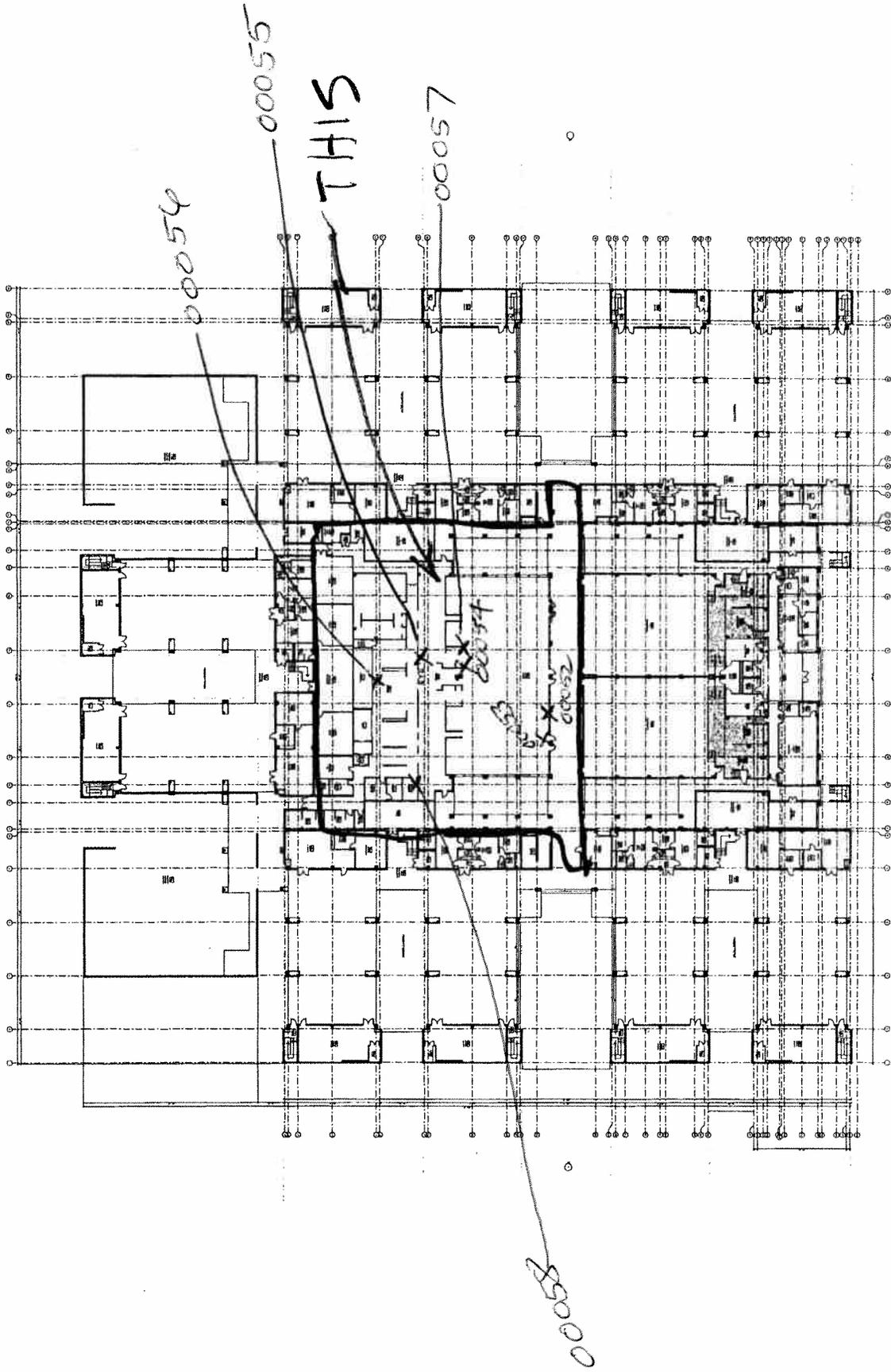
Section:



1-22-09
 SKETCH #3
 10465 IL

BLDG
 5482

Section:



1-22-09
 SKETCH # 4
 10465IL

BLOG 5500



HUB TESTING LABORATORIES INC.

Consulting and Testing Engineers

95 Beaver Street – Waltham, Massachusetts. 02453
(781) 893-8330 • FAX – (781) 893-4414

**Fort Jackson
Directorate of Contracting
Ms. Terry Wilson
Contract Administrator
4340 Magruder Avenue
Fort Jackson, South Carolina 29207**

**Asbestos Survey
Contract # W9124C-07-R0026**

Inspection of Building 4420

Prepared by:

**Hub Testing Laboratory, Inc.
Environmental Testing Services
95 Beaver Street, Waltham, Massachusetts 02453**

Hub Testing Laboratory Inc.
95 Beaver Street
Waltham, MA 02453

781/893-8330 781/893-4414 fax

Asbestos Survey
Contract # W9124C-07-R0026

March 20, 2008

Building Summary

Building No.	Description	UM	Units	Unit
4420	TRAINEE BKS	SF	285165	1B

A visual inspection of building 4420 was conducted. A list of homogeneous areas of suspect material was developed and each individual homogeneous area of suspect material was given a unique identification number. Each homogeneous area of suspect material was described and a photograph taken and the material inspected. The data pertaining to each homogeneous area of suspect material is located on the field inspection form. Any damage was noted and where appropriate samples were collected. Sample identification was made utilizing the homogeneous area of suspect material identification number and an alphabetized identification beginning with the letter "A" and progressing to an appropriate letter based on the number of samples collected. Samples were collected in groups of three or more as per the recommendations of 40 CFR Part 763. Where appropriate, samples previously collected were utilized to make the grouping. Sample locations were plotted on the drawings supplied by the client or generated using Punch Pro Platinum software. Hub Testing Laboratory, Inc. sample numbers are prefixed by the following symbol (^). An asterisk (*) is used to identify sample locations from previous Hub inspections and old sample numbers (as indicated by □ & O) from other sampling events were left on the drawings.

In addition to the photographs collected of each homogeneous area of suspect material additional photographs were collected at the discretion of the asbestos inspector to aid in identifying and describing the homogeneous area of suspect materials or sample locations if necessary. The photo number is supplied on the field inspection form.

The corresponding homogenous area of suspect material, photograph number, description, location, sample identifications, quantity and condition are supplied on the Hub Testing Laboratory, Inc. field inspection form.

The following homogeneous areas of suspect material were sampled and identified as being positive for the presence of asbestos:

Homogeneous Area of Suspect Material Identification	Description
4420-1S	12x12 Off white floor tile w/black streaks
4420-7S	Mastic associated w/1S
4420-25S (Assumed)	9x9 Green floor tile
4420-26S (Assumed)	9x9 Black floor tile
4420-27S (Assumed)	Mastic associated w/ 25S & 26S
4420-7S	Mastic associated w/6S

Recommendations: Maintain all asbestos containing materials in good condition until such time as it will be impacted by alteration.

Assumed materials should be treated as asbestos containing materials until such time as they are sampled and analyzed appropriately to determine if they contain asbestos. Until such time, care should be taken not to disturb, remove, or impact these materials.

The floor tiles are asbestos containing and should be maintained in good condition. A coat of wax can act as a seal to the surface and reduce the potential of fiber release. If the floor begins to deteriorate and break up or if the floor is in a high traffic area and begins to wear or break due to traffic it should be removed.

The mastic associated with the floor tile is asbestos containing. This mastic is adhered to the backside of the existing floor tile and may impact the treatment of the floor tile should it be necessary to remove the tile. Unless the slab or adhered floor tiles will be impacted, the mastic does not warrant any remediation.

Attachments Field Inspection Form
 Analytical Data
 Drawing(s)

Photos are attached in CD # 4.

Susan Boyle,
 Vice President

Hub Testing Laboratory, Inc.
95 Beaver Street, Waltham, MA 02453 781/893-8330 fax 781/893-4414

Building Number: 4420Inspector: Susan Boyle/ Mo JahanbakshDate: 1/28/08Building description: "Starship" barracks with a masonry exterior and pre-fab metal windows. Window caulking is siliconeBuilding picture # 1058

HM#	Homogeneous Area of Suspect Material Description	Photo	F/NF	Location	Quantity	Potential for Damage (PD)/ Significant Damage (PSD)	Condition (G/D/SD)	Samples
6S	12x12 Floor tile darker brown with white and brown streaks	1068	NF	2 nd Company main entrance	50ft ²	PD	D	A. Left side
								B. Middle
								C. Right side
7S	Associated mastic	1068	NF			PD	D	A. Left side
								B. Middle
								C. Right side
1S	12x12 Peel & stick faux parquet floor tile that is light + dark	1059	NF	HQ left side front office	150ft ²	PD	D	A. HQ left side front office
								B. HQ left side front office
								C. HQ left side front office
2S	12x12 Peel & stick faux parquet floor tile that is light + light	1060	NF	HQ left side front office	600ft ²	PD	D	A. HQ left side front office
								B. HQ left side front office
								C. HQ left side front office
3S	Brown coat	1067	NF	Associated with plaster ceilings, latrines and kitchen	Kitchen 120'x90'	PD	D	A. Rear left kitchen
								B. Rear center kitchen
								C. Rear right kitchen

¹ Sampled under Contract # W9124 C-04-0153.² Sample data prior to 2004 supplied by Fort Jackson.³ Previous building/roof picture**Key:****F** Friable**G** Good**PD** Potential for Damage**NF** Non Friable**D** Damaged**PSD** Potential for Significant Damage**SD** Significantly Damaged

Hub Testing Laboratory, Inc.
95 Beaver Street, Waltham, MA 02453 781/893-8330 fax 781/893-4414

Building Number: 4420Inspector: Susan Boyle/ Mo JahanbakshDate: 1/28/08

HM#	Homogeneous Area of Suspect Material Description	Photo	F/NF	Location	Quantity	Potential for Damage (PD)/ Significant Damage (PSD)	Condition (G/D/SD)	Samples
4S	Thermal surfacing insulation	1067	F	Throughout				Visually identified as fiberglass with some PVC elbows
5S	Flashing mastic		NF	Exterior hallways		PD	D	Visually identified as fiberglass
5S	2x2 Ceiling tile fissured w/dots	761 ³	F	Patched in classroom 1 and 2	80ft ²	PD	D	C. Classroom 2 Sampled to finish set from previous inspection below
19S	Top coat on cement ceilings	775 ³	F	Kitchen, latrines throughout and laundry rooms	120' x 90' 1600ft ² / ea. Co.	PD	D	C. Kitchen D. 1 st Co. laundry left side Sampled to finish set from previous inspection below
21S	Gray/brown HVAC mastic	780a ³	NF	Mechanical rooms – mixed throughout		PD	D	C. 1 st Co. 2 nd floor right side mechanical room Sampled to finish set from previous inspection below
Previously sampled								
2S	2x2 Ceiling tile dots w/holes	757 ³	F	Classrooms 1 & 2 Cafeteria Sleeping bays 1 st , 2 nd , 3 rd & 4 th Companies	9,600ft ² 2,400ft ²	PD	D	Negative ¹

¹ Sampled under Contract # W9124 C-04-0153.² Sample data prior to 2004 supplied by Fort Jackson.³ Previous building/roof picture**Key:****F** Friable**NF** Non Friable**G** Good**D** Damaged**SD** Significantly Damaged**PD** Potential for Damage**PSD** Potential for Significant Damage

Hub Testing Laboratory, Inc.
95 Beaver Street, Waltham, MA 02453 781/893-8330 fax 781/893-4414

Building Number: 4420Inspector: Susan Boyle/ Mo JahanbakshDate: 1/28/08

HM#	Homogeneous Area of Suspect Material Description	Photo	F/NF	Location	Quantity	Potential for Damage (PD)/ Significant Damage (PSD)	Condition (G/D/SD)	Samples
1S	12x12 Floor tile off-white w/black streaks	756 ³	NF	4 th Co. offices and under carpet 5 th Co. Day Room - 20x42 5 th Co. offices - 20x48 3 rd Co. Day Room - 20x48 ea. 1 st Co. & 4 th Co. Day Rooms - 42x20 ea. 2 nd Co. Day Room mixed w/6S - 42x20 Classrooms 1 & 2 - 9,600ft ² Offices except for latrines & offices beside latrine - 4,300ft ² 1 st Co. offices - 20x48 2 nd Co. offices - mixed w/6S - 20x48 HQ, halls and right front - 5000ft ²		PD	D	Positive¹
3S	Cove base molding	759 ³	NF	Classrooms 1 & 2, sporadically throughout, transient barracks, supply rooms, cafeteria, sporadically throughout all company offices and HQ offices		PD	D	Visually identified as rubber
4S	Cove base mastic	758 ³	NF			PD	D, Exposed residue	Negative ¹
5S	2x2 Ceiling tile fissured w/dots	761 ³	F	Patched in classroom 1 and 2	80ft ²	PD	D	Negative ¹
6S	12x12 Floor tile tan mottled	766 ³	NF	2 rooms beside latrines in office section & patched in some offices & front L office, 2 nd Co. offices, 1 st Fl - mixed w/1S cannot locate in 4 th Co. offices but may be under carpet, 4 th Co. supply room 3 rd Co. offices - over 1S in entry & office on L, 20ft ² behind info desk ,20' x36', 250ft ²		PD	D	Negative ¹

¹ Sampled under Contract # W9124 C-04-0153.² Sample data prior to 2004 supplied by Fort Jackson.³ Previous building/roof picture**Key:****F** Friable**G** Good**PD** Potential for Damage**NF** Non Friable**D** Damaged**PSD** Potential for Significant Damage**SD** Significantly Damaged

Hub Testing Laboratory, Inc.
95 Beaver Street, Waltham, MA 02453 781/893-8330 fax 781/893-4414

Building Number: 4420Inspector: Susan Boyle/ Mo JahanbakshDate: 1/28/08

HM#	Homogeneous Area of Suspect Material Description	Photo	F/NF	Location	Quantity	Potential for Damage (PD)/ Significant Damage (PSD)	Condition (G/D/SD)	Samples
7S	Mastic assoc. w/1S		NF	Same as 1S		PD	D	Positive¹
8S	2x4 Ceiling tile fissured & dotted, heavily patterned	764 ³ contrast w/10S	F	Mixed in 1 st , 2 nd , 3 rd , 4 th , 5 th Co. offices mixed in Supply & day rooms mixed in transient barracks and HQ	20'x48'/ea. 20'x40'/ea. 350ft ² /ea.	PD	D	Negative ¹
9S	2x4 Ceiling tile fissured & dotted, heavily patterned w/paint in the fissures	767 ³	F	Mixed in 1 st , 2 nd , 3 rd , 4 th , 5 th Co. offices mixed in supply & day rooms, mixed in transient barracks and HQ	20'x48'/ea. 20'x40'/ea.	PD	D	Negative ¹
10S	2x4 Ceiling tile fissured w/small dots	765 ³ contrast w/8S	F	Mixed in 1 st , 2 nd , 3 rd , 4 th , 5 th Co. offices mixed in supply & day Rooms, mixed in transient barracks and HQ	20'x48'/ea. 20'x40'/ea.	PD	D	Negative ¹
11S	Spray on insulation	762 ³ 768 ³	F	On beam running east to west in office		PD	D Exposed, delaminating	Negative ¹

¹ Sampled under Contract # W9124 C-04-0153.² Sample data prior to 2004 supplied by Fort Jackson.³ Previous building/roof picture**Key:****F** Friable**G** Good**PD** Potential for Damage**NF** Non Friable**D** Damaged**PSD** Potential for Significant Damage**SD** Significantly Damaged

Hub Testing Laboratory, Inc.
95 Beaver Street, Waltham, MA 02453 781/893-8330 fax 781/893-4414

Building Number: 4420Inspector: Susan Boyle/ Mo JahanbakshDate: 1/28/08

HM#	Homogeneous Area of Suspect Material Description	Photo	F/NF	Location	Quantity	Potential for Damage (PD)/ Significant Damage (PSD)	Condition (G/D/SD)	Samples
12S	2x4 Ceiling tile smooth	769 ³	F	Offices – mixed in removed except for 1 tile in 5 th Co. office		PD		Visually identified as fiberglass
13S	White HVAC mastic	763 ³ 780 ³	NF	Overhead in offices, mechanical rooms throughout, cafeteria and company areas		PD	D – small tears & exposed	Negative ¹
14S	Mastic assoc. w/6S		NF	Same as 6S		PD	D	Negative ¹
15S	12x12 Floor tile white w/light tan & gray streaks (new in appearance)	773 ³	NF	Cafeteria, looks like replacement sleeping bays – 1 st , 2 nd , 3 rd & 4 th companies 4 th Co. supply room	5310ft ² 48'x110' 28'x12' 12'x20'	PD	G	Negative ¹
16S	Mastic assoc. w/15S		NF	Same as 15S, looks like replacement Did not see black residue in kitchen, looks like abated & replaced		G		Negative ¹
17S	Sheet rock	774 ³	F	Cafeteria 4 th Co. supply room walls 2 nd Co. supply room 1 st Co. supply room 1 st Co. office-small 1 st Co. sleeping bays	160ft ² 42'x8'(2) 650ft ² 1200ft ² /ea. bay	G		Negative ¹

¹ Sampled under Contract # W9124 C-04-0153.² Sample data prior to 2004 supplied by Fort Jackson.³ Previous building/roof picture**Key:****F** Friable**NF** Non Friable**G** Good**D** Damaged**SD** Significantly Damaged**PD** Potential for Damage**PSD** Potential for Significant Damage

Hub Testing Laboratory, Inc.
95 Beaver Street, Waltham, MA 02453 781/893-8330 fax 781/893-4414

Building Number: 4420Inspector: Susan Boyle/ Mo JahanbakshDate: 1/28/08

HM#	Homogeneous Area of Suspect Material Description	Photo	F/NF	Location	Quantity	Potential for Damage (PD)/ Significant Damage (PSD)	Condition (G/D/SD)	Samples
18S	Joint compound		F	Associated w/17S		PD	G	Negative ¹
19S	Top coat on cement ceilings	775 ³	F	Kitchen, latrines throughout and laundry rooms	120'x90' 1600ft ² / ea. Co.	PD	D	Negative ¹
20S	Rough coat on exterior cement walkway ceilings		F	Exterior open spaces with ceilings		PD	D	Negative ¹
21S	Gray/brown HVAC mastic	780 ^{3a}	NF	Mechanical rooms – mixed throughout				Negative ¹
22S	12x12 Floor tile off-white w/tan splotches	782 ³		2 nd Co. day room mixed w/1S & 6S 2 nd Co. supply room 5 th Co. supply room	20ft ² 500ft ² 800ft ²	PD	D	Negative ¹
23S	Mastic assoc. w/22S				20ft ² 500ft ² 800ft ²	PD	D	Negative ¹

Photo 783³ - L is 22S / Mid is 6S / R is 1S¹ Sampled under Contract # W9124 C-04-0153.² Sample data prior to 2004 supplied by Fort Jackson.³ Previous building/roof picture**Key:****F** Friable**NF** Non Friable**G** Good**D** Damaged**SD** Significantly Damaged**PD** Potential for Damage**PSD** Potential for Significant Damage

Hub Testing Laboratory, Inc.
95 Beaver Street, Waltham, MA 02453 781/893-8330 fax 781/893-4414

Building Number: 4420Inspector: Susan Boyle/ Mo JahanbakshDate: 1/28/08

HM#	Homogeneous Area of Suspect Material Description	Photo	F/NF	Location	Quantity	Potential for Damage (PD)/ Significant Damage (PSD)	Condition (G/D/SD)	Samples
24S	2x4 Ceiling tile small fissures & dots	784 ³	F	3 rd Co. mixed in w/8, 9, 10S HQ mixed		PD	D	Very few of this type of ceiling tile; therefore did not sample
25S	9x9 Floor tile green (in a checker board w/26S)	785 ³	NF	3 rd Co. supply room 1 st Co. supply room	≈34'x20' 120ft ²	PD	D	Assumed positive¹
26S	9x9 Floor tile black (in a checker board w/25S)	785 ³	NF	3 rd Co. supply room 1 st Co. supply room	34'x20'	PD	D	Assumed positive¹
27S	Mastic assoc. w/25S & 26S		NF	3 rd Co. supply room 1 st Co. supply room	34'x20'	PD	D	Assumed positive¹
28S	12x12 Floor tile brown patterned	786 ³	NF	2 nd Co. supply room	70ft ²	PD	D	Negative ¹
<ul style="list-style-type: none"> HVAC insulation is fiberglass. There seems to be brown at seams on older galvanized and white on the fiberglass. Transient barracks – carpet over cement, no black mastic residue. 								

¹ Sampled under Contract # W9124 C-04-0153.² Sample data prior to 2004 supplied by Fort Jackson.³ Previous building/roof picture**Key:****F** Friable**NF** Non Friable**G** Good**D** Damaged**SD** Significantly Damaged**PD** Potential for Damage**PSD** Potential for Significant Damage

Hub Testing Laboratory, Inc.
 95 Beaver Street, Waltham, MA 02453 781/893-8330 fax 781/893-4414

Building Number: 4420Inspector: Susan Boyle/ Mo JahanbakshDate: 1/28/08

HM#	Homogeneous Area of Suspect Material Description	Photo	F/NF	Location	Quantity	Potential for Damage (PD)/ Significant Damage (PSD)	Condition (G/D/SD)	Samples
1R	Roofing foam	122 ³	NF	Entire roof	250,000ft ²	PD	D	Negative ¹
2R	Mastic on foam roof		NF	Entire roof	250,000ft ²	PD	D	Negative ¹
*Entire roof is damaged in areas & is leaking into building								

¹ Sampled under Contract # W9124 C-04-0153. ² Sample data prior to 2004 supplied by Fort Jackson. ³ Previous building/roof picture

Key:**F** Friable**NF** Non Friable**G** Good**D** Damaged**SD** Significantly Damaged**PD** Potential for Damage**PSD** Potential for Significant Damage

SCHNEIDER LABORATORIES

INCORPORATED

2512 W. Cary Street • Richmond, Virginia • 23220-5117
804-353-6778 • 800-785-LABS (5227) • (FAX) 804-359-1475*Excellence in Service and Technology*

AIHA/ELLAP 100527, NVLAP 101150-0, NYELAP/NELAC 11413, CAELAP 2078, NC 593, SC 93003

LABORATORY ANALYSIS REPORT

Asbestos Identification by EPA Method 600/M4/82/020

ACCOUNT #:	2377-08-1029	DATE COLLECTED:	1/28/2008
CLIENT:	HUB Testing Laboratory, Inc.	DATE RECEIVED:	2/14/2008
ADDRESS:	95 Beaver Street	DATE ANALYZED:	2/20/2008
	Waltham, MA 02453	DATE REPORTED:	2/21/2008
PROJECT NAME:	Fort Jackson		
JOB LOCATION:	Building 4420		
PROJECT NO.:	W9124C-07-C-0040		
PO NO.:		SampleType:	BULK

Client Sample No.	SLI Sample/ Layer ID	Sample Identification/ Layer Name	PLM Analysis Results	
			Asbestos Fibers	Other Materials
4420-6S-A	29633281	L Side		
Layer 1:	Floor Tile		None Detected	100% NON FIBROUS MATERIAL
	Dark Brown, Organically Bound			
4420-6S-B	29633282	Middle		
Layer 1:	Floor Tile		None Detected	100% NON FIBROUS MATERIAL
	Dark Brown, Organically Bound			
4420-6S-C	29633283	R Side		
Layer 1:	Floor Tile		None Detected	100% NON FIBROUS MATERIAL
	Dark Brown, Organically Bound			
4420-7S-A	29633284	L Side		
Layer 1:	Mastic		6% CHRYSOTILE	94% NON FIBROUS MATERIAL
	Black, Bituminous			

Total Number of Pages in Report: 3

Results relate only to samples as received by the laboratory.

Visit www.slabinc.com for current certifications.

Samples analyzed by the EPA Test Method are subject to the limitations of light microscopy including matrix interference. Gravimetric reduction and correlative analyses are recommended for all non-friable, organically bound materials. This method has a reporting limit of 1% or greater. Visual estimation contains an inherent range of uncertainty. This report must not be reproduced except in full with the approval of the lab, and must not be used to claim NVLAP or other gov't agency endorsement.

Account - Workorder 2377-08-1029 (Continued)

Client Sample No.	SLI Sample/ Layer ID	Sample Identification/ Layer Name	PLM Analysis Results	
			Asbestos Fibers	Other Materials
4420-7S-B	29633285	Middle		
Layer 1:	Mastic			
Not analyzed due to positive stop instructions.				
4420-7S-C	29633286	R Side		
Layer 1:	Mastic			
Not analyzed due to positive stop instructions.				
4420-1S-A	29633287	HQ L Side Frnt Office		
Layer 1:	Floor Tile Dark Brown, Organically Bound		None Detected	100% NON FIBROUS MATERIAL
4420-1S-B	29633288	HQ L Side Frnt Office		
Layer 1:	Floor Tile Dark Brown, Organically Bound		None Detected	100% NON FIBROUS MATERIAL
4420-1S-C	29633289	HQ L Side Frnt Office		
Layer 1:	Floor Tile Dark Brown, Organically Bound		None Detected	100% NON FIBROUS MATERIAL
4420-2S-A	29633290	HQ L Side Frnt Office		
Layer 1:	Floor Tile Light Beige, Organically Bound		None Detected	100% NON FIBROUS MATERIAL
4420-2S-B	29633291	HQ L Side Frnt Office		
Layer 1:	Floor Tile Light Beige, Organically Bound		None Detected	100% NON FIBROUS MATERIAL
4420-2S-C	29633292	HQ L Side Frnt Office		
Layer 1:	Floor Tile Light Beige, Organically Bound		None Detected	100% NON FIBROUS MATERIAL

Total Number of Pages in Report: 3

Results relate only to samples as received by the laboratory.

Visit www.slabinc.com for current certifications.

Samples analyzed by the EPA Test Method are subject to the limitations of light microscopy including matrix interference. Gravimetric reduction and correlative analyses are recommended for all non-friable, organically bound materials. This method has a reporting limit of 1% or greater. Visual estimation contains an inherent range of uncertainty. This report must not be reproduced except in full with the approval of the lab, and must not be used to claim NVLAP or other gov't agency endorsement.

Account - Workorder 2377-08-1029 (Continued)

Client Sample No.	SLI Sample/ Layer ID	Sample Identification/ Layer Name	PLM Analysis Results	
			Asbestos Fibers	Other Materials
4420-3S-A	29633293	Rear L Kitchen		
Layer 1:	Brown Coat Brown, Granular		None Detected	100% NON FIBROUS MATERIAL
4420-3S-B	29633294	Rear Ctr Kitchen		
Layer 1:	Brown Coat Brown, Granular		None Detected	100% NON FIBROUS MATERIAL
4420-3S-C	29633295	Rear R Kitchen		
Layer 1:	Brown Coat Brown, Granular		None Detected	100% NON FIBROUS MATERIAL
4420-5S-C	29633772			
Layer 1:	Ceiling Tile White, Fibrous		None Detected	40% CELLULOSE FIBER 30% MINERAL/GLASS WOOL 20% FOAMED GLASS 10% NON FIBROUS MATERIAL
Sample not as described on COC.				
4420-11S-B	29633773			
Layer 1:	Insulation Beige, Fibrous		None Detected	85% CELLULOSE FIBER 15% NON FIBROUS MATERIAL
4420-19S-C	29633774			
Layer 1:	Granular Material White, Granular		None Detected	100% NON FIBROUS MATERIAL
4420-19S-D	29633775			
Layer 1:	Granular Material White, Granular		None Detected	100% NON FIBROUS MATERIAL
4420-21S-C	29633776			
Layer 1:	Soft Material Brown, Soft		None Detected	100% NON FIBROUS MATERIAL

Analyst: NATHANIEL VAUGHN

Total Number of Pages in Report: 3

Results relate only to samples as received by the laboratory.

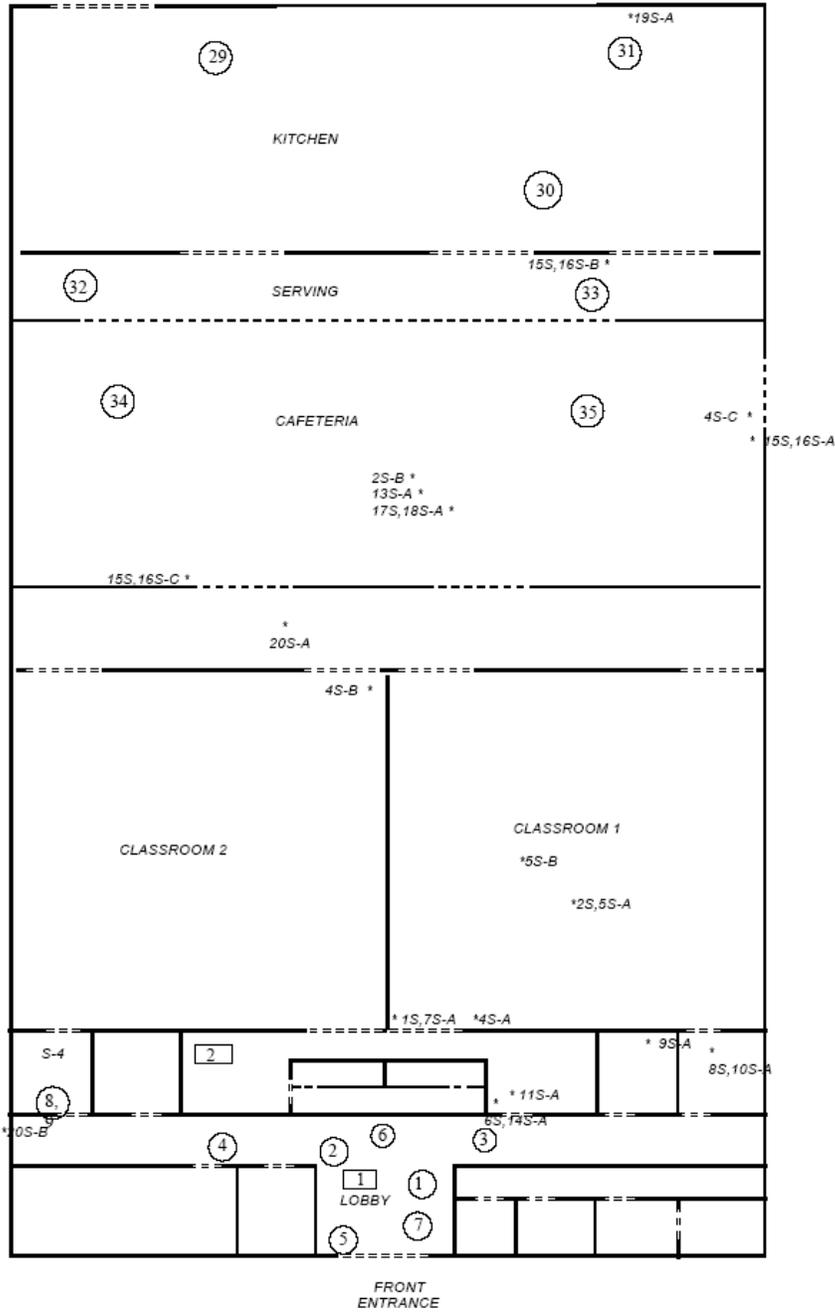


Reviewed By:

Hind Eldanaf, Analyst

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Samples analyzed by the EPA Test Method are subject to the limitations of light microscopy including matrix interference. Gravimetric reduction and correlative analyses are recommended for all non-friable, organically bound materials. This method has a reporting limit of 1% or greater. Visual estimation contains an inherent range of uncertainty. This report must not be reproduced except in full with the approval of the lab, and must not be used to claim NVLAP or other gov't agency endorsement.



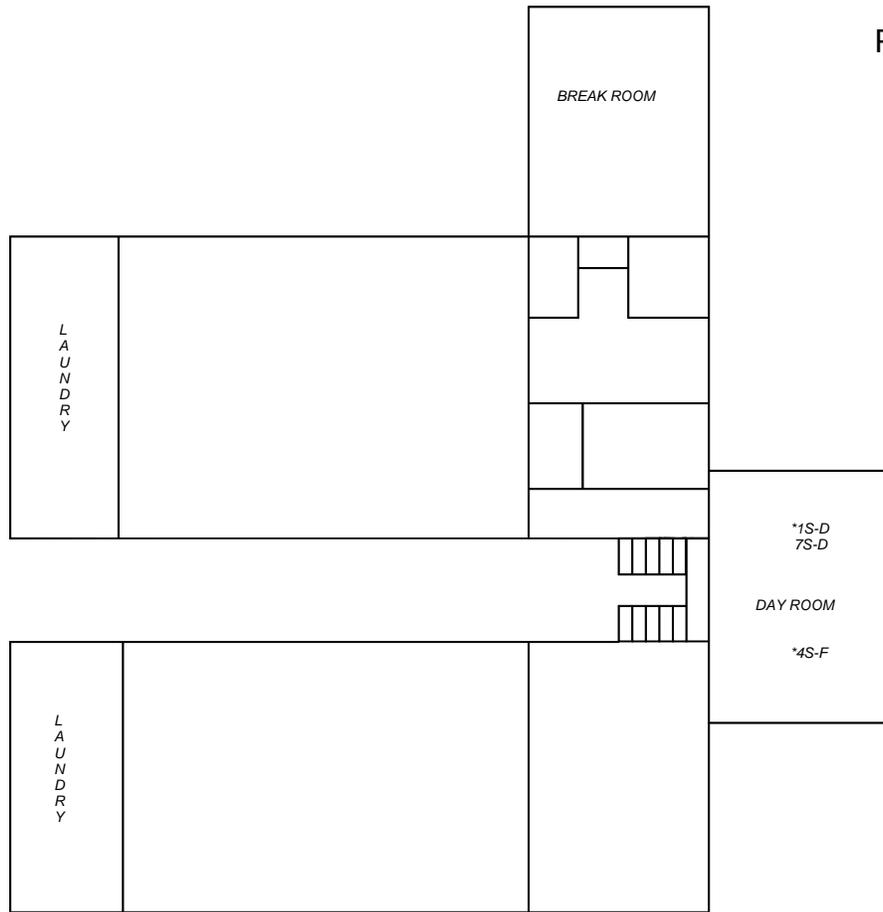
B- 4420
HEADQUARTERS, CLASSROOMS, CAFETERIA AREAS

Key:

O & □ = Previous sample location & number

* = Previous sample location & number from Hub inspection

^ = 2007 Sample location & number



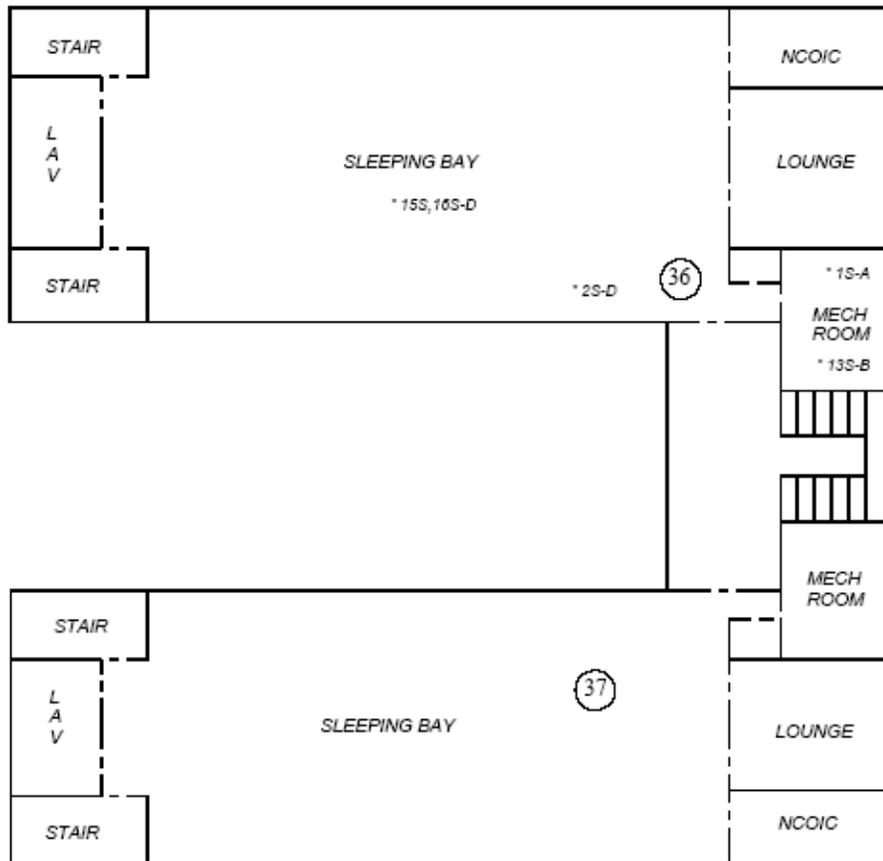
BLDG 4420
FIRST COMPANY AREA
1ST FLOOR

Key:

O & = Previous sample location & number

** = Previous sample location & number from Hub inspection*

^ = 2007 Sample location & number



BLDG 4420
FIRST COMPANY AREA
2ND FLOOR

Key:

O & □ = Previous sample location & number

* = Previous sample location & number from Hub inspection

^ = 2007 Sample location & number



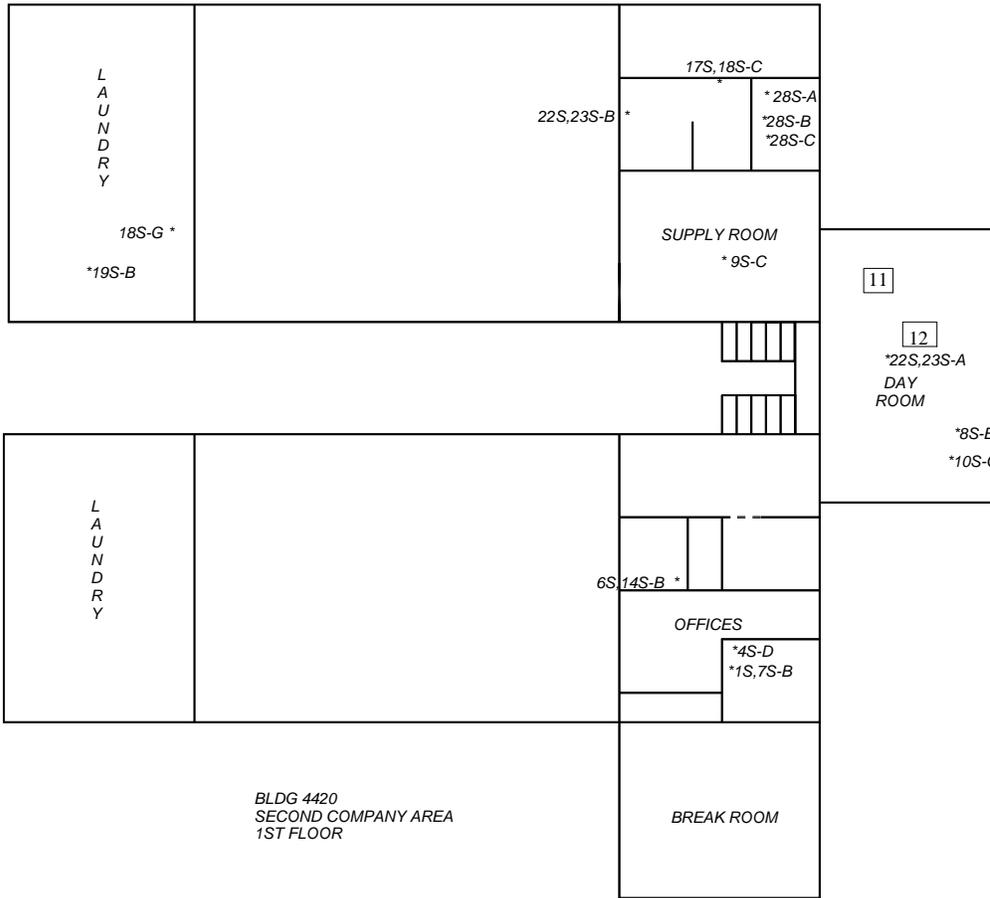
BLDG 4420
FIRST COMPANY AREA
3RD FLOOR

Key:

O & = Previous sample location & number

* = Previous sample location & number from Hub inspection

^ = 2007 Sample location & number



Key:

O & = Previous sample location & number

* = Previous sample location & number from Hub inspection

^ = 2007 Sample location & number



BLDG 4420
SECOND COMPANY AREA
2ND FLOOR

Key:

O & = Previous sample location & number

** = Previous sample location & number from Hub inspection*

^ = 2007 Sample location & number



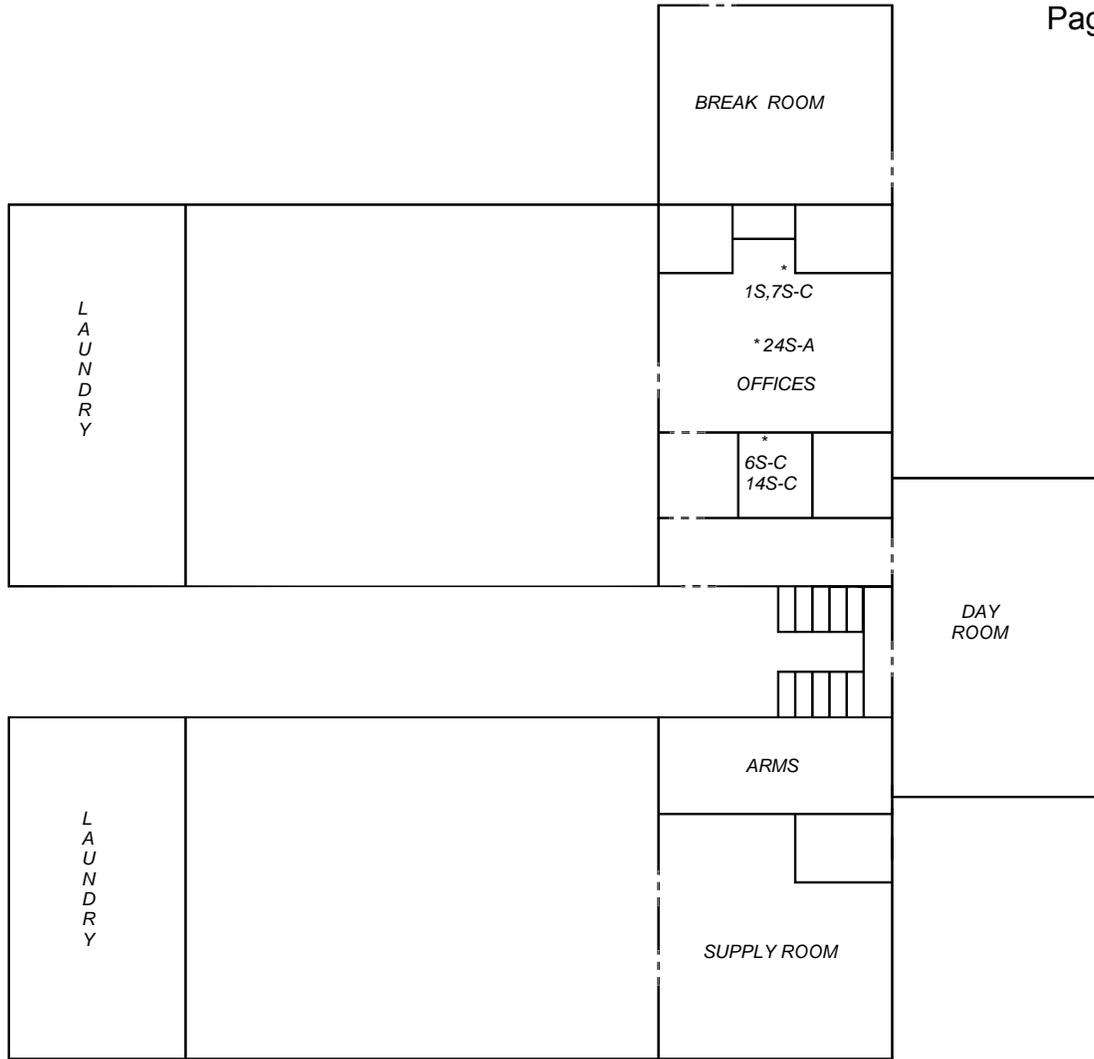
BLDG 4420
SECOND COMPANY AREA
3RD FLOOR

Key:

O & □ = Previous sample location & number

** = Previous sample location & number from Hub inspection*

^ = 2007 Sample location & number



BLDG 4420
THIRD COMPANY AREA
1ST FLOOR

Key:

O & = Previous sample location & number

* = Previous sample location & number from Hub inspection

^ = 2007 Sample location & number



B- 4420
THIRD COMPANY AREA
2ND FLOOR

Key:

O & = Previous sample location & number

** = Previous sample location & number from Hub inspection*

^ = 2007 Sample location & number



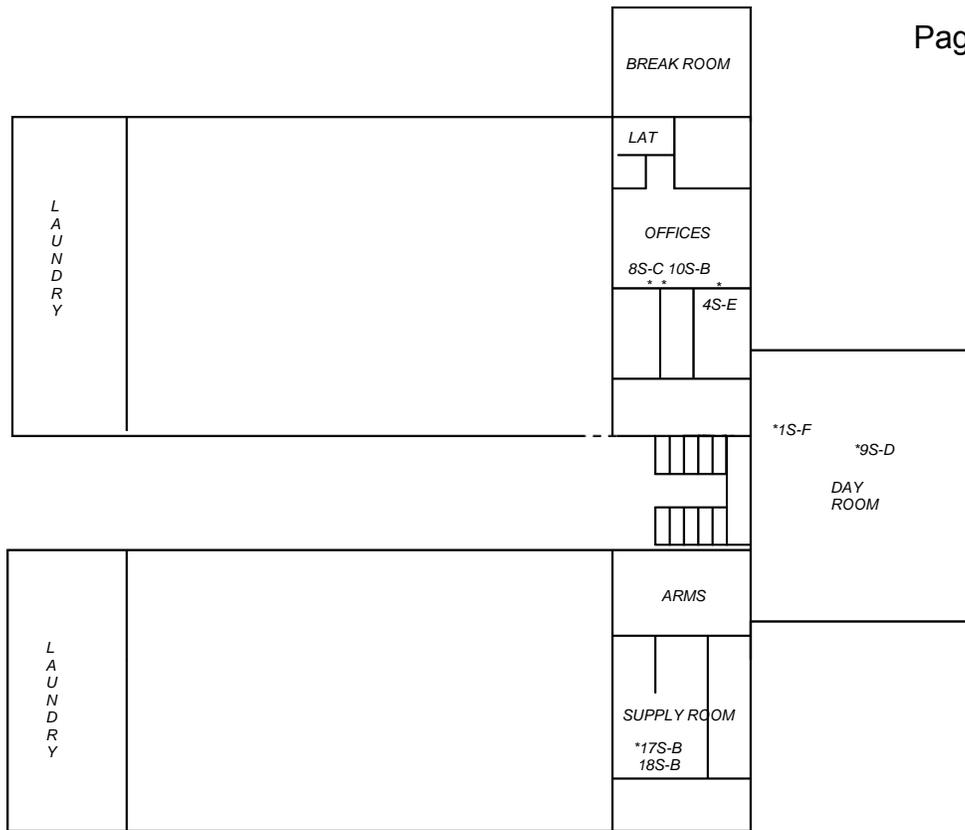
B- 4420
THIRD COMPANY AREA
2ND FLOOR

Key:

O & □ = Previous sample location & number

* = Previous sample location & number from Hub inspection

^ = 2007 Sample location & number



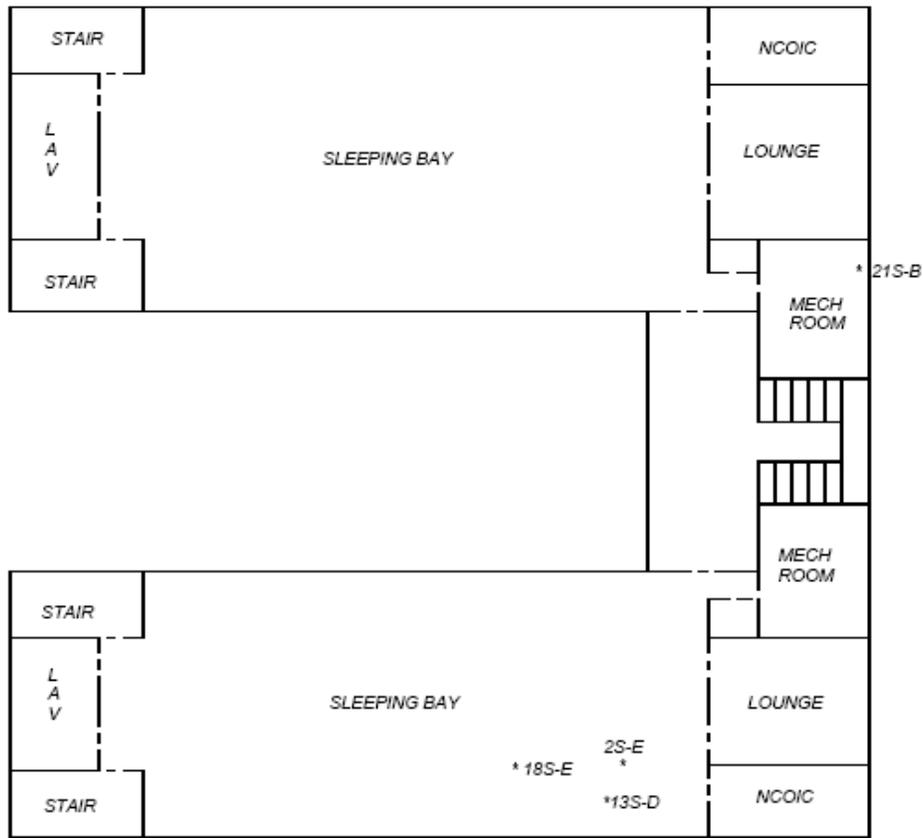
BLDG 4420
FOURTH COMPANY AREA
1ST FLOOR

Key:

O & = Previous sample location & number

* = Previous sample location & number from Hub inspection

^ = 2007 Sample location & number



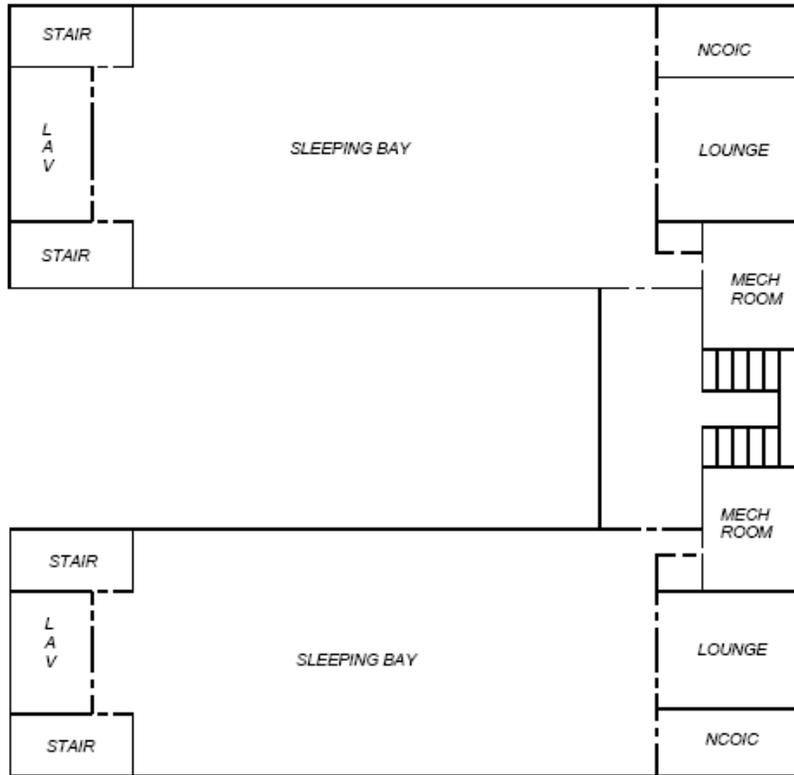
BLDG 4420
FOURTH COMPANY AREA
2ND FLOOR

Key:

O & □ = Previous sample location & number

* = Previous sample location & number from Hub inspection

^ = 2007 Sample location & number



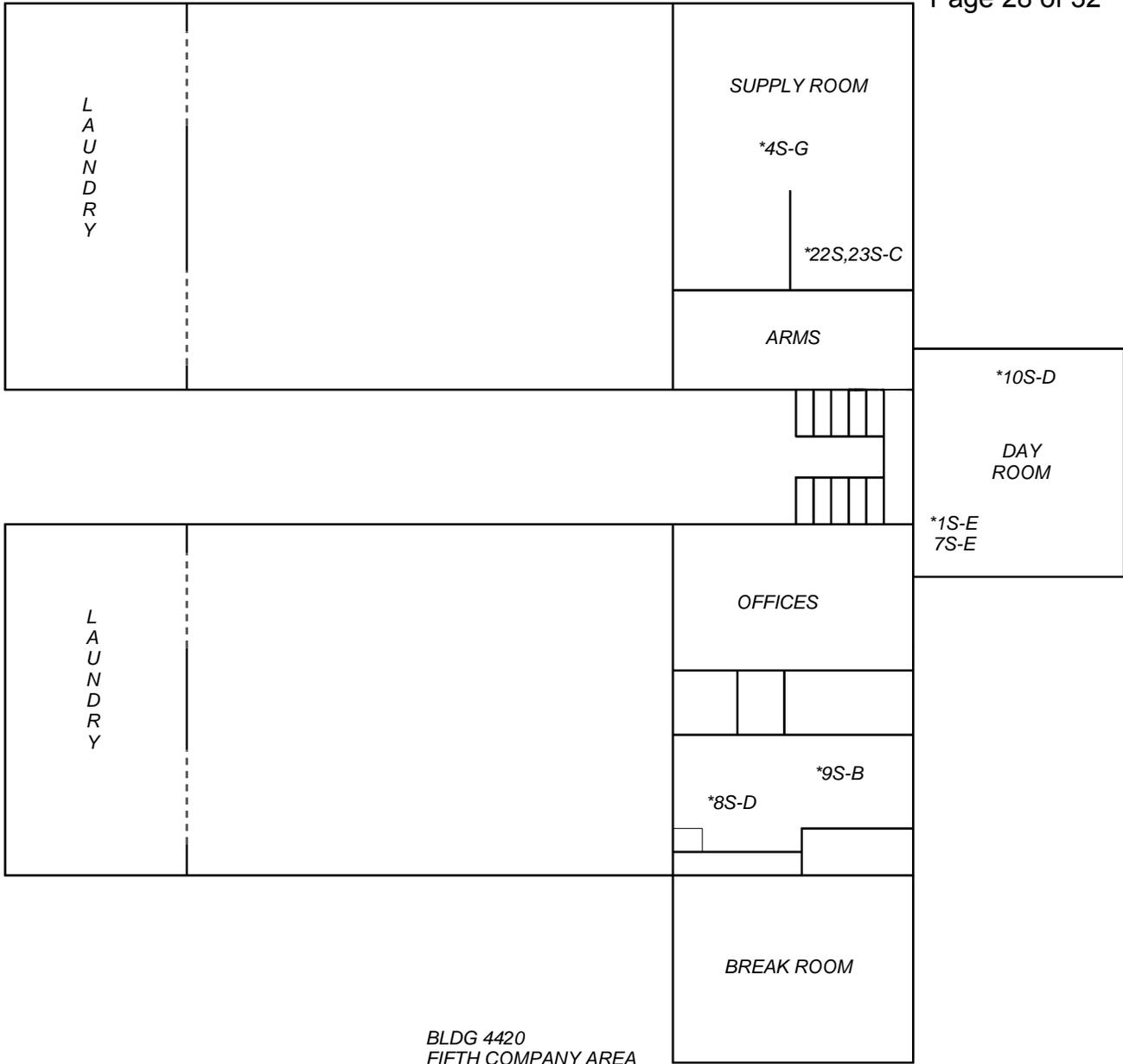
BLDG 4420
FOURTH COMPANY AREA
3RD FLOOR

Key:

O & □ = Previous sample location & number

* = Previous sample location & number from Hub inspection

^ = 2007 Sample location & number

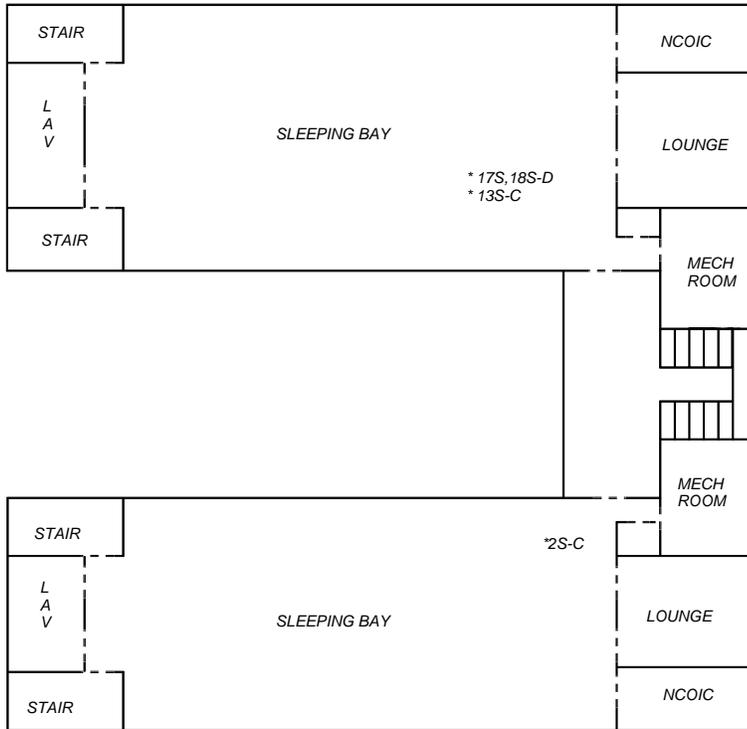


Key:

O & = Previous sample location & number

* = Previous sample location & number from Hub inspection

^ = 2007 Sample location & number



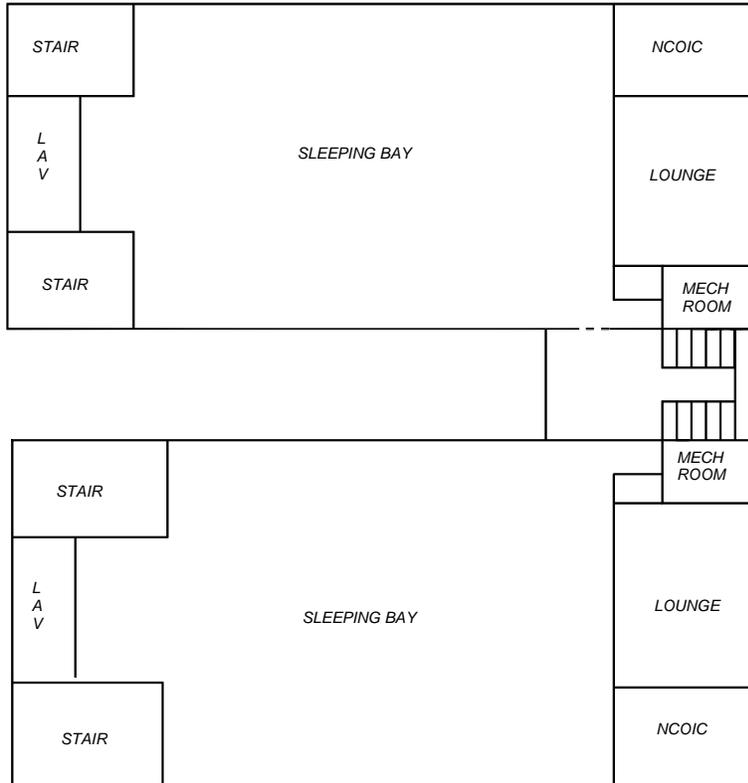
BLDG 4420
FIFTH COMPANY AREA
2ND FLOOR

Key:

O & = Previous sample location & number

* = Previous sample location & number from Hub inspection

^ = 2007 Sample location & number



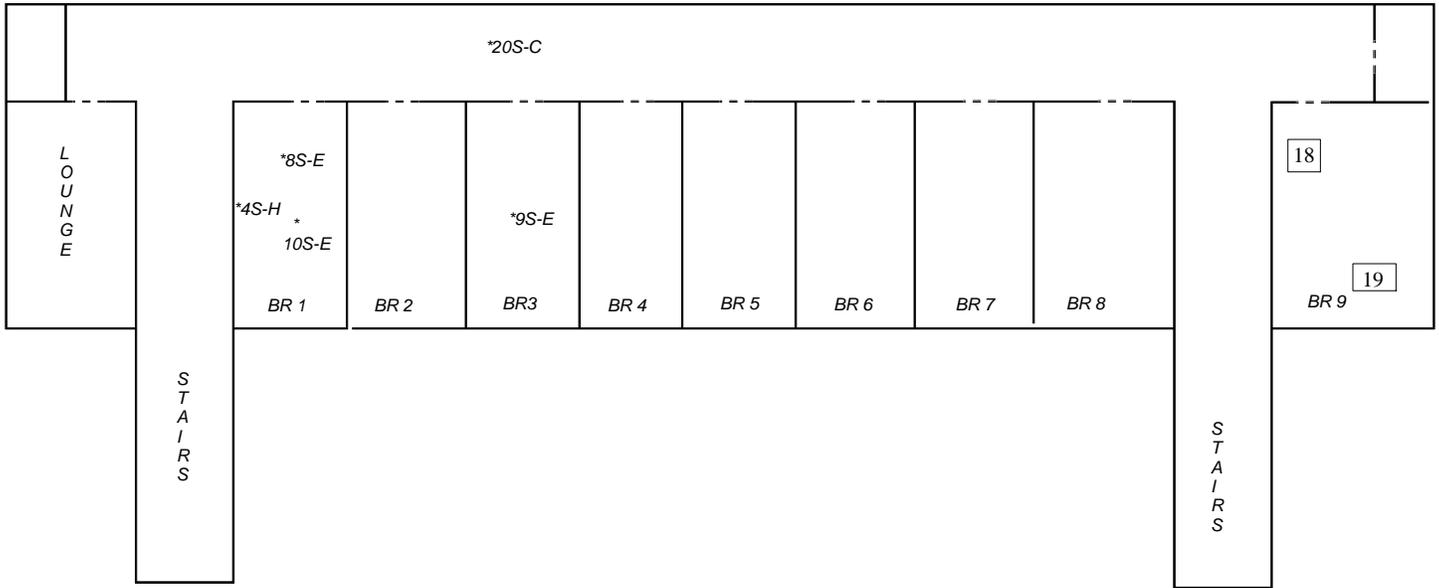
BLDG 4420
FIFTH COMPANY AREA
3RD FLOOR

Key:

O & = Previous sample location & number

* = Previous sample location & number from Hub inspection

^ = 2007 Sample location & number



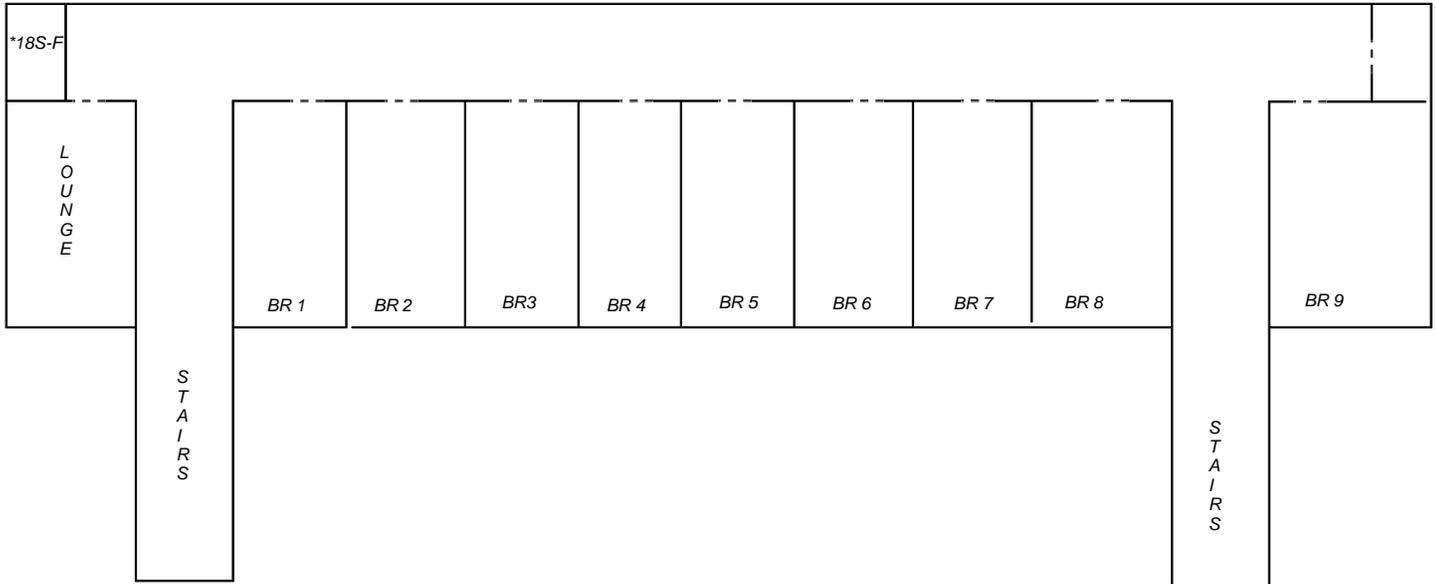
B- 4420
TRANSIENT BARRACKS
2ND FLOOR

Key:

O & = Previous sample location & number

* = Previous sample location & number from Hub inspection

^ = 2007 Sample location & number



B- 4420
TRANSIENT BARRACKS
3RD FLOOR

Key:

O & = Previous sample location & number

* = Previous sample location & number from Hub inspection

^ = 2007 Sample location & number

APPENDIX F
Conceptual Aesthetic Considerations

Not Used

APPENDIX G
GIS Data

Not Used

Appendix H Exterior Signage

APPENDIX H Exterior Signage

General Information

The following series of signs and specifications has been developed specifically taken from TM5-807-10, *Signage*, H.Q.D.A. December 1983, and from the recently developed TRADOC Regulation No. 420-14, Facilities Engineering Exterior Sign Standards. Several of the signs shown in the following system have been designed for this Post, are not shown in either of the sources listed, and are unique to this installation. Several other signs in this system are to replace signs shown in either or in both sources, such as the sign for naming streets. The system of signs shown in this design guide shall take precedence over all other sources, technical manuals or regulations. This system is however, restricted to the typical basic signs normally needed on Post and there may be a need for a sign type or size that is not shown in this guide. When such a case occurs, or when the design, construction, or placement information presented herein is not sufficient, additional information is to be taken first, from TRADOC Regulation No. 420-14 and second from TM5-807-10

Colors and Materials

All colors to be used are taken from standards developed by the Federal Administration, and include the equivalent Federal Standard 595a number as well as the Pantone Matching System number, which can be found in the Appendix in the Color Index. All signs shall be standard white vinyl die-cut letters on standard brown baked enamel aluminum posts, unless otherwise noted. Alkyd, epoxy or urethane enamels may be used. Reflective or vinyl sheeting and reflective graphics on reflective sheeting may be used when approved by the D.E.H. Steel, polycarbonate or exterior plywood sign panels and steel or wood sign posts may be used when approved by the D.E.H.

Traffic Symbols

All traffic signs and symbols shall conform to those designated in the manual "Uniform Traffic Control Devices 1978 by the U.S. Department of Transportation Federal Highway Administration.

Illumination

All signs may be illuminated with non glare light sources that are not apparent in daylight hours such as indirect or below grade weather proof lights. Light shall be restricted to the sign panel only and shall be evenly distributed.

MASTER PLAN. In order to assure that all installation signage communicates clearly in an efficient and systematic way, it is strongly recommended that an Installation or Small Area sign master plan be prepared. This plan should show the location and content of every proposed exterior identification, guide, mandatory/prohibitory, and informational sign on the Installation. The plan consists of two parts, the sign location plan and the sign schedule.

A. Sign Location Plan. The sign location plan should be prepared using a current site plan of the Installation showing all structures and other major features. To prepare a sign location plan, determine the message content, sign type, and preliminary location of each required sign. Field verify the preliminary locations, and if necessary modify the locations to accommodate existing conditions. Assign and record a sequential number for each sign on the sign location plan.

B. Sign Schedule. After preparation of the sign location plan, a sign schedule should be prepared indicating all signs required or proposed using the assigned location numbers.

The system is comprised of a logical progression of sign types which guide travel to activities or facilities through orientation to major routes within the Installation and identification of each destination. The basic sequence consists of

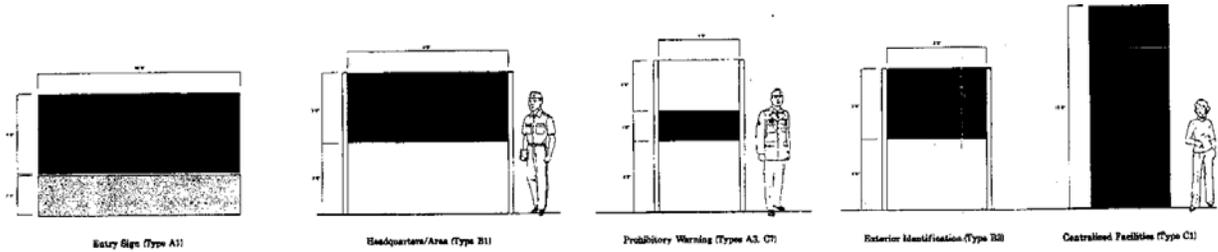
- Identification of the Installation.
- Notification of security enforced on the Installation.
- Identification of the major units stationed at the Installation.
- Orientation to the site.
- Direction to destinations via street names and addresses.
- Identification of destinations.

This progression of signs is supplemented as required with informational, motivational, and mandatory/prohibitory signage. Consistent and widely understood nomenclature must be used on all signs to avoid confusion. Colors to be used are to be standard brown (30099) for sign boards with white (27875) die-cut reflective letters except where otherwise noted.

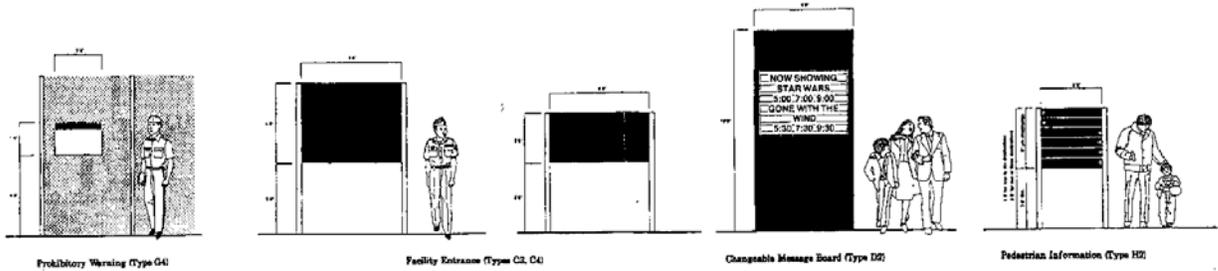
EMBLEMS Standard colors for Army signage are listed in tables 2-1 and 2-2. Colors for military emblems must be in accordance with The Institute of Heraldry, US Army, HQDA (DAAG-HDZ-A), Cameron Station, 5010 Duke Street, Alexandria, Virginia 22314, whose specifications utilize colors from the Standard color card of America, the Color Association of the United States, Inc. Branch colors are listed in table 2-1 in accordance with AR 670-1.

Standard colors developed for the Federal Highway Administration are utilized on guide and mandatory/prohibitory signs. Colors for safety are in accordance with AR-385-30. Paints, inks, and reflective sheeting materials used in the production of signs must match the standard colors.

SIGN TYPES:



Sign types given refer to designations in Technical Manual TM 9-807-10



Typography

Two typefaces are used in the signage system: Helvetica medium and Helvetica regular (with the exception of traffic control signs which follow guidelines in Standard Alphabets for Highway Signs and Pavement Markings published by the Federal Highway Administration). Since typefaces are not completely standardized in the printing and signage industries, any typeface being considered must be visually matched with examples shown:

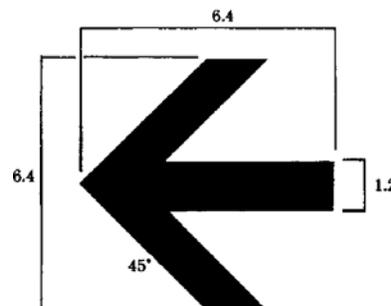
- A. Helvetica Medium. Helvetica medium is the primary system typeface and is used for major information on all signs.

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890\$G%/(&.,, ,,,,"',-:) . .

- B. Helvetica Regular. Helvetica regular is used for secondary information on signs and for translations of foreign languages using roman characters. Helvetica regular is never used in a situation requiring arrows.

ABCDEFGHIJKLMNOPQRSTUVWXYZ
 abcdefg hij klmnopq rst uvwxyz
 1234567890\$C%/(&.;"',!"? =-~)

- C. **Letter Spacing.** Application of letters should be proportionately spaced to maintain visually equal spacing and alignment. Mechanically equal spacing will not be used.
1. **Letter Spacing Standards.** Letter spacing standards should be followed for both Helvetica medium and Helvetica regular typefaces. These standards are based on a unit system. Each unit is equivalent to 1/50th of the capital letter height.
 2. **Tiles Systems.** Adhesive-backed vinyl die-cut letters supplied on proportionately sized paperboard tiles are an alternative letter spacing method. These tiles are notched to assure vertical alignment. The tiles are placed next to each other, lining up the alignment notches with the grid lines drawn on the sign face. Tile systems allow installation personnel to prepare professional quality signs with minimal training. Since letters are available individually, any message can be prepared as required, provided that an inventory of character tiles is maintained.
 3. **Pre-spaced system.** Adhesive-backed vinyl die-cut letters, pre-spaced and aligned on a transparent carrier sheet, are another alternative letter spacing method. This allows installation personnel to prepare professional quality signs quickly with minimal training. No inventory is required; however, lead time is necessary for manufacturers to prepare ordered messages.
- D. **Standard arrows.** All guide and informational signage intended for pedestrian use, either exterior or interior, must use the arrow shown.



CAPITAL LETTER HEIGHT=5.0

E. **Layout Guidelines.**

1. Good judgment is the key to deciding where the lines should break in a sign message. Single ideas or names should appear on the same line, as follows:

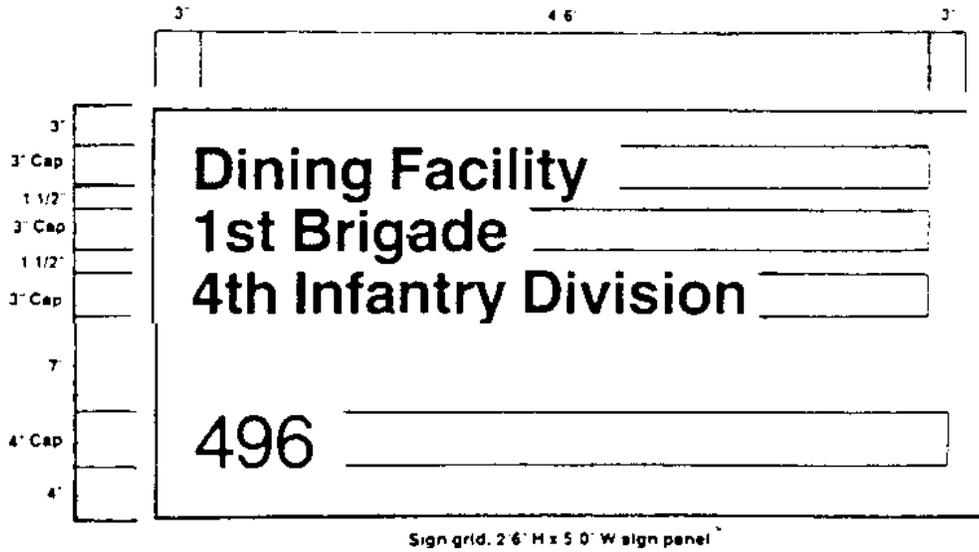
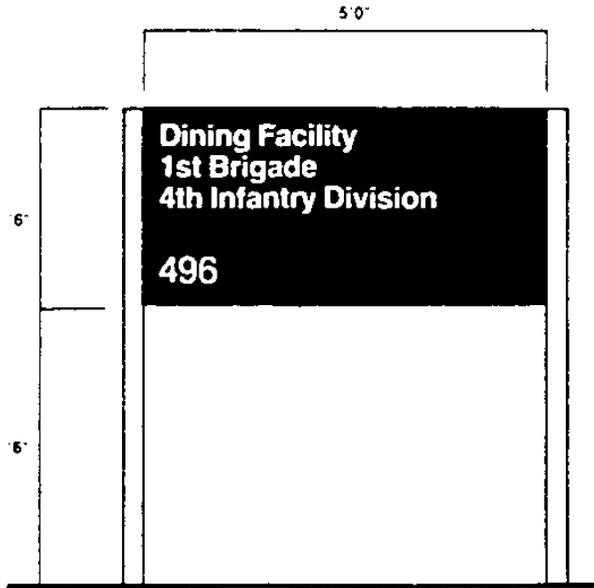
- a. Headquarters
Fort McPherson
 - b. Not,
Headquarters
Fort McPherson
2. Names should be spelled out in full whenever possible, unless otherwise specified in the authorized unit name, as follows:
- a. 4th Infantry Division
 - b. 4th Battalion 61st ADA

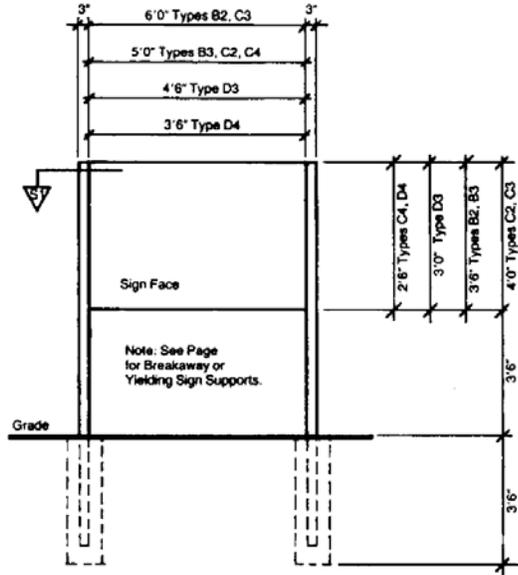
If abbreviations are required, they must be in accordance with *AR 310-50*.

3. Numbers should be used for the titles of military units except corps, which are designated by Roman numerals, and armies, which are spelled out in accordance with *AR 340-15*, as follows:
- a. Eighth US Army
 - b. 56th Artillery Brigade
4. Line breaks should be balanced, as follows:
- a. Material Development and Readiness Command
 - b. Engineering Plans/Real Property
 - c. United States Post Office
 - d. Authorized
 - e. Training and Doctrine Command

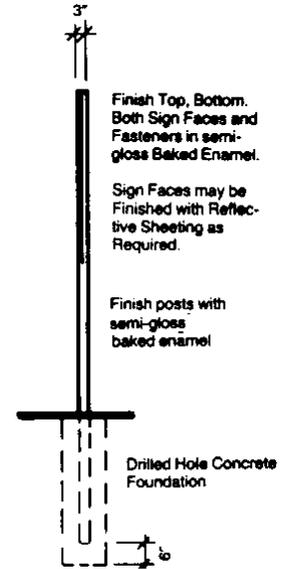
Facility Entrance : Sign 'Types a, C4

To be used at: Secondary centralized military and community facilities, primary military and community facilities, areas of warning, vehicular directional information, and for standard morale signs.

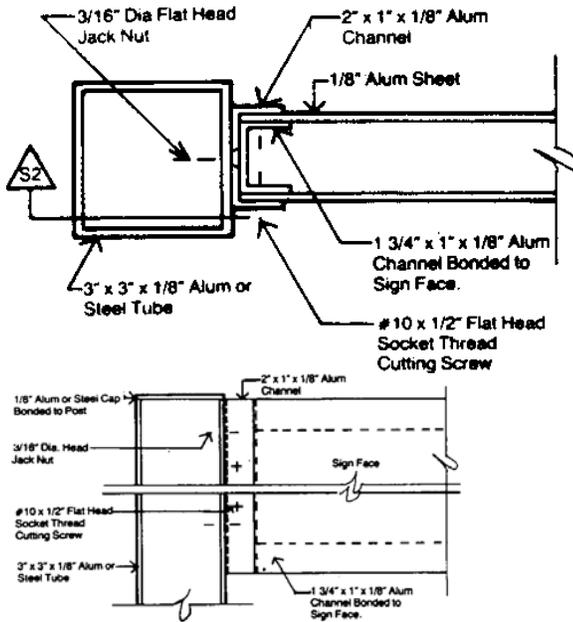




**Front Elevation: Sign Types 82,83,C 2, C3,C4.D3.
Horizontal**



Section: S1

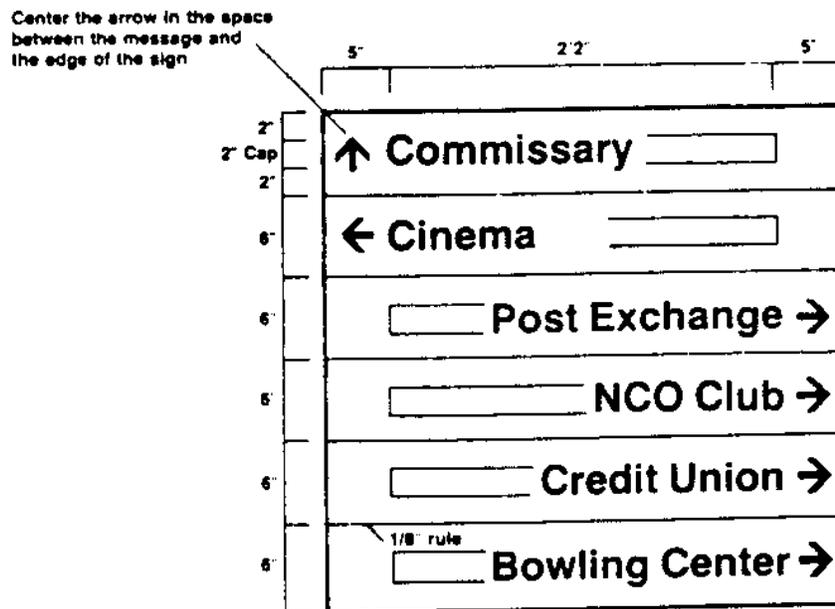
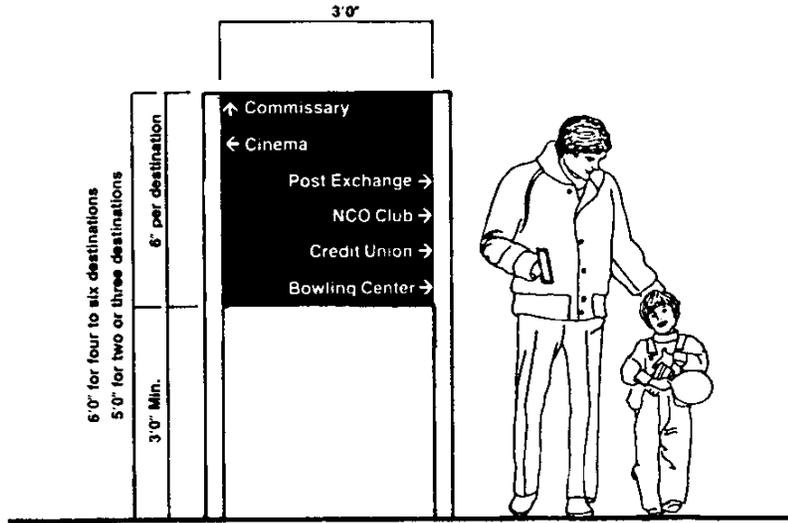


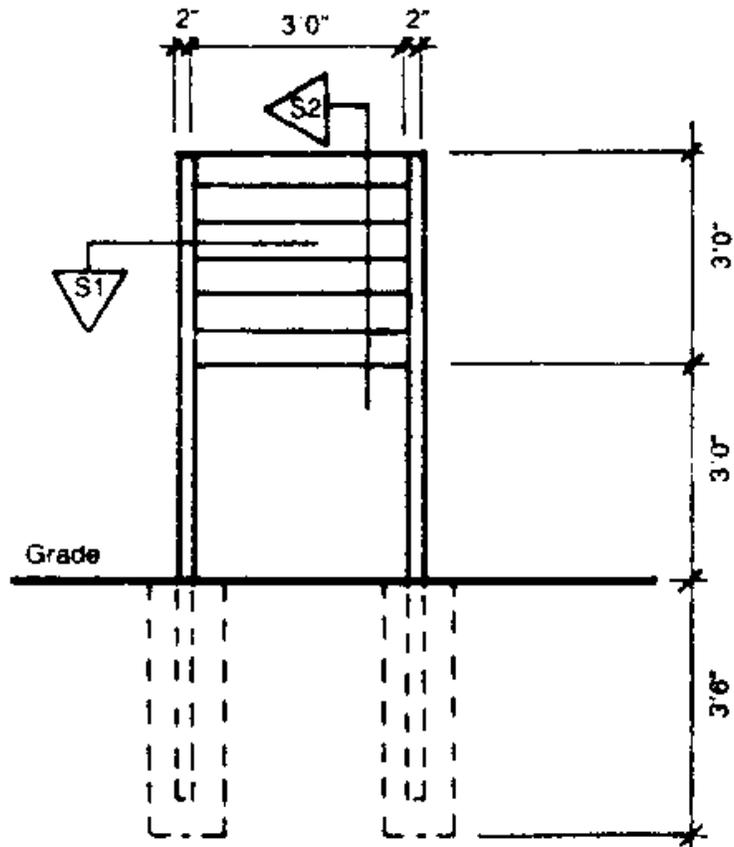
**Horizontal Section S2
Section**

Vertical

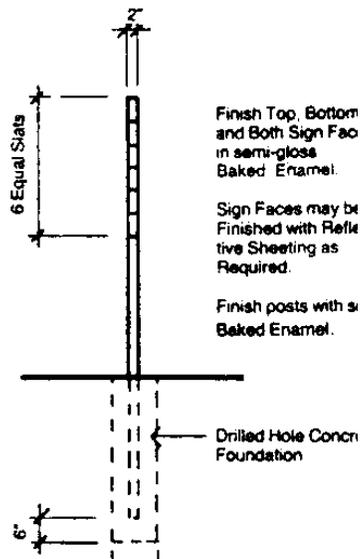
Pedestrian Information

To be used for pedestrian, and bicycles path directional information.





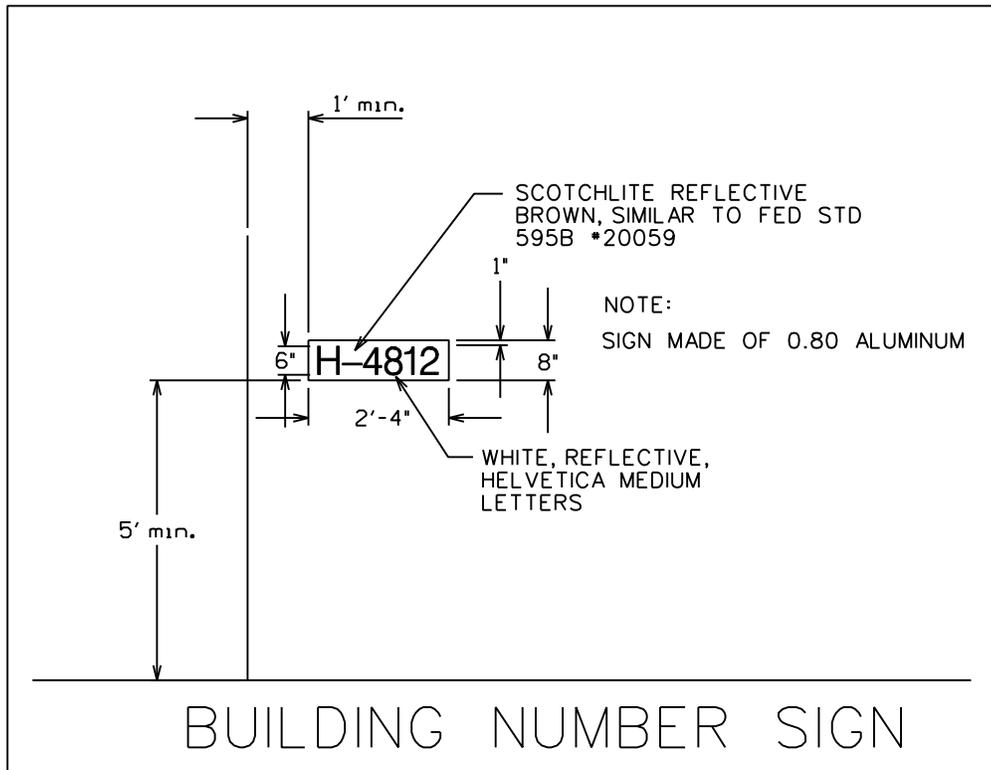
Front Elevation Sign Type H2



Section

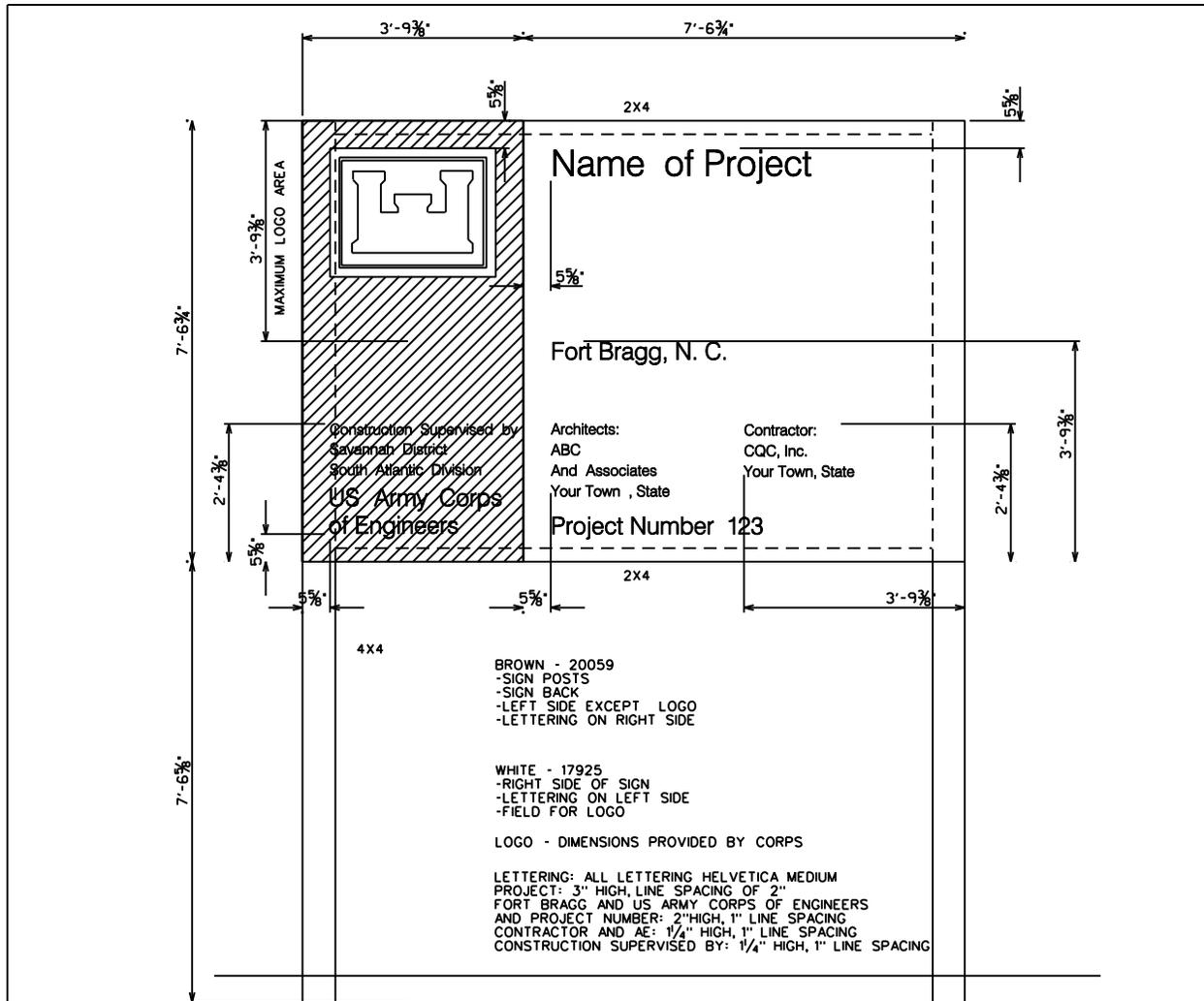
SKETCH SHEET

BUILDING ADDRESS SIGNS



JOB		REFERENCED DRAWING NO. _____	SKETCH
SHEET TITLE	BUILDING ADDRESS _____ SIGN _____	REFERENCED SHEET NO. _____	SK-G_ - 1.
		CONTRACT NO. _____	1. OF 7.
BASE	FI JACKSON S.C.	MODIFICATION NO. _____	DATE MAY 2000
		INVITATION NO. _____	DSGR
		ADDED BY AMENDMENT NO. _____	_____

SKETCH SHEET



PROJECT SIGN FOR
 SAVANNAH MANAGED DESIGNS

FORT BRAGG DESIGN GUIDE STANDARD 3 FEB 1997

CONSTRUCTION SIGN

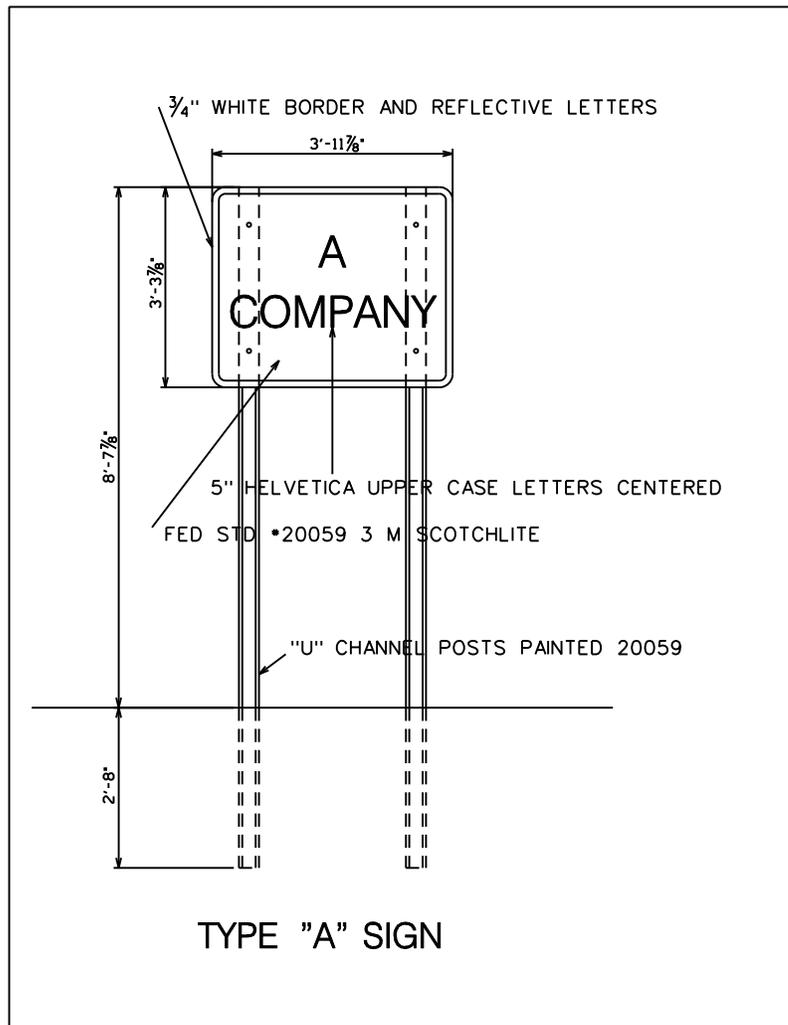
JOB		REFERENCED DRAWING NO. _____	SKETCH
SHEET TITLE	CONSTRUCTION SIGN _____	REFERENCED SHEET NO. _____	SK-G_ - 2_
		CONTRACT NO. _____	2_ OF 7_
BASE	E.I. JACKSON S.C.	MODIFICATION NO. _____	DATE
		INVITATION NO. _____	MAY 2000
		ADDED BY AMENDMENT NO. _____	DSGR

SKETCH SHEET

TYPE A SIGN

SPECIFICATIONS: TWO FEET SIX INCHES HIGH BY THREE FEET WIDE. FEDERAL STANDARD 595 COLOR BROWN (20059) ALUMINUM PANEL (HIGHWAY TYPE) WITH 3/4" WHITE BORDER AND WHITE REFLECTIVE LETTERS. THE SIGN IS MOUNTED ON TWO METAL "U" CHANNEL POSTS PAINTED BROWN 20059. TYPE FACE BE UPPER CASE "HELVITICA" AND CENTERED.

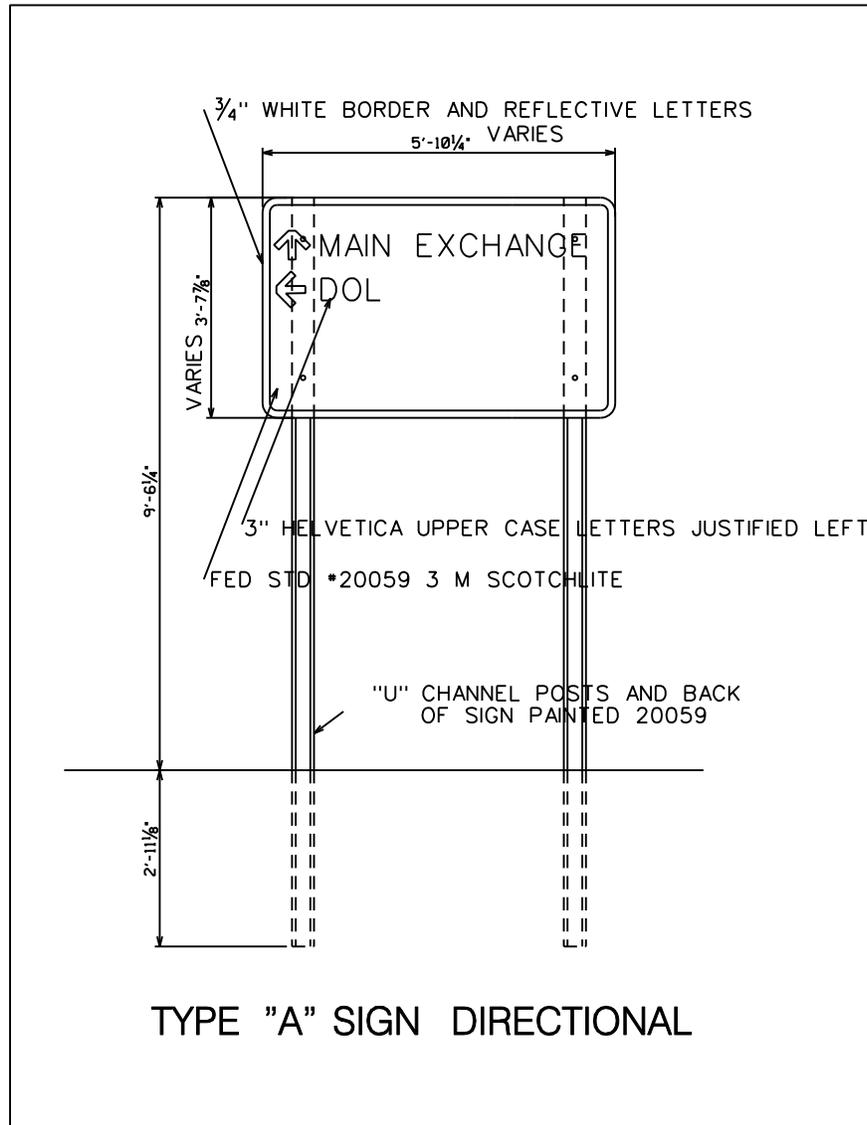
USES - COMPANY/BATTERY/DETACHMENT, DIRECTORATES, EDUCATION CENTERS AND ANNEXES, "G" LEVEL STAFF SECTIONS, MEDICAL AND HEALTH CARE FACILITIES (SMALL CLINICS), SPECIAL ADMINISTRATION OFFICES, RE-ENLISTMENT OFFICES, CLUBS IN TEMPORARY BUILDINGS, THRIFT SHOP, ARTS, AND CRAFTS, AUTO CRAFT SHOPS, MOTORCYCLE, SPORTS FIELD, HORSE STABLE, AND STADIUM.



JOB		REFERENCED DRAWING NO. _____	SKETCH
SHEET TITLE	UNIT / ORGANIZATION SIGN - TYPE A	REFERENCED SHEET NO. _____	SK-G - 3
		CONTRACT NO. _____	3 OF 7
BASE	FT. JACKSON S.C.	MODIFICATION NO. _____	DATE MAY 2000
		INVITATION NO. _____	DSGR
		ADDED BY AMENDMENT NO. _____	_____

SKETCH SHEET

TYPE A SIGN



TYPE "A" SIGN DIRECTIONAL

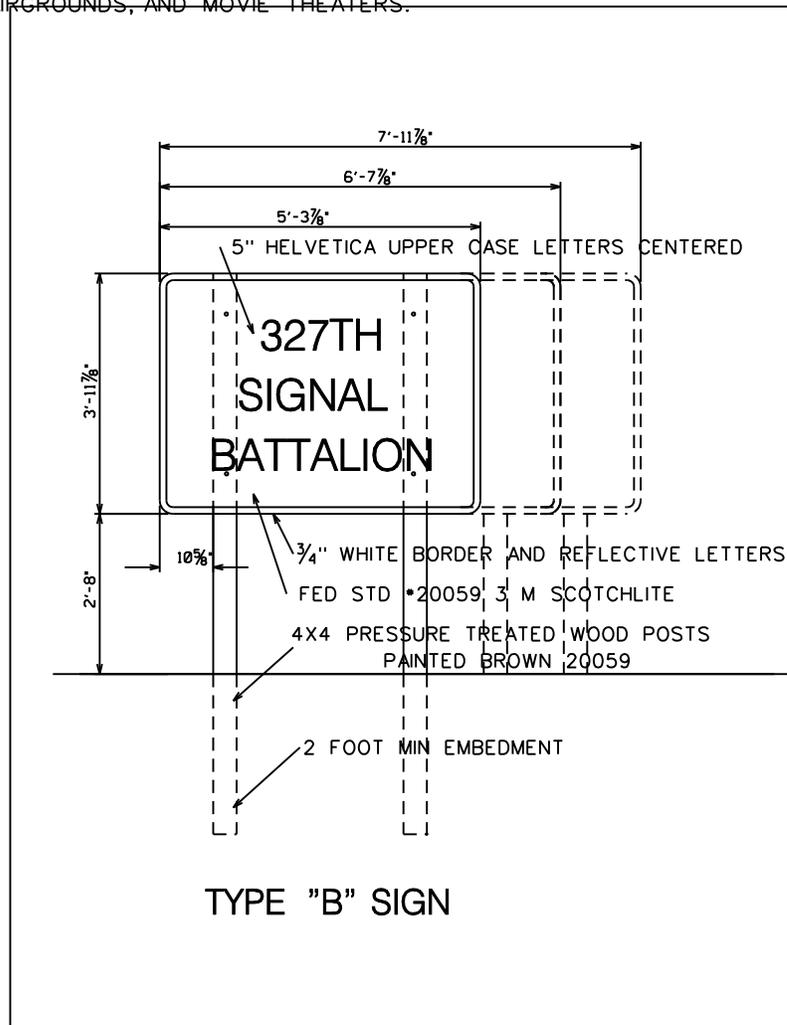
JOB		REFERENCED DRAWING NO. _____	SKETCH
SHEET TITLE	DIRECTIONAL_SIGN _____ TYPE_A _____	REFERENCED SHEET NO. _____	SK-G_ - 4_
		CONTRACT NO. _____	4_ OF 7_
BASE	E.I. JACKSON S.C.	MODIFICATION NO. _____	DATE MAY_2000_
		INVITATION NO. _____	DSGR
		ADDED BY AMENDMENT NO. _____	_____

SKETCH SHEET

TYPE B SIGN

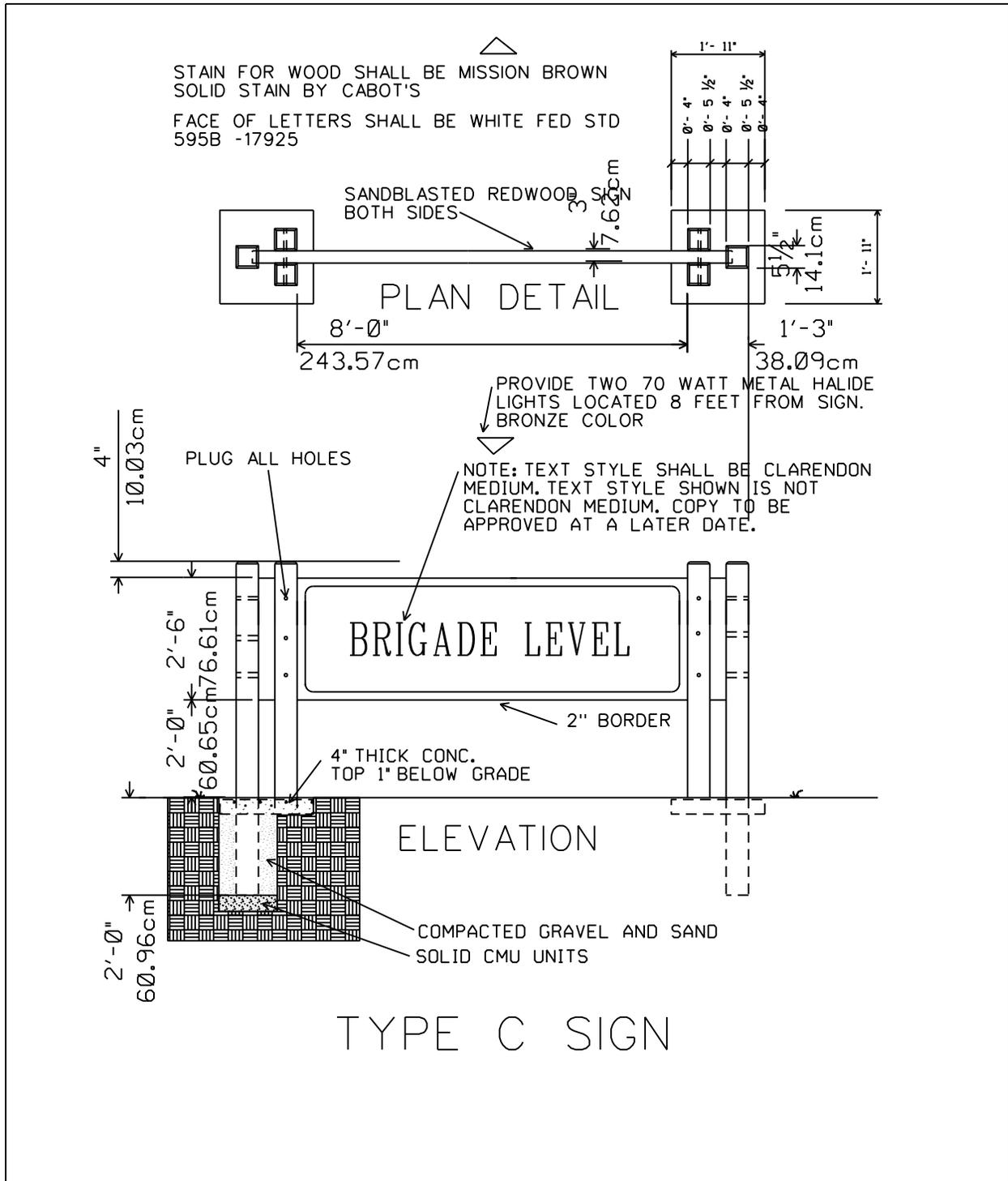
SPECIFICATIONS: THREE FEET HIGH BY FOUR FIVE OR SIX FEET WIDE. BROWN (20059) ALUMINUM PANEL (HIGHWAY TYPE) WITH 3/4" WHITE BORDER AND WHITE REFLECTIVE LETTERS. WIDTH IS DEPENDENT ON USAGE AND SITE RESTRICTIONS. THE SIGN IS MOUNTED ON TWO PRESSURE TREATED WOOD FOUR INCH BY FOUR INCH POSTS PAINTED BROWN 20059. TYPE FACE BE UPPER CASE "HELVITICA" AND CENTERED.

USES - BATTALION LEVEL COMMANDS, OFFICES AND ACTIVITIES FREQUENTED BY NON-FORT BRAGG PERSONNEL, DVERTISING/MOTIVATIONAL, FAIRGROUNDS, AND MOVIE THEATERS.



JOB		REFERENCED DRAWING NO. _____	SKETCH
SHEET TITLE	UNIT / ORGANIZATION SIGN - TYPE B	REFERENCED SHEET NO. _____	SK-6-5
		CONTRACT NO. _____	5 OF 7
BASE	FT. JACKSON, S.C.	MODIFICATION NO. _____	DATE MAY 2000
		INVITATION NO. _____	DSGR
		ADDED BY AMENDMENT NO. _____	_____

SKETCH SHEET



JOB		REFERENCED DRAWING NO. _____	SKETCH
SHEET TITLE	UNIT / ORGANIZATION SIGN - TYPE C	REFERENCED SHEET NO. _____	SK-G_ - 6_
		CONTRACT NO. _____	6_ OF 7_
BASE	E.I. JACKSON S.C.	MODIFICATION NO. _____	DATE MAY 2000
		INVITATION NO. _____	DSGR
		ADDED BY AMENDMENT NO. _____	_____

SKETCH SHEET

SPECIFICATIONS - TWO FEET-SIX INCHES HIGH BY EIGHT FEET WIDE REDWOOD PANEL WITH A TWO INCH SMOOTH BORDER AND SANDBLASTED RAISED WHITE REFLECTIVE LETTERS. THE SIGN IS MOUNTED ON SIX INCH BY SIX INCH, REDWOOD POSTS, THREE ON EACH END. TYPE FACE SHALL BE "CLARENDON MEDIUM" AND CENTERED. STAIN COLOR SHALL BE "MISSION BROWN" BY CABOT STAINS (FED STD 595B 20059)

USES - BRIGADE/GROUP/REGIMENT, "FLAG LEVEL" UNITS, MEDICAL AND HEALTH CARE FACILITIES (LARGE CLINICS), CHILD CARE CENTERS, LIBRARIES, SCHOOLS, PHYSICAL FITNESS CENTERS, MEMORIALIZATION SIGNS, BANKS, MUSEUMS, AND PARADE FIELDS.

TYPE C SIGN

JOB		REFERENCED DRAWING NO. _____	SKETCH
SHEET TITLE	UNIT / ORGANIZATION SIGN -- TYPE C SPECS	REFERENCED SHEET NO. _____	SK-G-7
		CONTRACT NO. _____	7 OF 7
BASE	E.I. JACKSON S.C.	MODIFICATION NO. _____	DATE MAY 2000
		INVITATION NO. _____	DSGR
		ADDED BY AMENDMENT NO. _____	_____

DESCRIPTION										CULTURE										USE																	
Deciduous	Growth rate: Fast	Moderate	Slow	Texture: Coarse	Medium	Fine	Flowering: Yes	Form: Horizontal	Rounded	Oval	Pyramidal	Columnar	Irregular	Upright	Spreading	Weeping	Exposure: Sun	Semi-Shade	Moisture Requirement: High	Medium	Low	Well-drained	Pest/Disease: Subject	Not Subject	Soil Fertility: High	Medium	Low	Environmental: Erosion	Shade	Transitional/Natural	Visual: Street Trees	Ornamental	Screen-Tall				
Common Name																																					
<i>Magnolia soulangeana</i> Saucer Magnolia*																																					
<i>Malus floribunda</i> Crabapple*																																					
<i>Nyssa sylvatica</i> Blackgum																																					
<i>Oxydendrum arboreum</i> Sourwood																																					
<i>Pinus echinata</i> Shortleaf Pine																																					
<i>Pinus elliottii</i> Slash Pine																																					
<i>Pinus palustris</i> Longleaf Pine																																					
<i>Pinus taeda</i> Loblolly Pine																																					
<i>Platanus occidentalis</i> Sycamore																																					
<i>Prunus caroliniana</i> Cherry Laurel																																					
<i>Quercus alba</i> White Oak																																					

	DESCRIPTION											CULTURE						USE																			
	Group:	Evergreen	Deciduous	Growth rate: Fast	Moderate	Slow	Texture: Coarse	Medium	Fine	Flowering: Yes	Form: Horizontal	Rounded	Oval	Irregular	Upright	Spreading	Weeping	Exposure: Sun	Semi-Shade	Shade	Moisture Requirement: High	Medium	Low	Well-drained	Pest/Disease: Subject	Not Subject	Soil Fertility: High	Medium	Low	Environmental: Erosion	Shade	Transitional/Natural	Visual: Street Trees	Ornamental	Screen-Tall	Screen-Low	
<i>Botanical Name</i>																																					
<i>Common Name</i>																																					
<i>Hypericum patulum</i> St. John's Wort	■			■			■		■						■		■						■			■	■	■	■		■				■		■
<i>Myrica pensylvanica</i> Bayberry	■			■			■				■				■		■	■				■	■			■	■	■	■			■					■
<i>Photinia glabra</i> Red Tip	■		■				■							■			■					■				■		■							■	■	■
<i>Yucca filamentosa</i> Adam's Needle	■			■			■		■								■	■				■	■	■						■					■		



Ground Covers:

	DESCRIPTION										CULTURE							USE															
	Group: Evergreen	Deciduous	Growth rate: Fast	Moderate	Slow	Texture: Coarse	Medium	Fine	Flowering: Yes	Form: Horizontal	Pyramidal	Irregular	Upright	Spreading	Exposure: Sun	Semi-Shade	Shade	Moisture Requirement: High	Medium	Low	Well-drained	Peat/Disease: Subject	Not Subject	Soil Fertility: High	Medium	Low	Environmental: Erosion	Shade	Transitional/Natural	Visual: Ornamental	Screen-Fall	Screen-Low	
Botanical Name																																	
Common Name																																	
<i>Ajuga reptans</i> Carpet Bugle	■	■				■		■		■			■		■		■			■	■			■			■						
<i>Cotoneaster sp.</i> Cotoneaster	■			■			■	■	■				■		■					■	■	■			■			■					
<i>Gelsemium sempervirens</i> Carolina Jessamine	■		■				■	■						■	■	■		■				■			■					■	■	■	
██████████																																	
██████████																																	
<i>Hemerocallis sp.</i> Daylily		■	■			■	■	■					■	■	■			■	■	■		■	■	■	■			■	■				
<i>Hypericum calycinum</i> Aaronsbeard	■		■				■		■				■	■	■			■	■		■	■	■	■			■						
<i>Juniperus sp.</i> Juniper	■			■				■		■			■	■						■	■		■			■			■				
<i>Liriope sp.</i> Monkey Grass	■		■				■		■				■	■	■			■	■		■	■	■	■			■	■					
<i>Ophiopogon japonicum</i> Mondo Grass	■		■				■						■	■	■			■	■		■	■	■	■			■	■					

Vines:

	DESCRIPTION							CULTURE							USE																					
	Group	Evergreen	Deciduous	Growth rate	Moderate	Texture	Coarse	Medium	Fine	Flowering	Yes	Form	Spreading	Exposure	Sun	Semi-Shade	Shade	Moisture Requirement	High	Medium	Low	Well-drained	Pest/Disease	Subject	Not Subject	Soil Fertility	High	Medium	Low	Environmental	Erosion	Shade	Transitional/Natural	Visual	Ornamental	Screen-Tall
Botanical Name																																				
Common Name																																				
<i>Ampelopsis brevipedunculata</i> Ampelopsis		■	■	■		■							■	■				■				■			■								■		■	■
<i>Campis radicans</i> Trumpetcreeper		■	■			■		■					■	■				■	■	■				■	■	■	■						■		■	■
<i>Clematis sp.</i> Clematis		■	■			■	■	■					■	■				■	■	■				■	■	■	■						■		■	■
<i>Gelsemium sempervirens</i> Carolina Jessamine	■					■		■	■				■	■	■			■					■			■		■					■			
<i>Hedera helix</i> English Ivy	■			■	■	■																														
[REDACTED]																																				
<i>Vitis sp.</i> Grape		■	■			■							■					■				■	■			■							■			
<i>Rosa hybrida</i> Climbing Rose		■	■			■	■	■					■					■				■	■		■								■			■
<i>Parthenocissus quinquefolia</i> Virginia Creeper		■		■	■								■	■				■						■		■		■					■	■	■	

Turf:

	DESCRIPTION					CULTURE								USE		
	Growth rate: Fast	Texture: Coarse	Medium	Fine	Flowering: Yes	Form: Spreading	Exposure: Sun	Semi-Shade	Moisture Requirement: High	Medium	Low	Well-drained	Pest/Disease: Subject	Soil Fertility: Medium	Environmental: Erosion	Transitional/Natural
Botanical Name																
Common Name																
<i>Axonopus affinis</i> Carpet Grass	■	■				■			■	■		■	■	■	■	
<i>Cynodon dactylon</i> Bermudagrass **	■		■	■		■	■			■	■	■	■	■	■	
<i>Lolium multiflorum</i> Annual Ryegrass	■	■				■	■	■		■			■	■	■	
Wildflower Seed Mix ***					■										■	■

** Or suitable hybrids of Bermuda, including Tihay (Tifton419)

*** All wildflower seed mixtures to contain 40% annuals, 20% biennials, and 40% perennials with a mixture of spring, summer and fall blooming species using a minimum of 12 species. Mixture can be adapted for erosion control, shade tolerance and/or height restrictions.

APPENDIX J
Drawings

Not Used

APPENDIX K Fuel Cost Information

The following utility rates for this installation are provided for design

Electrical:

Demand Charge - \$00.087 per kilowatt

Natural Gas:

Commodity Charge Rate - \$ 6.33 per thousand cubic feet

Water:

Commodity Charge Rate - \$2.07 per kgal

Sewer:

Commodity Charge Rate - \$1.13 per kgal

Purchased/Central Steam:

Commodity Charge Rate – N/A

Purchased High Temperature Water:

Commodity Charge Rate - \$10.39 per Mbtu

Purchased Chilled Water:

Commodity Charge Rate - \$10.17 per Mbtu

Appendix L LEED Project Guidance

APPENDIX L

REV 2.0 - 30 NOV 2008

LEED Project Credit Guidance

This spreadsheet indicates Army required credits, Army recommendations regarding preference and avoidance of individual credits, project-specific ranking of individual point preferences, discussion of Installation roles in support of individual credits, and issues that Government Project Delivery Teams (PDTs) need to be aware of relating to individual credits. The Resources section that follows provides references and resources that relate to LEED, including policy and legal requirements, design guides and documentation resources.

LEED 2.2 Credit Paragraph		Army Guidance: Required - Preferred - Avoid	Project Preference Ranking: (1=most preferred, blank=no preference, X=preference not applicable to this credit, Rqd=required)	
	LEED Project Credit Guidance			
PAR	FEATURE			REMARKS
CATEGORY 1 - SUSTAINABLE SITES (14 POSSIBLE POINTS)				
SSPR1	Construction Activity Pollution Prevention (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met. Related to compliance with 40 CFR 122.26 (Clean Water Act).

SS1	Site Selection		X	See paragraph LEED CREDITS COORDINATION for information relating to this credit.
SS2	Development Density & Community Connectivity - OPTION 1 DENSITY		X	Credit is determined by Installation's site selection. See paragraph LEED CREDITS COORDINATION for information relating to this credit.
	Development Density & Community Connectivity - OPTION 2 CONNECTIVITY		X	Credit is determined by Installation's site selection. See paragraph LEED CREDITS COORDINATION for information relating to this credit.
SS3	Brownfield Redevelopment		X	Credit is determined by Installation's site selection. See paragraph LEED CREDITS COORDINATION for information relating to this credit.
SS4.1	Alternative Transportation: Public Transportation Access		X	Credit is determined by Installation's site selection. See paragraph LEED CREDITS COORDINATION for information relating to this credit.
SS4.2	Alternative Transportation: Bicycle Storage & Changing Rooms	Pref		
SS4.3	Alternative Transportation: Low Emitting & Fuel Efficient Vehicles - OPTION 1			Requires provision of vehicles, which cannot be purchased with construction funds. Assume Government will not provide vehicles unless indicated otherwise.
SS4.3	Alternative Transportation: Low Emitting & Fuel Efficient Vehicles - OPTION 2	Pref		
SS4.3	Alternative Transportation: Low Emitting & Fuel Efficient Vehicles - OPTION 3			Requires provision of vehicle refueling stations. Installation must support type of fuel and commit to maintaining/supporting refueling stations.
SS4.4	Alternative Transportation: Parking Capacity	Pref		
SS5.1	Site Development: Protect or Restore Habitat			

SS5.2	Site Development: Maximize Open Space	Pref		Assume AGMBC option for aggregated open space at another location on the installation is not available to the project unless indicated otherwise.
SS6.1	Stormwater Design: Quantity Control	Pref		Related to compliance with 40 CFR 122.26 (Clean Water Act).
SS6.2	Stormwater Design: Quality Control			
SS7.1	Heat Island Effect: Non-Roof	Pref		
SS7.2	Heat Island Effect: Roof	Pref		Coordinate with nearby airfield requirements, which may preclude this credit.
SS8	Light Pollution Reduction	Pref		
CATEGORY 2 – WATER EFFICIENCY (5 POSSIBLE POINTS)				
WE1.1	Water Efficient Landscaping: Reduce by 50%	Pref		Project must include landscaping to be eligible for this credit.
WE1.2	Water Efficient Landscaping: No Potable Water Use or No Irrigation	Pref		Project must include landscaping to be eligible for this credit.
WE2	Innovative Wastewater Technologies - OPTION 1			
WE2	Innovative Wastewater Technologies - OPTION 2			
WE3.1	Water Use Reduction: 20% Reduction	Pref		Related to Army mandate for waterless urinals beginning FY10.
WE3.2	Water Use Reduction: 30% Reduction	Pref		
CATEGORY 3 – ENERGY AND ATMOSPHERE (17 POSSIBLE POINTS)				
EAPR1	Fundamental Commissioning of the Building Energy Systems (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met.
EAPR2	Minimum Energy Performance (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met.
EAPR3	Fundamental Refrigerant Management (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met.
EA1	Optimize Energy Performance	Rqd	Rqd	Earning of LEED EA1 points as indicated in paragraph ENERGY CONSERVATION, as a minimum, is required. Note that LEED points calculation is based on energy cost reduction.

EA2.1	On-Site Renewable Energy			
EA3	Enhanced Commissioning			The Commissioning Authority may be provided through the Design-Build Contractor only if in accordance with USGBC Credit Interpretation Ruling (CIR) dated 9/15/06. Commissioning Authority activities begin during design phase and continue well beyond beneficial occupancy. Assume Government will not provide CxA post-occupancy activities unless indicated otherwise.
EA4	Enhanced Refrigerant Management			
EA5	Measurement & Verification			Credit relates to EPACT metering requirements. Provider and funding of post-occupancy activities must be coordinated. Assume Government will not provide post-occupancy activities unless indicated otherwise.
EA6	Green Power		X	Credit is determined by Installation's purchase of green power. See paragraph LEED CREDITS COORDINATION for information relating to this credit.
CATEGORY 4 – MATERIALS AND RESOURCES (13 POSSIBLE POINTS)				
MRPR1	Storage & Collection of Recyclables (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met. Installation provides collection service and outside receptacle needs coordination.
MR1.1	Building Reuse: Maintain 75% of Existing Walls, Floors & Roof			
MR1.2	Building Reuse: Maintain 95% of Existing Walls, Floors & Roof			
MR1.3	Building Reuse: Maintain 50% of Interior Non-Structural Elements			
MR2.1	Construction Waste Management: Divert 50% From Disposal	Pref	1	See paragraph CONSTRUCTION AND DEMOLITION (C&D) WASTE MANAGEMENT for project requirement.

MR2.2	Construction Waste Management: Divert 75% From Disposal	Pref		
MR3.1	Materials Reuse: 5%			
MR3.2	Materials Reuse: 10%			
MR4.1	Recycled Content: 10% (post-consumer + 1/2 pre-consumer)	Pref		Relates directly to EPA CPG compliance. Federal regulation as well as Federal, DOD and Army policies require purchase of products that contribute to this credit.
MR4.2	Recycled Content: 20% (post-consumer + 1/2 pre-consumer)	Pref		Relates directly to EPA CPG compliance.
MR5.1	Regional Materials:10% Extracted, Processed & Manufactured Regionally			
MR5.2	Regional Materials:20% Extracted, Processed & Manufactured Regionally			
MR6	Rapidly Renewable Materials			Relates directly to USDA FB4P biobased materials compliance.
MR7	Certified Wood			
CATEGORY 5 – INDOOR ENVIRONMENTAL QUALITY (15 POSSIBLE POINTS)				
EQPR1	Minimum IAQ Performance (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met. Related to compliance with 10 CFR 434 (Federal Energy Code).
EQPR2	Environmental Tobacco Smoke (ETS) Control (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met. Assume all buildings are smoke free unless indicated otherwise. Family housing, barracks and other lodging are facility types where smoking may be permitted in some cases. If Statement of Work indicates smoking is permitted in these types of facilities, the requirements of LEED-NC 2.2 Option 3 apply.
EQ1	Outdoor Air Delivery Monitoring			
EQ2	Increased Ventilation			May adversely effect ability to earn energy optimization credits.

EQ3.1	Construction IAQ Management Plan: During Construction	Pref		
EQ3.2	Construction IAQ Management Plan: Before Occupancy	Pref		Construction schedule must accommodate activities required for this credit.
EQ4.1	Low Emitting Materials: Adhesives & Sealants	Pref		
EQ4.2	Low Emitting Materials: Paints & Coatings	Pref		
EQ4.3	Low Emitting Materials: Carpet Systems	Pref		
EQ4.4	Low Emitting Materials: Composite Wood & Agrifiber Products	Pref		
EQ5	Indoor Chemical & Pollutant Source Control	Pref		System requiring weekly cleaning to earn this credit is not a permitted option for Army projects.
EQ6.1	Controllability of Systems: Lighting			
EQ6.2	Controllability of Systems: Thermal Comfort			
EQ7.1	Thermal Comfort: Design			
EQ7.2	Thermal Comfort: Verification			Project must earn credit EQ7.1 to be eligible for this credit. Assume Government will not provide post-occupancy activities unless indicated otherwise.
EQ8.1	Daylight & Views: Daylight 75% of Spaces	Pref		
EQ8.2	Daylight & Views: Views for 90% of Spaces	Pref		
CATEGORY 6 – FACILITY DELIVERY PROCESS (5 POSSIBLE POINTS)				
IDc1.1	Innovation in Design			
IDc1.2	Innovation in Design			
IDc1.3	Innovation in Design			
IDc1.4	Innovation in Design			
IDc2	LEED Accredited Professional	Rqd	Rqd	LEED AP during design and construction is required.

Resources. Following are resources with web links, discussion of Federal and Army mandates and policies that relate to LEED, sources of design guidance and documentation tools to assist the PDT. Use of/compliance with documents indicated in this appendix is not required unless indicated in RFP. In the event of conflict between RFP and this appendix, RFP takes precedence.

Federal Mandates

EPA, *Environmentally Preferable Purchasing (EPP) Program* (EPA), available through URL: <http://www.epa.gov/oppt/epp/> . Resulting from Executive Order [EO] 13101 *Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition* (White House, 14 September 1998), it establishes basic guidelines for EPP as well as forms the basis for Comprehensive Procurement Guidelines (see below).

Comprehensive Procurement Guidelines [CPG], www.epa.gov/cpg.

The EPA publishes the Comprehensive Procurement Guidelines (CPGs), found in 40 CFR 247, that provide a list of products that must contain recovered material. **This is required regardless of whether the LEED recycled content credit is pursued or not.** Recommendations for the percentages of recovered materials are published in a companion document titled the Recovered Materials Advisory Notice (RMAN). Additional products are added every 2-3 years. The CPGs currently include several commonly used construction products (such as concrete, floor tiles, and roofing materials) and landscaping products (such as site furnishings and landscaping timbers).

EPA requires that the purchase of products listed on the CPG contain at least the recycled content indicated in the CPG when practicable. For every project, designer must review the current CPG list and, unless designer determines that justification for non-use exists, ensure that the technical specifications require at least the recycled content indicated in the CPG. The following are considered adequate justifications for non-use:

- a. The product does not meet appropriate performance standards.
- b. The product is not available within a reasonable time frame.
- c. The product is not available competitively (from two or more sources).
- d. The product is only available at an unreasonable price (compared with a comparable non-recycled content product).

Applicable FAR provisions and clauses: FAR Part 23.4, *Use of Recovered Materials*, 52.223-4, *Recovered Material Certification*, 52.223-9, *Estimate of Percentage of Recovered Material Content for EPA-Designated Products*. Note that although EPA designated recycled content products contribute to the LEED recycled content credit, satisfying this requirement does not guarantee that the project will reach the cumulative total required to earn the LEED credit.

USDA Federal Biobased Products Preferred Procurement Program (FB4P)

<http://www.biobased.oce.usda.gov>

The USDA has a program similar to the EPA CPG, found in 7 CFR 2902, that provides a list of designated products that must contain bio-based material with recommendations for the percentages of bio-based content. The rules for use of designated products are the same as EPA CPG. Currently the only designated construction product is roof coatings, however additional products may be added. For every project, designer must review the current USDA designations for products applicable to the project and, if any are found, unless designer determines that justification for non-use exists, ensure that the technical specifications require at least the bio-based content indicated in the designation.

All Federal contracts that involve the use or purchase of USDA- designated products must specify that the associated procurement requirements be met and must include applicable FAR provisions and clauses (currently not yet published). Note that although USDA designated bio-based content products contribute to the LEED rapidly renewable materials credit, satisfying this requirement does not guarantee that the project will reach the cumulative total required to earn the LEED credit.

Army Policy and Mandates

ECB 2006-7R Army Standard for Urinals (09 AUG2006) www.hnd.usace.army.mil/techinfo "Publications", "Engineering and Construction Bulletins". Mandates waterless urinals beginning FY10.

United States Green Building Council/LEED

USGBC Website – <http://www.usgbc.org>

LEED-NC (New Construction) v.2.2 Rating System, October 2005 --
<https://www.usgbc.org/ShowFile.aspx?DocumentID=1095>

LEED-NC v.2.2 Registered Project Checklist --
https://www.usgbc.org/FileHandling/show_general_file.asp?DocumentID=1096

LEED-NC v.2.2 Reference Guide – Available by purchase from the USGBC at:
<http://www.usgbc.org/b2c/b2c/mainFS.jsp>

LEED Letter Templates – Use of LEED Letter Templates for projects not registered with USGBC is a copyright infringement and is not permitted. Samples of the templates are available for review only at: <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1447>. (Fully functional access to LEED On-Line is only available to projects registered with the USGBC.)

LEED Credit Interpretations (CIRs) – Available on the members only side of the USGBC website. Click 'My Account' from the USGBC main web page (log-in and look for CIRs under 'My Resources.'

LEED Application Guide for Multiple Buildings and On-Campus Building Projects
https://www.usgbc.org/FileHandling/show_general_file.asp?DocumentID=1097. Provides direction in applying LEED-NC v2.1 and v2.2 to projects in a campus or multi-building setting such as corporate campuses, college campuses, and government installations (i.e. there is one owner or common property management and control).

General Resources

Unified Facilities Guide Specifications (UFGS) www.wbdg.org/ccb

UFGS are non-proprietary guide specifications covering a broad range of products and systems and incorporating agency-specific guidance and many sustainability updates. They are used and maintained by USACE, NAVFAC, AFCESA and NASA.

UFGS are in the process of being updated to include Specifier notes relating to all current EPA CPG product designations, but this process is not complete yet. Designer MUST address EPA CPG requirements in specifications on a product-by-product basis.

UFGS 01 33 29 *LEED™ Documentation*. This section includes overview and documentation requirements plus credit-specific requirements.

UFGS 01 62 35 *Recycled/Recovered Materials*. This section addresses EPA CPG compliance requirements.

UFGS 02 42 00 *Construction and Demolition Waste Management*. For DB and DBB use. This section includes requirement for waste management plan, diversion requirements and reporting.

UFGS 23 08 00.00 10 *Commissioning of HVAC Systems*. This section includes qualifications, standards and documentation, also includes several test checklists. Because it is limited to HVAC only it **does not** by itself satisfy the LEED fundamental commissioning requirement. Commissioning of other LEED required systems and coordination of documentation associated with this additional commissioning must be addressed.

USACE LEED Credit Documentation Tools

LEED 2.2 Documentation Requirements and Submittals Checklist. USACE Spreadsheet is available at <http://en.sas.usace.army.mil> to fill in for project submittals.

Commissioning Plan Document for LEED Fundamental Commissioning USACE template available at <http://en.sas.usace.army.mil> to edit to create project-specific document.

Owners Project Requirements Document for LEED Fundamental Commissioning. USACE template available at <http://en.sas.usace.army.mil> for Design Agent/Owner to edit to create project-specific document. Completed document should be included in DB RFPs or provided to Design Team at start of design.

Basis of Design Document for LEED Fundamental Commissioning. USACE template available at <http://en.sas.usace.army.mil> for Designer of Record to edit to create project-specific document.

Appendix M

Owner's Project Requirements

Owner's Project Requirements Document for LEED Fundamental Commissioning

Project: Army Standard Design Starship Renovation (SSR)

Approved:

Name

Owner's Representative

Date

Name

Design Agent's Representative

Date

Overview and Instructions

The purpose of this document is to provide clear and concise documentation of the Owner's goals, expectations and requirements for commissioned systems, and shall be utilized throughout the project delivery and commissioning process to provide an informed baseline and focus for design development and for validating systems' energy and environmental performance.

The Owner's Project Requirements Document is a required document for LEED Version 2.2 EA Prerequisite 1, Fundamental Commissioning of the Building Energy Systems. It shall be completed by the Corps District/Design Agent based on coordination with the Installation/User/Proponent and shall be approved by the Installation/User/Proponent representative.

Use of this template is not required, nor are there any restrictions on editing of it. It is provided simply as a tool to assist project teams in meeting the documentation requirements for LEED Fundamental Commissioning. The intent of the Owner's Project Requirements Document, per the LEED v2.2 Reference Guide, is to detail the functional requirements of a project and the expectations of the building's use and operation as it relates to commissioned systems. This template contains the basic recommended components indicated in the LEED v2.2 Reference Guide. It should be adapted as needed to suit the project, remaining reflective of the LEED intent.

The Owner's Project Requirements Document should ideally be completed before the start of design and furnished to the design team. It must be completed prior to the approval of Contractor submittals of any commissioned equipment or systems to meet LEED requirements.

Updates to the Owner's Project Requirements Document throughout the course of project delivery shall be made by the Corps District/Design Agent based on decisions and agreements coordinated with and agreed to by the Installation/User/Proponent.

The Owner's Project Requirements Document shall be included in the project's LEED documentation file under EA PR1, Fundamental Commissioning of the Building Energy Systems.

Owner's Project Requirements Document for LEED Fundamental Commissioning

Table of Contents

1. Owner and User Requirements
 - Primary Purpose, Program and Use
 - Project History
 - Broad Goals
2. Environmental and Sustainability Goals
 - Energy Efficiency Goals
 - General
 - Siting
 - Building Façade
 - Building Fenestration
 - Building Envelope
 - Roof
 - Other
3. Indoor Environmental Quality Requirements
 - Intended Use
 - Occupancy Schedule
 - Accommodations for After-Hours Use
 - Lighting, Temperature, Humidity, Air Quality, Ventilation, Filtration
 - Acoustics
 - Occupant Ability to Adjust System Controls
 - Types of Lighting
4. Equipment and Systems Expectations
 - Space Heating
 - Ventilation
 - Air Conditioning
 - Refrigeration
 - HVAC Controls
 - Domestic Hot Water
 - Lighting Controls
 - Day-lighting Controls
 - Emergency Power
 - Other
5. Building Occupant and O&M Personnel Requirements
 - Facility Operation
 - EMCS
 - Occupant Training and Orientation
 - O&M Staff Training and Orientation

TABLE 1

1. **Owner and User Requirements**

What is the primary purpose, program and use of this project? (Example: office building with data center)

The project objective is to design and construct facilities for the military that are consistent with the design and construction practices used for private sector projects that perform similar functions to the military projects. For example, Starship Facility has the similar function as Basic Combat Training Complex (BT); therefore, the design and construction practices should be consistent with the design and construction of a BT. These components are more fully described in Paragraph 3 of the Scope of Work in the RFP.

Describe pertinent project history. (example: standard design development)

It is the intent of Government to issue design-build Request for Proposals (RFPs) under the contracts awarded as a result of this solicitation, which may be used as the basis for subsequent RFPs/task orders at the same or other installations within the region, i.e., "adapt-build" and/or as fully-designed RFP/task orders.

Broad Goals

What are the broad goals relative to program needs?

Design objective of the basic Starship is to provide a flexible facility suitable to house soldiers while training. Goals for the Starship also include providing an economical, standardized facility that meets the basic functional needs of the unit.

What are the broad goals relative to future expansion?

No future expansion is anticipated with facility type

What are the broad goals relative to flexibility?

The goal is to allow ready adaptability in response to changes in force structure, equipment and doctrine.

What are the broad goals relative to quality of materials?

The government places value in methods that streamline construction, manage labor and other resource constraints in an effort to reduce costs and support an aggressive schedule, while meeting contract and quality requirements. It is the Army's objective that these buildings will have a 25-year useful design life before a possible re-use/re-purpose or renovation requirement, to include normal sustainment, restoration, modernization activities and a 50-year building replacement life. Therefore, the design and construction should provide an appropriate level of quality to ensure the continued use of the facility over that period with the application of reasonable preventive maintenance and repairs that would be industry-acceptable to a major civilian sector project owner. The site infrastructure will have at least a 50-year life expectancy with industry-accepted maintenance and repair cycles.

What are the broad goals relative to construction costs?

Facility must meet budget.

What are the broad goals relative to operational costs?

Meet EPACT 2005 (reduced water, energy consumption). Minimize operating costs as much as possible within first cost budget.

Other broad goals: *(Insert as applicable)*

To provide essentially the same functional facility at all locations (site-adapt) to the extent possible to facilitate unit mobility and to reduce repetitive design costs. To achieve overall program efficiencies and cost reductions using regional task order contracts for each standard.

2. Environmental and Sustainability Goals

What are the project goals relative to sustainability and environmental issues? (example: LEED Silver rating)

The project goals relative to sustainability and environmental issues are to achieve LEED Silver rating.

What are the project goals relative to energy efficiency? (example: Meet EPACT)

The project goals relative to energy efficiency are to meet EPACT 2005.

What are the project goals and requirements for building siting that will impact energy use?

Same facility must be site-adapted nationwide with minimal design effort. Consistent building orientation cannot always be expected. Consider variations in availability of fuel sources. Special local requirements are indicated in Paragraph 6 of the Scope of Work.

What are the project goals and requirements for building facade that will impact energy use?

Same facility must be site-adapted nationwide with minimal design effort. Exterior appearance will vary to be compatible with adjoining environment’s architectural theme and Antiterrorism/Force Protection requirements. Special local requirements are indicated in Paragraph 6 of the Scope of Work.

What are the project goals and requirements for building fenestration that will impact energy use?

Same facility must be site-adapted nationwide with minimal design effort. Fenestration will vary to be compatible with adjoining environment’s architectural theme and Antiterrorism/Force Protection requirements. Consistent building orientation cannot be expected at all sites. Antiterrorism/Force Protection criteria (UFC 4-010-01) requires laminated glass and heavy-duty frame. Special local requirements are indicated in Paragraph 6 of the Scope of Work.

What are the project goals and requirements for building envelope that will impact energy use?

ASHRAE 90.1 and EPACT 2005 are required. Special local requirements are indicated in Paragraph 6 of the Scope of work.

What are the project goals and requirements for building roof that will impact energy use?

Special local requirements are indicated in Paragraph 6 of the Scope of Work.

Other: *(Insert as applicable)*

3. Indoor Environmental Quality Requirements

What is the intended use for all spaces? For all spaces that have an intended use that is not readily apparent from the space name, provide this information in Table 1.

Starship Facility has the similar function as Basic Combat Training Complex (BT).

What is the anticipated occupancy schedule (numbers of occupants and time frames) for all occupied spaces? Indicate the default occupancy schedule below and for all spaces that have an occupancy schedule that differs from the default, provide this information in Table 1.

Typical occupancy schedule is normal business workday as well as occupancy during nights and weekend.

What accommodations for after-hours use are required? (example: access control, lighting controls, HVAC controls) Indicate general accommodations required below and for all spaces that have special requirements, provide this information in Table 1.

Accommodations for after-hours will be required. Special local requirements are indicated in Paragraph 6 of the Scope of Work.

What are the lighting, temperature, humidity, air quality, ventilation and filtration requirements for all spaces? Indicate the default requirements below and for all spaces that have a requirement that differs from the default, provide this information in Table 1.

Lighting: See the Scope of Work of RFP

Temperature: See the Scope of Work of RFP

Humidity: See the Scope of Work of RFP

Air Quality: See the Scope of Work of RFP

Ventilation: See the Scope of Work of RFP

Filtration: See the Scope of Work of RFP

What are the acoustical requirements for all spaces? Indicate the default acoustical requirements below and for all spaces that have a requirement that differs from the default, provide this information in Table 1.

See the Scope of Work of RFP.

What is the desired level of occupant ability to adjust systems controls? Indicate the default desired levels below and for all spaces that have a desired level that differs from the default, provide this information in Table 1.

Lighting: See the Scope of Work of RFP

Temperature: See the Scope of Work of RFP

Humidity: See the Scope of Work of RFP

Air Quality: See the Scope of Work of RFP

Ventilation: See the Scope of Work of RFP

What, if any, specific types of lighting are desired? (example: fluorescent in 2x2 grid, accent lighting, particular lamps)

Special local requirements are indicated in Paragraph 6 of the Scope of Work.

4. Equipment and System Expectations

(Complete for each category as applicable or indicate "none identified" or "N/A". Add desired features information for other anticipated commissioned systems as applicable)

Indicate desired features for the following commissioned system: Space Heating

Desired Type: _____
Quality: _____
Preferred Manufacturer: _____
Reliability: _____
Automation: _____
Flexibility: _____
Maintenance Requirements: _____
Efficiency Target: _____
Desired Technologies: _____

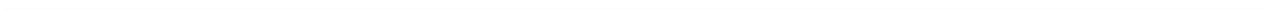
Indicate desired features for the following commissioned system: Ventilation

Desired Type: _____
Quality: _____
Preferred Manufacturer: _____
Reliability: _____
Automation: _____
Flexibility: _____
Maintenance Requirements: _____
Efficiency Target: _____
Desired Technologies: _____

Indicate desired features for the following commissioned system: Air Conditioning

Desired Type: _____
Quality: _____
Preferred Manufacturer: _____
Reliability: _____
Automation: _____
Flexibility: _____
Maintenance Requirements: _____
Efficiency Target: _____
Desired Technologies: _____

Indicate desired features for the following commissioned system: Refrigeration



Desired Type: _____

Quality: _____

Preferred Manufacturer: _____

Reliability: _____

Automation: _____

Flexibility: _____

Maintenance Requirements: _____

Efficiency Target: _____

Desired Technologies:

Indicate desired features for the following commissioned system: HVAC Controls

Desired Type: _____

Quality: _____

Preferred Manufacturer: _____

Reliability: _____

Automation: _____

Flexibility: _____

Maintenance Requirements: _____

Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Domestic Hot Water

Desired Type: _____

Quality: _____

Preferred Manufacturer: _____

Reliability: _____

Automation: _____

Flexibility: _____

Maintenance Requirements: _____

Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Lighting Controls

Desired Type: _____

Quality: _____

Preferred Manufacturer: _____

Reliability: _____

Automation: _____

Flexibility: _____

Maintenance Requirements: _____

Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Day-lighting Controls

Desired Type: _____

Quality: _____

Preferred Manufacturer: _____

Reliability: _____

Automation: _____

Flexibility: _____

Maintenance Requirements: _____

Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Emergency Power

Desired Type: _____

Quality: _____

Preferred Manufacturer: _____

Reliability: _____

Automation: _____

Flexibility: _____

Maintenance Requirements: _____

Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Other - _____

Desired Type: _____

Quality: _____

Preferred Manufacturer: _____

Reliability: _____

Automation: _____

Flexibility: _____

Maintenance Requirements: _____

Efficiency Target: _____

Desired Technologies: _____

5. Building Occupant and O&M Personnel Requirements

How will the facility be operated? Who will operate the facility?

See the Scope of Work of RFP. _____

Will the facility be connected to an EMCS? If so, what are the interface requirements? (example: monitoring points, control points, scheduling)

See the Scope of Work of RFP.

What is the desired level of training and orientation for building occupants to understand and use the building systems?

See the Scope of Work of RFP.

What is the desired level of training and orientation for O&M staff to understand and maintain the building systems?

See the Scope of Work of RFP.

Table 1

Space	Use / Activity	Number Occupants	Special Occupancy Schedule	After Hours Use Reqmt.	Special Cooling Reqmt.	Special Heating Reqmt.	Special Humidity Reqmt.	Special Ventil./Filtration Reqmt.	Special Acoustic Reqmt.	Special Lighting Reqmt.	Special Occupancy Adjustability Reqmt.

APPENDIX N
LEED Requirements for Multiple Contractor Combined Projects

Not Used

Appendix O
LEED Strategy Tables

LEED Credit Paragraph	LEED 2.2 Strategy Table	Building CTR Substitution Permitted	Site CTR Substitution Permitted	Required Points Strategy	Overall direction per current USACE Army Sustainable Design and Development policy is for a major renovation project to achieve as a minimum goal, the Silver level of achievement within the United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design New Construction (LEED-NC) Green Building Rating System. The intent of the current policy is to achieve a maximum level of sustainability for all projects with a minimum level established for new construction and major renovation. The current direction is not to pursue Certification with the USGBC but to produce separable documentation in support of the Government's own Validation process should it seek to confirm strategies and points claimed by the D/B. A variance from the strategy listed herein is allowed after application for approval from the Government and so long as substitutions do not jeopardize combined building/site points or overall score.
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PAR	FEATURE					REMARKS
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CATEGORY 1 – SUSTAINABLE SITES						
SSPR1	Construction Activity Pollution Prevention (PREREQUISITE)		NO	R	D/B to include measures to satisfy this in the submittal.	
SS1	Site Selection		NO		Coordinate with Government	GD determine if credit is earned. GD either prepare documentation in-house or require CTR to prepare it.
SS2	Development Density & Community Connectivity		NO		Coordinate with Government	GD determine if credit is earned. GD either prepare documentation in-house or require CTR to prepare it.
SS3	Brownfield Redevelopment		NO		Coordinate with Government	GD determine if credit is earned. GD either prepare documentation in-house or require CTR to prepare it.
SS4.1	Alternative Transportation: Public Transportation Access		NO		Coordinate with Government	GD determine if credit is earned. GD either prepare documentation in-house or require CTR to prepare it.
SS4.2	Alternative Transportation: Bicycle Storage & Changing Rooms	NO	NO	1	Combined Bldg/Site credit. Site CTR responsible for bicycle storage. Building CTR responsible for shower/changing rooms.	Edit as needed based on COS sitework scope versus GD sitework scope.
SS4.3	Alternative Transportation: Low Emitting & Fuel Efficient Vehicles - OPTION 1		YES	1	Coordinate with Government	
SS4.3	Alternative Transportation: Low Emitting & Fuel Efficient Vehicles - OPTION 2		YES	1	Coordinate with Government	
SS4.3	Alternative Transportation: Low Emitting & Fuel Efficient Vehicles - OPTION 3	NO	NO	1	Coordinate with Government	Describe required system, building CTR responsibilities and site CTR responsibilities in remarks column if this credit is included in strategy.
SS4.4	Alternative Transportation: Parking Capacity		YES	1	Coordinate with Government	
SS5.1	Site Development: Protect or Restore Habitat		YES			
SS5.2	Site Development: Maximize Open Space		YES			
SS6.1	Stormwater Design: Quantity Control		YES			
SS6.2	Stormwater Design: Quality Control		YES			
SS7.1	Heat Island Effect: Non-Roof		YES			
SS7.2	Heat Island Effect: Roof	YES	NIC	1	D/B to include measures to satisfy this in the submittal.	
SS8	Light Pollution Reduction	NO	NO	1	D/B to include measures to satisfy this in the submittal and follow up with Government.	
CATEGORY 2 – WATER EFFICIENCY						
WE1.1	Water Efficient Landscaping: Reduce by 50%		YES			
WE1.2	Water Efficient Landscaping: No Potable Water Use or No Irrigation		YES			
WE2	Innovative Wastewater Technologies	NO	NO	1	D/B to include measures to satisfy this in the submittal.	
WE3.1	Water Use Reduction: 20% Reduction	YES		1	Building CTR responsible.	
WE3.2	Water Use Reduction: 30% Reduction	YES		1	Building CTR responsible.	
CATEGORY 3 – ENERGY AND ATMOSPHERE						
EAPR1	Fundamental Commissioning of the Building Energy Systems (PREREQUISITE)	NO	NO	R	Building CTR responsible for commissioning of building systems. Site CTR responsible for commissioning of site systems.	
EAPR2	Minimum Energy Performance (PREREQUISITE)	NO		R	Building CTR responsible.	
EAPR3	Fundamental Refrigerant Management (PREREQUISITE)	NO		R	Building CTR responsible.	
EA1	Optimize Energy Performance	YES		6	Building CTR responsible. Must comply with EPACT	
EA2	On-Site Renewable Energy	YES	NO		Coordinate with Government	COS and GD must identify required systems and not permit substitution if Bldg/Site system is pursued. Bldg CTR may be allowed this credit as a substitution with caveat that it not include change to site work or requirement for coordination on site component.

LEED Credit Paragraph	LEED 2.2 Strategy Table	Building CTR Substitution Permitted	Site CTR Substitution Permitted	Required Points Strategy	Overall direction per current USACE Army Sustainable Design and Development policy is for a major renovation project to achieve as a minimum goal, the Silver level of achievement within the United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design New Construction (LEED-NC) Green Building Rating System. The intent of the current policy is to achieve a maximum level of sustainability for all projects with a minimum level established for new construction and major renovation. The current direction is not to pursue Certification with the USGBC but to produce separable documentation in support of the Government's own Validation process should it seek to confirm strategies and points claimed by the D/B. A variance from the strategy listed herein is allowed after application for approval from the Government and so long as substitutions do not jeopardize combined building/site points or overall score.
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PAR	FEATURE				REMARKS
EA3	Enhanced Commissioning	NO	NO		Coordinate with Government
EA4	Enhanced Refrigerant Management	YES		1	D/B to include measures to satisfy this in the submittal.
EA5	Measurement & Verification	YES		1	D/B to include measures to satisfy this in the submittal.
EA6	Green Power	NO			GD determine if credit is earned.

CATEGORY 4 – MATERIALS AND RESOURCES

MRPR1	Storage & Collection of Recyclables (PREREQUISITE)	NO		R	D/B to include measures to satisfy this in the submittal.	
MR1.1	Building Reuse: Maintain 75% of Existing Walls, Floors & Roof			1	D/B shall confirm and and document demolition vs maintaining existing elements	
MR1.2	Building Reuse: Maintain 95% of Existing Walls, Floors & Roof					
MR1.3	Building Reuse: Maintain 50% of Interior Non-Structural Elements					
MR2.1	Construction Waste Management: Divert 50% From Disposal	NO	NO	1	D/B to include measures to satisfy this in the submittal.	Review and modify each CTR percentage based on site conditions and scope of work.
MR2.2	Construction Waste Management: Divert 75% From Disposal	NO	NO			
MR3.1	Materials Reuse: 5%	NO	NO	1	D/B shall confirm and and document salvage effort.	Review and modify each CTR percentage based on site conditions and scope of work. Identify known materials available for reuse.
MR3.2	Materials Reuse: 10%	NO	NO	1	D/B shall confirm and and document salvage effort.	Review and modify each CTR percentage based on site conditions and scope of work. Identify known materials available for reuse.
MR4.1	Recycled Content: 10% (post-consumer + 1/2 pre-consumer)	NO	NO	1	D/B shall confirm and and document salvage effort.	Review and modify each CTR percentage based on site conditions and scope of work.
MR4.2	Recycled Content: 20% (post-consumer + 1/2 pre-consumer)	NO	NO	1	D/B shall confirm and and document salvage effort.	Review and modify each CTR percentage based on site conditions and scope of work.
MR5.1	Regional Materials:10% Extracted, Processed & Manufactured Regionally	NO	NO	1	D/B shall confirm and and document salvage effort.	Review and modify each CTR percentage based on site conditions and scope of work.
MR5.2	Regional Materials:20% Extracted, Processed & Manufactured Regionally	NO	NO		D/B shall confirm and and document salvage effort.	Review and modify each CTR percentage based on site conditions and scope of work.
MR6	Rapidly Renewable Materials	YES		1	Building CTR responsible.	
MR7	Certified Wood	YES			Building CTR responsible.	If any appreciable permanent incorporation of wood materials is anticipated in the site contract, state each CTR percentage based on site conditions and scope of work and do not permit substitution.

CATEGORY 5 – INDOOR ENVIRONMENTAL QUALITY

EQPR1	Minimum IAQ Performance (PREREQUISITE)	NO		R	Building CTR responsible.	
EQPR2	Environmental Tobacco Smoke (ETS) Control (PREREQUISITE)	NO	NO	R	Smoking is prohibited in non-residential federal facilities. Building CTR responsible for building ETS control features. Site CTR responsible for site ETS features.	
EQ1	Outdoor Air Delivery Monitoring	YES			Building CTR responsible.	
EQ2	Increased Ventilation	YES			Building CTR responsible.	
EQ3.1	Construction IAQ Management Plan: During Construction	YES		1	Building CTR responsible.	
EQ3.2	Construction IAQ Management Plan: Before Occupancy	YES		1	Building CTR responsible.	
EQ4.1	Low Emitting Materials: Adhesives & Sealants	YES		1	Building CTR responsible.	
EQ4.2	Low Emitting Materials: Paints & Coatings	YES		1	Building CTR responsible.	

Section:

LEED Credit Paragraph	LEED 2.2 Strategy Table	Building CTR Substitution Permitted	Site CTR Substitution Permitted	Required Points Strategy	Overall direction per current USACE Army Sustainable Design and Development policy is for a major renovation project to achieve as a minimum goal, the Silver level of achievement within the United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design New Construction (LEED-NC) Green Building Rating System. The intent of the current policy is to achieve a maximum level of sustainability for all projects with a minimum level established for new construction and major renovation. The current direction is not to pursue Certification with the USGBC but to produce separable documentation in support of the Government's own Validation process should it seek to confirm strategies and points claimed by the D/B. A variance from the strategy listed herein is allowed after application for approval from the Government and so long as substitutions do not jeopardize combined building/site points or overall score.
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PAR	FEATURE				REMARKS
EQ4.3	Low Emitting Materials: Carpet Systems	YES		1	Building CTR responsible.
EQ4.4	Low Emitting Materials: Composite Wood & Agrifiber Products	YES		1	Building CTR responsible.
EQ5	Indoor Chemical & Pollutant Source Control	YES		1	Building CTR responsible.
EQ6.1	Controllability of Systems: Lighting	YES			Building CTR responsible.
EQ6.2	Controllability of Systems: Thermal Comfort	YES			Building CTR responsible.
EQ7.1	Thermal Comfort: Design	YES		1	Building CTR responsible.
EQ7.2	Thermal Comfort: Verification	YES			Building CTR responsible.
EQ8.1	Daylight & Views: Daylight 75% of Spaces	YES			Building CTR responsible. If a floor plan is provided in Task Order, include a statement regarding whether that floor plan meets the requirement. If so, attach calculation spreadsheet FIO.
EQ8.2	Daylight & Views: Views for 90% of Spaces	YES			Building CTR responsible. If a floor plan is provided in Task Order, include a statement regarding whether that floor plan meets the requirement. If so, attach calculation spreadsheet and drawings FIO.
CATEGORY 6 – FACILITY DELIVERY PROCESS					
IDc1.1	Innovation in Design	YES	YES		Proposed credit must fall within D/B scope, be coordinated with other credits and reviewed with Government
IDc1.2	Innovation in Design	YES	YES		Proposed credit must fall within D/B scope, be coordinated with other credits and reviewed with Government
IDc1.3	Innovation in Design	YES	YES		Proposed credit must fall within D/B scope, be coordinated with other credits and reviewed with Government
IDc1.4	Innovation in Design	YES	YES		Proposed credit must fall within D/B scope, be coordinated with other credits and reviewed with Government
IDc2	LEED Accredited Professional	NO	NO	1	
TOTAL				35	

APPENDIX P**LEED Registration of Army Projects****15 April 2010****Number of Registrations**

Each building must be registered separately, except multiple instances of a standard building on a shared site may be registered as a single project. If a single registration for multiple buildings is chosen, all buildings under the single registration must earn exactly the same points. Do not register buildings that are exempt from a specific LEED achievement requirement.

Typical Registration Procedure

1. Login, complete the online registration form (see guidance below) at the GBCI LEED Online website <http://www.gbci.org/DisplayPage.aspx?CMSPageID=174> and submit it online.
2. Pay the registration fee via credit card (USACE staff: credit card PR&C is funded by project design or S&A funds).
3. GBCI will follow up with a final invoice, the LEED-online passwords and template information.
4. The individual who registers the project online is, by default, the Project Administrator.

Completing the Registration Form**BEFORE YOU BEGIN:**

Create a personal account with USGBC if you do not have one.

You will need the following information:

Project name as it appears in P2 (obtain from USACE Project Manager)

Building number/physical address of project

Zip code for Installation/project location

Anticipated construction start and end dates

Total gross area all non-exempt buildings in registration

Total construction cost all non-exempt buildings only (see Project Details Section instructions below)

ACCOUNT/LOGIN INFORMATION

1. The person registering the project **must have an account with USGBC** (login and password) to complete the form. Go to <http://www.gbci.org/>, click on "register a project" at the drop-down menu for project certification (at the top of the page) and select "register now for LEED 2009" to start the project registration process. If you have an account, login with your email address and password and select "register new project" to proceed. If you do not have an account, you may select "register a new account" and follow the instructions. It is recommended that you create an account separately on the USGBC website before you start the form. **IMPORTANT: USACE team members are members of USGBC and are eligible for Member prices. USACE team members registering projects should be sure to include the USACE Corporate Access ID in their personal account profile (if you do not have it contact richard.l.schneider@usace.army.mil or judith.f.milton@usace.army.mil for the number).**
2. The Account/Login Information section is filled out by the person registering the project. It may be a Contractor or a USACE staff member.

ELIGIBILITY SECTION

Follow directions (accepting the terms and conditions)

Review your profile information and make corrections if needed

RATING SYSTEM SELECTION SECTION

Select single project registration and I know which rating system.

Select the rating system - currently only LEED-NC and LEED for Homes are approved for Army use without special approval.

LEED Minimum Program Requirements: select YES

RATING SYSTEM RESULTS SECTION

Confirm selected rating system.

PROJECT INFORMATION SECTION

Project Title: Begin the project title with a one-word identifier for the Installation. Do not include the word "Fort". After this match the project name used in P2 (contact the USACE Project Manager for this information) and identify the building being registered. Example: "Stewart 4th IBC - DFAC".

Project Address 1 and 2: This is the physical location of the project. Provide building number, street address, block number or whatever is known to best describe the location of the project on the Installation.

Project City: Installation Name

State, Country, Zip Code: Self-explanatory

Anticipated Construction Start and End Dates: Self-explanatory – give your best guess if unknown. Note that required data entry format is: 1 or 2 digit month/1 or 2 digit date/4 digit year (example 3/23/2010)

Gross Square Footage: Provide total area all buildings in LEED project. Exclude the area of any buildings that are exempt from the LEED achievement requirement (for example, exclude an unconditioned storage shed to be constructed with a barracks complex).

Is Project Confidential: Indicate NO except, if project has security sensitivity (elements that are FOUO or higher security), indicate YES.

Notification of Local Chapter: Indicate NO unless Government/USACE Project Manager requests you to indicate YES.

Anticipated Project Type: Select the most appropriate option from the drop-down menu.

Anticipated Certification Level: Select the applicable option from the drop-down menu (Silver is the usual level).

PROJECT OWNER INFORMATION SECTION

Project Owner First Name, Last Name, email, phone, address: The Project Owner is the USACE Project Manager. Obtain this info from the USACE Project Manager.

Organization: U.S. Army Corps of Engineers. This field MUST be completed this way because it will be used as a search field by higher HQ to find all USACE registered projects. You may supplement it with district name at the end but DO NOT revise or use an acronym.

May we publish Owner information: Indicate NO

Owner Type: Pick Federal Government from drop-down menu.

Project Owner Assertion: Check the box

PAYMENT INFORMATION

Self-explanatory

APPENDIX Q
REV 1.1 – 31 MAY 2009
AREA COMPUTATIONS

Computation of Areas: Compute the "gross area" and "net area" of facilities (excluding family housing) in accordance with the following subparagraphs:

(1) Enclosed Spaces: The "gross area" is the sum of all floor spaces with an average clear height $\geq 6'-11"$ (as measured to the underside of the structural system) and having perimeter walls which are $\geq 4'-11"$. The area is calculated by measuring to the exterior dimensions of surfaces and walls.

(2) Half-Scope Spaces: Areas of the following spaces shall count as one-half scope when calculating "gross area":

- Balconies
- Porches
- Covered exterior loading platforms or facilities
- Covered but not enclosed passageways and walks
- Open stairways (both covered and uncovered)
- Covered ramps
- Interior corridors (Unaccompanied Enlisted Personnel Housing Only)

(3) Excluded Spaces: The following spaces shall be excluded from the "gross area" calculation:

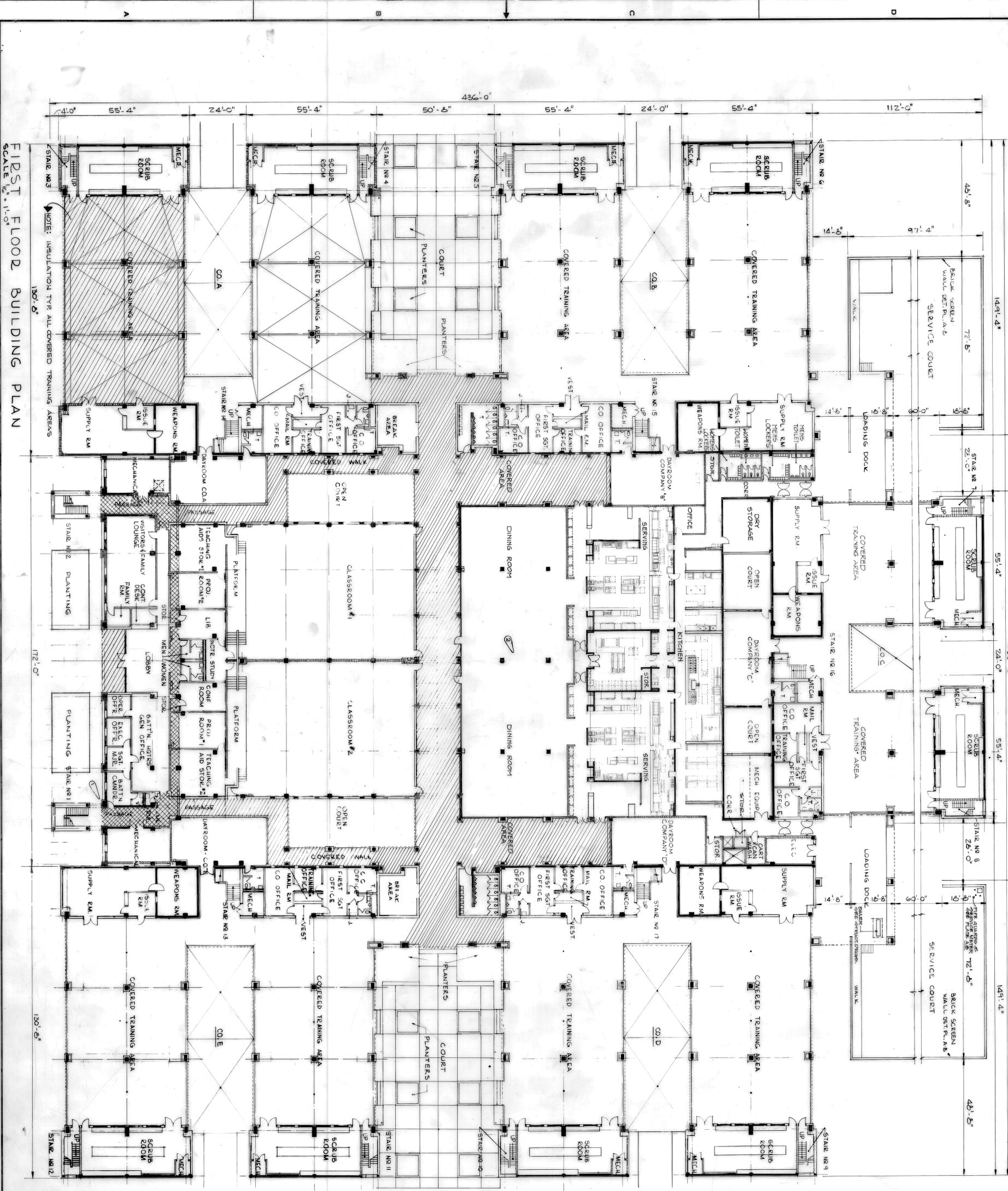
- Crawl spaces
- Uncovered exterior loading platforms or facilities
- Exterior insulation applied to existing buildings
- Open courtyards
- Open paved terraces
- Uncovered ramps
- Uncovered stoops
- Utility tunnels and raceways
- Roof overhangs and soffits measuring less than 3'-0" from the exterior face of the building to the fascia

(4) Net Floor Area: Where required, "net area" is calculated by measuring the inside clear dimensions from the finish surfaces of walls. If required, overall "assignable net area" is determined by subtracting the following spaces from the "gross area":

- Basements not suited as office, special mechanical, or storage space
- Elevator shafts and machinery space
- Exterior walls
- Interior partitions
- Mechanical equipment and water supply equipment space
- Permanent corridors and hallways
- Stairs and stair towers
- Janitor closets
- Electrical equipment space
- Electronic/communications equipment space

RMS SUBMITTAL REGISTER INPUT FORM			CONTRACT NUMBER		DELIVERY ORDER																				
TITLE AND LOCATION																									
Button	<-----Right click for Instructions		TYPE OF SUBMITTAL								CLASSIFICATION				REVIEWING OFFICE										
SECTION	PARAGRAPH NUMBER	DESCRIPTION OF ITEM SUBMITTED	01 - PRECON SUBMITTALS	02 - SHOP DRAWINGS	03 - PRODUCT DATA	04 - SAMPLES	05 - DESIGN DATA	06 - TEST REPORTS	07 - CERTIFICATES	08 - MFRS INSTRUCTIONS	09 - MFRS FIELD REPORT	10 - O&M DATA	11 - CLOSEOUT SUBMITTALS	FO - FOR INFORMATION ONLY	GA - GOVERNMENT APPROVED	DA - DESIGNER OF RECORD APPROVAL	CR - CONFORMANCE REVIEW	DA / CR	DA / GA	DO - DISTRICT OFFICE	AO - AREA OFFICE	RO - RESIDENT OFFICE	PO - PROJECT OFFICE	DR - DESIGNER OF RECORD	AE - ARCHITECT / ENGINEER
00 72 00	52.236-13	Accident Prevention Plan	X													X									
00 73 00	1.11	Dev. From Accept. Design. No Deviation from Contract					X											X						X	
00 73 00	1.11	Dev. From Accepted Design - Deviates from Contract					X											X						X	
00 73 00	1.17	Supplemental Price Breakdown	X											X											
00 73 00	1.18	SSHO Qualifications	X											X											
01 10 00	5.2.3.1	(if concrete pavement) Joint Layout Plan with design drawings					X								X										
01 10 00	5.5.2	Building Envelope Sealing Performance Testing					X							X											
01 10 10	***	Tests as Req by Codes - DOR Develops Test Program					X							X										X	
01 10 00	5.8.3	BAS Review Information		X										X										X	
01 10 00	5.8.3	BAS Performance Verification Test					X							X									X	X	
01 10 00	5.8.4	Testing Adjusting and Balancing					X							X									X	X	
01 10 00	5.8.5	Commissioning					X							X									X	X	
01 10 00	6.15	Environmental As Required for Site Specific					X									X							X	X	
01 10 00	6.16	Permits as required for Site specific					X									X							X	X	
01 10 00	5.10.2	Fire Protection Tests						X	X					X									X	X	
01 32 01.00 10	3.4.1	Preliminary Project Schedule	X												X								X		
01 32 01.00 10	3.4.2	Initial Project Schedule	X												X								X		
01 32 01.00 10	3.4.3	Design Package Schedule	X												X								X		
01 32 01.00 10	3.6.1	Periodic schedule updates from the Contractor	X												X								X		
01 32 01.00 10	3.7	Time Extension Request (Schedule)	X												X								X		
01 33 00	1.8	Submittal Register - DOR Input Required	X												X								X		
01 33 00	1.8	Submittal Register Updates (Design Packages, etc.)	X												X								X		
01 33 00	1.3.1	Substitution of Manuf or Model Named in Proposal		X	X										X								X		
01 33 16	1.2	Identify Designer(s) of Record	X												X								X		
01 33 16	1.1.2 / 3.2.4	Fast Track Design Package(s)					X									X						X	X		
01 33 16	1.2	Identification of all Designers of Record	X													X							X		
01 33 16	3.2.1	Site and Utility Des Package, incl. Substantiation					X									X						X	X		
01 33 16	3.2.2/3.5	Interim Des Subm Package(s), incl. Substantiation					X									X						X	X		
01 33 16	3.5.1	Drawings					X									X						X	X		
01 33 16	3.5.2.2	Sitework Design Analyses					X									X						X	X		
01 33 16	3.5.2.3	Structural Design Analyses					X									X						X	X		
01 33 16	3.5.2.4	Security Design Analyses					X									X						X	X		
01 33 16	3.5.2.5	Architectural Design Analyses					X									X						X	X		
01 33 16	3.5.2.6	Mechanical Design Analyses					X									X						X	X		
01 33 16	3.5.2.7	Life Safety Design Analyses					X									X						X	X		
01 33 16	3.5.2.8	Plumbing Design Analyses					X									X						X	X		
01 33 16	3.5.2.9	Elevator Design Analyses (as Applicable)					X									X						X	X		
01 33 16	3.5.2.10	Electrical Design Analyses					X									X						X	X		
01 33 16	3.5.2.11	Telecommunications Design Analyses					X									X						X	X		
01 33 16	3.5.2.12	Cathodic Protection Design Analyses					X									X						X	X		
01 33 16	3.5.3	Geotechnical Investigations and Reports					X									X						X	X		
01 33 16	3.5.4	LEED Submittals					X									X						X	X		
01 33 16	3.5.5	Energy Conservation Documentation					X									X						X	X		
01 33 16	3.5.6	Specifications					X									X						X	X		
01 33 16	3.5.7	Building Rendering					X									X						X	X		
01 33 16	3.2.4/3.7	Final Des Submittal Package(s), incl. Substantiation					X									X						X	X		
01 33 16	3.7.5	DD Form 1354 (Transfer of Real Property)										X				X						X			
01 33 16	3.2.5/3.8	Design Complete Submittal Package(s)					X									X						X	X		
01 33 16	3.3.3	Design and Code Review Checklists					X									X						X	X		
01 33 16	A-2.0	SID - Interim and Final (as applicable)		X	X		X								X							X			
01 33 16	B-2.0	FFE (as Applicable)					X								X							X			
01 45 04.00 10	3.2	Design and Construction QC Plan	X													X						X			
01 57 20.00.10	1.2	Environmental Protection Plan	X													X						X			
01 78 02.00 10	1.2.1	Final as-Built Drawings											X		X							X			
01 78 02.00 10	1.2.3.11	Non-Hazardous Solid Waste Diversion Reports						X						X								X			
01 78 02.00 10	1.2.7	Provide final as-built CADD and BIM Model files											X		X							X			
01 78 02.00 10	1.2.9	Provide scans of all other docs in Adobe.pdf format											X		X							X			
01 78 02.00 10	1.3.1	Equip-in-Place list of all installed equip and cost											X		X							X			
01 78 02.00 10	1.3.2	Data on equip not addressed in O&M manuals											X		X							X			
01 78 02.00 10	1.3.3	Final as-built specs - electronic files											X		X							X			
01 78 02.00 10	1.4.2.1	Warranty management plan - FAR 52.246-21											X		X							X			
01 78 02.00 10	1.4.2.1	Certificates of Warranty for extended warranty items											X		X							X			
01 78 02.00 10	1.4.2.1	Contractor's POCs for implementing warranty process											X		X							X			
01 78 02.00 10	1.4.2.1	List of each warranted equip, item, feature or system											X		X							X			
01 78 02.00 10	1.5	See also Section 01 10 00 par. 5.8.4 and 5.8.5											X		X							X			
01 78 02.00 10	1.6.1.2	Equipment O&M Manuals - 1 electronic / 2 hard copies											X		X							X			
01 78 02.00 10	1.7	Field Training DVD Videos									X			X								X			
01 78 02.00 10	1.8	Pricing of CF/CI and GF/CI Property											X		X							X			
01 78 02.00 10	1.11	List of Completed Cleanup Items											X				X					X			

SYMBOL	ZONE	DESCRIPTION	DATE	BY
1	3A	ISSUED IN ACCORDANCE WITH AMBUSH NO. 0001	13 JUN 74	ASB
2	3B	ISSUED IN ACCORDANCE WITH AMBUSH NO. 1128 73-18-1	15 OCT 73	JIS
3	AS BUILT	AS BUILT		



FIRST FLOOR BUILDING PLAN
SCALE: 1/8" = 1'-0"

RECORD DRAWING

1/8" = 1'-0"
Scale: 0 10 20 30 40 feet

E.M. JACKSON, S.C.
SCHEMATIC PLAN
FIRST FLOOR BUILDING PLAN
SOUTH CAROLINA

DATE: 9 MAY 1975

SCALE: 1/8" = 1'-0"

SHEET 49 OF 239

BASIC DESIGN DATA

AREA ENCLOSED: 212,222 AREA PORCHES, ETC. (1/2) 24,321 NO. FLOORS: 3

STP. DWG. NO.: _____ DATE: _____

OTHER: FY-19 E.M. BARRACKS, EAST JACKSON SOUTH CAROLINA

TITLE: E.M. BARRACKS COMPLEX, FORT JACKSON, SOUTH CAROLINA

CONSTRUCTION: _____

TYPE (C OR N): N

FOUNDATIONS: SPREAD FOOTINGS

FLOORS: CONC. SLAB ON GRC. PAN JOIST

ROOF CONSTR.: CONC. SLAB ON GRC. PAN JOIST

TYPE OF FILL: G.A.S. #3 2"11

TYPE OF HEATING SYSTEM: HIGH TEMPERATURE HOT WATER

AIR CONDITIONING DESIGN CONDITIONS:

UP VALUE: WALLS .16 ROOF .05 SOIL BEARING 2.5 K/SF

ROOF LOAD: DL, VARIABLES LL 20 K/SF WIND LOAD 90 M.P.H.

MAJOR DIFFERENCES BETWEEN BASIS OF DESIGN AND THIS DESIGN: SEISMIC LOADING

SEISMIC ZONE: 2 YES NO

ALL EXTERIOR WALLS TO EXTEND TO CONSTRUCTION

INTERIOR PARTITIONS - C' MIN. ABOVE CEILING

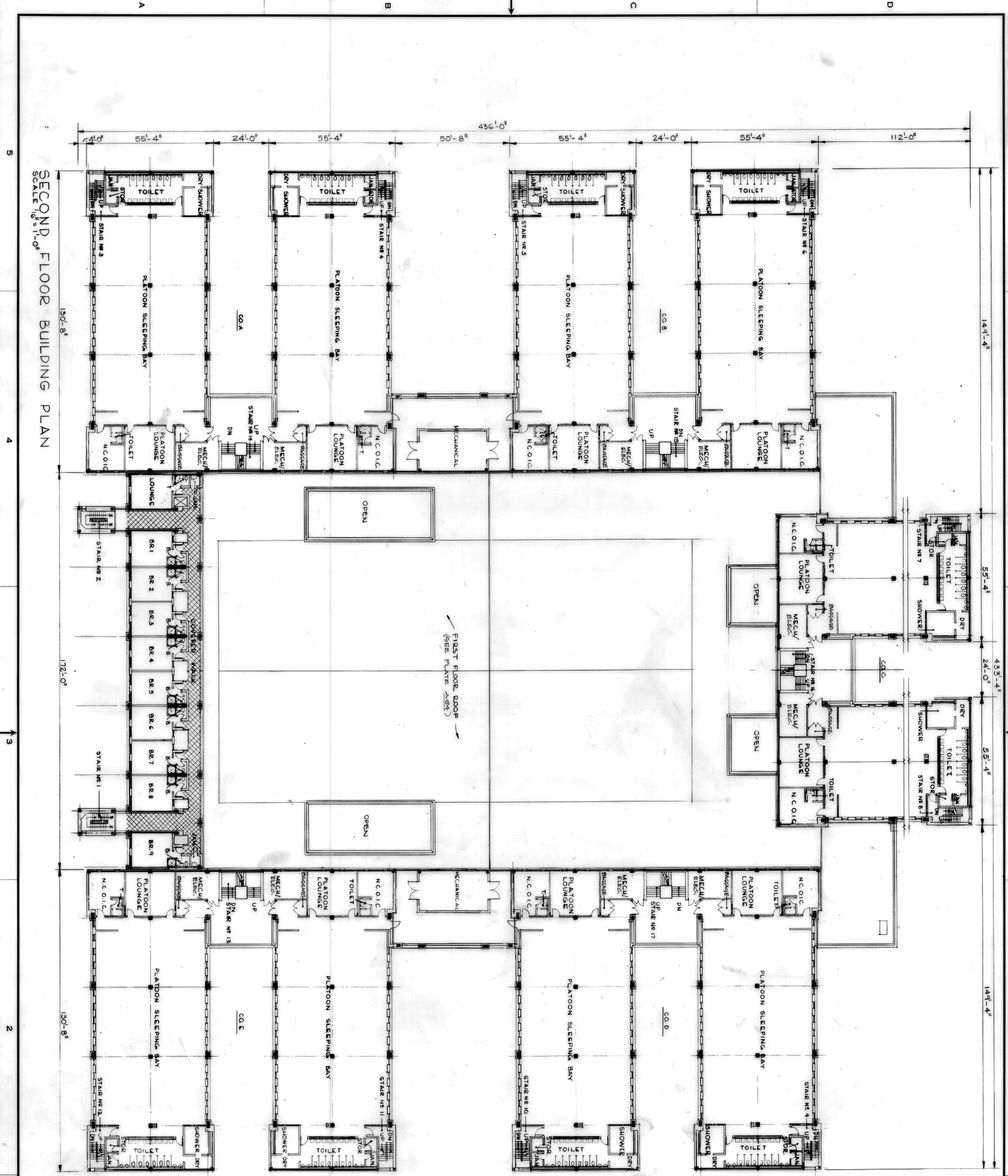
STRUCTURAL SHEAR WALLS TO CONSTRUCTION

BATT INSULATION ABOVE CLS

BATT INSULATION ABOVE CLS AND/OR INSULATION OVER PARTS OF CEILING OF STRUCTURE - SEE FLOOR 201 & 202

INDICATES INTERIOR WALLS TO EXTEND TO TOP OF CEILING OR INTERIORS ABOVE. SEE STRUCTURAL DRAWINGS FOR WALL DETAILS. SEE STRUCTURAL TRICAL & ALL INTERIORS OF DAYROOMS, CLASSROOM #1 & #2, ALL MECHANICAL/ELECTRICAL ROOMS AND ALL STAIRS, FOR STRUCTURAL BEAMS DRAWINGS AND DRIVING AREAS SEE STRUCTURAL DRAWINGS.

SYMBOL	ZONE	REVISIONS	DESCRIPTION	DATE	BY
			AS BUILT	NOV 23 1977	



SECOND FLOOR BUILDING PLAN

SCALE 1/8" = 1'-0"

SEE NOTES PLATE A-1

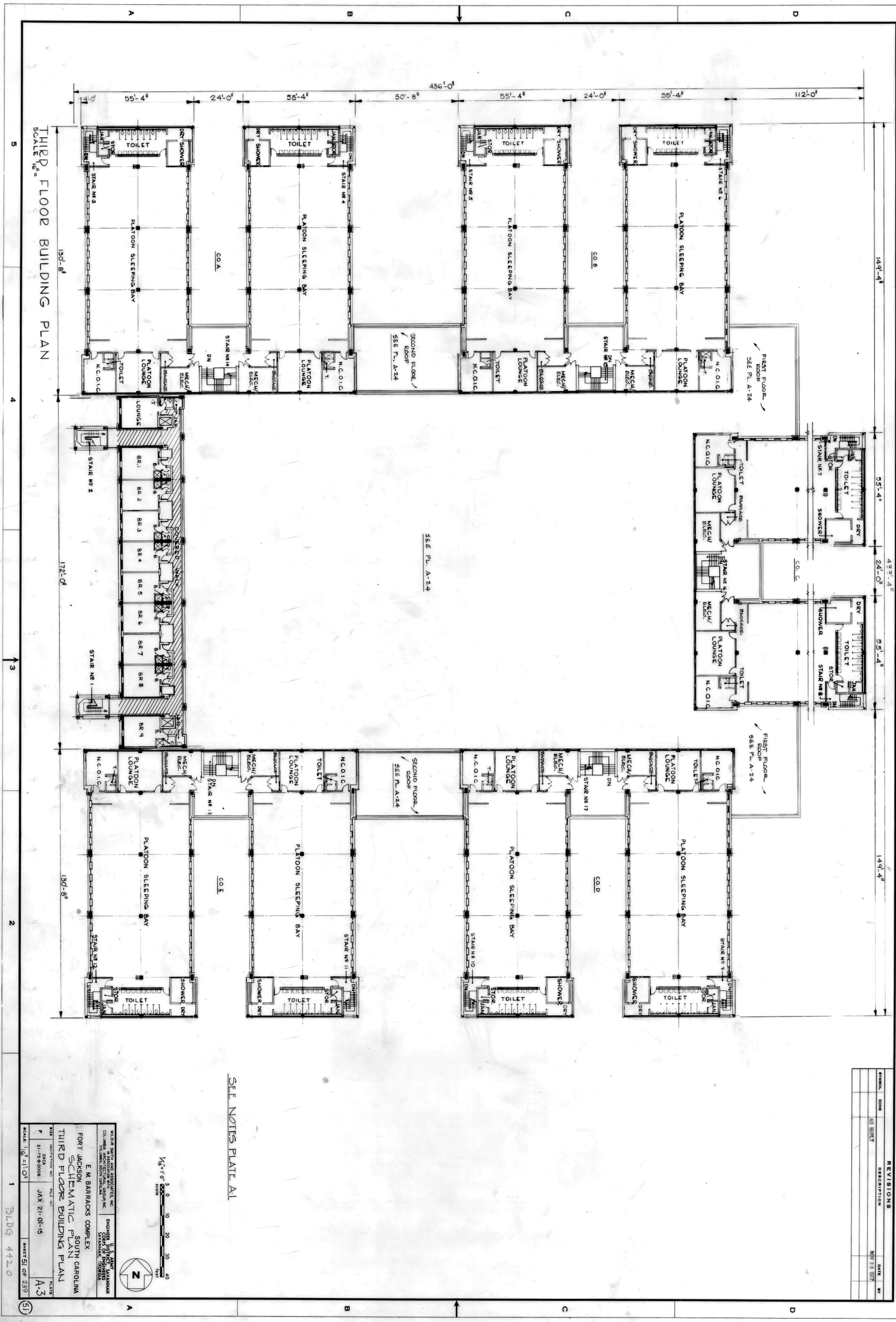


RECORD DRAWING

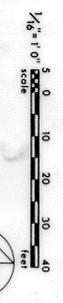
<p>U. S. ARMY ENGINEER DISTRICT SAVANNAH SAVANNAH, GEORGIA</p>	<p>E. M. BARRACKS COMPLEX FORT JACKSON, S.C. SCHEMATIC PLAN SECOND FLOOR BUILDING PLAN</p>
<p>DATE: 21-11-78 SCALE: 1/8" = 1'-0"</p>	<p>FILE NO.: JAX 21-01-15 SHEET 50 OF 739</p>

A-2

REVISIONS			
SYMBOL	ZONE	DESCRIPTION	DATE
	AS BUILT		NOV 28 1977



SEE NOTES PLATE A1



WILSON SWINNEY ASSOCIATES, INC.
 ENGINEERS, ARCHITECTS, INTERIORS
 1015 W. MARKET STREET, SUITE 100
 SAVANNAH, GEORGIA 31401

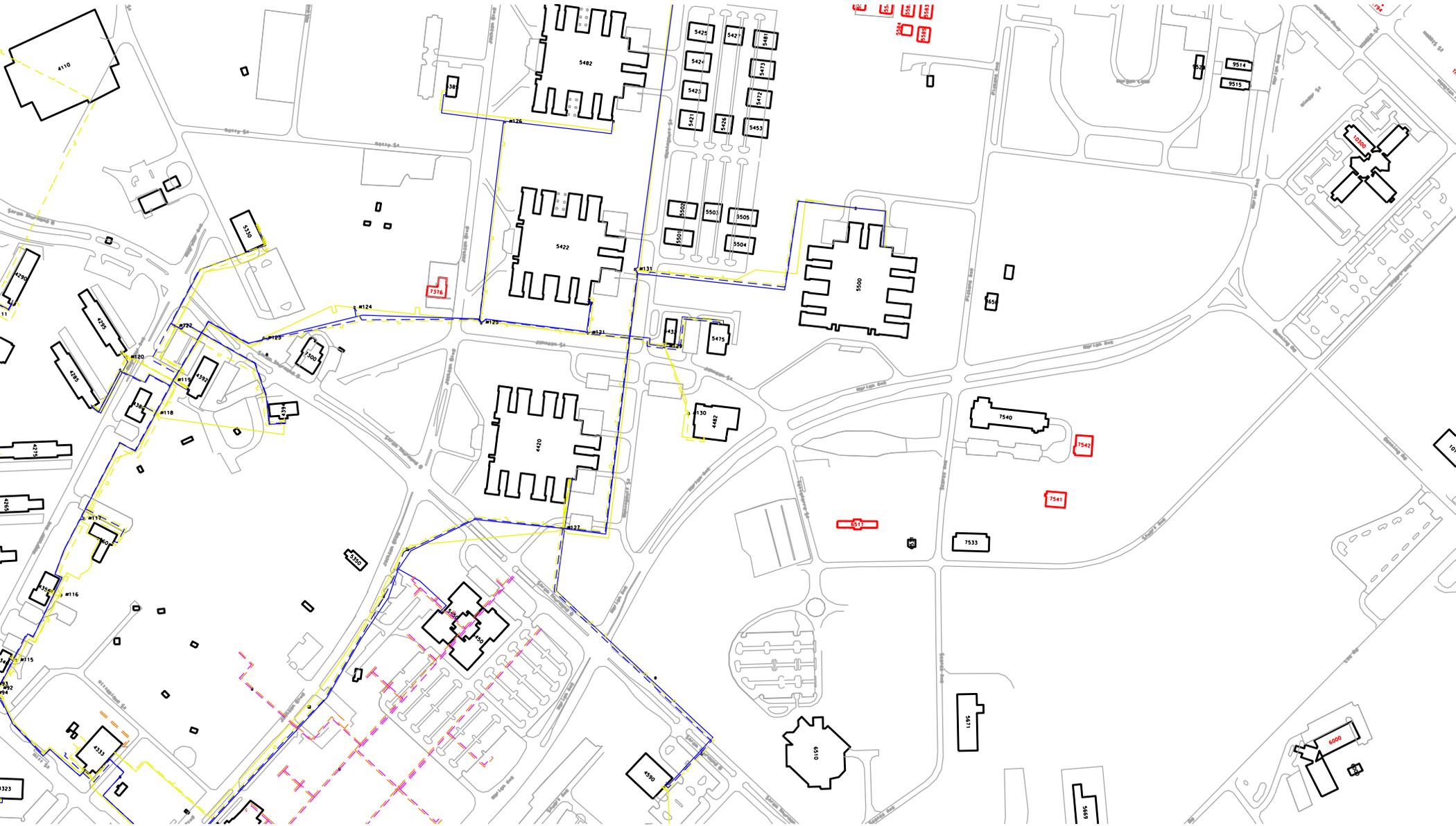
FOR T. JACKSON
 SOUTHERN CAROLINA
 SCHEMATIC PLAN
 THIRD FLOOR BUILDING PLAN

E. M. BARRACKS COMPLEX

DATE: 8-17-75
 FILE NO.: JAX 21-01-15
 SHEET 51 OF 239

SCALE: 1/8" = 1'-0"

A-3



Fort Jackson Resident Office - Field Office Requirements

1.7.1 Field Engineer's Office

The contractor shall provide the Government Field Engineer with an office (24' x 60' Doublewide, 1440 SF) on the project site, to include four (4) offices, one (1) conference room, one (1) break room and one (1) unisex restroom. Provide space heat/cooling, electric light and power, potable water & sewer, telephone service, and data.

The doublewide shall have a minimum of two doors, battery operated smoke detector alarm, a sufficient number of adjustable windows for adequate light and ventilation. The windows and doors shall be screened and the doors provided with deadbolt type locking devices or a padlock and heavy duty hasp bolted to the door. Door hinge pins shall be non-removable. The windows shall be arranged to open and to be securely fastened from the inside. Glass panels in windows shall be protected by bars or heavy mesh screens to prevent easy access to the building through these panels.

Exterior entrances will have covered porch area (front porch area, ADA accessible) with landing in front of door measuring approximately 10' by 15'). Front entrance shall have double doors with standard space no less than 48"; second entrance landing to measure 8' by 10'. Provide sidewalks to the common way.

Toilet facility (unisex) consisting of one lavatory and one water closet complete with water heater, and connections to water and sewer mains, and a supply of approved drinking water. Provide a water cooler with bottled water.

Air conditioning capable of maintaining the office at 50 percent relative humidity and a room temperature 30 degrees F below the outside temperature when the outside temperature is 95 degrees F shall be furnished.

Each office will include a pedestal desk with drawers, high back chair, bookcase, two (2) outlets, dry-erase board, and 4 drawer file cabinets. Conference room will have a conference table with seating area for twelve (12) chairs, plan table, bookcase and six (6) outlets. Twelve (12) Conference Chairs will be supplied.

Break area will have 10' of cabinet/countertop space, large kitchen sink, four (4) wall mounted outlets at counter surface level, a full sized refrigerator, and microwave.

Data and long distance phone will be supplied. Data will provide 1 MB/S minimum. Data provided will be a separate account and able to support a multi-mode router and a Cisco 871 router. Each office and conference room will have one (1) phone and one (1) data connection. A networkable color copier with scanning, fax, duplex printing, an stapling capabilities shall be included.

Janitorial services will be provided on a weekly basis.

At the completion of the project, the office shall remain the property of the Contractor and shall be removed from the site. Utilities shall be connected and disconnected in accordance with local codes and to the satisfaction of the Contracting Officer.

THIS DRAWING WAS PREPARED AT THE SCALE INDICATED IN THE TITLE BLOCK. INACCURACIES IN THE STATED SCALE MAY BE INTRODUCED WHEN DRAWINGS ARE REPRODUCED BY ANY MEANS. USE THE GRAPHIC SCALE BAR IN THE PROVIDED BELOW TO DETERMINE THE ACTUAL SCALE OF THIS DRAWING.

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ENGINEER, TO ALTER THIS DOCUMENT.

I:\COE-SAV.6348\45867.SURVEY-WORK-TO\DOCS\DWG\SHEETS\TRACK 1-13\1-13_45867G001.DWG 6/24/2010 12:16 PM

FORT JACKSON ARMY BASE

1-13 IN BN, HURTTGEN FOREST TRACK, FACILITY NO. 4489

COLUMBIA SOUTH CAROLINA

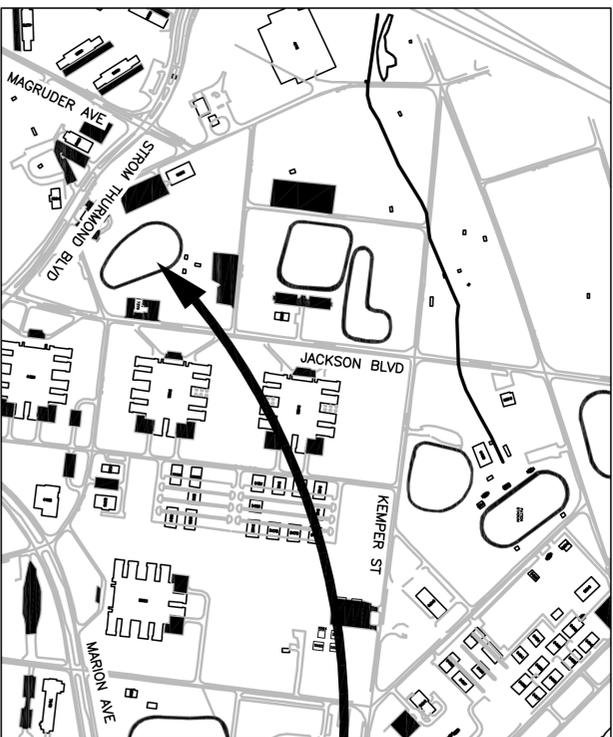
CONSTRUCT BATTALION SYNTHETIC RUNNING TRACK

VICINITY MAP



PROJECT SITE

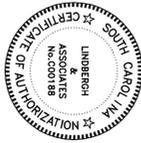
SITE MAP



HURTTGEN FOREST TRACK

DRAWING INDEX

COVER SHEET & INDEX	G-001
GENERAL NOTES	C-001
DEMOLITION PLAN	C-100
SITE PLAN	C-200
GRADING & DRAINAGE PLAN	C-300
EROSION CONTROL DETAILS	C-610
EROSION CONTROL DETAILS	C-611
SITE DETAILS	C-620
GRADING & DRAINAGE DETAILS	C-630



NO.	DATE	REVISION	INIT.

CIVIL
UNITED STATES ARMY
CONSTRUCT BATTALION
SYNTHETIC RUNNING TRACK
FORT JACKSON, SC
COVER SHEET & INDEX

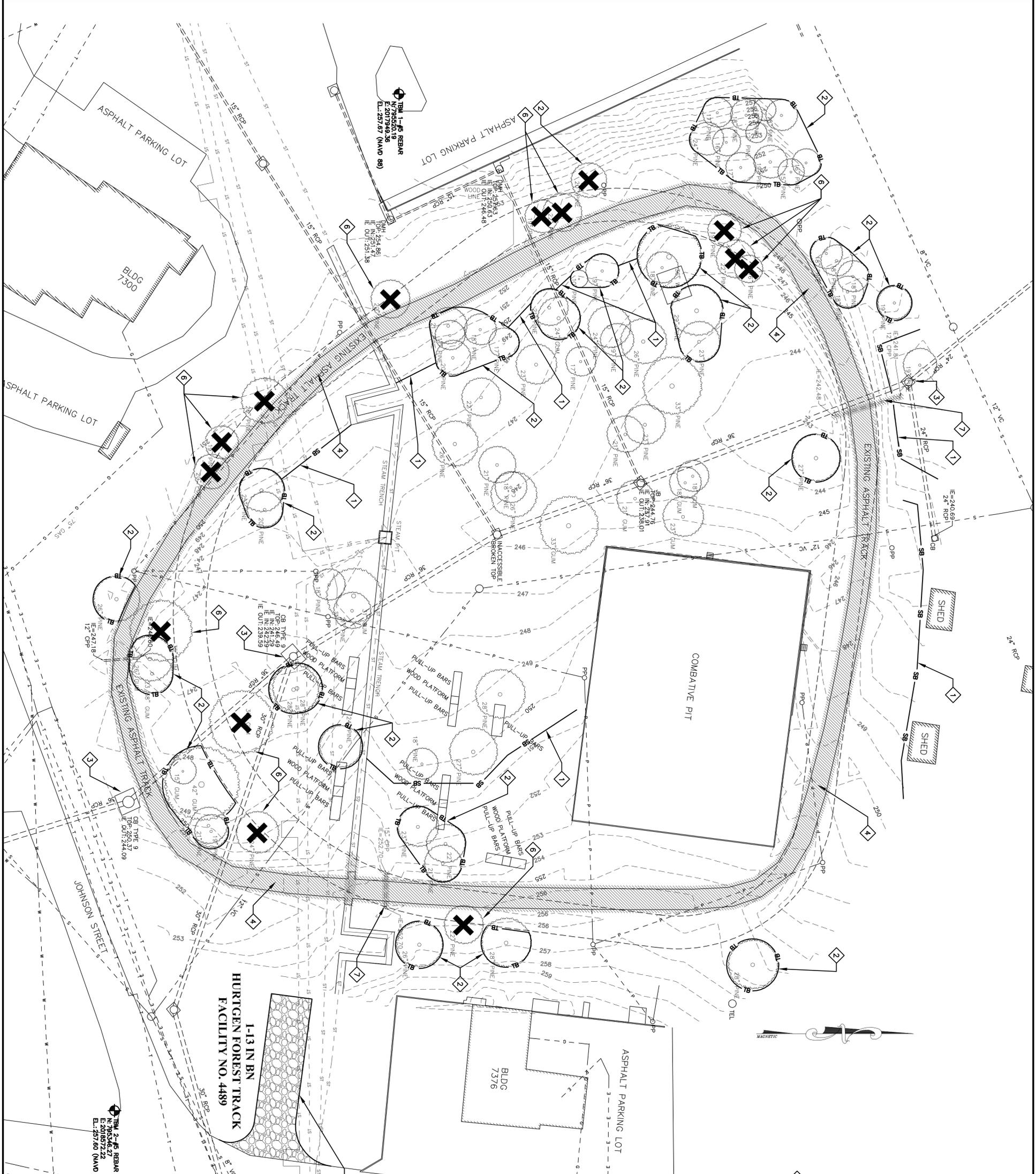
USACE DISTRICT
SAVANNAH CONTRACT #
XXXXX-XX-X-XXXX
IN CHARGE OF JFM
DESIGNED BY M.T. BW
CHECKED BY JFM
DRAWN BY M.T. BW
DATE 06/11/2010
FILE NO.
1-13_45867G001

G-001

I:\COE-SAV.6348\45867.SURVEY-WORK-TO\DOCS\DWG\SHEETS\TRACK 1-13\1-13_45867C100.DWG 6/24/2010 12:16 PM

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ENGINEER, TO ALTER THIS DOCUMENT.

THIS DRAWING WAS PREPARED AT THE SCALE INDICATED IN THE TITLE BLOCK. INACCURACIES IN THE STATED SCALE MAY BE INTRODUCED WHEN DRAWINGS ARE REPRODUCED BY ANY MEANS. USE THE GRAPHIC SCALE BAR IN THE PROVIDED BELOW TO DETERMINE THE ACTUAL SCALE OF THIS DRAWING.



- GENERAL NOTES:**
1. SEE SHEET C001 FOR CIVIL LEGEND, ABBREVIATIONS, AND GENERAL NOTES.
 2. CONTRACTOR IS RESPONSIBLE FOR ALL WORK SHOWN, UNLESS SPECIFICALLY INDICATED OTHERWISE.
 3. CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING TO DETERMINE THE EXTENT OF THE PROJECT.
 4. CONTRACTOR SHALL CONTACT PALMETTO UTILITY LOCATION SERVICE AT 1-888-721-7877 PRIOR TO ANY WORK. CONTRACTOR IS RESPONSIBLE FOR FIELD LOCATING AND PROTECTING ALL UTILITIES. CONTACT THE ENGINEER IN THE EVENT THAT UTILITIES CONFLICT WITH NEW FACILITIES.
 5. ALL PROJECT STAKEOUT SHALL BE PERFORMED BY A REGISTERED LAND SURVEYOR TO BE PAID FOR BY THE CONTRACTOR. FOR STAKEOUT, DO NOT RELY SOLELY ON THE PHYSICAL SCALE AS SHOWN IN DRAWINGS. REFER TO THE GIVEN DIMENSIONS, SYMBOL LEGEND, KEYNOTES, AND REFERENCED DETAILS FOR CORRECT STAKEOUT.
- KEYNOTES:**
1. INSTALL SILT FENCE AS SHOWN LAW DETAIL A/0610.
 2. INSTALL TREE PROTECTION BARRICADES AS SHOWN LAW DETAIL B/0610.
 3. INSTALL STORM INLET PROTECTION LAW DETAIL B/0611.
 4. DEMOLISH AND REMOVE EXISTING ASPHALT TRACK SURFACE IN ITS ENTIRETY.
 5. INSTALL CONSTRUCTION ENTRANCE AS SHOWN LAW DETAIL A/0611.
 6. REMOVE EXISTING TREES AND STUMPS IN THEIR ENTIRETY AS SHOWN. BACKFILL AND COMPACT LOCATIONS OF STUMP REMOVAL.
 7. REMOVE EXISTING OPP PIPING.

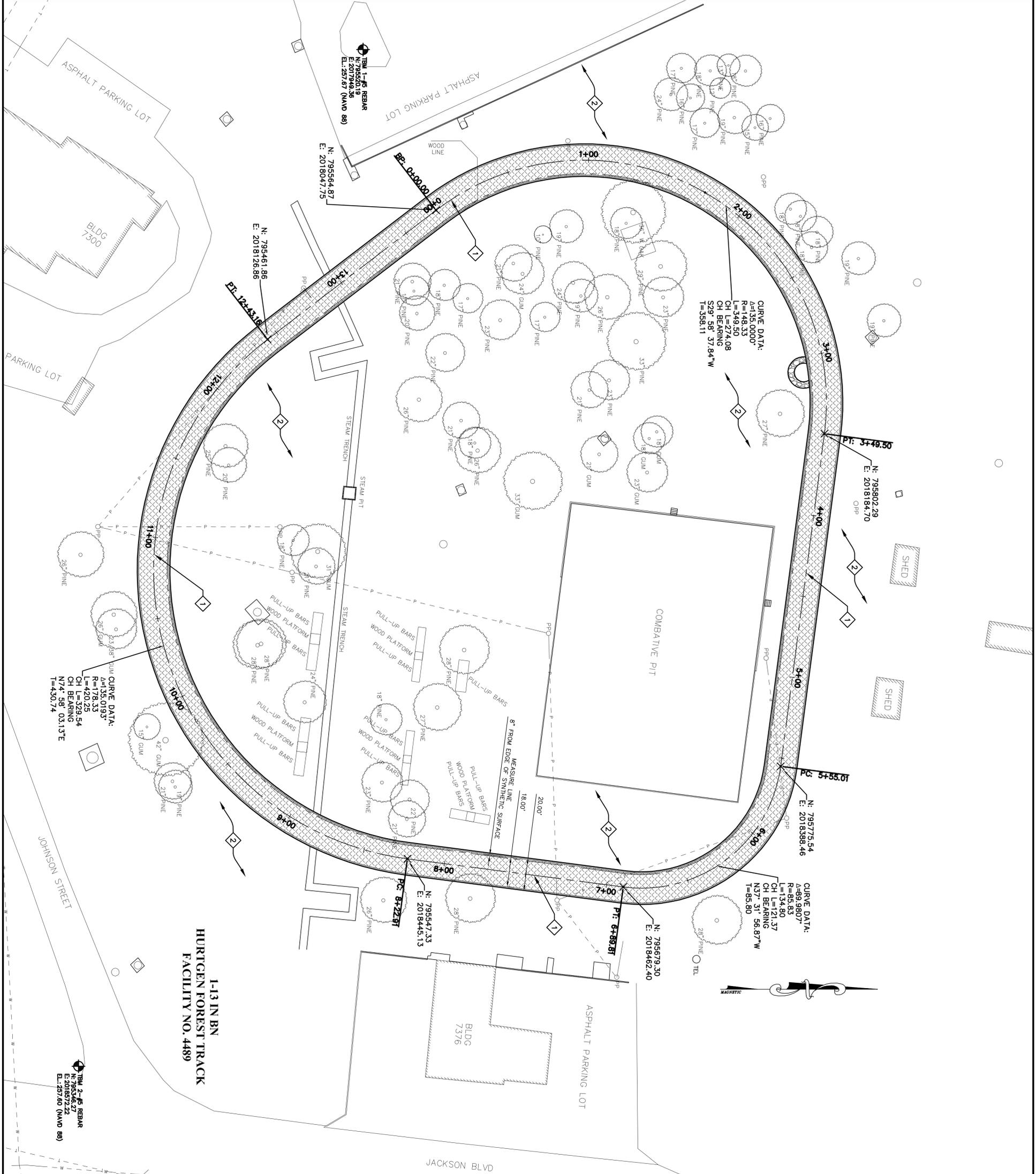


<p>C-100</p>	<p>CIVIL UNITED STATES ARMY CONSTRUCT BATTALION SYNTHETIC RUNNING TRACK FORT JACKSON, SC</p> <p>DEMOLITION PLAN</p>		<p>LINDBERGH & ASSOCIATES, LLC 2170 Ashley Phosphate Road - Suite 504 Charleston, South Carolina, 29406 Phone: (843)553-6670 Fax: (843)553-0755</p>								
<p>USACE DISTRICT SAVANNAH CONTRACT# XXXXX-X-X-XXXX IN CHARGE OF JFM DESIGNED BY JFM CHECKED BY JFM DRAWN BY MNT DATE 04/15/2010 FILE NO. 1-13_45867C100</p>	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:10%;">NO.</th> <th style="width:10%;">DATE</th> <th style="width:40%;">REVISION</th> <th style="width:10%;">INIT.</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	NO.	DATE	REVISION	INIT.					<p>USACE DISTRICT SAVANNAH CONTRACT# XXXXX-X-X-XXXX IN CHARGE OF JFM DESIGNED BY JFM CHECKED BY JFM DRAWN BY MNT DATE 04/15/2010 FILE NO. 1-13_45867C100</p>	<p>USACE DISTRICT SAVANNAH CONTRACT# XXXXX-X-X-XXXX IN CHARGE OF JFM DESIGNED BY JFM CHECKED BY JFM DRAWN BY MNT DATE 04/15/2010 FILE NO. 1-13_45867C100</p>
NO.	DATE	REVISION	INIT.								

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- GENERAL NOTES:**
1. SEE SHEET C001 FOR CIVIL LEGEND, ABBREVIATIONS, AND GENERAL NOTES.
 2. CONTRACTOR IS RESPONSIBLE FOR ALL WORK SHOWN, UNLESS SPECIFICALLY INDICATED OTHERWISE.
 3. CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING TO DETERMINE THE EXTENT OF THE PROJECT.
 4. CONTRACTOR SHALL CONTACT PALMETTO UTILITY LOCATION SERVICE AT 1-888-472-7877 PRIOR TO ANY WORK. CONTRACTOR IS RESPONSIBLE FOR FIELD LOCATING AND PROTECTING ALL UTILITIES. CONTACT THE ENGINEER IN THE EVENT THAT UTILITIES CONFLICT WITH NEW FACILITIES.
 5. ALL PROJECT STAKEOUT SHALL BE PERFORMED BY A REGISTERED LAND SURVEYOR TO BE PAID FOR BY THE CONTRACTOR. FOR STAKEOUT, DO NOT RELY SOLELY ON THE PHYSICAL SCALE AS SHOWN IN DRAWINGS. REFER TO THE GIVEN DIMENSIONS, SYMBOL LEGEND, KEYNOTES, AND REFERENCED DETAILS FOR CORRECT STAKEOUT.
- KEYNOTES:**
1. INSTALL NEW BITUMINOUS ASPHALT PAVEMENT AND SYNTHETIC TRACK PAVEMENT LAW DETAILS C/0620 AND D/0620.
 2. ESTABLISH NEW GRASS SEED FOR ALL DISTURBED AREAS. PLENTER INSPECTION AND REPORTS SHALL BE REQUIRED. GRASS HAS BEEN ESTABLISHED AND AREAS SHOW SUFFICIENT GRASS GROWTH, GOVERNMENT ACCEPTS THE PROJECT.

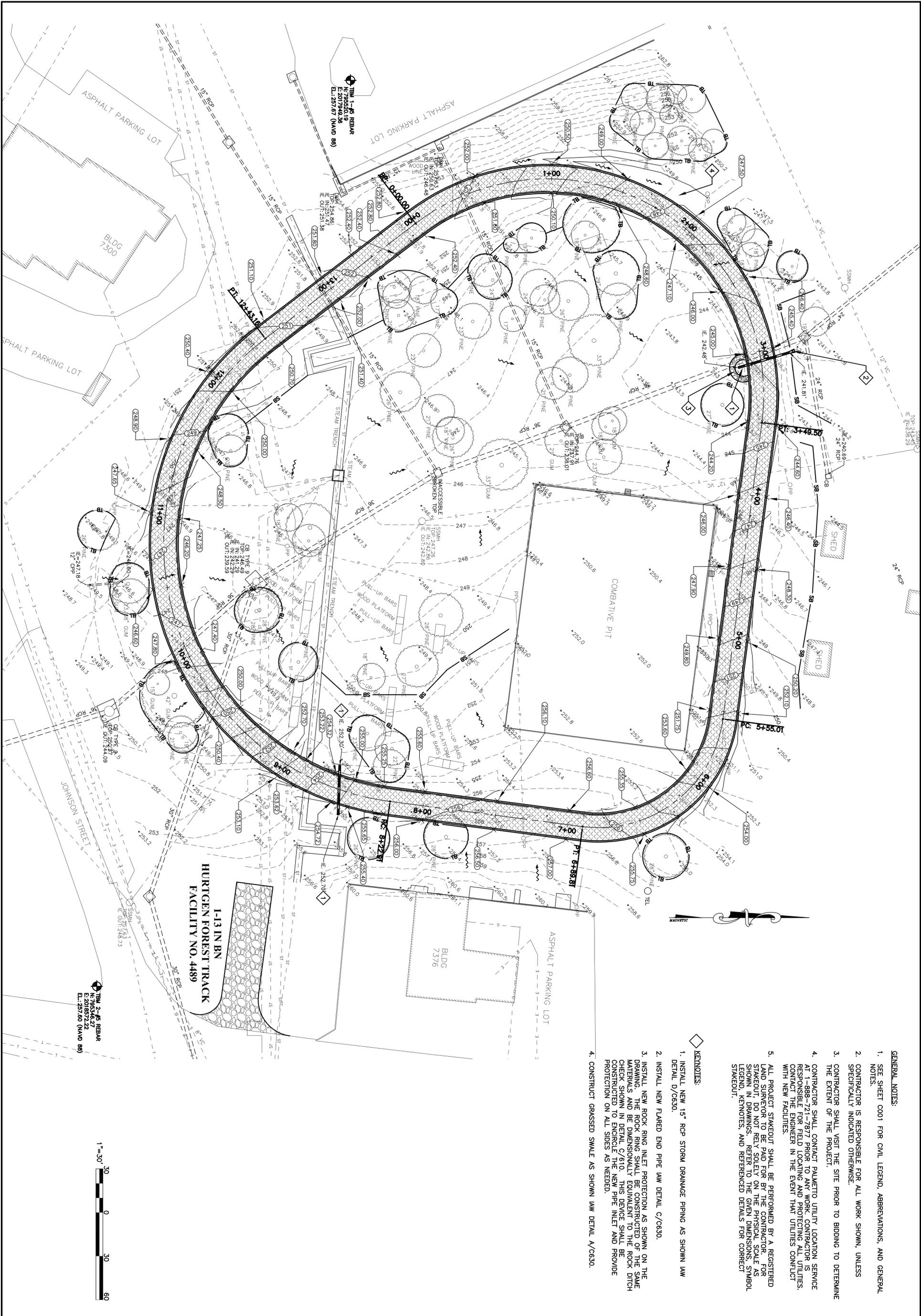


<p>C-200</p>	<p>CIVIL UNITED STATES ARMY CONSTRUCT BATTALION SYNTHETIC RUNNING TRACK FORT JACKSON, SC</p> <p>SITE PLAN</p>		<p>LINDBERGH & ASSOCIATES, LLC 2170 Ashley Phosphate Road - Suite 504 Charleston, South Carolina, 29406 Phone: (843)553-6670 Fax: (843)553-0755</p>								
<p>USACE DISTRICT SAVANNAH CONTRACT# XXXXX-XX-X-XXXX IN CHARGE OF JFM DESIGNED BY JFM CHECKED BY JFM DRAWN BY MNT DATE 04/15/2010 FILE NO. 1-13_45867C200</p>	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:10%;">NO.</th> <th style="width:10%;">DATE</th> <th style="width:40%;">REVISION</th> <th style="width:40%;">INIT.</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	NO.	DATE	REVISION	INIT.					<p>USACE DISTRICT SAVANNAH CONTRACT# XXXXX-XX-X-XXXX IN CHARGE OF JFM DESIGNED BY JFM CHECKED BY JFM DRAWN BY MNT DATE 04/15/2010 FILE NO. 1-13_45867C200</p>	<p>USACE DISTRICT SAVANNAH CONTRACT# XXXXX-XX-X-XXXX IN CHARGE OF JFM DESIGNED BY JFM CHECKED BY JFM DRAWN BY MNT DATE 04/15/2010 FILE NO. 1-13_45867C200</p>
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- GENERAL NOTES:**
1. SEE SHEET C001 FOR CIVIL LEGEND, ABBREVIATIONS, AND GENERAL NOTES.
 2. CONTRACTOR IS RESPONSIBLE FOR ALL WORK SHOWN, UNLESS SPECIFICALLY INDICATED OTHERWISE.
 3. CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING TO DETERMINE THE EXTENT OF THE PROJECT.
 4. CONTRACTOR SHALL CONTACT PALMETTO UTILITY LOCATION SERVICE AT 1-888-721-7877 PRIOR TO ANY WORK. CONTRACTOR IS RESPONSIBLE FOR FIELD LOCATING AND PROTECTING ALL UTILITIES. CONTACT THE ENGINEER IN THE EVENT THAT UTILITIES CONFLICT WITH NEW FACILITIES.
 5. ALL PROJECT STAKEOUT SHALL BE PERFORMED BY A REGISTERED LAND SURVEYOR. DO NOT RELY SOLELY ON THE PHYSICAL SCALE AS SHOWN IN DRAWINGS. REFER TO THE GIVEN DIMENSIONS, SYMBOL LEGEND, KEYNOTES, AND REFERENCED DETAILS FOR CORRECT STAKEOUT.
- KEYNOTES:**
1. INSTALL NEW 15" RCP STORM DRAINAGE PIPING AS SHOWN LAW DETAIL D/0630.
 2. INSTALL NEW FLARED END PIPE LAW DETAIL C/0630.
 3. INSTALL NEW ROCK RING INLET PROTECTION AS SHOWN ON THE DRAWING. THE ROCK RING SHALL BE CONSTRUCTED OF THE SAME MATERIALS AND BE DIMENSIONALLY EQUIVALENT TO THE ROCK CHECK SHOWN IN DETAIL C/810. THIS DEVICE SHALL BE CONSTRUCTED TO ENGINEER THE NEW PIPE INLET AND PROVIDE PROTECTION ON ALL SIDES AS NEEDED.
 4. CONSTRUCT GRASSED SMALE AS SHOWN LAW DETAIL A/0630.

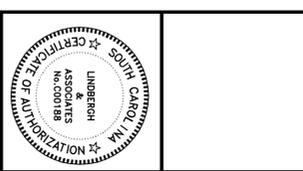
B.M. 2-45 REBAR
E. 2085.67
E. 2085.72
E. 2077.80 (NAND 89)

1"=30'
0 30 60

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**UNITED STATES ARMY
CONSTRUCT BATTALION
SYNTHETIC RUNNING TRACK
FORT JACKSON, SC
GRADING & DRAINAGE PLAN**

USACE DISTRICT
SAVANNAH CONTRACT#
XXXXXXXX-XX-XXXX
IN CHARGE OF JFM
DESIGNED BY JFM
CHECKED BY JFM
DRAWN BY MNT
DATE 06/11/2010
FILE NO.
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NO.	DATE	REVISION	INIT.

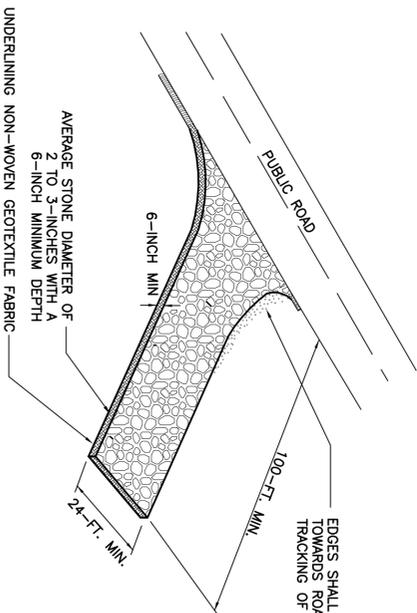


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EDGES SHALL BE TAPERED OUT TOWARDS ROAD TO PREVENT TRACKING OF MUD ON THE EDGES

INSTALL A CULVERT PIPE ACROSS THE ENTRANCE WHEN NEEDED TO PROVIDE POSITIVE DRAINAGE.

DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM THE STONE PAD TO A SEDIMENT TRAP OR BASIN OR OTHER SEDIMENT TRAPPING STRUCTURE.

WHEN AND WHERE TO USE IT

STABILIZED CONSTRUCTION ENTRANCES SHOULD BE USED AT ALL POINTS WHERE TRAFFIC WILL BE LEAVING A CONSTRUCTION SITE AND MOVING DIRECTLY ONTO A PUBLIC ROAD.

IMPORTANT CONSIDERATIONS

IF WASHING IS USED, PROVISIONS MUST BE MADE TO INTERCEPT THE WASH WATER AND TRAP THE SEDIMENT BEFORE IT IS CARRIED OFF-SITE. WASHDOWN FACILITIES SHALL BE REQUIRED AS DIRECTED BY SCDHEC AS NEEDED. WASHDOWN AREAS IN GENERAL MUST BE ESTABLISHED WITH CRUSHED GRAVEL AND DRAIN INTO A SEDIMENT TRAP OR SEDIMENT BASIN. CONSTRUCTION ENTRANCES SHOULD BE USED IN CONJUNCTION WITH THE STABILIZATION OF CONSTRUCTION ROADS TO REDUCE THE AMOUNT OF MUD PICKED UP BY VEHICLES.

INSTALLATION:

REMOVE ALL VEGETATION AND ANY OBJECTIONABLE MATERIAL FROM THE FOUNDATION AREA.

DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM STONES TO A SEDIMENT TRAP OR BASIN.

INSTALL A NON-WOVEN GEOTEXTILE FABRIC PRIOR TO PLACING ANY STONE.

INSTALL A CULVERT PIPE ACROSS THE ENTRANCE WHEN NEEDED TO PROVIDE POSITIVE DRAINAGE.

THE ENTRANCE SHALL CONSIST OF 1-INCH TO 3-INCH D50 STONE PLACED AT A MINIMUM DEPTH OF 6-INCHES.

MINIMUM DIMENSIONS OF THE ENTRANCE SHALL BE 24- FEET WIDE BY 100- FEET LONG, AND MAY BE MODIFIED AS NECESSARY TO ACCOMMODATE SITE CONSTRAINTS.

THE EDGES OF THE ENTRANCE SHALL BE TAPERED OUT TOWARDS THE ROAD TO PREVENT TRACKING OF MUD AT THE EDGE OF THE ENTRANCE.

INSPECTION AND MAINTENANCE:

INSPECT CONSTRUCTION ENTRANCES EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24-HOURS AFTER EACH RAINFALL EVENT THAT PRODUCES ½-INCHES OR MORE OF PRECIPITATION, OR AFTER HEAVY USE. CHECK FOR MUD AND SEDIMENT BUILDUP AND PAD INTEGRITY. MAKE DAILY INSPECTIONS DURING PERIODS OF WET WEATHER. MAINTENANCE IS REQUIRED MORE FREQUENTLY IN WET WEATHER CONDITIONS. RESHAPE THE STONE PAD AS NEEDED FOR DRAINAGE AND RUNOFF CONTROL.

WASH OR REPLACE STONES AS NEEDED AND AS DIRECTED BY THE INSPECTOR. THE STONE IN THE ENTRANCE SHOULD BE WASHED OR REPLACED WHENEVER THE ENTRANCE FAILS TO REDUCE MUD BEING CARRIED OFF-SITE BY VEHICLES. FREQUENT WASHING WILL EXTEND THE USEFUL LIFE OF STONE.

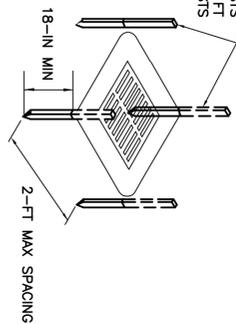
IMMEDIATELY REMOVE MUD AND SEDIMENT TRACKED OR WASHED ONTO PUBLIC ROADS BY BRUSHING OR SWEEPING. FLUSHING SHOULD ONLY BE USED WHEN THE WATER CAN BE DISCHARGED TO A SEDIMENT TRAP OR BASIN.

REPAIR ANY BROKEN PAVEMENT IMMEDIATELY.

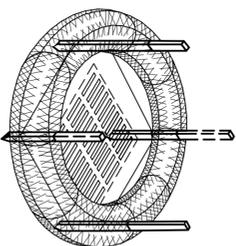
A STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE

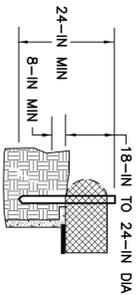
2-IN X 2-IN WOOD POSTS OR 1.25 LB/LINEAR FT STEEL POSTS



POST INSTALLATION DETAIL



SEDIMENT TUBE INSTALLATION DETAIL



SEDIMENT TUBE BURIAL DETAIL

MATERIALS:

SEDIMENT TUBES FOR TYPE A INLET STRUCTURE FILTERS EXHIBIT THE FOLLOWING PROPERTIES:

PRODUCED BY A MANUFACTURER EXPERIENCED IN SEDIMENT TUBE MANUFACTURING.

COMPOSED OF COMPACTED GEOTEXTILES, CURLED EXCELSIOR WOOD, NATURAL COCONUT FIBERS, HARDWOOD MULCH OR A MIX OF THESE MATERIALS ENCLOSED BY A FLEXIBLE NETTING MATERIAL.

STRAW, STRAW FIBER, STRAW BALES, PINE NEEDLES, AND LEAF MULCH ARE NOT ALLOWED UNDER THIS SPECIFICATION.

UTILIZES OUTER NETTING THAT CONSISTS OF SEAMLESS, HIGH-DENSITY POLYETHYLENE PHOTODEGRADABLE MATERIALS TREATED WITH ULTRAVIOLET STABILIZERS OR A SEAMLESS, HIGH-DENSITY POLYETHYLENE NON-DEGRADABLE MATERIALS.

DIAMETER RANGING FROM 18-INCHES TO 24-INCHES.

CURLED EXCELSIOR WOOD, OR NATURAL COCONUT ROLLED EROSION CONTROL PRODUCTS (RECPs) THAT ARE ROLLED UP TO CREATE A SEDIMENT TUBE ARE NOT ALLOWED UNDER THIS SPECIFICATION.

SELECT APPLICABLE SEDIMENT TUBES FROM THE SODOT APPROVED PRODUCTS LIST.

USE 48-INCH LONG WOOD POSTS THAT MEET THE FOLLOWING REQUIREMENTS:

2-INCH BY 2-INCH SIZE.

HEAVY-DUTY WIRE STAPLES AT LEAST 1½-INCH LONG, SPACED A MAXIMUM OF 6-INCHES APART TO ATTACH THE FILTER FABRIC TO WOODEN STAKES.

USE 48-INCH LONG STEEL POSTS THAT MEET THE FOLLOWING MINIMUM PHYSICAL REQUIREMENTS:

BE COMPOSED OF HIGH STRENGTH STEEL WITH MINIMUM YIELD STRENGTH OF 50,000 PSI.

HAVE A STANDARD 7/8" SECTION WITH A NOMINAL FACE WIDTH OF 1.38-INCHES AND NOMINAL 7/8" LENGTH OF 1.48-INCHES.

WEIGH 1.25 POUNDS PER FOOT (± 8%).

BE PAINTED WITH A WATER BASED BAKED ENAMEL PAINT.

INSTALLATION:

REMOVE ALL ROCKS, CLDS, VEGETATION OR OTHER OBSTRUCTIONS SO INSTALLED SEDIMENT TUBES HAVE DIRECT CONTACT WITH THE UNDERLYING SOIL OR SURFACE.

INSTALL SEDIMENT TUBES BY LAYING THEM FLAT ON THE GROUND. CONSTRUCT A SMALL TRENCH TO A DEPTH THAT IS 20% OF THE SEDIMENT TUBE DIAMETER. LAY THE SEDIMENT TUBE IN THE TRENCH AND COMPACT THE UPSTREAM SEDIMENT TUBE SOIL INTERFACE. DO NOT COMPLETELY BURY SEDIMENT TUBES DURING INSTALLATION.

LAP THE ENDS OF ADJACENT SEDIMENT TUBES A MINIMUM OF 6-INCHES TO PREVENT FLOW AND SEDIMENT FROM PASSING THROUGH THE FIELD JOINT. NEVER STACK SEDIMENT TUBES ON TOP OF ONE ANOTHER. INSTALL SEDIMENT TUBES USING WOODEN STAKES (2-INCH X 2-INCH) OR STEEL POSTS (STANDARD "U" OR "T" SECTIONS WITH A MINIMUM WEIGHT OF 1.25 POUNDS PER FOOT) A MINIMUM OF 48-INCHES IN LENGTH.

PLACED ON 2-FOOT CENTERS. INTERTWINE THE STAKES WITH THE OUTER MESH ON THE DOWNSTREAM SIDE, AND DRIVE THE STAKES IN THE GROUND TO A MINIMUM DEPTH OF 24-INCHES LEAVING LESS THAN 12-INCHES OF STAKE ABOVE THE EXPOSED SEDIMENT TUBE.

INSPECTION AND MAINTENANCE:

INSPECT EVERY SEVEN CALENDAR DAYS AND WITHIN 24-HOURS AFTER EACH RAINFALL EVENT THAT PRODUCES ½-INCHES OR MORE OF PRECIPITATION. INSPECT SEDIMENT TUBES AFTER INSTALLATION FOR GAPS UNDER THE TUBES AND FOR GAPS BETWEEN JOINTS OF ADJACENT ENDS OF SEDIMENT TUBES. REPAIR RILLS, GULLIES, AND ALL UNDERCUTTING NEAR SEDIMENT TUBES. REMOVE AND/OR REPLACE INSTALLED SEDIMENT TUBES AS REQUIRED TO ADAPT TO CHANGING CONSTRUCTION SITE CONDITIONS. REMOVE ALL SEDIMENT TUBES FROM THE SITE WHEN THE FUNCTIONAL LONGEVITY IS EXCEEDED AS DETERMINED BY THE ENGINEER, INSPECTOR OR MANUFACTURER'S REPRESENTATIVE. DISPOSE OF SEDIMENT TUBES IN REGULAR MEANS AS NON-HAZARDOUS, INERT MATERIAL.

B INLET PROTECTION — SEDIMENT TUBE

NOT TO SCALE



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**UNITED STATES ARMY
CONSTRUCT BATTALION
SYNTHETIC RUNNING TRACK
FORT JACKSON, SC**

EROSION CONTROL DETAILS

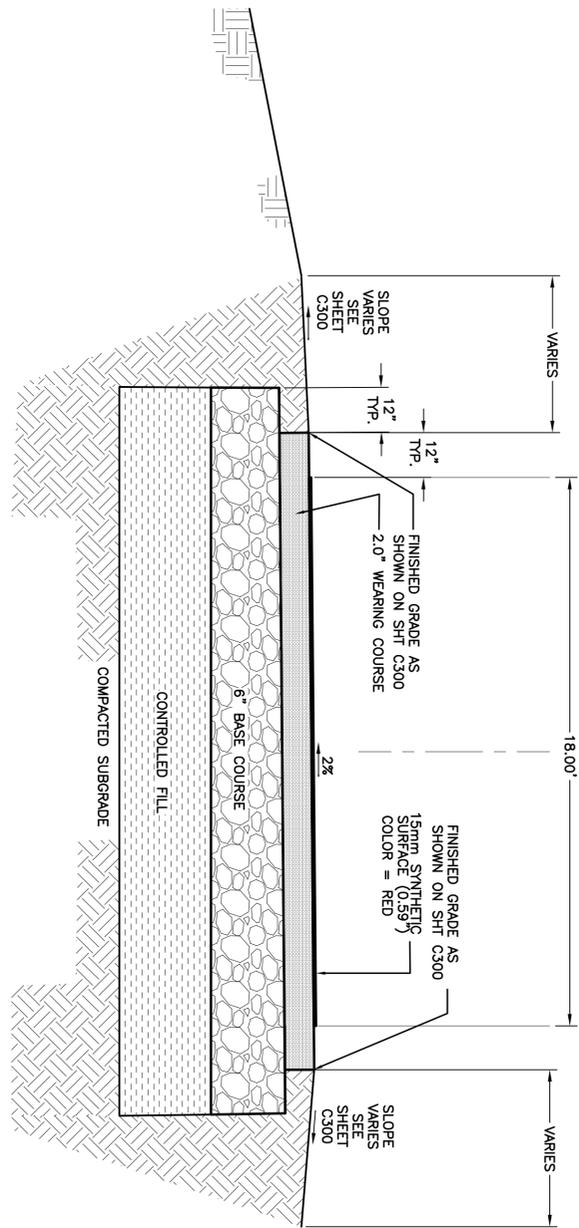
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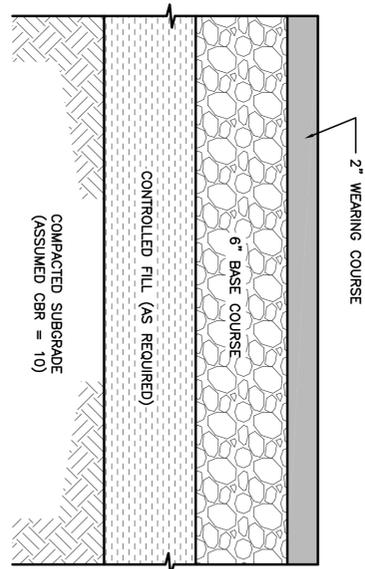
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C RUNNING TRACK PAVEMENT SECTION
NOT TO SCALE



NOTE: WHERE NO CURB & GUTTER, ROLL CURB, SIDEWALK, INTEGRAL CURB & WALK, VERTICAL CURB, OR GRANITE CURB, BASE COURSE SHALL EXTEND 12" PAST EDGE OF PAVEMENT.

D TYPICAL ASPHALTIC CONCRETE PAVEMENT SECTION
SCALE: NTS

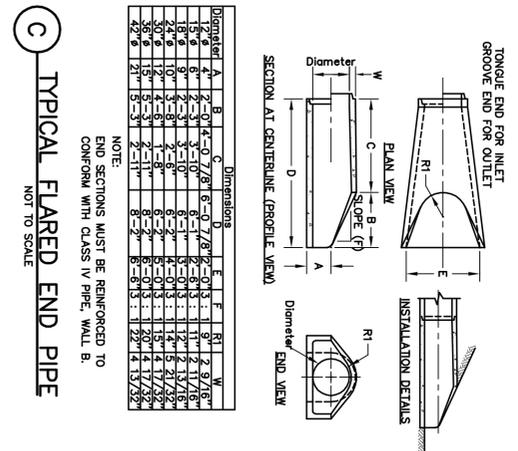
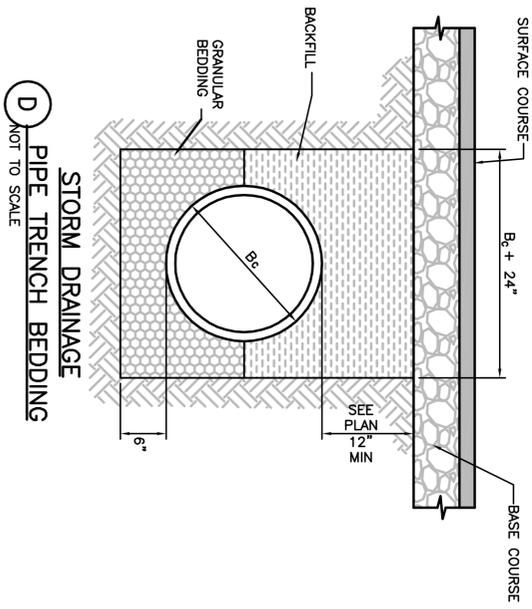
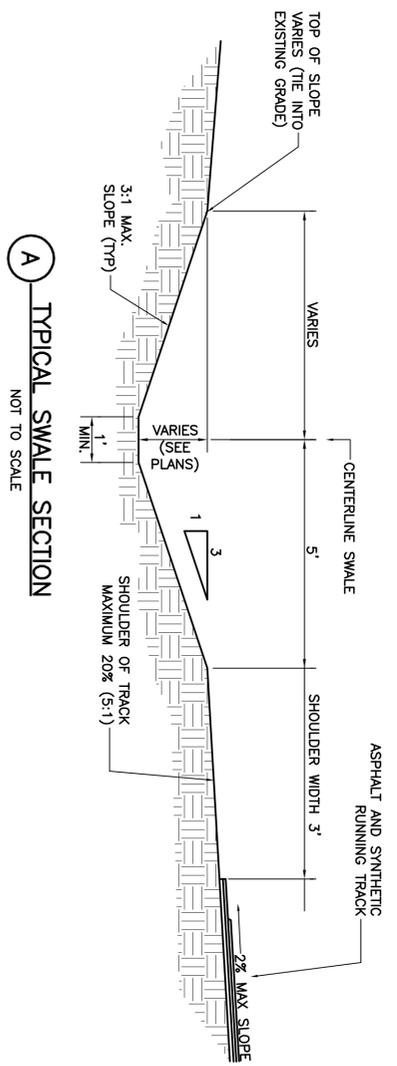
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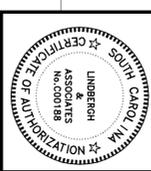
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USACE DISTRICT
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DESIGNED BY MMY
CHECKED BY JFM
DRAWN BY MMY
DATE 06/11/2010
FILE NO.
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SYNTHETIC RUNNING TRACK
FORT JACKSON, SC
GRADING & DRAINAGE DETAILS

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Phone: (843)553-6670 Fax: (843)553-0755

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
CHARLESTON, SOUTH CAROLINA

Construct Battalion Synthetic Running Track
(Hurtgen Forest, Facility No. 4489)
at

FORT JACKSON

COLUMBIA, SOUTH CAROLINA

DESIGN BY:

LINDBERGH & ASSOCIATES, LLC
2170 ASHLEY PHOSPHATE ROAD
CHARLESTON, SC 29406



SPECIFICATIONS PREPARED BY:

CIVIL
LINDBERGH & ASSOCIATES
J. Forest McKenzie II, P. E., P.L.S.

SPECIFICATIONS SUBMITTED BY: _____ DATE: _____
J. Forest McKenzie II, P.E., P.L.S.

SPECIFICATIONS APPROVED BY: _____ DATE: _____

Construct Battalion Synthetic Running Track
 Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
 100% Submittal

SECTION 00 01 15

LIST OF DRAWINGS

01/07

PART 1 GENERAL

1.1 SUMMARY

This section lists the drawings for the project pursuant to contract clause "DFARS 252.236-7001, Contract Drawings, Maps and Specifications."

1.2 CONTRACT DRAWINGS

Contract drawings are as follows:

DRAWING NO.	USACE DWG NO.	TITLE
G001	XXXXXXX	COVER SHEET & INDEX
C001	XXXXXXX	CIVIL LEGEND, NOTES, AND ABBREVIATIONS
C100	XXXXXXX	EXISTING SITE & DEMOLITION PLAN
C200	XXXXXXX	SITE PLAN
C300	XXXXXXX	GRADING & DRAINAGE PLAN
C610	XXXXXXX	DEMOLITION & EROSION CONTROL DETAILS
C611	XXXXXXX	EROSION CONTROL DETAILS
C620	XXXXXXX	SITE DETAILS
C630	XXXXXXX	GRADING & DRAINAGE DETAILS

-- End of Document --

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

SECTION 01 11 00

SUMMARY OF WORK

01/08

PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

1.1.1 Project Description

The work includes furnishing labor, materials and equipment required to construct a new synthetic running track that shall be a minimum of 1/4 MILE long and 18 feet wide. Demolition of existing facilities and associated sitework are also included in the scope of work. This project includes filling, grading, drainage improvements, sodding and seeding. This project will also include erosion control and incidental related work.

1.1.2 Location

The work shall be located at Fort Jackson, Columbia, SC, approximately as indicated. The exact location will be shown by the Contracting Officer.

1.2 OCCUPANCY OF PREMISES

Before work is started, the Contractor shall arrange with the Contracting Officer a sequence of procedure, means of access, space for storage of materials and equipment, and use of approaches.

1.3 EXISTING WORK

In addition to "FAR 52.236-9, Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements":

- a. Remove or alter existing work in such a manner as to prevent injury or damage to any portions of the existing work which remain.
- b. Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as approved by the Contracting Officer. At the completion of operations, existing work shall be in a condition equal to or better than that which existed before new work started.

1.4 LOCATION OF UNDERGROUND FACILITIES

Obtain digging permits prior to start of excavation by contacting the Contracting Officer 15 calendar days in advance. Scan the construction site with electromagnetic or sonic equipment, and mark the surface of the ground where existing underground utilities are discovered. Verify the elevations of existing piping, utilities, and any type of underground obstruction not indicated to be specified or removed but indicated or discovered during scanning in locations to be traversed by piping, ducts, and other work to be conducted or installed. Verify elevations before installing new work closer than nearest manhole or other structure at which an adjustment in grade can be made.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
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1.4.1 Notification Prior to Excavation

Notify the Contracting Officer at least 48 hours prior to starting excavation work.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
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SECTION 01 14 00

WORK RESTRICTIONS

07/07

PART 1 GENERAL

1.1 SPECIAL SCHEDULING REQUIREMENTS

1.1.1 General

a. Have materials, equipment, and personnel required to perform the work at the site prior to the commencement of the work.

b. The Base will remain in operation during the entire construction period. The Contractor shall conduct his operations so as to cause the least possible interference with normal operations of the activity.

c. Permission to interrupt any Activity roads and/or utility service shall be requested in writing a minimum of 15 calendar days prior to the desired date of interruption.

d. The Battalion will move their training operations to the other site during the construction of this project.

e. The work under this contract requires special attention to the scheduling and conduct of the work in connection with existing operations. Identify on the construction schedule each factor which constitutes a potential interruption to operations.

1.1.2 Family Day and Graduations

a. Family days **are defined as Thursdays(?), between ?::? am and ?::? pm.**

b. Graduation days **are defined as Fridays, between ?::? am and ?::?.**

c. Work is restricted to noise limited work activities during these hours.

d. Deliveries are not permitted due to the volume of visitor traffic during these times.

1.2 CONTRACTOR ACCESS AND USE OF PREMISES

1.2.1 Activity Regulations

Ensure that Contractor personnel employed on the Activity become familiar with and obey Activity regulations including safety, fire, traffic and security regulations. Keep within the limits of the work and avenues of ingress and egress. Do not enter any restricted areas unless required to do so and until cleared for such entry. The Contractor's equipment shall be conspicuously marked for identification.

1.2.1.1 Subcontractors and Personnel Contacts

Furnish a list of contact personnel of the Contractor and subcontractors including addresses and telephone numbers for use in the event of an emergency. As changes occur and additional information becomes available, correct and change the information contained in previous lists.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

1.2.1.2 Identification Badges

Identification badges will be furnished without charge. Application for and use of badges will be as directed. Access Badges will be displayed at all times. Furnish a completed EMPLOYMENT ELIGIBILITY VERIFICATION (DHS FORM I-9) form for all personnel requesting badges. This form is available at: <http://www.uscis.gov/portal/site/uscis/forms>
Immediately report instances of lost or stolen badges to the Contracting Officer.

The following documentation must be provided to obtain an access badge:

- a. Background Check. A criminal background check conducted by the Base Security Manager's Office is required prior to badge issuance.
- b. Proof of Valid Government Contract. The contractor must submit Form I-9, Base Access Badge and DoD Vehicle Pass/Decal Request, to the Base Security Manager's Office via the contracting agency. In the event of a subcontract, the primary contractor is responsible for submitting the required documentation of any subcontractor employees requesting installation access.
- c. Photo ID. The following are acceptable forms of photo identification: (1) A valid federal, state, or local government agency picture identification card; (2) A valid state driver's license; (3) A valid passport; (4) A valid Permanent Resident Card or Alien Registration Receipt Card with photograph; and (5) All other forms of acceptable identification ID listed in Reference (e), the Form I-9. This form is available at: <http://www.uscis.gov/portal/site/uscis/forms>
- d. Proof of employment eligibility. The following are acceptable as proof of employment eligibility: (1) Social Security Card; (2) Birth certificate; (3) Immigration and Naturalization Services (INS) forms; and (4) All other forms of acceptable documentation listed on the Form I-9. This form is available at: <http://www.uscis.gov/portal/site/uscis/forms>

1.2.1.3 Form I-9

A pdf format copy of Form I-9 is appended at the end of this Section.

1.2.2 Working Hours

Regular working hours shall consist of an 8 1/2 hour period established by the Contractor Officer, between Monday through Friday, excluding Government holidays.

1.2.3 Work Outside Regular Hours

Work outside regular working hours requires Contracting Officer approval. Make application 15 calendar days prior to such work to allow arrangements to be made by the Government for inspecting the work in progress, giving the specific dates, hours, location, type of work to be performed, contract number and project title. Based on the justification provided, the Contracting Officer may approve work outside regular hours. During periods of darkness, the different parts of the work shall be lighted in a manner

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

approved by the Contracting Officer.

1.2.4 Utility Cutovers and Interruptions

- a. Make utility cutovers and interruptions after normal working hours or on Saturdays, Sundays, and Government holidays. Conform to procedures required in the paragraph "Work Outside Regular Hours."
- b. Ensure that new utility lines are complete, except for the connection, before interrupting existing service.
- c. Interruption to water, sanitary sewer, storm sewer, telephone service, electric service, air conditioning, heating, fire alarm, and compressed air shall be considered utility cutovers pursuant to the paragraph entitled "Work Outside Regular Hours."
- d. Operation of Station Utilities: The Contractor shall not operate nor disturb the setting of control devices in the station utilities system, including water, sewer, electrical, and steam services. The Government will operate the control devices as required for normal conduct of the work. The Contractor shall notify the Contracting Officer giving reasonable advance notice when such operation is required.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

SECTION 01 20 00.00 20

PRICE AND PAYMENT PROCEDURES

07/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EP-1110-1-8 (2005) Construction Equipment Ownership
and Operating Expense Schedule, Vol 1-12

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Schedule of prices; G

1.3 SCHEDULE OF PRICES

1.3.1 Data Required

Within 15 calendar days of notice of award, prepare and deliver to the Contracting Officer a schedule of prices (construction contract) on the forms furnished by the Government. Provide a detailed breakdown of the contract price, giving quantities for each of the various kinds of work, unit prices, and extended prices therefor.

1.3.2 Schedule Instructions

Payments will not be made until the Schedule of Prices has been submitted to and accepted by the Contracting Officer. Identify the cost for site work, and include incidental work to the 5 foot line. Identify costs for the building(s), and include work out to the 5 foot line. Work out to the 5 foot line shall include construction encompassed within a theoretical line 5 feet from the face of exterior walls and shall include attendant construction, such as cooling towers, placed beyond the 5 foot line.

1.4 CONTRACT MODIFICATIONS

In conjunction with the Contract Clause "DFARS 252.236-7000, Modification Proposals-Price Breakdown," and where actual ownership and operating costs of construction equipment cannot be determined from Contractor accounting records, equipment use rates shall be based upon the applicable provisions of the EP-1110-1-8.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

1.5 CONTRACTOR'S INVOICE AND CONTRACT PERFORMANCE STATEMENT

1.5.1 Content of Invoice

Requests for payment will be processed in accordance with the Contract Clause "FAR 52.232-27, Prompt Payment Construction Contracts."

- a. The Contractor's invoice certified by QC, on the form furnished by the Government for this purpose, showing in summary form, the basis for arriving at the amount of the invoice. Submit original and five copies.
- b. The Contract Performance Statement on the form furnished by the Government for this purpose, showing in detail, the estimated cost, percentage of completion, and value of completed performance for each of the construction categories stated in this contract. Submit original and two copies.
- c. Final invoice shall be accompanied by Final Release Form. If the contractor is incorporated, the release shall contain the corporate seal. An officer of the corporation shall sign the release and the corporate secretary shall certify the release
- d. Updated construction and equipment delivery schedules (two copies).
Updated network mathematical analysis (three copies).
- e. Contractor Safety Self Evaluation Checklist (original)

1.5.2 Mailing of Invoices

- a. All invoices shall be forwarded with specific marking on the envelope. This marking shall be in the front lower left hand corner, in large letters, "INVOICES - ENCLOSED."
- b. Invoices not completed in accordance with contract requirements will be returned to the Contractor for correction of the deficiencies.
- c. Final invoices not accompanied by Final Release Form will be considered incomplete and will be returned to the Contractor.

1.6 PAYMENTS TO THE CONTRACTOR

Payments will be made on submission of itemized requests by the Contractor which comply with the requirements of this section, and will be subject to reduction for overpayments or increase for underpayments made on previous payments to the Contractor.

1.6.1 Obligation of Government Payments

The obligation of the Government to make payments required under the provisions of this contract will, at the discretion of the Contracting Officer, be subject to reductions and/or suspensions permitted under the FAR and agency regulations including the following in accordance with "FAR 32.503-6:

- a. Reasonable deductions due to defects in material or workmanship;
- b. Claims which the Government may have against the Contractor under or in connection with this contract;

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

- c. Unless otherwise adjusted, repayment to the Government upon demand for overpayments made to the Contractor; and
- d. Failure to provide up to date record drawings not current as stated in Contract Clause "FAC 5252.236-9310, Record Drawings."

1.6.2 Payment for Materials Offsite

Payments may be made to the Contractor for materials stored off construction sites under the following conditions:

- a. Conditions described in the paragraph entitled "Payments to the Contractor";
- b. Material within a distance of 10 miles by streets and roads to the county of the construction site;
- c. Materials adequately insured and protected from theft and exposure;
- d. Materials not susceptible to deterioration or physical damage in storage or in transit to the job site are acceptable for progress payments. Items such as steel, machinery, pipe and fittings, precast/prestressed concrete piles, and electrical cable are acceptable; items such as gypsum wallboard, glass, insulation, and wall coverings are not;
- e. Materials in transit to the job site or storage site are not acceptable for payment; and
- f. Conditions specified in "FAR 52.232-5(b) Payments Under Fixed Price Construction Contracts."

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

08/08

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

List of contact personnel; G

Insurance; G

Personnel list; G

Vehicle list; G

Statement of Acknowledgement Form SF 1413

1.2 VIEW LOCATION MAP

Submit to the Contracting Officer, prior to or with the first digital photograph submittals, a sketch or drawing indicating the required photographic locations. Update as required if the locations are moved.

1.3 PROGRESS AND COMPLETION PICTURES

Photographically document site conditions prior to start of construction operations. Provide monthly, and within one month of the completion of work, digital photographs, 1600x1200x24 bit true color minimum resolution in JPEG file format showing the sequence and progress of work. Take a minimum of 20 digital photographs each week throughout the entire project from a minimum of ten views from points located by the Contracting Officer. Submit a view location sketch indicating points of view. Submit with the monthly invoice two sets of digital photographs each set on a separate CD-R, cumulative of all photos to date. Indicate photographs demonstrating environmental procedures. Photographs for each month shall be in a separate monthly directory and each file shall be named to indicate its location on the view location sketch. The view location sketch shall also be provided on the CD as digital file. All file names shall include a date designator. Cross reference submittals in the appropriate daily report. Photographs shall be provided for unrestricted use by the Government.

1.4 MINIMUM INSURANCE REQUIREMENTS

Procure and maintain during the entire period of performance under this contract the following minimum insurance coverage:

- a. Comprehensive general liability: \$500,000 per occurrence

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

- b. Automobile liability: \$200,000 per person, \$500,000 per occurrence for bodily injury, \$20,000 per occurrence for property damage
- c. Workmen's compensation as required by Federal and State workers' compensation and occupational disease laws.
- d. Employer's liability coverage of \$100,000, except in States where workers compensation may not be written by private carriers,
- e. Others as required by South Carolina State law..

1.5 CONTRACTOR PERSONNEL REQUIREMENTS

1.5.1 Subcontractors and Personnel

Furnish a list of contact personnel of the Contractor and subcontractors including addresses and telephone numbers for use in the event of an emergency. As changes occur and additional information becomes available, correct and change the information contained in previous lists.

1.5.2 Identification Badges

Identification badges, if required, will be furnished without charge. Application for and use of badges will be as directed. Immediately report instances of lost or stolen badges to the Contracting Officer.

1.5.3 Subcontractor Special Requirements

1.5.3.1 Asbestos Containing Material

All contract requirements of Section 02 82 16.00 20, "Engineering Control of Asbestos Containing Materials" assigned to the Private Qualified Person (PQP) shall be accomplished directly by a first tier subcontractor.

1.5.4 Contractor Personnel Requirements

Failure to obtain entry approval will not affect the contract price or time of completion.

1.6 SUPERVISION

Have at least one qualified supervisor capable of reading, writing, and conversing fluently in the English language on the job site during working hours. In addition, if a Quality Control (QC) representative is required on the contract, then that individual shall also have fluent English communication skills.

1.7 PRECONSTRUCTION CONFERENCE

After award of the contract, but prior to commencement of any work at the site, meet with the Contracting Officer to discuss and develop a mutual understanding relative to the administration of the value engineering and safety program, preparation of the schedule prices, shop drawings, and other submittals, scheduling programming, and prosecution of the work. Major subcontractors who will engage in the work shall also attend.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

1.8 ELECTRONIC MAIL (E-MAIL) ADDRESS

The Contractor shall establish and maintain electronic mail (e-mail) capability along with the capability to open various electronic attachments in Microsoft, Adobe Acrobat, and other similar formats. Within 10 days after contract award, the Contractor shall provide the Contracting Officer a single (only one) e-mail address for electronic communications from the Contracting Officer related to this contract including, but not limited to contract documents, invoice information, request for proposals, and other correspondence. The Contracting Officer may also use email to notify the Contractor of base access conditions when emergency conditions warrant, such as hurricanes, terrorist threats, etc. Multiple email address will not be allowed.

It is the Contractor's responsibility to make timely distribution of all Contracting Officer initiated e-mail with its own organization including field office(s). The Contractor shall promptly notify the Contracting Officer, in writing, of any changes to this email address.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

SECTION 01 32 17.00 20

NETWORK ANALYSIS SCHEDULES (NAS)

11/08

PART 1 GENERAL

1.1 DESCRIPTION

The network analysis system shall consist of the network analysis schedule (diagram) and associated reports. The scheduling of all procurement and construction shall be the responsibility of the Contractor. Construction increments will be interrelated on a single schedule that represents the entire project duration from Contract Award to the Contract Completion Date. Schedule updates will build upon each other and will include construction increments as they are detailed, submitted and accepted. Submission of progress and revision data will be used to measure work progress, aid in the evaluation for requests for time extensions, and to provide the basis of all progress payments. The Critical Path Method (CPM) of network calculation shall be used to generate the project schedule and will utilize the Precedence Diagram Method (PDM) to satisfy both time and cost applications. All progress payment amounts will be derived from and tied to the cost-loaded schedule activities.

For consistency, when scheduling software terminology is used in this specification, the terms in Primavera's scheduling programs are used. Primavera Project Planner, P3, Primavera Project Manager, SureTrak and PrimeContract are registered trademarks or service marks of Primavera Systems, Inc. Adobe and Acrobat are registered trademarks of Adobe Systems Incorporated.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Qualifications; G

Standard Activity ID Dictionary; G

Construction Network Analysis Schedule; G

Baseline Network Analysis Schedule; G

SD-07 Certificates

Monthly Network Analysis Updates; G

SD-11 Closeout Submittals

As-Built Schedule; G

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

1.3 SCHEDULE ACCEPTANCE

Review comments made by the Government on the Contractor's schedule(s) will not relieve the Contractor from compliance with requirements of the Contract Documents. The Contractor is responsible for scheduling, sequencing, and prosecuting the Work to comply with the requirements of the Contract Documents. Government acceptance extends only to the activities of the Contractor's schedule that the Government has been assigned responsibility and agrees it is responsible. The Government will also review for contract imposed schedule constraints and conformance, and cost loading of the CPM activities. Comments offered on other parts of the schedule, which the Contractor is assigned responsibility, are offered as a courtesy and are not conditions of Government acceptance; but are for the general conformance with established industry schedule concepts.

1.3.1 Schedule Acceptance Prior to Start of Work

The Baseline Network Analysis Schedule described in the paragraph entitled "Baseline Network Analysis Schedule" must be submitted and accepted by the Government before the Contractor will be allowed to start work on the construction stage(s) of the contract. Examples of construction stages are, but not limited to; demolition, site work, temporary work for construction, etc.

1.3.2 Acceptance

- a. When the Construction Network Analysis Schedule is submitted and accepted by the Contracting Officer, it will then be considered the "Baseline Network Analysis Schedule". The Baseline Network Analysis Schedule will then be used by the Contractor for planning, organizing, and directing the work; reporting progress; and requesting payment for work accomplished. The schedule will be updated monthly by the Contractor and submitted monthly with the progress pay request to reflect the current status of the work. Submittal and acceptance of the Baseline Network Analysis Schedule and accurate updated schedules accompanying the pay requests are both conditions precedent to processing pay requests. Only bonds will be paid prior to acceptance of the Baseline Schedule(s).
- b. Submittal of the Baseline Network, and subsequent schedule updates, will be understood to be the Contractor's certification that the submitted schedule meets all of the requirements of the Contract Documents, represents the Contractor's plan on how the work will be accomplished, and accurately reflects the work that has been accomplished and how it was sequenced (as-built logic).

1.4 SOFTWARE

The scheduling software that will be utilized by the Government on this project is SureTrak by Primavera Systems, Inc.. Notwithstanding any other provision in the contract, schedules submitted for this project must be prepared using either Primavera P3 or Primavera SureTrak (files saved in Concentric P3 format). The Contractor shall provide electronic files saved in a format that is compatible with the Contracting Officer's current software version. Submission of data from another software system where data conversion techniques or software is used to import into Primavera's scheduling software is not acceptable and will be cause for rejection of the submitted schedule.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

1.5 QUALIFICATIONS

The Contractor shall designate a part time Scheduler that will be responsible for the development, preparation, and maintenance of an accurate, computerized Network Analysis Schedule. Part time is defined as the Scheduler performing coordination, attending project meetings, and updates. The Scheduler shall have previously developed, created and maintained at least 2 previous computerized schedules of similar size and complexity of this contract. A resume outlining the qualifications of the Scheduler and their SureTrak or P3 training certificate from an authorized Primavera trainer shall be submitted for acceptance to the Contracting Officer. If at a later date, the Contracting Officer considers the Contractor's Scheduler to be incompetent or objectionable, the Contractor will propose a new Scheduler, meeting the qualification requirements. Payments will not be processed until an acceptable Scheduler is provided.

1.6 NETWORK SYSTEM FORMAT

The system shall consist of time scaled logic diagrams and specified reports.

1.6.1 Diagrams

Show the order and interdependence of activities and the sequence in which the work is planned to be accomplished. The basic concept of the network analysis diagram will be followed to show how the start of a given activity is dependent on the completion of preceding activities and how its completion restricts or restrains the start of following activities. Activity durations shall not be resource-driven, activities shall start according to network logic and finish when its duration has elapsed. Diagrams shall be sorted by Early Start Date and will show a continuous flow from left to right with no logic (relationship lines) from right to left. With the exception of the Contract Award, Start Project and End Project milestone activities, no activities will be open-ended; each activity will have predecessor and successor ties. The diagram shall clearly show the activities of the critical path and must be red in color. Once an activity exists on the schedule it may not be deleted or renamed, and must remain in the logic. No more than 20 percent of the activities may be critical or near critical. Critical will be defined as having zero days of Total Float. "Near critical" will be defined as having Total Float in the range of 1 to 14 days. Show the following information on the diagrams for each activity:

- a. Activity ID
- b. Activity Description
- c. Original Duration in Work Days
- d. Remaining duration
- e. Actual Duration in Work Days
- f. Early Start Date
- g. Early Finish Date
- h. Total Float

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

Provide network diagrams on tabloid (11X17) sheets. Updated diagrams shall show the date of the latest revision.

1.6.2 Schedule Activity Properties and Level of Detail

Numbering shall be assigned so that, in general, predecessor activity numbers are smaller numerically than the successor activity numbers. Skip numbering shall be used on the network to allow insertion of additional activities for contract modifications and logic changes. Activity categories included in the schedule are specified below.

1.6.2.1 Activity Categories

- a. Procurement Activities: Tasks related to the procurement of material or equipment shall be included as separate activities in the project schedule. Examples of procurement activities include, but are not limited to; Material/equipment submittal preparation, submittal and approval of material/equipment; delivery of O&M manuals; material/equipment fabrication and delivery, delivery of extra parts, extra stock, special tools, notification of Government Furnished Material/Equipment delivery requirement, etc. As a minimum, separate procurement activities will be provided for every specification section. If the Contractor intends on using Just-In-Time (JIT) delivery methods, the schedule will show each JIT delivery with relationship tie to the Construction Activity specifically for the JIT delivery. Material and equipment for which payment will be requested in advance of installation shall be cost-loaded with the procurement costs (e.g.; the delivery milestone(s)). All activities within a procurement process/cycle will have a unique identifier in the activity code to show their relationships and will extend to the related construction activities (i.e., CSI Code).

If the Government's action on any submittal is "Disapproved" or "Revise and Resubmit", a new series of Procurement Activities will be inserted into the schedule. Predecessor for the new submittal preparation activity will be the original approval activity and the successor of the new approval activity will be the fabrication/deliver activity for the equipment or material.

- b. Government Activities: Government and other agency activities that could impact progress shall be clearly identified. Government activities include, but are not limited to; Government approved submittal reviews, Government conducted inspections/tests, environmental permit approvals by State regulators, utility outages, Notice(s) to Proceed and delivery of Government Furnished Material/Equipment. Show activities indicating Government furnished materials and equipment utilizing delivery dates indicated in "FAR 52.245-2, Government Property (Fixed-Price Contracts)." Government activities will be driven by calendars that reflect Saturdays, Sundays and all Federal Holidays as non-work days.
- c. Construction Quality Management (CQM) Activities: CQM Activities will identify the Preparatory Phase and Initial Phase for each Definable Feature of Work identified in the Contractor's Quality Control Plan. These activities will be added to each 3-Week Look Ahead Schedule referenced in the paragraph entitled "THREE-WEEK

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

LOOK AHEAD SCHEDULE" and will also be included in each monthly update referenced in the paragraph entitled "Monthly Network Analysis Updates". The Follow-up Phase will be represented by the Construction Activities in the Baseline Schedule and in the schedule updates.

- d. Construction Activities: Construction activities shall include, but are not limited to: Tasks related to mobilization or demobilization; the installation of temporary or permanent work by tradesman; testing and inspections of installed work by technicians, inspectors or engineers; start-up and testing of equipment; commissioning of building and related systems; scheduling of specified manufacture's representatives; Punch Out Inspection; Pre-Final Inspection, Final Acceptance Inspection; final clean-up; training to be provided; and administrative tasks necessary to start, proceed with, accomplish or finalize the contract. No onsite construction activity shall have a duration in excess of 20 working days. Contractor activities will be driven by calendars that reflect Saturdays, Sundays and all Federal Holidays as non-work days.

1.6.2.2 Project Milestones

Dates shall be shown on the diagram for the start of the project, any contract required interim start and completion dates, contract completion date and other significant milestones.

- a. Project Start Date Milestones: The schedule shall start no earlier than the Contract Award Date and the project duration (Day 1) will start on the Notice-to-Proceed (NTP) date. The Contractor shall include as the first milestone in the schedule, an activity named "Contract Award". Another milestone shall be included that will be named "Start Project". The Contract Award and Project Start milestones shall have mandatory start constraint dates equal to the Contract Award and NTP dates, respectively.
- b. Constraint of Last Activity Milestone: The Contractor shall include as the last activity in the project schedule, an activity named "End Project". The "End Project" activity shall have a mandatory finish constraint equal to the contract completion date for the project. Calculation of project updates shall be such that if the finish of the last activity falls after the contract completion date, then the float calculation shall reflect negative float on the critical path and if the finish of the last activity falls before the contract completion date, the float calculation shall reflect positive float on the critical path. The only predecessor activity to this activity will be either the "Contractor Early Completion" or the "Substantial Completion" milestone, whichever is used by the Contractor.
- c. Early Project Completion: In the event the Contractor's project schedule shows completion of the project prior to the contract completion date, the Contractor shall include an activity named "Contractor Early Completion". The activity shall be a milestone with an unconstrained date representing the Contractor's Early Completion date. The only successor activity to this activity will be the "End Project" milestone.
- d. Substantial Completion: If the Contractor elects to include an

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

activity for Substantial Completion, then it is agreed that Substantial Completion will be the point in time that the Government considers the project is complete and ready for its intended use. The activity will be named "Substantial Completion". The activity shall be a milestone with an unconstrained date representing the Contractor's Substantial Completion date. The only successor activity to this activity will be the "End Project" milestone.

1.6.2.3 Activity Identification (ID) and Description

- a. Standard Activity ID Dictionary: The Contractor shall submit the alphanumeric coding scheme for Schedule Activity Numbers that shall be used throughout the project. The coding scheme submitted shall list the values for each activity code and translate those values into project specific designations. Code length shall not exceed 10 characters. Once accepted, the coding scheme will be used for the duration of the project.
- b. Activity Description: Each activity shall have a narrative description consisting of a Verb or work function (e.g.; form, pour, excavate), an Object (e.g.; slab, footing, under floor plumbing), and Area (e.g.; 3rd floor, northeast quadrant, basement).

1.6.2.4 Activity Code Dictionary and Values

The Contractor shall establish the activity codes identified in this specification. The codes will have values assigned that will allow the scheduling program to sort, select, group and organize the activities in the schedule. Activity codes include, but are not limited to, the following codes:

- a. Area Code: All activities shall be identified in the project schedule by the Area Code in which the activity occurs. Activities shall not be contained in more than one Area Code. Area is defined as distinct separations in construction, such as a story of construction, separate structure, usage or function difference, utility distribution systems, etc.
- b. Responsibility Code: All activities in the project schedule shall be identified with the party responsible to perform the task. Responsibility includes, but is not limited to; the Prime Contractor, subcontracting firm, or Government agency performing a given task. Activities shall not belong to more than one responsible party. The responsible party for each activity shall be identified by a responsibility code. For example, a responsibility code value, "ELEC", may be used to identify the "Electrical Subcontractor".
- c. CSI Code: All activities in the project schedule shall be identified with its respective 5-digit Specification Section number. Activities shall not belong to more than one Section number. If an activity does not have an applicable CSI Code, (such as "Mobilize"), the code will be "00000".
- d. Drawing Code: All activities in the project schedule shall be identified with its respective project Drawing Code. The Drawing Code is the Sheet Number on the primary project drawing, which

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

indicates the work to be performed. Activities shall not belong to more than one Drawing Code. Examples of Drawing Codes are "C-10", "C.10" or "C10". The code system will allow organizing all activities by Drawing Code in alpha and numeric order. If an activity does not have an applicable Drawing Code, (such as "Mobilize"), the code will be "00000".

- e. Modification Code: The Modification Code shall identify activities that are modified or added by contract modification. Activities shall not belong to more than one Modification Code. The Government will assign the modification number, which will be shown on the Standard Form 30. Use a shortened version of the modification number for the code (e.g.; A00010 = 010).
- f. Request for Equitable Adjustment (REA) or Claim Code: Activities that are modified or added, as a result of a Contractor's REA or Claim shall be identified by a code generated by the Contractor. Activities shall not belong to more than one REA or Claim Code.

1.6.2.5 Cost and Resource Loading

- a. Quantities and Units of Measure: Each cost loaded activity will have a detailed breakdown of the contract price, giving quantities for each of the various kinds of work, unit prices, etc. These entries are informational only and are non-calculating. Quantities shall be entered as Log Text 1 (in SureTrak) or Log 1 (in P3) for each activity, column heading will be "Quantities". Units of Measure shall be entered as Log Text 2 (in SureTrak) or Log 2 (in P3) for each activity, column heading will be "Units of Measure".

1.6.2.6 Anticipated Weather Delays

Schedule activity duration(s) shall be formulated with allowance for normal adverse weather conditions. Any activity duration, which could be impacted by normally anticipated adverse weather (precipitation, high or low temperature, wind, etc.), due to the time period that the Contractor has scheduled the work, shall include an adjustment to include the anticipated weather delay. The Contractor shall anticipate delay by comparing the contractually imposed environmental restrictions in the Contract Documents to the National Oceanic and Atmospheric Association's (NOAA) historical monthly averages for the NOAA location closest to the project site. The number of anticipated adverse weather delays allocated to an activity will be reflected in the activity's calendar. A lost workday, due to weather conditions, is defined as a day in which the Contractor's workforce cannot work 50 percent or more of the day on the impacted activity(s). The Contractor shall immediately notify the Contracting Officer when a lost day has occurred due to weather, will record on the Daily Reports the occurrence of adverse weather and resultant impact to the normally scheduled work. If the number of actual adverse weather delay days exceeds the number of days anticipated, the Contracting Officer will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days and issue a modification in accordance with the contract clauses.

Construct Battalion Synthetic Running Track
 Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
 100% Submittal

1.6.2.7 Schedule Software Settings and Restrictions

- a. Activity Constraints: Date/time constraint(s), other than those required by the contract, will not be allowed unless accepted by the Contracting Officer. Contractor will identify any constraints proposed and provide an explanation for the purpose of the constraint in the Narrative Report.
- b. Lags: Lags will not be used when the creation of an activity will perform the same function (e.g., concrete cure time). Lag durations contained in the project schedule shall not have a negative value. Contractor will identify any lag proposed and provide an explanation for the purpose of the lag in the Narrative Report.
- c. Default Progress Data Disallowed: Actual Start and Finish dates shall not be automatically updated by default mechanisms that may be included in the CPM scheduling software system. Actual Start and Actual Finish dates on the CPM schedule shall match the dates provided from Contractor Quality Control and Production Reports. These reports will be the sole basis for updating the schedule. Work activities will be updated by actual work progression rather than being cash flow driven. Actual labor and equipment hours used on activities will be derived from the Daily Reports.
- d. Software Settings: If the contractor chooses to use Primavera's SureTrak software, the Autocost Rules shall be set to:
 - 1) Uncheck - Link Remaining Duration and Schedule Percent Complete;
 - 2) Check - Use Updated Percent Complete Against Budget to Estimate Actual to Date;
 - 3) Check - Freeze Resource Units per Hour When Quantities Change;
 - 4) Check - Update Cost and Revenue Information; and,
 - 5) Set Resource Data to "Two decimal places".

If the contractor chooses to use Primavera's P3 software, the AutoCost rules shall be set as shown below, all others shall be deactivated (i.e.; check boxes and radio buttons not filled in):

- 1) Use the update percent complete against budget to estimate: Actual cost to date.
- 2) Link budget and EAC for non-progressed activities: Budget-EAC.
- 3) Perform these calculations during each schedule computation: Apply these rules when moving from one Resource to another.

Schedule calculations and Out-of-Sequence progress (if applicable) shall be handled through Retained Logic, not Progress Override. All activity durations and float values will be shown in days, time will not be shown in the duration display. Activity progress will be shown using Remaining Duration. Date format will be DDMMYY (i.e., 11DEC02). Default activity type will be set to "Task".

1.6.3 Required Tabular Reports

The following reports will be based on the information in the paragraph entitled "Diagrams" and included with the schedule submittals and in each updated schedule submission provided on disk by the Contractor:

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

- a. Earned Value Report: Listing all activities having a budget amount and cost. A compilation of total earnings on the project from the notice to proceed to the most recent monthly progress payment request and the difference between the previous request amount and the current payment request amount. Sort report first by resource and then by activity.
- b. Log Report: With each updated schedule submission, provide a computer generated Log Report using a recognized schedule comparison software listing all changes made between the previous schedule and current updated schedule. Identify the name of the previous schedule and name of the current schedule being compared. This report will as a minimum show changes for: Added & Deleted Activities, Original Durations, Remaining Durations, Activity Percent Complete, Total Float, Free Float, Calendars, Descriptions, Constraints (added, deleted or changed), Actual Starts/Finishes, Added/Deleted Resources, Resource Quantities, Costs, Resource Percents, Added/Deleted Relations, Changed Relation Lags, Changed Driving Relations, and Changed Critical Status.

1.7 SUBMISSION AND ACCEPTANCE

1.7.1 Preliminary Meeting

Prior to the preparation of the Construction Network Analysis Schedule for acceptance; the Contracting Officer, Contractor and the scheduler shall participate in a preliminary meeting to discuss the proposed schedule and requirements of this section prior to submission of the network. Discussions shall include: 1) Which construction activities may have delivered material costs included (e.g., concrete placement, etc.), 2) Which procurement activities will have material/equipment costs separated from their respective construction activity costs (e.g., any stored equipment, etc.) and, 3) Which procurement and construction activities will have separate testing/inspection costs; per the paragraph entitled "Cost Loading Activities".

1.7.2 Construction Network Analysis Schedule

Submit the complete network analysis schedule and obtain acceptance prior to starting construction work. Submit three copies of the diagrams described in the paragraph entitled "Diagrams" and the reports listed in the paragraph entitled "Required Tabular Reports". As part of this submittal, provide the Project Name format (and Project Group Name if used) that will be used by the Contractor to identify initial schedule submittals, updates, fragnets, changes, etc.

1.7.3 Review and Evaluation

After the Government's review(s) of the Construction Network Analysis Schedule, the Contractor shall meet with the Contracting Officer to discuss the review and evaluation of the NAS submittal. Revisions necessary as a result of this review shall be resubmitted for acceptance within 10 calendar days after the meeting.

1.7.4 Baseline Network Analysis Schedule

Once review comments are resolved and the Contracting Officer has accepted the Construction Network Analysis Schedule, the Contractor shall within 5

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

calendar days furnish:

- a. Two copies of the network diagrams.
- b. Two copies of the reports listed in paragraph entitled "Required Tabular Reports".
- c. Two sets of data disks containing the project schedule shall be provided for the each Baseline submission and every periodic project update. Data shall be submitted on electronic media that is acceptable to the Contracting Officer. A permanent exterior label shall be affixed to each disk submitted. The label shall indicate the type of schedule (Construction NAS, Baseline, Update, Recovery, Time Impact Analysis (PC#), etc.), full contract number, Project Name used to identify project in scheduling software, contract name & location, data status date, diskette number with total number of diskettes in set, software name and version used to run the schedule, and the name and telephone number of person responsible for the schedule.

For major revisions, updates or changes to the network diagrams, once accepted by the Contracting Officer, the Contractor shall submit these same diagrams and reports.

1.7.5 Monthly Network Analysis Updates

At monthly intervals the Contractor and Government representatives will meet to jointly update the project schedule and agree on percentage of payment for each activity progressed during the update period. The purpose of the meeting is to determine progress payment amounts for each activity, allow all parties to evaluate project status at the data date, provide a complete and accurate update of procurement and construction progress, create an historical record of the project and establish prediction of completion date(s) based upon current status. The Contractor is responsible to gather all supporting documentation, present the update data for the schedule and record the meeting minutes. All progress payment amounts will be derived from and tied to the cost-loaded schedule activities. Submit at monthly intervals a report of the actual construction progress by updating the required reports and the time scaled logic diagram. Meeting to update the schedule and the submission of an error free, acceptable updated schedule to the Government is a condition precedent to the processing of the Contractor's pay request. As a minimum, the following actions will be accomplished during the meeting:

- a. Identify activities started and completed during the previous period and enter the Actual Start and Actual Finish dates. It will be understood that Actual Start is defined as the date that work begins on an activity with the intent to pursue the work represented by the activity to substantial completion, and Actual Finish is defined as the date that the activity's work is substantially complete to the point that its successor activity(s) may begin.
- b. Show estimated duration (in workdays) to complete each activity started but not completed (remaining duration).
- c. Indicate percentage of cost payable and percent of work complete as separate and independent entries for each activity. The assignment of an Actual Finish date to an activity does not imply

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

that the activity's percent of payment will be stasured to 100%.

- d. Reflect changes in the network diagram. All changes (i.e., remaining duration changes, logic changes, new logic, conformed change orders, new activities, changes due to Conformed Modifications, changes in work sequence, entry of as-built relationship logic, etc.) shall be recorded and a note added to the activity log field. The log shall include as a minimum, the date and reason for the change, and description of the change.
- e. Submit two copies of a Narrative Report describing: 1) Progress made in each area of the project; 2) Changes in the following; activities, original durations, logic interdependencies, milestones, planned sequence of operations, critical path, and resource and loading; 3) Pending items and status thereof, including permits, change orders, and time extensions; 4) Status of Contract Completion Date and interim milestones; 5) Current and anticipated delays (describe cause of the delay and corrective action(s)); and 6) Description of current and future schedule problem areas. Each entry in the narrative report will cite the respective Activity ID and Activity Description.
- f. Submit two copies of the reports listed in paragraph entitled "Required Tabular Reports".
- g. Two hard copies of the network diagrams and two sets of data disks.
- h. Submit two copies of the Update Meeting minutes.

1.7.6 As-Built Schedule

As a condition precedent to the release of retention and making final payment, the Contractor shall submit an "As-Built Schedule", which is the last schedule update. The As-Built Schedule shall reflect the exact manner in which the project was actually constructed (including actual start and finish dates, activities, sequences, and logic) and shall be certified by the Contractor's Project Manager and Construction Scheduler as being a true reflection of the way the project was actually constructed. If more than one person filled the position(s) during the course of the project, each person will provide certification for the period of time they were responsible.

1.8 CONTRACT MODIFICATION

When a contract modification to the work is required, submit proposed revisions to the network with a fragnet and a cost proposal for each proposed change. All modifications shall be incorporated into the network analysis system as separate identifiable activities broken down and inserted appropriately on the first update following issuance of a directive to proceed with the change. Submit two copies of the Total Float Report, Log Report and a copy of the proposed Time Impact Analysis on disk, with the cost proposal. Unless the Contracting Officer requests otherwise, only conformed contract modification fragnets will be added into the subsequent monthly updates. All revisions to the current baseline schedule activities that are necessary to further refine the schedule so that the changed work activities can be logically tied to the schedule shall be made. Financial data shall not be incorporated into the schedule until the Contracting Officer signs the contract modification.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

1.8.1 Time Impact Analysis:

The Time Impact Analysis method shall be used by the Contracting Officer and Contractor in determining if a time extension or reduction to the contract milestone date(s) is justified. The Contractor shall provide a Time Impact Analysis to the Contracting Officer for any proposed contract change or as support for a Value Engineering Proposal, Variance Request, Claim or Request for Equitable Adjustment by the Contractor. Submit the Time Impact Analysis schedule, reports, etc. on disk and as a printed/plotted hardcopy.

- a. The Contractor shall submit a Time Impact Analysis (TIA) illustrating the influence of each change or delay on the Contract Completion Date or milestones. Unless the Contracting Officer requests an interim update to the schedule, the current monthly updated schedule accepted by the Government shall be used to display the impacts of the change. Unless requested by the Contracting Officer, no other non-conformed changes will be incorporated into the schedule being used to justify the change impact.
- b. Each TIA shall include a Fragmentary Network (fragnet) demonstrating how the Contractor proposes to incorporate the impact into the project schedule. A fragnet is defined as the sequence of new activities and/or activity revisions, logic relationships and resource changes that are proposed to be added to the existing schedule to demonstrate the influence of impacts to the schedule. The fragnet shall identify the predecessors to the new activities and demonstrate the impacts to successor activities. The Contractor shall provide a hardcopy printout of the fragnet activities and relationships being added and also insert the fragnet into the most current, accepted Monthly Network Analysis Update, run the schedule calculations and submit the impacted schedule with the proposal, claim, etc. Include a narrative report describing the effects of new activities and relationships to interim and contract completion dates, with each TIA. Submit time extension requests with a Time Impact Analysis and three hardcopies of the fragnet (in a graphic format), impacted schedule (with fragnet loaded), Total Float Report, Narrative Report and Log Report.
- c. Following the Contractor's receipt of a contract modification on a Standard Form 30 signed by the Government; all changes in the fragnet used to determine impacts, shall be incorporated into the schedule. Changes to the schedule will occur during the next monthly schedule update meeting.

1.8.2 No Reservation-Of-Rights

All direct costs, indirect costs, and time extensions will be negotiated and made full, equitable and final at the time of modification issuance.

1.9 CHANGES TO THE NETWORK ANALYSIS SCHEDULE

If changes in the method of operating and scheduling are desired, the Contracting Officer shall be notified in writing stating the reasons for the change. If the Contracting Officer considers these changes to be of a major nature, the Contractor may be required to revise and submit for acceptance, without additional cost to the Government, the network diagrams

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

and required reports. A change may be considered of a major nature if the estimated time required or actually used for an activity or the network logic has varied from the original plan to a degree that there is a reasonable doubt as to the effect on the contract completion date(s). Changes that affect activities with adequate float time shall be considered a major change when their cumulative effect could extend the contract completion date.

1.10 FLOAT

Use of float suppression techniques, such as; preferential sequencing (arranging critical path through activities more susceptible to Government caused delay), lag logic restraints, zero total or free float constraints, extended activity times, or imposing constraint dates other than as required by the contract, shall be cause for rejection of the project schedule or its updates. The use of Resource Leveling (or similar software features) used for the purpose of artificially adjusting activity durations to consume float and influence the critical path is expressly prohibited.

1.10.1 Definitions of Float

Free Float is the length of time the start of an activity can be delayed without delaying the start of a successor activity. Total Float is the length of time along a given network path that the actual start and finish of activity(s) can be delayed without delaying the project completion date. Project Float is the length of time between the Contractor's Early Completion (or Substantial Completion or similar activity) and the Contract Completion Date.

1.10.2 Ownership of Float

Float available in the schedule, at any time shall not be considered for the exclusive use of either the Government or the Contractor. During the course of contract execution, any float generated due to the efficiencies of either party is not for the sole use of the party generating the float; rather it is a shared commodity to be reasonably used by either party. Efficiencies gained as a result of favorable weather within a calendar month, where the number of days of normally anticipated weather is less than expected, will also contribute to the reserve of float. A schedule showing work completing in less time than the Contract time, and accepted by the Government, will be considered to have Project Float. Project Float will be a resource available to both the Government and the Contractor. No time extensions will be granted nor delay damages paid unless a delay occurs which impacts the Project's critical path, consumes all available float or contingency time, and extends the work beyond the Contract Completion Date.

1.10.3 Negative Float

Negative float will not be a basis for requesting time extensions. Any extension of time will be addressed in accordance with the paragraphs entitled "CONTRACT MODIFICATION". Scheduled completion date(s) that extend beyond the contract completion date(s) (evidenced by negative float) may be used in computations for assessment of payment withholdings. The use of this computation is not to be construed as a means of acceleration.

1.11 THREE-WEEK LOOK AHEAD SCHEDULE

To provide a more detailed day-to-day planning of upcoming construction

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

work, the Contractor shall prepare and issue detailed work plans that coordinate with and supplement the above defined network analysis. The work plans shall be keyed to the CPM activity numbers and shall be submitted each week and shall show the project activities that will occur during the current and following two-week interval. Additionally, the critical path activities are to be identified on the 3-Week Look Ahead Schedule. The schedule will be a bar chart type schedule prepared by the Contractor in sufficient detail to define the work to be accomplished, the crews, construction tools and equipment to be used during the current and next two-week interval. The bar charts shall be formatted to allow reproduction on 8 1/2 by 11 sheets. Three copies of the bar chart schedules shall be delivered to the Contracting Officer not less than 3 work hours prior to the start of the weekly coordination meeting.

1.12 CORRESPONDENCE AND TEST REPORTS

All correspondence (e.g., letters, Requests for Information (RFIs), e-mails, meeting minute items, Production and QC Daily Reports, material delivery tickets, photographs, etc.) shall reference the Schedule Activity Number(s) that are being addressed. All test reports (e.g., concrete, soil compaction, weld, pressure, etc.) shall reference the Schedule Activity Number(s) that are being addressed.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

SECTION 01 33 00

SUBMITTAL PROCEDURES

11/08

PART 1 GENERAL

1.1 DEFINITIONS

1.1.1 Submittal

Contract Clauses "FAR 52.236-5, Material and Workmanship," paragraph (b) and "FAR 52.236-21, Specifications and Drawings for Construction," paragraphs (d), (e), and (f) apply to all "submittals."

1.1.2 Submittal Descriptions (SD)

Submittals requirements are specified in the technical sections. Submittals are identified by Submittal Description (SD) numbers and titles as follows:

SD-01 Preconstruction Submittals

Submittals which are required prior to a notice to proceed commencing work on site. Submittals required prior to the start of the next major phase of the construction on a multi-phase contract. Schedules or tabular list of data or tabular list including location, features, or other pertinent information regarding products, materials, equipment, or components to be used in the work, submitted prior to contract notice to proceed or next major phase of construction.

Certificates of insurance
Surety bonds
List of proposed subcontractors
List of proposed products
Construction Progress Schedule
Network Analysis Schedule (NAS)
Submittal register
Schedule of prices
Health and safety plan
Work plan
Quality control (QC) plan
Environmental protection plan

SD-02 Shop Drawings

Drawings, diagrams and schedules specifically prepared to illustrate some portion of the work.

Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the product or system into the project.

Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work will be coordinated.

SD-03 Product Data

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other characteristics of materials, systems or equipment for some portion of the work.

Samples of warranty language when the contract requires extended product warranties.

SD-04 Samples

Fabricated or unfabricated physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged.

Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project.

Field samples and mock-ups constructed on the project site establish standards by which the ensuring work can be judged. Includes assemblies or portions of assemblies which are to be incorporated into the project and those which will be removed at conclusion of the work.

SD-06 Test Reports

Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. (Testing must have been within three years of date of contract award for the project.)

Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work or prototype prepared for the project before shipment to job site.

Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.

Investigation reports.

Daily logs and checklists.

Final acceptance test and operational test procedure.

SD-07 Certificates

Statements printed on the manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements. Must be dated after award of project contract and clearly name the project.

Document required of Contractor, or of a manufacturer, supplier, installer or subcontractor through Contractor, the purpose of which is to further quality of orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel qualifications.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

Confined space entry permits.

Text of posted operating instructions.

SD-08 Manufacturer's Instructions

Preprinted material describing installation of a product, system or material, including special notices and Material Safety Data sheets concerning impedances, hazards and safety precautions.

SD-10 Operation and Maintenance Data

Data that is furnished by the manufacturer, or the system provider, to the equipment operating and maintenance personnel, including manufacturer's help and product line documentation necessary to maintain and install equipment. This data is needed by operating and maintenance personnel for the safe and efficient operation, maintenance and repair of the item.

This data is intended to be incorporated in an operations and maintenance manual or control system.

SD-11 Closeout Submittals

Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.

Special requirements necessary to properly close out a construction contract. For example, Record Drawings and as-built drawings. Also, submittal requirements necessary to properly close out a major phase of construction on a multi-phase contract.

1.1.3 Approving Authority

Office or designated person authorized to approve submittal.

1.1.4 Work

As used in this section, on- and off-site construction required by contract documents, including labor necessary to produce submittals, construction, materials, products, equipment, and systems incorporated or to be incorporated in such construction.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor QC approval. Submit the following in accordance with this section.

SD-01 Preconstruction Submittals

Submittal register; G

1.3 USE OF SUBMITTAL REGISTER

Submittal register will be delivered to the Contractor, by Contracting Officer. Register will have the following fields completed, to the extent that will be required by the Government during subsequent usage.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

Column (c): Lists specification section in which submittal is required.

Column (d): Lists each submittal description (SD No. and type, e.g. SD-04 Drawings) required in each specification section.

Column (e): Lists one principal paragraph in specification section where a material or product is specified. This listing is only to facilitate locating submitted requirements. Do not consider entries in column (e) as limiting project requirements.

Column (f): Indicate approving authority for each submittal. A "G" indicates approval by Contracting Officer; a blank indicates approval by QC manager.

Prepare and maintain submittal register, as the work progresses. Do not change data which is output in columns (c), (d), (e), and (f) as delivered by Government; retain data which is output in columns (a), (g), (h), and (i) as approved.

1.3.1 Submittal Register

Submit submittal register. Submit with quality control plan and project schedule required by Section 01 45 01.00 20 QUALITY CONTROL(QC) - MINOR CONSTRUCTION and Section 01 32 17.00 20 NETWORK ANALYSIS SCHEDULES (NAS). Verify that all submittals required for project are listed and add missing submittals. Complete the following on the register:

Column (a) Activity Number: Activity number from the project schedule.

Column (g) Contractor Submit Date: Scheduled date for approving authority to receive submittals.

Column (h) Contractor Approval Date: Date Contractor needs approval of submittal.

Column (i) Contractor Material: Date that Contractor needs material delivered to Contractor control.

1.3.2 Contractor Use of Submittal Register

Update the following fields:

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

Column (j) Action Code (k): Date of action used to record Contractor's review when forwarding submittals to QC.

Column (l) List date of submittal transmission.

Column (q) List date approval received.

1.3.3 Approving Authority Use of Submittal Register

Update the following fields:

Column (b).

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

Column (l) List date of submittal receipt.

Column (m) through (p).

Column (q) List date returned to Contractor.

1.3.4 Contractor Action Code and Action Code

Entries used shall be as follows (others may be prescribed by Transmittal Form):

NR - Not Received

AN - Approved as noted

A - Approved

RR - Disapproved, Revise, and Resubmit

1.3.5 Copies Delivered to the Government

Deliver one copy of submittal register updated by Contractor to Government with each invoice request.

1.4 PROCEDURES FOR SUBMITTALS

1.4.1 Reviewing, Certifying, Approving Authority

QC organization shall be responsible for reviewing and certifying that submittals are in compliance with contract requirements. Approving authority on submittals is QC manager unless otherwise specified for specific submittal. At each "Submittal" paragraph in individual specification sections, a notation "G," following a submittal item, indicates Contracting Officer is approving authority for that submittal item. A notation "(LEED)" indicates the submittal shall be included in the LEED Documentation Notebook as defined in Section 01 33 29 LEED(TM) DOCUMENTATION.

1.4.2 Constraints

- a. Submittals listed or specified in this contract shall conform to provisions of this section, unless explicitly stated otherwise.
- b. Submittals shall be complete for each definable feature of work; components of definable feature interrelated as a system shall be submitted at same time.
- c. When acceptability of a submittal is dependent on conditions, items, or materials included in separate subsequent submittals, submittal will be returned without review.
- d. Approval of a separate material, product, or component does not imply approval of assembly in which item functions.

1.4.3 Scheduling

- a. Coordinate scheduling, sequencing, preparing and processing of submittals with performance of work so that work will not be

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

delayed by submittal processing. Allow for potential requirements to resubmit.

- b. Except as specified otherwise, allow review period, beginning with receipt by approving authority, that includes at least 15 working days for submittals for QC Manager approval and 20 working days for submittals for Contracting Officer approval. Period of review for submittals with Contracting Officer approval begins when Government receives submittal from QC organization. Period of review for each resubmittal is the same as for initial submittal.
- c. For submittals requiring review by fire protection engineer, allow review period, beginning when Government receives submittal from QC organization, of 30 working days for return of submittal to the Contractor. Period of review for each resubmittal is the same as for initial submittal.

1.4.4 Variations

Variations from contract requirements require Government approval pursuant to contract Clause entitled "FAR 52.236-21, Specifications and Drawings for Construction" and will be considered where advantageous to Government.

1.4.4.1 Considering Variations

Discussion with Contracting Officer prior to submission, will help ensure functional and quality requirements are met and minimize rejections and resubmittals. When contemplating a variation which results in lower cost, consider submission of the variation as a Value Engineering Change Proposal (VECP).

1.4.4.2 Proposing Variations

When proposing variation, deliver written request to the Contracting Officer, with documentation of the nature and features of the variation and why the variation is desirable and beneficial to Government. If lower cost is a benefit, also include an estimate of the cost saving. In addition to documentation required for variation, include the submittals required for the item. Clearly mark the proposed variation in all documentation.

1.4.4.3 Warranting That Variations Are Compatible

When delivering a variation for approval, Contractor warrants that this contract has been reviewed to establish that the variation, if incorporated, will be compatible with other elements of work.

1.4.4.4 Review Schedule Is Modified

In addition to normal submittal review period, a period of 10 working days will be allowed for consideration by the Government of submittals with variations.

1.4.5 Contractor's Responsibilities

- a. Determine and verify field measurements, materials, field construction criteria; review each submittal; and check and coordinate each submittal with requirements of the work and contract documents.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

- b. Transmit submittals to QC organization in accordance with schedule on approved Submittal Register, and to prevent delays in the work, delays to Government, or delays to separate Contractors.
- c. Advise Contracting Officer of variation, as required by paragraph entitled "Variations."
- d. Correct and resubmit submittal as directed by approving authority. When resubmitting disapproved transmittals or transmittals noted for resubmittal, the Contractor shall provide copy of that previously submitted transmittal including all reviewer comments for use by approving authority. Direct specific attention in writing or on resubmitted submittal, to revisions not requested by approving authority on previous submissions.
- e. Furnish additional copies of submittal when requested by Contracting Officer, to a limit of 20 copies per submittal.
- f. Complete work which must be accomplished as basis of a submittal in time to allow submittal to occur as scheduled.
- g. Ensure no work has begun until submittals for that work have been returned as "approved," or "approved as noted", except to the extent that a portion of work must be accomplished as basis of submittal.

1.4.6 QC Organization Responsibilities

- a. Note date on which submittal was received from Contractor on each submittal.
- b. Review each submittal; and check and coordinate each submittal with requirements of work and contract documents.
- c. Review submittals for conformance with project design concepts and compliance with contract documents.
- d. Act on submittals, determining appropriate action based on QC organization's review of submittal.
 - (1) When QC manager is approving authority, take appropriate action on submittal from the possible actions defined in paragraph entitled, "Actions Possible."
 - (2) When Contracting Officer is approving authority or when variation has been proposed, forward submittal to Government with certifying statement or return submittal marked "not reviewed" or "revise and resubmit" as appropriate. The QC organization's review of submittal determines appropriate action.
- e. Ensure that material is clearly legible.
- f. Stamp each sheet of each submittal with QC certifying statement or approving statement, except that data submitted in bound volume or on one sheet printed on two sides may be stamped on the front of the first sheet only.

- (1) When approving authority is Contracting Officer, QC

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

organization will certify submittals forwarded to Contracting Officer with the following certifying statement:

"I hereby certify that the (equipment) (material) (article) shown and marked in this submittal is that proposed to be incorporated with contract Number _____, is in compliance with the contract drawings and specification, can be installed in the allocated spaces, and is submitted for Government approval.

Certified by Submittal Reviewer _____, Date _____
(Signature when applicable)

Certified by QC Manager _____, Date _____"
(Signature)

(2) When approving authority is QC Manager, QC Manager will use the following approval statement when returning submittals to Contractor as "Approved" or "Approved as Noted."

"I hereby certify that the (material) (equipment) (article) shown and marked in this submittal and proposed to be incorporated with contract Number _____, is in compliance with the contract drawings and specification, can be installed in the allocated spaces, and is approved for use.

Certified by Submittal Reviewer _____, Date _____
(Signature when applicable)

Approved by QC Manager _____, Date _____"
(Signature)

- g. Sign certifying statement or approval statement. The person signing certifying statements shall be QC organization member designated in the approved QC plan. The signatures shall be in original ink. Stamped signatures are not acceptable.
- h. Update submittal register as submittal actions occur and maintain the submittal register at project site until final acceptance of all work by Contracting Officer.
- i. Retain a copy of approved submittals at project site, including Contractor's copy of approved samples.

1.4.7 Government's Responsibilities

When approving authority is Contracting Officer, the Government will:

- a. Note date on which submittal was received from QC manager, on each submittal for which the Contracting Officer is approving authority.
- b. Review submittals for approval within scheduling period specified and only for conformance with project design concepts and compliance with contract documents.
- c. Identify returned submittals with one of the actions defined in paragraph entitled "Actions Possible" and with markings appropriate for action indicated.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

1.4.8 Actions Possible

Submittals will be returned with one of the following notations:

- a. Submittals marked "not reviewed" will indicate submittal has been previously reviewed and approved, is not required, does not have evidence of being reviewed and approved by Contractor, or is not complete. A submittal marked "not reviewed" will be returned with an explanation of the reason it is not reviewed. Resubmit submittals returned for lack of review by Contractor or for being incomplete, with appropriate action, coordination, or change.
- b. Submittals marked "approved" "approved as submitted" authorize Contractor to proceed with work covered.
- c. Submittals marked "approved as noted" or "approval except as noted; resubmission not required" authorize Contractor to proceed with work as noted provided Contractor takes no exception to the notations.
- d. Submittals marked "revise and resubmit" or "disapproved" indicate submittal is incomplete or does not comply with design concept or requirements of the contract documents and shall be resubmitted with appropriate changes. No work shall proceed for this item until resubmittal is approved.

1.5 FORMAT OF SUBMITTALS

1.5.1 Transmittal Form

Transmit each submittal, except sample installations and sample panels to office of approving authority. Transmit submittals with transmittal form prescribed by Contracting Officer and standard for project. On the transmittal form identify Contractor, indicate date of submittal, and include information prescribed by transmittal form and required in paragraph entitled "Identifying Submittals." Each item requiring a submittal shall be listed separately on the transmittal form and shall reference the paragraph of the Section that describes that item. Process transmittal forms to record actions regarding samples installations.

1.5.2 Identifying Submittals

Identify submittals, except sample installations and sample panels, with the following information permanently adhered to or noted on each separate component of each submittal and noted on transmittal form. Mark each copy of each submittal identically, with the following:

- a. Project title and location.
- b. Construction contract number.
- c. Section number of the specification section by which submittal is required.
- d. Submittal description (SD) number of each component of submittal.
- e. When a resubmission, add alphabetic suffix on submittal description, for example, submittal 18 would become 18A, to indicate resubmission.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

- f. Name, address, and telephone number of subcontractor, supplier, manufacturer and any other second tier Contractor associated with submittal.
- g. Product identification and location in project.

1.5.3 Format for SD-02 Shop Drawings

- a. Shop drawings are not to be less than 8 1/2 by 11 inches nor more than 30 by 42 inches, except for full size patterns or templates. Prepare drawings to accurate size, with scale indicated, unless other form is required. Drawings are to be suitable for reproduction and be of a quality to produce clear, distinct lines and letters with dark lines on a white background.
- b. Present A4 8 1/2 by 11 inches sized shop drawings as part of the bound volume for submittals required by section. Present larger drawings in sets.
- c. Include on each drawing the drawing title, number, date, and revision numbers and dates, in addition to information required in paragraph entitled "Identifying Submittals."
- d. Number drawings in a logical sequence. Contractors may use their own number system. Each drawing is to bear the number of the submittal in a uniform location adjacent to the title block. Place the Government contract number in the margin, immediately below the title block, for each drawing.
- e. Reserve a blank space, no smaller than 4 by 4 inches on the right hand side of each sheet for the Government disposition stamp.
- f. Dimension drawings, except diagrams and schematic drawings; prepare drawings demonstrating interface with other trades to scale. Use the same unit of measure for shop drawings as indicated on the contract drawings. Identify materials and products for work shown.
- g. Include the nameplate data, size and capacity on drawings. Also include applicable federal, military, industry and technical society publication references.

1.5.4 Format of SD-03 Product Data and SD-08 Manufacturer's Instructions

- a. Present product data submittals for each section as a complete, bound volume. Include table of contents, listing page and catalog item numbers for product data.
- b. Indicate, by prominent notation, each product which is being submitted; indicate specification section number and paragraph number to which it pertains.
- c. Supplement product data with material prepared for project to satisfy submittal requirements for which product data does not exist. Identify this material as developed specifically for project, with information and format as required for submission of SD-07 Certificates.
- d. Provide product data in metric dimensions. Where product data are

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

included in preprinted catalogs with English units only, submit metric dimensions on separate sheet.

- e. Include the manufacturer's name, trade name, place of manufacture, and catalog model or number on product data. Also include applicable federal, military, industry and technical society publication references. Should manufacturer's data require supplemental information for clarification, submit as specified for SD-07 Certificates.
- f. Where equipment or materials are specified to conform to industry and technical society reference standards of the organizations such as American National Standards Institute (ANSI), ASTM International (ASTM), National Electrical Manufacturer's Association (NEMA), Underwriters Laboratories (UL), and Association of Edison Illuminating Companies (AEIC), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance. In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing, and approved by the Contracting Officer. State on the certificate that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.
- g. Collect required data submittals for each specific material, product, unit of work, or system into a single submittal and marked for choices, options, and portions applicable to the submittal. Mark each copy of the product data identically. Partial submittals will not be accepted for expedition of construction effort.
- h. Submit manufacturer's instructions prior to installation.

1.5.5 Format of SD-04 Samples

- a. Furnish samples in sizes below, unless otherwise specified or unless the manufacturer has prepackaged samples of approximately same size as specified:
 - (1) Sample of Equipment or Device: Full size.
 - (2) Sample of Materials Less Than 2 by 3 inches: Built up to A4 8 1/2 by 11 inches.
 - (3) Sample of Materials Exceeding A4 8 1/2 by 11 inches: Cut down to A4 8 1/2 by 11 inches and adequate to indicate color, texture, and material variations.
 - (4) Sample of Linear Devices or Materials: 10 inch length or length to be supplied, if less than 10 inches. Examples of linear devices or materials are conduit and handrails.
 - (5) Sample of Non-Solid Materials: Pint. Examples of non-solid materials are sand and paint.
 - (6) Color Selection Samples: 2 by 4 inches. Where samples are specified for selection of color, finish, pattern, or texture, submit the full set of available choices for the material or

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

product specified. Sizes and quantities of samples are to represent their respective standard unit.

(7) Sample Panel: 4 by 4 feet.

(8) Sample Installation: 100 square feet.

- b. Samples Showing Range of Variation: Where variations in color, finish, pattern, or texture are unavoidable due to nature of the materials, submit sets of samples of not less than three units showing extremes and middle of range. Mark each unit to describe its relation to the range of the variation.
- c. Reusable Samples: Incorporate returned samples into work only if so specified or indicated. Incorporated samples are to be in undamaged condition at time of use.
- d. Recording of Sample Installation: Note and preserve the notation of area constituting sample installation but remove notation at final clean up of project.
- e. When color, texture or pattern is specified by naming a particular manufacturer and style, include one sample of that manufacturer and style, for comparison.

1.5.6 Format of SD-05 Design Data and SD-07 Certificates

Provide design data and certificates on 8 1/2 by 11 inches paper. Provide a bound volume for submittals containing numerous pages.

1.5.7 Format of SD-06 Test Reports and SD-09 Manufacturer's Field Reports

- a. Provide reports on 8 1/2 by 11 inches paper in a complete bound volume.
- b. Indicate by prominent notation, each report in the submittal. Indicate specification number and paragraph number to which it pertains.

1.5.8 Format of SD-10 Operation and Maintenance Data (O&M)

Comply with the requirements specified in Section 01 78 23 OPERATION AND MAINTENANCE DATA for O&M Data format.

1.5.9 Format of SD-01 Preconstruction Submittals and SD-11 Closeout Submittals

- a. When submittal includes a document which is to be used in project or become part of project record, other than as a submittal, do not apply Contractor's approval stamp to document, but to a separate sheet accompanying document.
- b. Provide all dimensions in administrative submittals in metric. Where data are included in preprinted material with English units only, submit metric dimensions on separate sheet.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

1.6 QUANTITY OF SUBMITTALS

1.6.1 Number of Copies of SD-02 Shop Drawings

Submit six copies of submittals of shop drawings requiring review and approval only by QC organization and seven copies of shop drawings requiring review and approval by Contracting Officer.

1.6.2 Number of Copies of SD-03 Product Data and SD-08 Manufacturer's Instructions

Submit in compliance with quantity requirements specified for shop drawings.

1.6.3 Number of Samples SD-04 Samples

- a. Submit two samples, or two sets of samples showing range of variation, of each required item. One approved sample or set of samples will be retained by approving authority and one will be returned to Contractor.
- b. Submit one sample panel or provide one sample installation where directed. Include components listed in technical section or as directed.
- c. Submit one sample installation, where directed.
- d. Submit one sample of non-solid materials.

1.6.4 Number of Copies SD-05 Design Data and SD-07 Certificates

Submit in compliance with quantity requirements specified for shop drawings.

1.6.5 Number of Copies SD-06 Test Reports and SD-09 Manufacturer's Field Reports

Submit in compliance with quantity and quality requirements specified for shop drawings other than field test results that will be submitted with QC reports.

1.6.6 Number of Copies of SD-10 Operation and Maintenance Data

Submit Five copies of O&M Data to the Contracting Officer for review and approval.

1.6.7 Number of Copies of SD-01 Preconstruction Submittals and SD-11 Closeout Submittals

Unless otherwise specified, submit administrative submittals in compliance with quantity requirements specified for shop drawings.

1.7 SUBMITTAL REGISTER

Prepare and maintain submittal register, as the work progresses. Do not change data which is output in columns (c), (d), (e), and (f) as delivered by Government; retain data which is output in columns (a), (g), (h), and (i) as approved. A submittal register showing items of equipment and materials for which submittals are required by the specifications is provided as an attachment. This list may not be all inclusive and

Construct Battalion Synthetic Running Track
 Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
 100% Submittal

additional submittals may be required. Maintain a submittal register for the project in accordance with Section 01 45 01.10 USACE QUALITY CONTROL SYSTEM (QCS). The Government will provide the initial submittal register in electronic format with the following fields completed, to the extent that will be required by the Government during subsequent usage.

Column (c): Lists specification section in which submittal is required.

Column (d): Lists each submittal description (SD No. and type, e.g. SD-02 Shop Drawings) required in each specification section.

Column (e): Lists one principal paragraph in specification section where a material or product is specified. This listing is only to facilitate locating submitted requirements. Do not consider entries in column (e) as limiting project requirements.

Column (f): Indicate approving authority for each submittal.

The database and submittal management program will be furnished to Contractor on a Writable Compact Disk (CD-R), for operation on Windows based personal computer.

Thereafter, the Contractor is to track all submittals by maintaining a complete list, including completion of all data columns, including dates on which submittals are received and returned by the Government.

The Designer of Record shall develop a complete list of submittals during design and identify required submittals in the specifications, and use the list to prepare the Submittal Register. The list may not be all inclusive and additional submittals may be required by other parts of the contract. The Contractor is required to complete the submittal register and submit it to the Contracting Officer for approval within 30 calendar days after Notice to Proceed. The approved submittal register will serve as a scheduling document for submittals and will be used to control submittal actions throughout the contract period. Coordinate the submit dates and need dates with dates in the Contractor prepared progress schedule. Submit monthly or until all submittals have been satisfactorily completed, updates to the submittal register showing the Contractor action codes and actual dates with Government action codes. Revise the submittal register when the progress schedule is revised and submit both for approval.

1.7.1 Use of Submittal Register

Submit submittal register. Submit with QC plan and project schedule. Verify that all submittals required for project are listed and add missing submittals. Coordinate and complete the following fields on the register submitted with the QC plan and the project schedule:

Column (a) Activity Number: Activity number from the project schedule.

Column (g) Contractor Submit Date: Scheduled date for approving authority to receive submittals.

Column (h) Contractor Approval Date: Date Contractor needs approval of submittal.

Column (i) Contractor Material: Date that Contractor needs

Construct Battalion Synthetic Running Track
 Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
 100% Submittal

material delivered to Contractor control.

1.7.2 Contractor Use of Submittal Register

Update the following fields in the Government-furnished submittal register program or equivalent fields in program utilized by Contractor with each submittal throughout contract.

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

Column (j) Action Code (k): Date of action used to record Contractor's review when forwarding submittals to QC.

Column (l) List date of submittal transmission.

Column (q) List date approval received.

1.7.3 Approving Authority Use of Submittal Register

Update the following fields in the Government-furnished submittal register program or equivalent fields in program utilized by Contractor.

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

Column (l) List date of submittal receipt.

Column (m) through (p) List Date related to review actions.

Column (q) List date returned to Contractor.

1.7.4 Contractor Action Code and Action Code

Entries for columns (j) and (o), are to be used are as follows (others may be prescribed by Transmittal Form):

NR - Not Received

AN - Approved as noted

A - Approved

RR - Disapproved, Revise, and Resubmit

1.7.5 Copies Delivered to the Government

Deliver one copy of submittal register updated by Contractor to Government with each invoice request.

1.8 SCHEDULING

Schedule and submit concurrently submittals covering component items forming a system or items that are interrelated. Include certifications to be submitted with the pertinent drawings at the same time. No delay damages or time extensions will be allowed for time lost in late submittals. An additional 10 calendar days will be allowed and shown on the register for review and approval of submittals for refrigeration and HVAC control systems.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

- a. Coordinate scheduling, sequencing, preparing and processing of submittals with performance of work so that work will not be delayed by submittal processing. Allow for potential resubmittal of requirements.
- b. Submittals called for by the contract documents will be listed on the register. If a submittal is called for but does not pertain to the contract work, the Contractor is to include the submittal in the register and annotate it "N/A" with a brief explanation. Approval by the Contracting Officer does not relieve the Contractor of supplying submittals required by the contract documents but which have been omitted from the register or marked "N/A".
- c. Re-submit register and annotate monthly by the Contractor with actual submission and approval dates. When all items on the register have been fully approved, no further re-submittal is required.
- d. Carefully control procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."
- e. Except as specified otherwise, allow review period, beginning with receipt by approving authority, that includes at least 15 working days for submittals for QC Manager approval and 20 working days for submittals for Contracting Officer approval. Period of review for submittals with Contracting Officer approval begins when Government receives submittal from QC organization.
- f. For submittals requiring review by fire protection engineer, allow review period, beginning when Government receives submittal from QC organization, of 30 working days for return of submittal to the Contractor.
- g. Period of review for each resubmittal is the same as for initial submittal.

1.8.1 Reviewing, Certifying, Approving Authority

The QC organization is responsible for reviewing and certifying that submittals are in compliance with contract requirements. Approving authority on submittals is QC Manager unless otherwise specified for specific submittal. At each "Submittal" paragraph in individual specification sections, a notation "G," following a submittal item, indicates Contracting Officer is approving authority for that submittal item.

1.8.2 Constraints

- a. Conform to provisions of this section, unless explicitly stated otherwise for submittals listed or specified in this contract.
- b. Submit complete submittals for each definable feature of work. Submit at the same time components of definable feature interrelated as a system.
- c. When acceptability of a submittal is dependent on conditions,

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

items, or materials included in separate subsequent submittals, submittal will be returned without review.

- d. Approval of a separate material, product, or component does not imply approval of assembly in which item functions.

1.8.3 QC Organization Responsibilities

- a. Note date on which submittal was received from Contractor on each submittal.
- b. Review each submittal; and check and coordinate each submittal with requirements of work and contract documents.
- c. Review submittals for conformance with project design concepts and compliance with contract documents.
- d. Act on submittals, determining appropriate action based on QC organization's review of submittal.

(1) When QC Manager is approving authority, take appropriate action on submittal from the possible actions defined in paragraph entitled, "Actions Possible."

(2) When Contracting Officer is approving authority or when variation has been proposed, forward submittal to Government with certifying statement or return submittal marked "not reviewed" or "revise and resubmit" as appropriate. The QC organization's review of submittal determines appropriate action.

- e. Ensure that material is clearly legible.
- f. Stamp each sheet of each submittal with QC certifying statement or approving statement, except that data submitted in bound volume or on one sheet printed on two sides may be stamped on the front of the first sheet only.

(1) When approving authority is Contracting Officer, QC organization will certify submittals forwarded to Contracting Officer with the following certifying statement:

"I hereby certify that the (equipment) (material) (article) shown and marked in this submittal is that proposed to be incorporated with contract Number , is in compliance with the contract drawings and specification, can be installed in the allocated spaces, and is submitted for Government approval.

Certified by Submittal Reviewer _____, Date _____
(Signature when applicable)

Certified by QC Manager _____, Date _____"
(Signature)

(2) When approving authority is QC Manager, QC Manager will use the following approval statement when returning submittals to Contractor as "Approved" or "Approved as Noted."

"I hereby certify that the (material) (equipment) (article) shown and marked in this submittal and proposed to be incorporated with contract

Construct Battalion Synthetic Running Track
 Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
 100% Submittal

Number , is in compliance with the contract drawings and specification, can be installed in the allocated spaces, and is approved for use.

Certified by Submittal Reviewer _____, Date _____
 (Signature when applicable)

Approved by QC Manager _____, Date _____"
 (Signature)

- g. Sign certifying statement or approval statement. The QC organization member designated in the approved QC plan is the person signing certifying statements. The use of original ink for signatures is required. Stamped signatures are not acceptable.
- h. Update submittal register as submittal actions occur and maintain the submittal register at project site until final acceptance of all work by Contracting Officer.
- i. Retain a copy of approved submittals at project site, including Contractor's copy of approved samples.

1.9 GOVERNMENT APPROVING AUTHORITY

When approving authority is Contracting Officer, the Government will:

- a. Note date on which submittal was received from QC Manager.
- b. Review submittals for approval within scheduling period specified and only for conformance with project design concepts and compliance with contract documents.
- c. Identify returned submittals with one of the actions defined in paragraph entitled "Review Notations" and with markings appropriate for action indicated.

Upon completion of review of submittals requiring Government approval, stamp and date approved submittals. Six copies of the approved submittal will be retained by the Contracting Officer and five copies of the submittal will be returned to the Contractor.

1.9.1 Review Notations

Contracting Officer review will be completed within 10 calendar days after date of submission. Submittals will be returned to the Contractor with the following notations:

- a. Submittals marked "approved" or "accepted" authorize the Contractor to proceed with the work covered.
- b. Submittals marked "approved as noted" "or approved except as noted, resubmittal not required," authorize the Contractor to proceed with the work covered provided he takes no exception to the corrections.
- c. Submittals marked "not approved" or "disapproved," or "revise and resubmit," indicate noncompliance with the contract requirements or design concept, or that submittal is incomplete. Resubmit with appropriate changes. No work shall proceed for this item until resubmittal is approved.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

- d. Submittals marked "not reviewed" will indicate submittal has been previously reviewed and approved, is not required, does not have evidence of being reviewed and approved by Contractor, or is not complete. A submittal marked "not reviewed" will be returned with an explanation of the reason it is not reviewed. Resubmit submittals returned for lack of review by Contractor or for being incomplete, with appropriate action, coordination, or change.

1.10 DISAPPROVED OR REJECTED SUBMITTALS

Contractor shall make corrections required by the Contracting Officer. If the Contractor considers any correction or notation on the returned submittals to constitute a change to the contract drawings or specifications; notice as required under the clause entitled, "Changes" is to be given to the Contracting Officer. Contractor is responsible for the dimensions and design of connection details and construction of work. Failure to point out deviations may result in the Government requiring rejection and removal of such work at the Contractor's expense.

If changes are necessary to submittals, the Contractor shall make such revisions and submission of the submittals in accordance with the procedures above. No item of work requiring a submittal change is to be accomplished until the changed submittals are approved.

1.11 APPROVED/ACCEPTED SUBMITTALS

The Contracting Officer's approval or acceptance of submittals is not be construed as a complete check, and indicates only that the general method of construction, materials, detailing and other information are satisfactory design, general method of construction, materials, detailing and other information appear to meet the Solicitation and Accepted Proposal. Approval or acceptance will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Contractor Quality Control (CQC) requirements of this contract is responsible for dimensions, the design of adequate connections and details, and the satisfactory construction of all work. After submittals have been approved or accepted by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.12 APPROVED SAMPLES

Approval of a sample is only for the characteristics or use named in such approval and is not be construed to change or modify any contract requirements. Before submitting samples, the Contractor to assure that the materials or equipment will be available in quantities required in the project. No change or substitution will be permitted after a sample has been approved.

Match the approved samples for Materials and equipment incorporated in the work. If requested, approved samples, including those which may be damaged in testing, will be returned to the Contractor, at his expense, upon completion of the contract. Samples not approved will also be returned to the Contractor at its expense, if so requested.

Failure of any materials to pass the specified tests will be sufficient cause for refusal to consider, under this contract, any further samples of the same brand or make of that material. Government reserves the right to

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

disapproved any material or equipment which previously has proved unsatisfactory in service.

Samples of various materials or equipment delivered on the site or in place may be taken by the Contracting Officer for testing. Samples failing to meet contract requirements will automatically void previous approvals. Contractor to replace such materials or equipment to meet contract requirements.

Approval of the Contractor's samples by the Contracting Officer does not relieve the Contractor of his responsibilities under the contract.

1.13 WITHHOLDING OF PAYMENT

Payment for materials incorporated in the work will not be made if required approvals have not been obtained. No payment for materials incorporated in the work will be made if all required Designer of Record or required Government approvals have not been obtained. No payment will be made for any materials incorporated into the work for any conformance review submittals or information only submittals found to contain errors or deviations from the Solicitation or Accepted Proposal.

1.14 STAMPS

Stamps used by the Contractor on the submittal data to certify that the submittal meets contract requirements is to be similar to the following:

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

<p>CONTRACTOR</p> <p>(Firm Name)</p> <p>_____ Approved</p> <p>_____ Approved with corrections as noted on submittal data and/or attached sheets(s)</p> <p>SIGNATURE: _____</p> <p>TITLE: _____</p> <p>DATE: _____</p>

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SUBMITTAL REGISTER

CONTRACT NO.
W912HN-07-D-0025

Section:

TITLE AND LOCATION Construct Battalion Synthetic Running Track						CONTRACTOR											
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION REVIEW	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					REMARKS	
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE		DATE OF ACTION
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
	01 20 00.00 20		SD-01 Preconstruction Submittals Schedule of prices	1.3	G												
	01 30 00		SD-01 Preconstruction Submittals List of contact personnel Insurance Personnel list Vehicle list Statement of Acknowledgement Form SF 1413	1.6.1	G G G G												
	01 32 17.00 20		SD-01 Preconstruction Submittals Qualifications Standard Activity ID Dictionary Construction Network Analysis Schedule Baseline Network Analysis Schedule SD-07 Certificates Monthly Network Analysis Updates SD-11 Closeout Submittals As-Built Schedule	1.5 1.6.2.3 1.7.2 1.7.4 1.7.5 1.7.6	G G G G G G												
	01 33 00		SD-01 Preconstruction Submittals Submittal register	1.8	G												
	01 35 26		SD-01 Preconstruction Submittals Accident Prevention Plan (APP) Activity Hazard Analysis (AHA)	1.7 1.8	G A G A												

SUBMITTAL REGISTER

CONTRACT NO.
W912HN-07-D-0025

Section:

TITLE AND LOCATION Construct Battalion Synthetic Running Track						CONTRACTOR											
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					REMARKS	
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		01 35 26	SD-06 Test Reports														
			Reports	1.12													
			Accident Reports	1.12.1													
			Monthly Exposure Reports	1.12.3													
			Gas Protection	1.15													
			SD-07 Certificates														
			Hot work permit	1.9	G												
			Contractor Safety Self-Evaluation Checklist	1.4	G A												
			Certificate of Compliance														
		01 45 01	SD-01 Preconstruction Submittals														
			QC Plan	1.6	G												
		01 50 00	SD-03 Product Data														
			Backflow preventers	1.4													
			SD-06 Test Reports														
			Backflow Preventer Tests	3.3													
			SD-07 Certificates														
			Backflow Tester	1.6	G												
			Backflow Preventers	1.4													
		01 57 19.00 20	SD-01 Preconstruction Submittals														
			Preconstruction Survey	1.5.1	G												
			Dirt and Dust Control Plan	3.14.1	G												
			SD-06 Test Reports														
			Erosion and Sediment Control Inspection Reports		G												

SUBMITTAL REGISTER

CONTRACT NO.
W912HN-07-D-0025

Section:

TITLE AND LOCATION Construct Battalion Synthetic Running Track						CONTRACTOR											
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		01 57 19.00 20	Storm Water Inspection Reports for General Permit														
			Contractor 40 CFR employee training records	1.5.5													
			SD-11 Closeout Submittals Waste Determination Documentation	3.5													
			Disposal Documentation for Hazardous and Regulated Waste	3.6.1													
			Contractor 40 CFR Employee Training Records	1.5.5													
			Solid Waste Management Permit Contractor Hazardous Material Inventory Log	3.6	G												
			Hazardous Waste/Debris Management	3.13.1													
		01 78 00	SD-10 Operation and Maintenance Data														
			Equipment/Product Warranty List	1.4.1	G												
			SD-11 Closeout Submittals As-Built Drawings	1.3.1													
			Record of Materials		G												
			Equipment/Product Warranty Tag;		G												
			Form DD1354	1.7	G												
			Checklist for Form DD1354	1.7	G												

SUBMITTAL REGISTER

CONTRACT NO.
W912HN-07-D-0025

Section:

TITLE AND LOCATION Construct Battalion Synthetic Running Track						CONTRACTOR											
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION REVIEW	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					REMARKS	
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	02 41 00		SD-01 Preconstruction Submittals														
			Existing Conditions	1.6.2	G												
			SD-07 Certificates														
			Demolition Plan	1.8	G												
			Notifications	1.4.1	G												
			SD-11 Closeout Submittals														
			Receipts														
	31 00 00		SD-01 Preconstruction Submittals														
			Dewatering Work Plan		G												
			SD-03 Product Data														
			Utilization of Excavated Materials	3.8	G												
			SD-06 Test Reports														
			Testing	3.15													
			Borrow Fill Material		G												
			SD-07 Certificates														
			Testing	3.15	G												
	31 32 11		SD-01 Preconstruction Submittals														
			Work sequence schedule	1.6	G												
			Erosion control plan	1.6	G												
			SD-02 Shop Drawings														
			Layout	3.2.2	G												
			Erosion Control	3.2.2	G												
			Seed Establishment Period	2.2.2.1	G												
			Maintenance Record	3.6	G												
			SD-03 Product Data														
			Wood Cellulose Fiber	2.1.3	G												

SUBMITTAL REGISTER

CONTRACT NO.
W912HN-07-D-0025

Section:

TITLE AND LOCATION						CONTRACTOR											
Construct Battalion Synthetic Running Track																	
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					REMARKS	
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		31 32 11	Mulch Control Netting and Filter Fabric	2.1.5	G												
			Hydraulic Mulch	2.1.6	G												
			Erosion Control Blankets Type XI		G												
			Geotextile Fabrics		G												
			Equipment	1.2													
			Finished Grade	3.1.1													
			Erosion Control Blankets	2.2	G												
			SD-04 Samples														
			Materials	1.5													
			SD-06 Test Reports														
			Hydraulic Mulch	2.1.6	G												
			Geotextile Fabrics		G												
			Erosion Control Blankets	2.2	G												
			Sand	2.5	G												
			Gravel	2.5	G												
			SD-07 Certificates														
			Fill Material		G												
			Mulch	2.1	G												
			Hydraulic Mulch	2.1.6	G												
			Geotextile Fabrics		G												
			Installer's Qualification	1.4.1	G												
			Seed	2.2.2	G												
			Wood By-Products		G												
			Wood Cellulose Fiber	2.1.3	G												

SUBMITTAL REGISTER

CONTRACT NO.
W912HN-07-D-0025

Section:

TITLE AND LOCATION						CONTRACTOR											
Construct Battalion Synthetic Running Track						CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY						
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		31 32 11	SD-10 Operation and Maintenance Data														
			Maintenance Instructions	3.6.2	G												
			SD-11 Closeout Submittals														
			Wood Cellulose Fiber	2.1.3	G												
			Mulch Control Netting and Filter Fabric	2.1.5	G												
			Hydraulic Mulch	2.1.6	G												
			Erosion Control Blankets Type III		G												
			Geotextile Fabrics		G												
		32 10 00	SD-03 Product Data														
			Aggregate		G												
			Asphalt cement		G												
			Job Mix Formula	1.3.5	G												
			SD-06 Test Reports														
			Trial batch	1.3.4	G												
			Mix design	1.3.5	G												
			Graded Aggregate Base Course		G												
			Asphalt concrete Surface Course		G												
			Density	3.3.2.2	G												
			Thickness	3.3.2.2	G												
			Straightedge test	3.3.2.2	G												
			SD-07 Certificates														
			mix delivery record	1.3.3	G												
			Bituminous Prime Coat		G												
			Asphalt concrete	2.1	G												

SUBMITTAL REGISTER

CONTRACT NO.
W912HN-07-D-0025

Section:

TITLE AND LOCATION Construct Battalion Synthetic Running Track						CONTRACTOR											
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION REVIEW	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					REMARKS	
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		32 13 13.06	SD-03 Product Data														
			Curing materials		G												
			Cementitious Materials		G												
			Aggregate	2.1.3	G												
			SD-05 Design Data														
			mix design	2.2	G												
			SD-06 Test Reports														
			Aggregate	2.1.3	G												
			Concrete slump tests	3.6.2	G												
			SD-07 Certificates														
			Ready-mixed concrete plant	1.4.1	G												
			Cementitious materials		G												
		32 18 00	SD-03 Product Data														
			Synthetic Surface Material	2.1	G												
			SD-04 Samples														
			Synthetic Surface Material	2.1	G												
			SD-07 Certificates														
			Manufacturer	2.2.7	G												
			Installer	1.5.1	G												
		32 92 19	SD-03 Product Data														
			Wood cellulose fiber mulch	2.5.3	G												
			Fertilizer	2.4	G												
			SD-06 Test Reports														
			Topsoil composition tests	2.2.3	G												
			SD-07 Certificates														
			seed	2.1	G												

SUBMITTAL REGISTER

CONTRACT NO.
W912HN-07-D-0025

Section:

TITLE AND LOCATION Construct Battalion Synthetic Running Track						CONTRACTOR											
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	GOVT CLASSIFICATION / REVIEWER	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					REMARKS	
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		32 92 19	SD-08 Manufacturer's Instructions														
			Erosion Control Materials	2.7	G												
		32 92 23	SD-03 Product Data														
			Fertilizer	2.3	G												
			SD-06 Test Reports														
			Topsoil composition tests	2.2.3	G												
			SD-07 Certificates														
			sods	2.1	G												
		33 40 00	SD-03 Product Data														
			Placing Pipe	3.3													
			; G														
			SD-07 Certificates														
			Resin Certification	2.1.5													
			Resin Certification	2.1.6													
			; G														
			Determination of Density	3.7.5													
			Frame and Cover for Gratings	2.3.7													

Construct Battalion Synthetic Running Track
 Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
 100% Submittal

SECTION 01 35 26

GOVERNMENTAL SAFETY REQUIREMENTS

02/09

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.34 (2001; R 2005) Protection of the Public on
 or Adjacent to Construction Sites

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)

NASA NPG 8621.1 (2004a) NASA Mishap Reporting,
 Investigating and Record Keeping Policy

NASA NPG 8715.3 (2004) NASA Safety Manual

NASA NSS 1740.12 (1993) NASA Safety Standard For
 Explosives, Propellants and Pyrotechnics

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 241 (2004) Safeguarding
 Construction, Alteration, and Demolition
 Operations

NFPA 51B (2008) Fire Prevention During Welding,
 Cutting, and Other Hot Work

NFPA 70 (2007; AMD 1 2008) National Electrical
 Code - 2008 Edition

NFPA 70E (2008) Electrical Safety in the Workplace

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2008) Safety and Health Requirements
 Manual

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910 Occupational Safety and Health Standards

29 CFR 1926 Safety and Health Regulations for
 Construction

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation;
 submittals not having a "G" designation are for Contractor Quality Control

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

approval. Submit the following in accordance with Section 01 33 00
SUBMITTAL PROCEDURES:

Government acceptance is required for submittals with a "G, A" designation.

SD-01 Preconstruction Submittals

Accident Prevention Plan (APP); G, A

Activity Hazard Analysis (AHA); G, A

SD-06 Test Reports

Reports

Submit reports as their incidence occurs, in accordance with the requirements of the paragraph entitled, "Reports."

Accident Reports

Monthly Exposure Reports

Gas Protection

SD-07 Certificates

Hot work permit; G

Contractor Safety Self-Evaluation Checklist; G, A

Certificate of Compliance (Crane)

Submit one copy of each permit/certificate attached to each Daily Quality Control Report.

1.3 DEFINITIONS

a. High Visibility Accident. Any mishap which may generate publicity and/or high visibility.

b. Medical Treatment. Treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even through provided by a physician or registered personnel.

c. Recordable Injuries or Illnesses. Any work-related injury or illness that results in:

- (1) Death, regardless of the time between the injury and death, or the length of the illness;
- (2) Days away from work (any time lost after day of injury/illness onset);
- (3) Restricted work;
- (4) Transfer to another job;
- (5) Medical treatment beyond first aid;

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

(6) Loss of consciousness; or

(7) A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (1) through (6) above.

d. "USACE" property and equipment specified in USACE EM 385-1-1 should be interpreted as Government property and equipment.

1.4 CONTRACTOR SAFETY SELF-EVALUATION CHECKLIST

Contracting Officer will provide a "Contractor Safety Self-Evaluation checklist" to the Contractor at the pre-construction conference. The checklist will be completed monthly by the Contractor and submitted with each request for payment voucher. An acceptable score of 90 or greater is required. Failure to submit the completed safety self-evaluation checklist or achieve a score of at least 90, will result in a retention of up to 10 percent of the voucher.

1.5 REGULATORY REQUIREMENTS

In addition to the detailed requirements included in the provisions of this contract, work performed shall comply with USACE EM 385-1-1, and all , ordinances, criteria, rules and regulations affecting construction. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements govern.

1.6 SITE QUALIFICATIONS, DUTIES AND MEETINGS

1.6.1 Personnel Qualifications

1.6.1.1 Site Safety and Health Officer (SSHO)

Provide a site Safety and Health Officer (SSHO) at the work site at all times to perform safety and occupational health management, surveillance, inspections, and safety enforcement for the Contractor. The SSHO shall meet the following requirements:

Level 3:

A minimum of 5 years safety work on similar projects.
30-hour OSHA construction safety class or equivalent within the last 5 years.
An average of at least 24 hours of formal safety training each year for the past 5 years.
Competent person training as needed..

1.6.2 Personnel Duties

1.6.2.1 Site Safety and Health Officer (SSHO)

a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Attach safety inspection logs to the Contractors' daily quality control report.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

- b. Conduct mishap investigations and complete required reports. Maintain the OSHA Form 300 and Daily Production reports for prime and sub-contractors.
- c. Maintain applicable safety reference material on the job site.
- d. Attend the pre-construction conference, pre-work meetings including preparatory inspection meeting, and periodic in-progress meetings.
- e. Implement and enforce accepted APPS and AHAs.
- f. Maintain a safety and health deficiency tracking system that monitors outstanding deficiencies until resolution. Post a list of unresolved safety and health deficiencies on the safety bulletin board.
- g. Ensure sub-contractor compliance with safety and health requirements.

Failure to perform the above duties will result in dismissal of the superintendent and/or SSSHO, and a project work stoppage. The project work stoppage will remain in effect pending approval of a suitable replacement.

1.6.3 Meetings

1.6.3.1 Preconstruction Conference

- a. Contractor representatives who have a responsibility or significant role in accident prevention on the project shall attend the preconstruction conference. This includes the project superintendent, site safety and health officer, quality control supervisor, or any other assigned safety and health professionals who participated in the development of the APP (including the Activity Hazard Analyses (AHAs) and special plans, program and procedures associated with it).
- b. Discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the Contracting Officer's representative as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, review, and acceptance of AHAs to preclude project delays.
- c. Deficiencies in the submitted APP will be brought to the attention of the Contractor at the preconstruction conference, and the Contractor shall revise the plan to correct deficiencies and re-submit it for acceptance. Do not begin work until there is an accepted APP.
- d. The functions of a Preconstruction conference may take place at the Post-Award Kickoff meeting for Design Build Contracts.

1.6.3.2 Safety Meetings

Conduct and document meetings as required by EM 385-1-1. Attach minutes showing contract title, signatures of attendees and a list of topics discussed to the Contractors' daily quality control report.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

1.7 ACCIDENT PREVENTION PLAN (APP)

Use a qualified person to prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of USACE EM 385-1-1 and as supplemented herein. Cover all paragraph and subparagraph elements in USACE EM 385-1-1, Appendix A, "Minimum Basic Outline for Accident Prevention Plan" and show compliance with NASA NPG 8715.3. Specific requirements for some of the APP elements are described below. The APP shall be job-specific and address any unusual or unique aspects of the project or activity for which it is written. The APP shall interface with the Contractor's overall safety and health program. Include any portions of the Contractor's overall safety and health program referenced in the APP in the applicable APP element and made site-specific. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The APP shall be signed by the person and firm (senior person) preparing the APP, the Contractor, the on-site superintendent, the designated site safety and health officer and any designated CSP and/or CIH.

Submit the APP to the Contracting Officer 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP.

Once accepted by the Contracting Officer, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP will be cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified.

Once work begins, changes to the accepted APP shall be made with the knowledge and concurrence of the Contracting Officer, project superintendent, SSSH and quality control manager. Should any hazard become evident, stop work in the area, secure the area, and develop a plan to remove the hazard. Notify the Contracting Officer within 24 hours of discovery. Eliminate/remove the hazard. In the interim, take all necessary action to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ASSE/SAFE A10.34,) and the environment.

Copies of the accepted plan will be maintained at the Contracting Officer's office and at the job site.

The APP shall be continuously reviewed and amended, as necessary, throughout the life of the contract. Incorporate unusual or high-hazard activities not identified in the original APP as they are discovered.

1.7.1 EM 385-1-1 Contents

In addition to the requirements outlines in Appendix A of USACE EM 385-1-1, the following is required:

- a. Names and qualifications (resumes including education, training, experience and certifications) of all site safety and health personnel designated to perform work on this project to include the designated site safety and health officer and other competent and qualified

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

personnel to be used such as CSPs, CIHs, STSs, CHSTs. Specify the duties of each position.

b. Qualifications of competent and of qualified persons. As a minimum, designate and submit qualifications of competent persons for each of the following major areas: excavation; hazardous energy; health hazard recognition, evaluation and control of chemical, physical and biological agents; personal protective equipment and clothing to include selection, use and maintenance.

1.8 ACTIVITY HAZARD ANALYSIS (AHA)

The Activity Hazard Analysis (AHA) format shall be in accordance with USACE EM 385-1-1. Submit the AHA for review at least 15 calendar days prior to the start of each phase. Format subsequent AHAs as amendments to the APP. The analysis should be used during daily inspections to ensure the implementation and effectiveness of the activity's safety and health controls.

The AHA list will be reviewed periodically (at least monthly) at the Contractor supervisory safety meeting and updated as necessary when procedures, scheduling, or hazards change.

Develop the activity hazard analyses using the project schedule as the basis for the activities performed. Any activities listed on the project schedule will require an AHA. The AHAs will be developed by the contractor, supplier or subcontractor and provided to the prime contractor for submittal to the Contracting Officer.

1.9 DISPLAY OF SAFETY INFORMATION

Within 1 calendar days after commencement of work, erect a safety bulletin board at the job site. Include and maintain information on safety bulletin board as required by EM 385-1-1, section 01.A.06. Additional items required to be posted include:

a. Hot work permit.

1.10 SITE SAFETY REFERENCE MATERIALS

Maintain safety-related references applicable to the project, including those listed in the article "References." Maintain applicable equipment manufacturer's manuals.

1.11 EMERGENCY MEDICAL TREATMENT

Contractors will arrange for their own emergency medical treatment. Government has no responsibility to provide emergency medical treatment.

1.12 REPORTS

1.12.1 Accident Reports

a. Conduct an accident investigation for recordable injuries and illnesses, and property damage accidents resulting in at least \$2,000 in damages, to establish the root cause(s) of the accident, complete the Navy Contractor Significant Incident Report (CSIR) form USACE Accident Report Form 3394 and provide the report to the Contracting

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

Officer within 5 calendar day(s) of the accident. The Contracting Officer will provide copies of any required or special forms.

1.12.2 Accident Notification

Notify the Contracting Officer as soon as practical, but not later than four hours, after any accident meeting the definition of Recordable Injuries or Illnesses or High Visibility Accidents, property damage equal to or greater than \$2,000, or any weight handling equipment accident in accordance with NASA NPG 8621.1. Within notification include contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (to include type of construction equipment used, PPE used, etc.). Preserve the conditions and evidence on the accident site until the Government investigation team arrives on-site and Government investigation is conducted.

1.12.3 Monthly Exposure Reports

Monthly exposure reporting to the Contracting Officer is required to be attached to the monthly billing request. This report is a compilation of employee-hours worked each month for all site workers, both prime and subcontractor. The Contracting Officer will provide copies of any special forms.

1.13 HOT WORK

Submit and obtain a written permit prior to performing "Hot Work" (welding, cutting, etc.) or operating other flame-producing/spark producing devices, from the Fire Division. CONTRACTORS ARE REQUIRED TO MEET ALL CRITERIA BEFORE A PERMIT IS ISSUED. The Contractor will provide at least two (2) twenty (20) pound 4A:20 BC rated extinguishers for normal "Hot Work". All extinguishers shall be current inspection tagged, approved safety pin and tamper resistant seal. It is also mandatory to have a designated FIRE WATCH for any "Hot Work" done at this activity. The Fire Watch shall be trained in accordance with NFPA 51B and remain on-site for a minimum of 30 minutes after completion of the task or as specified on the hot work permit.

When starting work in the facility, require personnel to familiarize themselves with the location of the nearest fire alarm boxes and place in memory the emergency Fire Division phone number. ANY FIRE, NO MATTER HOW SMALL, SHALL BE REPORTED TO THE RESPONSIBLE FIRE DIVISION IMMEDIATELY.

1.14 FACILITY OCCUPANCY CLOSURE

Streets, walks, and other facilities occupied and used by the Government shall not be closed or obstructed without written permission from the Contracting Officer.

1.15 GAS PROTECTION

Contractor shall have one or more employees properly trained in operation of gas testing equipment and formally qualified as gas inspectors who shall be on duty during times workmen are in confined spaces. Their primary functions shall be to test for gas and operate testing equipment. Unless equipment of constant supervisory type with automatic alarm is employed,

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

gas tests shall be made at least every 2 hours or more often when character of ground or experience indicates gas may be encountered. A gas test shall be made before workmen are permitted to enter the excavation after an idle period exceeding one-half hour.

Readings shall be permanently recorded daily, indicating the concentration of gas, point of test, and time of test. Submit copies of the gas test readings to the Contracting Officer at the end of each work day.

Special requirements, coordination, and precautions will apply to areas that contain a hazardous atmosphere or, by virtue of their use or physical character, may be oxygen deficient. A check by Government is required prior to entering confined space. Surveillance and monitoring shall be required in these types of work spaces by both Contractor and Government personnel.

1.16 HIGH NOISE LEVEL PROTECTION

Operations performed by the Contractor that involve the use of equipment with output of high noise levels (jackhammers, air compressors, and explosive device activated tools) shall be scheduled for weekends. Use of any such equipment shall be approved in writing by the Contracting Officer prior to commencement of work.

1.17 SEVERE STORM PLAN

In the event of a severe storm warning, the Contractor must:

- a. Secure outside equipment and materials and place materials that could be damaged in protected areas.
- b. Check surrounding area, including roof, for loose material, equipment, debris, and other objects that could be blown away or against existing facilities.
- c. Ensure that temporary erosion controls are adequate.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 CONSTRUCTION AND/OR OTHER WORK

Comply with USACE EM 385-1-1, NFPA 241, the APP, the AHA, Federal and/or State OSHA regulations, and other related submittals and activity fire and safety regulations. The most stringent standard prevails.

3.1.1 Hazardous Material Use

Each hazardous material must receive approval prior to being brought onto the job site or prior to any other use in connection with this contract. Allow a minimum of 10 working days for processing of the request for use of a hazardous material.

3.1.2 Hazardous Material Exclusions

Notwithstanding any other hazardous material used in this contract,

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

radioactive materials or instruments capable of producing ionizing/non-ionizing radiation (with the exception of radioactive material and devices used in accordance with USACE EM 385-1-1 such as nuclear density meters for compaction testing and laboratory equipment with radioactive sources) as well as materials which contain asbestos, mercury or polychlorinated biphenyls, di-isocyanates, lead-based paint are prohibited. The Contracting Officer, upon written request by the Contractor, may consider exceptions to the use of any of the above excluded materials.

3.1.3 Unforeseen Hazardous Material

The design should have identified materials such as PCB, lead paint, and friable and non-friable asbestos. If additional material, not indicated, that may be hazardous to human health upon disturbance during construction operations is encountered, stop that portion of work and notify the Contracting Officer immediately. Within 14 calendar days the Government will determine if the material is hazardous. If material is not hazardous or poses no danger, the Government will direct the Contractor to proceed without change. If material is hazardous and handling of the material is necessary to accomplish the work, the Government will issue a modification pursuant to "FAR 52.243-4, Changes" and "FAR 52.236-2, Differing Site Conditions."

3.2 PRE-OUTAGE COORDINATION MEETING

Contractors are required to apply for utility outages at least 15 days in advance. As a minimum, the request should include the location of the outage, utilities being affected, duration of outage and any necessary sketches. Special requirements for electrical outage requests are contained elsewhere in this specification section. Once approved, and prior to beginning work on the utility system requiring shut down, attend a pre-outage coordination meeting with the Contracting Officer and the Public Utilities representative to review the scope of work and the lock-out/tag-out procedures for worker protection. No work will be performed on energized electrical circuits unless proof is provided that no other means exist.

3.3 SAFETY LOCKOUT/TAGOUT PROCEDURES

Contractor shall ensure that each employee is familiar with and complies with these procedures and 29 CFR 1910.147.

Contracting Officer will, at the Contractor's request, apply lockout/tagout tags and take other actions that, because of experience and knowledge, are known to be necessary to make the particular equipment safe to work on.

No person, regardless of position or authority, shall operate any switch, valve, or equipment that has an official lockout/tagout tag attached to it, nor shall such tag be removed except as provided in this section.

No person shall work on any equipment that requires a lockout/tagout tag unless he, his immediate supervisor, project leader, or a subordinate has in his possession the stubs of the required lockout/tagout tags.

When work is to be performed on electrical circuits, only qualified personnel shall perform work on electrical circuits.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

A supervisor who is required to enter an area protected by a lockout/tagout tag will be considered a member of the protected group provided he notifies the holder of the tag stub each time he enters and departs from the protected area.

Identification markings on building light and power distribution circuits shall not be relied on for established safe work conditions.

Before clearance will be given on any equipment other than electrical (generally referred to as mechanical apparatus), the apparatus, valves, or systems shall be secured in a passive condition with the appropriate vents, pins, and locks.

Pressurized or vacuum systems shall be vented to relieve differential pressure completely.

Vent valves shall be tagged open during the course of the work.

Where dangerous gas or fluid systems are involved, or in areas where the environment may be oxygen deficient, system or areas shall be purged, ventilated, or otherwise made safe prior to entry.

3.3.1 Tag Placement

Lockout/tagout tags shall be completed in accordance with the regulations printed on the back thereof and attached to any device which, if operated, could cause an unsafe condition to exist.

If more than one group is to work on any circuit or equipment, the employee in charge of each group shall have a separate set of lockout/tagout tags completed and properly attached.

When it is required that certain equipment be tagged, the Government will review the characteristics of the various systems involved that affect the safety of the operations and the work to be done; take the necessary actions, including voltage and pressure checks, grounding, and venting, to make the system and equipment safe to work on; and apply such lockout/tagout tags to those switches, valves, vents, or other mechanical devices needed to preserve the safety provided. This operation is referred to as "Providing Safety Clearance."

3.3.2 Tag Removal

When any individual or group has completed its part of the work and is clear of the circuits or equipment, the supervisor, project leader, or individual for whom the equipment was tagged shall turn in his signed lockout/tagout tag stub to the Contracting Officer. That group's or individual's lockout/tagout tags on equipment may then be removed on authorization by the Contracting Officer.

3.4 EQUIPMENT

3.4.1 Material Handling Equipment

a. Material handling equipment such as forklifts shall not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions.

c. Operators of forklifts or power industrial trucks shall be licensed in accordance with OSHA.

3.4.2 Equipment and Mechanized Equipment

a. Proof of qualifications for operator shall be kept on the project site for review.

b. Manufacture specifications or owner's manual for the equipment shall be on-site and reviewed for additional safety precautions or requirements that are sometimes not identified by OSHA or USACE EM 385-1-1. Incorporate such additional safety precautions or requirements into the AHAs.

c. Submit a Machinery & Mechanized Equipment Certification Form for acceptance by the Contracting Officer prior to being placed into use. A copy of the certification form will be provided during the Pre-construction Conference.

3.4.3 USE OF EXPLOSIVES

Explosives shall not be used or brought to the project site without prior written approval from the Contracting Officer. Such approval shall not relieve the Contractor of responsibility for injury to persons or for damage to property due to blasting operations.

Storage of explosives, when permitted on Government property, shall be only where directed and in approved storage facilities. These facilities shall be kept locked at all times except for inspection, delivery, and withdrawal of explosives.

Explosive work shall be performed in accordance with NASA NSS 1740.12. This document is available at:

<http://www.hq.nasa.gov/office/codeq/doctree/871912.htm>

3.5 EXCAVATIONS

Perform soil classification by a competent person in accordance with 29 CFR 1926.

3.5.1 Utility Locations

Prior to digging, the appropriate digging permit must be obtained. All underground utilities in the work area must be positively identified by a private utility locating service in addition to any station locating service and coordinated with the station utility department. Any markings made during the utility investigation must be maintained throughout the contract.

3.5.2 Utility Location Verification

The Contractor must physically verify underground utility locations by hand digging using wood or fiberglass handled tools when any adjacent construction work is expected to come within three feet of the underground system. Digging within 2 feet of a known utility must not be performed by

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

means of mechanical equipment; hand digging shall be used. If construction is parallel to an existing utility expose the utility by hand digging every 30.5 m (100 feet) if parallel within 1.5 m (5 feet) of the excavation.

3.5.3 Shoring Systems

Trench and shoring systems must be identified in the accepted safety plan and AHA. Manufacture tabulated data and specifications or registered engineer tabulated data for shoring or benching systems shall be readily available on-site for review. Job-made shoring or shielding must have the registered professional engineer stamp, specifications, and tabulated data. Extreme care must be used when excavating near direct burial electric underground cables.

3.5.4 Trenching Machinery

Operate trenching machines with digging chain drives only when the spotters/laborers are in plain view of the operator. Provide operator and spotters/laborers training on the hazards of the digging chain drives with emphasis on the distance that needs to be maintained when the digging chain is operating. Keep documentation of the training on file at the project site.

3.6 UTILITIES WITHIN CONCRETE SLABS

Utilities located within concrete slabs or pier structures, bridges, and the like, are extremely difficult to identify due to the reinforcing steel used in the construction of these structures. Whenever contract work involves concrete chipping, saw cutting, or core drilling, the existing utility location must be coordinated with station utility departments in addition to a private locating service. Outages to isolate utility systems must be used in circumstances where utilities are unable to be positively identified. The use of historical drawings does not alleviate the contractor from meeting this requirement.

3.7 ELECTRICAL

3.7.1 Conduct of Electrical Work

Underground electrical spaces must be certified safe for entry before entering to conduct work. Cables that will be cut must be positively identified and de-energized prior to performing each cut. Positive cable identification must be made prior to submitting any outage request for electrical systems. Arrangements are to be coordinated with the Contracting Officer and Station Utilities for identification. The Contracting Officer will not accept an outage request until the Contractor satisfactorily documents that the circuits have been clearly identified. Perform all high voltage cable cutting remotely using hydraulic cutting tool. When racking in or live switching of circuit breakers, no additional person other than the switch operator will be allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method. When working in energized substations, only qualified electrical workers will be permitted to enter. When work requires Contractor to work near energized circuits as defined by the NFPA 70, high voltage personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves with leather protective sleeves, fire retarding shirts, coveralls, face shields, and safety glasses. In addition, provide

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

electrical arc flash protection for personnel as required by NFPA 70E. Insulating blankets, hearing protection, and switching suits may also be required, depending on the specific job and as delineated in the Contractor's AHA.

3.7.2 Portable Extension Cords

Size portable extension cords in accordance with manufacturer ratings for the tool to be powered and protected from damage. Immediately removed from service all damaged extension cords. Portable extension cords shall meet the requirements of NFPA 70.

-- End of Section --

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

SECTION 01 42 00

SOURCES FOR REFERENCE PUBLICATIONS

11/08

PART 1 GENERAL

1.1 REFERENCES

Various publications are referenced in other sections of the specifications to establish requirements for the work. These references are identified in each section by document number, date and title. The document number used in the citation is the number assigned by the standards producing organization, (e.g. ASTM B 564 Nickel Alloy Forgings). However, when the standards producing organization has not assigned a number to a document, an identifying number has been assigned for reference purposes.

1.2 ORDERING INFORMATION

The addresses of the standards publishing organizations whose documents are referenced in other sections of these specifications are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided. Documents listed in the specifications with numbers which were not assigned by the standards producing organization should be ordered from the source by title rather than by number.

ACI INTERNATIONAL (ACI)
38800 Country Club Drive
Farmington Hills, MI 48331
Ph: 248-848-3700
Fax: 248-848-3701
E-mail: bkstore@concrete.org
Internet: <http://www.concrete.org>

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
(AASHTO)
444 North Capital Street, NW, Suite 249
Washington, DC 20001
Ph: 202-624-5800
Fax: 202-624-5806
E-Mail: info@ashto.org
Internet: <http://www.aashto.org>

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)
1800 East Oakton Street
Des Plaines, IL 60018-2187
Ph: 847-699-2929
Fax: 847-768-3434
E-mail: customerservice@asse.org
Internet: <http://www.asse.org>

AMERICAN WATER WORKS ASSOCIATION (AWWA)
6666 West Quincy Avenue
Denver, CO 80235
Ph: 800-926-7337
Fax: 303-347-0804

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

Internet: <http://www.awwa.org>

ASTM INTERNATIONAL (ASTM)
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959
Ph: 610-832-9500
Fax: 610-832-9555
E-mail: service@astm.org
Internet: <http://www.astm.org>

FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH
(FCCCHR)
University of South California
Kaprielian Hall 200
Los Angeles, CA 90089-2531
Ph: 213-740-2032 or 800-545-6340
Fax: 213-740-8399
E-mail: fccchr@usc.edu
Internet: <http://www.usc.edu/dept/fccchr>

GREEN SEAL (GS)
1001 Connecticut Avenue, NW
Suite 827
Washington, DC 20036-5525
Ph: 202-872-6400
Fax: 202-872-4324
E-mail: green seal@green seal.org
Internet: <http://www.green seal.org>

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)
Publication(s) Available From
Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402
Ph: 202-783-3238

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
1 Batterymarch Park
Quincy, MA 02169-7471
Ph: 617-770-3000
Fax: 617-770-0700
E-mail: webmaster@nfpa.org
Internet: <http://www.nfpa.org>

TURFGRASS PRODUCERS INTERNATIONAL (TPI)
2 East Main Street
East Dundee, IL 60118
Ph: 847-649-5555 or 800-405-8873
Fax: 847-649-5678
E-mail: info@turfgrasssod.org
Internet: <http://www.turfgrasssod.org>

U.S. ARMY CORPS OF ENGINEERS (USACE)
Order CRD-C DOCUMENTS from:
U.S. Army Engineer Waterways Experiment Station
ATTN: Technical Report Distribution Section, Services
Branch, TIC
3909 Halls Ferry Road
Vicksburg, MS 39180-6199

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

Ph: 601-634-2664
Fax: 601-634-2388
E-mail: mtc-info@erdc.usace.army.mil
Internet: <http://www.wes.army.mil/SL/MTC/handbook.htm>

Order Other Documents from:
USACE Publications Depot
Attn: CEHEC-IM-PD
2803 52nd Avenue
Hyattsville, MD 20781-1102
Ph: 301-394-0081
Fax: 301-394-0084
E-mail: pubs-army@usace.army.mil
Internet: <http://www.usace.army.mil/publications>
or <http://www.hnd.usace.army.mil/techinfo/engpubs.htm>

U.S. DEPARTMENT OF AGRICULTURE (USDA)
Order AMS Publications from:
AGRICULTURAL MARKETING SERVICE (AMS)
Seed Regulatory and Testing Branch
801 Summit Crossing Place, Suite C
Gastonia, NC 28054-2193
Ph: 704-810-8870
Fax: 704-852-4189
Internet: <http://www.ams.usda.gov/lsg/seed.htm>
E-mail: seed.ams@usda.gov

Order Other Publications from:
U.S. Department of Agriculture, Rural Utilities Service
14th and Independence Avenue, SW, Room 4028-S
Washington, DC 20250
Ph: 202-720-2791
Fax: 202-720-2166
Internet: <http://www.usda.gov/rus>

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460
Ph: 202-272-0167
Internet: <http://www.epa.gov>

--- Some EPA documents are available only from:
National Technical Information Service (NTIS)
5285 Port Royal Road
Springfield, VA 22161
Ph: 703-605-6585
Fax: 703-605-6900
E-mail: info@ntis.gov
Internet: <http://www.ntis.gov>

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)
8601 Adelphi Road
College Park, MD 20740-6001
Ph: 866-272-6272
Fax: 301-837-0483
Internet: <http://www.archives.gov>

Order documents from:

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

Superintendent of Documents
U.S. Government Printing Office (GPO)
732 North Capitol Street, NW
Washington, DC 20401
Ph: 202-512-1800
Fax: 202-512-2104
E-mail: contactcenter@gpo.gov
Internet: <http://www.gpoaccess.gov>

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Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

SECTION 01 45 01.00 20

QUALITY CONTROL (QC) - MINOR CONSTRUCTION

02/09

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U. S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1

(2003) Safety - Safety and Health
Requirements

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

QC Plan; G

Submit a QC plan within 15 calendar days after receipt of Notice of Award.

1.3 INFORMATION FOR THE CONTRACTING OFFICER (KO)

When WebCM is a requirement on the project, include all submissions of QC documentation through the Web Based Construction Management (WebCM) system. Refer to the requirements of Section 01 31 23 WEB BASED CONSTRUCTION MANAGEMENT (WEBCM). If WebCM is not a requirement of the project, prior to commencing work on construction, the Contractor can obtain a single copy set of the current report forms from the KO. The report forms will consist of the Contractor Production Report, Contractor Production Report (Continuation Sheet), Contractor Quality Control (CQC) Report, CQC Report (Continuation Sheet), Preparatory Phase Checklist, Initial Phase Checklist, Rework Items List, and Testing Plan and Log.

Deliver the following to the KO:

- a. CQC Report: Original and one copy, by 10:00 AM the next working day after each day that work is performed;
- b. Contractor Production Report: Original and one copy by 10:00 AM the next working day after each day that work is performed;
- c. Preparatory Phase Checklist: Original attached to the original CQC Report and one copy attached to each copy;
- d. Initial Phase Checklist: Original attached to the original CQC Report and one copy attached to each copy;

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

- e. Field Test Reports: One copy, within two working days after the test is performed, attached to the CQC Report;
- f. QC Meeting Minutes: One copy, within two working days after the meeting; and
- g. QC Certifications: As required by the paragraph entitled "QC Certifications."

1.4 QC PROGRAM REQUIREMENTS

Establish and maintain a QC program as described in this section. The QC program consists of a QC Manager, a QC plan, a Coordination and Mutual Understanding Meeting, QC meetings, three phases of control, submittal review and approval, testing, and QC certifications and documentation necessary to provide materials, equipment, workmanship, fabrication, construction and operations which comply with the requirements of this contract. The QC program shall cover on-site and off-site work and shall be keyed to the work sequence. No work or testing may be performed unless the QC Manager is on the work site.

1.4.1 Preliminary Work Authorized Prior to Acceptance

The only work that is authorized to proceed prior to the acceptance of the QC plan is mobilization of storage and office trailers, temporary utilities, and surveying.

1.4.2 Acceptance

Acceptance of the QC plan is required prior to the start of construction. The KO reserves the right to require changes in the QC plan and operations as necessary, including removal of personnel, to ensure the specified quality of work. The KO reserves the right to interview any member of the QC organization at any time in order to verify the submitted qualifications.

1.4.3 Notification of Changes

Notify the KO, in writing, of any proposed change, including changes in the QC organization personnel, a minimum of seven calendar days prior to a proposed change. Proposed changes shall be subject to the acceptance by the KO.

1.5 QC ORGANIZATION

1.5.1 QC Manager

1.5.1.1 Duties

Provide a QC Manager at the work site to implement and manage the QC program. In addition to implementing and managing the QC program, the QC Manager may perform the duties of project superintendent. The QC Manager is required to attend the Coordination and Mutual Understanding Meeting, conduct the QC meetings, perform the three phases of control, perform submittal review and approval, ensure testing is performed and provide QC certifications and documentation required in this contract. The QC Manager is responsible for managing and coordinating the three phases of control and documentation performed by others.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

1.5.1.2 Qualifications

An individual with a minimum of 10 years combined experience as a superintendent, inspector, QC Manager, project manager, or construction manager on similar size and type construction contracts which included the major trades that are part of this contract. The individual must be familiar with the requirements of the EM 385-1-1 and have experience in the areas of hazard identification and safety compliance.

1.5.1.3 Construction Quality Management Training

In addition to the above experience and education requirements, the QC Manager shall have completed the course Construction Quality Management for Contractors and will have a current certificate.

1.5.2 Alternate QC Manager Duties and Qualifications

Designate an alternate for the QC Manager to serve in the event of the designated QC Manager's absence. The period of absence may not exceed two weeks at one time, and not more than 30 workdays during a calendar year. The qualification requirements for the Alternate QC Manager shall be the same as for the QC Manager.

1.6 QC PLAN

1.6.1 Requirements

Provide, for acceptance by the KO, a QC plan submitted in a three-ring binder that covers both on-site and off-site work and includes the following with a table of contents listing the major sections identified with tabs.

- I. QC ORGANIZATION: A chart showing the QC organizational structure and its relationship to the production side of the organization.
- II. NAMES AND QUALIFICATIONS: In resume format, for each person in the QC organization. Include the CQM for Contractors course certification required by the paragraph entitled "Construction Quality Management Training".
- III. DUTIES, RESPONSIBILITY AND AUTHORITY OF QC PERSONAL: Of each person in the QC organization.
- IV. OUTSIDE ORGANIZATIONS: A listing of outside organizations such as architectural and consulting engineering firms that will be employed by the Contractor and a description of the services these firms will provide.
- V. APPOINTMENT LETTERS: Letters signed by an officer of the firm appointing the QC Manager and Alternate QC Manager and stating that they are responsible for managing and implementing the QC program as described in this contract. Include in this letter the QC Manager's authority to direct the removal and replacement of non-conforming work.
- VI. SUBMITTAL PROCEDURES AND INITIAL SUBMITTAL REGISTER: Procedures for reviewing, approving and managing submittals. Provide the name(s) of the person(s) in the QC organization

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

authorized to review and certify submittals prior to approval.

- VII. TESTING LABORATORY INFORMATION: Testing laboratory information required by the paragraphs "Accredited Laboratories" or "Testing Laboratory Requirements", as applicable.
- VIII. TESTING PLAN AND LOG: A Testing Plan and Log that includes the tests required, referenced by the specification paragraph number requiring the test, the frequency, and the person responsible for each test.
- IX. PROCEDURES TO COMPLETE REWORK ITEMS: Procedures to identify, record, track and complete rework items.
- X. DOCUMENTATION PROCEDURES: Use Government formats.
- XI. LIST OF DEFINABLE FEATURES: A Definable Feature of Work (DFOW) is a task, which is separate and distinct from other tasks, has the same control requirements and work crews. The list shall be cross-referenced to the Contractor's Construction Schedule and the specification sections. For projects requiring a Progress Chart, the list of definable features of work shall include but not be limited to all items of work on the schedule. For projects requiring a Network Analysis Schedule, the list of definable features of work shall include but not be limited to all critical path activities.
- XII. PROCEDURES FOR PERFORMING THREE PHASES OF CONTROL: For each DFOW provide Preparatory and Initial Phase Checklists. Each list shall include a breakdown of quality checks that will be used when performing the quality control functions, inspections, and tests required by the contract documents. The preparatory and initial phases shall be conducted with a view towards obtaining quality construction by planning ahead and identifying potential problems.
- XIII. PERSONNEL MATRIX: Not Applicable.
- XIV. PROCEDURES FOR COMPLETION INSPECTION: See the paragraph entitled "COMPLETION INSPECTIONS".
- XV. TRAINING PROCEDURES AND TRAINING LOG: Not Applicable.

1.7 COORDINATION AND MUTUAL UNDERSTANDING MEETING

During either the Pre-Construction conference or Post-Award Kickoff meeting, whichever is applicable, but prior to the start of construction, discuss the QC program required by this contract. The purpose of this meeting is to develop a mutual understanding of the QC details, including documentation, administration for on-site and off-site work, and the coordination of the Contractor's management, production and the QC personnel. At the meeting, the Contractor will be required to explain how three phases of control will be implemented for each DFOW. Contractor's personnel required to attend shall include the QC Manager, project manager, and superintendent. Minutes of the meeting will be prepared by the QC Manager and signed by both the Contractor and the KO. The Contractor shall provide a copy of the signed minutes to all attendees. Repeat the coordination and mutual understanding meeting when a new QC Manager is appointed.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

1.8 QC MEETING

After the start of construction, the QC Manager shall conduct QC meetings once every two weeks at the work site with the superintendent and the foreman responsible for the ongoing and upcoming work. The QC Manager shall prepare the minutes of the meeting and provide a copy to the KO within two working days after the meeting. As a minimum, the following shall be accomplished at each meeting:

- a. Review the minutes of the previous meeting;
- b. Review the schedule and the status of work and rework;
- c. Review the status of submittals;
- d. Review the work to be accomplished in the next two weeks and documentation required;
- e. Resolve QC and production problems (RFIs, etc.);
- f. Address items that may require revising the QC plan; and
- g. Review Accident Prevention Plan (APP).

1.9 THREE PHASES OF CONTROL

The three phases of control shall adequately cover both on-site and off-site work and shall include the following for each DFOV.

1.9.1 Preparatory Phase

Notify the KO at least two work days in advance of each preparatory phase. Conduct the preparatory phase with the superintendent and the foreman responsible for the definable feature of work. Document the results of the preparatory phase actions in the daily CQC Report and in the QC checklist. Perform the following prior to beginning work on each definable feature of work:

- a. Review each paragraph of the applicable specification sections;
- b. Review the contract drawings;
- c. Verify that appropriate shop drawings and submittals for materials and equipment have been submitted and approved. Verify receipt of approved factory test results, when required;
- d. Review the testing plan and ensure that provisions have been made to provide the required QC testing;
- e. Examine the work area to ensure that the required preliminary work has been completed;
- f. Examine the required materials, equipment and sample work to ensure that they are on hand and conform to the approved shop drawings and submitted data;
- g. Review the APP and appropriate Activity Hazard Analysis (AHA) to ensure that applicable safety requirements are met, and that

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

required Material Safety Data Sheets (MSDS) are submitted; and

- h. Discuss construction methods and the approach that will be used to provide quality construction by planning ahead and identifying potential problems for each DFW.

1.9.2 Initial Phase

Notify the KO at least two work days in advance of each initial phase. When construction crews are ready to start work on a DFW, conduct the Initial Phase with the foreman responsible for that DFW. Observe the initial segment of the work to ensure that it complies with contract requirements. Document the results of the Initial Phase in the daily CQC Report and in the QC checklist. Perform the following for each DFW:

- a. Establish the quality of workmanship required;
- b. Resolve conflicts;
- c. Ensure that testing is performed by the approved laboratory;
and
- d. Check work procedures for compliance with the APP and the appropriate AHA to ensure that applicable safety requirements are met.

1.9.3 Follow-Up Phase

Perform the following for on-going work daily, or more frequently as necessary, until the completion of each DFW and document in the daily CQC Report and in the QC checklist:

- a. Ensure the work is in compliance with contract requirements;
- b. Maintain the quality of workmanship required;
- c. Ensure that testing is performed by the approved laboratory;
- d. Ensure that rework items are being corrected; and
- e. Perform safety inspections.

1.9.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases shall be conducted on the same DFW if the quality of on-going work is unacceptable, if there are changes in the applicable QC organization, if there are changes in the on-site production supervision or work crew, if work on a DFW is resumed after substantial period of inactivity, or if other problems develop.

1.9.5 Notification of Three Phases of Control for Off-Site Work

Notify the KO at least two weeks prior to the start of the preparatory and initial phases.

1.10 SUBMITTAL REVIEW AND APPROVAL

Procedures for submission, review, and approval of submittals are described in the submittal section of the specification.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

1.11 TESTING

Except as stated otherwise in the specification sections, perform sampling and testing required under this contract.

1.11.1 Accreditation Requirements

Construction materials testing laboratories must be accredited by a laboratory accreditation authority and will be required to submit a copy of the Certificate of Accreditation and Scope of Accreditation. The laboratory's scope of accreditation must include the appropriate ASTM standards (i.e.; E 329, C 1077, D 3666, D 3740, A 880, E 543) listed in the technical sections of the specifications. Laboratories engaged in Hazardous Materials Testing shall meet the requirements of OSHA and EPA. The policy applies to the specific laboratory performing the actual testing, not just the "Corporate Office."

1.11.2 Laboratory Accreditation Authorities

Laboratory Accreditation Authorities include the National Voluntary Laboratory Accreditation Program (NVLAP) administered by the National Institute of Standards and Technology, the American Association of State Highway and Transportation Officials (AASHTO), International Accreditation Services, Inc. (IAS), U. S. Army Corps of Engineers Materials Testing Center (MTC), the American Association for Laboratory Accreditation (A2LA), the Washington Association of Building Officials (WABO) (Approval authority for WABO is limited to projects within Washington State), and the Washington Area Council of Engineering Laboratories (WACEL) (Approval authority by WACEL is limited to projects within the EFA Chesapeake and Public Works Center Washington geographical area).

1.11.3 Capability Check

The KO retains the right to check laboratory equipment in the proposed laboratory and the laboratory technician's testing procedures, techniques, and other items pertinent to testing, for compliance with the standards set forth in this contract.

1.11.4 Test Results

Cite applicable Contract requirements, tests or analytical procedures used. Provide actual results and include a statement that the item tested or analyzed conforms or fails to conform to specified requirements. If the item fails to conform, notify the KO immediately. Conspicuously stamp the cover sheet for each report in large red letters "CONFORMS" or "DOES NOT CONFORM" to the specification requirements, whichever is applicable. Test results shall be signed by a testing laboratory representative authorized to sign certified test reports. Furnish the signed reports, certifications, and other documentation to the KO via the QC Manager.

1.12 QC CERTIFICATIONS

1.12.1 Contractor Quality Control Report Certification

Each CQC Report shall contain the following statement: "On behalf of the Contractor, I certify that this report is complete and correct and equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

of my knowledge except as noted in this report."

1.12.2 Invoice Certification

Furnish a certificate to the KO with each payment request, signed by the QC Manager, attesting that as-built drawings are current and attesting that the work for which payment is requested, including stored material, is in compliance with contract requirements.

1.12.3 Completion Certification

Upon completion of work under this contract, the QC Manager shall furnish a certificate to the KO attesting that "the work has been completed, inspected, tested and is in compliance with the contract."

1.13 COMPLETION INSPECTIONS

1.13.1 Punch-Out Inspection

Near the completion of all work or any increment thereof established by a completion time stated in the Contract clause "Commencement, Prosecution, and Completion of Work," or stated elsewhere in the specifications, the QC Manager shall conduct an inspection of the work and develop a punch list of items which do not conform to the approved drawings and specifications. Include in the punch list any remaining items of the "Rework Items List", which were not corrected prior to the Punch-Out inspection. The punch list shall include the estimated date by which the deficiencies will be corrected. A copy of the punch list shall be provided to the KO. The QC Manager or staff shall make follow-on inspections to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government "Pre-Final Inspection".

1.13.2 Pre-Final Inspection

The Government will perform this inspection to verify that the facility is complete and ready to be occupied. A Government pre-final punch list may be developed as a result of this inspection. The QC Manager shall ensure that all items on this list are corrected prior to notifying the Government that a "Final" inspection with the customer can be scheduled. Any items noted on the "Pre-Final" inspection shall be corrected in a timely manner and shall be accomplished before the contract completion date for the work or any particular increment thereof if the project is divided into increments by separate completion dates.

1.13.3 Final Acceptance Inspection

The QC Manager, the superintendent, or other Contractor management personnel and the KO will be in attendance at this inspection. Additional Government personnel may be in attendance. The final acceptance inspection will be formally scheduled by the KO based upon results of the "Pre-Final Inspection". Notice shall be given to the KO at least 14 days prior to the final inspection. The notice shall state that all specific items previously identified to the Contractor as being unacceptable will be complete by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the KO to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause "Inspection of Construction".

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

1.14 DOCUMENTATION

Maintain current and complete records of on-site and off-site QC program operations and activities. The forms identified under the paragraph "INFORMATION FOR THE CONTRACTING OFFICER (KO)" shall be used. Reports are required for each day work is performed. Account for each calendar day throughout the life of the contract. Every space on the forms must be filled in. Use N/A if nothing can be reported in one of the spaces. The superintendent and the QC Manager must prepare and sign the Contractor Production and CQC Reports, respectively. The reporting of work shall be identified by terminology consistent with the construction schedule. In the "remarks" section in this report which will contain pertinent information including directions received, problems encountered during construction, work progress and delays, conflicts or errors in the drawings or specifications, field changes, safety hazards encountered, instructions given and corrective actions taken, delays encountered and a record of visitors to the work site. For each remark given, identify the Schedule Activity No. that is associated with the remark.

1.14.1 Quality Control Validation

Establish and maintain the following in a series of three ring binders. Binders shall be divided and tabbed as shown below. These binders shall be readily available to the Government's Quality Assurance Team during all business hours.

- a. All completed Preparatory and Initial Phase Checklists, arranged by specification section.
- b. All milestone inspections, arranged by Activity/Event Number.
- c. A current up-to-date copy of the Testing and Plan Log with supporting field test reports, arranged by specification section.
- d. Copies of all contract modifications, arranged in numerical order. Also include documentation that modified work was accomplished.
- e. A current up-to-date copy of the Rework Items List.
- f. Maintain up-to-date copies of all punch lists issued by the QC Staff on the Contractor and Sub-Contractors and all punch lists issued by the Government.

1.14.2 As-Built Drawings

The QC Manager is required to review the as-built drawings, required by Section 01 77 00.00 20 CLOSEOUT PROCEDURES, are kept current on a daily basis and marked to show deviations, which have been made from the Contract drawings. Ensure each deviation has been identified with the appropriate modifying documentation, e.g. PC number, modification number, RFI number, etc. The QC Manager shall initial each deviation or revision. Upon completion of work, the QC Manager shall submit a certificate attesting to the accuracy of the as-built drawings prior to submission to the KO.

1.15 NOTIFICATION ON NON-COMPLIANCE

The KO will notify the Contractor of any detected non-compliance with the

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the KO may issue an order stopping all or part of the work until satisfactory corrective action has been taken. The Contractor shall make no part of the time lost due to such stop orders the subject of claim for extension of time, for excess costs, or damages.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

-- End of Section --

Construct Battalion Synthetic Running Track
 Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
 100% Submittal

SECTION 01 50 00

TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS

10/07

PART 1 GENERAL

1.1 SUMMARY

Requirements of this Section apply to, and are a component of, each section of the specifications.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C511 (2007) Standard for Reduced-Pressure
 Principle Backflow Prevention Assembly

FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH
(FCCCHR)

FCCCHR List (continuously updated) List of Approved
 Backflow Prevention Assemblies

FCCCHR Manual (1988e9) Manual of Cross-Connection Control

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 241 (2004) Safeguarding
 Construction, Alteration, and Demolition
 Operations

NFPA 70 (2007; AMD 1 2008) National Electrical
 Code - 2008 Edition

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submitted the following in accordance with Section 01 33 00
 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

SD-03 Product Data

Backflow preventers

SD-06 Test Reports

Backflow Preventer Tests

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

SD-07 Certificates

Backflow Tester Certification; G

Backflow Preventers Certificate of Full Approval

1.4 BACKFLOW PREVENTERS CERTIFICATE

Certificate of Full Approval from FCCCHR List, University of Southern California, attesting that the design, size and make of each backflow preventer has satisfactorily passed the complete sequence of performance testing and evaluation for the respective level of approval. Certificate of Provisional Approval will not be acceptable.

1.4.1 Backflow Prevention Training Certificate

Submit a certificate recognized by the State or local authority that states the Contractor has completed at least 10 hours of training in backflow preventer installations. The certificate must be current.

1.5 AVAILABLE AND USE OF UTILITY SERVICES

1.5.1 Temporary Utilities

Provide temporary utilities required for construction. Materials may be new or used, must be adequate for the required usage, not create unsafe conditions, and not violate applicable codes and standards.

1.5.2 Payment for Utility Services

a. The Government will make all reasonably required utilities available to the Contractor for contractor use from existing outlets and supplies. The amount of each utility service consumed will be charged to or paid for by the Contractor at prevailing private party rates determined by the Government. Private party rates are determined/re-determined annually by the Energy Conservation Advisory Board (ECAB) per policies contained in Depot Order 11300.2F and reflect the cost to the government to provide the utility services. The contractor shall pay for all utilities consumed during the extent of the contract until the contract is accepted as complete by the Government. This includes temporary trailers and new facility work.

b. The point at which the Government will deliver such utilities or services and the quantity available is as indicated. The contractor shall pay all costs incurred in connecting, converting, and transferring the utilities to the work. The contractor shall make connections, including providing backflow-preventing devices on connections to domestic water lines; providing meters; and providing transformers; and make disconnections. The electrical connection fee for the meter is \$74.00 and disconnection fee is \$37.00.

c. Following are the current utility rates that will be charged to the contractor:

Electricity - \$97.9271/1,000 KWH
Water - \$4.38/1,000 Gallons
Sewage - \$2.66/1,000 Gallons

d. These rates are subject to change per Paragraph 1.5.2.a above.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

1.5.3 Meters and Temporary Connections

At the Contractors expense and in a manner satisfactory to the Contracting Officer, provide and maintain necessary temporary connections, distribution lines, and meter bases (Government will provide meters) required to measure the amount of each utility used for the purpose of determining charges. Notify the Contracting Officer, in writing, 5 working days before final electrical connection is desired so that a utilities contract can be established. The Government will provide a meter and make the final hot connection after inspection and approval of the Contractor's temporary wiring installation. The Contractor will not make the final electrical connection. A utility outage form shall be submitted by the contractor whenever the contractor is connecting to the government utility system for a new facility. The new facility connection shall not be made until the project meter is installed and operating.

1.5.4 Advance Deposit

An advance deposit for utilities consisting of an estimated month's usage or a minimum of \$50.00 will be required. The last monthly bills for the fiscal year will normally be offset by the deposit and adjustments will be billed or returned as appropriate. Services to be rendered for the next fiscal year, beginning 1 October, will require a new deposit. Notification of the due date for this deposit will be mailed to the Contractor prior to the end of the current fiscal year.

1.5.5 Final Meter Reading

Before completion of the work and final acceptance of the work by the Government, notify the Contracting Officer, in writing, 5 working days before termination is desired. The Government will take a final meter reading, disconnect service, and remove the meters. The contractor shall remove all the temporary distribution lines, meter bases, and associated materials associated with the service connection. All outstanding utility bills shall be paid in full prior to final acceptance of the work by the Government.

1.6 BACKFLOW TESTER CERTIFICATION

Prior to testing, submit to the Contracting Officer certification issued by the State or local regulatory agency attesting that the backflow tester has successfully completed a certification course sponsored by the regulatory agency. Tester shall not be affiliated with any company participating in any other phase of this Contract.

1.7 WEATHER PROTECTION

Take necessary precautions to ensure that roof openings and other critical openings in the building are monitored carefully. Take immediate actions required to seal off such openings when rain or other detrimental weather is imminent, and at the end of each workday. Ensure that the openings are completely sealed off to protect materials and equipment in the building from damage.

1.7.1 Building and Site Storm Protection

When a warning of gale force winds is issued, take precautions to minimize danger to persons, and protect the work and nearby Government property.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

Precautions shall include, but are not limited to, closing openings; removing loose materials, tools and equipment from exposed locations; and removing or securing scaffolding and other temporary work. Close openings in the work when storms of lesser intensity pose a threat to the work or any nearby Government property.

1.7.1.1 Hurricane Condition of Readiness

Unless directed otherwise, comply with:

- a. Condition FOUR (Sustained winds of 50 knots or greater expected within 72 hours): Normal daily jobsite cleanup and good housekeeping practices. Collect and store in piles or containers scrap lumber, waste material, and rubbish for removal and disposal at the close of each work day. Maintain the construction site including storage areas, free of accumulation of debris. Stack form lumber in neat piles less than 4 feet high. Remove all debris, trash, or objects that could become missile hazards. Contact Contracting Officer for Condition of Readiness (COR) updates and completion of required actions.
- b. Condition THREE (Sustained winds of 50 knots or greater expected within 48 hours): Maintain "Condition FOUR" requirements and commence securing operations necessary for "Condition ONE" which cannot be completed within 18 hours. Cease all routine activities which might interfere with securing operations. Commence securing and stow all gear and portable equipment. Make preparations for securing buildings. Review requirements pertaining to "Condition TWO" and continue action as necessary to attain "Condition THREE" readiness. Contact Contracting Officer for weather and COR updates and completion of required actions.
- c. Condition TWO (Sustained winds of 50 knots or greater expected within 24 hours): Curtail or cease routine activities until securing operation is complete. Reinforce or remove form work and scaffolding. Secure machinery, tools, equipment, materials, or remove from the jobsite. Expend every effort to clear all missile hazards and loose equipment from general base areas. Contact Contracting Officer for weather and Condition of Readiness (COR) updates and completion of required actions.
- d. Condition ONE. (Sustained winds of 50 knots or greater expected within 12 hours): Secure the jobsite, and leave Government premises.

1.8 STATION OPERATION AFFECT ON CONTRACTOR OPERATIONS

1.8.1 Restricted Access Areas

The Government will monitor work in areas indicated. Notify Contracting Officer at least 14 calendar days prior to starting work in these areas.

1.8.2 Special Restrictions Regarding Access of Vehicles and Parking

1.8.2.1 Interruption of Vehicular Traffic

If during the performance of work, it becomes necessary to modify vehicular traffic patterns at any locations, notify the Contracting Officer at least 15 calendar days prior to the proposed modification date, and provide a

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

Traffic Control Plan detailing the proposed controls to traffic movement for approval. The plan shall be in accordance with State and local regulations and the FHWA SA-89-006, Part VI. Provide cones, signs, barricades, lights, or other traffic control devices and personnel required to control traffic. Do not use foil-backed material for temporary pavement marking because of its potential to conduct electricity during accidents involving downed power lines.

1.9 STORAGE AREAS

Contractor shall be responsible for security of his property.

1.10 TEMPORARY SANITARY FACILITIES

Provide adequate sanitary conveniences of a type approved for the use of persons employed on the work, properly secluded from public observation, and maintained in such a manner as required and approved by the Contracting Officer. Maintain these conveniences at all times without nuisance. Upon completion of the work, remove the conveniences from the premises, leaving the premises clean and free from nuisance. Dispose of sewage through connection to a municipal, district, or station sanitary sewage system. Where such systems are not available, use chemical toilets or comparably effective units, and periodically empty wastes into a municipal, district, or station sanitary sewage system, or remove waste to a commercial facility. Obtain approval from the system owner prior to discharge into any municipal, district, or commercial sanitary sewer system. Any penalties and / or fines associated with improper discharge shall be the responsibility of the Contractor. Coordinate with the Contracting Officer and follow station regulations and procedures when discharging into the station sanitary sewer system. Include provisions for pest control and elimination of odors.

1.11 TEMPORARY BUILDINGS

Temporary facilities(including trailers) shall be in like new condition. Locate these facilities where directed and within the indicated operations area. Storage of material/debris under such facilities is prohibited. Contractor shall be responsible for the security of the stored property.

1.11.1 Maintenance of Temporary Facilities

Suitably paint and maintain the temporary facilities. Failure to do so will be sufficient reason to require their removal.

PART 2 PRODUCTS

2.1 BACKFLOW PREVENTERS

Reduced pressure principle type conforming to the applicable requirements AWWA C511. Provide backflow preventers complete with 150 pound flanged cast iron, bronze or brass mounted gate valve and strainer, stainless steel or bronze, internal parts. The particular make, model/design, and size of backflow preventers to be installed shall be included in the latest edition of the List of Approved Backflow Prevention Assemblies issued by the FCCCHR List and shall be accompanied by a Certificate of Full Approval from FCCCHR List.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

PART 3 EXECUTION

3.1 TEMPORARY PHYSICAL CONTROLS

3.1.1 Access Controls

3.1.1.1 Temporary Barricades

Contractor shall provide for barricading around all work areas to prevent public access.

3.1.1.2 Fencing

Fencing shall be provided along the construction site at all open excavations and tunnels to control access by unauthorized people. Fencing must be installed to be able to restrain a force of at least 250 pounds against it.

Enclose the project work are and Contractor lay-down area with a 8 feet high chain link fence and gates with brown, UV light resistant, plastic fabric mesh netting (similar to tennis court or other screening). Remove the fence upon completion and acceptance of the work. Intent is to block (screen) public view of the construction.

In addition, prior to the start of work, enclose those are at the construction site which are not within the construction fence with a temporary safety fence, including gates and warning signs, to protect the public from construction activities. The safety fence shall match the base standard color (or bright orange where it protects excavated areas), shall be made of high density polyethylene grid or approved equal, a minimum of 42 inches high, supported and tightly secured to steel posts located on minimum 10 foot centers. Remove the fence from the work site upon completion of the contract.

3.1.1.3 Signs

Place warning signs at the construction area perimeter designating the presence of construction hazards requiring unauthorized persons to keep out. Signs must be placed on all sides of the project, with at least one sign every 300 feet. All points of entry shall have signs designating the construction site as a hard hat area.

3.1.1.4 Traffic Work

All work around/involving roadways, to include roadway excavations and utility crossings, will be conducted in accordance with Manual of Traffic Control Devices. Contractors shall provide and ensure appropriate road closure and detour signs are established as necessary for motor traffic management. All road closures shall be coordinated with the Contracting Officer in advance. Self-illuminated (lighted) barricades shall be provided during hours of darkness. Brightly-colored (orange) vests are required for all personnel working in roadways. Road closures shall require a road closure plan showing the location of signage.

3.2 TEMPORARY WIRING

Provide temporary wiring in accordance with NFPA 241 and NFPA 70, Article 305-6(b), Assured Equipment Grounding Conductor Program. Program shall include frequent inspection of all equipment and apparatus.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

3.3 REDUCED PRESSURE BACKFLOW PREVENTERS

Provide an approved reduced pressure backflow prevention assembly at each location where the Contractor taps into the Government potable water supply.

A certified tester(s) shall perform testing of backflow preventer(s) for proper installation and operation and provide subsequent tagging. Backflow preventer tests shall be performed using test equipment, procedures, and certification forms conforming to those outlined in the latest edition of the Manual of Cross-Connection Control published by the FCCCHR Manual. Test and tag each reduced pressure backflow preventer upon initial installation (prior to continued water use) and quarterly thereafter. Tag shall contain the following information: make, model, serial number, dates of tests, results, maintenance performed, and signature of tester. Record test results on certification forms conforming to requirements cited earlier in this paragraph.

3.4 GRASS CUTTING

Cut grass (or annual weeds) within the construction and storage sites to a maximum 4 inch height at least once a week during the growing season unless the grass area is not visible to the public. Trim the grass around fences at time of grass cutting. Maintain grass or weeds on stockpiled earth as described above.

-- End of Section --

Construct Battalion Synthetic Running Track
 Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
 100% Submittal

SECTION 01 57 19.00 20

TEMPORARY ENVIRONMENTAL CONTROLS

02/09

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 833-R-060-04 (2000) Developing Your Storm Water
 Pollution Prevention Plan, a Guide for
 Construction Sites

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1910.120	Hazardous Waste Operations and Emergency Response
40 CFR 112	Oil Pollution Prevention
40 CFR 122.26	Storm Water Discharges (Applicable to State NPDES Programs, see section 123.25)
40 CFR 241	Guidelines for Disposal of Solid Waste
40 CFR 243	Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste
40 CFR 258	Subtitle D Landfill Requirements
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

Construct Battalion Synthetic Running Track
 Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
 100% Submittal

40 CFR 266	Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 270	EPA Administered Permit Programs: The Hazardous Waste Permit Program
40 CFR 271	Requirements for Authorization of State Hazardous Waste Programs
40 CFR 272	Approved State Hazardous Waste Management Programs
40 CFR 273	Standards For Universal Waste Management
40 CFR 279	Standards for the Management of Used Oil
40 CFR 280	Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (UST)
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan
40 CFR 355	Emergency Planning and Notification
40 CFR 372-SUBPART D	Specific Toxic Chemical Listings
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 173	Shippers - General Requirements for Shipments and Packagings
49 CFR 178	Specifications for Packagings

1.2 DEFINITIONS

1.2.1 Sediment

Soil and other debris that have eroded and have been transported by runoff water or wind.

1.2.2 Solid Waste

Garbage, refuse, debris, sludge, or other discharged material, including solid, liquid, semisolid, or contained gaseous materials resulting from domestic, industrial, commercial, mining, or agricultural operations. Types of solid waste typically generated at construction sites may include:

- a. Green waste: The vegetative matter from landscaping, land clearing and grubbing, including, but not limited to, grass,

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

bushes, scrubs, small trees and saplings, tree stumps and plant roots. Marketable trees, grasses and plants that are indicated to remain, be re-located, or be re-used are not included.

- b. Surplus soil: Existing soil that is in excess of what is required for this work, including aggregates intended, but not used, for on-site mixing of concrete, mortars and paving. Contaminated soil meeting the definition of hazardous material or hazardous waste is not included.
- c. Debris: Non-hazardous solid material generated during the construction, demolition, or renovation of a structure which exceeds 2.5 inch particle size that is: a manufactured object; plant or animal matter; or natural geologic material (e.g. cobbles and boulders), broken or removed concrete, masonry, and rock asphalt paving; ceramics; roofing paper and shingles. Inert materials may not be reinforced with or contain ferrous wire, rods, accessories and weldments. A mixture of debris and other material such as soil or sludge is also subject to regulation as debris if the mixture is comprised primarily of debris by volume, based on visual inspection..
- d. Wood: Dimension and non-dimension lumber, plywood, chipboard, hardboard. Treated and/or painted wood that meets the definition of lead contaminated or lead based contaminated paint is not included.
- e. Scrap metal: Scrap and excess ferrous and non-ferrous metals such as reinforcing steel, structural shapes, pipe and wire that are recovered or collected and disposed of as scrap. Scrap metal meeting the definition of hazardous material or hazardous waste is not included.
- f. Paint cans: Metal cans that are empty of paints, solvents, thinners and adhesives. If permitted by the paint can label, a thin dry film may remain in the can.
- g. Recyclables: Materials, equipment and assemblies such as doors, windows, door and window frames, plumbing fixtures, glazing and mirrors that are recovered and sold as recyclable. Metal meeting the definition of lead contaminated or lead based paint contaminated may not be included as recyclable if sold to a scrap metal company. Paint cans may be included as recyclable if sold to a scrap metal company.
- h. Hazardous Waste: By definition, to be a hazardous waste a material must first meet the definition of a solid waste. Hazardous waste and hazardous debris are special cases of solid waste. They have additional regulatory controls and must be handled separately. They are thus defined separately in this document.

Material not regulated as solid waste are: nuclear source or byproduct materials regulated under the Federal Atomic Energy Act of 1954 as amended; suspended or dissolved materials in domestic sewage effluent or irrigation return flows, or other regulated point source discharges; regulated air emissions; and fluids or wastes associated with natural gas or crude oil exploration or production.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

1.2.3 Hazardous Debris

As defined in Solid Waste paragraph, debris that contains listed hazardous waste (either on the debris surface, or in its interstices, such as pore structure) per 40 CFR 261; or debris that exhibits a characteristic of hazardous waste per 40 CFR 261.

1.2.4 Chemical Wastes

This includes salts, acids, alkalizes, herbicides, pesticides, and organic chemicals.

1.2.5 Garbage

Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.

1.2.6 Hazardous Waste

Any discarded material, liquid, solid, or gas, which meets the definition of hazardous material or is designated hazardous waste by the Environmental Protection Agency or State Hazardous Control Authority as defined in 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, 40 CFR 268, 40 CFR 270, 40 CFR 271, 40 CFR 272, 40 CFR 273, 40 CFR 279, and 40 CFR 280.

1.2.7 Hazardous Materials

Hazardous materials as defined in 49 CFR 171 and listed in 49 CFR 172.

Hazardous material is any material that:

- a. Is regulated as a hazardous material per 49 CFR 173, or
- b. Requires a Material Safety Data Sheet (MSDS) per 29 CFR 1910.120, or
- c. During end use, treatment, handling, packaging, storage, transpiration, or disposal meets or has components that meet or have potential to meet the definition of a hazardous waste as defined by 40 CFR 261 Subparts A, B, C, or D.

Designation of a material by this definition, when separately regulated or controlled by other instructions or directives, does not eliminate the need for adherence to that hazard-specific guidance which takes precedence over this instruction for "control" purposes. Such material include ammunition, weapons, explosive actuated devices, propellants, pyrotechnics, chemical and biological warfare materials, medical and pharmaceutical supplies, medical waste and infectious materials, bulk fuels, radioactive materials, and other materials such as asbestos, mercury, and polychlorinated biphenyls (PCBs). Nonetheless, the exposure may occur incident to manufacture, storage, use and demilitarization of these items.

1.2.8 Waste Hazardous Material (WHM)

Any waste material which because of its quantity, concentration, or physical, chemical, or infectious characteristics may pose a substantial hazard to human health or the environment and which has been so

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

designated. Used oil not containing any hazardous waste, as defined above, falls under this definition.

1.2.9 Oily Waste

Those materials which are, or were, mixed with used oil and have become separated from that used oil. Oily wastes also means materials, including wastewaters, centrifuge solids, filter residues or sludges, bottom sediments, tank bottoms, and sorbents which have come into contact with and have been contaminated by, used oil and may be appropriately tested and discarded in a manner which is in compliance with other State and local requirements.

This definition includes materials such as oily rags, "kitty litter" sorbent clay and organic sorbent material. These materials may be land filled provided that:

- a. It is not prohibited in other State regulations or local ordinances
- b. The amount generated is "de minimus" (a small amount)
- c. It is the result of minor leaks or spills resulting from normal process operations
- d. All free-flowing oil has been removed to the practical extent possible

Large quantities of this material, generated as a result of a major spill or in lieu of proper maintenance of the processing equipment, are a solid waste. As a solid waste, a hazardous waste determination must be performed prior to disposal. As this can be an expensive process, it is recommended that this type of waste be minimized through good housekeeping practices and employee education.

1.2.10 Regulated Waste

Those solid waste that have specific additional Federal, state, or local controls for handling, storage, or disposal.

1.2.11 Class I Ozone Depleting Substance (ODS)

Class I ODS is defined in Section 602(a) of The Clean Air Act and includes the following chemicals:

chlorofluorocarbon-11 (CFC-11)
chlorofluorocarbon-12 (CFC-12)
chlorofluorocarbon-13 (CFC-13)
chlorofluorocarbon-111 (CFC-111)
chlorofluorocarbon-112 (CFC-112)
chlorofluorocarbon-113 (CFC-113)
chlorofluorocarbon-114 (CFC-114)
chlorofluorocarbon-115 (CFC-115)
chlorofluorocarbon-211 (CFC-211)
chlorofluorocarbon-212 (CFC-212)
chlorofluorocarbon-213 (CFC-213)
chlorofluorocarbon-214 (CFC-214)
chlorofluorocarbon-215 (CFC-215)
chlorofluorocarbon-216 (CFC-216)

Construct Battalion Synthetic Running Track
 Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
 100% Submittal

chlorofluorocarbon-217 (CFC-217)
 chlorofluorocarbon-500 (CFC-500)
 chlorofluorocarbon-502 (CFC-502)
 chlorofluorocarbon-503 (CFC-503)
 halon-1211
 halon-1301
 halon-2402
 carbon tetrachloride
 methyl bromide
 methyl chloroform

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Preconstruction Survey; G
 Dirt and Dust Control Plan; G

SD-06 Test Reports

Erosion and Sediment Control Inspection Reports; G
 Storm Water Inspection Reports for General Permit
 Contractor 40 CFR employee training records

SD-11 Closeout Submittals

Some of the records listed below are also required as part of other submittals. For the "Records" submittal, maintain on-site a separate three-ring Environmental Records binder and submit at the completion of the project. Make separate parts to the binder corresponding to each of the applicable sub items listed below.

Waste Determination Documentation
 Disposal Documentation for Hazardous and Regulated Waste
 Contractor 40 CFR Employee Training Records
 Solid Waste Management Permit
 Contractor Hazardous Material Inventory Log; G
 Hazardous Waste/Debris Management

1.4 ENVIRONMENTAL PROTECTION REQUIREMENTS

Provide and maintain, during the life of the contract, environmental protection as defined. Plan for and provide environmental protective measures to control pollution that develops during normal construction practice. Plan for and provide environmental protective measures required to correct conditions that develop during the construction of permanent or

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

temporary environmental features associated with the project. Comply with Federal, State, and local regulations pertaining to the environment, including water, air, solid waste, hazardous waste and substances, oily substances, and noise pollution.

1.4.1 Environmental Compliance Assessment Training and Tracking System (ECATTS)

Submit a ECATTS list of Contractor and Subcontractor company names for each Contractor and Sub-contractor performing construction work on this project that has completed the required who have completed the required "Environmental Compliance Assessment Training and Tracking System (ECATTS)" training. This training is web-based and can be accessed from any computer with Internet access using the following instructions. NOTE: Prior to registration and completion of training the Contractor or Sub-Contractor Company Name and Contract Number must be in the training database. Submit Contractor and Sub-Contractor company names list for ECATTS for all sub-contractors doing work on this Contract Number to the Contracting Officer immediately after award of a contract. This list shall be updated and re-submitted as sub-contracts are awarded. Register for NAVFAC Environmental Compliance Training and Tracking System, by logging on to <http://navfac.ecatts.com/>. Obtain the password for registration from the Contracting Officer.

Personnel in the positions listed below shall complete ECATTS Training prior to starting their respective portions of on-site work under this contract. If personnel changes occur for any of these positions after starting work, replacement personnel shall complete ECATTS training within 14 days of assignment to the project.

Prime Contractor

- Project Manager
- Project Superintendent
- Quality Control Manager
- Environmental Manager (as specified in this specification)

Sub-Contractors

- Project Manager (or equivalent person)
- Superintendent (or equivalent job-site person)

This training has been structured to allow contractor personnel to receive credit under this contract and also to carry forward credit to future contracts. Contractors shall ensure that the QC Manager (and alternate QC Manager) or Environmental Manager review their training plans for new modules or updated training requirements prior to beginning work. Some training modules are tailored for specific State regulatory requirements; therefore, Contractors working in multiple states will be requires to re-take modules tailored to the state where the contract work is being performed.

1.4.2 Conformance with the Environmental Management System

The Contractor shall perform work under this contract consistent with the policy and objectives identified in the installation's Environmental Management System (EMS). The Contractor shall perform work in a manner that conforms to objectives and targets, environmental programs and operational controls identified by the EMS. The Contractor will provide monitoring and measurement information as necessary to address environmental performance relative to environmental, engery, and

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

transportation management goals. In the event an EMS nonconformance or environmental noncompliance associated with the contracted services, tasks, or actions occurs, the Contractor shall take corrective and/or preventative actions. In addition, the Contractor shall ensure that its employees are aware of their roles and responsibilities under the EMS and how these EMS roles and responsibilities affect work performed under the contract.

The Contractor is responsible for ensuring that their employees receive applicable environmental and occupational health and safety training, and keep up to date on regulatory required specific training for the type of work to be conducted onsite. All on-site Contractor personnel, and their subcontractor personnel, performing tasks that have the potential to cause a significant environmental impact shall be competent on the basis of appropriate education, training or experience. Upon contract award, the Contracting Officer's Representative will notify the installation's EMS coordinator to arrange EMS training. Refer to Section 01 57 19.01 20, Supplemental Temporary Environmental Controls for additional site specific EMS requirements related to construction. The installation's EMS coordinator shall identify training needs associated with environmental aspects and the EMS, and arrange training or take other action to meet these needs. The Contractor shall provide training documentation to the Contracting Officer. The EMS coordinator shall retain associated records.

1.5 QUALITY ASSURANCE

1.5.1 Preconstruction Survey

Perform a Preconstruction Survey of the project site with the Contracting Officer, and take photographs showing existing environmental conditions in and adjacent to the site. Submit a report for the record.

1.5.2 Regulatory Notifications

The Contractor is responsible for all regulatory notification requirements in accordance with Federal, State and local regulations. In cases where the Navy must also provide public notification (such as stormwater permitting), the Contractor must coordinate with the Contracting Officer. The Contractor shall submit copies of all regulatory notifications to the Contracting Officer prior to commencement of work activities. Typically, regulatory notifications must be provided for the following (this listing is not all inclusive): demolition, renovation, NPDES defined site work, remediation of controlled substances (asbestos, hazardous waste, lead paint).

1.5.3 Environmental Brief

Attend an environmental brief to be included in the preconstruction meeting. Provide the following information: types, quantities, and use of hazardous materials that will be brought onto the activity; types and quantities of wastes/wastewater that may be generated during the contract. Discuss the results of the Preconstruction Survey at this time.

Prior to initiating any work on site, meet with the Contracting Officer and activity environmental staff to discuss the proposed Environmental Management Plan. Develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural resources, required reports, required permits, permit requirements, and other measures to be taken.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

1.5.4 Environmental Manager

Appoint in writing an Environmental Manager for the project site. The Environmental Manager will be directly responsible for coordinating contractor compliance with Federal, State, local, and station requirements. The Environmental Manager will ensure compliance with Hazardous Waste Program requirements (including hazardous waste handling, storage, manifesting, and disposal); implement the Environmental Management Plan; ensure that all environmental permits are obtained, maintained, and closed out; ensure compliance with Storm Water Program Management requirements; ensure compliance with Hazardous Materials (storage, handling, and reporting) requirements; and coordinate any remediation of regulated substances (lead, asbestos, PCB transformers). This can be a collateral position; however the person in this position must be trained to adequately accomplish the following duties: ensure waste segregation and storage compatibility requirements are met; inspect and manage Satellite Accumulation areas; ensure only authorized personnel add wastes to containers; ensure all Contractor personnel are trained in 40 CFR requirements in accordance with their position requirements; coordinate removal of waste containers; and maintain the Environmental Records binder and required documentation, including environmental permits compliance and close-out.

1.5.5 Contractor 40 CFR Employee Training Records

Prepare and maintain employee training records throughout the term of the contract meeting applicable 40 CFR requirements. Submit these training records to the Contracting Officer at the conclusion of the project, unless otherwise directed.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 ENVIRONMENTAL MANAGEMENT PLAN

Prior to initiating any work on site, the Contractor will meet with the Contracting Officer to discuss the proposed Environmental Protection Plan and develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural resources, required reports, and other measures to be taken. The Contractor's Environmental Plan shall incorporate construction related objectives and targets from the installation's Environmental Management System. The Environmental Management Plan will be submitted in the following format and shall include the elements specified below.

- a. Description of the Environmental Management Plan
 - (1) General overview and purpose
 - (2) General site information
- b. Management of Natural Resources
 - (1) Land resources
 - (2) Tree protection

Construct Battalion Synthetic Running Track
 Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
 100% Submittal

- (3) Replacement of damaged landscape features
- (4) Temporary construction
- (5) Stream crossings
- (6) Fish and wildlife resources
- (7) Wetland areas
- c. Protection of Historical and Archaeological Resources
 - (1) Objectives
 - (2) Methods
- d. Storm Water Management and Control
 - (1) Ground cover
 - (2) Erodible soils
 - (3) Temporary measures
 - (a) Mechanical retardation and control of runoff
 - (b) Vegetation and mulch
 - (4) Effective selection, implementation and maintenance of Best Management Practices (BMPs).
- e. Protection of the Environment from Waste Derived from Contractor Operations
 - (1) Control and disposal of solid and sanitary waste.
 - (2) Control and disposal of hazardous waste (Hazardous Waste Management Section)

This item will consist of the management procedures for all hazardous waste to be generated. The elements of those procedures will coincide with the Activity Hazardous Waste Management Plan. A copy of the Activity Hazardous Waste Management Plan will be provided by the Contracting Officer. As a minimum, include the following:

- (a) Procedures to be employed to ensure a written waste determination is made for appropriate wastes which are to be generated;
- (b) Sampling/analysis plan;
- (c) Methods of hazardous waste accumulation/storage (i.e., in tanks and/or containers);
- (d) Management procedures for storage, labeling, transportation, and disposal of waste (treatment of waste is not allowed unless specifically noted);

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

(e) Management procedures and regulatory documentation ensuring disposal of hazardous waste complies with Land Disposal Restrictions (40 CFR 268);

(f) Management procedures for recyclable hazardous materials such as lead-acid batteries, used oil, and the like;

(g) Used oil management procedures in accordance with 40 CFR 279;

(h) Pollution prevention\hazardous waste minimization procedures;

(i) Plans for the disposal of hazardous waste by permitted facilities;

(j) Procedures to be employed to ensure all required employee training records are maintained.

f. Prevention of Releases to the Environment

(1) Procedures to prevent releases to the environment

(2) Notifications in the event of a release to the environment

g. Regulatory Notification and Permits

(1) List what notifications and permit applications must be made. Demonstrate that those permits have been obtained by including copies of all applicable, environmental permits..

3.1.1 Environmental Protection Plan Review

Fourteen days after the environmental protection meeting, submit the proposed Environmental Management Plan for further discussion, review, and approval. Commencement of work will not begin until the environmental management plan has been approved.

3.1.2 Licenses and Permits

Obtain licenses and permits pursuant to the "Permits and Responsibilities" FAR Clause 52.236-7.

The following permits will be obtained by the Contracting Officer:

a. SCDHEC Stormwater / Land Disturbance Permit

For permits obtained by the Contracting Officer, whether or not required by the permit, the Contractor is responsible for conforming to all permit requirements and performing all quality control inspections of the work in progress, and to submit notifications and certifications to the applicable regulatory agency via the Contracting Officer.

The inspections and certifications will be provided through the services of a Professional Engineer (PE), registered in the State where the work is being performed. As a part of the quality control plan, which is required to be submitted for approval by the quality control section, provide a sub item containing the name, appropriate professional registration or licence

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

number, address, and telephone number of the professionals or other qualified persons who will be performing the inspections and certifications for each permit.

3.2 PROTECTION OF NATURAL RESOURCES

Preserve the natural resources within the project boundaries and outside the limits of permanent work. Restore to an equivalent or improved condition upon completion of work. Confine construction activities to within the limits of the work indicated or specified. If the work is near streams, lakes, or other waterways, conform to the national permitting requirements of the Clean Water Act.

Do not disturb fish and wildlife. Do not alter water flows or otherwise significantly disturb the native habitat adjacent to the project and critical to the survival of fish and wildlife, except as indicated or specified.

Except in areas to be cleared, do not remove, cut, deface, injure, or destroy trees or shrubs without the Contracting Officer's permission. Do not fasten or attach ropes, cables, or guys to existing nearby trees for anchorages unless authorized by the Contracting Officer. Where such use of attached ropes, cables, or guys is authorized, the Contractor will be responsible for any resultant damage.

Protect existing trees which are to remain and which may be injured, bruised, defaced, or otherwise damaged by construction operations. Remove displaced rocks from uncleared areas. By approved excavation, remove trees with 30 percent or more of their root systems destroyed. Remove trees and other landscape features scarred or damaged by equipment operations, and replace with equivalent, undamaged trees and landscape features. Obtain Contracting Officer's approval before replacement.

The Contracting Officer's approval is required before any equipment will be permitted to ford live streams. In areas where frequent crossings are required, install temporary culverts or bridges. Obtain Contracting Officer's approval prior to installation. Remove temporary culverts or bridges upon completion of work, and repair the area to its original condition unless otherwise required by the Contracting Officer.

3.2.1 Erosion and Sediment Control Measures

3.2.1.1 Burnoff

Burnoff of the ground cover is not permitted.

3.2.1.2 Protection of Erodible Soils

Immediately finish the earthwork brought to a final grade, as indicated or specified. Immediately protect the side slopes and back slopes upon completion of rough grading. Plan and conduct earthwork to minimize the duration of exposure of unprotected soils.

3.2.1.3 Temporary Protection of Erodible Soils

Use the following methods to prevent erosion and control sedimentation:

- a. Mechanical Retardation and Control of Runoff

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

(1) Mechanically retard and control the rate of runoff from the construction site. This includes construction of diversion ditches, benches, berms, and use of silt fences and straw bales to retard and divert runoff to protected drainage courses.

b. Vegetation and Mulch

(1) Provide temporary protection on sides and back slopes as soon as rough grading is completed or sufficient soil is exposed to require erosion protection. Protect slopes by accelerated growth of permanent vegetation, temporary vegetation, mulching, or netting. Stabilize slopes by hydroseeding, anchoring mulch in place, covering with anchored netting, sodding, or such combination of these and other methods necessary for effective erosion control.

(2) Seeding: Provide new seeding where ground is disturbed. Include topsoil or nutriment during the seeding operation necessary to establish or reestablish a suitable stand of grass.

3.2.2 Erosion and Sediment Control Inspection Reports

3.2.2.1 Storm Water Notice of Intent for Construction Activities and Storm Water Pollution Prevention Plan

The Contractor shall submit a Storm Water Notice of Intent (for NPDES coverage under the general permit for construction activities) and a Storm Water Pollution Prevention Plan (SWPPP) for the project to the Contracting Officer prior and gain approval prior to the commencement of work. The SWPPP will meet the requirements of the State of South Carolina general permit for storm water discharges from construction sites. Submit the SWPPP along with any required Notice of Intent, Notice of Termination, and appropriate permit fees, via the Contracting Officer, to the appropriate Federal or State agency for approval, a minimum of 14 calendar days prior to the start of any land disturbing activities. The Contractor shall maintain an approved copy of the SWPPP at the construction on-site office, and continually update as regulations require, reflecting current site conditions.

(1) The SWPPP shall:

a. Identify potential sources of pollution which may be reasonably expected to affect the quality of storm water discharge from the site.

b. Describe and ensure implementation of practices which will be used to reduce the pollutants in storm water discharge from the site.

c. Ensure compliance with terms of the EPA or State general permit for storm water discharge.

d. Select applicable best management practices from EPA 833-R-060-04.

e. Include a completed copy of the Registration Statement, BMP Inspection Report Template and Notice of Termination except for the effective date.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

f. Storm Water Pollution Prevention Measures and Notice of Intent 40 CFR 122.26, EPA 833-R-060-04. Provide a "Storm Water Pollution Prevention Plan" (SWPPP) for the project. The SWPPP will meet the requirements of the EPA or State general permit for storm water discharges from construction sites. Submit the SWPPP along with any required Notice of Intent, Notice of Termination, and appropriate permit fees, via the Contracting Officer, to the appropriate Federal or State agency for approval, a minimum of 14 calendar days prior to the start of construction. A copy of the approved SWPPP will be kept at the construction on-site office, and continually updated as regulations require reflecting current site conditions.

3.3 HISTORICAL AND ARCHAEOLOGICAL RESOURCES

Carefully protect in-place and report immediately to the Contracting Officer historical and archaeological items or human skeletal remains discovered in the course of work. Upon discovery, notify the Contracting Officer. Stop work in the immediate area of the discovery until directed by the Contracting Officer to resume work. The Government retains ownership and control over historical and archaeological resources.

3.4 CONTROL AND DISPOSAL OF SOLID WASTE

Pick up solid wastes, and place in covered containers which are regularly emptied. Do not prepare or cook food on the project site. Prevent contamination of the site or other areas when handling and disposing of wastes. At project completion, leave the areas clean. Recycling is encouraged and can be coordinated with the Contracting Officer and the activity recycling coordinator. Remove all solid waste (including non-hazardous debris) from Government property and dispose off-site at an approved landfill. Solid waste disposal off-site must comply with most stringent local, State, and Federal requirements including 40 CFR 241, 40 CFR 243, and 40 CFR 258.

3.4.1 Dumpsters

Equip dumpsters with a secure cover and paint the standard base color. Keep cover closed at all times, except when being loaded with trash and debris. Locate dumpsters behind the construction fence or out of the public view. Empty site dumpsters at least once a week, or as needed to keep the site free of debris and trash. If necessary, provide 55 gallon trash containers painted the darker base color to collect debris in the construction site area. Locate the trash containers behind the construction fence or out of the public view. Empty trash containers at least once a day. For large demolitions, large dumpsters without lids are acceptable but should not have debris higher than the sides before emptying.

3.5 WASTE DETERMINATION DOCUMENTATION

Complete a Waste Determination form (provided at the pre-construction conference) for all contractor derived wastes to be generated. Base the waste determination upon either a constituent listing from the manufacturer used in conjunction with consideration of the process by which the waste was generated, EPA approved analytical data, or laboratory analysis (Material Safety Data Sheets (MSDS) by themselves are not adequate). Attach all support documentation to the Waste Determination form. As a minimum, a Waste Determination form must be provided for the following wastes (this listing is not all inclusive): oil and latex based painting

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

and caulking products, solvents, adhesives, aerosols, petroleum products, and all containers of the original materials.

3.5.1 Contractor Hazardous Material Inventory Log

Submit the Contractor Hazardous Material Inventory Log (found at: <http://www.wbdg.org/ccb/NAVGRAPH/01575n.pdf>), which provides information required by (EPCRA Sections 312 and 313) along with corresponding Material Safety Data Sheets (MSDS) to the Contracting Officer at the start and at the end of construction (30 days from final acceptance), and update no later than January 31 of each calendar year during the life of the contract. Documentation for any spills/releases, environmental reports or off-site transfers may be requested by the Contracting Officer.

3.5.2 Laboratory Analysis

Submit a copy of a Laboratory Analysis of solid waste and debris with the potential of becoming classified as a hazardous waste (i.e., abrasive/sand blasting debris, etc.). Waste stream determinations are required at the point of generation and must sufficiently document whether the waste will be a solid waste, hazardous waste, or Resource Conservation and Recovery Act (RCRA) exempt waste. Determinations must use EPA approved methods and provide written rationale for whether the waste is classified as hazardous or non-hazardous. The Contractor will bear the cost of the waste stream determinations, and the Contracting Officer reserves the right to request waste stream determinations on questionable waste streams.

3.6 CONTRACTOR HAZARDOUS MATERIAL INVENTORY LOG

Submit the "Contractor Hazardous Material Inventory Log" (found at: <http://www.wbdg.org/ccb/NAVGRAPH/graphoc.pdf>), which provides information required by (EPCRA Sections 312 and 313) along with corresponding Material Safety Data Sheets (MSDS) to the Contracting Officer at the start and at the end of construction (30 days from final acceptance), and update no later than January 31 of each calendar year during the life of the contract. Documentation for any spills/releases, environmental reports or off-site transfers may be requested by the Contracting Officer.

3.6.1 Disposal Documentation for Hazardous and Regulated Waste

Manifest, pack, ship and dispose of hazardous or toxic waste and universal waste that is generated as a result of construction in accordance with the generating facilities generator status under the Resource Conservation and Recovery Act. Contact the Contracting Officer for the facility RCRA identification number that is to be used on each manifest.

Submit a copy of the applicable EPA and or State permit(s), manifest(s), or license(s) for transportation, treatment, storage, and disposal of hazardous and regulated waste by permitted facilities. Hazardous or toxic waste manifest must be reviewed, signed, and approved by the Navy before the Contractor may ship waste. To obtain specific disposal instructions the Contractor must coordinate with the Activity environmental office. Refer to Section 01 57 19.01 20 for the Activity Point of Contact information.

3.7 POLLUTION PREVENTION/HAZARDOUS WASTE MINIMIZATION

Minimize the use of hazardous materials and the generation of hazardous waste. Include procedures for pollution prevention/ hazardous waste

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

minimization in the Hazardous Waste Management Section of the Environmental Management Plan. Consult with the activity Environmental Office for suggestions and to obtain a copy of the installation's pollution prevention/hazardous waste minimization plan for reference material when preparing this part of the plan. If no written plan exists, obtain information by contacting the Contracting Officer. Describe the types of the hazardous materials expected to be used in the construction when requesting information.

3.8 WHM/HW MATERIALS PROHIBITION

No waste hazardous material or hazardous waste shall be disposed of on government property. No hazardous material shall be brought onto government property that does not directly relate to requirements for the performance of this contract. The government is not responsible for disposal of Contractor's waste material brought on the job site and not required in the performance of this contract. The intent of this provision is to dispose of that waste identified as waste hazardous material/hazardous waste as defined herein that was generated as part of this contract and existed within the boundary of the Contract limits and not brought in from offsite by the Contractor. Incidental materials used to support the contract including, but not limited to aerosol cans, waste paint, cleaning solvents, contaminated brushes, rags, clothing, etc. are the responsibility of the Contractor. The list is illustrative rather than inclusive. The Contractor is not authorized to discharge any materials to sanitary sewer, storm drain, or to the river or conduct waste treatment or disposal on government property without written approval of the Contracting Officer.

3.9 HAZARDOUS MATERIAL MANAGEMENT

No hazardous material shall be brought onto government property that does not directly relate to requirements for the performance of this contract.

Include hazardous material control procedures in the Safety Plan. Address procedures and proper handling of hazardous materials, including the appropriate transportation requirements. Submit a MSDS and estimated quantities to be used for each hazardous material to the Contracting Officer prior to bringing the material on base. Typical materials requiring MSDS and quantity reporting include, but are not limited to, oil and latex based painting and caulking products, solvents, adhesives, aerosol, and petroleum products. At the end of the project, provide the Contracting Officer with the maximum quantity of each material that was present at the site at any one time, the dates the material was present, the amount of each material that was used during the project, and how the material was used. Ensure that hazardous materials are utilized in a manner that will minimize the amount of hazardous waste that is generated. Ensure that all containers of hazardous materials have NFPA labels or their equivalent. Keep copies of the MSDS for hazardous materials on site at all times and provide them to the Contracting Officer at the end of the project. Certify that all hazardous materials removed from the site are hazardous materials and do not meet the definition of hazardous waste per 40 CFR 261.

3.10 PETROLEUM PRODUCTS AND REFUELING

Conduct the fueling and lubricating of equipment and motor vehicles in a manner that protects against spills and evaporation. Manage all used oil generated on site in accordance with 40 CFR 279. Determine if any used oil

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

generated while on-site exhibits a characteristic of hazardous waste. Used oil containing 1000 parts per million of solvents will be considered a hazardous waste and disposed of at Contractor's expense. Used oil mixed with a hazardous waste will also be considered a hazardous waste.

3.10.1 Oily and Hazardous Substances

Prevent oil or hazardous substances from entering the ground, drainage areas, or navigable waters. In accordance with 40 CFR 112, surround all temporary fuel oil or petroleum storage tanks with a temporary berm or containment of sufficient size and strength to contain the contents of the tanks, plus 10 percent freeboard for precipitation. The berm will be impervious to oil for 72 hours and be constructed so that any discharge will not permeate, drain, infiltrate, or otherwise escape before cleanup occurs.

3.10.2 Inadvertent Discovery of Petroleum Contaminated Soil or Hazardous Wastes

If petroleum contaminated soil or suspected hazardous waste is found during construction that was not identified in the contract documents, the contractor shall immediately notify the contracting officer. The contractor shall not disturb this material until authorized by the contracting officer.

3.11 FUEL TANKS

Petroleum products and lubricants required to sustain up to 30 days of construction activity may be kept on site. Storage and refilling practices shall comply with 40 CFR Part 112. Secondary containment shall be provided and be no less than 110 percent of the tank volume plus five inches of free-board. If a secondary berm is used for containment then the berm shall be impervious to oil for 72 hours and be constructed so that any discharge will not permeate, drain, infiltrate, or otherwise escape before cleanup occurs. Drips pans are required and the tanks must be covered during inclement weather.

3.12 RELEASES/SPILLS OF OIL AND HAZARDOUS SUBSTANCES

Exercise due diligence to prevent, contain, and respond to spills of hazardous material, hazardous substances, hazardous waste, sewage, regulated gas, petroleum, lubrication oil, and other substances regulated by environmental law. Maintain spill cleanup equipment and materials at the work site. In the event of a spill, take prompt, effective action to stop, contain, curtail, or otherwise limit the amount, duration, and severity of the spill/release. In the event of any releases of oil and hazardous substances, chemicals, or gases; immediately (within 15 minutes) notify the Base or Activity Fire Department, the activity's Command Duty Officer, and the Contracting Officer. If the contractor's response is inadequate, the Navy may respond. If this should occur, the contractor will be required to reimburse the government for spill response assistance and analysis.

The Contractor is responsible for verbal and written notifications as required by the federal 40 CFR 355, State, local regulations and Navy Instructions. Spill response will be in accordance with 40 CFR 300 and applicable State and local regulations. Contain and clean up these spills without cost to the Government. If Government assistance is requested or required, the Contractor will reimburse the Government for such

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

assistance. Provide copies of the written notification and documentation that a verbal notification was made within 20 days.

Maintain spill cleanup equipment and materials at the work site. Clean up all hazardous and non-hazardous (WHM) waste spills. The Contractor shall reimburse the government for all material, equipment, and clothing generated during any spill cleanup. The Contractor shall reimburse the government for all costs incurred including sample analysis materials, equipment, and labor if the government must initiate its own spill cleanup procedures, for Contractor responsible spills, when:

- a. The Contractor has not begun spill cleanup procedure within one hour of spill discovery/occurrence, or
- b. If, in the government's judgment, the Contractor's spill cleanup is not adequately abating life threatening situation and/or is a threat to any body of water or environmentally sensitive areas.

3.13 CONTROL AND MANAGEMENT OF HAZARDOUS WASTES

3.13.1 Hazardous Waste/Debris Management

Identify all construction activities which will generate hazardous waste/debris. Provide a documented waste determination for all resultant waste streams. Hazardous waste/debris will be identified, labeled, handled, stored, and disposed of in accordance with all Federal, State, and local regulations including 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, and 40 CFR 268.

Hazardous waste will also be managed in accordance with the approved Hazardous Waste Management Section of the Environmental Protection Plan. Store hazardous wastes in approved containers in accordance with 49 CFR 173 and 49 CFR 178. Hazardous waste generated within the confines of Government facilities will be identified as being generated by the Government.

Prior to removal of any hazardous waste from Government property, all hazardous waste manifests must be signed by activity personnel from the Station Environmental Office. No hazardous waste will be brought onto Government property. Provide to the Contracting Officer a copy of waste determination documentation for any solid waste streams that have any potential to be hazardous waste or contain any chemical constituents listed in 40 CFR 372-SUBPART D. For hazardous wastes spills, verbally notify the Contracting Officer immediately.

3.13.1.1 Regulated Waste Storage/Satellite Accumulation/90 Day Storage Areas

If the work requires the temporary storage/collection of regulated or hazardous wastes, the Contractor will request the establishment of a Regulated Waste Storage Area, a Satellite Accumulation Area, or a 90 Day Storage Area at the point of generation. The Contractor must submit a request in writing to the Contracting Officer providing the following information:

<u>Contract Number</u>	_____	<u>Contractor</u>	_____
<u>Haz/Waste or Regulated Waste POC</u>	_____	<u>Phone Number</u>	_____

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

Type of Waste _____ Source of Waste _____

Emergency POC _____ Phone Number _____

Location of the Site: _____
(Attach Site Plan to the Request)

Attach a waste determination form. Allow ten working days for processing this request. The designated area where waste is being stored shall be barricaded and a sign identifying as follows:

"DANGER - UNAUTHORIZED PERSONNEL KEEP OUT"

3.14 DUST CONTROL

Keep dust down at all times, including during nonworking periods. Sprinkle or treat, with dust suppressants, the soil at the site, haul roads, and other areas disturbed by operations. Dry power brooming will not be permitted. Instead, use vacuuming, wet mopping, wet sweeping, or wet power brooming. Air blowing will be permitted only for cleaning nonparticulate debris such as steel reinforcing bars. Only wet cutting will be permitted for cutting concrete blocks, concrete, and bituminous concrete. Do not unnecessarily shake bags of cement, concrete mortar, or plaster.

3.14.1 Dirt and Dust Control Plan

Submit truck and material haul routes along with a plan for controlling dirt, debris, and dust on base roadways. As a minimum, identify in the plan the subcontractor and equipment for cleaning along the haul route and measures to reduce dirt, dust, and debris from roadways.

3.15 ABRASIVE BLASTING

3.15.1 Blasting Operations

The use of silica sand is prohibited in sandblasting.

Provide tarpaulin drop cloths and windscreens to enclose abrasive blasting operations to confine and collect dust, abrasive, agent, paint chips, and other debris. Perform work involving removal of hazardous material in accordance with 29 CFR 1910.

3.15.2 Disposal Requirements

Submit analytical results of the debris generated from abrasive blasting operations per paragraph entitled Laboratory Analysis of this section. Hazardous waste generated from blasting operations will be managed in accordance with paragraph entitled "Hazardous Waste\Debris Management" of this section and with the approved HWMP. Disposal of non-hazardous abrasive blasting debris will be in accordance with paragraph entitled, "Control and Disposal of Solid Wastes".

3.16 NOISE

Make the maximum use of low-noise emission products, as certified by the EPA. Blasting or use of explosives will not be permitted without written permission from the Contracting Officer, and then only during the designated times. Confine pile-driving operations to the period between 8

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

a.m. and 4 p.m., Monday through Friday, exclusive of holidays, unless otherwise specified.

-- End of Section --

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

SECTION 01 78 00

CLOSEOUT SUBMITTALS

01/08

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM E 1971 (2005) Stewardship for the Cleaning of
Commercial and Institutional Buildings

GREEN SEAL (GS)

GS-37 (2000; R 2005) Industrial and
Institutional Cleaners

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-10 Operation and Maintenance Data

Equipment/Product Warranty List; G

Submit Data Package 1 in accordance with Section 01 78 23
OPERATION AND MAINTENANCE DATA.

SD-11 Closeout Submittals

As-Built Drawings

Drawings showing final as-built conditions of the project. The final CADD record drawings must consist of one set of electronic CADD drawing files in the specified format, one set of mylar drawings, 2 sets of blue-line prints of the mylars, and one set of the approved working Record drawings.

Record of Materials; G

Equipment/Product Warranty Tag;; G

Form DD1354; G

Checklist for Form DD1354; G

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

1.3 PROJECT RECORD DOCUMENTS

1.3.1 As-Built Drawings

NFAS 5252.236-9310, Record Drawings."

1.3.2 As-Built Record of Materials

Furnish a record of materials used on the project
Where several manufacturers' brands, types, or classes of the item listed
have been used in the project, designate specific areas where each item was
used. Designations shall be keyed to the areas and spaces depicted on the
contract drawing. Furnish the record of materials used in the following
format:

RECORD OF DESIGNATED EQUIPMENT AND MATERIALS DATA

Description	Specification Section	Manufacturer and Catalog, Model, and Serial Number	Composition and Size	Where Used
_____	_____	_____	_____	_____

1.4 EQUIPMENT/PRODUCT WARRANTIES

1.4.1 Equipment/Product Warranty List

Furnish to the Contracting Officer a bound and indexed notebook containing
written warranties for equipment/products furnished under the contract, and
prepare a complete listing of such equipment/products. The
equipment/products list shall state the specification section applicable to
the equipment/product, duration of the warranty therefor, start date of the
warranty, ending date of the warranty, and the point of contact for
fulfillment of the warranty. The warranty period shall begin on the same
date as project acceptance and shall continue for the full product warranty
period. Execute the full list and deliver to the Contracting Officer prior
to final acceptance of the facility.

1.4.2 Equipment Warranty Tags and Guarantor's Local Representative

Furnish with each warranty the name, address, and telephone number of the
guarantor's representative nearest to the location where the equipment and
appliances are installed. The guarantor's representative, upon request of
the station representative, shall honor the warranty during the warranty
period, and shall provide the services prescribed by the terms of the
warranty. At the time of installation, tag each item of warranted
equipment with a durable, oil- and water-resistant tag approved by the
Contracting Officer. Attach tag with copper wire and spray with a clear
silicone waterproof coating. Leave the date of acceptance and QC's
signature blank until project is accepted for beneficial occupancy. Tag
shall show the following information:

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

1.4.3 Warranty Tags

EQUIPMENT/PRODUCT WARRANTY TAG

- a. Type of product/material_____.
- b. Model number_____.
- c. Serial number_____.
- d. Contract number_____.
- e. Warranty period_____from_____to_____.
- f. Inspector's signature_____.
- g. Construction Contractor_____.
- Address_____.
- Telephone number_____.
- h. Warranty contact_____.
- Address_____.
- Telephone number_____.
- i. Warranty response time priority code_____.
- j. WARNING - PROJECT PERSONNEL TO PERFORM ONLY OPERATIONAL MAINTENANCE DURING THE WARRANTY PERIOD.

1.5 OPERATION AND MAINTENANCE MANUALS

Operation and Maintenance Manuals must be consistent with the manufacturer's standard brochures, schematics, printed instructions, general operating procedures, and safety precautions. Bind information in manual format and grouped by technical sections. Test data must be legible and of good quality. Light-sensitive reproduction techniques are acceptable provided finished pages are clear, legible, and not subject to fading. Pages for vendor data and manuals must have 0.3937-inch holes and be bound in 3-ring, loose-leaf binders. Organize data by separate index and tabbed sheets, in a loose-leaf binder. Binder must lie flat with printed sheets that are easy to read. Caution and warning indications must be clearly labeled.

Submit classroom and field instructions in the operation and maintenance of systems equipment where required by the technical provisions. These services must be directed by the Contractor, using the manufacturer's

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

factory-trained personnel or qualified representatives. Contracting Officer will be given 7 calendar days written notice of scheduled instructional services. Instructional materials belonging to the manufacturer or vendor, such as lists, static exhibits, and visual aids, must be made available to the Contracting Officer.

Submit 6 copies of the project operation and maintenance manuals 30 calendar days prior to testing the system involved. Update and resubmit data for final approval no later than 30 calendar days prior to contract completion.

1.6 CLEANUP

Provide final cleaning in accordance with ASTM E 1971. Leave premises "broom clean." Comply with GS-37 for general purpose cleaning and bathroom cleaning. Use only nonhazardous cleaning materials, including natural cleaning materials, in the final cleanup. Clean interior and exterior glass surfaces exposed to view; remove temporary labels, stains and foreign substances; polish transparent and glossy surfaces; vacuum carpeted and soft surfaces. Clean equipment and fixtures to a sanitary condition. Replace filters of operating equipment and comply with the Indoor Air Quality (IAQ) Management Plan. Clean debris from roofs, gutters, downspouts and drainage systems. Sweep paved areas and rake clean landscaped areas. Remove waste and surplus materials, rubbish and construction facilities from the site. Recycle, salvage, and return construction and demolition waste from project in accordance with the Waste Management Plan. Promptly and legally transport and dispose of any trash. Do not burn, bury, or otherwise dispose of trash on the project site.

1.7 REAL PROPERTY RECORD

Near the completion of Project, but a minimum of 60 days prior to final acceptance of the work, complete, update draft attached to this section, and submit an accounting of all installed property on Form DD1354 "Transfer and Acceptance of Military Real Property." Contact the Contracting Officer for any project specific information necessary to complete the DD Form 1354. For information purposes, a blank DD Form 1354 (fill-able) in ADOBE (PDF) may be obtained at the following web site:

<http://www.dtic.mil/whs/directives/infomgt/forms/eforms/dd1354.pdf>

Submit the completed Checklist for Form DD1354 of Government-Furnished and Contractor-Furnished/Contractor Installed items. Attach this list to the updated DD Form 1354. Instructions for completing the form and a blank checklist (fill-able) in ADOBE (PDF) may be obtained at the following web site:

<http://www.hnd.usace.army.mil/techinfo/UFC/UFC1-300-08/UFC1-300-08.pdf>
See Appendix D of this pdf for the checklist.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

-- End of Section --

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

SECTION 01 78 23

OPERATION AND MAINTENANCE DATA

07/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM E 1971 (2005) Stewardship for the Cleaning of
Commercial and Institutional Buildings

1.2 SUBMISSION OF OPERATION AND MAINTENANCE DATA

Submit Operation and Maintenance (O&M) Data specifically applicable to this contract and a complete and concise depiction of the provided equipment, product, or system, stressing and enhancing the importance of system interactions, troubleshooting, and long-term preventative maintenance and operation. The subcontractors shall compile and prepare data and deliver to the Contractor prior to the training of Government personnel. The Contractor shall compile and prepare aggregate O&M data including clarifying and updating the original sequences of operation to as-built conditions. Organize and present information in sufficient detail to clearly explain O&M requirements at the system, equipment, component, and subassembly level. Include an index preceding each submittal. Submit in accordance with this section and Section 01 33 00 SUBMITTAL PROCEDURES.

1.2.1 Package Quality

Documents must be fully legible. Poor quality copies and material with hole punches obliterating the text or drawings will not be accepted.

1.2.2 Package Content

Data package content shall be as shown in the paragraph titled "Schedule of Operation and Maintenance Data Packages." Comply with the data package requirements specified in the individual technical sections, including the content of the packages and addressing each product, component, and system designated for data package submission.

1.2.3 Changes to Submittals

Manufacturer-originated changes or revisions to submitted data shall be furnished by the Contractor if a component of an item is so affected subsequent to acceptance of the O&M Data. Changes, additions, or revisions required by the Contracting Officer for final acceptance of submitted data, shall be submitted by the Contractor within 30 calendar days of the notification of this change requirement.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

1.3 TYPES OF INFORMATION REQUIRED IN O&M DATA PACKAGES

1.3.1 Operating Instructions

Include specific instructions, procedures, and illustrations for the following phases of operation for the installed model and features of each system:

1.3.1.1 Safety Precautions

List personnel hazards and equipment or product safety precautions for all operating conditions.

1.3.1.2 Operator Prestart

Include procedures required to install, set up, and prepare each system for use.

1.3.1.3 Startup, Shutdown, and Post-Shutdown Procedures

Provide narrative description for Startup, Shutdown and Post-shutdown operating procedures including the control sequence for each procedure.

1.3.1.4 Normal Operations

Provide narrative description of Normal Operating Procedures. Include Control Diagrams with data to explain operation and control of systems and specific equipment.

1.3.1.5 Emergency Operations

Include Emergency Procedures for equipment malfunctions to permit a short period of continued operation or to shut down the equipment to prevent further damage to systems and equipment. Include Emergency Shutdown Instructions for fire, explosion, spills, or other foreseeable contingencies. Provide guidance and procedures for emergency operation of all utility systems including required valve positions, valve locations and zones or portions of systems controlled.

1.3.1.6 Operator Service Requirements

Include instructions for services to be performed by the operator such as lubrication, adjustment, inspection, and recording gage readings.

1.3.1.7 Environmental Conditions

Include a list of Environmental Conditions (temperature, humidity, and other relevant data) that are best suited for the operation of each product, component or system. Describe conditions under which the item equipment should not be allowed to run.

1.3.2 Preventive Maintenance

Include the following information for preventive and scheduled maintenance to minimize corrective maintenance and repair for the installed model and features of each system. Include potential environmental and indoor air quality impacts of recommended maintenance procedures and materials.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

1.3.2.1 Lubrication Data

Include preventative maintenance lubrication data, in addition to instructions for lubrication provided under paragraph titled "Operator Service Requirements":

- a. A table showing recommended lubricants for specific temperature ranges and applications.
- b. Charts with a schematic diagram of the equipment showing lubrication points, recommended types and grades of lubricants, and capacities.
- c. A Lubrication Schedule showing service interval frequency.

1.3.2.2 Preventive Maintenance Plan and Schedule

Include manufacturer's schedule for routine preventive maintenance, inspections, tests and adjustments required to ensure proper and economical operation and to minimize corrective maintenance. Provide manufacturer's projection of preventive maintenance work-hours on a daily, weekly, monthly, and annual basis including craft requirements by type of craft. For periodic calibrations, provide manufacturer's specified frequency and procedures for each separate operation.

1.3.2.3 Cleaning Recommendations

Provide environmentally preferable cleaning recommendations in accordance with ASTM E 1971.

1.3.3 Corrective Maintenance (Repair)

Include manufacturer's recommended procedures and instructions for correcting problems and making repairs for the installed model and features of each system. Include potential environmental and indoor air quality impacts of recommended maintenance procedures and materials.

1.3.3.1 Troubleshooting Guides and Diagnostic Techniques

Include step-by-step procedures to promptly isolate the cause of typical malfunctions. Describe clearly why the checkout is performed and what conditions are to be sought. Identify tests or inspections and test equipment required to determine whether parts and equipment may be reused or require replacement.

1.3.3.2 Wiring Diagrams and Control Diagrams

Wiring diagrams and control diagrams shall be point-to-point drawings of wiring and control circuits including factory-field interfaces. Provide a complete and accurate depiction of the actual job specific wiring and control work. On diagrams, number electrical and electronic wiring and pneumatic control tubing and the terminals for each type, identically to actual installation configuration and numbering.

1.3.3.3 Maintenance and Repair Procedures

Include instructions and a list of tools required to repair or restore the product or equipment to proper condition or operating standards.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

1.3.3.4 Removal and Replacement Instructions

Include step-by-step procedures and a list required tools and supplies for removal, replacement, disassembly, and assembly of components, assemblies, subassemblies, accessories, and attachments. Provide tolerances, dimensions, settings and adjustments required. Instructions shall include a combination of text and illustrations.

1.3.3.5 Spare Parts and Supply Lists

Include lists of spare parts and supplies required for maintenance and repair to ensure continued service or operation without unreasonable delays. Special consideration is required for facilities at remote locations. List spare parts and supplies that have a long lead-time to obtain.

1.3.4 Corrective Maintenance Work-Hours

Include manufacturer's projection of corrective maintenance work-hours including requirements by type of craft. Corrective maintenance that requires completion or participation of the equipment manufacturer shall be identified and tabulated separately.

1.3.5 Appendices

Provide information required below and information not specified in the preceding paragraphs but pertinent to the maintenance or operation of the product or equipment. Include the following:

1.3.5.1 Product Submittal Data

Provide a copy of all SD-03 Product Data submittals required in the applicable technical sections.

1.3.5.2 Manufacturer's Instructions

Provide a copy of all SD-08 Manufacturer's Instructions submittals required in the applicable technical sections.

1.3.5.3 O&M Submittal Data

Provide a copy of all SD-10 Operation and Maintenance Data submittals required in the applicable technical sections.

1.3.5.4 Parts Identification

Provide identification and coverage for all parts of each component, assembly, subassembly, and accessory of the end items subject to replacement. Include special hardware requirements, such as requirement to use high-strength bolts and nuts. Identify parts by make, model, serial number, and source of supply to allow reordering without further identification. Provide clear and legible illustrations, drawings, and exploded views to enable easy identification of the items. When illustrations omit the part numbers and description, both the illustrations and separate listing shall show the index, reference, or key number that will cross-reference the illustrated part to the listed part. Parts shown in the listings shall be grouped by components, assemblies, and subassemblies in accordance with the manufacturer's standard practice. Parts data may cover more than one model or series of equipment,

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

components, assemblies, subassemblies, attachments, or accessories, such as typically shown in a master parts catalog

1.3.5.5 Warranty Information

List and explain the various warranties and clearly identify the servicing and technical precautions prescribed by the manufacturers or contract documents in order to keep warranties in force. Include warranty information for primary components such as the compressor of air conditioning system.

1.3.5.6 Personnel Training Requirements

Provide information available from the manufacturers that is needed for use in training designated personnel to properly operate and maintain the equipment and systems.

1.3.5.7 Testing Equipment and Special Tool Information

Include information on test equipment required to perform specified tests and on special tools needed for the operation, maintenance, and repair of components.

1.3.5.8 Testing and Performance Data

Include completed prefunctional checklists, functional performance test forms, and monitoring reports. Include recommended schedule for retesting and blank test forms.

1.3.5.9 Contractor Information

Provide a list that includes the name, address, and telephone number of the General Contractor and each Subcontractor who installed the product or equipment, or system. For each item, also provide the name address and telephone number of the manufacturer's representative and service organization that can provide replacements most convenient to the project site. Provide the name, address, and telephone number of the product, equipment, and system manufacturers.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

Construct Battalion Synthetic Running Track
 Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
 100% Submittal

SECTION 02 41 00

DEMOLITION
 10/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
 (AASHTO)

AASHTO M 145 (1991; R 2004) Classification of Soils and
 Soil-Aggregate Mixtures for Highway
 Construction Purposes

AASHTO T 180 (2001; R 2004) Moisture-Density Relations
 of Soils Using a 4.54-kg (10-lb) Rammer
 and an 457-mm (18-in) Drop

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.6 (2006) Safety Requirements for Demolition
 Operations

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2008) Safety and Health Requirements
 Manual

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 61 National Emission Standards for Hazardous
 Air Pollutants

1.2 GENERAL REQUIREMENTS

Do not begin demolition or deconstruction until authorization is received from the Contracting Officer. The work of this section is to be performed in a manner that maximizes salvage and recycling of materials. Remove rubbish and debris from the project site; do not allow accumulations inside the buildings. The work includes demolition, and removal of resulting rubbish and debris. Remove rubbish and debris from Government property daily, unless otherwise directed. Store materials that cannot be removed daily in areas specified by the Contracting Officer. In the interest of occupational safety and health, perform the work in accordance with EM 385-1-1, Section 23, Demolition, and other applicable Sections.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Existing Conditions; G

SD-07 Certificates

Demolition Plan; G
Notifications; G

Proposed demolition, and removal procedures for approval before work is started.

SD-11 Closeout Submittals

Receipts

Receipts or bills of lading, as specified.

1.4 REGULATORY AND SAFETY REQUIREMENTS

Comply with federal, state, and local hauling and disposal regulations. In addition to the requirements of the "Contract Clauses," conform to the safety requirements contained in ASSE/SAFE A10.6.

1.4.1 Notifications

1.4.1.1 General Requirements

Furnish timely notification of demolition projects to Federal, State, regional, and local authorities in accordance with 40 CFR 61, Subpart M. Notify the South Carolina Department of Health and Environmental Control (SCDHEC) and the Contracting Officer in writing 10 working days prior to the commencement of work in accordance with 40 CFR 61, Subpart M.

1.5 DUST AND DEBRIS CONTROL

Prevent the spread of dust and debris to areas adjacent to the project area and avoid the creation of a nuisance or hazard in the surrounding area. Do not use water if it results in hazardous or objectionable conditions such as, but not limited to, ice, flooding, or pollution.

1.6 PROTECTION

1.6.1 Traffic Control Signs

Where pedestrian and driver safety is endangered in the area of removal work, use traffic barricades with flashing lights. Notify the Contracting Officer prior to beginning such work.

1.6.2 Existing Conditions Documentation

Before beginning any demolition or deconstruction work, survey the site and examine the drawings and specifications to determine the extent of the work. Record existing conditions in the presence of the Contracting Officer showing the condition of structures and other facilities adjacent to areas of alteration or removal. Photographs sized 4 inch will be acceptable as a record of existing conditions. Include in the record the

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

elevation of the top of foundation walls, finish floor elevations, possible conflicting electrical conduits, plumbing lines, alarms systems, the location and extent of existing cracks and other damage and description of surface conditions that exist prior to before starting work. It is the Contractor's responsibility to verify and document all required outages which will be required during the course of work, and to note these outages on the record document.

1.6.3 Items to Remain in Place

Take necessary precautions to avoid damage to existing items to remain in place, to be reused, or to remain the property of the Government. Repair or replace damaged items as approved by the Contracting Officer. Coordinate the work of this section with all other work indicated. Construct and maintain shoring, bracing, and supports as required. Ensure that structural elements are not overloaded. Increase structural supports or add new supports as may be required as a result of any cutting, removal, deconstruction, or demolition work performed under this contract. Do not overload pavements to remain. Provide new supports and reinforcement for existing construction weakened by demolition, deconstruction, or removal work. Repairs, reinforcement, or structural replacement require approval by the Contracting Officer prior to performing such work.

1.6.4 Existing Construction Limits and Protection

Do not disturb existing construction beyond the extent indicated or necessary for installation of new construction. Provide protective measures to control accumulation and migration of dust and dirt in all work areas. Remove dust, dirt, and debris from work areas daily. Contractor shall provide means and methods during construction of the new running track for protecting the existing obstacle course within the limits of construction.

1.6.5 Trees

Protect trees within the project site which might be damaged during demolition or deconstruction, and which are indicated to be left in place, by a 6 foot high fence. Erect and secure fence a minimum of 5 feet from the trunk of individual trees or follow the outer perimeter of branches or clumps of trees. Replace any tree designated to remain that is damaged during the work under this contract with like-kind or as approved by the Contracting Officer.

1.6.6 Utility Service

Maintain existing utilities indicated to stay in service and protect against damage during demolition and deconstruction operations.

1.6.7 Facilities

Protect electrical and mechanical services and utilities. Where removal of existing utilities and pavement is specified or indicated, provide approved barricades, temporary covering of exposed areas, and temporary services or connections for electrical and mechanical utilities.

1.6.8 Protection of Personnel

Before, during and after the demolition work the Contractor shall continuously evaluate the condition of the areas being demolished and take

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

immediate action to protect all personnel working in and around the project site.

1.7 BURNING

The use of burning at the project site for the disposal of refuse and debris will not be permitted .

1.8 REQUIRED DATA

Prepare a Demolition Plan. Include in the plan procedures for careful removal and disposition of materials specified to be salvaged, coordination with other work in progress, a detailed description of methods and equipment to be used for each operation and of the sequence of operations. Identify components and materials to be salvaged for reuse or recycling with reference to paragraph Existing Facilities to be Removed. Append tracking forms for all removed materials indicating type, quantities, condition, destination, and end use. Coordinate with Waste Management Plan.

Provide procedures for safe conduct of the work in accordance with EM 385-1-1. Plan shall be approved by Contracting Officer prior to work beginning.

1.9 ENVIRONMENTAL PROTECTION

Comply with the Environmental Protection Agency requirements specified.

1.10 USE OF EXPLOSIVES

Use of explosives will not be permitted.

PART 2 PRODUCTS

2.1 FILL MATERIAL

Comply with excavating, backfilling, and compacting procedures for soils used as backfill material to fill voids, depressions or excavations resulting from demolition of structures.

Fill material shall comply with the requirements indicated in Section 31 00 00 EARTHWORK. In addition, fill material must be free from roots and other organic matter, trash, debris, frozen materials, and stones larger than 2 inches in any dimension.

Proposed fill material must be sampled and tested by an approved soil testing laboratory, as follows:

Soil classification	AASHTO M 145
Moisture-density relations	AASHTO T 180, Method B or D

PART 3 EXECUTION

3.1 EXISTING FACILITIES TO BE REMOVED

Inspect and evaluate existing structures on site for reuse. Existing construction scheduled to be removed for reuse shall be disassembled. Dismantled and removed materials are to be separated, set aside, and prepared as specified, and stored or delivered to a collection point for reuse, remanufacture, recycling, or other disposal, as specified.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

Materials shall be designated for reuse on site whenever possible.

3.1.1 Structures

a. Remove existing structures indicated to be removed to 3 feet below grade. Remove sidewalks, curbs, and roads as indicated.

3.1.2 Utilities and Related Equipment

3.1.2.1 General Requirements

Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by the Contracting Officer. Do not interrupt existing utilities serving facilities occupied and used by the Government except when approved in writing and then only after temporary utility services have been approved and provided. Do not begin demolition or deconstruction work until all utility disconnections have been made. Shut off and cap utilities for future use, as indicated.

3.1.2.2 Disconnecting Existing Utilities

Remove existing utilities , as indicated or uncovered by work and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by the Contracting Officer. When utility lines are encountered that are not indicated on the drawings, the Contracting Officer shall be notified prior to further work in that area. Remove meters and related equipment and deliver to a location in accordance with instructions of the Contracting Officer.

3.1.3 Paving and Slabs

Remove concrete and asphaltic concrete paving and slabs including aggregate base to a depth of 6 inches below existing adjacent grade. Provide neat sawcuts at limits of pavement removal as indicated. Pavement and slabs designated to be recycled and utilized in this project shall be moved, ground and stored as directed by the Contracting Officer. Pavement and slabs not to be used in this project shall be removed from the Installation at Contractor's expense.

3.2 CONCURRENT EARTH-MOVING OPERATIONS

Do not begin excavation, filling, and other earth-moving operations that are sequential to demolition work in areas occupied by structures to be demolished until all demolition in the area has been completed and debris removed. Fill holes, open basements and other hazardous openings.

3.3 DISPOSITION OF MATERIAL

3.3.1 Title to Materials

Except for salvaged items specified in related Sections, and for materials or equipment scheduled for salvage, all materials and equipment removed and not reused or salvaged, shall become the property of the Contractor and shall be removed from Government property. Title to materials resulting from demolition, and materials and equipment to be removed, is vested in the Contractor upon approval by the Contracting Officer of the Contractor's demolition, and removal procedures, and authorization by the Contracting Officer to begin demolition. The Government will not be responsible for the condition or loss of, or damage to, such property after contract

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

award. Showing for sale or selling materials and equipment on site is prohibited.

3.3.2 Reuse of Materials and Equipment

Remove and store materials and equipment in the Demolition Plan indicated to be reused or relocated to prevent damage, and reinstall as the work progresses.

3.3.3 Salvaged Materials and Equipment

Remove materials and equipment indicated on the drawings to be reused or located to prevent damage, and reinstall as the work progresses.

The following materials/items shall be salvaged/relocated as shown on Drawing C-100.

1. Pull-Up Bar
2. Wood Platforms

3.3.4 Unsalvageable and Non-Recyclable Material

Dispose of unsalvageable and non-recyclable noncombustible material off the site.

3.4 CLEANUP

Remove debris and rubbish from basement and similar excavations. Remove and transport the debris in a manner that prevents spillage on streets or adjacent areas. Apply local regulations regarding hauling and disposal.

3.5 DISPOSAL OF REMOVED MATERIALS

3.5.1 Regulation of Removed Materials

Dispose of debris, rubbish, scrap, and other nonsalvageable materials resulting from removal operations with all applicable federal, state and local regulations as contractually specified in the Waste Management Plan . Storage of removed materials on the project site is prohibited.

3.5.2 Burning on Government Property

Burning of materials removed from demolished and deconstructed structures will not be permitted on Government property.

3.5.3 Removal from Government Property

Transport waste materials removed from demolished and deconstructed structures, except waste soil, from Government property for legal disposal. Dispose of waste soil as directed.

-- End of Section --

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

SECTION 31 00 00

EARTHWORK
08/08

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
(AASHTO)

AASHTO T 180 (2001; R 2004) Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and an 457-mm (18-in) Drop

AASHTO T 224 (2001; R 2004) Correction for Coarse Particles in the Soil Compaction Test

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C600 (2005) Installation of Ductile-Iron Water Mains and Their Appurtenances

ASTM INTERNATIONAL (ASTM)

ASTM C 136 (2006) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

ASTM D 1140 (2000; R 2006) Amount of Material in Soils Finer than the No. 200 (75-micrometer) Sieve

ASTM D 1556 (2007) Density and Unit Weight of Soil in Place by the Sand-Cone Method

ASTM D 1557 (2007) Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³) (2700 kN-m/m³)

ASTM D 1883 (2007) CBR (California Bearing Ratio) of Laboratory-Compacted Soils

ASTM D 2434 (1968; R 2006) Permeability of Granular Soils (Constant Head)

ASTM D 2487 (2006e1) Soils for Engineering Purposes (Unified Soil Classification System)

ASTM D 2937 (2004) Density of Soil in Place by the Drive-Cylinder Method

Construct Battalion Synthetic Running Track
 Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
 100% Submittal

ASTM D 422	(1963; R 2007) Particle-Size Analysis of Soils
ASTM D 4318	(2005) Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D 6938	(2007a) Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
ASTM D 698	(2007e1) Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/cu. ft. (600 kN-m/cu. m.))

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 600/4-79/020	(1983) Methods for Chemical Analysis of Water and Wastes
EPA SW-846.3-3	(1999, Third Edition, Update III-A) Test Methods for Evaluating Solid Waste: Physical/Chemical Methods

1.2 DEFINITIONS

1.2.1 Satisfactory Materials

Satisfactory materials comprise any materials classified by ASTM D 2487 as GW, GP, GM, GP-GM, GW-GM, GC, GP-GC, GM-GC, SW, SP, SW-SM, SW-SC, SP-SM, SP-SC, and CL . Satisfactory materials for grading comprise stones less than 8 inches, except for fill material for pavements and railroads which comprise stones less than 3 inches in any dimension.

1.2.2 Unsatisfactory Materials

Materials which do not comply with the requirements for satisfactory materials are unsatisfactory. Unsatisfactory materials also include man-made fills; trash; refuse; backfills from previous construction; and material classified as satisfactory which contains root and other organic matter or frozen material. Notify the Contracting Officer when encountering any contaminated materials.

1.2.3 Cohesionless and Cohesive Materials

Cohesionless materials include materials classified in ASTM D 2487 as GW, GP, SW, and SP. Cohesive materials include materials classified as GC, SC, ML, CL, MH, and CH. Materials classified as GM and SM will be identified as cohesionless only when the fines are nonplastic. Perform testing, required for classifying materials, in accordance with ASTM D 4318, ASTM C 136, ASTM D 422, and ASTM D 1140.

1.2.4 Degree of Compaction

Degree of compaction required, except as noted in the second sentence, is expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557 abbreviated as a percent of laboratory maximum density. Since ASTM D 1557 applies only to soils that have 30

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

percent or less by weight of their particles retained on the 3/4 inch sieve, express the degree of compaction for material having more than 30 percent by weight of their particles retained on the 3/4 inch sieve as a percentage of the maximum density in accordance with AASHTO T 180 and corrected with AASHTO T 224. To maintain the same percentage of coarse material, use the "remove and replace" procedure as described in NOTE 8 of Paragraph 7.2 in AASHTO T 180.

1.2.5 Topsoil

Material suitable for topsoils obtained from offsite areas is defined as: Natural, friable soil representative of productive, well-drained soils in the area, free of subsoil, stumps, rocks larger than one inch diameter, brush, weeds, toxic substances, and other material detrimental to plant growth. Amend topsoil pH range to obtain a pH of 5.5 to 7.

1.2.6 Unstable Material

Unstable material are too wet to properly support the utility pipe, conduit, or appurtenant structure.

1.2.7 Select Granular Material

1.2.7.1 General Requirements

Select granular material consist of materials classified as GW, GP, SW, or SP by ASTM D 2487 where indicated. The liquid limit of such material must not exceed 35 percent when tested in accordance with ASTM D 4318. The plasticity index must not be greater than 12 percent when tested in accordance with ASTM D 4318, and not more than 35 percent by weight may be finer than No. 200 sieve when tested in accordance with ASTM D 1140. Provide a minimum coefficient of permeability of 0.002 feet per minute when tested in accordance with ASTM D 2434.

1.2.7.2 California Bearing Ratio Values

Bearing Ratio: At 0.1 inch penetration, provide a bearing ratio of 10 percent at 95 percent ASTM D 1557 maximum density as determined in accordance with ASTM D 1883 for a laboratory soaking period of not less than 4 days. Conform the combined material to the following sieve analysis:

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
2 1/2 inch	100
No. 4	40 - 85
No. 10	20 - 80
No. 40	10 - 60
No. 200	5 - 25

1.2.8 Initial Backfill Material

Initial backfill consists of select granular material or satisfactory materials free from rocks 1-1/2 inches or larger in any dimension or free from rocks of such size as recommended by the pipe manufacturer, whichever is smaller. When the pipe is coated or wrapped for corrosion protection, free the initial backfill material of stones larger than 1-1/2 inches in any dimension or as recommended by the pipe manufacturer, whichever is smaller.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

1.2.9 Expansive Soils

Expansive soils are defined as soils that have a plasticity index equal to or greater than 30 when tested in accordance with ASTM D 4318.

1.3 SYSTEM DESCRIPTION

1.3.1 Classification of Excavation

No consideration will be given to the nature of the materials, and all excavation will be designated as unclassified excavation.

1.3.1.1 Common Excavation

Include common excavation with the satisfactory removal and disposal of all materials not classified as rock excavation.

1.4 CRITERIA FOR BIDDING

Base bids on the following criteria:

- a. Surface elevations are as indicated.
- b. Pipes or other artificial obstructions, except those indicated, will not be encountered.
- c. Ground water elevations indicated by the boring log were those existing at the time subsurface investigations were made and do not necessarily represent ground water elevation at the time of construction.
- d. Material character is indicated by the boring logs.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Dewatering Work Plan; G

Submit 15 days prior to starting work.

SD-03 Product Data

Utilization of Excavated Materials; G

SD-06 Test Reports

Testing Fill Material (Field Density Tests)
Borrow Fill Material; G

Within 24 hours of conclusion of physical tests, 4 copies of test results, including calibration curves and results of calibration tests.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

SD-07 Certificates

Testing; G

Qualifications of the Corps validated commercial testing laboratory or the Contractor's validated testing facilities.

1.6 SITE CONDITIONS

1.6.1 Dewatering Work Plan

Submit procedures for accomplishing dewatering work.

1.6.2 Utilities

The Contractor shall locate all underground utilities. See requirements specified in Section 01 11 00 SUMMARY OF WORK. Movement of construction machinery and equipment over pipes and utilities during construction shall be at the Contractor's risk. Excavation made with power-driven equipment is not permitted within 2 feet of known Government owned utility or subsurface construction. For work immediately adjacent to or for excavations exposing a utility or other buried obstruction, excavate by hand. Start hand excavation on each side of the identified obstruction and continue until the obstruction is uncovered or until clearance for the new grade is assured. Support uncovered lines or other existing work as affected by the contract excavation until approval for backfill is granted by the Contracting Officer. Report damage to utility lines or subsurface construction immediately to the Contracting Officer.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Soil Materials

Provide materials free from debris, roots, wood, scrap materials, vegetable matter, refuse or frozen material. Maximum particle size permitted is 3 inches. Use excavated material from the site for the work indicated when material falls within the requirements specified herein.

2.1.1.1 Controlled Fill and Controlled Backfill

Provide materials classified as GW, GP, SW, SP, or SM by ASTM D 2487 where indicated.

2.1.1.2 General Backfill Beside Structures

Soft, spongy, highly plastic, or otherwise unstable material is prohibited.

2.1.1.3 General Site Fill, Backfill and Embankment Material

Provide a soil material from the borrow pit that can be readily compacted to the specified densities. Materials shall be classified as GP, GW, SP, SW or SM by ASTM D 2487.

2.1.1.4 Working Platform

Material and thickness of working platform for support of construction equipment shall be at the discretion of the construction contractor. The

Construct Battalion Synthetic Running Track
 Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
 100% Submittal

gradation and placement of such material shall not create large, void spaces upon which overlying work is indicated to be placed.

2.2 REQUIREMENTS FOR OFFSITE SOILS

Test offsite soils brought in for use as backfill for Total Petroleum Hydrocarbons (TPH), Benzene, Toluene, Ethyl Benzene, and Xylene (BTEX) and full Toxicity Characteristic Leaching Procedure (TCLP) including ignitability, corrosivity and reactivity. Backfill shall contain a maximum of 100 parts per million (ppm) of total petroleum hydrocarbons (TPH) and a maximum of 10 ppm of the sum of Benzene, Toluene, Ethyl Benzene, and Xylene (BTEX) and shall pass the TCPL test. Determine TPH concentrations by using EPA 600/4-79/020 Method 418.1. Determine BTEX concentrations by using EPA SW-846.3-3 Method 5030/8020. Perform TCLP in accordance with EPA SW-846.3-3 Method 1311. Provide Borrow Site Testing for TPH, BTEX and TCLP from a composite sample of material from the borrow site, with at least one test from each borrow site. Do not bring material onsite until tests have been approved by the Contracting Officer.

2.3 BURIED WARNING AND IDENTIFICATION TAPE

Provide polyethylene plastic and metallic core or metallic-faced, acid- and alkali-resistant, polyethylene plastic warning tape manufactured specifically for warning and identification of buried utility lines. Provide tape on rolls, 3 inch minimum width, color coded as specified below for the intended utility with warning and identification imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, "CAUTION, BURIED (intended service) LINE BELOW" or similar wording. Provide permanent color and printing, unaffected by moisture or soil.

Warning Tape Color Codes

Red:	Electric
Blue:	Water Systems

2.3.1 Warning Tape for Metallic Piping

Provide acid and alkali-resistant polyethylene plastic tape conforming to the width, color, and printing requirements specified above, with a minimum thickness of 0.003 inch and a minimum strength of 1500 psi lengthwise, and 1250 psi crosswise, with a maximum 350 percent elongation.

2.3.2 Detectable Warning Tape for Non-Metallic Piping

Provide polyethylene plastic tape conforming to the width, color, and printing requirements specified above, with a minimum thickness of 0.004 inch, and a minimum strength of 1500 psi lengthwise and 1250 psi crosswise. Manufacture tape with integral wires, foil backing, or other means of enabling detection by a metal detector when tape is buried up to 3 feet deep. Encase metallic element of the tape in a protective jacket or provide with other means of corrosion protection.

2.4 DETECTION WIRE FOR NON-METALLIC PIPING

Insulate a single strand, solid copper detection wire with a minimum of 12 AWG.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

PART 3 EXECUTION

3.1 STRIPPING OF TOPSOIL

Where indicated or directed, strip topsoil to a depth of 1 to 2 inches. Spread topsoil on areas already graded and prepared for topsoil, or transported and deposited in stockpiles convenient to areas that are to receive application of the topsoil later, or at locations indicated or specified. Keep topsoil separate from other excavated materials, brush, litter, objectionable weeds, roots, stones larger than 2 inch in diameter, and other materials that would interfere with planting and maintenance operations. Remove from the site any surplus of topsoil from excavations and gradings.

3.2 GENERAL EXCAVATION

Perform excavation of every type of material encountered within the limits of the project to the lines, grades, and elevations indicated and as specified. Perform the grading in accordance with the typical sections shown and the tolerances specified in paragraph FINISHING. Transport satisfactory excavated materials and place in fill or embankment within the limits of the work. Excavate unsatisfactory materials encountered within the limits of the work below grade and replace with satisfactory materials as directed. Include such excavated material and the satisfactory material ordered as replacement in excavation. Dispose surplus satisfactory excavated material not required for fill or embankment in areas approved for surplus material storage or designated waste areas. Dispose unsatisfactory excavated material in designated waste or spoil areas. During construction, perform excavation and fill in a manner and sequence that will provide proper drainage at all times. Excavate material required for fill or embankment in excess of that produced by excavation within the grading limits from the borrow areas indicated or from other approved areas selected by the Contractor as specified.

3.2.1 Ditches, Gutters, and Channel Changes

Finish excavation of ditches, gutters, and channel changes by cutting accurately to the cross sections, grades, and elevations shown on Drawings. Do not excavate ditches and gutters below grades shown. Backfill the excessive open ditch or gutter excavation with satisfactory, thoroughly compacted, material or with suitable stone or cobble to grades shown. Dispose excavated material as shown or as directed, except in no case allow material be deposited a maximum 4 feet from edge of a ditch. Maintain excavations free from detrimental quantities of leaves, brush, sticks, trash, and other debris until final acceptance of the work.

3.2.2 Drainage Structures

Make excavations to the lines, grades, and elevations shown, or as directed. Provide trenches and foundation pits of sufficient size to permit the placement and removal of forms for the full length and width of structure footings and foundations as shown. Clean rock or other hard foundation material of loose debris and cut to a firm, level, stepped, or serrated surface. Remove loose disintegrated rock and thin strata. Do not disturb the bottom of the excavation when concrete or masonry is to be placed in an excavated area. Do not excavate to the final grade level until just before the concrete or masonry is to be placed.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

3.2.3 Drainage

Provide for the collection and disposal of surface and subsurface water encountered during construction. Completely drain construction site during periods of construction to keep soil materials sufficiently dry. Construct storm drainage features (ponds/basins) at the earliest stages of site development, and throughout construction grade the construction area to provide positive surface water runoff away from the construction activity or provide temporary ditches, swales, and other drainage features and equipment as required to maintain dry soils. When unsuitable working platforms for equipment operation and unsuitable soil support for subsequent construction features develop, remove unsuitable material and provide new soil material as specified herein. It is the responsibility of the Contractor to assess the soil and ground water conditions presented by the plans and specifications and to employ necessary measures to permit construction to proceed.

3.2.4 Dewatering

Control groundwater flowing toward or into excavations to prevent sloughing of excavation slopes and walls, boils, uplift and heave in the excavation and to eliminate interference with orderly progress of construction. Do not permit French drains, sumps, ditches or trenches within 3 feet of the foundation of any structure, except with specific written approval, and after specific contractual provisions for restoration of the foundation area have been made. Take control measures by the time the excavation reaches the water level in order to maintain the integrity of the in situ material. While the excavation is open, maintain the water level continuously, at least 1 foot below the working level. Operate dewatering system continuously until construction work below existing water levels is complete. Submit performance records weekly.

3.2.5 Trench Excavation Requirements

Excavate the trench as recommended by the manufacturer of the pipe to be installed. Slope trench walls below the top of the pipe, or make vertical, and of such width as recommended in the manufacturer's printed installation manual. Provide vertical trench walls where no manufacturer's printed installation manual is available. Shore trench walls more than 4 feet high, cut back to a stable slope, or provide with equivalent means of protection for employees who may be exposed to moving ground or cave in. Shore vertical trench walls more than 4 feet high. Excavate trench walls which are cut back to at least the angle of repose of the soil. Give special attention to slopes which may be adversely affected by weather or moisture content. Do not exceed the trench width below the pipe top of 24 inches plus pipe outside diameter (O.D.) for pipes of less than 24 inch inside diameter, and do not exceed 36 inch plus pipe outside diameter for sizes larger than 24 inch inside diameter. Where recommended trench widths are exceeded, provide redesign, stronger pipe, or special installation procedures by the Contractor. The Contractor is responsible for the cost of redesign, stronger pipe, or special installation procedures without any additional cost to the Government.

3.2.5.1 Bottom Preparation

Grade the bottoms of trenches accurately to provide uniform bearing and support for the bottom quadrant of each section of the pipe. Excavate bell holes to the necessary size at each joint or coupling to eliminate point bearing. Remove stones of 2 inch or greater in any dimension, or as

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

recommended by the pipe manufacturer, whichever is smaller, to avoid point bearing.

3.2.5.2 Removal of Unyielding Material

Where unyielding material is encountered in the bottom of the trench, remove such material 4 inches below the required grade and replaced with suitable materials as provided in paragraph BACKFILLING AND COMPACTION.

3.2.5.3 Removal of Unstable Material

Where unstable material is encountered in the bottom of the trench, remove such material to the depth directed and replace it to the proper grade with select granular material as provided in paragraph BACKFILLING AND COMPACTION. When removal of unstable material is required due to the Contractor's fault or neglect in performing the work, the Contractor is responsible for excavating the resulting material and replacing it without additional cost to the Government.

3.2.5.4 Excavation for Appurtenances

Provide excavation for manholes, catch-basins, inlets, or similar structures sufficient to leave at least 12 inch clear between the outer structure surfaces and the face of the excavation or support members. Clean rock of loose debris and cut to a firm surface either level, stepped, or serrated, as shown or as directed. Remove loose disintegrated rock and thin strata. Specify removal of unstable material. When concrete or masonry is to be placed in an excavated area, take special care not to disturb the bottom of the excavation. Do not excavate to the final grade level until just before the concrete or masonry is to be placed.

3.2.6 Underground Utilities

The Contractor is responsible for movement of construction machinery and equipment over pipes and utilities during construction. Excavation made with power-driven equipment is not permitted within two feet of known Government-owned utility or subsurface construction. For work immediately adjacent to or for excavations exposing a utility or other buried obstruction, excavate by hand. Start hand excavation on each side of the indicated obstruction and continue until the obstruction is uncovered or until clearance for the new grade is assured. Support uncovered lines or other existing work affected by the contract excavation until approval for backfill is granted by the Contracting Officer. Report damage to utility lines or subsurface construction immediately to the Contracting Officer.

3.2.7 Structural Excavation

Ensure that footing subgrades have been inspected and approved by the Contracting Officer prior to concrete placement. Excavate to bottom of pile cap prior to placing or driving piles, unless authorized otherwise by the Contracting Officer. Backfill and compact over excavations and changes in grade due to pile driving operations to 95 percent of ASTM D 698 maximum density.

3.3 SELECTION OF BORROW MATERIAL

Select borrow material to meet the requirements and conditions of the particular fill or embankment for which it is to be used. Obtain borrow material from the borrow areas selected by the Contractor from approved

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

private sources.

3.4 SHORING

3.4.1 General Requirements

Submit a Shoring and Sheet piling plan for approval 15 days prior to starting work. Submit drawings and calculations, certified by a registered professional engineer, describing the methods for shoring and sheet piling of excavations. Finish shoring, including sheet piling, and install as necessary to protect workmen, banks, adjacent paving, structures, and utilities. Remove shoring, bracing, and sheet piling as excavations are backfilled, in a manner to prevent caving.

3.4.2 Geotechnical Engineer

Hire a Professional Geotechnical Engineer to provide inspection of excavations and soil/groundwater conditions throughout construction. The Geotechnical Engineer is responsible for performing pre-construction and periodic site visits throughout construction to assess site conditions. The Geotechnical Engineer is responsible for updating the excavation, sheet piling and dewatering plans as construction progresses to reflect changing conditions and submit an updated plan if necessary. Submit a monthly written report, informing the Contractor and Contracting Officer of the status of the plan and an accounting of the Contractor's adherence to the plan addressing any present or potential problems. The Contracting Officer is responsible for arranging meetings with the Geotechnical Engineer at any time throughout the contract duration.

3.4.2.1 Earthwork Recommendations (Part of Geotechnical Report)

A. Site Preparation

1. The initial step in site preparation should be the removal of remnant topsoil, vegetative growth, tree stumps, roots, asphalt, and other deleterious material.
2. Subsequent cavities (i.e. deleterious materials, root balls, etc.) in areas to be filled, or at or near proposed finished grades should be backfilled with Controlled Fill (subsequently described). The organic debris should be disposed of off site.
3. After stripping and subgrade repair and soil is dry under new running track, the exposed subgrade soils should be proofrolled using a loaded tandem axle truck or similar construction equipment to delineate areas of soft subgrade soils. A geotechnical engineer or their representative should monitor the proofrolling operations. Areas that pump or rut excessively should be undercut and reworked or replaced with Controlled Fill. Other structural areas should be graded to promote positive drainage and direct stormwater runoff from these areas both during construction and during the operational life of the structures. After proofrolling, fill operations may proceed as necessary to establish nominal construction grades.

B. Controlled Fill

1. Controlled Fill soils should be free of organics and debris. Fill soils should be sands classified as SC or SM according to the Unified Soil Classification System, with a Modified Proctor Maximum Dry Density

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

ASTM D 1557 of at least 100 pounds per cubic foot (pcf). The fill should have a maximum fines content (i.e. percent passing a #200 sieve) of 15 percent.

2. Controlled Fill should be placed in uniform lifts and compacted to at least 95% of its Modified Proctor Maximum Dry Density as determined by ASTM D 1557. The upper 1 foot of the running track subgrade should be compacted to 98 percent of its Maximum Dry Density as determined from ASTM D 1557.

C. Fill Monitoring

1. It is important that fill be uniformly well compacted. Accordingly, fill placement should be monitored by a qualified Special Inspector (SI) working under the direction of the Geotechnical Engineer licensed in the State of South Carolina.

3.5 GRADING AREAS

Where indicated, divide work into grading areas within which satisfactory excavated material will be placed in embankments, fills, and required backfills. Do not haul satisfactory material excavated in one grading area to another grading area except when so directed in writing. Place and grade stockpiles of satisfactory and unsatisfactory and wasted materials as specified. Keep stockpiles in a neat and well drained condition, giving due consideration to drainage at all times. Clear, grub, and seal by rubber-tired equipment, the ground surface at stockpile locations; separately stockpile excavated satisfactory and unsatisfactory materials. Protect stockpiles of satisfactory materials from contamination which may destroy the quality and fitness of the stockpiled material. If the Contractor fails to protect the stockpiles, and any material becomes unsatisfactory, remove and replace such material with satisfactory material from approved sources.

3.6 FINAL GRADE OF SURFACES TO SUPPORT CONCRETE

Do not excavate to final grade until just before asphaltic concrete track concrete is to be placed. Roughen the level surfaces, and cut the sloped surfaces, as indicated, into rough steps or benches to provide a satisfactory bond. Protect all surfaces from erosion resulting from ponding or water flow.

3.7 GROUND SURFACE PREPARATION

3.7.1 General Requirements

Remove and replace unsatisfactory material with satisfactory materials, as directed by the Contracting Officer, in surfaces to receive fill or in excavated areas. Scarify the surface to a depth of 6 inch before the fill is started. Plow, step, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so that the fill material will bond with the existing material. When subgrades are less than the specified density, break up the ground surface to a minimum depth of 6 inch, pulverizing, and compacting to the specified density. When the subgrade is part fill and part excavation or natural ground, scarify the excavated or natural ground portion to a depth of 12 inch and compact it as specified for the adjacent fill.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

3.7.2 Frozen Material

Do not place material on surfaces that are muddy, frozen, or contain frost. Finish compaction by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, or other approved equipment well suited to the soil being compacted. Moisten material as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction with the equipment used.

3.8 UTILIZATION OF EXCAVATED MATERIALS

Dispose unsatisfactory materials removing from excavations off Government property. Use satisfactory material removed from excavations, insofar as practicable, in the construction of fills, embankments, subgrades, shoulders, bedding (as backfill), and for similar purposes. Do not waste any satisfactory excavated material without specific written authorization.

3.9 BURIED TAPE AND DETECTION WIRE

3.9.1 Buried Warning and Identification Tape

Provide buried utility lines with utility identification tape. Bury tape 12 inch below finished grade; under pavements and slabs, bury tape 6 inch below top of subgrade.

3.9.2 Buried Detection Wire

Bury detection wire directly above non-metallic piping at a distance not to exceed 12 inch above the top of pipe. Extend the wire continuously and unbroken, from manhole to manhole. Terminate the ends of the wire inside the manholes at each end of the pipe, with a minimum of 3 feet of wire, coiled, remaining accessible in each manhole. Furnish insulated wire over it's entire length. Install wires at manholes between the top of the corbel and the frame, and extend up through the chimney seal between the frame and the chimney seal. For force mains, terminate the wire in the valve pit at the pump station end of the pipe.

3.10 BACKFILLING AND COMPACTION

Place backfill adjacent to any and all types of structures, and compact to at least 90 percent laboratory maximum density for cohesive materials or 95 percent laboratory maximum density for cohesionless materials, to prevent wedging action or eccentric loading upon or against the structure. Prepare ground surface on which backfill is to be placed as specified in paragraph GROUND SURFACE PREPARATION. Provide compaction requirements for backfill materials in conformance with the applicable portions of paragraphs GROUND SURFACE PREPARATION. Finish compaction by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment.

3.10.1 Trench Backfill

Backfill trenches to the grade shown. Backfill the trench to 1 foot above the top of pipe prior to performing the required pressure tests. Leave the joints and couplings uncovered during the pressure test.

3.10.1.1 Replacement of Unyielding Material

Replace unyielding material removed from the bottom of the trench with

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

select granular material or initial backfill material.

3.10.1.2 Replacement of Unstable Material

Replace unstable material removed from the bottom of the trench or excavation with select granular material placed in layers not exceeding 6 inch loose thickness.

3.10.1.3 Bedding and Initial Backfill

Provide bedding of the type and thickness shown. Place initial backfill material and compact it with approved tampers to a height of at least one foot above the utility pipe or conduit. Bring up the backfill evenly on both sides of the pipe for the full length of the pipe. Take care to ensure thorough compaction of the fill under the haunches of the pipe. Except as specified otherwise in the individual piping section, provide bedding for buried piping in accordance with AWWA C600, Type 4, except as specified herein. Compact backfill to top of pipe to 95 percent of ASTM D 698 maximum density. Provide plastic piping with bedding to spring line of pipe. Provide materials as follows:

- a. Class I: Angular, 0.25 to 1.5 inch, graded stone, including a number of fill materials that have regional significance such as coral, slag, cinders, crushed stone, and crushed shells.
- b. Class II: Coarse sands and gravels with maximum particle size of 1.5 inch, including various graded sands and gravels containing small percentages of fines, generally granular and noncohesive, either wet or dry. Soil Types GW, GP, SW, and SP are included in this class as specified in ASTM D 2487.

3.10.1.4 Final Backfill

Fill the remainder of the trench, except for special materials for roadways, railroads and airfields, with satisfactory material. Place backfill material and compact as follows:

- a. Roadways, Railroads, and Airfields: Place backfill up to the required elevation as specified. Do not permit water flooding or jetting methods of compaction.
- b. Sidewalks, Turfed or Seeded Areas and Miscellaneous Areas: Deposit backfill in layers of a maximum of 12 inch loose thickness, and compact it to 85 percent maximum density for cohesive soils and 90 percent maximum density for cohesionless soils. Do not permit compaction by water flooding or jetting. Apply this requirement to all other areas not specifically designated above.

3.10.2 Backfill for Appurtenances

After the manhole, catchbasin, inlet, or similar structure has been constructed and the concrete has been allowed to cure for 2 days, place backfill in such a manner that the structure is not be damaged by the shock of falling earth. Deposit the backfill material, compact it as specified for final backfill, and bring up the backfill evenly on all sides of the structure to prevent eccentric loading and excessive stress.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

3.11 SPECIAL REQUIREMENTS

Special requirements for both excavation and backfill relating to the specific utilities are as follows:

3.11.1 Water Lines

Excavate trenches to a depth that provides a minimum cover of 3 feet from the existing ground surface, or from the indicated finished grade, whichever is lower, to the top of the pipe.

3.12 SUBGRADE PREPARATION

3.12.1 Proof Rolling

See Paragraph 3.4.3.1.A, Site Preparation for requirements.

3.12.2 Construction

Shape subgrade to line, grade, and cross section, and compact as specified. Include plowing, disking, and any moistening or aerating required to obtain specified compaction for this operation. Remove soft or otherwise unsatisfactory material and replace with satisfactory excavated material or other approved material as directed. Bring up low areas resulting from removal of unsatisfactory material or excavation of rock to required grade with satisfactory materials, and shape the entire subgrade to line, grade, and cross section and compact as specified. Do not vary the elevation of the finish subgrade more than 0.05 foot from the established grade and cross section.

3.12.3 Compaction

Finish compaction by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment. Except for paved areas and railroads, compact each layer of the embankment to at least 95 percent of laboratory maximum density.

3.13 FINISHING

Finish the surface of excavations, embankments, and subgrades to a smooth and compact surface in accordance with the lines, grades, and cross sections or elevations shown. Provide the degree of finish for graded areas within 0.1 foot of the grades and elevations indicated except that the degree of finish for subgrades specified in paragraph SUBGRADE PREPARATION. Finish gutters and ditches in a manner that will result in effective drainage. Finish the surface of areas to be turfed from settlement or washing to a smoothness suitable for the application of turfing materials. Repair graded, topsoiled, or backfilled areas prior to acceptance of the work, and re-established grades to the required elevations and slopes.

3.13.1 Grading Around Structures

Construct areas within 5 feet outside of each building and structure line true-to-grade, shape to drain, and maintain free of trash and debris until final inspection has been completed and the work has been accepted.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

3.14 PLACING TOPSOIL

On areas to receive topsoil, prepare the compacted subgrade soil to a 2 inch depth for bonding of topsoil with subsoil. Spread topsoil evenly to a thickness of 4 inches and grade to the elevations and slopes shown. Do not spread topsoil when frozen or excessively wet or dry. Obtain material required for topsoil in excess of that produced by excavation within the grading limits from areas indicated.

3.15 TESTING

Perform testing by a Corps validated commercial testing laboratory or the Contractor's validated testing facility. If the Contractor elects to establish testing facilities, do not permit work requiring testing until the Contractor's facilities have been inspected, Corps validated and approved by the Contracting Officer. Determine field in-place density in accordance with ASTM D 1556 or ASTM D 6938. When ASTM D 6938 is used, check the calibration curves and adjust using only the sand cone method as described in ASTM D 1556. ASTM D 6938 results in a wet unit weight of soil in determining the moisture content of the soil when using this method. Check the calibration curves furnished with the moisture gauges along with density calibration checks as described in ASTM D 6938; check the calibration of both the density and moisture gauges at the beginning of a job on each different type of material encountered and at intervals as directed by the Contracting Officer. ASTM D 2937, use the Drive Cylinder Method only for soft, fine-grained, cohesive soils. When test results indicate, as determined by the Contracting Officer, that compaction is not as specified, remove the material, replace and recompact to meet specification requirements. Perform tests on recompacted areas to determine conformance with specification requirements. Appoint a registered professional civil engineer to certify inspections and test results. These certifications shall state that the tests and observations were performed by or under the direct supervision of the engineer and that the results are representative of the materials or conditions being certified by the tests. The following number of tests, if performed at the appropriate time, will be the minimum acceptable for each type operation.

The SI should perform in-place field density tests typically conducted at a rate of one (1) per 2,000 square feet (sf) per lift of fill or as otherwise indicated by the Geotechnical Engineer or project documents. Monitoring of fill placement should at a minimum include the following:

- a. Soil type
- b. Lift thickness
- c. Moisture content
- d. Density
- e. Compaction Equipment

3.15.1 Fill and Backfill Material Gradation

One test per 50 cubic yards stockpiled or in-place source material. Determine gradation of fill and backfill material in accordance with ASTM C 136.

3.15.2 In-Place Densities

- a. One test per 2000 square feet, or fraction thereof, of each lift of fill or backfill areas compacted by other than hand-operated machines.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

b. One test per 2000 square feet, or fraction thereof, of each lift of fill or backfill areas compacted by hand-operated machines.

c. One test per 100 linear feet, or fraction thereof, of each lift of embankment or backfill for roads.

3.15.3 Check Tests on In-Place Densities

If ASTM D 6938 is used, check in-place densities by ASTM D 1556 as follows:

a. One check test per lift for each 2000 square feet, or fraction thereof, of each lift of fill or backfill compacted by other than hand-operated machines.

b. One check test per lift for each 2000 square feet, of fill or backfill areas compacted by hand-operated machines.

c. One check test per lift for each 100 linear feet, or fraction thereof, of embankment or backfill for roads .

3.15.4 Moisture Contents

In the stockpile, excavation, or borrow areas, perform a minimum of two tests per day per type of material or source of material being placed during stable weather conditions. During unstable weather, perform tests as dictated by local conditions and approved by the Contracting Officer.

3.15.5 Optimum Moisture and Laboratory Maximum Density

Perform tests for each type material or source of material including borrow material to determine the optimum moisture and laboratory maximum density values. One representative test per 50 cubic yards of fill and backfill, or when any change in material occurs which may affect the optimum moisture content or laboratory maximum density.

3.15.6 Tolerance Tests for Subgrades

Perform continuous checks on the degree of finish specified in paragraph SUBGRADE PREPARATION during construction of the subgrades.

3.15.7 Displacement of Sewers

After other required tests have been performed and the trench backfill compacted to 3 feet above the finished grade surface, inspect the pipe to determine whether significant displacement has occurred. Conduct this inspection in the presence of the Contracting Officer. Inspect pipe sizes larger than 36 inch, while inspecting smaller diameter pipe by shining a light or laser between manholes or manhole locations, or by the use of television cameras passed through the pipe. If, in the judgement of the Contracting Officer, the interior of the pipe shows poor alignment or any other defects that would cause improper functioning of the system, replace or repair the defects as directed at no additional cost to the Government.

3.16 DISPOSITION OF SURPLUS MATERIAL

Provide surplus material or other soil material not required or suitable for filling or backfilling, and brush, refuse, stumps, roots, and timber as removed from Government property as directed by the Contracting Officer.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

-- End of Section --

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

SECTION 31 32 11

SOIL SURFACE EROSION CONTROL

08/08

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D 3787	(2007) Bursting Strength of Textiles - Constant-Rate-of-Traversal (CRT), Ball Burst Test
ASTM D 4533	(2004; R 2009) Trapezoid Tearing Strength of Geotextiles
ASTM D 4632	(2008) Grab Breaking Load and Elongation of Geotextiles
ASTM D 4972	(2001; R 2007) pH of Soils
ASTM D 5268	(2007) Topsoil Used for Landscaping Purposes
ASTM D 5852	(2000; R 2007) Standard Test Method for Erodibility Determination of Soil in the Field or in the Laboratory by the Jet Index Method
ASTM D 6629	(2001; R 2007) Selection of Methods for Estimating Soil Loss by Erosion

U.S. DEPARTMENT OF AGRICULTURE (USDA)

AMS Seed Act	(1940; R 1988; R 1998) Federal Seed Act
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1.2 SYSTEM DESCRIPTION

The work consists of furnishing and installing temporary and permanent soil surface erosion control materials to prevent the pollution of air, water, and land, including fine grading, blanketing, stapling, mulching, vegetative measures, structural measures, and miscellaneous related work, within project limits and in areas outside the project limits where the soil surface is disturbed from work under this contract at the designated locations. This work includes all necessary materials, labor, supervision and equipment for installation of a complete system. Coordinate this section with the requirements of Section 31 00 00 EARTHWORK, Section 32 92 19 SEEDING, and Section 32 92 23 SODDING. Complete backfilling the openings

Construct Battalion Synthetic Running Track
 Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
 100% Submittal

in synthetic grid systems and articulating cellular concrete block systems a maximum 7 days after placement to protect the material from ultraviolet radiation.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Work sequence schedule; G
 Erosion control plan; G

SD-02 Shop Drawings

Layout; G
 Erosion Control; G

Scale drawings defining areas to receive recommended materials as required by federal, state or local regulations.

Seed Establishment Period; G

Calendar time period for the seed establishment period. When there is more than one seed establishment period, the boundaries of the seeded area covered for each period shall be described.

Maintenance Record; G

Record of maintenance work performed, of measurements and findings for product failure, recommendations for repair, and products replaced.

SD-03 Product Data

Wood Cellulose Fiber; G
 Mulch Control Netting and Filter Fabric; G
 Hydraulic Mulch; G
 Erosion Control Blankets Type XI; G
 Geotextile Fabrics; G

Manufacturer's literature including physical characteristics, application and installation instructions. Documentation indicating percentage of post-industrial and post-consumer recycled content per unit of product. Indicate relative dollar value of recycled content products to total dollar value of products included in project.

Equipment

A listing of equipment to be used for the application of erosion control materials.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

Finished Grade; G
Erosion Control Blankets; G

Condition of finish grade status prior to installation; location of underground utilities and facilities.

SD-04 Samples

Materials

- a . Standard mulch; 2 pounds.
- b . Hydraulic mulch; 2 pounds.
- c . Geotextile fabrics; 6 inch square.
- d . Erosion control blankets; 6 inch square.

SD-06 Test Reports

Hydraulic Mulch; G
Geotextile Fabrics; G
Erosion Control Blankets; G

Certified reports of inspections and laboratory tests, prepared by an independent testing agency, including analysis and interpretation of test results. Each report shall be properly identified. Test methods used and compliance with recognized test standards shall be described.

Sand; G
Gravel; G

Sieve test results. Sand shall be uniformly graded.

SD-07 Certificates

Fill Material; G
Mulch; G
Hydraulic Mulch; G
Geotextile Fabrics; G

Prior to delivery of materials, certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates shall include the following.

For items listed in this section:

- a. Certification of recycled content or,
- b. Statement of recycled content.
- c. Certification of origin including the name, address and telephone number of manufacturer.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

Installer's Qualification; G

The installer's company name and address; training and experience and or certification.

Seed; G

Classification, botanical name, common name, percent pure live seed, minimum percent germination and hard seed, maximum percent weed seed content, and date tested.

Wood By-Products; G

Composition, source, and particle size. Products shall be free from toxic chemicals or hazardous material.

Wood Cellulose Fiber; G

Certification stating that wood components were obtained from managed forests.

SD-10 Operation and Maintenance Data

Maintenance Instructions; G

Instruction for year-round care of installed material. The Contractor shall include manufacturer supplied spare parts.

SD-11 Closeout Submittals

Wood Cellulose Fiber; G

Mulch Control Netting and Filter Fabric; G

Hydraulic Mulch; G

Erosion Control Blankets Type III ; G

Geotextile Fabrics; G

1.4 QUALITY ASSURANCE

1.4.1 Installer's Qualification

The installer shall be certified by the manufacturer for training and experience installing the material.

1.4.2 Erosion Potential

Assess potential effects of soil management practices on soil loss in accordance with ASTM D 6629. Assess erodibility of soil with dominant soil structure less than 2.8 to 3.1 inches in accordance with ASTM D 5852.

1.4.3 Substitutions

Substitutions will not be allowed without written request and approval from the Contracting Officer.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

1.5 DELIVERY, STORAGE, AND HANDLING

Store materials in designated areas and as recommended by the manufacturer protected from the elements, direct exposure, and damage. Do not drop containers from trucks. Material shall be free of defects that would void required performance or warranty. Deliver geosynthetic binders and synthetic soil binders in the manufacturer's original sealed containers and stored in a secure area.

- a. Furnish erosion control blankets and geotextile fabric in rolls with suitable wrapping to protect against moisture and extended ultraviolet exposure prior to placement. Label erosion control blanket and geotextile fabric rolls to provide identification sufficient for inventory and quality control purposes.
- b. All synthetic grids, synthetic sheets, and articulating cellular concrete block grids shall be sound and free of defects that would interfere with the proper placing of the block or impair the strength or permanence of the construction. Minor cracks in synthetic grids and concrete cellular block, incidental to the usual methods of manufacture, or resulting from standard methods of handling in shipment and delivery, will not be deemed grounds for rejection.
- c. Inspect seed upon arrival at the jobsite for conformity to species and quality. Seed that is wet, moldy, or bears a test date five months or older, shall be rejected.

1.6 SCHEDULING

Submit a construction work sequence schedule, with the approved erosion control plan a minimum of 30 days prior to start of construction. The work schedule shall coordinate the timing of land disturbing activities with the provision of erosion control measures to reduce on-site erosion and off-site sedimentation. Coordinate installation of temporary erosion control features with the construction of permanent erosion control features to assure effective and continuous control of erosion, pollution, and sediment deposition. Include a vegetative plan with planting and seeding dates and fertilizer, lime, and mulching rates. Distribute copies of the work schedule and erosion control plan to site subcontractors. Address the following in the erosion control plan:

- a. Statement of erosion control and stormwater control objectives.
- b. Description of temporary and permanent erosion control, stormwater control, and air pollution control measures to be implemented on site.
- c. Description of the type and frequency of maintenance activities required for the chosen erosion control methods.
- d. Comparison of proposed post-development stormwater runoff conditions with predevelopment conditions.

1.7 WARRANTY

Erosion control material shall have a warranty for use and durable condition for project specific installations. Temporary erosion control materials

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

shall carry a minimum eighteen month warranty. Permanent erosion control materials shall carry a minimum three year warranty.

PART 2 PRODUCTS

2.1 MULCH

Mulch shall be free from weeds, mold, and other deleterious materials. Mulch materials shall be native to the region.

2.1.1 Straw

Straw shall be stalks from oats, wheat, rye, barley, or rice, furnished in air-dry condition and with a consistency for placing with commercial mulch-blowing equipment.

2.1.2 Hay

Hay shall be native hay, sudan-grass hay, broomsedge hay, or other herbaceous mowings, furnished in an air-dry condition suitable for placing with commercial mulch-blowing equipment.

2.1.3 Wood Cellulose Fiber

Wood cellulose fiber shall be 100 percent recycled material and shall not contain any growth or germination-inhibiting factors and shall be dyed with non-toxic, biodegradable dye an appropriate color to facilitate placement during application. Composition on air-dry weight basis: a minimum 9 to a maximum 15 percent moisture, and between a minimum 4.5 to a maximum 6.0 pH. Wood cellulose fiber shall not contain environmentally hazardous levels of heavy metals. Materials may be bulk tested or tested by toxicity characteristic leaching procedure (TCLP).

2.1.4 Shredded Bark

Locally shredded material shall be treated to retard the growth of mold and fungi.

2.1.5 Mulch Control Netting and Filter Fabric

Mulch control netting and filter fabric may be constructed of lightweight recycled plastic, cotton, or paper or organic fiber. The recycled plastic shall be a woven or nonwoven polypropylene, nylon, or polyester containing stabilizers and/or inhibitors to make the fabric resistant to deterioration from UV, and with the following properties:

- a. Minimum grab tensile strength (TF 25 #1/ASTM D 4632), 180 pounds.
- b. Minimum Puncture (TF 25 #4/ASTM D 3787), 75 psi in the weakest direction.
- c. Apparent opening sieve size of a minimum 40 and maximum 80 (U.S. Sieve Size).
- d. Minimum Trapezoidal tear strength (TF 25 #2/ASTM D 4533), 50 pounds.

Construct Battalion Synthetic Running Track
 Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
 100% Submittal

2.1.6 Hydraulic Mulch

Hydraulic mulch shall be made of 100 percent virgin aspen wood fibers. Wood shall be naturally air-dried to a moisture content of 10.0 percent, plus or minus 3.0 percent. A minimum of 50 percent of the fibers shall be equal to or greater than 0.15 inch in length and a minimum of 75 percent of the fibers shall be retained on a 28 mesh screen. Hydraulic mulch shall have the following mixture characteristics:

<u>CHARACTERISTIC (typical)</u>	<u>VALUE</u>
pH	5.4 \pm 0.1
Organic Matter (oven dried basis),	percent 99.3 within \pm 0.2
Inorganic Ash (oven dried basis),	percent 0.7 within \pm 0.2
Water Holding Capacity,	percent 1,401

2.1.7 Tackifier

Tackifier shall be a blended polyacrylimide material with non-ionic galactomannan of Gramineae endosperm in powder and crystalline form with molecular weights over 250,000. Tackifier shall be added to the hydraulic mulch as per the manufacturer's recommendations .

2.1.8 Dye

Dye shall be a water-activated, green color. Pre-package dye in water dissolvable packets in the hydraulic mulch.

2.2 EROSION CONTROL BLANKETS

2.2.1 Erosion Control Blankets Type III

Type III blankets shall be used for erosion control and vegetation establishment on roadside embankments, abutments, berms, shoulders, and median swales where natural vegetation will provide long term stabilization. Erosion control blanket shall be a machine-produced mat consisting of 70 percent straw and 30 percent coconut fiber. The blanket shall be of consistent thickness with the straw and coconut fiber evenly distributed over the entire area of the mat. Cover the blanket on the top side with heavyweight photodegradable polypropylene netting having UV additives to delay breakdown and an approximate 5/8 by 5/8 inch mesh, and on the bottom side with a lightweight photodegradable polypropylene netting with an approximate 1/2 by 1/2 inch mesh. Sew the blanket together on 1.5 inch centers with degradable thread. The erosion control blanket shall have the following properties:

Material Content

Straw	70 percent by approximately 0.35 lb/yd ² .
Coconut Fiber	30 percent by approximately 0.15 lb/yd ² weight.
Netting	Top side heavyweight photodegradable with UV additives and approximately 3 lb/1,000 ft ² weight

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

Bottom side lightweight photodegradable
with approximately
1.64 lb/1,000 ft² weight.

NOTE: Photodegradable life a minimum of 10 months with a minimum 90 percent light penetration. Apply to slopes with a gradient less than 1.5:1.

2.2.2 Seed

2.2.2.1 Seed Classification

State-certified native seed mix of the latest season's crop shall be provided in original sealed packages bearing the producer's guaranteed analysis for percentages of mixture, purity, germination, hard seed, weed seed content, and inert material. Conform labels to the AMS Seed Act and applicable state seed laws. Submit the Seed Establishment Period information as specified in the Submittals paragraph.

2.2.2.2 Permanent Seed Species and Mixtures

Proportion permanent seed species and mixtures by weight as follows:

Minimum % Purity	Minimum % Germination	Botanical Name	Common Name
97	85	Cynodon dactylon	Hulled Common Bermuda Grass
97	85	Cynodon dactylon	Unhulled Common Bermuda Grass
98	85	Panicum ramosum	Brown Top Millet
97	85	Lolium Multiflorum	Rye (Grain)
-	-	Paspalum Notatum	Bahiagrass

Seeding will be completed in accordance with Sections 31 00 00 EARTHWORK and 32 92 19 SEEDING.

2.2.2.3 Quality

Weed seed shall be a maximum 1 percent by weight of the total mixture.

2.2.3 Staking

Stakes shall be 100 percent biodegradable manufactured from recycled plastic or wood and shall be designed to safely and effectively secure erosion control blankets for temporary or permanent applications. The biodegradable stake shall be fully degradable by biological activity within a reasonable time frame. The bio-plastic resin used in production of the biodegradable

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

stake shall consist of polylactide, a natural, completely biodegradable substance derived from renewable agricultural resources. The biodegradable stake must exhibit ample rigidity to enable being driven into hard ground, with sufficient flexibility to resist shattering. Serrate the biodegradable stake on the leg to increase resistance to pull-out from the soil.

2.2.4 Staples

Staples shall be as recommended by the manufacturer.

2.3 SEDIMENT FENCING

Wood or burlap.

2.4 COMPOST FILTER BERMS

Compost berms shall consist of 100 percent biobased trapezoidal-shaped compost piles arranged across slopes. Berms shall have the following properties:

Parameter	Range
Particle size	3/8-1/2 inch sieve and 2-3 inch sieve (ratio = 1:1)
Moisture content	20% - 50%
Soluble salt	4.0 - 6.0 mmhos/cm
Organic matter	40% - 70%
pH	6.0 - 8.0
Nitrogen content	0.5% - 2.0%
Human made inerts	0.0% - 1.0%
Size	1 - 2 feet H x 2.5 - 4 feet W

2.5 AGGREGATE

Aggregate shall be offsite material generated from grading and demolition operations, as available. Recycled crushed concrete shall be free of steel, free-draining and graded between a minimum 3/4 inch and a maximum 1.5 inches. Crushed rock shall be crushed run between a minimum 0.5 inches and a maximum 2 inches. Gravel shall be river run between a minimum 0.5 inches and a maximum 2 inches. Submit sieve test results for both gravel and sand.

2.6 WATER

Unless otherwise directed, water is the responsibility of the Contractor. Water shall be potable or supplied by an existing irrigation system.

PART 3 EXECUTION

3.1 WEATHER CONDITIONS

Perform erosion control operations under favorable weather conditions; when excessive moisture, frozen ground or other unsatisfactory conditions prevail, the work shall be stopped as directed. When special conditions warrant a variance to earthwork operations, submit a revised construction schedule for approval. Do not apply erosion control materials in adverse weather conditions which could affect their performance.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

3.1.1 Finished Grade

Verify that finished grades are as indicated on the drawings; complete finish grading and compaction in accordance with Section 31 00 00 EARTHWORK, prior to the commencement of the work. Verify and mark the location of underground utilities and facilities in the area of the work. Repair damage to underground utilities and facilities at the Contractor's expense.

3.1.2 Placement of Erosion Control Blankets

Before placing the erosion control blankets, ensure the subgrade has been graded smooth; has no depressed, void areas; is free from obstructions, such as tree roots, projecting stones or other foreign matter. Verify that mesh does not include invasive species. Vehicles will not be permitted directly on the blankets.

3.2 SITE PREPARATION

3.2.1 Soil Test

Test soil in accordance with ASTM D 5268 and ASTM D 4972 for determining the particle size and mechanical analysis. Sample collection onsite shall be random over the entire site. The test shall determine the soil particle size as compatible for the specified material.

3.2.2 Layout

Erosion control material locations may be adjusted to meet field conditions. When soil tests result in unacceptable particle sizes, a shop drawing shall be submitted indicating the corrective measures.

3.2.3 Protecting Existing Vegetation

When there are established lawns in the work area, the turf shall be covered and/or protected or replaced after construction operations. Identify existing trees, shrubs, plant beds, and landscape features that are to be preserved on site by appropriate tags and barricade with reusable, high-visibility fencing along the dripline. Mitigate damage to existing trees at no additional cost to the Government. Damage shall be assessed by a state certified arborist or other approved professional using the National Arborist Association's tree valuation guideline.

3.2.4 Obstructions Below Ground

When obstructions below ground affect the work, submit shop drawings showing proposed adjustments to placement of erosion control material for approval.

3.3 INSTALLATION

Immediately stabilize exposed soil using mulch and seed. Stabilize areas for construction access immediately as specified in the paragraph Construction Entrance. Install principal sediment basins and traps before any major site grading takes place. Provide additional sediment traps and sediment fences as grading progresses. Provide inlet and outlet protection at the ends of new drainage systems. Remove temporary erosion control measures at the end of construction and provide permanent seeding.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

3.3.1 Construction Entrance

Provide as indicated on drawings, a minimum of 6 inches thick, at points of vehicular ingress and egress on the construction site. Construction entrances shall be cleared and grubbed, and then excavated a minimum of 3 inches prior to placement of the filter fabric and aggregate. The aggregate shall be placed in a manner that will prevent damage and movement of the fabric. Place fabric in one piece, where possible. Overlap fabric joints a minimum of 12 inches.

3.3.2 Compost Filter Berms

Place compost filter berm uncompacted on bare soil as indicated on drawings, parallel to base of slope, and according to manufacturer recommendations. When no longer required, berm material may be left to decompose naturally, or distributed over area for use as a soil amendment or ground cover.

3.3.3 Seeding

When seeding is required prior to installing mulch on synthetic grid systems verify that seeding will be completed in accordance with Sections 31 00 00 EARTHWORK and 32 92 19 SEEDING.

3.3.4 Mulch Installation

Install mulch in the areas indicated. Apply mulch evenly at the rate of 2 tons per acre.

3.3.5 Mulch Control Netting

Netting may be stapled over mulch according to manufacturer's recommendations.

3.3.6 Mechanical Anchor

Mechanical anchor shall be a V-type-wheel land packer; a scalloped-disk land packer designed to force mulch into the soil surface; or other suitable equipment.

3.3.7 Non-Asphaltic Tackifier

Apply hydrophilic colloid at the rate recommended by the manufacturer, using hydraulic equipment suitable for thoroughly mixing with water. Apply a uniform mixture over the area.

3.3.8 Wood Cellulose Fiber

Apply wood cellulose fiber as part of the hydraulic mulch operation.

3.3.9 Hydraulic Mulch Application

3.3.9.1 Unseeded Area

Install hydraulic mulch as indicated and in accordance with manufacturer's recommendations. Mix hydraulic mulch with water at the rate recommended by the manufacturer for the area to be covered. Mixing shall be done in equipment manufactured specifically for hydraulic mulching work, including an agitator in the mixing tank to keep the mulch evenly disbursed.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

3.3.9.2 Seeded Area

For hydraulic seeded areas, apply mulch at the rate of 0.516 per square yard with the seed and fertilizer, and at the rate of 0.75 per square yard in a second application of mulch only.

3.3.10 Erosion Control Blankets

a. Install erosion control blankets as indicated and in accordance with manufacturer's recommendations. The extent of erosion control blankets shall be as shown on drawings.

b. Orient erosion control blankets in vertical strips and anchored with staples, as indicated. Abut adjacent strips to allow for installation of a common row of staples. Overlap horizontal joints between erosion control blankets sufficiently to accommodate a common row of staples with the uphill end on top.

c. Where exposed to overland sheet flow, locate a trench at the uphill termination. Staple the erosion control blanket to the bottom of the trench. Backfill and compact the trench as required.

d. Where terminating in a channel containing an installed blanket, the erosion control blanket shall overlap installed blanket sufficiently to accommodate a common row of staples.

3.3.11 Sediment Fencing

Install posts at the spacing indicated on drawings and at an angle between 2 degrees and 20 degrees towards the potential silt load area. Sediment fence height shall be approximately 16 inches. Do not attach filter fabric to existing trees. Secure filter fabric to the post and wire fabric using staples, tie wire, or hog rings. Imbed the filter fabric into the ground as indicated on drawings. Splice filter fabric at support pole using a 6 inches overlap and securely seal.

3.4 CLEAN-UP

Dispose of excess material, debris, and waste materials offsite at an approved landfill or recycling center. Clear adjacent paved areas. Immediately upon completion of the installation in an area, protect the area against traffic or other use by erecting barricades and providing signage as required, or as directed.

3.5 WATERING SEED

Start watering immediately after installing erosion control blanket type III. Apply water to supplement rainfall at a sufficient rate to ensure moist soil conditions to a minimum 1 inch depth. Prevent run-off and puddling. Do no drive watering trucks over turf areas, unless otherwise directed. Prevent watering of other adjacent areas or plant material.

3.6 MAINTENANCE RECORD

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

Furnish a record describing the maintenance work performed, record of measurements and findings for product failure, recommendations for repair, and products replaced.

3.6.1 Maintenance

Maintenance shall include eradicating weeds; protecting embankments and ditches from surface erosion; maintaining the performance of the erosion control materials and mulch; protecting installed areas from traffic.

3.6.2 Maintenance Instructions

Furnish written instructions containing drawings and other necessary information, describing the care of the installed material; including, when and where maintenance should occur, and the procedures for material replacement.

3.6.3 Patching and Replacement

Unless otherwise directed, material shall be placed, seamed or patched as recommended by the manufacturer. Remove material not meeting the required performance as a result of placement, seaming or patching from the site. Replace the unacceptable material at no additional cost to the Government.

3.7 SATISFACTORY STAND OF GRASS PLANTS

When erosion control blanket type III is installed, evaluate the grass plants for species and health when the grass plants are a minimum 1 inch high. A satisfactory stand of grass plants from the revegetation mat area shall be a minimum 10 grass plants per square foot. The total bare spots shall not exceed 2 percent of the total revegetation mat area.

-- End of Section --

Construct Battalion Synthetic Running Track
 Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
 100% Submittal

SECTION 32 10 00

BITUMINOUS CONCRETE PAVEMENT

08/08

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
 (AASHTO)

AASHTO T 230 (1968; R 2000) Determining Degree of
 Pavement Compaction of Bituminous
 Aggregate Mixtures

AASHTO T 30 (2008) Mechanical Analysis of Extracted
 Aggregate

ASTM INTERNATIONAL (ASTM)

ASTM D 1559 (1989) Resistance to Plastic Flow of
 Bituminous Mixtures Using Marshall
 Apparatus

ASTM D 2028 (1997; R 2004) Cutback Asphalt
 (Rapid-Curing Type)

ASTM D 2172 (2005) Quantitative Extraction of Bitumen
 from Bituminous Paving Mixtures

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION (SCDOT)

DOT SS-1 (2007) Standard Specifications for Highway
 Construction

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Aggregate; G
 Asphalt cement; G

Submit documentation indicating percentage of post-industrial and post-consumer recycled content per unit of product. Indicate relative dollar value of recycled content products to total dollar value of products included in project.

SD-05 Desgn Data

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

Job Mix Formula; G

For each type of asphaltic concrete

SD-06 Test Reports

Trial batch reports; G

Mix design; G

Graded Aggregate Base Course; G

Asphalt concrete Surface Course; G

Density; G

Thickness; G

Straightedge test; G

Submit reports for testing specified under paragraph entitled
"Field Quality Control."

SD-07 Certificates

Asphalt mix delivery record; G

Bituminous Prime Coat; G

Asphalt concrete; G

Submit certificates, signed by the producer, that paving
materials and incidental construction items conform to
specification requirements.

1.3 QUALITY ASSURANCE

1.3.1 Regulatory Requirements

DOT SS-1, Divisions 300, 400, and 600 and all applicable supplemental
specifications. Paragraphs in DOT SS-1 entitled "Quantity and Payment"
shall not apply.

1.3.2 Modification of References

Where term "Engineer" is used in DOT SS-1 Specifications it shall be
construed to mean Contracting Officer. Where term "state" is used, it
shall mean "Federal Government".

1.3.3 Mix Delivery Record Data

Record and submit the following information to each load of mix delivered
to the job site. Submit within one day after delivery on
Government-furnished forms:

a. Truck No:

b. Time In:

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

- c. Time Out:
- d. Tonnage and Discharge Temperature:
- e. Mix Type:
- f. Location:
- g. Stations Placed:

1.3.4 Trial Batch

Submit current bituminous design reports for all mix types proposed for use on the project.

1.3.5 Mix Design

Submit results of laboratory tests performed on each mix design. Testing shall have been accomplished not more than one year prior to date of material placement. The job mix formula shall be submitted for approval and shall include the specific gravities of aggregate and bitumen.

1.4 ENVIRONMENTAL REQUIREMENTS

Do not produce or place bituminous concrete when the weather is rainy or foggy, when the base course is frozen or has excess moisture, or when the ambient temperature is less than 40 degrees F in the shade away from artificial heat.

PART 2 PRODUCTS

2.1 ASPHALT CONCRETE

Provide asphalt concrete in accordance with the applicable requirements of the DOT SS-1, except where specified otherwise. Recycled asphalt pavement material shall not be used even if by DOT SS-1.

2.2 GRADED AGGREGATE BASE COURSE

SCDOT Specification, DOT SS-1 Specification: materials for construction of the base course shall be in accordance with Division 300, Section 305 and all applicable supplemental specifications.

2.3 SURFACE COURSE

SCDOT Specification, DOT SS-1: materials for construction of the hot-mix asphalt surface course, Type CM shall be in accordance with Division 400, Sections 401, 403 and all applicable supplemental technical specifications.

2.4 BITUMINOUS PRME COAT

Prime coat material shall be EA-P Special liquid asphalt meeting the requirements of SCDOT Specification, DOT SS-1.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Excavation and Filling

Excavation and filling to establish elevation of subgrade is specified in Section 31 00 00 EARTHWORK.

3.2 CONSTRUCTION

Provide construction in accordance with the applicable requirements of the SCDOT Specification, DOT SS-1, except where indicated or specified otherwise.

3.2.1 Subgrade

SCDOT Specification, DOT SS-1: preparation of subgrade shall be in accordance with Division 200, Section 208 and Section 31 00 00 EARTHWORK. Verify compacted subgrade, granular base, or stabilized soil is acceptable and ready to support paving and imposed loads.

3.2.2 Graded Aggregate Base Course

SCDOT Specification, DOT SS-1: methods of construction of the base course shall be in accordance with Division 300, Section 305.

3.2.3 Bituminous Prime Coat

3.2.3.1 For Graded Aggregate Base Course

Apply not more than 0.15 gallons per square yard, nor less than 0.10 gallons per square yard of EA-P Special liquid asphalt, conforming to ASTM D 2027 or ASTM D 2028, respectively, to the completed and accepted base course after receiving approval for priming. Obtain the Contracting Officer's approval for the temperature of application and weather conditions for application. Do not permit traffic on the primed area until the prime coat has cured adequately.

3.2.4 Surface Course

SCDOT Specification, DOT SS-1: methods of construction of the surface course shall be in accordance with Division 400, Sections 401 and 403. Placement will not be permitted unless the Contractor has a working asphalt thermometer on site.

3.3 FIELD QUALITY CONTROL

Sample shall be taken by Contractor as specified herein. Contractor shall replace pavement where sample cores have been removed. Submit 2 pavement cores when using the in-place nuclear density method.

3.3.1 Sample and Core Identification

Place each sample and core in a container and securely seal to prevent loss of material. Tag each sample for identification. Tag shall contain the following information:

- a. Contract No.

Construct Battalion Synthetic Running Track
 Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
 100% Submittal

- b. Sample No.
- c. Quantity
- d. Date of Sample
- e. Sample Description
- f. Source/Location/Stations Placed/depth below the finish grade
- g. Intended Use
- h. Thicknesses of various lifts placed

3.3.2 Testing

3.3.2.1 Bituminous Mix Testing

Take two samples per day per mix type at plant or from truck. Test uncompacted mix for extraction in accordance with ASTM D 2172 and sieve analysis in accordance with AASHTO T 30. Test samples for stability and flow in accordance with ASTM D 1559. When two consecutive tests fail to meet requirements of specifications, cease placement operations and test a new trial batch prior to resumption of placement operations. Submit 2 per day of each mix type. When two tests on uncompacted mix fail submit new trial batch for approval.

3.3.2.2 Testing of Pavement Course

- a. Density: Determine density of pavement by testing cores obtained from the wearing course in accordance with AASHTO T 230. Take three cores at location designated by Contracting Officer for each 200 tons, or fraction thereof, of asphalt placed. Deliver cores undisturbed and undamaged to laboratory and provide test results within 48 hours of each day placement of paving materials.
- b. Thickness: Determine thickness of the binder and wearing course from cores taken for density test.
- c. Straightedge Test: Test compacted surface of wearing course with a straightedge as work progresses. Apply straightedge parallel with and at right angles to center line after final rolling. Variations in the wearing course surface shall not be more than 1/4 inch from the lower edge of the 10 foot straightedge. Pavement showing irregularities greater than that specified shall be corrected as directed by Contracting Officer.

3.4 WASTE MANAGEMENT

Protect excess material from contamination and return to manufacturer, or reuse on-site for walkways, patching, ditch beds, speed bumps, or curbs.

-- End of Section --

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

SECTION 32 13 13.06

PORTLAND CEMENT CONCRETE PAVEMENT FOR ROADS AND SITE FACILITIES

08/08

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ACI INTERNATIONAL (ACI)

ACI 211.1	(1991; R 2002) Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
ACI 301	(2005; Errata 2008) Specifications for Structural Concrete
ACI 305R	(1999; Errata 2006) Hot Weather Concreting
ACI 306.1	(1990; R 2002) Standard Specification for Cold Weather Concreting

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 182	(2005) Standard Specification for Burlap Cloth Made from Jute or Kenaf and Cotton Mats
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ASTM INTERNATIONAL (ASTM)

ASTM C 1077	(2008) Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
ASTM C 143/C 143M	(2008) Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C 150	(2007) Standard Specification for Portland Cement
ASTM C 171	(2007) Standard Specification for Sheet Materials for Curing Concrete
ASTM C 172	(2008) Standard Practice for Sampling Freshly Mixed Concrete
ASTM C 309	(2007) Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C 31/C 31M	(2008a) Standard Practice for Making and

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

Curing Concrete Test Specimens in the Field

ASTM C 33

(2007) Standard Specification for Concrete
Aggregates

ASTM C 94/C 94M

(2007) Standard Specification for
Ready-Mixed Concrete

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Curing materials; G

Submit a complete list of materials including type, brand and applicable reference specifications.

Cementitious Materials; G

Aggregate; G

Submit documentation indicating percentage of post-industrial and post-consumer recycled content per unit of product. Indicate relative dollar value of recycled content products to total dollar value of products included in project.

SD-05 Design Data

Concrete mix design; G

Thirty days minimum prior to concrete placement, submit a mix design, with applicable tests, for each strength and type of concrete for approval. Submit a complete list of materials including type; brand; source and amount of cement, fly ash, slag, and admixtures; and applicable reference specifications. Provide mix proportion data using at least three different water-cement ratios for each type of mixture, which will produce a range of strength encompassing those required for each class and type of concrete required. Submittal shall clearly indicate where each mix design will be used when more than one mix design is submitted. Obtain acknowledgement of approvals prior to concrete placement. Submit a new mix design for each material source change.

SD-06 Test Reports

Aggregate tests; G

Concrete slump tests; G

SD-07 Certificates

Ready-mixed concrete plant; G

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

Cementitious materials; G

1.3 DELIVERY, STORAGE, AND HANDLING

ASTM C 94/C 94M.

1.4 QUALITY ASSURANCE

1.4.1 Ready-mixed Concrete Plant Certification

Provide documentation that the ready-mix plant is certified by the National Ready-Mix Concrete Association (NRMCA).

1.4.2 Required Information

Submit copies of laboratory test reports showing that the mix has been successfully tested to produce concrete with the properties specified and that mix will be suitable for the job conditions. The laboratory test reports shall include mill test and all other test for cementitious materials, aggregates, and admixtures. Provide maximum nominal aggregate size, gradation analysis, percentage retained and passing sieve, and a graph of percentage retained verses sieve size. Test reports shall be submitted along with the concrete mix design. Sampling and testing of materials, concrete mix design, sampling and testing in the field shall be performed by a commercial testing laboratory which conforms to ASTM C 1077. The laboratory shall be approved in writing by the Government.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Cement

ASTM C 150, Type I or II with maximum alkali content of 0.60%. Cement certificate shall include test results in accordance with ASTM C 150, including equivalent alkalies indicated in the Supplementary Optional Chemical Requirements.

2.1.1.1 Cement

ASTM C 150, Type I or II with maximum alkali content of 0.60%. Cement certificate shall include test results in accordance with ASTM C 150, including equivalent alkalies indicated in the Supplementary Optional Chemical Requirements.

2.1.2 Water

ASTM C 94/C 94M, fresh, clean, and potable.

2.1.3 Aggregate

2.1.3.1 Fine Aggregates

ASTM C 33.

2.1.3.2 Coarse Aggregates

ASTM C 33.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

2.2 CONTRACTOR-FURNISHED MIX DESIGN

Contractor-furnished mix design concrete shall be designed in accordance with ACI 211.1 except as modified herein, and the mix design shall be as specified herein under paragraph entitled "Submittals." The concrete shall have a minimum flexural strength of 650 pounds per square inch at 28 days. The concrete shall be air entrained as specified below. Maximum size aggregate shall be 1.5 inches. The minimum cementitious factor is 564 lbs per cubic yard and slump shall be 1 to 3 inches.

If the cementitious material is not sufficient to produce concrete of the flexural strength required it shall be increased as necessary, without additional compensation under the contract.

2.2.1 Air Content

Mixtures shall have air content by volume of concrete of 5 to 7 percent, based on measurements made immediately after discharge from the mixer.

2.3 CONCRETE CURING MATERIALS

2.3.1 Impervious Sheet Materials

Impervious sheet materials shall conform to ASTM C 171, type optional, except that polyethylene film, if used, shall be white opaque.

2.3.2 Burlap

Burlap shall conform to AASHTO M 182.

2.3.3 White Pigmented Membrane-Forming Curing Compound

White pigmented membrane-forming curing compound shall conform to ASTM C 309, Type 2.

PART 3 EXECUTION

3.1 SUBGRADE PREPARATION

The subgrade shall be constructed to the specified grade and cross section prior to concrete placement. Subgrade shall be placed and compacted in conformance with Section 31 00 00 EARTHWORK.

3.1.1 Concrete Ramp Subgrade

The subgrade shall be tested for grade and cross section with a template extending the full width of the concrete ramp and supported between side forms.

3.1.2 Maintenance of Subgrade

The subgrade shall be maintained in a smooth, compacted condition in conformity with the required section and established grade until the concrete is placed. The subgrade shall be in a moist condition when concrete is placed. The subgrade shall be prepared and protected to produce a subgrade free from frost when the concrete is deposited.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

3.2 FORMS

3.2.1 Construction

Construct forms to be removable without damaging the concrete.

3.2.2 Coating

Before placing the concrete, coat the contact surfaces of forms with a non-staining mineral oil, non-staining form coating compound, or two coats of nitro-cellulose lacquer. When using existing pavement as a form, clean existing concrete and then coat with asphalt emulsion bondbreaker before concrete is placed.

3.2.3 Grade and Alignment

Check and correct grade elevations and alignment of the forms immediately before placing the concrete.

3.3 MEASURING, MIXING, CONVEYING, AND PLACING CONCRETE

3.3.1 Measuring

ASTM C 94/C 94M.

3.3.2 Mixing

ASTM C 94/C 94M, except as modified herein. Begin mixing within 30 minutes after cement has been added to aggregates. When the air temperature is greater than 85 degrees F, reduce mixing time and place concrete within 60 minutes. Additional water may be added to bring slump within required limits as specified in Section 11.7 of ASTM C 94/C 94M, provided that the specified water-cement ratio is not exceeded.

3.3.3 Conveying

ASTM C 94/C 94M.

3.3.4 Placing

Follow guidance of ACI 301, except as modified herein. Do not exceed a free vertical drop of 3 feet from the point of discharge. Place concrete continuously at a uniform rate, with minimum amount of segregation, without damage to the grade and without unscheduled stops except for equipment failure or other emergencies. If this occurs within 10 feet of a previously placed expansion joint, remove concrete back to joint, repair any damage to grade, install a construction joint and continue placing concrete only after cause of the stop has been corrected.

3.3.5 Vibration

Immediately after spreading concrete, consolidate concrete with internal type vibrating equipment along the boundaries of all slabs regardless of slab thickness, and interior of all concrete slabs 6 inches or more in thickness. Limit duration of vibration to that necessary to produce consolidation of concrete. Excessive vibration will not be permitted. Vibrators shall not be operated in concrete at one location for more than 15 seconds. At the option of the Contractor, vibrating equipment of a type approved by the Contracting Officer may be used to consolidate concrete in

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

unreinforced pavement slabs less than 6 inches thick.

3.3.5.1 Vibrating Equipment

Operate equipment, except hand-manipulated equipment, ahead of the finishing machine. Select the number of vibrating units and power of each unit to properly consolidate the concrete. Mount units on a frame that is capable of vertical movement and, when necessary, radial movement, so vibrators may be operated at any desired depth within the slab or be completely withdrawn from the concrete. Clear distance between frame-mounted vibrating units that have spuds that extend into the slab at intervals across the paving lane shall not exceed 30 inches. Distance between end of vibrating tube and side form shall not exceed 2 inches. For pavements less than 10 inches thick, operate vibrators at mid-depth parallel with or at a slight angle to the subbase. For thicker pavements, angle vibrators toward the vertical, with vibrator tip preferably about 2 inches from subbase, and top of vibrator a few inches below pavement surface. Vibrators may be pneumatic, gas driven, or electric, and shall be operated at frequencies within the concrete of not less than 8,000 vibrations per minute. Amplitude of vibration shall be such that noticeable vibrations occur at 1.5 foot radius when the vibrator is inserted in the concrete to the depth specified.

3.3.6 Cold Weather

Except with authorization, do not place concrete when ambient temperature is below 40 degrees F or when concrete is likely to be subjected to freezing temperatures within 24 hours. When authorized, when concrete is likely to be subjected to freezing within 24 hours after placing, heat concrete materials so that temperature of concrete when deposited is between 65 and 80 degrees F. Methods of heating materials are subject to approval of the Contracting Officer. Do not heat mixing water above 165 degrees F. Remove lumps of frozen material and ice from aggregates before placing aggregates in mixer. Follow practices found in ACI 306.1.

3.3.7 Hot Weather

Maintain required concrete temperature in accordance with Figure 2.1.5 in ACI 305R to prevent evaporation rate from exceeding 0.2 pound of water per square foot of exposed concrete per hour. Cool ingredients before mixing or use other suitable means to control concrete temperature and prevent rapid drying of newly placed concrete. After placement, use fog spray, apply monomolecular film, or use other suitable means to reduce the evaporation rate. Start curing when surface of fresh concrete is sufficiently hard to permit curing without damage. Cool underlying material by sprinkling lightly with water before placing concrete. Follow practices found in ACI 305R.

3.4 FINISHING CONCRETE

Start finishing operations immediately after placement of concrete. Use finishing machine, except hand finishing may be used in emergencies and for concrete slabs in inaccessible locations or of such shapes or sizes that machine finishing is impracticable. Finish pavement surface on both sides of a joint to the same grade. Finish formed joints from a securely supported transverse bridge. Provide hand finishing equipment for use at all times. Transverse and longitudinal surface tolerances shall be 1/4 inch in 10 feet.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

3.4.1 Side Form Finishing

Strike off and screed concrete to the required slope and cross-section by a power-driven transverse finishing machine. Transverse rotating tube or pipe shall not be permitted unless approved by the Contracting Officer. Elevation of concrete shall be such that, when consolidated and finished, pavement surface will be adequately consolidated and at the required grade. Equip finishing machine with two screeds which are readily and accurately adjustable for changes in pavement slope and compensation for wear and other causes. Make as many passes over each area of pavement and at such intervals as necessary to give proper compaction, retention of coarse aggregate near the finished surface, and a surface of uniform texture, true to grade and slope. Do not permit excessive operation over an area, which will result in an excess of mortar and water being brought to the surface.

3.4.1.1 Joint Finish

Before concrete is hardened, correct edge slump of pavement, exclusive of edge rounding, in excess of 0.02 foot. Finish concrete surface on each side of construction joints to the same plane, and correct deviations before newly placed concrete has hardened.

3.4.1.2 Hand Finishing

Strike-off and screed surface of concrete to elevations slightly above finish grade so that when concrete is consolidated and finished pavement surface is at the indicated elevation. Vibrate entire surface until required compaction and reduction of surface voids is secured with a strike-off template.

3.4.1.3 Longitudinal Floating

After initial finishing, further smooth and consolidate concrete by means of hand-operated longitudinal floats. Use floats that are not less than 12 feet long and 6 inches wide and stiffened to prevent flexing and warping.

3.4.2 Texturing

Before the surface sheen has disappeared and before the concrete hardens, the surface of the pavement shall be given a texture as described herein. Following initial texturing on the first day of placement, the Placing Foreman, Contracting Officer representative, and a representative of the Using Agency shall inspect the texturing for compliance with design requirements. After curing is complete, all textured surfaces shall be thoroughly power broomed to remove all debris. Any type of transverse texturing shall produce grooves in straight lines across each lane within a tolerance of plus or minus 1/2 inch of a true line. The concrete in areas of recesses for tie-down anchors, lighting fixtures, and other outlets in the pavement shall be finished to provide a surface of the same texture as the surrounding area.

3.4.2.1 Brooming

Finish the surface of the slab by brooming the surface with a new wire broom at least 18 inches wide. Gently pull the broom over the surface of the pavement from edge to edge just before the concrete becomes non-plastic. Slightly overlap adjacent strokes of the broom. Broom perpendicular to centerline of pavement so that corrugations produced will

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

be uniform in character and width, and not more than 1/16 inch in depth. Broomed surface shall be free from porous spots, irregularities, depressions, and small pockets or rough spots such as may be caused by accidentally disturbing particles of coarse aggregate embedded near the surface.

3.4.3 Edging

At the time the concrete has attained a degree of hardness suitable for edging, carefully finish slab edges, including edges at formed joints, with an edge having a maximum radius of one-eighth inch. When brooming is specified for the final surface finish, edge transverse joints before starting brooming, then operate broom to obliterate as much as possible the mark left by the edging tool without disturbing the rounded corner left by the edger. Clean by removing loose fragments and soupy mortar from corners or edges of slabs which have crumbled and areas which lack sufficient mortar for proper finishing. Refill voids solidly with a mixture of suitable proportions and consistency and refinish. Remove unnecessary tool marks and edges. Remaining edges shall be smooth and true to line.

3.4.4 Repair of Surface Defects

Follow guidance of ACI 301.

3.5 CURING AND PROTECTION

Protect concrete adequately from injurious action by sun, rain, flowing water, frost, mechanical injury, tire marks and oil stains, and do not allow it to dry out from the time it is placed until the expiration of the minimum curing periods specified herein. Use White-Burlap-Polyethylene Sheet, except as specified otherwise herein. Maintain temperature of air next to concrete above 40 degrees F for the full curing periods.

3.5.1 White-Burlap-Polyethylene Sheet

Wet entire exposed surface thoroughly with a fine spray of water, saturate burlap but do not have excessive water dripping off the burlap and then cover concrete with White-Burlap-Polyethylene Sheet, burlap side down. Lay sheets directly on concrete surface and overlap 12 inches. Make sheeting not less than 18 inches wider than concrete surface to be cured, and weight down on the edges and over the transverse laps to form closed joints. Repair or replace sheets when damaged during curing. Check daily to assure burlap has not lost all moisture. If moisture evaporates, resaturate burlap and re-place on pavement (re-saturation and re-placing shall take no longer than 10 minutes per sheet). Leave sheeting on concrete surface to be cured for at least 7 days.

3.6 FIELD QUALITY CONTROL

3.6.1 Sampling

The Contractor's approved laboratory shall collect samples of fresh concrete in accordance with ASTM C 172 during each working day as required to perform tests specified herein. Make test specimens in accordance with ASTM C 31/C 31M. Contractor shall test concrete samples for 7-day and 28-day flexural strength.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

3.6.2 Consistency Tests

The Contractor's approved laboratory shall perform concrete slump tests in accordance with ASTM C 143/C 143M. Take samples for slump determination from concrete during placement. Perform tests at the beginning of a concrete placement operation and for each batch (minimum) or every 20 cubic yards (maximum) of concrete to ensure that specification requirements are met.

3.6.3 Surface Testing

Surface testing for surface smoothness and plan grade shall be performed as indicated below by the Testing Laboratory. The measurements shall be properly referenced in accordance with paving lane identification and stationing, and a report given to the Government within 24 hours after measurement is made. A final report of surface testing, signed by a Registered Engineer, containing all surface measurements and a description of all actions taken to correct deficiencies, shall be provided to the Government upon conclusion of surface testing.

3.6.3.1 Surface Smoothness Requirements

The finished surfaces of the pavements shall have no abrupt change of 1/8 inch or more, and all pavements shall be within the tolerances specified when checked with a 12 foot straightedge: 1/5 inch longitudinal and 1/4 inch transverse directions for roads and streets and 1/4 inch for both directions for other concrete surfaces, such as parking areas.

3.6.3.2 Surface Smoothness Testing Method

The surface of the pavement shall be tested with the straightedge to identify all surface irregularities exceeding the tolerances specified above. The entire area of the pavement shall be tested in both a longitudinal and a transverse direction on parallel lines approximately 15 feet apart. The straightedge shall be held in contact with the surface and moved ahead one-half the length of the straightedge for each successive measurement. The amount of surface irregularity shall be determined by placing the straightedge on the pavement surface and allowing it to rest upon the two highest spots covered by its length and measuring the maximum gap between the straightedge and the pavement surface, in the area between these two high points.

3.6.4 Plan Grade Testing and Conformance

The surfaces shall vary not more than 0.06 foot above or below the plan grade line or elevation indicated. Each pavement category shall be checked by the Contractor for conformance with plan grade requirements by running lines of levels at intervals to determine the elevation at each joint intersection.

3.6.5 Test for Pavement Thickness

Measure during concrete placement to determine in-place thickness of concrete pavement.

3.7 WASTE MANAGEMENT

In accordance with the Waste Management Plan.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX

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-- End of Section --

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

SECTION 32 18 00

ATHLETIC AND RECREATIONAL SURFACING

05/09

PART 1 GENERAL

1.1 SUMMARY

The work to be performed under this section consists of furnishing all required labor, materials, equipment, implements, parts, and supplies necessary for providing synthetic surfacing over concrete pavement.

1.2 DEFINITIONS

1.2.1 Track Surface

The track surface material is a mixture of uniformly graded rubber particles bound together with formulated styrene butadiene resin (SBR).

1.3 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D 412 (2006ae1e2) Standard Test Methods for
Vulcanized Rubber and Thermoplastic
Elastomers - Tension

1.4 PRODUCT USE

The track surface material is designed as a durable, resilient surface for running track and field event areas. The system is placed over a clean, table, tightly-textured asphalt base. The surface is not intended for vehicular traffic.

1.5 QUALITY ASSURANCE LIMITATION

1.5.1 Installer Qualifications

The installer of the track surface shall be factory-trained and experienced in the installation of the same type of track surface set forth herein. The installer shall have been actively engaged in the installation of said surface for not less than five years, and shall have completed at least ten tracks using the same system as set forth herein.

1.5.2 Weather Conditions

The quality of the installation is dependent upon proper weather conditions. No installation shall be made when rain is imminent or when ambient temperatures are below 50 degrees F. It is best to install the system in sunny weather with day-time temperatures of at least 60 degrees F. When night-time temperature fall below 45 degrees F, the system should not be installed.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

1.6 PROJECT CONDITIONS

1.6.1 Drainage

Areas adjacent to the asphalt substrate upon which the track surface material is installed shall be graded to drain away from the track surface. Subsurface design shall provide for a free flow of subsurface moisture away from the track and field events.

1.6.2 Asphalt Substrate

The asphalt upon which the track surface material is installed shall be clean, free-draining, and shall exhibit the planarity and tolerances as shown in the Engineering detail drawing "Running Track Pavement Section".

1.6.3 Finish Grading, Landscaping and Other Vegetation

Sod or other landscaping materials shall not impede the flow of surface water from the track and field event surfaces. Project phasing shall be arranged so that during the track surface installation, straw and other mulching materials, leaves, and other foreign materials shall not be allowed to blow onto the track surface. The same materials shall be prevented from accumulating on the track surface after installation.

1.7 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Synthetic Surface Material; G

Manufacturer's descriptive data and catalogue cuts.

SD-04 Samples

Synthetic Surface Material; G

- a. Synthetic Surfacing: A minimum 2 by 2 inch sample.

SD-07 Certificates

Manufacturer of the synthetic surface materials; G

Installer; G

The manufacturer of the synthetic surface material shall be in the business of producing products to be used for synthetic surface for a minimum of five years.

The installer of the synthetic surface materials shall be factory-trained and experienced in the installation in the same type of the surfacing materials specified in this section for a minimum of five years. Submit a list of projects, including locations and year the work was performed.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
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1.8 WARRANTY

The track surface material shall be warranted against defects in workmanship and materials for a period of five (5) years from the date of acceptance of work. The specific length of the warranty shall be set forth in the contract documents. The contractor shall repair or replace defective surface at no cost to the owner. Excluded from the warranty are defects caused by faulty design, acts of God, improper maintenance, abuse, and uses other than those set forth above. The owner is required to maintain the facility in accordance with the maintenance instructions which are provided with the warranty.

PART 2 PRODUCTS

2.1 GENERAL

The synthetic sport surface shall comprise of a rubber, polymer-bound base mat using polymeric base mat resins, rubber particulates, black SBR base, rubber particulate red EPDM top, two applications of structural spray wearing surface with red EPDM rubber spray granules to provide a minimum total thickness of 0.59 inches (15 mm). The synthetic surface material shall be suitable for 1/8 inch pyramid type spike use.

2.2 MATERIALS

2.2.1 Polymeric Primer Resin

Polymeric primer resin exhibiting a typical Tensile Strength ASTM D 412 of 180 psi and a typical Elongation ASTM D 412 of 1,350 percent.

2.2.2 Polymeric Mat Resin

Polymeric mat resin exhibiting a typical Tensile Strength ASTM D 412 of 1,750 psi and a typical Elongation ASTM D 412 of 500 percent.

2.2.3 Base Rubber Particulate

Black SBR rubber particulate having a specific gravity of 1.15.
Black EPDM may be used upon request.

2.2.4 Top Rubber Particulate

Red EPDM rubber particulate.

2.2.5 Structural Spray Polymer

Polymeric spray resin exhibiting a typical Tensile Strength ASTM D 412 of 700 psi and a typical Elongation ASTM D 412 of 500 percent.

2.2.6 EPDM Rubber Spray Granulate

Pigmented granulated EPDM rubber for spray layers. Provide Red color.

2.2.7 Line Marking Paint

Polymeric line marking paint approved by the manufacturer of the synthetic track surface material.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

PART 3 EXECUTION

3.1 PREPARATION

New asphalt shall be allowed to cure for a minimum of fourteen days prior to the installation of any surfacing materials. The asphalt substrate shall meet the conditions set forth in Paragraph 1.6 above.

3.2 MAT CONSTRUCTION

The track surface shall be constructed in accordance with methods approved by the manufacturer of the system. The methods employed shall be designed to fully encapsulate all rubber particulate with a resin film of sufficient thickness to produce the required system tensile strength.

3.2.1 Rubber, Polymer-Bound Base Mat

The rubber, polymer-bound base mat shall be constructed using the following material quantities:

- a. Polymeric Base Mat Resins: 3.3 to 3.4 lbs. of solids per square yard of surface area.
- b. Rubber Particulate: Base: Black - 8 pounds per square yard. Top: Red - 6 pounds per square yard.

3.3 STRUCTURAL SPRAY WEARING LAYERS

The structural spray wearing layers shall be constructed using the following material quantities:

- a. Spray Coating Mixture (two applications):
Approximately 2.7 pounds per square yard to 3.6 pounds per square yard. Not less than 60 percent of the spray mixture shall be the structural spray polymer. The finished surface shall be uniform in appearance, depth and density, and shall exhibit the following physical characteristics:
- b. Thickness: 5/8 inch measured with Floortest FT-3
- c. Color: Red

-- End of Section --

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

SECTION 32 92 19

SEEDING

10/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D 4972 (2001; R 2007) pH of Soils

U.S. DEPARTMENT OF AGRICULTURE (USDA)

AMS Seed Act (1940; R 1988; R 1998) Federal Seed Act

DOA SSIR 42 (1996) Soil Survey Investigation Report No. 42, Soil Survey Laboratory Methods Manual, Version 3.0

1.2 DEFINITIONS

1.2.1 Stand of Turf

95 percent ground cover of the permanent grass.

1.3 RELATED REQUIREMENTS

Section 31 00 00 EARTHWORK.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Wood cellulose fiber mulch; G

Fertilizer; G

Include physical characteristics, and recommendations.

SD-06 Test Reports

Topsoil composition tests (reports and recommendations); G.

SD-07 Certificates

State certification and approval for seed; G

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

SD-08 Manufacturer's Instructions

Erosion Control Materials; G

1.5 DELIVERY, STORAGE, AND HANDLING

1.5.1 Delivery

1.5.1.1 Seed Protection

Protect from drying out and from contamination during delivery, on-site storage, and handling.

1.5.1.2 Fertilizer Delivery

Deliver to the site in original, unopened containers bearing manufacturer's chemical analysis, name, trade name, trademark, and indication of conformance to state and federal laws. Instead of containers, fertilizer may be furnished in bulk with certificate indicating the above information.

1.5.2 Storage

1.5.2.1 Seed, Fertilizer Storage

Store in cool, dry locations away from contaminants.

1.5.2.2 Topsoil

Prior to stockpiling topsoil, treat growing vegetation with application of appropriate specified non-selective herbicide. Clear and grub existing vegetation three to four weeks prior to stockpiling topsoil.

1.5.2.3 Handling

Do not drop or dump materials from vehicles.

1.6 TIME RESTRICTIONS AND PLANTING CONDITIONS

1.6.1 Restrictions

Do not plant when the ground is frozen, snow covered, muddy, or when air temperature exceeds 100 degrees Fahrenheit.

1.7 TIME LIMITATIONS

1.7.1 Seed

Apply seed within twenty four hours after seed bed preparation.

1.8 REQUIREMENTS

Hydroseed Common Bermuda seeds over entire area to receive grass.

- a. All hydroseeding (permanent grassing) operations shall be started at such a time that it will allow full establishment of turf over the designated area as per Paragraphs 1.2.1 and 3.3 of this Section.
- b. Install permanent grassing during the spring or summer seasons.

Construct Battalion Synthetic Running Track
 Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
 100% Submittal

- c. If permanent grassing cannot be established during the designated phases, establish common rye grass.

The cost shall be based on establishing both permanent and common rye grassing. The following summer planting period, the Contractor shall prepare the rye grass area for installation of permanent grass.

PART 2 PRODUCTS

2.1 SEED

2.1.1 Classification

Provide State-approved seed of the latest season's crop delivered in original sealed packages, bearing producer's guaranteed analysis for percentages of mixtures, purity, germination, weedseed content, and inert material. Label in conformance with AMS Seed Act and applicable state seed laws. Wet, moldy, or otherwise damaged seed will be rejected. Field mixes will be acceptable when field mix is performed on site in the presence of the Contracting Officer .

2.1.2 Planting Dates

<u>Planting Season</u>	<u>Planting Dates</u>
Season 1	April 1 - September 1
Season 2	September 1 - April 1

2.1.3 Seed Purity

Botanical Name	Common Name	Min. Percent Pure Seed	Min. Percent Germination and Hard Seed	Max. Percent Weed Seed
Cynodon Dactylon	Bermuda	99	99	1
Lolium Perenne	Ryegrass	99	99	1

2.1.4 Seed Mixture by Weight

<u>Planting Season</u>	<u>Variety</u>	<u>Percent (by Weight)</u>
Season 1	Common Bermuda Permanent Grassing	100
Season 2	Rye Grass Temporary Grassing	100

Proportion seed mixtures by weight. Temporary seeding must later be replaced for a permanent stand of grass. The same requirements of turf establishment apply for temporary seeding.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

2.2 TOPSOIL

2.2.1 On-Site Topsoil

Surface soil stripped and stockpiled on site and modified as necessary to meet the requirements specified for topsoil in paragraph entitled "Composition."

2.2.2 Off-Site Topsoil

Conform to requirements specified in paragraph entitled "Composition." Additional topsoil shall be furnished by the Contractor.

2.2.3 Composition

Containing from 5 to 10 percent organic matter as determined by the topsoil composition tests of the Organic Carbon, 6A, Chemical Analysis Method described in DOA SSIR 42. Maximum particle size, 3/4 inch, with maximum 3 percent retained on 1/4 inch screen. The pH shall be tested in accordance with ASTM D 4972. Topsoil shall be free of sticks, stones, roots, and other debris and objectionable materials. Other components shall conform to the following limits:

Silt	25-50 percent
Clay	10-30 percent
Sand	20-35 percent
pH	5.5 to 7.0
Soluble Salts	600 ppm maximum

2.3 SOIL CONDITIONERS

Add conditioners to topsoil as required to bring into compliance with "composition" standard for topsoil as specified herein.

2.4 FERTILIZER

2.4.1 Granular Fertilizer

Synthetic, granular controlled release fertilizer containing the following minimum percentages, by weight, of plant food nutrients:

10 percent available nitrogen
10 percent available phosphorus
10 percent available potassium

2.4.2 Hydroseeding Fertilizer

Controlled release fertilizer, to use with hydroseeding and composed of pills coated with plastic resin to provide a continuous release of nutrients for at least 6 months and containing the following minimum percentages, by weight, of plant food nutrients.

16 percent available nitrogen
7 percent available phosphorus
12 percent available potassium

2.5 MULCH

Mulch shall be free from noxious weeds, mold, and other deleterious

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

materials.

2.5.1 Straw

Stalks from oats, wheat, rye, barley, or rice. Furnish in air-dry condition and of proper consistency for placing with commercial mulch blowing equipment. Straw shall contain no fertile seed.

2.5.2 Hay

Air-dry condition and of proper consistency for placing with commercial mulch blowing equipment. Hay shall be sterile, containing no fertile seed.

2.5.3 Wood Cellulose Fiber Mulch

Use recovered materials of either paper-based (100 percent) or wood-based (100 percent) hydraulic mulch. Processed to contain no growth or germination-inhibiting factors and dyed an appropriate color to facilitate visual metering of materials application. Composition on air-dry weight basis: 9 to 15 percent moisture, pH range from 5.5 to 8.2. Use with hydraulic application of grass seed and fertilizer.

2.6 WATER

Source of water shall be approved by Contracting Officer and of suitable quality for irrigation, containing no elements toxic to plant life.

2.7 EROSION CONTROL MATERIALS

Erosion control material shall conform to the following:

2.7.1 Erosion Control Blanket

100 percent agricultural straw stitched with a degradable nettings, designed to degrade within 12 months.

2.7.2 Erosion Control Fabric

Fabric shall be knitted construction of polypropylene yarn with uniform mesh openings 3/4 to 1 inch square with strips of biodegradable paper. Filler paper strips shall have a minimum life of 6 months.

2.7.3 Erosion Control Net

Net shall be heavy, twisted jute mesh, weighing approximately 1.22 pounds per linear yard and 4 feet wide with mesh openings of approximately 1 inch square.

2.7.4 Erosion Control Material Anchors

Erosion control anchors shall be as recommended by the manufacturer.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 EXTENT OF WORK

Provide soil preparation (including soil conditioners as required),

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

fertilizing, seeding, and surface topdressing of all newly graded finished earth surfaces, unless indicated otherwise, and at all areas inside or outside the limits of construction that are disturbed by the Contractor's operations.

3.1.1.1 Topsoil

Provide 4 inches of existing soil to meet indicated finish grade. After areas have been brought to indicated finish grade, incorporate fertilizer and soil conditioners into soil a minimum depth of 4 inches by disking, harrowing, tilling or other method approved by the Contracting Officer. Remove debris and stones larger than 3/4 inch in any dimension remaining on the surface after finish grading. Correct irregularities in finish surfaces to eliminate depressions. Protect finished topsoil areas from damage by vehicular or pedestrian traffic.

3.1.1.2 Fertilizer Application Rates

Apply fertilizer at rates as determined by laboratory soil analysis of the soils at the job site. For bidding purposes only apply at rates for the following:

Synthetic Fertilizer 400 pounds per acre

3.2 SEEDING

3.2.1 Seed Application Seasons and Conditions

Immediately before seeding, restore soil to proper grade. Do not seed when ground is muddy, frozen, snow covered, or in an unsatisfactory condition for seeding. If special conditions exist that may warrant a variance in the above seeding dates or conditions, submit a written request to the Contracting Officer stating the special conditions and proposed variance. Apply seed within twenty four hours after seedbed preparation. Sow seed by approved sowing equipment. Sow one-half the seed in one direction, and sow remainder at right angles to the first sowing.

3.2.2 Seed Application Method

Seeding method shall be broadcasted and drop seeding, or hydroseeding.

3.2.2.1 Broadcast and Drop Seeding (Temporary Seeding)

Rye Grass seed shall be uniformly broadcast at the rate of 1.0 pound per 1000 square feet. Use broadcast or drop seeders. Sow one-half the seed in one direction, and sow remainder at right angles to the first sowing. Cover seed uniformly to a maximum depth of 1/4 inch in clay soils and 1/2 inch in sandy soils by means of spike-tooth harrow, cultipacker, raking or other approved devices.

3.2.2.2 Hydroseeding (Permanent Seeding)

First, mix water and fiber. Wood cellulose fiber, paper fiber, or recycled paper shall be applied as part of the hydroseeding operation. Fiber shall be added at 1,000 pounds, dry weight, per acre. Then add and mix seed and fertilizer to produce a homogeneous slurry. Common Bermuda seed shall be mixed to ensure broadcasting at the rate of 200 pounds per acre. When hydraulically sprayed on the ground, material shall form a blotter like cover impregnated uniformly with grass seed. Spread with one application

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

with no second application of mulch.

3.2.3 Mulching

3.2.3.1 Hay or Straw Mulch

Hay or straw mulch shall be spread uniformly at the rate of 2 tons per acre. Mulch shall be spread by hand, blower-type mulch spreader, or other approved method. Mulching shall be started on the windward side of relatively flat areas or on the upper part of steep slopes, and continued uniformly until the area is covered. The mulch shall not be bunched or clumped. Sunlight shall not be completely excluded from penetrating to the ground surface. All areas installed with seed shall be mulched on the same day as the seeding. Mulch shall be anchored immediately following spreading.

3.2.4 Rolling

Immediately after seeding, firm entire area except for slopes in excess of 3 to 1 with a roller not exceeding 90 pounds for each foot of roller width. If seeding is performed with cultipacker-type seeder or by hydroseeding, rolling may be eliminated.

3.2.5 Erosion Control Material

Install in accordance with manufacturer's instructions, where indicated.

3.2.6 Watering

Start watering areas seeded as required by temperature and wind conditions. Apply water at a rate sufficient to insure thorough wetting of soil to a depth of 2 inches without run off. During the germination process, seed is to be kept actively growing and not allowed to dry out.

3.3 TURF ESTABLISHMENT PERIOD

3.3.1 Period Parameters

Turf establishment period will be in effect until turf (permanent grass) has been mowed three times.

3.3.2 Acceptance Parameters

Turf (permanent grass) shall be established over 95 percent of the area and no bare areas larger than 12 square inches for areas to be seeded without any soil erosion.

3.3.3 Maintenance During Turf Establishment Period

3.3.3.1 Mowing (Temporary and Permanent Grass)

Mow turf areas to an average height of 2 inches when average height of grass becomes 4 inches.

3.3.3.2 Promotion of Turf Growth (Temporary and Permanent Grass)

Mow, remove excess clippings, eradicate weeds, water, fertilize, overseed/re-seed and perform other operations necessary to promote turf growth.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

3.3.3.3 Post Fertilization (Temporary and Permanent Grass)

Post fertilize the turfed area with commercial grade fertilizer as per rate and schedule specified in this section.

3.3.3.4 Replanting

Replant as required to establish turf (temporary and permanent grass).

3.3.4 Inspection and Acceptance

Inspection will be made upon written request from the Contractor at least 10 days prior to the last day of the turf (permanent grass) establishment period. The acceptance will be based on a satisfactory stand of turf as per Paragraph entitled "Acceptance Parameters".

3.4 PROTECTION OF TURF AREAS

Immediately after turfing, protect area against traffic and other use.

3.5 RESTORATION

Restore to original condition existing turf areas which have been damaged during turf installation operations at the Contractor's expense. Keep clean at all times at least one paved pedestrian access route and one paved vehicular access route to each building. Clean other paving when work in adjacent areas is complete.

-- End of Section --

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

SECTION 32 92 23

SODDING

04/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D 4972 (2001; R 2007) pH of Soils

TURFGRASS PRODUCERS INTERNATIONAL (TPI)

TPI GSS (1995) Guideline Specifications to Turfgrass Sodding

U.S. DEPARTMENT OF AGRICULTURE (USDA)

DOA SSIR 42 (1996) Soil Survey Investigation Report No. 42, Soil Survey Laboratory Methods Manual, Version 3.0

1.2 DEFINITIONS

1.2.1 Stand of Turf

100 percent ground cover of the established species.

1.3 RELATED REQUIREMENTS

Section 31 00 00 EARTHWORK and Section 32 92 19 SEEDING applies to this section for pesticide use and plant establishment requirements, with additions and modifications herein.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Fertilizer; G

Include physical characteristics, and recommendations.

SD-06 Test Reports

Topsoil composition tests (reports and recommendations); G

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

SD-07 Certificates

Sod farm certification for sods. Indicate type of sod in accordance with TPI GSS; G.

1.5 DELIVERY, STORAGE, AND HANDLING

1.5.1 Delivery

1.5.1.1 Sod Protection

Protect from drying out and from contamination during delivery, on-site storage, and handling.

1.5.1.2 Fertilizer Delivery

Deliver to the site in original, unopened containers bearing manufacturer's chemical analysis, name, trade name, trademark, and indication of conformance to state and federal laws. Instead of containers, fertilizer may be furnished in bulk with certificate indicating the above information.

1.5.2 Storage

1.5.2.1 Sod Storage

Lightly sprinkle with water, cover with moist burlap, straw, or other approved covering; and protect from exposure to wind and direct sunlight until planted. Provide covering that will allow air to circulate so that internal heat will not develop. Do not store sod longer than 24 hours. Do not store directly on concrete or bituminous surfaces.

1.5.2.2 Topsoil

Prior to stockpiling topsoil, treat growing vegetation with application of appropriate specified non-selective herbicide. Clear and grub existing vegetation three to four weeks prior to stockpiling topsoil.

1.5.2.3 Handling

Do not drop or dump materials from vehicles.

1.6 TIME RESTRICTIONS AND PLANTING CONDITIONS

1.6.1 Restrictions

Do not plant when the ground is frozen, muddy, or when air temperature exceeds 90 degrees Fahrenheit.

1.7 TIME LIMITATIONS

1.7.1 Sod

Place sod a maximum of thirty six hours after initial harvesting, in accordance with TPI GSS as modified herein.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

PART 2 PRODUCTS

2.1 SODS

2.1.1 Classification

Nursery grown, certified as classified in the TPI GSS. Machine cut sod at a uniform thickness of 3/4 inch within a tolerance of 1/4 inch, excluding top growth and thatch. Each individual sod piece shall be strong enough to support its own weight when lifted by the ends. Broken pads, irregularly shaped pieces, and torn or uneven ends will be rejected. Wood pegs and wire staples for anchorage shall be as recommended by sod supplier.

2.1.2 Purity

Sod species shall be genetically pure, free of weeds, pests, and disease.

2.1.3 Planting Dates

Lay sod from April 1 to October 1 for warm season spring planting.

2.1.4 Composition

2.1.4.1 Proportion

Proportion grass species as follows.

Botanical Name	Common Name	Percent:
Cynodon	Bermuda	99
Dactylon		

2.2 TOPSOIL

2.2.1 On-Site Topsoil

Surface soil stripped and stockpiled on site and modified as necessary to meet the requirements specified for topsoil in paragraph entitled "Composition."

2.2.2 Off-Site Topsoil

Conform to requirements specified in paragraph entitled "Composition." Additional topsoil shall be furnished by the Contractor

2.2.3 Composition

Containing from 5 to 10 percent organic matter as determined by the topsoil composition tests of the Organic Carbon, 6A, Chemical Analysis Method described in DOA SSIR 42. Maximum particle size, 3/4 inch, with maximum 3 percent retained on 1/4 inch screen. The pH shall be tested in accordance with ASTM D 4972. Topsoil shall be free of sticks, stones, roots, and other debris and objectionable materials. Other components shall conform to the following limits:

Silt	25-50 percent
Clay	10-30 percent
Sand	20-35 percent
pH	5.5 to 7.0

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

Soluble Salts 600 ppm maximum

2.3 FERTILIZER

2.3.1 Granular Fertilizer

Synthetic, granular controlled release fertilizer containing the following minimum percentages, by weight, of plant food nutrients:

16 percent available nitrogen
4 percent available phosphorus
8 percent available potassium

2.4 WATER

Source of water shall be approved by Contracting Officer and of suitable quality for irrigation containing no element toxic to plant life.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 EXTENT OF WORK

Provide soil preparation , fertilizing, and sodding of all newly graded finished earth surfaces, unless indicated otherwise, and at all areas inside or outside the limits of construction that are disturbed by the Contractor's operations.

3.1.2 Soil Preparation

Provide 4 inches of existing on-site topsoil to meet indicated finish grade. After areas have been brought to indicated finish grade, incorporate fertilizer into soil a minimum depth of 4 inches by disking, harrowing, tilling or other method approved by the Contracting Officer. Remove debris and stones larger than 3/4 inch in any dimension remaining on the surface after finish grading. Correct irregularities in finish surfaces to eliminate depressions. Protect finished topsoil areas from damage by vehicular or pedestrian traffic.

3.1.2.1 Fertilizer Application Rates

Apply fertilizer at rates as determined by laboratory soil analysis of the soils at the job site. For bidding purposes only apply at rates for the following:

Synthetic Granular Fertilizer 400 pounds per acre .

3.2 SODDING

3.2.1 Finished Grade and Topsoil

Prior to the commencement of the sodding operation, the Contractor shall verify that finished grades are as indicated on drawings; the placing of topsoil, smooth grading, and compaction requirements have been completed in accordance with Section 31 00 00 EARTHWORK.

The prepared surface shall be a maximum 1 inch below the adjoining grade of any surfaced area. New surfaces shall be blended to existing areas. The

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

prepared surface shall be completed with a light raking to remove from the surface debris and stones over a minimum 5/8 inch in any dimension.

3.2.2 Placing

Place sod a maximum of 36 hours after initial harvesting, in accordance with TPI GSS as modified herein.

3.2.3 Sodding Slopes and Ditches

For slopes 2:1 and greater, lay sod with long edge perpendicular to the contour. For V-ditches and flat bottomed ditches, lay sod with long edge perpendicular to flow of water. Anchor each piece of sod with wood pegs or wire staples maximum 2 feet on center. On slope areas, start sodding at bottom of the slope.

3.2.4 Finishing

After completing sodding, blend edges of sodded area smoothly into surrounding area. Air pockets shall be eliminated and a true and even surface shall be provided. Frayed edges shall be trimmed and holes and missing corners shall be patched with sod.

3.2.5 Rolling

Immediately after sodding, firm entire area except for slopes in excess of 3 to 1 with a roller not exceeding 90 pounds for each foot of roller width.

3.2.6 Watering

Start watering areas sodded as required by daily temperature and wind conditions. Apply water at a rate sufficient to ensure thorough wetting of soil to minimum depth of 6 inches. Run-off, puddling, and wilting shall be prevented. Unless otherwise directed, watering trucks shall not be driven over turf areas. Watering of other adjacent areas or plant material shall be prevented.

3.3 PROTECTION OF TURF AREAS

Immediately after turfing, protect area against traffic and other use.

-- End of Section --

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

SECTION 33 40 00

STORM DRAINAGE UTILITIES

08/09

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

1.1.1 Pipe Culverts and Storm Drains

The length of pipe installed will be measured along the centerlines of the pipe from end to end of pipe without deductions for diameter of manholes. Pipe will be paid for at the contract unit price for the number of linear feet of culverts or storm drains placed in the accepted work.

1.1.2 Storm Drainage Structures

The quantity of manholes and inlets will be measured as the total number of manholes and inlets of the various types of construction, complete with frames and gratings or covers and, where indicated, with fixed side-rail ladders. The depth of manholes and inlets will be measured from the top of grating or cover to invert of outlet pipe.

1.1.3 Walls and Headwalls

Walls and headwalls will be measured by the number of cubic yards of reinforced concrete, plain concrete, or masonry used in the construction of the walls and headwalls. Wall and headwalls will be paid for at the contract unit price for the number of walls and headwalls constructed in the completed work.

1.1.4 Flared End Sections

Flared end sections will be measured by the unit. Flared end sections will be paid for at the contract unit price for the various sizes in the accepted work.

1.1.5 Sheeting and Bracing

Payment will be made for that sheeting and bracing ordered to be left in place, based on the number of square feet of sheeting and bracing remaining below the surface of the ground.

1.1.6 Rock Excavation

Payment will be made for the number of cubic yards of material acceptably excavated, as specified and defined as rock excavation in Section 31 00 00 EARTHWORK, measured in the original position, and computed by allowing actual width of rock excavation with the following limitations: maximum rock excavation width, 30 inches for pipe of 12 inch or less nominal diameter; maximum rock excavation width, 16 inches greater than outside diameter of pipe of more than 12 inch nominal diameter. Measurement will include authorized overdepth excavation. Payment will also include all necessary drilling and blasting, and all incidentals necessary for satisfactory excavation and disposal of authorized rock excavation. No separate payment will be made for backfill material required to replace

Construct Battalion Synthetic Running Track
 Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
 100% Submittal

rock excavation; this cost shall be included in the Contractor's unit price bid per cubic yard for rock excavation. In rock excavation for manholes and other appurtenances, 1 foot will be allowed outside the wall lines of the structures.

1.1.7 Backfill Replacing Unstable Material

Payment will be made for the number of cubic yards of select granular material required to replace unstable material for foundations under pipes or drainage structures, which will constitute full compensation for this backfill material, including removal and disposal of unstable material and all excavating, hauling, placing, compacting, and all incidentals necessary to complete the construction of the foundation satisfactorily.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 190	(2008) Bituminous Coated Corrugated Metal Culvert Pipe and Pipe Arches
AASHTO M 198	(2008) Standard Specification for Joints for Concrete Pipe, Manholes and Precast Box Sections Using Preformed Flexible Joint Sealants
AASHTO M 243	(1996; R 2008) Field-Applied Coating of Corrugated Metal Structural Plate for Pipe, Pipe-Arches, and Arches
AASHTO M 294	(2009) Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm Diameter

ASTM INTERNATIONAL (ASTM)

ASTM A 123/A 123M	(2009) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 48/A 48M	(2003; R 2008) Standard Specification for Gray Iron Castings
ASTM A 536	(1984; R 2009) Standard Specification for Ductile Iron Castings
ASTM A 716	(2008) Standard Specification for Ductile Iron Culvert Pipe
ASTM A 74	(2009) Standard Specification for Cast Iron Soil Pipe and Fittings
ASTM A 798/A 798M	(2007) Standard Practice for Installing Factory-Made Corrugated Steel Pipe for

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

Sewers and Other Applications

ASTM A 807/A 807M	(2002; R 2008) Standard Practice for Installing Corrugated Steel Structural Plate Pipe for Sewers and Other Applications
ASTM A 929/A 929M	(2001; R 2007) Standard Specification for Steel Sheet, Metallic-Coated by the Hot-Dip Process for Corrugated Steel Pipe
ASTM B 26/B 26M	(2009) Standard Specification for Aluminum-Alloy Sand Castings
ASTM C 12	(2008) Standard Practice for Installing Vitrified Clay Pipe Lines
ASTM C 139	(2005) Standard Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes
ASTM C 14	(2007) Standard Specification for Concrete Sewer, Storm Drain, and Culvert Pipe
ASTM C 1433	(2008) Standard Specification for Precast Reinforced Concrete Box Sections for Culverts, Storm Drains, and Sewers
ASTM C 231	(2009a) Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C 270	(2008a) Standard Specification for Mortar for Unit Masonry
ASTM C 32	(2009) Standard Specification for Sewer and Manhole Brick (Made from Clay or Shale)
ASTM C 425	(2004) Standard Specification for Compression Joints for Vitrified Clay Pipe and Fittings
ASTM C 443	(2005a) Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
ASTM C 444	(2003; R 2009) Perforated Concrete Pipe
ASTM C 478	(2009) Standard Specification for Precast Reinforced Concrete Manhole Sections
ASTM C 55	(2006e1) Concrete Brick
ASTM C 564	(2008) Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings
ASTM C 62	(2008) Building Brick (Solid Masonry Units Made from Clay or Shale)

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

ASTM C 655	(2009) Reinforced Concrete D-Load Culvert, Storm Drain, and Sewer Pipe
ASTM C 76	(2008a) Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM C 877	(2008) External Sealing Bands for Concrete Pipe, Manholes, and Precast Box Sections
ASTM C 923	(2008) Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals
ASTM D 1056	(2007) Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber
ASTM D 1171	(1999; R 2007) Rubber Deterioration - Surface Ozone Cracking Outdoors or Chamber (Triangular Specimens)
ASTM D 1557	(2007) Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft ³) (2700 kN-m/m ³)
ASTM D 1751	(2004; R 2008) Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
ASTM D 1752	(2004a; R 2008) Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion
ASTM D 1784	(2008) Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
ASTM D 2167	(2008) Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D 2321	(2005) Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
ASTM D 2729	(2003) Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM D 3034	(2008) Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM D 3350	(2008) Polyethylene Plastics Pipe and

Construct Battalion Synthetic Running Track
 Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
 100% Submittal

Fittings Materials

ASTM D 6938	(2007a) Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
ASTM F 477	(2008) Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM F 679	(2008) Poly(Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings
ASTM F 714	(2008) Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter
ASTM F 794	(2003) Standard Specification for Poly(Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter
ASTM F 894	(2007) Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe
ASTM F 949	(2009) Poly(Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Placing Pipe; G

Printed copies of the manufacturer's recommendations for installation procedures of the material being placed, prior to installation.

SD-07 Certificates

Resin Certification; G

Determination of Density; G
 Frame and Cover for Gratings; G

Certified copies of test reports demonstrating conformance to applicable pipe specifications, before pipe is installed. Certification on the ability of frame and cover or gratings to carry the imposed live load.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

1.4 DELIVERY, STORAGE, AND HANDLING

1.4.1 Delivery and Storage

Materials delivered to site shall be inspected for damage, unloaded, and stored with a minimum of handling. Materials shall not be stored directly on the ground. The inside of pipes and fittings shall be kept free of dirt and debris. Before, during, and after installation, plastic pipe and fittings shall be protected from any environment that would result in damage or deterioration to the material. Keep a copy of the manufacturer's instructions available at the construction site at all times and follow these instructions unless directed otherwise by the Contracting Officer. Solvents, solvent compounds, lubricants, elastomeric gaskets, and any similar materials required to install plastic pipe shall be stored in accordance with the manufacturer's recommendations and shall be discarded if the storage period exceeds the recommended shelf life. Solvents in use shall be discarded when the recommended pot life is exceeded.

1.4.2 Handling

Materials shall be handled in a manner that ensures delivery to the trench in sound, undamaged condition. Pipe shall be carried to the trench, not dragged.

PART 2 PRODUCTS

2.1 PIPE FOR CULVERTS AND STORM DRAINS

Pipe for culverts and storm drains shall be of the sizes indicated and shall conform to the requirements specified.

2.1.1 Concrete Pipe

Manufactured in accordance with and conforming to ASTM C 76, Class III, or ASTM C 655.

2.1.2 Ductile Iron Culvert Pipe

ASTM A 716.

2.1.3 Cast-Iron Soil Piping

Cast-Iron Soil Pipe shall conform to ASTM A 74, service-weight; gaskets shall be compression-type rubber conforming to ASTM C 564.

2.1.4 Perforated Piping

2.1.4.1 Concrete Pipe

Manufactured in accordance with and conforming to ASTM C 444, and applicable requirements of ASTM C 14.

2.1.4.2 PVC Pipe

ASTM D 2729.

2.1.5 PVC Pipe

Submit the pipe manufacturer's resin certification, indicating the cell

Construct Battalion Synthetic Running Track
 Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
 100% Submittal

classification of PVC used to manufacture the pipe, prior to installation of the pipe.

2.1.5.1 Type PSM PVC Pipe

ASTM D 3034, Type PSM, maximum SDR 35, produced from PVC certified by the compounder as meeting the requirements of ASTM D 1784, minimum cell class 12454-B.

2.1.5.2 Profile PVC Pipe

ASTM F 794, Series 46, produced from PVC certified by the compounder as meeting the requirements of ASTM D 1784, minimum cell class 12454-B.

2.1.5.3 Smooth Wall PVC Pipe

ASTM F 679 produced from PVC certified by the compounder as meeting the requirements of ASTM D 1784, minimum cell class 12454-B.

2.1.5.4 Corrugated PVC Pipe

ASTM F 949 produced from PVC certified by the compounder as meeting the requirements of ASTM D 1784, minimum cell class 12454-B.

2.1.6 PE Pipe

Submit the pipe manufacturer's resin certification, indicating the cell classification of PE used to manufacture the pipe, prior to installation of the pipe. The minimum cell classification for polyethylene plastic shall apply to each of the seven primary properties of the cell classification limits in accordance with ASTM D 3350.

2.1.6.1 Smooth Wall PE Pipe

ASTM F 714, maximum DR of 21 for pipes 3 to 24 inches in diameter and maximum DR of 26 for pipes 26 to 48 inches in diameter. Pipe shall be produced from PE certified by the resin producer as meeting the requirements of ASTM D 3350, minimum cell class 335434C.

2.1.6.2 Corrugated PE Pipe

AASHTO M 294, Type S or C. For slow crack growth resistance, acceptance of resins shall be determined by using the notched constant ligament-stress (NCLS) test meeting the requirements of AASHTO M 294. Pipe walls shall have the following properties:

Nominal Size (in.)	Minimum Wall Area (square in/ft)	Minimum Moment of Inertia of Wall Section (in to the 4th/in)
12	1.50	0.024
15	1.91	0.053
18	2.34	0.062
24	3.14	0.116
30	3.92	0.163
36	4.50	0.222
42	4.69	0.543

Construct Battalion Synthetic Running Track
 Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
 100% Submittal

Nominal Size (in.)	Minimum Wall Area (square in/ft)	Minimum Moment of Inertia of Wall Section (in to the 4th/in)
48	5.15	0.543
54	5.67	0.800
60	6.45	0.800

2.1.6.3 Profile Wall PE Pipe

ASTM F 894, RSC 160, produced from PE certified by the resin producer as meeting the requirements of ASTM D 3350, minimum cell class 334433C. Pipe walls shall have the following properties:

Nominal Size (in.)	Minimum Wall Area (square in/ft)	Minimum Moment Of Inertia of Wall Section (in to the 4th/in)	
		Cell Class 334433C	Cell Class 335434C
18	2.96	0.052	0.038
21	4.15	0.070	0.051
24	4.66	0.081	0.059
27	5.91	0.125	0.091
30	5.91	0.125	0.091
33	6.99	0.161	0.132
36	8.08	0.202	0.165
42	7.81	0.277	0.227
48	8.82	0.338	0.277

2.2 DRAINAGE STRUCTURES

2.2.1 Flared End Sections

Sections shall be of a standard design fabricated from zinc coated steel sheets meeting requirements of ASTM A 929/A 929M.

2.2.2 Precast Reinforced Concrete Box

Manufactured in accordance with and conforming to ASTM C 1433.

2.3 MISCELLANEOUS MATERIALS

2.3.1 Concrete

Unless otherwise specified, concrete and reinforced concrete shall conform to the requirements for 4000 psi concrete under Section 03 30 00 CAST-IN-PLACE CONCRETE. The concrete mixture shall have air content by volume of concrete, based on measurements made immediately after discharge from the mixer, of 5 to 7 percent when maximum size of coarse aggregate exceeds 1-1/2 inches. Air content shall be determined in accordance with ASTM C 231. The concrete covering over steel reinforcing shall not be less

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

than 1 inch thick for covers and not less than 1-1/2 inches thick for walls and flooring. Concrete covering deposited directly against the ground shall have a thickness of at least 3 inches between steel and ground. Expansion-joint filler material shall conform to ASTM D 1751, or ASTM D 1752, or shall be resin-impregnated fiberboard conforming to the physical requirements of ASTM D 1752.

2.3.2 Mortar

Mortar for pipe joints, connections to other drainage structures, and brick or block construction shall conform to ASTM C 270, Type M, except that the maximum placement time shall be 1 hour. The quantity of water in the mixture shall be sufficient to produce a stiff workable mortar but in no case shall exceed 6 gallons of water per sack of cement. Water shall be clean and free of harmful acids, alkalies, and organic impurities. The mortar shall be used within 30 minutes after the ingredients are mixed with water. The inside of the joint shall be wiped clean and finished smooth. The mortar head on the outside shall be protected from air and sun with a proper covering until satisfactorily cured.

2.3.3 Precast Concrete Segmental Blocks

Precast concrete segmental block shall conform to ASTM C 139, not more than 8 inches thick, not less than 8 inches long, and of such shape that joints can be sealed effectively and bonded with cement mortar.

2.3.4 Brick

Brick shall conform to ASTM C 62, Grade SW; ASTM C 55, Grade S-I or S-II; or ASTM C 32, Grade MS. Mortar for jointing and plastering shall consist of one part portland cement and two parts fine sand. Lime may be added to the mortar in a quantity not more than 25 percent of the volume of cement. The joints shall be filled completely and shall be smooth and free from surplus mortar on the inside of the structure. Brick structures shall be plastered with 1/2 inch of mortar over the entire outside surface of the walls. For square or rectangular structures, brick shall be laid in stretcher courses with a header course every sixth course. For round structures, brick shall be laid radially with every sixth course a stretcher course.

2.3.5 Precast Reinforced Concrete Manholes

Conform to ASTM C 478. Joints between precast concrete risers and tops shall be made with flexible watertight, rubber-type gaskets meeting the requirements of paragraph JOINTS.

2.3.6 Prefabricated Corrugated Metal Manholes

Manholes shall be of the type and design recommended by the manufacturer. Manholes shall be complete with frames and cover, or frames and gratings.

2.3.7 Frame and Cover for Gratings

Frame and cover for gratings shall be cast gray iron, ASTM A 48/A 48M, Class 35B; cast ductile iron, ASTM A 536, Grade 65-45-12; or cast aluminum, ASTM B 26/B 26M, Alloy 356.OT6. Weight, shape, size, and waterway openings for grates and curb inlets shall be as indicated on the plans.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

2.3.8 Joints

2.3.8.1 Flexible Watertight Joints

- a. **Materials:** Flexible watertight joints shall be made with plastic or rubber-type gaskets for concrete pipe and with factory-fabricated resilient materials for clay pipe. The design of joints and the physical requirements for plastic gaskets shall conform to AASHTO M 198, and rubber-type gaskets shall conform to ASTM C 443. Factory-fabricated resilient joint materials shall conform to ASTM C 425. Gaskets shall have not more than one factory-fabricated splice, except that two factory-fabricated splices of the rubber-type gasket are permitted if the nominal diameter of the pipe being gasketed exceeds 54 inches.
- b. **Test Requirements:** Watertight joints shall be tested and shall meet test requirements of paragraph HYDROSTATIC TEST ON WATERTIGHT JOINTS. Rubber gaskets shall comply with the oil resistant gasket requirements of ASTM C 443. Certified copies of test results shall be delivered to the Contracting Officer before gaskets or jointing materials are installed. Alternate types of watertight joint may be furnished, if specifically approved.

2.3.8.2 External Sealing Bands

Requirements for external sealing bands shall conform to ASTM C 877.

2.3.8.3 Flexible Watertight, Gasketed Joints

- a. **Gaskets:** When infiltration or exfiltration is a concern for pipe lines, the couplings may be required to have gaskets. The closed-cell expanded rubber gaskets shall be a continuous band approximately 7 inches wide and approximately 3/8 inch thick, meeting the requirements of ASTM D 1056, Type 2 A1, and shall have a quality retention rating of not less than 70 percent when tested for weather resistance by ozone chamber exposure, Method B of ASTM D 1171. Rubber O-ring gaskets shall be 13/16 inch in diameter for pipe diameters of 36 inches or smaller and 7/8 inch in diameter for larger pipe having 1/2 inch deep end corrugation. Rubber O-ring gaskets shall be 1-3/8 inches in diameter for pipe having 1 inch deep end corrugations. O-rings shall meet the requirements of AASHTO M 198 or ASTM C 443. Flexible plastic gaskets shall conform to requirements of AASHTO M 198, Type B.
- b. **Connecting Bands:** Connecting bands shall be of the type, size and sheet thickness of band, and the size of angles, bolts, rods and lugs as indicated or where not indicated as specified in the applicable standards or specifications for the pipe. Exterior rivet heads in the longitudinal seam under the connecting band shall be countersunk or the rivets shall be omitted and the seam welded. Watertight joints shall be tested and shall meet the test requirements of paragraph HYDROSTATIC TEST ON WATERTIGHT JOINTS.

2.3.8.4 PVC Plastic Pipes

Joints shall be solvent cement or elastomeric gasket type in accordance with the specification for the pipe and as recommended by the pipe manufacturer.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

2.3.8.5 Smooth Wall PE Plastic Pipe

Pipe shall be joined using butt fusion method as recommended by the pipe manufacturer.

2.3.8.6 Corrugated PE Plastic Pipe

Pipe joints shall be soil tight and shall conform to the requirements in AASHTO M 294. Water tight joints shall be made using a PE coupling and rubber gaskets as recommended by the pipe manufacturer. Rubber gaskets shall conform to ASTM F 477.

2.3.8.7 Profile Wall PE Plastic Pipe

Joints shall be gasketed or thermal weld type with integral bell in accordance with ASTM F 894.

2.3.8.8 Ductile Iron Pipe

Couplings and fittings shall be as recommended by the pipe manufacturer.

2.4 STEEL LADDER

Steel ladder shall be provided where the depth of the storm drainage structure exceeds 12 feet. These ladders shall be not less than 16 inches in width, with 3/4 inch diameter rungs spaced 12 inches apart. The two stringers shall be a minimum 3/8 inch thick and 2-1/2 inches wide. Ladders and inserts shall be galvanized after fabrication in conformance with ASTM A 123/A 123M.

2.5 RESILIENT CONNECTORS

Flexible, watertight connectors used for connecting pipe to manholes and inlets shall conform to ASTM C 923.

2.6 EROSION CONTROL RIPRAP

Provide nonerodible rock not exceeding 15 inches in its greatest dimension and choked with sufficient small rocks to provide a dense mass with a minimum thickness of 8 inches, as indicated.

PART 3 EXECUTION

3.1 EXCAVATION FOR PIPE CULVERTS, STORM DRAINS, AND DRAINAGE STRUCTURES

Excavation of trenches, and for appurtenances and backfilling for culverts and storm drains, shall be in accordance with the applicable portions of Section 31 00 00 EARTHWORK and the requirements specified below.

3.1.1 Trenching

The width of trenches at any point below the top of the pipe shall be not greater than the outside diameter of the pipe plus 12 inches to permit satisfactory jointing and thorough tamping of the bedding material under and around the pipe. Sheeting and bracing, where required, shall be placed within the trench width as specified, without any overexcavation. Where trench widths are exceeded, redesign with a resultant increase in cost of stronger pipe or special installation procedures will be necessary. Cost of this redesign and increased cost of pipe or installation shall be borne

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
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by the Contractor without additional cost to the Government.

3.1.2 Removal of Rock

Rock in either ledge or boulder formation shall be replaced with suitable materials to provide a compacted earth cushion having a thickness between unremoved rock and the pipe of at least 8 inches or 1/2 inch for each foot of fill over the top of the pipe, whichever is greater, but not more than three-fourths the nominal diameter of the pipe. Where bell-and-spigot pipe is used, the cushion shall be maintained under the bell as well as under the straight portion of the pipe. Rock excavation shall be as specified and defined in Section 31 00 00 EARTHWORK.

3.1.3 Removal of Unstable Material

Where wet or otherwise unstable soil incapable of properly supporting the pipe, as determined by the Contracting Officer, is unexpectedly encountered in the bottom of a trench, such material shall be removed to the depth required and replaced to the proper grade with select granular material, compacted as provided in paragraph BACKFILLING. When removal of unstable material is due to the fault or neglect of the Contractor while performing shoring and sheeting, water removal, or other specified requirements, such removal and replacement shall be performed at no additional cost to the Government.

3.2 BEDDING

The bedding surface for the pipe shall provide a firm foundation of uniform density throughout the entire length of the pipe.

3.2.1 Concrete Pipe Requirements

When no bedding class is specified or detailed on the drawings, concrete pipe shall be bedded in granular material minimum 4 inch in depth in trenches with soil foundation. Depth of granular bedding in trenches with rock foundation shall be 1/2 inch in depth per foot of depth of fill, minimum depth of bedding shall be 8 inch up to maximum depth of 24 inches. The middle third of the granular bedding shall be loosely placed. Bell holes and depressions for joints shall be removed and formed so entire barrel of pipe is uniformly supported. The bell hole and depressions for the joints shall be not more than the length, depth, and width required for properly making the particular type of joint.

3.2.2 Clay Pipe Requirements

Bedding for clay pipe shall be as specified by ASTM C 12.

3.2.3 Corrugated Metal Pipe

Bedding for corrugated metal pipe and pipe arch shall be in accordance with ASTM A 798/A 798M. It is not required to shape the bedding to the pipe geometry. However, for pipe arches, either shape the bedding to the relatively flat bottom arc or fine grade the foundation to a shallow v-shape. Bedding for corrugated structural plate pipe shall meet requirements of ASTM A 807/A 807M.

3.2.4 Ductile Iron and Cast-Iron Pipe

Bedding for ductile iron and cast-iron pipe shall be as shown on the

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

drawings.

3.2.5 Plastic Pipe

Bedding for PVC and PE pipe shall meet the requirements of ASTM D 2321. Bedding, haunching, and initial backfill shall be either Class IB or II material.

3.3 PLACING PIPE

Each pipe shall be thoroughly examined before being laid; defective or damaged pipe shall not be used. Plastic pipe shall be protected from exposure to direct sunlight prior to laying, if necessary to maintain adequate pipe stiffness and meet installation deflection requirements. Pipelines shall be laid to the grades and alignment indicated. Proper facilities shall be provided for lowering sections of pipe into trenches. Lifting lugs in vertically elongated metal pipe shall be placed in the same vertical plane as the major axis of the pipe. Pipe shall not be laid in water, and pipe shall not be laid when trench conditions or weather are unsuitable for such work. Diversion of drainage or dewatering of trenches during construction shall be provided as necessary. Deflection of installed flexible pipe shall not exceed the following limits:

TYPE OF PIPE	MAXIMUM ALLOWABLE DEFLECTION (%)
Ductile Iron Culvert	3
Plastic (PVC & HDPE)	5

Note post installation requirements of paragraph 'Deflection Testing' in PART 3 of this specification for all pipe products including deflection testing requirements for flexible pipe.

3.3.1 Corrugated PE Pipe

Laying shall be with the separate sections joined firmly on a bed shaped to line and grade and shall follow manufacturer's recommendations.

3.3.2 Corrugated Metal Pipe and Pipe Arch

Laying shall be with the separate sections joined firmly together, with the outside laps of circumferential joints pointing upstream, and with longitudinal laps on the sides. Part paved pipe shall be installed so that the centerline of bituminous pavement in the pipe, indicated by suitable markings on the top at each end of the pipe sections, coincides with the specified alignment of pipe. Fully paved steel pipe or pipe arch shall have a painted or otherwise applied label inside the pipe or pipe arch indicating sheet thickness of pipe or pipe arch. Any unprotected metal in the joints shall be coated with bituminous material as specified in AASHTO M 190 or AASHTO M 243. Interior coating shall be protected against damage from insertion or removal of struts or tie wires. Lifting lugs shall be used to facilitate moving pipe without damage to exterior or interior coatings. During transportation and installation, pipe or pipe arch and coupling bands shall be handled with care to preclude damage to the coating, paving or lining. Damaged coatings, pavings and linings shall be repaired in accordance with the manufacturer's recommendations prior to placing backfill. Pipe on which coating, paving or lining has been damaged to such an extent that satisfactory field repairs cannot be made shall be

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

removed and replaced. Vertical elongation, where indicated, shall be accomplished by factory elongation. Suitable markings or properly placed lifting lugs shall be provided to ensure placement of factory elongated pipe in a vertical plane.

3.3.3 Multiple Culverts

Where multiple lines of pipe are installed, adjacent sides of pipe shall be at least half the nominal pipe diameter or 3 feet apart, whichever is less.

3.4 JOINTING

3.4.1 Concrete and Clay Pipe

3.4.1.1 Cement-Mortar Bell-and-Spigot Joint

The first pipe shall be bedded to the established grade line, with the bell end placed upstream. The interior surface of the bell shall be thoroughly cleaned with a wet brush and the lower portion of the bell filled with mortar as required to bring inner surfaces of abutting pipes flush and even. The spigot end of each subsequent pipe shall be cleaned with a wet brush and uniformly matched into a bell so that sections are closely fitted. After each section is laid, the remainder of the joint shall be filled with mortar, and a bead shall be formed around the outside of the joint with sufficient additional mortar. If mortar is not sufficiently stiff to prevent appreciable slump before setting, the outside of the joint shall be wrapped or bandaged with cheesecloth to hold mortar in place.

3.4.1.2 Cement-Mortar Oakum Joint for Bell-and-Spigot Pipe

A closely twisted gasket shall be made of jute or oakum of the diameter required to support the spigot end of the pipe at the proper grade and to make the joint concentric. Joint packing shall be in one piece of sufficient length to pass around the pipe and lap at top. This gasket shall be thoroughly saturated with neat cement grout. The bell of the pipe shall be thoroughly cleaned with a wet brush, and the gasket shall be laid in the bell for the lower third of the circumference and covered with mortar. The spigot of the pipe shall be thoroughly cleaned with a wet brush, inserted in the bell, and carefully driven home. A small amount of mortar shall be inserted in the annular space for the upper two-thirds of the circumference. The gasket shall be lapped at the top of the pipe and driven home in the annular space with a caulking tool. The remainder of the annular space shall be filled completely with mortar and beveled at an angle of approximately 45 degrees with the outside of the bell. If mortar is not sufficiently stiff to prevent appreciable slump before setting, the outside of the joint thus made shall be wrapped with cheesecloth. Placing of this type of joint shall be kept at least five joints behind laying operations.

3.4.1.3 Cement-Mortar Diaper Joint for Bell-and-Spigot Pipe

The pipe shall be centered so that the annular space is uniform. The annular space shall be caulked with jute or oakum. Before caulking, the inside of the bell and the outside of the spigot shall be cleaned.

- a. Diaper Bands: Diaper bands shall consist of heavy cloth fabric to hold grout in place at joints and shall be cut in lengths that extend one-eighth of the circumference of pipe above the spring line on one side of the pipe and up to the spring line on the other side of the

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

pipe. Longitudinal edges of fabric bands shall be rolled and stitched around two pieces of wire. Width of fabric bands shall be such that after fabric has been securely stitched around both edges on wires, the wires will be uniformly spaced not less than 8 inches apart. Wires shall be cut into lengths to pass around pipe with sufficient extra length for the ends to be twisted at top of pipe to hold the band securely in place; bands shall be accurately centered around lower portion of joint.

- b. Grout: Grout shall be poured between band and pipe from the high side of band only, until grout rises to the top of band at the spring line of pipe, or as nearly so as possible, on the opposite side of pipe, to ensure a thorough sealing of joint around the portion of pipe covered by the band. Silt, slush, water, or polluted mortar grout forced up on the lower side shall be forced out by pouring, and removed.
- c. Remainder of Joint: The remaining unfilled upper portion of the joint shall be filled with mortar and a bead formed around the outside of this upper portion of the joint with a sufficient amount of additional mortar. The diaper shall be left in place. Placing of this type of joint shall be kept at least five joints behind actual laying of pipe. No backfilling around joints shall be done until joints have been fully inspected and approved.

3.4.1.4 Cement-Mortar Tongue-and-Groove Joint

The first pipe shall be bedded carefully to the established grade line with the groove upstream. A shallow excavation shall be made underneath the pipe at the joint and filled with mortar to provide a bed for the pipe. The grooved end of the first pipe shall be thoroughly cleaned with a wet brush, and a layer of soft mortar applied to the lower half of the groove. The tongue of the second pipe shall be cleaned with a wet brush; while in horizontal position, a layer of soft mortar shall be applied to the upper half of the tongue. The tongue end of the second pipe shall be inserted in the grooved end of the first pipe until mortar is squeezed out on interior and exterior surfaces. Sufficient mortar shall be used to fill the joint completely and to form a bead on the outside.

3.4.1.5 Cement-Mortar Diaper Joint for Tongue-and-Groove Pipe

The joint shall be of the type described for cement-mortar tongue-and-groove joint in this paragraph, except that the shallow excavation directly beneath the joint shall not be filled with mortar until after a gauze or cheesecloth band dipped in cement mortar has been wrapped around the outside of the joint. The cement-mortar bead at the joint shall be at least 1/2 inch, thick and the width of the diaper band shall be at least 8 inches. The diaper shall be left in place. Placing of this type of joint shall be kept at least five joints behind the actual laying of the pipe. Backfilling around the joints shall not be done until the joints have been fully inspected and approved.

3.4.1.6 Plastic Sealing Compound Joints for Tongue-and-Grooved Pipe

Sealing compounds shall follow the recommendation of the particular manufacturer in regard to special installation requirements. Surfaces to receive lubricants, primers, or adhesives shall be dry and clean. Sealing compounds shall be affixed to the pipe not more than 3 hours prior to installation of the pipe, and shall be protected from the sun, blowing dust, and other deleterious agents at all times. Sealing compounds shall

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

be inspected before installation of the pipe, and any loose or improperly affixed sealing compound shall be removed and replaced. The pipe shall be aligned with the previously installed pipe, and the joint pulled together. If, while making the joint with mastic-type sealant, a slight protrusion of the material is not visible along the entire inner and outer circumference of the joint when the joint is pulled up, the pipe shall be removed and the joint remade. After the joint is made, all inner protrusions shall be cut off flush with the inner surface of the pipe. If non-mastic-type sealant material is used, the "Squeeze-Out" requirement above will be waived.

3.4.1.7 Flexible Watertight Joints

Gaskets and jointing materials shall be as recommended by the particular manufacturer in regard to use of lubricants, cements, adhesives, and other special installation requirements. Surfaces to receive lubricants, cements, or adhesives shall be clean and dry. Gaskets and jointing materials shall be affixed to the pipe not more than 24 hours prior to the installation of the pipe, and shall be protected from the sun, blowing dust, and other deleterious agents at all times. Gaskets and jointing materials shall be inspected before installing the pipe; any loose or improperly affixed gaskets and jointing materials shall be removed and replaced. The pipe shall be aligned with the previously installed pipe, and the joint pushed home. If, while the joint is being made the gasket becomes visibly dislocated the pipe shall be removed and the joint remade.

3.4.1.8 External Sealing Band Joint for Noncircular Pipe

Surfaces to receive sealing bands shall be dry and clean. Bands shall be installed in accordance with manufacturer's recommendations.

3.4.2 Corrugated Metal Pipe

3.4.2.1 Field Joints

Transverse field joints shall be designed so that the successive connection of pipe sections will form a continuous line free of appreciable irregularities in the flow line. In addition, the joints shall meet the general performance requirements described in ASTM A 798/A 798M. Suitable transverse field joints which satisfy the requirements for one or more of the joint performance categories can be obtained with the following types of connecting bands furnished with suitable band-end fastening devices: corrugated bands, bands with projections, flat bands, and bands of special design that engage factory reformed ends of corrugated pipe. The space between the pipe and connecting bands shall be kept free from dirt and grit so that corrugations fit snugly. The connecting band, while being tightened, shall be tapped with a soft-head mallet of wood, rubber or plastic, to take up slack and ensure a tight joint. The annular space between abutting sections of part paved, and fully paved pipe and pipe arch, in sizes 30 inches or larger, shall be filled with a bituminous material after jointing. Field joints for each type of corrugated metal pipe shall maintain pipe alignment during construction and prevent infiltration of fill material during the life of the installations. The type, size, and sheet thickness of the band and the size of angles or lugs and bolts shall be as indicated or where not indicated, shall be as specified in the applicable standards or specifications for the pipe.

3.4.2.2 Flexible Watertight, Gasketed Joints

Installation shall be as recommended by the gasket manufacturer for use of

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXX-XX-XXXX
100% Submittal

lubricants and cements and other special installation requirements. The gasket shall be placed over one end of a section of pipe for half the width of the gasket. The other half shall be doubled over the end of the same pipe. When the adjoining section of pipe is in place, the doubled-over half of the gasket shall then be rolled over the adjoining section. Any unevenness in overlap shall be corrected so that the gasket covers the end of pipe sections equally. Connecting bands shall be centered over adjoining sections of pipe, and rods or bolts placed in position and nuts tightened. Band Tightening: The band shall be tightened evenly, even tension being kept on the rods or bolts, and the gasket; the gasket shall seat properly in the corrugations. Watertight joints shall remain uncovered for a period of time designated, and before being covered, tightness of the nuts shall be measured with a torque wrench. If the nut has tended to loosen its grip on the bolts or rods, the nut shall be retightened with a torque wrench and remain uncovered until a tight, permanent joint is assured.

3.5 DRAINAGE STRUCTURES

3.5.1 Manholes and Inlets

Construction shall be of reinforced concrete, plain concrete, brick, precast reinforced concrete, precast concrete segmental blocks, prefabricated corrugated metal, or bituminous coated corrugated metal; complete with frames and covers or gratings; and with fixed galvanized steel ladders where indicated. Pipe studs and junction chambers of prefabricated corrugated metal manholes shall be fully bituminous-coated and paved when the connecting branch lines are so treated. Pipe connections to concrete manholes and inlets shall be made with flexible, watertight connectors.

3.5.2 Walls and Headwalls

Construction shall be as indicated.

3.6 STEEL LADDER INSTALLATION

Ladder shall be adequately anchored to the wall by means of steel inserts spaced not more than 6 feet vertically, and shall be installed to provide at least 6 inches of space between the wall and the rungs. The wall along the line of the ladder shall be vertical for its entire length.

3.7 BACKFILLING

3.7.1 Backfilling Pipe in Trenches

After the pipe has been properly bedded, selected material from excavation or borrow, at a moisture content that will facilitate compaction, shall be placed along both sides of pipe in layers not exceeding 6 inches in compacted depth. The backfill shall be brought up evenly on both sides of pipe for the full length of pipe. The fill shall be thoroughly compacted under the haunches of the pipe. Each layer shall be thoroughly compacted with mechanical tampers or rammers. This method of filling and compacting shall continue until the fill has reached an elevation equal to the midpoint (spring line) of RCP or has reached an elevation of at least 12 inches above the top of the pipe for flexible pipe. The remainder of the trench shall be backfilled and compacted by spreading and rolling or compacted by mechanical rammers or tampers in layers not exceeding 8 inches. Tests for density shall be made as necessary to ensure conformance to the

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
100% Submittal

compaction requirements specified below. Where it is necessary, in the opinion of the Contracting Officer, that sheeting or portions of bracing used be left in place, the contract will be adjusted accordingly. Untreated sheeting shall not be left in place beneath structures or pavements.

3.7.2 Backfilling Pipe in Fill Sections

For pipe placed in fill sections, backfill material and the placement and compaction procedures shall be as specified below. The fill material shall be uniformly spread in layers longitudinally on both sides of the pipe, not exceeding 6 inches in compacted depth, and shall be compacted by rolling parallel with pipe or by mechanical tamping or ramming. Prior to commencing normal filling operations, the crown width of the fill at a height of 12 inches above the top of the pipe shall extend a distance of not less than twice the outside pipe diameter on each side of the pipe or 12 feet, whichever is less. After the backfill has reached at least 12 inches above the top of the pipe, the remainder of the fill shall be placed and thoroughly compacted in layers not exceeding 6 inches. Use select granular material for this entire region of backfill for flexible pipe installations.

3.7.3 Movement of Construction Machinery

When compacting by rolling or operating heavy equipment parallel with the pipe, displacement of or injury to the pipe shall be avoided. Movement of construction machinery over a culvert or storm drain at any stage of construction shall be at the Contractor's risk. Any damaged pipe shall be repaired or replaced.

3.7.4 Compaction

3.7.4.1 General Requirements

Cohesionless materials include gravels, gravel-sand mixtures, sands, and gravelly sands. Cohesive materials include clayey and silty gravels, gravel-silt mixtures, clayey and silty sands, sand-clay mixtures, clays, silts, and very fine sands. When results of compaction tests for moisture-density relations are recorded on graphs, cohesionless soils will show straight lines or reverse-shaped moisture-density curves, and cohesive soils will show normal moisture-density curves.

3.7.4.2 Minimum Density

Backfill over and around the pipe and backfill around and adjacent to drainage structures shall be compacted at the approved moisture content to the following applicable minimum density, which will be determined as specified below.

- a. Under airfield and heliport pavements, paved roads, streets, parking areas, and similar-use pavements including adjacent shoulder areas, the density shall be not less than 90 percent of maximum density for cohesive material and 95 percent of maximum density for cohesionless material, up to the elevation where requirements for pavement subgrade materials and compaction shall control.
- b. Under unpaved or turfed traffic areas, density shall not be less than 90 percent of maximum density for cohesive material and 95 percent of maximum density for cohesionless material.

Construct Battalion Synthetic Running Track
Facility No. 4489, Fort Jackson, Columbia, SC

NXXXXXX-XX-XXXX
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- c. Under nontraffic areas, density shall be not less than that of the surrounding material.

3.7.5 Determination of Density

Testing is the responsibility of the Contractor and performed at no additional cost to the Government. Testing shall be performed by an approved commercial testing laboratory or by the Contractor subject to approval. Tests shall be performed in sufficient number to ensure that specified density is being obtained. Laboratory tests for moisture-density relations shall be made in accordance with ASTM D 1557 except that mechanical tampers may be used provided the results are correlated with those obtained with the specified hand tamper. Field density tests shall be determined in accordance with ASTM D 2167 or ASTM D 6938. When ASTM D 6938 is used, the calibration curves shall be checked and adjusted, if necessary, using the sand cone method as described in paragraph Calibration of the referenced publications. ASTM D 6938 results in a wet unit weight of soil and ASTM D 6938 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gauges shall be checked along with density calibration checks as described in ASTM D 6938. Test results shall be furnished the Contracting Officer. The calibration checks of both the density and moisture gauges shall be made at the beginning of a job on each different type of material encountered and at intervals as directed.

-- End of Section --

CONSTRUCT BATTALION SYNTHETIC RUNNING TRACK HURTGEN FOREST TRACK, FACILITY No. 4489

Ft Jackson, South Carolina
 Richland County

ENGINEERING REPORT

Prepared By:

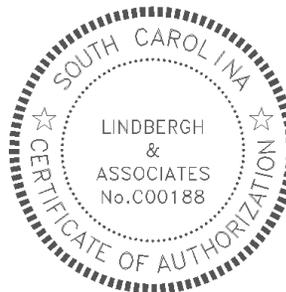


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June, 2010
 L&A Project No. # 45867

TABLE OF CONTENTS

SECTION 1 - PROJECT DESCRIPTION AND LOCATION..... 2
 SECTION 2 - STORM DRAINAGE SYSTEM CALCULATIONS & EROSION CONTROL..... 3
 SECTION 3 - EROSION CONTROL 7

Figures:

TOPOGRAPHIC MAP.....2A
 FIRMETTE.....6A
 SOIL MAP.....6B-6D
 HYDRAFLOW OUTPUT.....APPENDIX



SECTION 1 - PROJECT DESCRIPTION AND LOCATION

Title: Const. Battalion Synthetic Running Track – Facility #4489

Location: U.S. Army Installation – Fort Jackson
Columbia, SC Richland County

Latitude: 34°01’11.67” N

Longitude: 80°56’23.70” W

Property Owner:..... United States Army

Demolition will include:

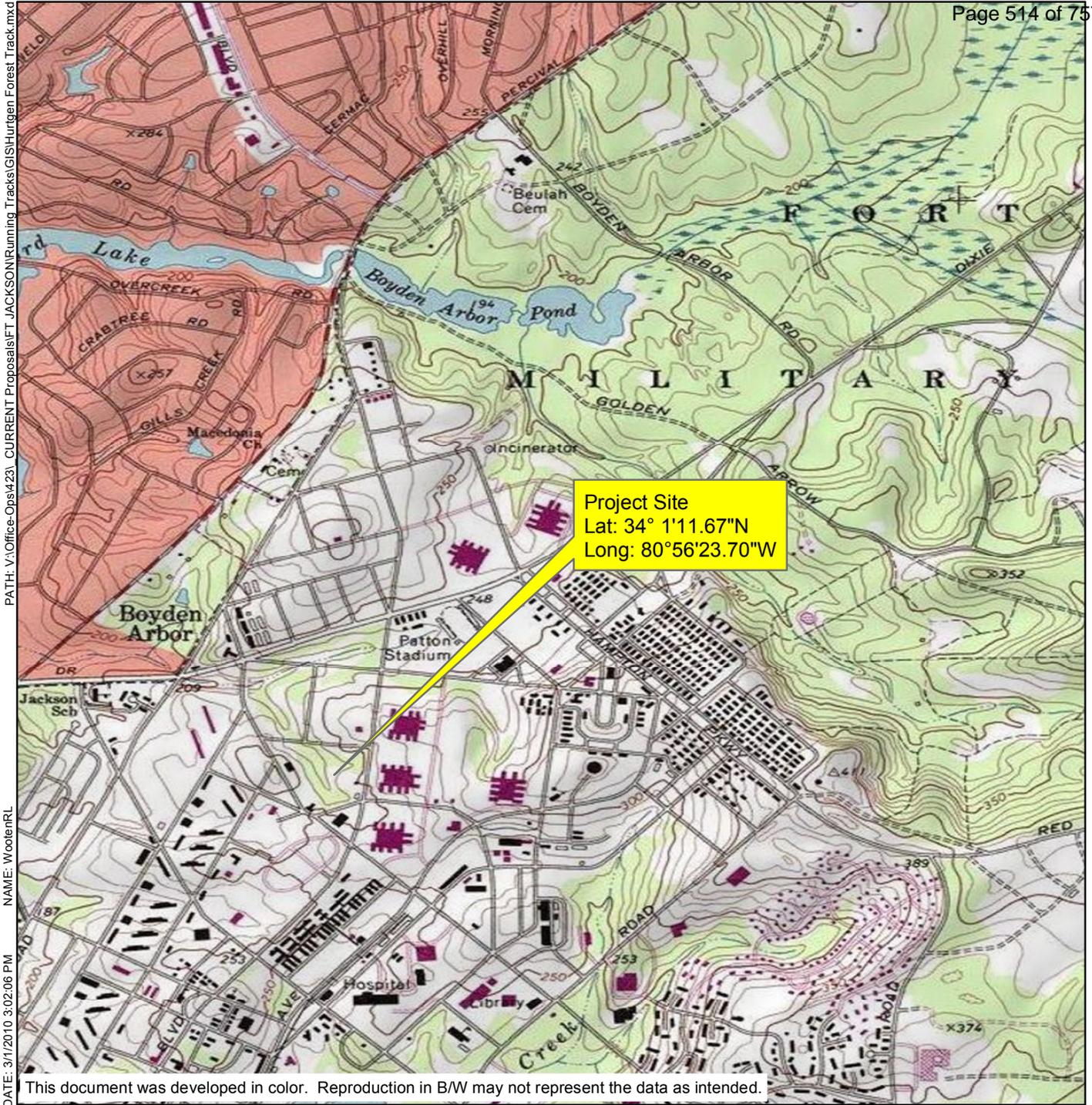
- Demolition of existing asphalt track
- Removal of trees

Site improvements will include:

- New reinforced concrete (RCP) piping
- Improved grading for drainage away from new track surface
- Synthetic track surface over asphalt base



L&A Project # 45867
Construct Battalion Synthetic Running Track
1-13th IN BN – Hurtgen Forest Track, Facility No. 4489

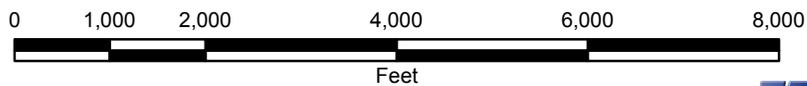


USACE, Fort Jackson Installation Support
 Hurtgen Forest Track, Facility No. 4489
 Fort Jackson, SC



MAP LOCATION

SITE LOCATION



SECTION 2 - STORM DRAINAGE SYSTEM CALCULATIONS & EROSION CONTROL**SUMMARY**

- Nearest Receiving Water Body: .. Unnamed Stream to Forrest Lake
- Distance to Water Body: 1,478 feet
- Project Area: 5.35 acres
- Disturbed Area: 1.26 acres

EROSION CONTROL

- Temporary & permanent grassing and landscaping
- Existing storm drainage inlet protection
- Silt fencing around perimeter of construction area

STORM DRAINAGE

- Sheet flow through grass areas and into existing drainage swales and catch basins.

ESTIMATED CONSTRUCTION SCHEDULE

Start Construction - August 1, 2010
End construction - September 30, 2010

CRITERIA

The basis of the storm drainage system design stems from requirements set forth by the General Permit for Stormwater Management and Sediment Reduction at the United States Army Training Center at Fort Jackson, South Carolina. This project will disturb two (2) acres or less, and is not part of a larger common plan for development. Therefore this project shall meet the requirements of section R.72-307H of the S.C. Storm water Management and Sediment Reduction Regulations.

WATER QUANTITYHydrology/Stormwater Modeling

Hydrology and stormwater modeling calculations are performed using *Hydraflow Hydrographs 2007* and *Hydraflow Express 2006*, by *Intellisolve*. Calculations are performed using the SCS Unit Hydrograph Method.

Basin Analysis

Basin analysis is performed to determine the characteristics of the basins (Pre-development and Post-development) that will influence the amount of runoff that can be anticipated for a given basin. Times of Concentration (T_c) – Times of concentration are calculated using the Lag Time Method explained more thoroughly on page 5 of this report.

Areas – Within the project boundaries, areas are measured directly from the drawings. For off-site contributory basins, areas are measured from available sources such as USGS Quadrangle Maps, other surveys or designs, FEMA panels, and as-built drawings. Areas are expressed in acres.



L&A Project # 45867

Construct Battalion Synthetic Running Track
1-13th IN BN – Hurtgen Forest Track, Facility No. 4489

Runoff Coefficients – Runoff coefficients area calculated for the SCS TR 55 ('CN' Curve Numbers). Curve Numbers are determined using the tables in the SCS TR 55 manual and are based on ground cover and the hydrologic soils group. The runoff coefficients used are as follows:

	Curve Number
Impervious	98
Pervious	86

Hydraulic & Hydrologic Calculations

Using the information calculated as indicated above, the individual construction area is analyzed to determine the peak flow, Q_p , for the site. Hydrology and storm water modeling calculations are performed using *Hydraflow Hydrographs software, 2007*. Calculations are performed using SCS unit hydrographs and in accordance with SCDHEC requirements for a “*volume based hydrograph method acceptable to the Commission. The storm duration for computational purposes for this method shall be the 24-hour rainfall event, SCS distribution with a 0.1 hour burst duration time increment.*”

Runoff computations are based on a design storm unit hydrograph. The design storm unit hydrograph parameter of Peak Factor is used to reflect the watershed storage onto the runoff hydrograph shape. The following parameters are used to select the Peak Factor value:

General Description	Peaking Factor
Urban areas with steep slopes	575
Typical NCRS Peaking Factor	484
Mixed urban/rural	400
Rural with rolling hills	300
Rural with slight slopes	200
Rural, very flat	100

Source: Hydrograph Peaking Factors and recession limb ratios (Wanielista, et. Al. 1997)



L&A Project # 45867
Construct Battalion Synthetic Running Track
1-13th IN BN – Hurtgen Forest Track, Facility No. 4489

$$1. Q_p = [484AQ]/T_p$$

Q_p = Peak rate of runoff in cubic feet per second (cfs)

484 = Shape factor (see above)

Q = Total excess precipitation (1 inch)

A = Drainage area in acres (mi²)

T_p = Time to peak (hours)

$$T_p = [T_c + D]/1.7$$

D = unit duration or time interval (hrs)

T_c = time of concentration, 1.67xLag Time (L, hrs)

$$L = [l^{0.8} (S+1)^{0.7}] / [1900Y^{0.5}]$$

l = hydraulic length (ft)

S = (1000/CN)-10

Y = Basin slope

CN = SCS curve number

$$\text{Time base } (T_b) = 2.67T_p$$

The unit hydrograph ordinates are then computed with an optimal time of interval of, no greater, than ½ the time to peak.

PRE-DEVELOPMENT HYDROLOGY NARRATIVE

The construction site for the Hurtgen Forest Track, Facility #4489 is located on the U.S. Army Installation Fort Jackson, SC, southwest of the intersection of Jackson Boulevard and Kelly Street, and just south of the Bayonet and 40 Rounds Tracks, Facilities #5386 and #5387. The current facilities are presently, and will continue to be utilized by the 1-13th Infantry Battalion as part of physical training. The predevelopment conditions include an asphalt track surface. The existing composite Runoff CN value is 87 with approximately 93% (4.97 acres) of the 5.35 acre site being pervious area. The site is surrounded by hilly terrain common to the midlands region of the South Carolina. The site currently slopes at 1.5% toward the northern corner of the track. A twelve inch section of corrugated plastic piping (CPP) conveys runoff in this area of the track to an area located outside the existing track perimeter; then collected by a type 9 catch basin. To the south, the land slopes at 5.60% where runoff is collected by an existing Type 9 catch basin. A single section of 12" CPP, also located in the southern portion, actually conveys storm water runoff from outside into the perimeter of the track. A large drainage system bisects the areas enclosed by the track, conveying runoff collected in the existing type 9 catch basins away from the site. The diameter of the reinforced concrete piping connecting the systems ranges from 15 inches to 36 inches (main trunk). The project is located in FEMA Flood Zone X.



L&A Project # 45867

Construct Battalion Synthetic Running Track
1-13th IN BN – Hurtgen Forest Track, Facility No. 4489

POST-DEVELOPMENT HYDROLOGY NARRATIVE

The proposed site improvements include the addition of a synthetic running track surface on top of paved asphalt. New RCP will be placed near the location of the existing piping at the northern corner of the track. The 12" CPP sections to the north and southeast will be demolished before the new track is constructed. The overall slope of the site will not change. The new composite Runoff CN value will remain 87 due the impervious area increase. Coupled with the fact that the slope of the track interior and the hydraulic length will remain static, the peak discharge of the site does increase from Pre to Post conditions. The 0.25 acre increase in impervious area is not significant enough to change the composite curve number value of the site.

EXISTING SOIL DESCRIPTION

	HSG	K, in/hr
Vaucluse loamy sand	C	0.32

Based on USGS Geological Survey

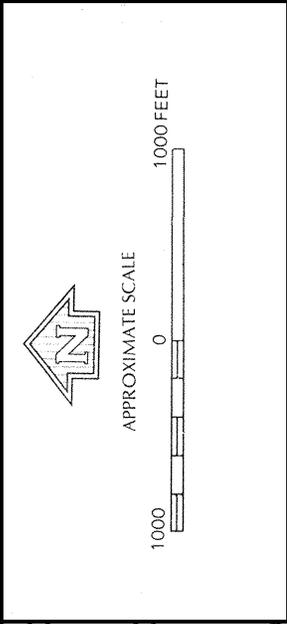
HYDROLOGY ANALYSIS SUMMARY

	Pre-Development Conditions	Post-Development Conditions
Impervious Area	0.38 ac	0.63 ac
Pervious Area	4.97 ac	4.72 ac
Total Area	5.35 ac	5.35 ac
Composite CN	87	87
2 yr runoff (cfs)	19.08 cfs	19.08 cfs
10 yr runoff (cfs)	31.61 cfs	31.61 cfs
25 yr runoff (cfs)	39.70 cfs	39.70 cfs

HYDRAFLOW OUTPUT

The Hurtgen Forest Facility #4489 Pre and Post Hydrographs seen in the *Hydraflow Hydrographs* output were computed to obtain a peak runoff (Q_p) for conditions before and after the new track is built. As seen in the chart above, the Pre and Post development flows and CN Values are the same. Therefore, peak flows leaving the site do not increase. Since there is no known flooding problem onsite, all 15" RCP replacing 12" CPP should be adequate handle the flows from the new track. Thus, a culvert analysis was not performed.





NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP
 RICHLAND COUNTY,
 SOUTH CAROLINA
 AND INCORPORATED AREAS

PANEL 115 OF 275
 (SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
COLUMBIA, CITY OF	450172	0115	G
UNINCORPORATED AREAS	450170	0115	G

Notice To User: The MAP NUMBER shown below should be used when placing map orders; the COMMUNITY NUMBER shown should be used on insurance applications for the subject community.

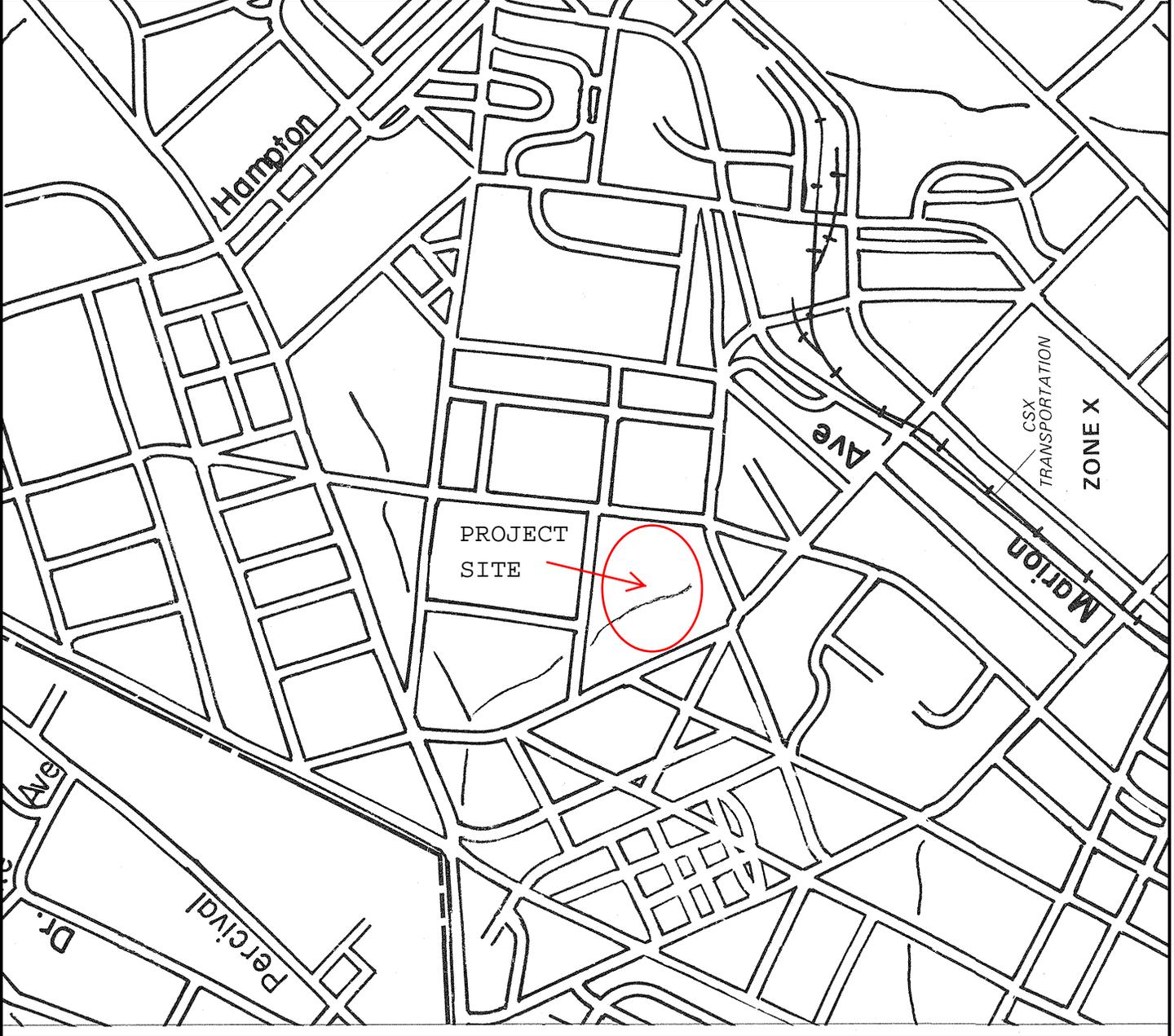
MAP NUMBER
 45079C0115 G

EFFECTIVE DATE:
 JANUARY 19, 1994



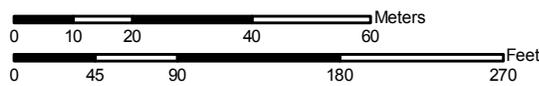
Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps, check the FEMA Flood Map Store at www.msc.fema.gov





Map Scale: 1:1,260 if printed on A size (8.5" x 11") sheet.



6B

MAP LEGEND

 Area of Interest (AOI)	 Very Stony Spot
 Soil Map Units	 Wet Spot
Special Point Features	 Other
 Blowout	Special Line Features
 Borrow Pit	 Gully
 Clay Spot	 Short Steep Slope
 Closed Depression	 Other
 Gravel Pit	Political Features
 Gravelly Spot	 Cities
 Landfill	Water Features
 Lava Flow	 Oceans
 Marsh or swamp	 Streams and Canals
 Mine or Quarry	Transportation
 Miscellaneous Water	 Rails
 Perennial Water	 Interstate Highways
 Rock Outcrop	 US Routes
 Saline Spot	 Major Roads
 Sandy Spot	 Local Roads
 Severely Eroded Spot	
 Sinkhole	
 Slide or Slip	
 Sodic Spot	
 Spoil Area	
 Stony Spot	

MAP INFORMATION

Map Scale: 1:1,260 if printed on A size (8.5" x 11") sheet.
 The soil surveys that comprise your AOI were mapped at 1:20,000.
 Please rely on the bar scale on each map sheet for accurate map measurements.
 Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: UTM Zone 17N NAD83
 This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.
 Soil Survey Area: Richland County, South Carolina
 Survey Area Data: Version 13, Feb 9, 2010
 Date(s) aerial images were photographed: 7/11/2006; 6/10/2006
 The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Richland County, South Carolina (SC079)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
PnC	Pelion-Urban land complex, 2 to 10 percent slopes	1.1	12.7%
VaD	Vaucluse loamy sand, 10 to 15 percent slopes	7.7	87.3%
Totals for Area of Interest		8.8	100.0%

SECTION 3 - EROSION CONTROL

The erosion control plan has been developed to meet the requirements of the South Carolina Department of Health & Environmental Control (SCDHEC) requirements for land disturbance. To minimize the amount of sediment leaving the site several methods will be used.

EROSION CONTROL DURING CONSTRUCTION

1. **Temporary Seeding & Mulching**

Temporary seeding and mulching will be utilized on all disturbed areas where work has been suspended for 14 days or more.

2. **Temporary Inlet Protection**

Temporary inlet protection will be provided at all existing catch basins and grate inlets. Protection will be provided by the placement of sediment tubes or rock ring checks around the grate and inlet or pipe opening for the duration of the project.

3. **Temporary Gravel Construction Entrance/Exit**

A temporary gravel construction entrance will be installed on the property, where applicable or feasible. The entrance will be graded so that runoff water will be directed to silt fencing.

4. **Silt Fencing**

A silt fence will be constructed around the site as necessary to prevent sediment from leaving the construction areas.

FINAL EROSION CONTROL

1. **Permanent Stabilization**

All areas will be permanently stabilized with pavement or permanent seeding.

2. **Rip Rap Outlet Protection**

All storm drain outlets will be equipped with rip rap erosion control beds sized to dissipate energy and reduce velocities to non erosive rates. (See Site Plans Sheet C630.)



Hydraflow Table of Contents

Watershed Model Schematic 1

Hydrograph Return Period Recap 2

2 - Year

Summary Report 3

Hydrograph Reports 4

 Hydrograph No. 1, SCS Runoff, Hurtgen Forest Pre 4

 Hydrograph No. 2, SCS Runoff, Hurtgen Forest Post 5

10 - Year

Summary Report 6

Hydrograph Reports 7

 Hydrograph No. 1, SCS Runoff, Hurtgen Forest Pre 7

 Hydrograph No. 2, SCS Runoff, Hurtgen Forest Post 8

25 - Year

Summary Report 9

Hydrograph Reports 10

 Hydrograph No. 1, SCS Runoff, Hurtgen Forest Pre 10

 Hydrograph No. 2, SCS Runoff, Hurtgen Forest Post 11

IDF Report 12

Watershed Model Schematic

1 - Hurtgen Forest Pre



2 - Hurtgen Forest Post



Legend

<u>Hyd.</u>	<u>Origin</u>	<u>Description</u>
1	SCS Runoff	Hurtgen Forest Pre
2	SCS Runoff	Hurtgen Forest Post

Hydrograph Return Period Recap

Hydraflow Hydrographs by Intelisolve v9.23

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	SCS Runoff	-----	-----	19.08	-----	-----	31.61	39.70	-----	-----	Hurtgen Forest Pre
2	SCS Runoff	-----	-----	19.08	-----	-----	31.61	39.70	-----	-----	Hurtgen Forest Post

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.23

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	19.08	2	718	44,133	----	-----	-----	Hurtgen Forest Pre
2	SCS Runoff	19.08	2	718	44,133	----	-----	-----	Hurtgen Forest Post
1-13 IN BN Hydraflow_ SCS.gpw					Return Period: 2 Year			Friday, Jun 11, 2010 Tuesday, July 06, 2010	

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.23

Friday, Jun 11, 2010

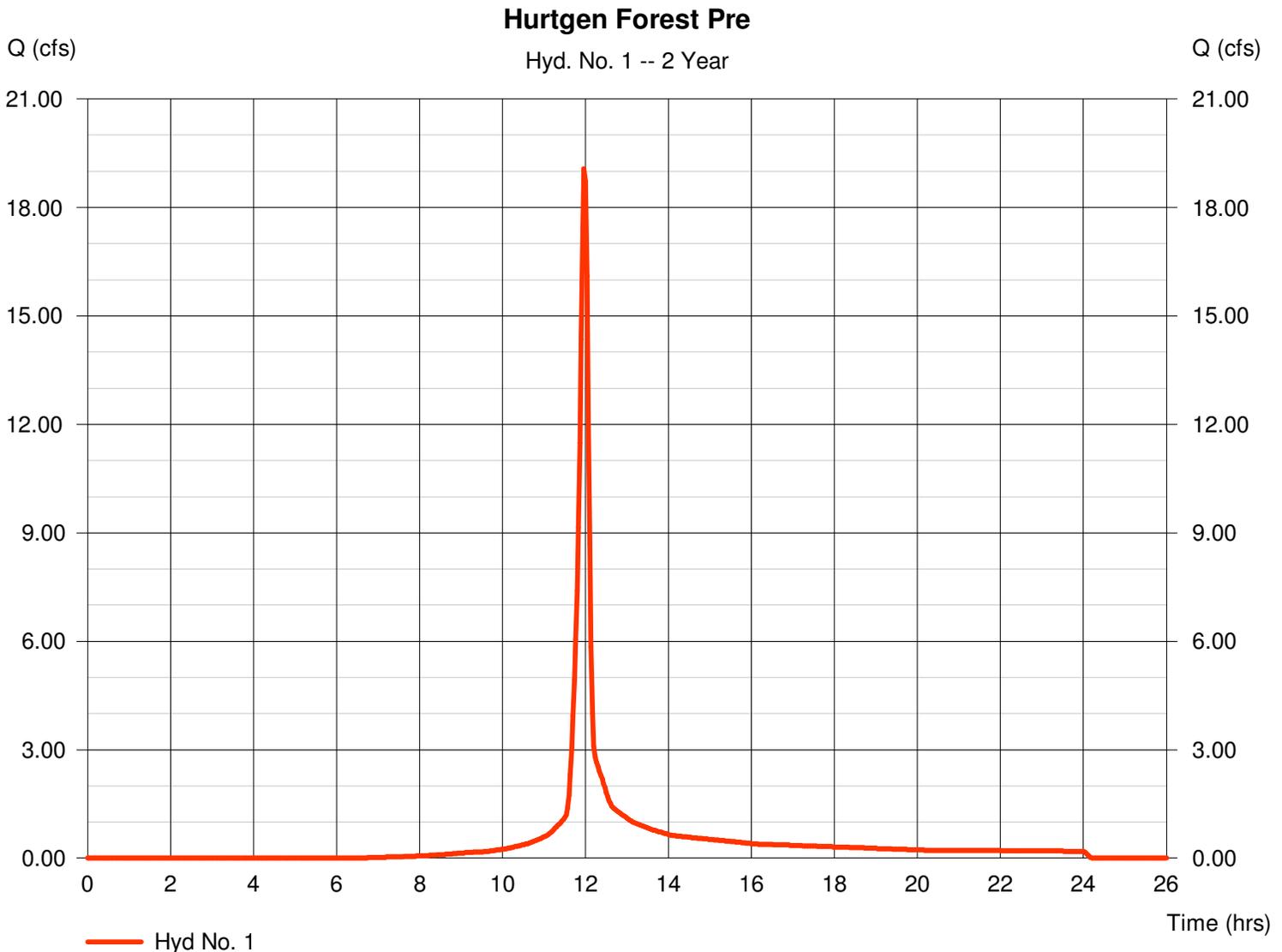
Hyd. No. 1

Hurtgen Forest Pre

Hydrograph type = SCS Runoff
 Storm frequency = 2 yrs
 Time interval = 2 min
 Drainage area = 5.350 ac
 Basin Slope = 2.8 %
 Tc method = LAG
 Total precip. = 3.60 in
 Storm duration = 24 hrs

Peak discharge = 19.08 cfs
 Time to peak = 11.97 hrs
 Hyd. volume = 44,133 cuft
 Curve number = 87*
 Hydraulic length = 450 ft
 Time of conc. (Tc) = 7.90 min
 Distribution = Type II
 Shape factor = 484

* Composite (Area/CN) = [(0.380 x 98) + (4.970 x 86)] / 5.350



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.23

Friday, Jun 11, 2010

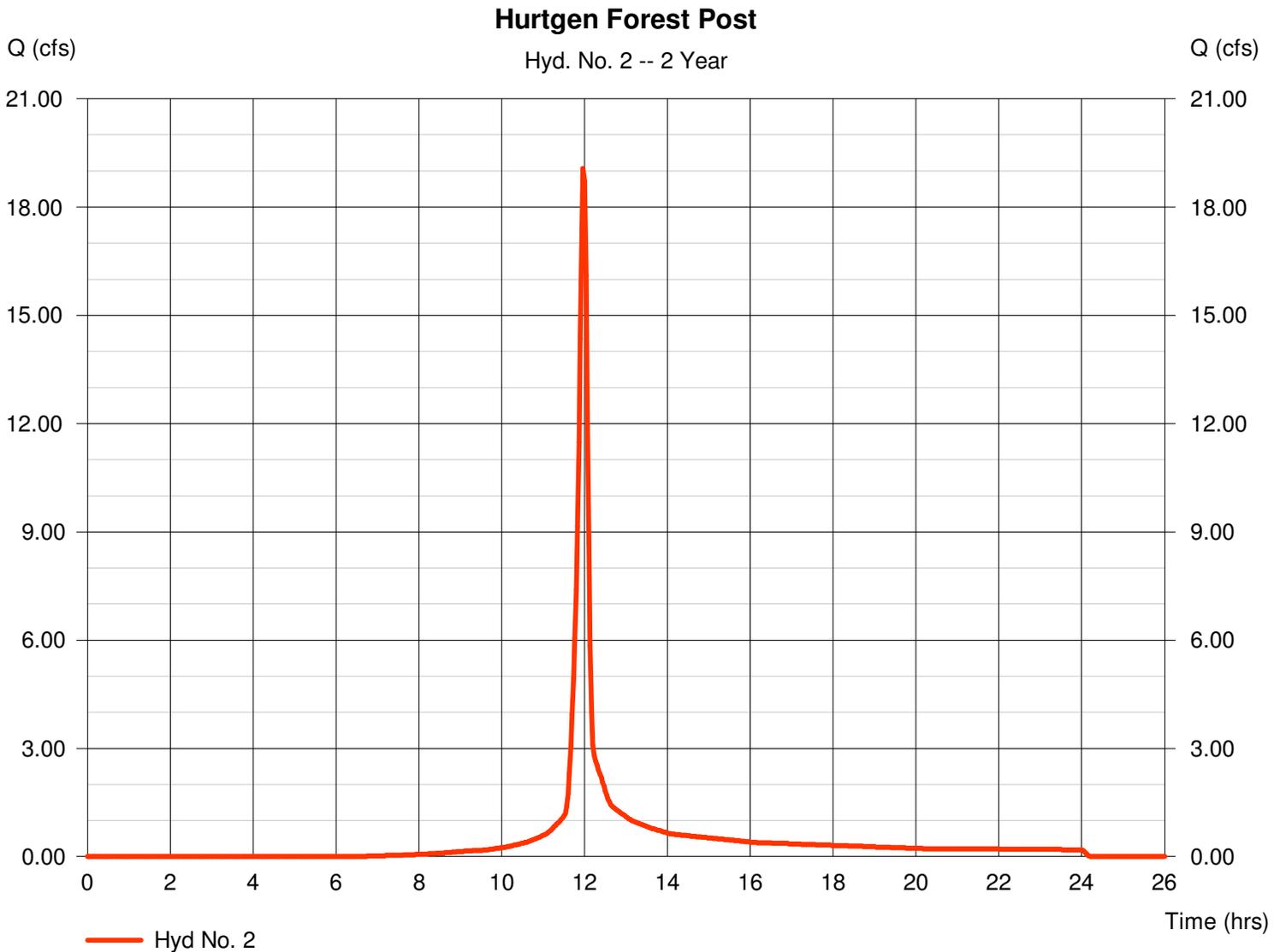
Hyd. No. 2

Hurtgen Forest Post

Hydrograph type = SCS Runoff
 Storm frequency = 2 yrs
 Time interval = 2 min
 Drainage area = 5.350 ac
 Basin Slope = 2.8 %
 Tc method = LAG
 Total precip. = 3.60 in
 Storm duration = 24 hrs

Peak discharge = 19.08 cfs
 Time to peak = 11.97 hrs
 Hyd. volume = 44,133 cuft
 Curve number = 87*
 Hydraulic length = 450 ft
 Time of conc. (Tc) = 7.90 min
 Distribution = Type II
 Shape factor = 484

* Composite (Area/CN) = [(4.720 x 86) + (0.630 x 98)] / 5.350



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.23

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description	
1	SCS Runoff	31.61	2	718	74,781	----	-----	-----	Hurtgen Forest Pre	
2	SCS Runoff	31.61	2	718	74,781	----	-----	-----	Hurtgen Forest Post	
1-13 IN BN Hydraflow_ SCS.gpw					Return Period: 10 Year			Friday, Jun 11, 2010 Tuesday, July 06, 2010		

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.23

Friday, Jun 11, 2010

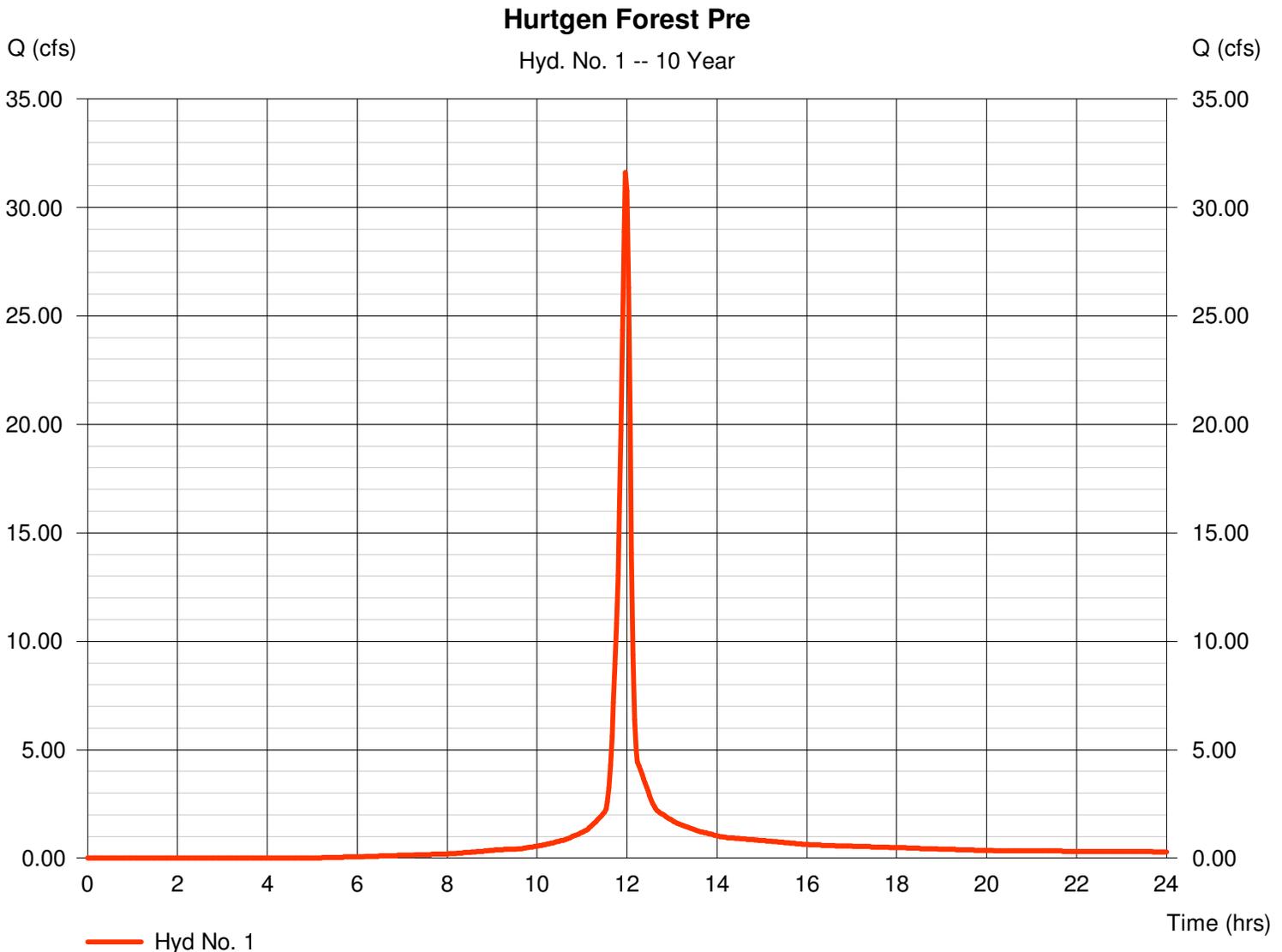
Hyd. No. 1

Hurtgen Forest Pre

Hydrograph type = SCS Runoff
 Storm frequency = 10 yrs
 Time interval = 2 min
 Drainage area = 5.350 ac
 Basin Slope = 2.8 %
 Tc method = LAG
 Total precip. = 5.30 in
 Storm duration = 24 hrs

Peak discharge = 31.61 cfs
 Time to peak = 11.97 hrs
 Hyd. volume = 74,781 cuft
 Curve number = 87*
 Hydraulic length = 450 ft
 Time of conc. (Tc) = 7.90 min
 Distribution = Type II
 Shape factor = 484

* Composite (Area/CN) = [(0.380 x 98) + (4.970 x 86)] / 5.350



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.23

Friday, Jun 11, 2010

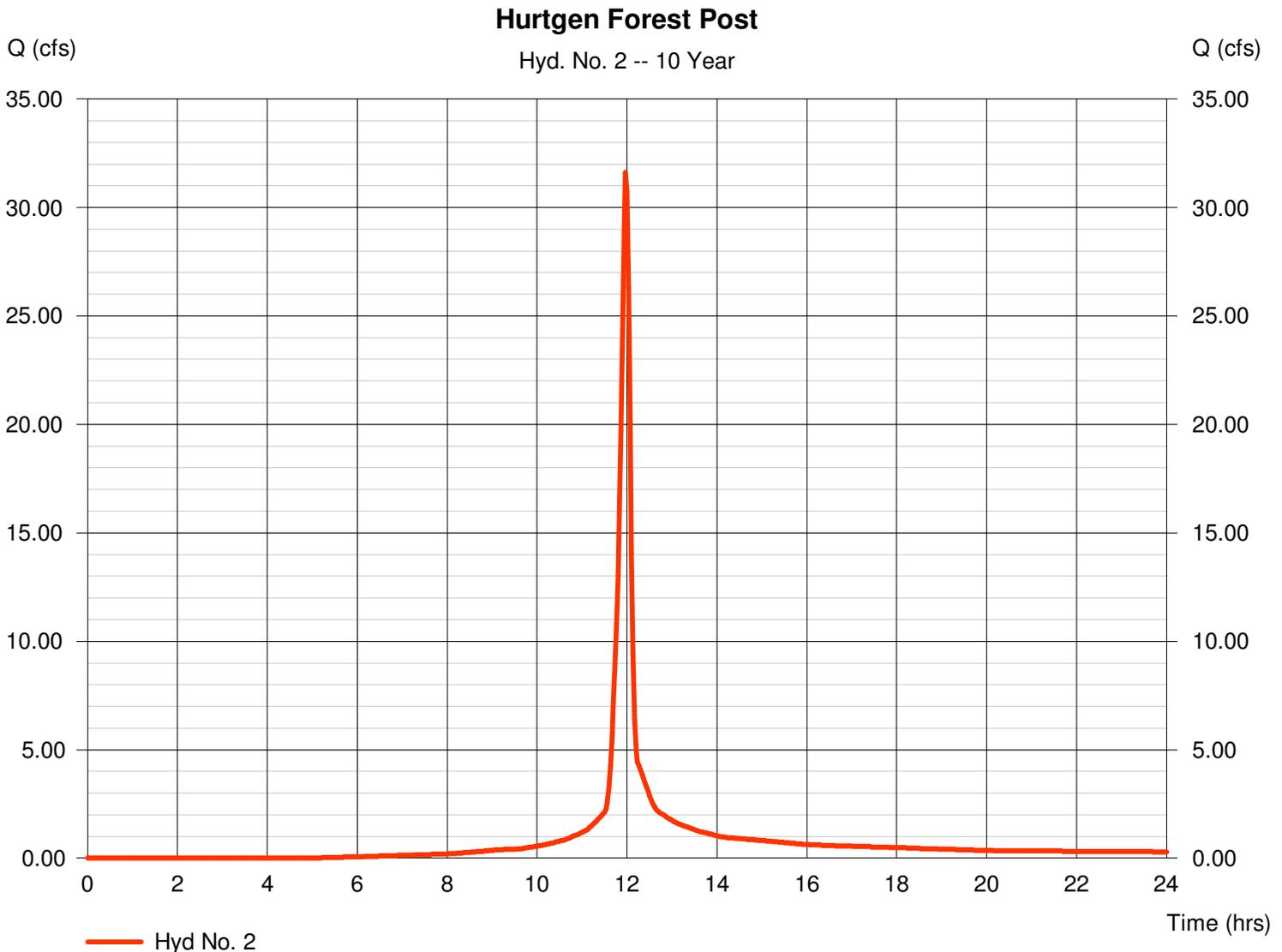
Hyd. No. 2

Hurtgen Forest Post

Hydrograph type = SCS Runoff
 Storm frequency = 10 yrs
 Time interval = 2 min
 Drainage area = 5.350 ac
 Basin Slope = 2.8 %
 Tc method = LAG
 Total precip. = 5.30 in
 Storm duration = 24 hrs

Peak discharge = 31.61 cfs
 Time to peak = 11.97 hrs
 Hyd. volume = 74,781 cuft
 Curve number = 87*
 Hydraulic length = 450 ft
 Time of conc. (Tc) = 7.90 min
 Distribution = Type II
 Shape factor = 484

* Composite (Area/CN) = [(4.720 x 86) + (0.630 x 98)] / 5.350



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.23

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	39.70	2	718	95,177	----	-----	-----	Hurtgen Forest Pre
2	SCS Runoff	39.70	2	718	95,177	----	-----	-----	Hurtgen Forest Post
1-13 IN BN Hydraflow_ SCS.gpw					Return Period: 25 Year			Friday, Jun 11, 2010 Tuesday, July 06, 2010	

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.23

Friday, Jun 11, 2010

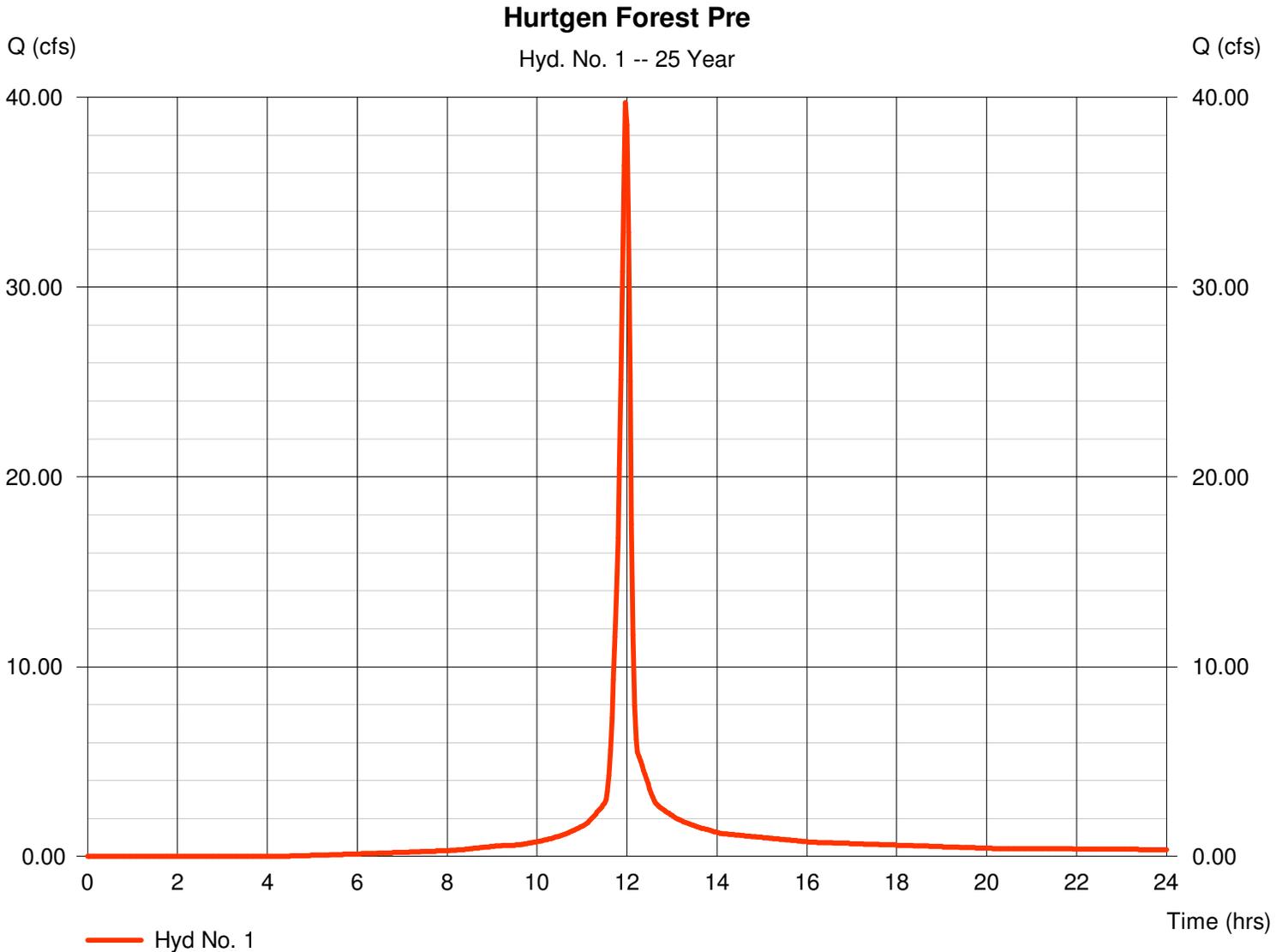
Hyd. No. 1

Hurtgen Forest Pre

Hydrograph type = SCS Runoff
 Storm frequency = 25 yrs
 Time interval = 2 min
 Drainage area = 5.350 ac
 Basin Slope = 2.8 %
 Tc method = LAG
 Total precip. = 6.40 in
 Storm duration = 24 hrs

Peak discharge = 39.70 cfs
 Time to peak = 11.97 hrs
 Hyd. volume = 95,177 cuft
 Curve number = 87*
 Hydraulic length = 450 ft
 Time of conc. (Tc) = 7.90 min
 Distribution = Type II
 Shape factor = 484

* Composite (Area/CN) = [(0.380 x 98) + (4.970 x 86)] / 5.350



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.23

Friday, Jun 11, 2010

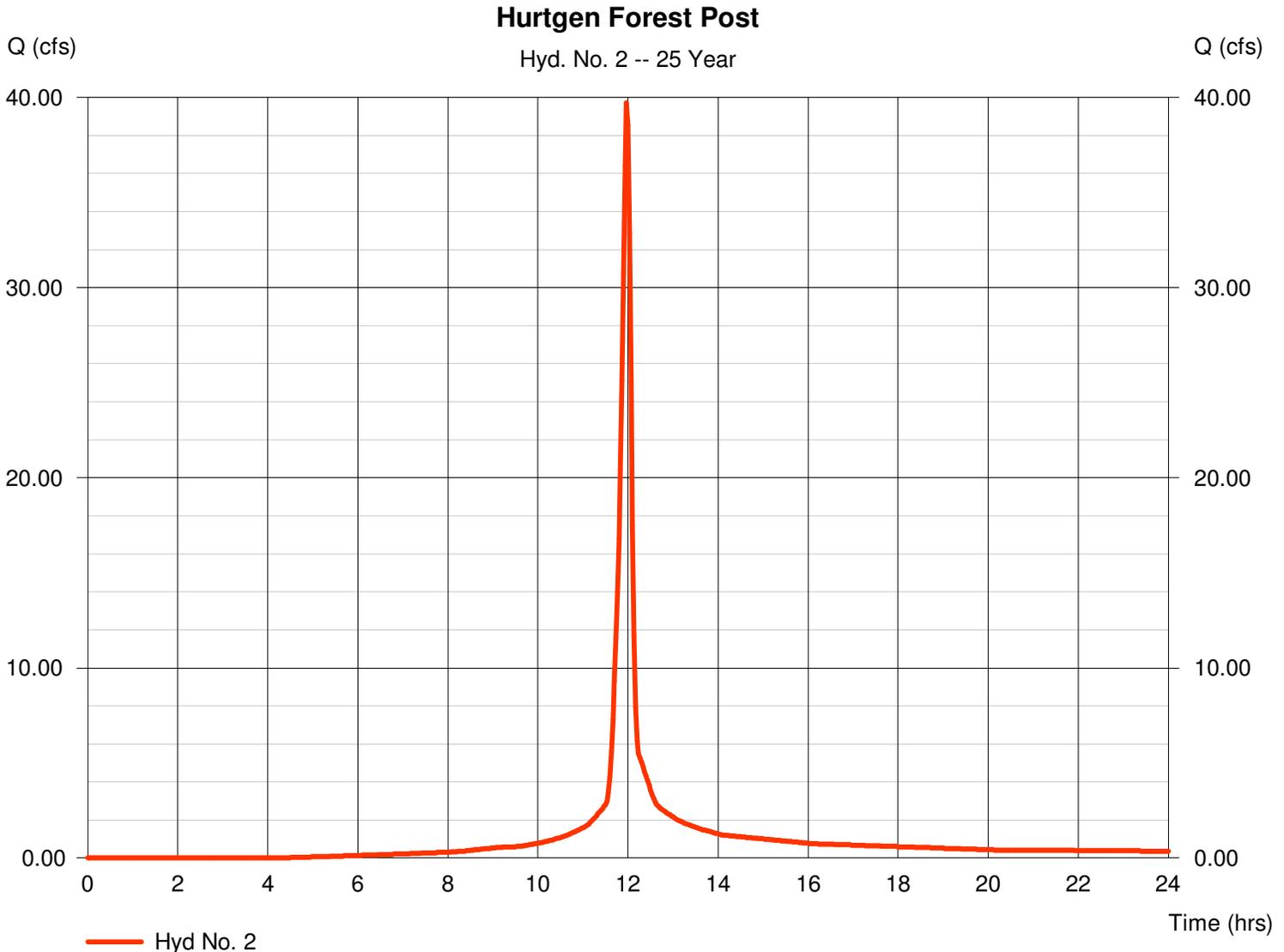
Hyd. No. 2

Hurtgen Forest Post

Hydrograph type = SCS Runoff
 Storm frequency = 25 yrs
 Time interval = 2 min
 Drainage area = 5.350 ac
 Basin Slope = 2.8 %
 Tc method = LAG
 Total precip. = 6.40 in
 Storm duration = 24 hrs

Peak discharge = 39.70 cfs
 Time to peak = 11.97 hrs
 Hyd. volume = 95,177 cuft
 Curve number = 87*
 Hydraulic length = 450 ft
 Time of conc. (Tc) = 7.90 min
 Distribution = Type II
 Shape factor = 484

* Composite (Area/CN) = [(4.720 x 86) + (0.630 x 98)] / 5.350



Hydraflow Rainfall Report

Hydraflow Hydrographs by Intelisolve v9.23

Friday, Jun 11, 2010

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	-----
2	244.3449	34.9581	1.0316	-----
3	0.0000	0.0000	0.0000	-----
5	258.5057	32.7568	1.0177	-----
10	267.5425	31.3999	1.0094	-----
25	279.7735	29.5904	0.9974	-----
50	288.7131	28.2613	0.9888	-----
100	296.6622	27.0486	0.9811	-----

File name: RichlandCounty_SC.idf

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.44	4.82	4.32	3.92	3.58	3.30	3.05	2.84	2.66	2.50	2.36	2.23
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.42	5.66	5.05	4.57	4.17	3.83	3.54	3.29	3.08	2.89	2.72	2.57
10	7.11	6.24	5.56	5.02	4.57	4.19	3.87	3.60	3.36	3.15	2.97	2.81
25	8.16	7.14	6.34	5.70	5.18	4.75	4.38	4.07	3.79	3.56	3.35	3.16
50	9.03	7.86	6.96	6.25	5.67	5.19	4.78	4.43	4.14	3.87	3.64	3.44
100	9.88	8.57	7.57	6.78	6.14	5.61	5.17	4.79	4.46	4.18	3.93	3.71

Tc = time in minutes. Values may exceed 60.

Precip. file name: RichlandCounty_SC.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	3.10	3.60	0.00	4.50	5.30	6.40	7.30	8.30
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Tuesday, July 06, 2010

Army Regulation 190-11

Military Police

**Physical
Security of
Arms,
Ammunition,
and Explosives**

**Headquarters
Department of the Army
Washington, DC
12 February 1998**

UNCLASSIFIED

SUMMARY of CHANGE

AR 190-11

Physical Security of Arms, Ammunition, and Explosives

This revision-

- o Requires review of DA Form 4604-R, Security Construction Statement, during physical security surveys and inspections and revalidation by engineer personnel every 5 years (para 2-2d).
- o Requires close monitoring by all officers, noncommissioned officers, or civilian equivalents of control of ammunition and explosives during field training or range firing to eliminate most security problems (para 2-5f).
- o Requires installation commanders providing logistical support to provide a copy of an unsatisfactory physical security survey or inspection concerning Reserve component and Reserve Officer Training Corps (ROTC) units, to include written comments to show which elements have received copies (para 2-6a(4)).
- o Does not allow ROTC/Junior ROTC units, gun clubs, and activities under the responsibility of the Director of Civilian Marksmanship Program to possess or store Category I or Category II arms, ammunition, or explosives (AA&E) (para 2-7).
- o Abolishes the requirement to provide copies of the results of AR 15-6 investigations to the Commander, U.S. Army Military Police Operations Agency (para 2-9c).
- o Abolishes the requirement for appointment of and instructions for boards of officers and investigating officers (para 2-9c).
- o Identifies additional personnel selection requirements for transporting Categories I, II, or classified AA&E (para 2-11).
- o Adds a new DA Form 7281-R (Command Oriented Arms, Ammunition, and Explosives (AA&E) Security Screening and Evaluation Record) to aid in the screening process of AA&E assignments (para 2-11).
- o Abolishes exemption for officer personnel from command developed security screening procedures before access to Categories I and II is authorized (para 2-11b).
- o Requires formal agreements concerning physical security requirements for AA&E to be implemented by an appendix to a host tenant activity support agreement or by a letter of instruction (para 3-2c).

- o Requires AA&E storage facilities that require intrusion detection systems (IDS) to be protected by at least two types of sensors, one of which must be a volumetric sensor (para 3-6a).
- o Requires civilian contractor employees involved in the design, operation, and maintenance of IDS for AA&E facilities to possess a minimum security clearance of confidential (para 3-6h).
- o Allows local for the use of electronic generation DA Form 5513-R (para 3-8a).
- o Requires the recording of combinations to locks on vault doors or GSA-approved Class 5 or 6 security containers storing AA&E using the SF 700 (Security Container Information) (para 3-8b).
- o Revises table 4-1 (para 4-2f).
- o Incorporates the security requirements for AA&E at Army museums from AR 190-18, section III (para 4-13).
- o Requires armed guards to be posted on Categories I and II AA&E facilities upon failure of IDS (para 5-2a(3)(a)).
- o Requires Categories III and IV bulk AA&E storage areas protected by IDS to be checked by a security patrol at irregular intervals not to exceed 48 hours (para 5-2b(2)).
- o Requires primary and backup communications at guard posts located at bulk AA&E storage facilities to be tested daily by supervisor personnel (para 5-7).
- o Gives King Tut blocks equal priority for the protection of Categories I through IV AA&E (para 5-13).
- o Requires weapons to be registered in the DOD Central Registry prior to shipment of abandoned and confiscated privately-owned firearms to Anniston Army Depot (para 6-7a).
- o Adds/revises security guidance on: vessel movements of U.S.-owned AA&E to and from overseas and intra-theater movements (para 7-6c); small quantity shipments and organic and unit movements (para 7-9); foreign military sales movements (para 7-12); contract movements (7-13); commercial shipments at DOD installations and activities (para 7-14); and transportation of marksmanship weapons and ammunition (para 7-18).
- o Prohibits personnel from carrying, moving, or storing Government AA&E in privately-owned vehicles either on or off installations (para 7-15).
- o Table 7-1 has been redesignated as paragraph 7-19.

- o Lifts the restriction on the use of containers on a flatcar shipment of Categories I and II AA&E, and revises security standards for AA&E shipment (para 7-19).
- o Requires overseas installation commanders to send completed DA Forms 3056 to Director, Crime Records Center (CRC). Director, CRC, will be required to make lost, stolen, or recovered weapon entries into the NCIC from overseas commands (para 8-3c).
- o Requires lost, stolen, or recovered weapons to be promptly entered in the DOD Central Registry (para 8-3f).
- o Clarifies that blank ammunition, .22 caliber rimfire ammunition, and inert training ammunition is excluded from the requirements of this regulation (para B-1).
- o Adds the AT-4 antitank weapon to Category I (missiles and rockets) AA&E (para B-2a(1)).
- o Identifies the M16A2 rifle and the squad automatic weapon (SAW) as Category II arms (para B-2b(1)).
- o Adds critical binary munitions components containing "DF" and "QL" as Category II ammunition and explosives (para B-2c(2)(d)).
- o Revises physical security standards for commercial terminals (app C).
- o Revises and renames appendix E to losses/overages list for AR 15-6 investigations (app E).
- o Abolishes the semiannual reporting requirement (RCS CSPA-1645) Physical Security of Sensitive Conventional AA&E (app G).
- o Moves AA&E facility criteria from chapter 4 to appendix G (para G-1).
- o Adds extracted information from DOD 5100.76-M in-- a. New appendix H (replaces DODI 5220.30) and prescribes standards for safeguarding certain categories of sensitive AA&E in the custody of or being manufactured by DOD prime contractors and subcontractors. b. New appendix I, Enhanced Transportation Security Measures During Terrorist Threat Conditions.
- o Authorizes exact replication of any DA or DD Forms prescribed in this regulation that are generated by the automated Military Police Management Information System in place of the official printed version of the form (app A, sec III).

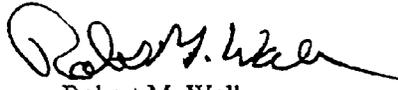
Headquarters
Department of the Army
Washington, DC
12 February 1998

***Army Regulation 190–11**

Effective 12 March 1998

Military Police

Physical Security of Arms, Ammunition, and Explosives



Robert M. Walker
Acting Secretary of the Army

States under the applicability of this regulation.

Applicability. This regulation applies to the Active Army, United States Army Reserve, Army National Guard of the United States, and contractor-owned, contractor-operated facilities. This regulation is mandatory for use by all major Army commands and for incorporation into those Department of Defense contracts where it is relevant. Appendix H is effective immediately for all new acquisitions. This regulation does not apply to privately-owned weapons in household goods shipments. This publication applies during partial and full mobilization.

Proponent and exception authority. The proponent of this regulation is the Deputy Chief of Staff for Operations and Plans. The Deputy Chief of Staff for Operations and Plans has the authority to approve exceptions to this regulation that are consistent with controlling law and regulation. The Deputy Chief of Staff for Operations and Plans may delegate this authority in writing to a division chief within the proponent agency in the grade of colonel or the civilian equivalent.

Army management control process. This regulation is subject to the requirements of AR 11–2. It contains internal control provisions but does not contain

checklists for conducting internal control reviews. These checklists are contained in DA Circular 11–89–2.

Supplementation. Supplementation of this regulation is prohibited without prior approval of HQDA (DAMO–ODL), 400 ARMY PENTAGON, WASH DC 20310–0400.

Interim changes. Interim changes to this regulation are not official unless they are authenticated by the Administrative Assistant to the Secretary of the Army. Users will destroy interim changes on their expiration dates unless sooner superseded or rescinded.

Suggested Improvements. Users are invited to send comments and suggested improvements, through established command channels, on DA Form 2028 (Recommended Changes to Publications and Blank Forms) to HQDA (DAMO–ODL), 400 ARMY PENTAGON, WASH DC 20310–0400.

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History. This publication was originally printed on 30 September 1993. This printing publishes Change 1.

Summary. Changes have been made throughout this regulation. Major changes include revision of policy governing security of Category I missiles; the frequency of security checks for all categories of AA&E; the addition of an appendix that contains guidesheets for operational checks of an intrusion detection system; the addition of an appendix that contains a guidesheet for AA&E; and the inclusion of the Army National Guard of the United

Contents (Listed by paragraph and page number)

Chapter 1 General Information, page 1

Section I

Introduction, page 1

Purpose • 1–1, page 1

References • 1–2, page 2

Explanation of abbreviations and terms • 1–3, page 2

Section II

Responsibilities, page 2

*This regulation supersedes AR 190–11, 31 March 1986; and paragraphs 3, 4, 5, 10, 12, 14, 18, 20 through 26, and appendix B of AR 190–18, 1 April 1984.

Contents—Continued

The Deputy Chief of Staff for Operations and Plans • 1–4, *page 2*
 HQDA staff agencies, MACOMs, Army National Guard of the United States, and installation commanders • 1–5, *page 2*
 Rescinded • 1–6, *page 2*
 The Chief of Engineers • 1–7, *page 2*
 The Commanding General, U.S. Army Materiel Command • 1–8, *page 2*
 Commanding General, U.S. Army Criminal Investigation Command • 1–9, *page 2*
 Commanders and custodians of AA&E • 1–10, *page 3*
 Active Army installation commanders, Reserve Component commanders, and unit commanders • 1–11, *page 3*
 Commanders or directors of activities, installation planning boards, and responsible or accountable officers • 1–12, *page 3*
 Security of nonsensitive AA&E • 1–13, *page 3*
 Transportation security • 1–14, *page 4*

Chapter 2**Policy, page 4**

General • 2–1, *page 4*
 Construction of facilities • 2–2, *page 4*
 Priority lists • 2–3, *page 5*
 Waivers and exceptions • 2–4, *page 5*
 Security of AA&E during training, and aboard ships • 2–5, *page 6*
 Inspections and audits • 2–6, *page 6*
 Prohibition • 2–7, *page 7*
 Requisition • 2–8, *page 7*
 Investigations • 2–9, *page 7*
 Training • 2–10, *page 8*
 Personnel • 2–11, *page 8*

Chapter 3**Physical Security Planning, page 11**

General • 3–1, *page 11*
 Coordination • 3–2, *page 11*
 Contingency plans • 3–3, *page 12*
 Security threats • 3–4, *page 12*
 Implementation of physical security planning • 3–5, *page 12*
 Intrusion Detection Systems • 3–6, *page 13*
 Security forces • 3–7, *page 14*
 Key and lock controls • 3–8, *page 15*

Chapter 4**Protection of Arms, page 16**

General • 4–1, *page 16*
 Storage and supplemental controls • 4–2, *page 17*
 Storage of classified weapon trainers • 4–3, *page 20*
 Consolidated arms rooms • 4–4, *page 21*
 privately-owned weapons and ammunition • 4–5, *page 21*
 Weapons and ammunition for marksmanship matches and other special purposes • 4–6, *page 21*
 Commercial weapons and ammunition • 4–7, *page 22*
 Contract guard weapons and ammunition • 4–8, *page 22*
 General officer weapons and ammunition • 4–9, *page 22*
 U.S. Military Academy weapons • 4–10, *page 22*
 Demilitarized weapons • 4–11, *page 22*
 Foreign weapons and ammunition • 4–12, *page 22*
 Museums Arms and Ammunition • 4–13, *page 23*
 Arms parts • 4–14, *page 23*

Contents—Continued

Restricted area posting • 4–15, *page 23*
 IDS signs • 4–16, *page 24*
 Fences • 4–17, *page 24*
 Security of tools and high-value items • 4–18, *page 24*
 Access control • 4–19, *page 24*
 Security of Class 5 storage containers • 4–20, *page 24*
 Arming of unit arms rooms armorers • 4–21, *page 24*

Chapter 5**Protection of Nonnuclear Missiles, Rockets, Ammunition and Explosives, *page 24***

General • 5–1, *page 24*
 Bulk storage areas • 5–2, *page 25*
 Fences • 5–3, *page 25*
 Security lighting • 5–4, *page 26*
 Guard protection and surveillance • 5–5, *page 27*
 Locks and keys • 5–6, *page 27*
 Communications • 5–7, *page 27*
 Protection of missiles, rockets, ammunition, and explosives at unit level • 5–8, *page 27*
 Entry control • 5–9, *page 28*
 Restricted areas • 5–10, *page 29*
 IDS signs • 5–11, *page 29*
 Storage of classified items • 5–12, *page 29*
 Additional security measures for igloos and magazines • 5–13, *page 29*

Chapter 6**Accountability, Disposition, Disposal, and Demilitarization, *page 29***

Nonnuclear missiles and rockets (Category I) • 6–1, *page 29*
 Arms • 6–2, *page 30*
 Ammunition and explosives • 6–3, *page 31*
 Inventory losses • 6–4, *page 31*
 Inventory effectiveness review • 6–5, *page 31*
 Disposal and demilitarization • 6–6, *page 31*
 Disposal of abandoned and confiscated privately-owned firearms • 6–7, *page 32*

Chapter 7**Transportation, *page 32***

General • 7–1, *page 32*
 Responsibilities relating to transportation • 7–2, *page 32*
 Standards • 7–3, *page 33*
 Special considerations for Category I items • 7–4, *page 34*
 Physical security standards for sensitive AA&E • 7–5, *page 34*
 Special considerations for water shipments • 7–6, *page 34*
 Consideration for air movements • 7–7, *page 34*
 Special consideration for small quantity shipments • 7–8, *page 34*
 Organic and unit movements • 7–9, *page 34*
 Commercial movements • 7–10, *page 34*
 Overseas in-theater movements • 7–11, *page 34*
 Foreign military sales (FMS) shipments • 7–12, *page 35*
 Contract movements • 7–13, *page 35*
 Security of commercial shipments at DOD installations and activities • 7–14, *page 35*
 Movement of AA&E by unit or organization transportation • 7–15, *page 36*
 Provost marshal and security office support • 7–16, *page 36*
 Control of protective security seals • 7–17, *page 36*
 Transportation of marksmanship weapons and ammunition • 7–18, *page 36*

Contents—Continued

Security standards for AA&E shipments • 7–19, *page 36*

Chapter 8

Reports, Investigative Aids, and Disposition of Records, *page 39*

General • 8–1, *page 39*

Incident reports to components • 8–2, *page 39*

Investigative aids • 8–3, *page 40*

Disposition of records • 8–4, *page 41*

Appendixes

A. References, *page 42*

B. Sensitive Arms, Ammunition, and Explosives (AA&E) Security Risk Categorization, *page 46*

C. Physical Security Standards for Commercial Terminals (Extracted from DOD 5100.76–M), *page 50*

D. Physical Security Standards for Military Terminals (Extracted from 5100.76–M), *page 51*

E. Losses/Overages List for AR 15–6 Investigations, *page 53*

F. Specification for Intrusion Detection System Signs, *page 55*

G. Criteria for Facilities Storing Sensitive AA&E, *page 56*

H. Physical Security Standards for DOD AA&E at contractor-owned, contractor-operated (COCO) Facilities (Extracted from DOD 5100.76–M), *page 58*

I. Enhanced Transportation Security Measures During Terrorist Threat Conditions (Extracted from DOD 5100.76–M), *page 65*

J. Arms, Ammunition, and Explosives Guidesheet, *page 67*

K. Joint–Services Interior Intrusion Detection System (J–SIIDS) Operational Checks, *page 70*

Table List

Table 4–1: Methods for rendering Small Arms inoperable, *page 19*

Table B–1: Decision Logic Formulas (DLFs), *page 47*

Table B–2: Risk Factors—Utility, *page 48*

Table B–3: Risk Factors—Casualty/Damage Effect, *page 48*

Table B–4: Risk Factors—Adaptability, *page 48*

Table B–5: Risk Factors—Portability, *page 49*

Table B–6: Computation of risk factor numerical values¹, *page 49*

Table C–1: Physical Security Standard for Commercial Terminals, *page 50*

Figure List

Figure 2–1: Sample of a completed DA Form 3056, *page 10*

Figure F–1: Sample Intrusion Detection System Sign, *page 55*

Glossary**Index****Reproducible Forms**

Chapter 1 General Information

Section I Introduction

1-1. Purpose

a. This regulation prescribes standards and criteria for the physical security of sensitive conventional arms, ammunition, and explosives (AA&E), including nonnuclear missiles and rockets, as set forth in appendix B, in the custody of any Department of the Army (DA) Component, or contractor and subcontractor. (See app H for AA&E physical security standards at contractor facilities.) This regulation also prescribes policy, procedures, and standards, and assigns responsibilities for the effective implementation and application of physical security of AA&E.

b. Although the standards and criteria in this regulation will provide adequate protection against loss or theft of AA&E at most DA activities, and Department of Defense (DOD) (DA) contractor activities, the threat or characteristics of a particular location may require increased measures subject to approval by the major Army commands (MACOMs) concerned. MACOMs will establish procedures to review the justification of military construction projects that exceed the criteria in this regulation. This regulation does not authorize methods or operations inconsistent with AR 385-64, paragraphs 1 through 12 and appendix A.

c. The provisions of this regulation apply to sensitive conventional arms, ammunition and explosives as follows:

(1) *Arms.* Weapons that will, or are designed to, expel a projectile or flame by the action of an explosive and the frame or receiver of such weapons and comparable foreign arms, U.S. prototype arms and illegally manufactured arms which are retained in the inventory for training, familiarization, and evaluation. This includes handguns, shoulder-fired weapons, light automatic weapons up to and including .50 caliber machine-guns, multibarrel machine-guns such as the 7.62mm M134, recoilless rifles up to and including 106mm, mortars up to and including 81mm, man-portable rocket launchers, flame-throwers, and individually operated weapons that are portable or can be fired without special mounts or firing devices and that have potential use in civil disturbances and are vulnerable to theft. Comparable foreign arms, U.S. prototype arms, and illegally manufactured weapons retained in the inventory for training, familiarization, and evaluation are also included.

(2) *Ammunition.* A device charged with explosives, propellants, pyrotechnics, initiating composition, riot control agents, chemical herbicides, smoke and flame for use in connection with defense or offense including demolition and having, in general, an individual or unit of issue, container, or package weight of 100 pounds or less. Included are rounds of 40mm and larger; conventional, guided missile, and rocket ammunition weighing 100 pounds or less per round; and 1,000 or more rounds of ammunition smaller than 40mm; and, other ammunition specified in appendix B. Ammunition excluded from the specified requirements of this regulation are the following:

(a) Devices charged with nuclear or biological agents;

(b) Devices charged with chemical agents, except for those specified in appendix B;

(c) Blank ammunition, .22 caliber rimfire ammunition, inert training ammunition;

(d) Artillery, tank, mortar ammunition 90mm and larger, and naval gun ammunition 3 inches, 76mm, and larger. However, this ammunition requires Transportation Protective Service as set forth in chapter 7.

(3) *Explosives.* Any chemical compound, mixture, or device, the primary purpose of which is to function by explosion. The term includes, but is not limited to, individual land mines, demolition charges, blocks of explosives and other explosives consisting of 10 pounds or more. The scope of this regulation additionally includes and is limited to:

(a) Categorized explosives specified in appendix B.

(b) Uncategorized Class A and B explosives when being transported (see chap 7).

d. AA&E items covered by this regulation that are also classified will be stored and transported per AR 380-5, appendix H, AR 55-355, chapter 34, and this regulation. Where specific individual requirements differ between these regulations, the more stringent requirement will be followed.

e. MACOMs will prescribe physical security requirements for AA&E items outside the scope of this regulation. Consistent with operational and safety requirements and this regulation, physical security requirements for production and manufacturing operations at Government facilities will be prescribed by the Joint Ordnance Commanders' Group (JOCG).

f. The criteria in this regulation are intended for sites where AA&E are maintained on a permanent basis during daily peacetime conditions, and not for training, contingency sites or operations, such as wartime, force generations, exercises, or operational readiness inspections. For sites and operations not specifically covered in this regulation, MACOMs will establish requirements and procedures to provide protection for AA&E consistent with the philosophy of this regulation, when operationally and environmentally feasible. Upon declaration of war, commanders may prescribe procedures suspending specific physical security provisions of this regulation to account for local conditions, while ensuring maximum practical security for Government personnel and property. This authority is granted to installation, division, and separate brigade commanders and may be delegated to commanders in the grade of lieutenant colonel. Upon mobilization (prior to a declaration of war), this authority is granted to commander of MACOMs and

may not be further delegated. In the above circumstances (declaration of war or mobilization), suspension of transportation physical security requirements will be coordinated promptly with HQDA (DAMO-ODL and DALO-TSP) and with the Commander (CDR), Military Traffic Management Command (MTMC).

g. The Army's inventory of AA&E is a vital part of its readiness posture. Loss or theft of such material can foster fear in the public sector and create an image of the Army's inability to secure its assets. The degree of security to provide AA&E is contingent upon many variables. It is impractical, therefore, to prescribe definitive DA physical security standards to cover all anticipated conditions that could impose a threat to the security of the items to be protected. Minimum physical security standards are prescribed in this regulation. As the criminal or other type threats to these materials increase at the local level, security measures at that level may need to be more stringent than those prescribed in this regulation. Commander will notify Headquarters, Department of the Army (HQDA) immediately through commander channels local resources are inadequate to provide necessary protection.

1-2. References

Required and related publications and prescribed and related forms are listed in appendix A.

1-3. Explanation of abbreviations and terms

Abbreviations and special terms used in this regulation are explained in the consolidated glossary.

Section II

Responsibilities

1-4. The Deputy Chief of Staff for Operations and Plans

The Deputy Chief of Staff for Operations and Plans (DCSOPS) will develop policies, standards, and procedures on the physical security of sensitive conventional AA&E.

1-5. HQDA staff agencies, MACOMs, Army National Guard of the United States, and installation commanders

Heads of HQDA staff agencies, MACOMs, Army National Guard of the United States, and installation commanders will support the AA&E physical security program according to prescribed responsibilities in AR 190-13, paragraph 1-5 and this regulation.

- a. All commanders will apply enough human resources and funds to A&E physical security programs at all levels.
- b. MACOM commanders will identify resource needs in the planning, programming and budgeting system, and allocate necessary resources to support their AA&E physical security program. Installation commanders will ensure funds identified for physical security are used as intended.

1-6. Rescinded

1-7. The Chief of Engineers

The Chief of Engineers (COE) will ensure that construction plans for new or modified AA&E storage facilities meet the minimum standards prescribed by this regulation.

1-8. The Commanding General, U.S. Army Materiel Command

The Commanding General, U.S. Army Materiel Command (CG, AMC) will prescribe policies, procedures, and standards to physically secure AA&E manufacturing and production facilities and those AA&E under research, development or being tested and evaluated under DA jurisdiction. Implementing instructions issued by CG, AMC will be according to the philosophy and policies in this regulation. AMC, through tri-Service coordination, will use the Decision Logic Tables (see para B-3) and will determine the appropriate risk categories for AA&E items. Security requirements for conventional ammunition and explosives during production and manufacturing operations at Government-owned, contractor-operated (GOCO) facilities are prescribed by the JOCG (DOD 5160.65-M, chap 12). Security requirements for AA&E in the custody of or being manufactured at contractor-owned, contractor-operated (COCO) facilities are established in appendix H.

1-9. Commanding General, U.S. Army Criminal Investigation Command

The CG, U.S. Army Criminal Investigation Command (USACIDC) will—

- a. Conduct preliminary investigation into losses of all Category I and II AA&E items, regardless of dollar value, to determine if a crime was committed.
- b. Conduct preliminary investigation into losses of Category III and IV items meeting the quantities listed in appendix E, regardless of dollar value, to determine if a crime was committed.
- c. Conduct investigations of actual or attempted break-ins or armed robberies of AA&E storage facilities.
- d. Provide copies of USACIDC Serious/Sensitive Incident (SSI) reports which may be prepared pertaining to *a*, *b*, and *c* above to HQDA (DAMO-ODL-S), 400 ARMY PENTAGON, WASH DC 20310-0400.

- e.* If a crime was committed, conduct a complete investigation and provide HQDA (DAMO–ODL–S), upon request, copies of such investigation reports.
- f.* If needed, coordinate with the proper law enforcement activity (LEA), provost marshal office (PMO), or security office, to ensure assignment of a physical security specialist to the investigation.
- g.* Using the results of completed investigations, assist HQDA (DAMO–ODL) and the commander concerned in evaluating existing security measures and recommending corrective action to improve security of such items.

1–10. Commanders and custodians of AA&E

Commanders and custodians of AA&E will—

- a.* Comply with this regulation.
- b.* Ensure necessary measures are taken to safeguard AA&E at all times. This includes providing specific instructions on individual responsibility for AA&E during operational or field training conditions, care and maintenance, competitive marksmanship meet, and storage on, or when mounted on, vehicles and aircraft.
- c.* Ensure timely submission of serious incident reports (SIR) per AR 190–40, paragraph 4–9.
- d.* Report all losses (actual or suspected) or recoveries within 2 hours of initial detection to the proper law enforcement agencies.
- e.* Conduct prompt investigation of losses after a decision of the USACIDC that criminal acts were not involved.
- f.* Fix responsibility when negligence is determined and take proper corrective action to prevent further loss.
- g.* Publicize AA&E security and loss prevention through command information and unit training programs.
- h.* Plan, program, budget, and allocate resources for the implementation of required policies outlined in this regulation.
- i.* Ensure that AA&E storage facilities are checked, inventoried, and inspected as required by this regulation.

1–11. Active Army installation commanders, Reserve Component commanders, and unit commanders

Active Army installation commanders, Reserve Component (RC) commanders, and ROTC unit commanders will—

- a.* Coordinate physical security plans with local LEAs and supporting military intelligence (MI) and USACIDC elements.
- b.* Set up liaison at the local level with the agencies per chapter 3.
- c.* Ensure that agreements governing consolidated AA&E storage facilities and the storage of AA&E property of Federal, State, contractor agencies, and foreign government agencies contain definite assignment in writing of responsibility for the items stored.
- d.* Conduct unannounced inspections as often as deemed necessary by the commander concerned.
- e.* Ensure construction programming documents involving AA&E facilities have been coordinated with the responsible provost marshal or security officer.

1–12. Commanders or directors of activities, installation planning boards, and responsible or accountable officers

a. Commanders or directors of activities, and units on Active Army installations, or subinstallations, will coordinate physical security plans for standard operating procedures (SOPs) once a year with the installation PMO or Security Office. They will—

- (1) Ensure their security procedures are current and in keeping with the command and HQDA physical security directives.
- (2) Include provisions in security procedures for applying physical security measures for storage areas in keeping with the host commanders assessment.
- b.* Commanders or directors of tenant activities (located both on and off the installation) must identify their security requirements to the host installation. They will ensure funding provisions are considered in proper budget programs.
- c.* Installation planning boards will include a physical security representative from the LEA, PMO or Security Office as a voting member on all actions. The representatives will ensure that provisions of this regulation are considered and made a matter of record during the planning process.
- d.* This regulation does not relieve responsible or accountable officers of this responsibility to account for property.
- e.* Persons issued or holding AA&E are responsible for properly securing such property while it is charged or entrusted to their care.

1–13. Security of nonsensitive AA&E

AA&E that does not meet the criteria in this regulation for “sensitive” items must be safeguarded from pilferage, theft, and wrongful destruction when stored or deployed in the field. Although this regulation does not prescribe security criteria for these items, AR 190–13, paragraph 1–5, assigns commanders the responsibility to ensure reasonable security measures are taken to safeguard property and facilities that may be vulnerable to criminal acts or other

disruptive activities. Commanders and security personnel involvement is necessary to ensure that the security measures taken provide enough security based on an assessment of the threat and vulnerability of the items concerned. Such security measures can include use of fences, lighting, locks and key control, security patrols, and any other measures deemed suitable by the commander responsible for the security of the items involved.

1–14. Transportation security

Responsibilities pertaining to transportation security standards and procedures are discussed in paragraph 7–2 for: the Commander, Military Traffic Management Command (MTMC), (para 7–2*a* and *b*), overseas theater commanders (para 7–2*a*), the Military Airlift Command (MAC) (para 7–2*c*), and the Military Sealift Command (MSC) (para 7–2*d*).

Chapter 2 Policy

2–1. General

a. Systems should incorporate technology and equipment available within the Federal Government and the private sector to provide cost effective protection, automated accountability, and inventory control. Physical security equipment management policy is established in AR 190–13, chapter 4. Security criteria will be included in initial plans for research and development, as well as all new or modified construction projects.

b. To minimize the cost of physical security and inventory control, and to reduce theft vulnerability, the quantities of AA&E and the number of storage facilities for AA&E should be reduced. Storage should be consolidated to the maximum extent consistent with operational, safety, and training requirements.

(1) AA&E should be removed from designated storage areas as briefly as possible. The quantity to be removed should be as small as possible to support specific missions or projects. Storage areas should be as small as possible consistent with safety standards, security, and mission requirements.

(2) Further reduction of costs for protection and inventory control can be effected by grouping the consolidation of AA&E into smaller storage areas by assigned risk category, and providing the degree of physical security protection needed for that category. Priority attention will be given to demilitarization or disposal of obsolete and unserviceable AA&E to avoid unnecessary storage, security, and inventory–related costs.

(3) The provisions of this regulation are intended to provide adequate storage security for AA&E at most DA activities. There may be a few unusual activities, such as large depots or remote storage areas without existing electrical service, where not all criteria in this regulation can be directly applied in a cost effective manner. At these unusual or unique facilities, local conditions must be carefully evaluated, and the security system must be tailored to the local conditions, based on practicability and cost, rather than specific security requirements prescribed herein. In these instances, waivers or exceptions should conform to the requirements provided in paragraph 2–4.

2–2. Construction of facilities

a. The provisions of this regulation are mandatory for new construction of permanent land–based installations for storage of sensitive AA&E. Modification to existing facilities will be accomplished in accordance with the criteria set forth in this regulation.

b. The tearing down and rebuilding of facilities will not be undertaken unless the concerned MACOM has determined that existing security measures cannot be supplemented to provide the required degree of protection. When nonstandard structures or facilities provide equivalent or better protection, modifications will not be undertaken. Exceptions to this policy will be granted under paragraph 2–4.

c. Upgrading of existing storage structures must be consistent with approved plans for future development and new construction plans. The type, planned use, modification costs, and remaining economic life of storage structures must be considered. Additionally, in determining upgrade requirements, ammunition and explosives will be consolidated by risk category to the maximum extent consistent with operational, safety, and training requirements. Compensatory security measures will be established for AA&E storage structures that do not meet minimum construction standards. Definitive drawings and specifications for new construction, upgrade, or modification of AA&E storage structures will be coordinated with the engineer office, safety office, and LEA, PMO, or security police office to ensure safety and physical security requirements are met.

d. Qualified engineer personnel will verify the structure composition of AA&E storage facilities (for example, walls, ceilings, roofs, floors, and doors). Statements will be prepared on DA Form 4604–R (Security Construction Statement). Statements will indicate the highest construction category met for storage of AA&E, for example, Category I, II, III, or IV AA&E items and date of applicable regulation. (See para 2–4 for procedures when structural deficiencies exist.) The DA Form 4604–R will be affixed to the interior wall of each AA&E storage facility. The DA Form 4604–R will be locally reproduced on 8½–x 11–inch paper. A copy for reproduction purposes is located at the back of this publication. A blanket statement on DA Form 4604–R may be issued at an installation for all facilities, such as ammunition magazines, constructed according to the same specifications. Under these circumstances a copy of the DA

Form 4604-R need not be affixed to the interior wall of each individual storage structure, but must specifically identify the facilities by number and location, and be readily available for inspection. Security construction statements will be reviewed during physical security surveys and inspections. The statements will be revalidated by engineer personnel every 5 years.

e. Physical security personnel will monitor construction of new facilities and renovation of existing facilities. Engineer personnel will coordinate new construction and renovation projects with the local provost marshal or security officer. In addition to meeting construction standards, storage of AA&E will meet physical security criteria, such as Intrusion Detection System (IDS), locks and hasps, lighting, and security patrols, as necessary, for the particular category of AA&E involved.

2-3. Priority lists

The MACOMs will establish a priority list for meeting the security requirements. Requirements will be listed in priority sequence by category for planning, programming, and budgeting purposes. Priority of installation of IDS is as follows:

- a.* Facilities storing Category I items, when protection is inadequate. Those having the largest quantity will receive initial attention.
- b.* Facilities storing Category II items.
- c.* Facilities storing Category III items.
- d.* Facilities storing Category IV items.
- e.* Deviations from these priorities will be permitted only when MACOMs have determined that a local threat dictates these deviations.

2-4. Waivers and exceptions

Commanders are authorized 10 percent deviation from the physical security construction standards established by this regulation for existing facilities. Otherwise waivers and exceptions to the physical security requirements of this regulation must be granted by the DCSOPS or his or her delegated authority in accordance with the procedures established by HQDA (DAMO-ODL) under the following provisions:

- a.* Waiver and exceptions will be considered individually; blanket waivers and exceptions will not be authorized. Requests for waivers or exceptions applying to commercial carrier's transportation minimum security standards (chap 7), together with compensatory measures taken, will be forwarded through the Commander, Military Traffic Management Command, ATTN: MT-SS, 5611 Columbia Pike, Falls Church, VA 22041, to HQDA (DAMO-ODL-S), 400 ARMY PENTAGON, WASH DC 20310-0400.
- b.* Waivers normally may be granted for a period of 1 year and may be extended only after a review of the circumstances necessitating the extension. Waivers will not exceed 2 years when resource considerations clearly indicate a continued waiver requirement beyond the normal 1 year waiver period. Justification for such waivers will be required. Each extension will state first extension, second extension, and so forth.
- c.* Exceptions will be granted only when correction of a deficiency is not feasible or when the security afforded is equivalent to or better than that afforded under the standard criteria.
- d.* Requests for waivers and exceptions will contain compensatory measures in effect or recommended. Approvals for waivers and exceptions will specify required compensatory measures. Equivalent protection exceptions do not require compensatory measures.
- e.* Deficiencies that will be corrected within 60 days will not require a waiver or exception; however, compensatory measures will be taken during the interval.
- f.* Authority to grant waivers and exceptions constituting standards below those prescribed in this regulation must be approved by the DCSOPS or his or her designated authority. U.S. Army Reserve Command requests for waivers and exceptions will be submitted through command channels through the Commander, U.S. Forces Command, Fort McPherson, Georgia 30330-6000, to HQDA (DAMO-ODL-S), 400 ARMY PENTAGON, WASH DC 20310-0400.
- g.* Requests for physical security waivers or exceptions will be coordinated between the LEA, PMO, or security office of the installation or activity. When structural deficiencies exist, requests also will be coordinated with the supporting engineer.
- h.* A request for a physical security waiver or an exception will include—
 - (1) A statement of the problems or deficiencies that constitute standards below those cited in this regulation.
 - (2) Compensatory measures in effect at AA&E storage facilities to make up for noncompliance with required standards of protection.
 - (3) Reasons the unit, facility, or installation cannot comply with the requirements of this regulation.
 - (4) The commander's statement of corrective action taken or planned to correct the deficiencies for which the waiver or exception is required.
 - (5) Each successive command's recommendation.

- i.* The unit and the approving headquarters will retain on file the approved waiver or exception, including the documents listed inc above.
- j.* Exceptions will be regarded as generally permanent; however, they will be reviewed at least once every 2 years to determine if they need to be continued. The review will be conducted by the authority who approved the exception.
- k.* Exceptions previously granted under the criteria of the previous AR 190–11 remain valid under the provisions of this regulation. Such exceptions need not be resubmitted for approval. However, such exceptions will be reviewed as indicated in paragraph*j* above.

2–5. Security of AA&E during training, and aboard ships

Specific criteria and standards for protection of AA&E during training and in shipboard armories or otherwise on board ships will be developed by the MACOM concerned, based on the security philosophy in this regulation. AA&E deployed in the field for training or operational purposes will be secured at all times. The deploying commander will establish and enforce procedures for securing deployed AA&E based on an assessment of the threat, objectives, location, and duration of the deployment. The following guidelines apply:

- a.* AA&E will be under continuous positive control.
- b.* AA&E will not be left unattended or unsecured.
- c.* Persons charged with custody of AA&E will have the capability to sound the alarm if a forceful theft is attempted.
- d.* A response force will be available to protect the AA&E.
- e.* A system of supervisory checks will be established to ensure all personnel comply with security procedures. Supervisory checks of the AA&E holding area will be made to ensure the AA&E being guarded have not been tampered with.
- f.* Control of ammunition and explosives during field training or range firing will be monitored closely by all officers, noncommissioned officers (NCOs), or civilian equivalents. Upon completion of training, the area(s) will be policed and unused ammunition and explosives collected for turn–in. Personnel will be checked closely to ensure unused ammunition and explosives are not retained. Close supervision by officers, NCOs, or civilian equivalents can eliminate most security problems in the training area.
- g.* Selection of personnel to perform guard duties at AA&E holding areas will be closely monitored by commanders to ensure only responsible individuals are assigned duty.

2–6. Inspections and audits

Security measures including theft or loss reporting and inventory and accountability procedures for AA&E will be examined during inspections and audits. The status of existing waivers and exceptions will be examined for compliance and continuing necessity.

- a.* Physical security inspections will be conducted according to AR 190–13, paragraphs 2–11, on facilities in which AA&E governed by this regulation are stored. Additionally, conduct physical security surveys and inspections as follows:
 - (1) For new AA&E storage facilities, before and immediately after occupancy.
 - (2) On significant change in facility structure.
 - (3) After a forced entry or attempted forced entry with or without theft.
 - (4) When units have received an unsatisfactory rating on physical security survey/inspection, reinspection will be within 6 months. A copy of an unsatisfactory physical security survey or inspection concerning RC and ROTC units will be furnished the installation commander providing logistical report. The followup report will include written comments to show what elements have received copies.
- b.* Physical security inspections of AA&E deployed in the field for training and operations will be conducted to ensure these items are properly protected.
- c.* Results of physical security inspections and surveys will be briefed to the commander responsible for the security of the facility or area inspected.
- d.* Inventory, accountability, issue and turn–in procedures will be included in physical security inspections/surveys to ensure the procedures support the physical security program. AR 710–2, chapter 2, applies to supply operations below the wholesale level. AR 740–26, chapter 2, establishes physical inventory controls at the wholesale level. Chapter 4, this regulation, applies regarding accountability requirements for contractor owned and commercial arms and ammunition.
- e.* When custody of arms storage facilities is transferred between authorized persons, they will conduct a physical count of the weapons and ammunition stored therein, per requirements in AR 710–2, paragraphs 2–12 and 2–53; and DA Pam 710–2–1, paragraph 9–11. The inventory and change of custody will be conducted and recorded per AR 710–2, paragraphs 2–12 and 2–53; and DA Pam 710–2–1, paragraph 9–11.

2-7. Prohibition

a. Gun clubs and activities under the responsibility of the Director of Marksmanship are not authorized to possess or store Category I or Category II AA&E. The Army National Guard and reserves are not permitted permanently to store Category I AA&E. However, with prior HQDA (DAMO-ODL) approval, they are authorized to temporarily store (not to exceed 90 days) Category I AA&E at ammunition supply points for training of Army National Guard and reserve units. Additionally, Army National Guard and reserve units are authorized temporary custody (not to exceed 14 days) of Category I AA&E for training on military installations. In both instances, physical security measures in chapter 5 and paragraph 7-15c of this regulation must be followed.

b. Reserve Officers Training Corps (ROTC/JROTC) units are not authorized to possess or store Category I AA&E. ROTC units (with the exception of Norwich University, Virginia Military Institute, Texas A&M, the Citadel, and North Georgia College) and gun clubs are not authorized to permanently possess or store Category II AA&. ROTC units may retain temporary (overnight/weekend) custody of AA& for training purposes. This temporary custody will not exceed 72 hours. Physical security measures in chapter 4 will be adhered to.

c. ROTC units may use Category II weapons for familiarization training and field training exercises or marksmanship, on or off a military reservation. Active Army installations, RC facilities and National Guard units are encouraged to provide support to ROTC units when requested.

2-8. Requisition

HQDA (DALO-SMP-S) will establish procedures for item managers to ensure necessary requisition verification of AA&E items. Commanders will include instructions to ensure AA&E requisitions are authorized by designated personnel and released only to properly identified authorized personnel. The procedures will include positive steps for rejecting excess and unauthorized requisitions. (See AR 710-2, para 2-52, for policy on requisitioning.)

2-9. Investigations

A thorough investigation will be made of lost, stolen, or missing AA&E to determine the circumstances surrounding the loss or theft and to fix responsibility as necessary. Inventory and accountability losses will be investigated thoroughly. Before any loss can be attributed to any inventory or accountability discrepancy, it must be determined through investigation that the loss was not the result of theft or misappropriation, per AR 735-5, chapter 13, as appropriate.

a. Guidance on actions to be taken. Active Army and RC commanders, or their designated representatives, having direct responsibility for AA&E lost, stolen or missing or the receiving unit or agency will—

(1) Notify the supporting LEA, PM, or security office as soon as the incident is discovered. The notice will be as complete as possible but will not be delayed because of incomplete data. USAR will notify the PMO or LEA responsible for the geographical area. In CONUS, this notice will include the proper FBI field office having area jurisdiction. Civil authorities in overseas areas will be notified according to local policy.

(2) When sensitive AA&E are reported lost, a preliminary investigation will be conducted by the USACIDC to determine criminality before beginning any administrative action (see para 1-4).

(3) Start administrative action per AR 735-5, chapter 13, if the USACIDC investigation determines a crime was not committed. The report of survey or an equal procedure will not be used as a disciplinary or punitive measure. The use of this administrative procedure will not prevent recourse to disciplinary measures when proper. Therefore, the survey will not be used instead of a criminal investigation when one is warranted.

(4) Determine accountability for recovered property per AR 735-5, paragraphs 14-16 and 14-17. A person may be held responsible and be required to pay for a loss. If so, he or she will not be allowed to claim title or obtain ownership of the item if it is recovered.

(5) Consider relative investigative findings in violation of this or other applicable regulations. Take proper punitive action if events warrant.

(6) Request, through channels, that an AR 15-6 investigation be initiated for AA&E in appendix E. This may be used instead of a Report of Survey per AR 735-5, paragraph 13-2.

b. Property overages. Property overages will be handled in the same way as stated in *a* above.

c. The investigation. Facts must be presented by the requesting person. The installation, depot, or community commander may then direct that an investigation be initiated. The officer appointed to conduct the investigation will follow procedures per AR 15-6, chapters 3, 4, and 5, and this regulation.

d. In-transit losses. Consignees of AA&E shipments will report in-transit losses to the supporting LEA, PMO, or security office.

e. Inventory adjustments. Inventory losses or overages may be determined as administrative, computer, or other type accountability errors and not actual losses. This determination will be made only after investigative action has established the cause of the discrepancy. (In no case may a weapon, ammunition, or explosive loss or overage be attributed to inventory error unless the responsible agency, unit, or activity conducts an investigation that, beyond a doubt, excludes the possibility of theft or loss.) When such a decision has been made, DA Form 3056 (Report of Missing/Recovered Firearms, Ammunition and Explosives) will be submitted (fig 2-1). The form will explain—

- (1) The rationale for such a decision.
- (2) The type of inventory adjustment action taken.
- (3) The name, grade, and duty position of the approval authority.

f. Transportation losses. Transportation officers, or their designated representatives, will inform the supporting LEA, PMO, or security office when claims or other data reflect the loss of AA&E from shipment or storage. This report will include household goods and losses of privately-owned weapons.

g. Competitive marksmanship weapons. Members of the Civilian Marksmanship Program will report the loss of AA&E to the local police or Federal Bureau of Investigation (FBI), and the director of the program.

h. Criminal investigation reports. The CG, USACIDC will provide HQDA (DAMO-ODL-S), upon request, copies of completed criminal investigation reports. The reports will describe the loss or theft of AA&E. Reports prepared by the FBI will be included as attachments or as received.

2-10. Training

a. Commanders responsible for AA&E will establish a training program for those personnel responsible for the accountability of these items. The training program will be designed to—

(1) Provide training in inventory and accountability procedures as outlined in applicable 700-series Army regulations.

(2) Fit the requirements of different groups of personnel responsible for accountability.

(3) Indoctrinate personnel in the principles, criteria, and procedures for accountability and inventory, including disciplinary actions against individuals responsible for violating security requirements as prescribed in this regulation.

b. Commanders will initiate an aggressive training program to ensure all unit personnel are aware of their responsibilities for the security and accountability of AA&E. A training program will also be established to ensure requirements of AR 190-56, chapter 4, are kept and to ensure continued proficiency of the guard force. As a minimum, this training will include—

(1) Care and use of weapons, to include qualification firing with assigned weapons within the past 12 months.

(2) Legal authority, responsibility, and jurisdiction of guards on duty, to include apprehension, search and seizure, and use of force.

(3) Physical fitness training.

(4) Guard orders, to include communications and duress procedures.

(5) Duties in the event of emergencies, such as alerts, fire, explosion, civil disturbance, intrusion, attempted seizure, or terrorist incident.

(6) Current criminal threat to AA&E.

(7) Crime prevention.

(8) Common forms of sabotage and espionage, to include current threat situation.

(9) Location of hazardous and vulnerable equipment and materiel, to include high security risk AA&E requiring special attention or more frequent security checks.

(10) Location of fire protection equipment, decontamination stations, electrical switches, and first aid facilities.

(11) Operation and monitoring of intrusion detection system.

(12) Additional training subjects are listed in AR 190-13, paragraph 2-5.

c. Commanders will take continuing action through annual update refresher briefings to ensure that all personnel are aware of their responsibilities for the control and safeguarding of AA&E.

2-11. Personnel

a. Commanders will be selective in assigning personnel to duties involving control of AA&E. Only personnel who are mature, stable, and have shown a willingness and capability to perform assigned tasks in a dependable manner will be assigned to duties which involve responsibility for the control, accountability, and shipment of AA&E. As part of this selection process, personnel assigned duties involved in the control, accountability, and shipment of AA&E will be screened and evaluated using DA Form 7281-R (Command Oriented Arms, Ammunition, and Explosives (AA&E) Security Screening and Evaluation Records). DA Form 7281-R may be locally reproduced on 8½- x 11-inch paper. A copy of this form for reproduction purposes is located in the back of this handbook. Completed forms will be retained on file within the command until the individual departs, or is relieved of his or her AA&E oriented duties. In addition, MACOMs will implement procedures to ensure the following:

(1) Any Government employee (civilian or military) or DA contractor (including commercial carrier) employee operating a vehicle or providing security to a vehicle transporting Category I, II, or classified AA&E will as a minimum have been the subject of a favorable National Agency Check (NAC) or Entrance National Agency Check (ENTNAC), per AR 380-67, paragraph 3-613, except as provided below.

(2) Officers of U.S. flag carriers will be licensed in accordance with U.S. Coast Guard requirements.

(3) Designated carrier employees providing Protection Security Service for the transportation of items classified

SECRET will possess a Government-issued SECRET clearance per AR 380-67, paragraph 3-613, and carrier issued identification.

(4) In situations or at locations where these requirements cannot reasonably be accomplished, a properly cleared escort will be provided to accompany the shipment and prevent unauthorized access. Procedures that address these concerns will be prepared by the cognizant security office and will include statements regarding two-person rule and other specific procedures, as appropriate.

b. Commanders will determine the reliability and trustworthiness of the following personnel before they are assigned duties involving control of AA&E:

(1) Personnel authorized unaccompanied access to arms, and Category I and II ammunition and explosives storage facilities.

(2) Personnel authorized to receive, store, or issue arms and Category I and II ammunition and explosives at such storage facilities.

(3) Personnel authorized to issue or control keys to AA&E storage facilities in (1) and (2) above.

c. Commanders will prohibit access to above personnel when doubt exists as to their reliability or trustworthiness. All personnel will be required to undergo a command oriented security screening or an equivalent foreign country check before access is authorized. The security screening check will be designed to provide the commander reasonable assurance that personnel with character traits that raise significant doubt as to their honesty or stability are not afforded access. At a minimum, the command oriented security screening will include:

(1) A personal interview of the individual conducted by his or her immediate commander or supervisor.

(2) A request for medical file check of active duty military personnel.

(3) A personnel records check.

(4) A records check of the provost marshal or security office.

(5) A records check of local civilian law enforcement agencies in the area of the person's residence if permitted by state or local laws.

d. Commanders may deny access to the above personnel when doubt exists as to their reliability or trustworthiness. The following disqualifying factors will be considered:

(1) Record of alcohol abuse.

(2) Record of unauthorized use, sale, or possession of drugs and narcotics.

(3) Record of mental instability or disorders.

(4) Record of judicial or nonjudicial punishment.

(5) Pattern of behavior or actions which are reasonably indicative of a contemptuous attitude toward the law.

(6) Any other character trait, or a record of conduct, or adverse information, which, in the commander's judgment, would be prejudicial to reliability or trustworthiness.

e. Continuing evaluation of all personnel is essential to the success of the AA&E security screening policy. All personnel involved in AA&E will be fully cognizant of their responsibilities to observe and report promptly to the commander any incident or condition which might result in temporary or permanent disqualification of such personnel. Security screening checks inc above will be repeated every 3 years.

Chapter 3 Physical Security Planning

3-1. General

In assessing local requirements for protection, the following factors should be considered:

- a. Threat assessment based on information furnished by local intelligence, criminal investigative, or law enforcement agencies.
- b. Types of AA&E, other sensitive assets, property maintained and mission of the facility.
- c. Location, size, and vulnerability of storage facilities.
- d. Vulnerability of AA&E to theft and loss.
- e. Geographic location within the installation and relative to surrounding population centers.
- f. Availability and responsiveness of security forces.
- g. Availability or existence of security enhancing systems, including:
 - (1) Perimeter barriers.
 - (2) Security lighting.
 - (3) Communication systems.
 - (4) Key and lock controls.
 - (5) Stringent construction criteria for storage areas and armories.
 - (6) Personnel and vehicular entry control.
 - (7) Security training programs.
 - (8) IDS (including closed circuit television (CCTV)).
 - (9) Military Working Dogs.
 - (10) Security guard personnel.

3-2. Coordination

a. In developing a security plan, coordination and close liaison should be effected between the military commander and—

- (1) Adjacent installations or units.
- (2) Federal agencies.
- (3) State and local agencies.
- (4) Similar host country agencies.

b. To the extent permissible, such interaction should allow for an exchange of intelligence information on security measures being employed, contingency plans, and any other information to enhance local security.

c. On an installation, the host activity will assume responsibility for coordinating physical security efforts of all tenants, regardless of the DOD components represented, as outlined in the support agreements and the host activity security plan. Applicable provisions will be included in, or be an appendix to, the support agreement.

(1) Bilateral storage agreements will be used when—

(a) AA&E are stored on the installations or facilities of other U.S. or foreign government agencies or other DOD services.

(b) Consolidated storage facilities are used to store AA&E belonging to more than one unit or organization.

(2) A formal agreement will contain definite assignment of physical security responsibility for the items stored. The agreement will address—

(a) Maximum quantities to be stored.

(b) Physical safeguards to be used.

(c) Frequency of and the responsibility for physical inventories or reconciliation's.

(d) Reporting of losses for investigations.

(e) Key control procedures.

(f) Unit that has overall responsibility for the storage facility.

(g) Procedures for authorization and identification of individuals to receipt for physically taking custody of AA&E.

(h) Risk Categories of items to be stored.

d. The formal agreement concerning physical security requirements for AA&E can be implemented by an appendix to a host/tenant activity support agreement or by a Letter of Instruction (LOI).

e. The purpose of such coordination is protection in depth. Authority, jurisdiction, and responsibility must be set forth in a manner that ensures protection and avoids duplication of effort.

3-3. Contingency plans

In most instances it will be necessary to increase security for AA&E and other sensitive property, assets and facilities during periods of natural disasters, natural emergencies, or periods of increased threat from terrorist or criminal elements. Therefore, contingency plans should include provisions for increasing the physical security measures and procedures for storage areas based on the local commander's assessment of the situation. These provisions should be designed for early detection of an attempted intrusion, theft, or interruption of normal security conditions.

3-4. Security threats

a. The security plan will provide for the identification of local threats and should make full use of the investigative resources available in the geographic area to anticipate criminal activities that threaten the physical security of AA&E assets. At a minimum, liaison shall be established with the following agencies.

- (1) Local Federal Bureau of Investigation field office.
- (2) Local law enforcement agencies.
- (3) Intelligence and investigative agencies of the Uniformed Services.
- (4) Bureau of Alcohol, Tobacco, and Firearms field office.
- (5) Host country agencies where applicable.

b. Installation plans shall address actions to counter thefts by employees. These actions include personnel screening (see para 2-12) and the monitoring to minimize opportunities for employee theft and to detect concealed shortages.

c. The USACIDC is designated as the single MACOM for receiving, analyzing, and disseminating data on the criminal threat to the security of the United States Army. The U.S. Army Intelligence and Security Command (INSCOM) will perform a similar function as related to terrorist, hostile intelligence, demonstrator, and hostile special operation threats.

d. Commanders responsible for storage of AA&E will—

(1) Coordinate with local USACIDC and Military Intelligence (MI) elements to receive current data on any threat to the security of these items. USACIDC and MI personnel shall conduct periodic visits with commanders or their designated representatives. These visits should provide updated threat analysis data based on observed vulnerabilities.

(2) Assess the local requirements for physical security protection.

(3) Incorporate into local security plans or SOPs, procedures for providing the following essential elements of criminal data to the nearest MP and USACIDC representatives as the data become available.

(a) Any intent to steal AA&E.

(b) Suspicious acts indicating that a storage area is being targeted by criminal elements.

(c) Alleged offers to buy or barter for AA&E.

(d) Losses of AA&E, including alleged inventory or administrative errors, together with the events surrounding individual losses.

3-5. Implementation of physical security planning

Commanders at each installation, unit or activity will—

a. Issue instructions regarding all phases of security operations pertinent to the installation, unit or activity. These instructions will be reviewed at least annually for relevance and currency.

b. Develop and implement an effective security awareness program based on current physical security plans.

c. Develop effective countermeasures to prevent or reduce the risk posed by potential threats.

(1) Countermeasures should be consistent with the current physical security plan and the requirements of Army physical security regulations and MACOM supplements.

(2) Physical security countermeasures consist of measures and procedures designed to reduce risk by—

(a) Providing means of alerting response forces to the presence of intruders as soon as possible.

(b) Providing means of delaying intruders long enough to prevent intruders from completing the purpose of the intrusion.

(3) Physical security measures and procedures are specified in Army regulations and MACOM supplements and include—

(a) Area patrols.

(b) Continuous surveillance.

(c) Security fences, doors, walls and locks.

(d) Security vaults.

(e) Security lighting.

(f) IDS.

(g) CCTV.

(h) Clear zones.

(i) Response forces.

d. Sensitive or critical items or equipment should be stored in inner zones of an installation. This may require inventory, segregation, and restorage, where practical by risk categories.

e. Security protection requirements for AA&E will be based on the highest category item stored in magazines or other structures.

3-6. Intrusion Detection Systems

The IDS is an essential part of the physical security system. IDS consists of the combination of electronic components, including sensors, control units, transmission lines, and monitoring units integrated to be capable of detecting one or more types of intrusion into an area protected by the system. IDS includes both interior and exterior systems. The system will report directly to an alarm monitoring station. The system will be an approved DOD standardized system or a MACOM approved commercial system.

a. IDS will include a central control station where alarms will sound and from which a response force can be dispatched. An alarm bell located only at the protected location is not acceptable. The IDS will be designed to cause an alarm to sound at the central control panel whenever the system is turned off or malfunctions. Some means of communication will be provided between the protected areas and the monitoring area to coordinate status changes. Telephone communication should be considered. On and off, access, and secure switches not located at a central control station will be located within the alarmed area. The response force should respond to an activated alarm as soon as possible, but in no case may arrival at the scene exceed 15 minutes. Facilities off military installations, will have a local alarm in addition to monitoring capability. Alarm circuitry that requires alarm signals to be cleared either by the central control station alarm monitor or by entering the protected area will be used. Use of alarm delay switches at RC facilities is discouraged. AA&E storage facilities (other than bulk storage facilities) that require IDS will be protected by at least two types of sensors, one of which is a volumetric sensor. Additional levels of protection, when practical, are encouraged (e.g., duress signaling components) and will be considered for Category I and II arms storage facilities.

b. Facilities having IDS will have signs prominently displayed announcing the presence of IDS. They will be affixed at eye level, when possible, on the exterior of each interior wall that contains an entrance to the protected area. They will be affixed on exterior walls only when the exterior wall contains an entrance to the protected area. Specifications for IDS signs are per appendix F.

c. IDS will include a protected, independent, backup power supply that will provide a minimum of 4 hours of uninterrupted power, or other duration as outlined in the site survey.

d. Where an IDS is used in civilian communities, arrangements will be made to connect alarms to civil police headquarters, private security companies, or a monitoring service from which immediate response can be directed in case of unauthorized entry.

(1) A commercial answering service is not authorized.

(2) Coordination is required with civil authorities to ensure a response force can be directed to respond immediately.

e. A daily log will be maintained of all alarms received, and at a minimum will include—

(1) The nature of the alarm; for example, intrusion system failure or nuisance alarm.

(2) The date and time the alarm was received.

(3) The location, and action taken in response to the alarm.

f. Logs will be maintained for a minimum of 90 days and will be reviewed periodically to identify, monitor, and correct IDS reliability problems.

(1) DA Form 4930-R (Alarm/Intrusion Detection Record), may be used to record alarms received. DA Form 4930-R will be locally reproduced on 8½- x 11-inch paper. A copy for reproduction purposes is located at the back of this handbook.

(2) Computer generated printout of alarms may be used as a substitute provided all required information has been included or supplemental information is included in a log.

(3) Serious or recurring problem areas will be described in writing and sent through command channels to CDR, U.S. Army Belvoir R&D Center, ATTN: AMCPM-PSE, Fort Belvoir, VA 22060-5606.

g. Transmission lines for the alarm circuits will have line supervision (connecting lines will be electrically supervised to detect evidence of tampering or malfunction and any visible lines must be inspected weekly) or two independent means of alarm signal transmission from the alarm area to the monitoring station must be provided. One of the two independent means of alarm signal transmission must be either a long-range radio or cellular telephone link. Two undedicated, hardwire telephone links are not acceptable. The dual transmission equipment must continuously monitor the integrity of both the telephone wire line and cellular or long range radio links. Upon loss of either communication path, the system must immediately initiate notification to the monitoring facility via the other communication link. Because of the criticality of the information to be transmitted, the dual transmission equipment must be able to seize control of the communication links, even if that link is already in use. Physical protection of both communication links is critical. Therefore, the hardware communication links is critical. Therefore, the hardware communications link will be enclosed in metallic conduit from the protected area to wherever the communication is made to the telephone network. Communications equipment, including cellular equipment, will be mounted in tamper protected enclosures. Communications equipment, including cellular antennas where possible, will be located within

the protected area. Additionally, a protected backup independent power source of 8 hours minimum duration will be provided. Telephone communication between a central control station and alarm zones to provide for controlled entry by authorized personnel should be considered as an adjunct to the IDS. Systems will be tested quarterly and a log maintained at least 1 year for recording all tests. Visible lines will be inspected on a regular basis.

h. Following requirements also apply:

(1) IDS will be considered for security classification if it meets the specific classifying criteria per AR 380–5, chapter 2 and appendix G. If classified, appropriate personnel security clearance must be obtained.

(2) Only authorized personnel should be allowed access to unclassified IDS installation wiring diagrams for a specific facility or location. This also applies to information on known, specific vulnerabilities or counter-measures affecting the IDS.

(3) Civilian employees whose duties involve the design, operation, or maintenance of IDS require completion of a favorable National Agency Check with written inquiries (NACI) prior to appointment to such noncritical-sensitive positions. Civilian contractor employees must possess a minimum security clearance of CONFIDENTIAL, granted in accordance with AR 380–67, paragraph 3–400.

(4) A check of the National Crime Information Center (NCIC) for installers and maintainers of unclassified IDS is a command decision. The decision will be based on—

(a) The sensitivity of the area to be protected.

(b) The need for quality control over personnel having access.

(5) All installers, maintainers, and operators of unclassified IDS will undergo a command-oriented security check. The security check should be made with the area provost marshal (PM) or other agencies that might have information on file bearing on the honesty or stability of the individual. Requirement for above command-oriented security checks should be based on local jurisdiction policies, the local threat and sensitivity, and vulnerability of the facility protected.

(6) All keys associated with IDS components will be safeguarded and controlled according to paragraph 3–8.

(a) Monthly Joint-Service Interior Detection System (J-SIIDS) operational checks to ensure activation of the sensors will be conducted utilizing appendix K. In addition, a visual inspection of components and conduit for evidence of tampering will be conducted during the monthly inspection. Commercial intrusion detection systems employing sensors equipped with a remote-test feature that activate the same sensing phenomenology as would an actual intruder do not require operational checks by unit personnel. Each zone component will be checked and tested by alarm maintenance personnel a minimum of every six months during preventive maintenance. Commercial intrusion detection systems that do not have a remote-test feature will be tested monthly utilizing the manufacturers operational test.

(b) Installation physical security inspectors will include a check of each IDS during any security inspection to verify the IDS is operating satisfactorily. Checks will include inspection of components and conduit for evidence of tampering. Checks will also be made of unit log entries and records regarding operation and inspection of IDS.

(7) Before accepting a newly installed IDS system for operation, an inspection will be conducted by qualified technical personnel to ensure the system meets all minimum acceptable standards. The statement of verification will be maintained in the using unit or organization files. DA Form 4604–R may be used to record the verification.

(8) Maintenance of IDS will be provided by personnel qualified in installation and repair of IDS. Such maintenance will be performed consistent with operational requirements to ensure continuous operation and reliability of each system in use.

(9) All intrusion detection equipment enclosures with removable covers will be equipped with tamper switches. The tamper detection will be continuously monitored whether the system is in the “secure” or the “access” mode of operation. Enclosures that are not routinely opened for maintenance purposes (such as pull boxes) shall be equipped with tamper switches.

3–7. Security forces

A security or guard patrol or unit personnel will periodically check facilities and areas used to store sensitive or critical items or equipment as prescribed herein and as dictated by a threat and vulnerability analysis. Checks will be conducted on an irregular basis during nonduty hours to avoid establishment of a pattern. Security checks will be made to ensure unauthorized personnel are not in the area and the structures are intact and have not been broken into. During periods of increased vigilance because of a threat situation, security patrols will physically inspect doors and locks on all storage structures in their area of responsibility. Selection of personnel to perform guard duties will be closely monitored by commanders to ensure only properly trained and reliable individuals are assigned duty. Supervisory checks will be conducted to ensure guard duties are being performed properly.

a. Security patrols may be conducted by military personnel; civilian security personnel, including contract personnel; U.S. Marshal Service; or State, local, or campus police.

b. DA-controlled security forces will be provided with adequate means of communication.

c. Security forces personnel (e.g., guards, security patrols, security reaction forces) may be armed with appropriate weapons and ammunition at the discretion of the commander concerned. If such personnel are armed, provisions of AR 190–14, chapters 2 and 4 apply.

d. Guard procedures will be reviewed at least annually and revised if necessary to provide greater application of

security measures, and will place special emphasis on guard post locations and guard orientation concerning duties to be performed.

e. Inspections and guard checks will be increased during nights, weekends, and holidays to provide for deterrence of violations and early detection of loss. These checks will be recorded and will consist of an inspection of the building or facility including all doors and windows. Records of these checks will be maintained in an active file for a minimum of 90 days, and then destroyed.

f. Law enforcement patrol plans will be coordinated and integrated with the guard plan or other security plans and programs to the maximum extent possible. When facilities are located in civilian communities, liaison will be established with local civil police agencies to ensure that periodic surveillance is conducted and that a coordination plan for security exits.

3-8. Key and lock controls

a. Only approved locks and locking devices (including hasps and chains) will be used. See the consolidated glossary for a list of DA-approved locks and hasps. All questions regarding the identity of approved commercial equivalent locks and locking devices (including hasps and chains) meeting Military Specifications will be addressed to the Naval Civil Engineering Laboratory (NCEL), Port Hueneme, CA. Personnel can obtain the most current version of the specifications by contacting the NCEL at DSN 360-5927 or (805) 982-5927. Keys will be signed out to authorized personnel, as needed, on a key control register. The DA Form 5513-R (Key Control Register and Inventory) is approved for use to meet the requirements of this regulation. DA Form 5513-R will be locally or electronically reproduced on 8½- x 11-inch paper. The electronically generated form must contain all data elements and follow exact format of the existing printed form. The form number of the electronically generated form will be shown as DA Form 5513-R-E and the date will be the same as the date of the current edition of the printed form. A copy for reproduction purposes is located at the back of this handbook. When not in use, the key control register will be kept in a locked container that does not contain or store classified material and to which access is controlled. Keys and combinations to locks for AA&E storage facilities, arms racks, IDS (operational or maintenance), or key containers will not be removed from the installation except to provide for protected storage elsewhere. Keys to locks securing key containers will be afforded physical protection equivalent to that provided by the key container itself. Keys to AA&E storage buildings, rooms, racks, containers, and IDS will be maintained separately from other keys, and accessible only to those individuals whose official duties require access to them. A current roster of these individuals will be kept within the unit, agency, or organization. The roster will be protected from public view. The roster will be signed by the designated official and contain the names of those individuals authorized to receive keys from the key custodian. (See *c* below). At no time will keys be in the custody of a person not listed on the roster. A key control register will be maintained at the unit level to ensure continuous accountability for keys, ensure positive control of keys, and establish responsibility for the custody of stored AA&E. Key control registers will contain printed name and signature of the individual receiving the key, date and hour of issuance, serial number or other identifying information of the key, printed name and signature of the person issuing the key, date and hour key was returned, and the printed name and signature of the individual receiving the returned key. Completed key control registers will be retained in files for a minimum of 90 days and then disposed of per established MACOM procedures.

b. Keys to AA&E storage buildings, rooms, racks, containers, and IDS may be secured together in the same key container. However, keys required for maintenance and repair of IDS, including keys to the control unit door and monitor cabinet, will be kept separate from other operational IDS keys and access permitted only to authorized maintenance personnel. Under no circumstances will IDS or AA&E keys or locks, or alternate keys or locks be placed in any security container that contains or stores classified material.

(1) When arms and ammunition are stored in the same areas, keys to those storage areas may be maintained together, but separately from other keys that do not pertain to AA&E storage. The number of keys will be held to the minimum essential. Keys may not be left unattended or unsecured at any time.

(2) When not attended or being used keys will be stored in containers of at least 20-gauge steel or material of equivalent strength, and equipped with GSA-approved low (secondary) security padlocks or GSA-approved built-in 3-position changeable combination locks, or in Class 5 or Class 6 GSA-approved, 3 position, changeable combination container that do not contain or store classified material. Combinations will be recorded on SF 700 (Security Container Information), sealed in the envelope provided, and stored in a container per AR 380-5, chapter 5. Keys and combinations to locks will be accounted for at all times. Key containers weighing less than 500 pounds will be fastened to the structure with bolts or chains equipped with secondary padlocks to preclude easy removal.

(3) In the event of lost, misplaced, or stolen keys, an investigation will be conducted immediately. The affected locks or cores to locks will be replaced immediately. Replacement or reserve locks, cores, and keys will be secured to preclude access by unauthorized individuals. The use of a master key system or multiple key system is prohibited.

c. A key and lock custodian, where duties include assuring proper handling of keys and locks, will be appointed in writing. Only the commander and the key custodian (or alternate, if appointed) will issue and receive keys to and from individuals on the key access roster (*a* above). Personnel listed on the roster may transfer custody, in writing, among themselves. The key and lock custodian's duties will also include procurement and receipt of keys and locks, and investigation of lost or stolen keys. The key and lock custodian will maintain a record to identify each key and lock

and combinations to locks used by the activity, including replacement or reserve keys and locks. The record will show the current location and custody of each key and lock. The key and lock custodian(s) will ensure that individuals who are designated to issue, receive, and account for keys in their absence, clearly understand local key control procedures. The key and lock custodian will maintain a key control register at all times to ensure continuous accountability for keys of locks used to secure AA&E.

d. Padlocks will be locked to the staple or hasp when the area of container is open to preclude theft, loss, or substitution of the lock.

e. Padlocks and their keys will be inventoried by serial number semiannually. Padlocks and keys which do not have a serial number will be given one. This number will be inscribed on the lock or key as appropriate. The inventory records will be retained in unit files for a minimum of 1 year and then disposed of per established MACOM procedures. A key and lock inventory will contain a record of keys, locks, key serial numbers, lock serial numbers, location, and the number of keys maintained for each lock. This record will be secured in the key depository.

f. When individuals are charged with the responsibility for safeguarding or otherwise having keys immediately available, they will sign for a sealed container of keys. A sealed container is a locked and sealed key container, or a sealed envelope (SF 700 per AR 380-5, paragraph 5-104) containing the key or combination to the key container. When the sealed container of keys is transferred from one individual to another, the unbroken seal is evidence that the keys have not been disturbed. The seal need not be broken for inventory of keys. However, evidence of tampering with a sealed container will require an inventory of the keys and such other action as may be required by the commander concerned. If the keys are not placed in a sealed container, an inventory of keys will be made by serial number or other identifying information of the key (e.g., stamped number on key). The inventory and change of custody will be recorded on the DA Form 5513-R. See paragraph 2-12, for requirements to determine reliability of personnel authorized to issue and control keys to arms and category I and II ammunition and explosives storage facilities.

g. Combinations to locks on vault doors or GSA approved Class 5 or Class 6 security containers will be changed annually or upon change of custodian, armorer, or other person having knowledge of the combination, or when the combination has been subject to possible compromise. Combinations will also be changed when a container is first put into service. The combination will be recorded using SF 700, sealed in the envelope provided, and stored in a container meeting storage requirements per AR 380-5, chapter 5. No other written record of the combination will be kept. Controls will be established to ensure that the envelopes containing combinations to locks or containers are not made available to unauthorized personnel.

h. Replacement of lock cylinders and broken keys for high security locks may be requested through normal supply channels. Requests will be coordinated through the key control custodian. MACOMs are designated as approval authorities for any deviation in key procurement procedures.

Chapter 4

Protection of Arms

4-1. General

This chapter prescribes the criteria and standards for the protection of arms in custody of DA Components, COE drawing DEF 141-90-04 depicts arms storage room construction meeting the criteria and standards prescribed by this regulation. Arms, including firearms in rod and gun club facilities, will be stored in an arms room, modular vault, or an arms storage building per the requirements of this chapter.

a. When storage in an arms storage room, modular vault, or building will impede training or operational requirements, arms may be stored or installed on the naval craft, vehicle, or aircraft to which assigned or in other configurations per this regulation and as specified by HQDA. Specific guidance issued by HQDA (DAMO-ODL) will be furnished the Deputy Under Secretary of Defense for Policy (DUSDP) within 90 days. Weapons stored or installed in tanks, vehicles, or aircraft will be protected as part of the overall system in which they are stored or installed.

(1) Commanders will establish appropriate security measures to ensure weapons stored or installed in tanks, vehicles, or aircraft are protected at all times, particularly when tanks, vehicles, or aircraft are unmanned. The following guidance applies:

(a) When not in use, tanks, vehicles, or aircraft containing weapons will be parked inside a secure motor pool or an aircraft park area. Level III security III security measures in AR 190-51, paragraphs 3-3 and 3-5, apply.

(b) When operational readiness permits, weapons mounted on tanks, vehicles, or aircraft that are accessible and easily removable will be dismounted and secured inside the locked tank, vehicle, or aircraft, or other secure location. Weapons that are dismounted and secured inside the locked tank, vehicle, or aircraft and weapons that remain installed on board, will be made inoperative by removal of barrels or other essential firing components. Such components will be secured in a locked metal container inside the tank, vehicle, or aircraft, or other secure location. The container will be secured to the tank, vehicle, aircraft, or other secure structure with bolts or chains equipped with secondary padlocks. Spare barrels may be stored inside a locked, totally enclosed armored combat vehicle when the other

essential firing components are secured in an arms storage room and the vehicle is parked inside a motor park which provides continuous surveillance by guards and Level III security measures per AR 190–51, paragraph 3–3 and 3–5.

(c) Weapon systems that are impractical to dismount, due to operational readiness or damage to the weapon system will be made inoperable by the removal of essential component or components. Such components will be secured as in (b) above. Electrical power may be considered an essential component on the 20MM and 30MM weapon systems.

(d) When electrical power is the only essential component removed from the weapons systems, ammunition for those weapons systems will not be stored on board the tank, vehicle, or aircraft. Level II security measures per AR 190–51, paragraph 3–3 and 3–5 apply.

(2) Large weapons (e.g., crew served weapons and mortar tubes) that cannot be secured in arms rooms, or other arms storage facilities, because of inadequate storage space, may be stored in a locked, totally enclosed armored vehicle. In such cases, security requirements in (1) above apply.

(3) Large weapons that cannot be secured in arms rooms, as stated above, may also be secured in other secure locations, such as a room made secure by compensatory measures. In such cases, protection and surveillance by guard or other personnel will be provided according to the risk category of the weapons involved. Such weapons will be rendered inoperable according to the requirements prescribed in (b) above.

(4) During maintenance support operations, weapon components may be stored in a storage facility meeting security requirements according to the risk category of the items involved.

(5) MACOM commanders may authorize storage of small quantities of Category IV arms in a GSA approved Class 5 security containers not storing classified documents or materials without IDS, security lighting, and security patrol requirements. MACOMs will decide the number to be stored on the basis of mission and operational requirements in conjunction with an assessment of vulnerability and threat conditions. Provisions of above apply only to small units (e.g., USACIDC detachment) that must store a small quantity of prescribed weapons for operational requirements.

b. Individuals issued, or in possession of arms, are responsible for security of this property while it is entrusted to their care.

(1) Each weapon issued for training, operations, or any other reasons will be carried on the person of the individual to whom issued at all times or it will be properly safeguarded and secured. Except during emergencies, weapons will not be entrusted to the custody of any other person except those responsible for the security of operational weapons. These persons will comply with issue and turn-in procedures. Local procedures will be established to secure and account for the weapons of personnel medically evacuated during training.

(2) During field exercises and training, pistols and revolvers issued to persons will be secured to the person by either a locally made lanyard or military issued field lanyards (NSN 8465–00–965–1705).

(3) Pistols or revolvers that lack a device to affix the lanyard will be secured by running the lanyard through the pistol/revolver trigger guard during field and training exercises when drawing the pistol/revolver is not contemplated. If drawing the pistol/revolver is contemplated, such pistols/revolvers are exempt from the lanyard requirements.

(4) Pistols and revolvers issued for operational purposes need not be secured by a lanyard except where specified in other regulations.

(5) Local commanders will prescribe specific accountability and security measures to prevent the loss of other weapons assigned to persons.

(6) USACIDC may authorize individuals to retain their assigned weapons in their private quarters if the necessity is dictated by operational requirements. In such instances, USACIDC will establish accountability safeguards and security measures.

4–2. Storage and supplemental controls

a. Storage and supplemental controls.

(1) New facilities built for storage of Category II arms will meet the facility criteria in appendix G.

(2) An existing facility in which Category II, III, and IV arms are stored together will meet the criteria for facilities storing Category II arms in appendix G unless the MACOM commander determines it to have equivalent or better security.

(3) Category II arms stored in arms storage buildings or rooms that do not meet or exceed the criteria for Category II arms may be stored in GSA approved Class 5 security containers not containing classified documents or materials, or in a safe-type steel file container not containing classified documents or materials, having a 3-position, dial-type, combination lock providing forced entry protection as approved by GSA (Federal Specification AA–F–363B, as amended) or in approved modular vaults not containing classified documents or materials with GSA approved Class 5 vault doors or GSA approved Class 5 armory doors. Modular vaults meeting Federal Specification AA–V–2737 may be used to meet this requirement. Vaults, containers and safes will be under 24 hour armed guard surveillance or protected by an approved IDS and the facility will be checked by a security patrol at least once every 8 hours.

(4) Category III and Category IV arms will be stored in facilities meeting or exceeding the criteria in appendix G.

(5) Categories III and IV arms that are stored in facilities that do not meet or exceed the criteria for Categories III and IV arms may be stored in a GSA approved Class 5 security container, not containing classified material or documents, or a safe-type steel file cabinet not containing classified material or providing forced entry protection as

approved by GSA (Federal Specification AA-F-363B, as amended). Containers weighing less than 500 pounds will be secured to the structure.

(6) Category IV arms that are stored in unmanned facilities not equipped with an IDS will be checked by a security or guard patrol at irregular intervals not to exceed 24 hours.

b. Rescinded.

c. Arms racks and storage containers.

(1) When not in use, arms will be stored in banded crates, metal containers, approved standard issue racks or locally fabricated arms racks, and secured in approved weapons storage facilities. Standard issue approved metal wall lockers or metal cabinets may be used. Crates or containers will be banded, locked, or sealed in a way that will prevent weapon removal without leaving visible signs of tampering. Screws or bolts used in assembling containers, lockers, or cabinets will be made secure to prevent disassembly.

(2) All arms racks or containers will be locked with approved secondary padlocks. In facilities that are not manned 24 hours a day, rifle racks and containers weighing less than 500 pounds will be fastened to the structure (or fastened together in groups totaling more than 500 pounds) with bolts or with chains equipped with secondary padlocks. Bolts used to secure racks will be spot welded, brazed, or peened to prevent easy removal. Chains used to secure racks (and containers) will be heavy duty hardened steel, welded, straight links steel, galvanized of at least 5/16-inch thickness, or of equivalent resistance to force required to cut or break a secondary padlock.

(3) Hinged locking bars for racks will have the hinge pins welded or otherwise secured to prevent easy removal. Locally fabricated racks will provide, at a minimum, security equivalent to standard issue racks. All racks will be so constructed as to prevent the removal of a weapon by disassembly. Locally fabricated arms racks will provide protection from forced entry equip to the M12 rack (M-16 rifle rack). Technical data package (TDP) sketches and assembly instructions for local fabrication of arms racks may be requested from CDR, U.S. Army Armament, Munitions and Chemical Command, ATTN: AMSMC-MAG-SS, Rock Island, IL 61299-6000. The local engineer will certify that locally fabricated arms racks are constructed according to TDP specifications and drawings. The engineer certification will serve as security verification for adequacy of such racks. The certification will be maintained on file in the location where such racks are used.

(4) When weapons are in transit, stored in depots or warehouses or held for contingencies, the weapons crates or containers need not be fastened to the structure. However, such crates or containers will be banded or locked and sealed in a way that will prevent weapon removal without leaving visible signs of tampering. The facilities and buildings in which these weapons are stored will meet the structure and other security requirements of this regulation. Arms being unpacked or packed for shipping, or in assembly-line configuration in a maintenance repair or rebuild facility, do not require storage in racks or containers. However, the facilities in which they are stored will meet the structure and other security requirements of this regulation.

d. Security lighting.

(1) Interior and exterior lighting will be provided for all arms storage buildings, buildings in which arms storage rooms are located, and arms storage rooms. The lighting will be sufficient to allow guards (or individuals responsible for maintaining surveillance) to see illegal acts such as forced entry, or the unauthorized removal of arms during hours of reduced visibility.

(2) Areas appropriate for lighting include entrances to buildings, corridors, and arms rooms. When an arms room is located inside a building, the entrance door to the arms room will be illuminated. Arms rooms that are located within another room (for example, supply room), do not require security lighting over the arms room door. When an arms room is located inside another secured room, the exterior door to that room will be illuminated.

(3) Security lighting will also be provided for motor pools, hangars, and outdoor parking areas for vehicles or aircraft that have weapons installed or stored on board.

(4) Switches for exterior lights will be installed so that they are not accessible to unauthorized individuals.

(5) Exterior lights will be covered with wire mesh screen, or equipped with vandal resistant lenses, that will prevent the lights from being broken by thrown objects.

e. Doors, locks, and locking devices.

(1) Except for GSA approved Class 5 steel vault doors with built-in, three position, changeable combination locks, doors used for access to arms storage rooms or structures will be locked with an approved high security locking device or high security padlock and hasp providing comparable protection to the locks. An approved high security shrouded hasp will be used to secure Category I and II AA&E storage facilities to enhance their security. Doors used for access to arms storage rooms will be locked with approved locks and hasps. On existing storage facilities equipped with double-door protection, high security padlocks and hasps will be used on the most secure door. Secondary padlocks will be used to secure the other door of the double-door concept. Other doors that cannot be secured from the inside with locking bars or dead bolts will be secured on the inside with approved secondary padlocks, e.g., issue window or portals. When high security hasps are installed, locking bars and T-pins should be left in place to aid in opening and closing doors and prevent any future misalignment of the hasps. Panic hardware, when required, will be installed to prevent opening the door by tampering from the outside. Panic hardware will meet safety, fire, and building codes and be approved by the Underwriters Laboratory or host country requirements as applicable.

(2) Key and lock controls will be established per paragraph 3–8.

(3) Facilities in which vehicles or aircraft are stored with sensitive items aboard will be secured by approved secondary padlocks. Aircraft will be secured with manufacturer–installed or approved modification work order door–locking devices when not in use. All hatches and other openings to track vehicles which cannot be secured from the inside will be secured from the outside with approved secondary padlocks.

f. Additional controls.

(1) *IDS for arms storage facilities.* Arms room storing Category II arms, GSA–approved Class 5 Weapons Storage Cabinets, and GSA approved security modular vaults will be provided with an approved IDS. Facilities without an operational IDS require constant surveillance by an armed guards for Category II arms while Category III and IV facilities require only constant surveillance. In the event that the arming of guards off a military installation is prohibited by State or territorial law, a request for exception to this requirement according to paragraph 2–4 is required. The exception will include the rationale and justification for not utilizing armed guards and the compensatory security measures taken.

(2) *Security patrols.*

(a) Facilities will be checked by a security patrol periodically as dictated by any threat and by the vulnerability of the facility. For Category II IDS protected facilities, the intervals between checks will not exceed 8 hours. For Category III and IV facilities, the intervals between checks will be once every 24 hours and once every 48 hours for IDS protected storage facilities.

(b) Facilities storing arms outside a military installation will be checked by a security patrol on an irregular basis at an interval not to exceed 24 hours.

(3) *Rendering weapons inoperable.* If the facility is not located on a military installation, weapon will be rendered inoperable by the method shown in table 4–1 under any of the conditions below:

(a) A facility does not meet structural criteria.

(b) A threat is received.

(c) An IDS is inoperative for a period of 24 hours or longer.

(d) During periods of annual field training, if arms are left in the facility.

(e) Decision of the commander having direct security responsibility for the facility.

(4) *Storing removed items.* The item(s) removed for the purpose of rendering a weapon inoperable will be tagged with the weapons serial number to ensure return to the same weapon and secured in a separate building. Etching of weapon's serial number on the removed parts is prohibited. The removed items will be stored in a locked container in a secure area away from the arms storage facility. If a secure area is not available for separate storage of these items, the container will be stored in the arms storage facility and secured to the structure with an approved lock and chain or equal methods when the container weighs less than 500 pounds.

Table 4–1
Methods for rendering Small Arms inoperable

Weapon: Carbine, Caliber .30 M1

Method: Remove bolt assembly

Weapon: Gun, Auto 25mm M242

Method: Remove bolt and track assembly

Weapon: Launcher, grenade 40mm M79

Method: Remove barrel assembly

Weapon: Launcher, grenade 40mm M203

Method: Remove barrel assembly

Weapon: MG, Caliber .50 M2 series

Method: Remove bolt assembly

Weapon: MG, 7.62mm M60 series

Method: Remove breech block

Weapon: MG, 7.62mm M73 series

Method: Remove breech block

Weapon: MG, Caliber .50 M85

Method: Remove bolt assembly

Weapon: MG, 7.62mm M219

Method: Remove Breech block

Table 4–1
Methods for rendering Small Arms inoperable—Continued

Weapon: MG, 7.62mm M240 series
Method: Remove bolt and operating rod assembly
Weapon: MG, 5.56mm 249
Method: Remove bolt and slide assembly
Weapon: MG, 40mm MK19 Mod 3
Method: Remove bolt assembly
Weapon: Pistol, semi–auto, Caliber .45 M1911A1
Method: Remove firing pin and spring. Leave stop installed to prevent damage of firing pin hold
Weapon: Pistol, semi–auto, Caliber .22
Method: Remove bolt or slide assembly
Weapon: Pistol, semi–auto, 9mm M9
Method: Remove firing pin assembly, recoil spring, and the spring guide from the spring assembly
Weapon: Rifle, Caliber .22—all types
Method: Remove bolt assembly
Weapon: Rifle, Caliber .30 M1 series
Method: Remove bolt assembly
Weapon: Rifle, 7.62mm M14 series
Method: Remove bolt assembly
Weapon: Rifle, 5.56mm, M16 series
Method: Remove firing pin
Weapon: Rifle, Caliber .30 M1918
Method: Remove firing pin series
Weapon: Shotgun, 12 gauge, riot type
Method: Remove barrel assembly
Weapon: Sub MG, Caliber .45 M1 series
Method: Remove bolt assembly
Weapon: Sub MG, Caliber .45 M3 series
Method: Remove bolt assembly
Weapon: Sub MG, 5.56mm M231
Method: Remove firing pin
Weapon: Recoilless rifle, 90mm M67
Method: Remove breech block
Weapon: Revolver, Colt
Method: Remove cylinder and crane assembly
Weapon: Revolver, Ruger
Method: Remove strut assembly
Weapon: Revolver, Smith and Wesson
Method: Remove cylinder and yoke assembly

g. RC weapons. The Army policy of close cooperation between Active Army and RC activities is an essential element in eliminating the theft or loss of AA&E. At times, RC activities may need to use local Active Army facilities for the temporary storage of AA&E as the result of emergency situations; for example, during vehicle breakdown when transporting weapons, when an increased threat situation is forecast or present, and during rifle matches. Active Army facilities are authorized and encouraged to assist in temporarily securing RC items. However, the receiving unit will ensure the accountability (number and type items, including serial numbers) of those items accepted for storage. The above policy also applies between Reserve components as well as the temporary storage of Active Army stocks at Reserve storage facilities.

4-3. Storage of classified weapon trainers

Because of security classification, nuclear weapon trainers or other classified weapon trainers may be stored in separate locked containers, or wire cages, in arms storage facilities when alternate facilities are not available per AR 380-5, chapter 5. Commanders will prescribe supplementary measures and controls to prevent unauthorized access and ensure the items are accounted for at all times.

4-4. Consolidated arms rooms

Arms belonging to more than one unit or organization may be stored in the same arms room or arms storage facility. Arms will be identified by unit. One commander will be designated as having responsibility for the overall security of the consolidated storage facility. Access controls will be established to ensure protection of each unit's arms. Procedures will also be established to fix responsibility for issue, receipt, and physical accountability for arms, including ammunition, and all other sensitive items, stored in the consolidated storage facility, per AR 710-2, paragraph 2-12; and DA Pam 710-2-1, paragraph 9-11. Where feasible, unit arms will be separated by secondary padlocks. If this is done, each unit will maintain sensitive items. Units with small quantities of arms may use locked metal containers instead of separation by partitions. In all cases, one designated commander will continue to have responsibility for the overall security of the consolidated storage facility, including access to that facility. COE drawing DEF 33-33-18 depicts a consolidated arms storage building meeting this criteria. COE drawing STD 40-21-01 depicts expanded metal mesh security cage. Units will provide the commander responsible for the overall security of the consolidated storage facility. Procedures for such consolidated arrangements will be established in SOP of the consolidated storage facility, or in the SOP of the higher headquarters.

4-5. privately-owned weapons and ammunition

a. Commanders will ensure privately-owned arms and ammunition (including authorized war trophies) are protected on their installations and facilities. Based upon local requirements and availability of resources, Commanders may establish and maintain a system for the registration of privately owned arms on their installations. Commanders will—

(1) Secure arms and ammunition in the installation armory or unit arms rooms in approved locked containers separate from the military AA&E. Storage requirements in this regulation apply. Installation commanders may authorize storage of these items in other locations on military installations, provided they are properly secured.

(2) Account for and inventory arms and ammunition.

(a) A DA Form 3749 (Weapons Receipt) will be issued for each privately-owned weapon secured in the arms rooms.

(b) privately-owned weapons will be inventoried in conjunction with, and at the frequency of the inventory of Government weapons.

(c) Commanders will establish limits on the quantity and type of privately owned ammunition stored in the arms room, based upon availability of space and safety considerations.

(3) Post applicable local regulations and State and local law information on ownership, registration, and possession of weapons and ammunition on unit bulletin boards.

(4) Conduct inspections per AR 190-13, paragraph 2-8, and this regulation to ensure proper storage and control.

(5) Process unauthorized AA&E per AR 190-22, paragraph 3-4.

(6) Prohibit retention and storage of incendiary devices and explosives.

(7) Brief all newly assigned persons on this regulation and subordinate command guidance. All personnel will be made aware of changes.

b. Personnel keeping or storing privately owned arms and ammunition (including authorized war trophies) on military installation will—

(1) Comply with local regulations and local and State laws on ownership, possession, registration, off-post transport, and use.

(2) Store both arms and ammunition in the unit arms room or other locations authorized by the installation commander.

(3) Follow local security and safety regulations. Safeguard the unit issued DA Form 3749 for turn-in to the unit armorer when the weapon is withdrawn from the arms room.

(4) Withdraw privately-owned weapons and ammunition from the unit arms rooms only upon approval of the unit commander or the commander's authorized representative.

(5) Ship or store arms and ammunition as personal property, if authorized, per AR 55-355, paragraph 50-12. When loss occurs, notify the local provost marshal or security officer immediately.

(6) Comply with the National Firearms Act of 1968 when receiving or bringing arms into the United States. Automatic arms must be turned over to the Bureau of Alcohol, Tobacco and Firearms (BATF), or brought under Army control.

4-6. Weapons and ammunition for marksmanship matches and other special purposes

a. Weapons and ammunition for marksmanship matches and other purposes will be protected at all times.

b. When not in use, marksmanship weapons used in matches or ceremonies away from a military installation will be stored in authorized active, USAR, or ROTC arms rooms. Weapons and ammunition may be stored in a civilian police station under police control. If these facilities are not available, weapons and ammunition will be stored in locked containers or rooms attended at all times by at least one team member or designated person.

c. The storage of automatic weapons in other than an authorized arms room is prohibited.

d. Exceptions to *b* above for marksmanship weapons are authorized USAR and ROTC marksmanship personnel when firing as persons (away from their teams). Exception criteria are as follows:

(1) Authority to grant exceptions is delegated to MACOM commanders and heads of Army staff agencies commanding field operating agencies and activities. This authority may not be further delegated.

(2) Eligibility is limited to persons who are active members representing an ROTC region, a major USAR command, or higher-level team. Eligibility is limited only for a specified period of marksmanship participation. Weapons will be returned to the proper authorized arms rooms for storage upon completing the marksmanship match.

(3) Exceptions will be held to a minimum. Each written request for exception will include a statement that other secure facilities are not available. Each request will outline compensatory measures to be applied. If weapons are to be stored in private homes, the weapons will be secured in a locked, metal container. The container will not be prominently displayed. It will be secured to a firm structure in the home.

(4) Arms used during matches or practice away from the facility and not secured as in (3) above will be stored under *b* above.

4-7. Commercial weapons and ammunition

a. Commercial arms and ammunition in stock or maintained by nonappropriated fund activities and installation-approved private organization activities will be protected according to security and accountability procedures equal to those prescribed in this regulation for military arms and ammunition. Commanders will prescribe specific inventory accountability procedures to ensure protection of these items against theft or loss.

b. Commands will discontinue the sale or possession of weapons and ammunition by nonappropriated fund activities failing to comply with this regulation.

(1) During nonduty hours, commercial arms and ammunition will be stored in facilities meeting the requirements of this chapter. The storage area will be protected by a certified, approved IDS.

(2) When displayed, arms and ammunition will be under the surveillance of sales personnel. Arms and ammunition will be secured in such a way as to prevent loss or theft as follows:

(a) Ammunition equal to one day's estimated sales may be displayed in a locked showcase or security case or fixture. If possible, empty boxes will be displayed in the showcases and sales will be made from reserve stock.

(b) Gun and ammunition fixtures will be locked except when merchandise is presented to the customer for inspection.

4-8. Contract guard weapons and ammunition

a. Protection of contract guard weapons and ammunition not U.S. Government property is the responsibility of the contractor. If granted permission by the installation commander to store on military reservations, these items will be provided the same degree of protection against loss or theft as Army weapons and ammunition will be stored in arms storage facilities meeting the requirements of this regulation. In addition these weapons and ammunition will be accounted for at all times. These weapons and ammunition are not authorized to be stored in AA&E storage facilities containing Government weapons and ammunition.

b. Commanders will prescribe the specific accountability procedures for contract guard weapons and ammunition.

4-9. General officer weapons and ammunition

Small arms and ammunition issued to general officers are exempt from all provisions of this regulation except loss and investigations requirements. The items will be stored in a manner deemed appropriate by the general officer.

4-10. U.S. Military Academy weapons

U.S. Military Academy (USMA) weapons issued to each cadet are granted an exception to the storage security requirement in this chapter. The Superintendent, USMA, will set up proper security for cadet weapons to ensure weapons are safeguarded at all times.

4-11. Demilitarized weapons

Demilitarized weapons, although not classified as sensitive, will be secured as commanders may direct.

4-12. Foreign weapons and ammunition

a. Arms and ammunition of foreign origin in custody of the Army for intelligence, research, development, test, evaluation, or other purposes, will be controlled and safeguarded in the same way as that prescribed for U.S. military weapons and ammunition.

b. Provisions of AR 700–99, chapter 2, apply to captured enemy weapons and ammunition.

4–13. Museums Arms and Ammunition

a. *General.*

(1) Arms, 19th century or older and not requiring metallic cartridges are classified as museum artifacts and are excluded from the physical security requirements for storage of arms. Security requirements for these artifacts will be determined per AR 190–51, appendix B.

(2) All operable and inoperable arms not on display will be secured according to this regulation.

(3) Live ammunition will not be used for museum displays. Display ammunition, arming pins, caps, or other detonating devices will be rendered temporarily inoperable.

b. *Transportation.* Museum weapons in transit will be protected according to this regulation.

c. *Arms storage facilities.* The provisions of this regulation apply for the storage of museums arms and ammunition.

d. *Arms on display.*

(1) Ready-to-fire weapons containing self-primed metallic cartridges will be modified to make them temporarily inoperable. Removal of firing pins, internal mechanisms, or parts will satisfy this requirement; however, parts must be secured against pilferage. Modifications will not detract from the display value of the item. Under no conditions will any weapon be permanently altered by welding or cutting without written approval of the Chief of Military History.

(2) Weapons on display in exhibit or display cases will be secured to prevent their easy removal. Security measures will be as inconspicuous as possible so as not to detract from the aesthetic appearance of the display.

(3) Classified component parts will be removed before any nonnuclear missiles, rockets, or other AA&E are displayed.

e. *Accountability.* All museum weapons are subject to the following requirements:

(1) A current inventory by serial number will be maintained.

(2) All weapons, with or without serial numbers will be marked with a catalog number. Numbers should be easy to find, legible, and placed on the weapon in a position where they do not interfere with the display or study value of the weapon.

(3) Commanders should consider photographing unique museum items as an identification aid in case of theft. Color photographs often preserve a more complete and accurate record than black and white photographs. Negatives should be kept separate from the original photographs.

(4) A serial or catalog number list of weapons stored in banded or sealed containers will be fastened to the outside of each container. The contents will be authenticated with the signature of the curator or other responsible person. Banded containers will be examined quarterly for tampering and their contents inventoried annually. When seals are used, they will be controlled as stated in AR 190–51, appendix E.

(5) All museum weapons will be visibly inventoried, except weapons stored in banded containers as follows:

(a) Museum personnel will inventory weapons by physical count weekly, and serial or catalog number quarterly.

(b) A disinterested officer will conduct a semiannual inventory of all weapons except those stored in banded containers. The results of this inventory will be kept for 1 year.

(6) Inventory records will be kept on DA Form 2609 (Historical Property Catalog) according to AR 870–20, chapter 4. Inventory files will be maintained for at least 1 year.

f. *Small Arms Serialization Program.* All weapons with serial numbers will be registered with the DOD Central Registry according to AR 710–3, paragraph 4–11. A manual recording system should be used for those weapons that the Small Arms Serialization Program will not accept because they are foreign, have nonnumeric serial numbers, and so forth.

g. *Missing or recovered museum weapons.* Procedures for reporting missing or recovered weapons are contained in this regulation.

4–14. Arms parts

Major parts for arms, such as barrels and major subassemblies, will be afforded at least the same protection as Category IV arms. The frame or receiver of an arm constitutes a weapon and such parts, therefore, must be stored according to the correct category; for example, the receiver of a .30 caliber machine gun will be stored as a Category II weapon.

4–15. Restricted area posting

Areas where arms are stored will be designated and posted as restricted areas according to AR 190–13, paragraph 6–4. Posting will be visible at eye level when possible. It will include fire control measures, when required. In the areas where a predominant minority language is spoken and clear justification exists, local commanders may specify multilingual posting. In overseas commands where posting is authorized, areas will be posted in English and the host country language. International sign decals are contained in Military Specification MIL–M–43994A.

4-16. IDS signs

Arms storage facilities having IDS will have signs prominently displayed announcing the presence of IDS (see app F). They will be affixed at eye level, when possible, on the exterior of each interior wall that contains an entrance to the arms storage room, vault, or building. They will be affixed on exterior walls only when the exterior wall contains an entrance to the arms storage facility.

4-17. Fences

Arms storage buildings, bulk storage areas, and outside areas where vehicles and aircraft are routinely parked with weapons aboard may be surrounded with fencing when determined necessary by the commander concerned. Such determination will be made based on an assessment of local threats, vulnerabilities, and cost effectiveness. Fencing construction criteria is prescribed in paragraph 5-3.

4-18. Security of tools and high-value items

a. Tools such as hammers, bolt cutters, chisels, crowbars, hacksaws, cutting torches, and similar items which could be used to assist in gaining unauthorized access to an arms storage facility must not be readily accessible to intruders. Tools of this type should be removed from the vicinity of the arms storage facility or room. When an arms storage facility is the only security location available, such tools will be stored in a locked container within the facility. When the access door to an arms storage room is located within the unit supply room, tools will not be stored in the supply room.

b. When other secure storage facilities are reasonably available high-value items will not be stored in arms storage facilities. Such items include field glasses, compasses, watches, and highly valuable items subject to pilferage. In the absence of secure facilities, commanders may authorize (in writing) those sensitive items to be stored in arms storage facilities. Commanders are cautioned, however that each additional item of value stored in a weapons storage area increases the target potential to criminals.

4-19. Access control

a. Routine or unaccompanied access by enlisted and civilian personnel to arms storage facilities will be limited to the least practical number of responsible persons designated by the unit commander. The names and duty positions of these persons will be posted inside the arms room. These persons will be authorized unaccompanied access to the arms storage facilities only after they have satisfactorily undergone a command-developed background check that has been verified by a review of personnel records. (See para 2-12.) Unit officer personnel, with the unit commander's approval, should be permitted routine unaccompanied access. However, those officers authorized unaccompanied access will be designated in writing by the commander. The list will be posted as above.

b. In addition to the requirements in (a) above, a two-person rule may be established for access to arms storage facilities. At the option of the commander concerned, two authorized persons may be required to be present during any operation which affords access to these facilities. If the two-person rule is used, commanders should establish appropriate lock and key control procedures to preclude defeat of the two-person rule concept.

4-20. Security of Class 5 storage containers

a. Class 5 security containers authorized for use instead of arms rooms must be adequately protected. The following factors must be considered for each container:

- (1) Its vulnerability when left unattended for extended periods of time.
- (2) Vulnerability of the location where the container is placed.
- (3) Accessibility and ease of removal of the container.
- (4) The position where the container will be least vulnerable to unauthorized access by heavy lifting equipment (e.g., forklifts, dollies).
- (5) The position from which unauthorized persons would find it extremely difficult to remove the container.

b. Positive overall security of the arms stored in the container will be achieved. Commanders will ensure that structure protection provided by the storage container is adequately increased by the physical security measures specified in this regulation.

4-21. Arming of unit arms rooms armorers

Depending on the local threat, environment, and location of unit arms rooms, (or other arms storage facilities), commanders concerned will determine the need to arm unit armorers (or other on duty personnel) during the performance of their duties to prevent the possible armed robbery or forcible theft of weapons and ammunition. If such personnel are armed, provisions of AR 190-14, paragraphs 2-2, 4-1, and 4-4, apply.

Chapter 5 Protection of Nonnuclear Missiles, Rockets, Ammunition and Explosives

5-1. General

Nonnuclear missiles, rockets, ammunition, and explosives listed in appendix B will be protected in accordance with this chapter. Individuals issued or in possession of missiles, rockets, ammunition, or explosives are responsible for security of such property while it is charged or entrusted to their care. All unused ammunition and explosives will be turned in to the proper authority per AR 710-2, paragraph 2-52. Ammunition and explosives deployed in the field for training or operational purposes will be protected at all times as prescribed in paragraph 2-5. Missiles, rockets, ammunition, and explosive items installed in vehicles and aircraft are considered in use and will be protected as part of the overall system in which they are installed. Other criteria in this chapter does not apply to such missiles, rockets, ammunition, and explosive items. Commanders will ensure that necessary security measures are taken to protect ammunition and explosives stored in vehicles and aircraft as prescribed in paragraphs 5-3 and 5-4. (See app H for AA&E physical security standards at contractor facilities).

5-2. Bulk storage areas

a. Category I and Category II.

(1) *Bulk storage.* Bulk storage areas are considered to be depot activities, prestock points, and ammunition supply points at which bulk quantities of missiles, rockets, ammunition, and explosives are stored. Storage is usually in original containers. Storage structures acceptable for storage of Category I and II ammunition and explosives are those earth-covered magazines and igloos listed AR 385-64, paragraphs 1 through 12 and appendix A. Commanders may permit storage of missiles, rockets, ammunition, or explosives in other types of structures that provide the necessary delay time equivalent to earth covered magazines and igloos and if all other requirements of AR 385-64 are met.

(2) *Supplemental controls.*

(a) *IDS.* Category I and II storage facilities and structures will be protected by IDS. Facilities without an operational IDS will have armed guards posted 24 hours a day to maintain constant, unobstructed observation of the storage structures, prevent any unauthorized access to the protected structure, make known any unauthorized access to the structure.

(b) *Security patrols.* Storage facilities and structures will be checked by a security patrol periodically as dictated by any threat and by the vulnerability of the facility. Checks will be conducted on an irregular basis during nonduty hours. For Category I and II facilities protected by an operational IDS, the intervals between checks will be once every 2 hours. For facilities without an operational IDS, the intervals between checks will be hourly for Category I and once every two hours for Category II facilities.

b. Category III and IV

(1) *Bulk Storage.* Ammunition and explosives listed under Category III and IV will be stored in structures that meet the criteria in appendix G, or in structures which provide delay time which meets or exceeds that criteria as certified by qualified engineer personnel.

(2) *IDS.* IDS is optional for Category III and IV facilities and structures. New IDS will not be programmed for Category III and IV facilities (structures) unless it is determined necessary based on an assessment of the local threats, vulnerabilities, and cost effectiveness.

(3) *Security patrols.* Storage facilities and structures will be checked by a security patrol periodically as dictated by any threat and by the vulnerability of the facility. For Category III and IV facilities protected by an operational IDS, the intervals between checks will be 72 hours and once every 48 hours for facilities not protected by an operational IDS.

(4) *Inert and expended launcher tubes, inert mines, and inert rocket launcher training devices, and practice rockets* are vulnerable to pilferage, misuse, or possible conversion to live ammunition. Such items will be clearly marked according to AR 385-65, paragraph 4, to prevent accidental turn-in, or turn-in as live fire residue. Those items that can be converted to operable weapons will be accounted for and secured as Category IV live ammunition and explosives.

c. *Rescinded.*

5-3. Fences

a. Categories I and II missile, rocket, ammunition, and explosive storage areas will be surrounded with security fencing constructed and configured as set forth below. New chain link fencing will not be programmed for Category III and IV storage facilities unless it is determined necessary based on an assessment of local threats, vulnerabilities, and cost effectiveness. COE drawing STD 40-16-08 depicts chain link fence construction standards.

b. Fence fabric will be of chain link (galvanized, aluminized, or plastic coated woven steel) 2-inch square mesh 9-gauge diameter wire, including coating. In Europe, fencing may be North Atlantic Treaty Organization (NATO) Standard Designed Fencing (2.5-3mm gauge, 76mm grid opening, 2 meter height, and 3.76 meter post separation).

c. Posts, bracing's, and other structural members will be located on the inside of the fence fabric. Galvanized steel

or aluminum tie-wires equal in gauge to fencing will be used to secure the fence fabric to posts and other structural members.

d. The minimum height of the fence fabric will be 6 feet without an outrigger (COE drawing STD 40-16-08, Type FE-5).

e. The bottom of the fence fabric will extend to within 2 inches of firm ground. Surfaces will be stabilized in areas where loose sand, shifting soils, or surface waters may cause erosion and thereby assist an intruder in penetrating the area. Where surface stabilization is not possible, or is impracticable, concrete curbs, sills, or other similar type anchoring devices, extending below ground level will be provided.

f. Modifications to chain link fencing will not be made to conform to the requirements of this paragraph if the existing fencing provides an equivalent or greater penetration resistance, as determined by the commander concerned.

g. The barrier will have a minimum number of vehicular and pedestrian gates, consistent with the operational requirements. These gates will be structurally comparable, provide penetration resistance equivalent to the adjacent fence, and be designed so that the traffic through them will be under the positive control of the security force. Unless manned 24 hours a day, gates will be provided with an approved lock. Hinge pins and hardware will be welded or otherwise modified to prevent easy removal.

h. Drainage structures and water passages penetrating the barrier be barred to provide penetration resistance equivalent to the fence itself. Openings to the drainage structures having a cross-sectional area greater than 96 square inches, and a smallest dimension greater than 6 inches will be protected by securely fastened welded bar grills. As an alternative, drainage structures may be constructed of multiple pipes, each pipe having a diameter of 10 inches or less, joined to each other and to the drainage culvert. Multiple pipes of this diameter may also be placed and secured in the "in-flow" end of the drainage culvert to prevent intrusion into the area.

i. Building walls may be incorporated into the barrier system if they provide penetration resistance equivalent to the perimeter barrier and are subject to observation.

j. If practicable, clear zones will extend 12 feet on the outside and 30 feet on the inside of the perimeter fence. Clear zones for Categories I and II AA&E will be free of all obstacles, topographical features, and vegetation exceeding 8 inches in height which reduce the effectiveness of the physical barrier, impede observation, or provide cover and concealment of an intruder. Clear zones for Categories III and IV AA&E will be free of obstacles, topographical features, and vegetation which reduce the effectiveness of the physical barrier.

(1) Vegetation or topographical features which must be retained in clear zones for erosion control, passive defense, or for legal reasons will be trimmed or pruned to eliminate concealment and checked by security patrols at irregular intervals.

(2) Perimeter light poles, fire hydrants, steam pipes, or other similar objects; barricades for explosives safety purposes; and entry control buildings within the clear zone that represent no aid to circumvent the perimeter barrier or do not provide concealment to an intruder do not violate the requirements of clear zones.

k. Fencing needs will be evaluated and determined for each installation on a case-by-case basis. The installation of new security fencing around an outer perimeter may not be cost effective. The following will be considered:

(1) If the storage area perimeter has adequate security fencing, fencing of inner zones may not be required.

(2) If the storage area outer perimeter has barbed wire fencing or no fencing, security fencing of inner zone storage areas may be more practical and cost effective.

(3) If the storage area outer perimeter is partially fenced, it may be more cost effective to complete the loop rather than to install fencing around inner zone storage areas.

(4) If natural barriers, such as mountains, cliffs, rivers, seas, or other difficult-to-traverse terrain, form portions of the perimeter and provide equivalent or more security than fencing, security fencing of inner zone storage areas may not be required.

5-4. Security lighting

a. Security lighting will be provided for Category I and II storage facilities. New security lighting systems will not be programmed for Category III and IV facilities unless determined necessary based on an assessment of the local threats and vulnerabilities. Security lighting requirements will conform to ammunition and safety requirements per AR 385-64, paragraphs 1 through 12 and appendix A. However, existing security lighting for Category III and IV storage facilities will not be removed solely to comply with this paragraph. Security lighting will—

(1) Be provided for exterior doors of all Category I and II items storage rooms and magazines.

(2) Have switches for exterior lights installed so that they are not accessible to unauthorized individuals.

(3) Have all exterior lights covered with wire mesh screen that will prevent their being broken by thrown objects. Vandal resistant lenses may be used instead of wire mesh screen.

(4) Be provided for motor pools, hangars, and outdoor parking areas for vehicles and aircraft that have Category I and II ammunition and explosives stored on board, and for such items located in open storage areas.

(5) Be provided along storage site perimeter barriers determined necessary by the Commander. Commanders will determine perimeter lighting needs depending on the threat, perimeter extremities, and surveillance capabilities.

b. Field manual (FM) 19-30, chapter 6, will be used as a guide in deciding lighting descriptions, layouts, lighting

patterns, and minimum protective lighting intensities and requirements. COE drawing STD 40-04-08 depicts a typical design for a conventional ammunition storage area security lighting system.

c. Emergency lighting and standby power are not required, but will be considered when the threat and vulnerability warrant.

5-5. Guard protection and surveillance

Protection and surveillance by guards or other personnel together with other physical security measures will be established for facilities or temporary open storage areas as set forth in this regulation and otherwise as needed to ensure protection at the facilities. At a minimum, entrance and exit points into magazine and holding areas where vehicles, railcars or aircraft with missiles, rockets, ammunition or explosives aboard are parked, will be controlled by guards or other personnel. When duty personnel are not present or IDS or closed circuit television are not used, enough security patrols will be provided to allow physical inspection of each aircraft, railcar, or vehicle at a frequency determined by the commander concerned, based on the category of AA&E, the threat, and the location.

5-6. Locks and keys

a. *Locks.* A class 5 steel vault door with a built-in, 3-position, dial-type, changeable combination lock or a key operated high security padlock and hasp will be used on doors to structures housing classified material per AR 380-5, chapter 5. Otherwise, each ammunition magazine or room constructed in accordance with chapter 4 will be secured with an approved high security padlock and high security hasp. Storage facility hasps and locking hardware will provide comparable protection to that afforded by the locks approved or other high security locking hardware. See the consolidated glossary, for list of approved DA locks and hasps. Facilities in which aircraft or vehicles are stored with ammunition aboard will be secured with an approved security padlock. See paragraph 3-8, for further guidance.

b. *Key and lock control.* Key and lock control will be established in accordance with paragraph 3-8. Use of master key system or multiple key system is prohibited.

c. *Category I Storage Facilities.*

(1) Doors used for access to Category I storage facilities will be locked with a high security padlock and hasp and one secondary padlock (medium or low security).

(2) Access to, or possession of, both keys to Category I storage facilities by one person is prohibited. A key control system will be established so that no one will be allowed to interchange access to keys to installed "A""B" locks.

(3) Key control officers and locksmiths will not be authorized access to information concerning the specific locations of installed locks protecting Category I structures at the site (for example, specific storage igloos within a site).

(4) Keys and locks subject to the two person rule will not be placed in use at the facility by the key control officer. Such keys and locks will be placed in use by the respective key control custodians. Additionally, the key control officer is not authorized access to such keys while the locks are in use under the two person rule.

(5) The rotation of padlocks will not be required when two locks are installed on each Category I structure and a system is set up for separating these locks into "A" and "B" locks. Personnel will be identified and authorized access only to either "A" or "B" keys or locks, but not both. The system will preclude an individual from interchanging access to the "A" and "B" keys.

5-7. Communications

Reliable and efficient primary and backup means of external and internal communications, at least one of which is radio, will be established at magazine areas to permit notification of emergency conditions. The communication system will be easily accessible to guard and security personnel on their posts and will be tested daily by supervisory security personnel. The backup system will be of a mode other than that of the primary communication system. Both primary and backup guard (security) communications will be tested at least once during each shift.

5-8. Protection of missiles, rockets, ammunition, and explosives at unit level

a. Unit level stocks are those stored in basic load quantities (quantities stored in tactical configuration for readiness and emergency purposes) or which are on hand for operational and training purposes.

b. A typical facility for storage of operational quantities of ammunition would be a building used to store ammunition on a rifle range or a military police or guard (security) arms room. Such facilities will comply with the requirements for unit arms rooms, paragraph 4-2 or paragraph 5-2, for bulk ammunition storage magazines.

c. The following are minimum requirements for safeguarding and maintaining unit level stocks:

(1) Depending upon tactical and contingency considerations, unit level stocks will be stored in ammunition storage rooms or magazines that are equivalent to the structural standards prescribed in paragraph 5-2.

(a) Commanders may authorize in writing the storage of small quantities of ammunition in unit arms storage rooms. The authorization will be posted in the arms room. Storage will be consistent with operational requirements. Ammunition authorized for storage in unit arms storage rooms will be stored in containers. Ammunition will be secured in banded crates, or in approved metal containers, or cabinets that are approved standard issue, commercial, or approved

locally fabricated. Approved standard issue metal wall lockers may be used. Security containers (GSA approved class 5) not storing or containing classified documents or material may also be used. Crates will be banded or sealed, in a way that will prevent ammunition removal without leaving visible signs of tampering. Ammunition stored in metal containers, or cabinets, will be secured with secondary padlocks. Screws and bolts used in assembling containers, lockers, or cabinets, will be made secure to prevent disassembly. Containers weighing less than 500 pounds will be fastened to the structure (or fastened together in groups totaling more than 500 pounds) with bolts or chains equipped with secondary padlocks.

(b) Commanders will establish security procedures for issue of basic load ammunition that will enable the unit to achieve its combat or contingency missions. When tactical, operational, or readiness conditions permit, basic load ammunition will be stored in ammunition storage rooms or magazines that are equivalent to the structural standards prescribed for the risk category of the items.

(c) For safety reasons, live ammunition will not left in weapons magazines stored in the arms room.

(2) When operational and training requirements preclude storage of unit level stocks or explosives in ammunition storage magazines, these stocks may be stored in or on combat vehicles, aircraft, ships, or trailers, or in other configurations required by the operational environment. When stored in this manner, unit level stock storage areas will comply with criteria specified by the MACOM.

(3) Ammunition and explosives may be stored aboard vehicles or aircraft provided the vehicle or aircraft is located inside a motor pool or park or aircraft park area. When stored in this configuration, supplemental security measures in AR 190-51, paragraphs 3-3 and 3-5, apply.

(4) Vehicles or aircraft with missiles and rockets in a ready-to-fire configuration will be provided 24 hour armed guard surveillance.

(5) Ammunition and explosives in open storage (such as vehicle holding area, ammunition supply point, and aircraft cargo area) are especially vulnerable to theft or sabotage. Commanders will prescribe necessary security measures to protect items located in open storage. Ammunition and explosives in temporary open storage will be secured under the following procedures:

(a) Perimeter barrier, either temporary or permanent.

(b) Guard surveillance (post guards or on duty personnel).

(c) Security lighting during hours of darkness or reduced visibility.

(d) Inventory, accountability, and control.

(e) Posted restricted limited area.

(f) Access control (see para 5-9).

(g) Communication systems.

(6) When more than one unit uses the same area, stocks will be separated and identified by unit. One unit will be designated as responsible for the security of the entire area, including access control.

(7) When the threat or other conditions dictate, responsible commanders will decide the advisability of separate storage of battery coolant units (BCU) from the REDEYE weapon. Threat conditions, operational requirements for BCU, and other mission criteria are factors that will determine container location.

d. The following are additional minimum requirements for safeguarding and maintaining Category I missiles at deployment Ammunition Holding Areas (AHA) and at unit areas:

(1) Unit level stocks of Category I missiles will be stored in ammunition storage rooms or magazines equivalent to the structural standards prescribed in paragraph 5-2.

(2) Vehicles or aircraft storing Category I missiles will be provided 24 hour armed guards to maintain constant, unobstructed observation of the vehicle or aircraft. When stored in this configuration, supplemental security measures in AR 190-51, paragraphs 3-3E(3) and 3-5E(8) also apply.

(3) Category I missiles will not be stored in open storage (for example, vehicle holding areas, aircraft cargo holding areas, ammunition supply points, AHAs). Category I missiles at these locations will be secured as follows:

(a) Placed in approved containers (MILVAN, SEAVAN, or CONEX), or in a totally enclosed storage structure. The doors will be secured with two approved medium security or low security locks. Key and lock controls in paragraph 5-6c apply.

(b) The Category I storage area will be provided 24 hour constant armed guard surveillance.

(c) The two person rule will apply for access to Category I missiles at these locations.

5-9. Entry control

a. Vehicular and personnel gates will be secured and strict key control accountability will be observed. A pass, badge, or access roster plus a registration system, will be used to admit properly identified authorized personnel to storage areas.

(1) Vehicle and personnel gates will be secured except when it is necessary to allow authorized entry into or exit from, the area.

(2) Keys and locks to gates will be controlled and accounted for per paragraph 3-8.

- (3) Entry and exit procedures will include checks of personnel and vehicles for unauthorized material.
- (4) Persons requiring frequent recurring entrance to the area will either be listed on an entry control roster prepared by the responsible storage commander or issued a photographic security badge which clearly establishes the authority to enter. The roster will contain as a minimum, the name, grade, and unit or organization of each authorized person.
- (5) privately-owned vehicles and leased vehicles will not be permitted inside storage facilities and areas. Government vehicles, and vehicles operated by DOD contract personnel on official business are authorized entry.
- (6) Upon exiting, all vehicles will be thoroughly inspected to ensure that only authorized material is being removed.
- (7) Vehicles leased by Government agencies are considered to be Government vehicles for the contracted period. Rental vehicles obtained by Government employees for official use during periods of temporary duty will be allowed entry when the employee's official duties require such entry.
 - b. Personnel, including guards or host country guards, whose duties require unescorted access to storage facilities containing classified missiles and rockets, or other classified items, will have a security clearance commensurate with the classification of the items involved.
 - c. A two-person rule will be established for access to storage facilities containing Category I missiles and rockets. No one individual can have access.

5-10. Restricted areas

Areas in which sensitive missiles, rockets, explosive, or ammunition are stored will be designated and posted as restricted areas per AR 190-13, chapter 6.

5-11. IDS signs

Signs clearly announcing the presence of an IDS will be displayed on ammunition storage rooms, magazines, or perimeter barriers using such a system. Signs will be affixed at eye level, when possible. They will be affixed on the exterior walls containing an entrance to the ammunition or explosives storage room, vault, building, or magazine or, in the case of alarmed barrier fences, on the outside of the fence at about 100-meter intervals. Signs will be placed at a location where they will not hinder observation or fields of fire. Signs will not be placed where they may be used by intruders to gain entry. Alarm signs will not create nuisance alarms. Otherwise, the signs will be posted outside the perimeter fence. IDS signs meeting the specifications of appendix F will be used.

5-12. Storage of classified items

Classified AA&E storage facilities will comply with standards set forth in paragraph 4-2 or AR 380-5, appendix H. Classified missiles and rockets, or other classified items, will be segregated from unclassified items stored in the same storage facility. Strict access and accountability control procedures will be established by the commander. See paragraph 5-9 for two-person rule requirement for access to Category I missiles and rockets. Personnel whose duties require access to above storage facilities will have a security clearance commensurate with the classification of the items involved. Classified AA&E material manuals and documents should normally be stored separately from the ordnance items per AR 380-5, paragraph 5-102.

5-13. Additional security measures for igloos and magazines

Additional security measures may be used to enhance overall security of ammunition and explosives stored in unalarmed igloos and magazines or to increase the delay time of alarmed igloos and magazines.

- a. King Tut blocks may be placed in front of igloo or magazine doors to increase the difficulty and the delay time associated with opening them after locks have been defeated.
- b. Expanded metal cages may be placed in front of igloo or magazine doors to provide an additional barrier to entry. Where the igloo or magazine is to have an IDS, sensors may be placed on the cage to provide detection prior to the aggressor reaching the door.

Chapter 6

Accountability, Disposition, Disposal, and Demilitarization

6-1. Nonnuclear missiles and rockets (Category I)

- a. Each Commander having custody of nonnuclear missiles and rockets establish and maintain records which will provide for continuous accountability. This will include those issued for training by requiring the return of unexpended missiles and expended residue. When possible, such records will be maintained by serial number. Incoming shipments will be inventoried promptly after receipt to ensure that all items have been received. All contracts for the procurement of nonnuclear missiles and rockets will provide for individual serialization.
- b. In addition to the inventory requirements in AR 740-26, chapter 2, and AR 710-2, paragraphs 2-12, 2-53, and 3-43, the following apply:

- (1) Unit level. A 100 percent physical count will be taken monthly. A 100 percent physical inventory by serial number will be taken quarterly.
- (2) Depot, post, or base level. A 100 percent inventory will be taken semiannually.

6-2. Arms

a. Arms Serial Number Registration and Reporting.

(1) *DOD Central Registry.* A DOD Central Registry will be maintained to record, by serial number, the ownership account of all arms. AR 710-3, chapter 4, establishes policies and prescribes responsibilities and procedures for serial number registration and reporting of arms belonging to Army units, organizations, activities, and installations which maintain property books and stock record accounts. MACOMs will emphasize the necessity for strict compliance with the prescribed reporting requirements. Questions concerning registry operations will be referred to the DOD Central Registry at: Commander, U.S. Army Armament, Munitions and Chemical Command, ATTN: AMSMC-MMD-LW, Rock Island, Illinois 61299-6000. DSN 793-4678/4977/6519 or commercial (309) 782-4678/4977/6519.

(2) Delineation of responsibilities.

(a) The Department of the Army is the assigned agency responsible for operating and maintaining the DOD Central Registry. This registry maintains control over serial numbers of arms and a file of those arms that have been lost, stolen, demilitarized, or shipped outside the DOD. The DOD Central Registry will be updated by tapes, forwarded to it monthly from the MACOM registries which contain in serial sequence the most recent list of serial numbers of arms for which the MACOM maintains accountability. The tape will also include a history file of arms reported lost, stolen, demilitarized, or shipped outside the control of the DOD.

(b) Each MACOM is responsible for maintaining a mechanized registry for serial numbers of arms in their inventory. The registry will be updated based on transaction reporting, i.e., receipts, issues, and turn ins.

(c) When the DOD Central Registry receives an inquiry concerning a lost, stolen, or recovered weapon that is listed with the registry as DOD property, or as missing from a DOD activity, the Central Registry will inform the affected MACOM registry. Commanders will establish procedures to ensure that such losses, thefts, or recoveries are, or have been, appropriately investigated per paragraph 2-9, and reported as outlined in chapter 8 of this regulation. Commanders will also ensure that MACOM AA&E recovered by police or investigative agencies are returned to MACOM control for disposition upon completion of investigative and prosecutive action.

(3) *Exclusions.* privately-owned arms and arms purchased with nonappropriated funds are exempt from being reported to the DOD Central Registry. However, each post, camp, or station having nonappropriated fund arms will establish procedures to identify such weapons by type and serial number.

(4) Registration and reporting procedures.

(a) The arms serial number registration and reporting procedures will ensure control over all arms serial numbers in the following situations: from the manufacturers to depot; in storage; in transit to requisitioners; in post, camp, or station custody; in the hands of users during turn-ins; in renovation; and during disposal or demilitarization.

(b) The DOD Central Registry will maintain records of: serial number adjustments; shipments to flag rank officers; foreign military sales (FMS) and grant aid; activities outside the control of the Department of Defense; and transfers between DOD components. Incoming shipments will be inventoried promptly after receipt to ensure that all items have been received and entered into the DOD Central Registry or the MACOM registry, as appropriate.

(c) National or DOD Component-assigned stock numbers will be used by the MACOMs for the initial load and all later transactions to the DOD Central Registry.

(d) All arms, regardless of origin, that are accounted for in unclassified property records, will be reported. Automatic weapons will be reported on a priority basis.

(e) Arms with national stock numbers (NSN) or serial numbers, with missing, obliterated, mutilated, or illegible serial numbers, when discovered, will be reported to the DOD Central Registry by the MACOM registry, by message or letter for assignment of NSN and management control number serial number. Request must contain:

1. NSN or "None" if unknown.
2. Serial number or "None" if unknown.
3. Description, to include make, model, caliber, and any or other nomenclature data.

(f) When the DOD Central Registry identifies duplicate serial numbers by weapon type in the MACOMs, instructions will be provided by the U.S. Army Armament Munitions and Chemical Command (AMSMC-MMD-LW) for the modification of the serial numbers. Movement and shipment of weapons will not occur prior to correction of serial numbers.

(g) To ensure the DOD Central Registry is properly maintained, the following is required for small arms shipments: two weapon serial number (WSN) control cards for each weapon in shipment will be attached to the supply documentation; when operational procedures restrict compliance with the two WSN control card requirement, a listing of WSNs will be attached to the supply documentation; and incoming shipments will be opened by a designated receiver and the receipt of each item verified by check of the serial number. However, incoming shipments from new procurement received at depots that are preservation packaged need not be individually checked if the contract provides for a 100 percent serial certification by the contractor which is checked by government contract representatives based

upon acceptable sampling techniques. In this latter case, the receiving activity randomly will sample to verify the accuracy of serial numbers in each shipment from new procurement.

(h) The DOD Component registries will reconcile inter-Service transfers of weapons on a transaction-by-transaction basis. Follow-up procedures will be established to ensure that the loop is closed on inter-Service transfers.

b. Physical inventory control.

(1) All items included in the definition of the term "arms" will be subjected to physical inventory control per AR 740-26, chapter 4. All provisions requiring a high degree of protection and inventory control specified for sensitive items, apply.

(2) Policy and procedures for physical inventory control are per AR 740-26, chapter 4.

(a) The nature and sensitivity of arms control dictates strict adherence to the provisions of AR 740-26, chapter 4, with respect to physical inventories, research of potential inventory adjustments, reversal of inventory adjustments, retention of accountable documentation, quality control, and inventory effectiveness reporting.

(b) The special provisions for controlled inventory items are important to the control of arms. In addition to AR 740-26, the following minimum requirements will be met—

1. *Unit level.* A 100 percent physical count will be taken monthly and an inventory by serial number will be taken quarterly, except for boxed and banded arms. In this latter case, the count and inventory will consist of a 100 percent count as reflected by the number of items listed on the boxes. Any evidence of tampering will be cause for that box to be opened and 100 percent count to be taken of the weapons in the box. The inventory records will be maintained for a minimum of 2 years for inventories that do not reflect discrepancies. Records of inventories that reflect discrepancies will be maintained for a minimum of 4 years.

2. *Depot, post or base level.* Those arms not already entered into the DOD Central Registry will be completely inventoried in conjunction with the serialization reporting program. Therefore, the inventory will be taken once each FY at depot and semiannually at post or base level. These inventories will consist of a 100 percent count as reflected by the number of items listed on the boxes. A complete count will be made of the contents of every box that is opened or damaged. The inventory records will be maintained as required in 1 above.

6-3. Ammunition and explosives

a. All items included in the definition of the terms "Ammunition" and "Explosives" will be subject to physical inventory control procedures per AR 740-26, chapter 4, and AR 710-2, paragraphs 2-12, 2-53 and 3-43. All provisions of AR 740-26, chapter 4, and AR 710-2, chapter 2, requiring a high degree of protection and inventory control specified for sensitive items, apply. Upon receipt a check will be made to verify that all items shipped have been received.

b. Detailed policy and procedures for physical and inventory control of ammunition and explosives are per AR 740-26, chapter 4, and AR 710-2, chapter 2. The nature and sensitivity of ammunition control dictates strict adherence to all provisions with respect to the following:

- (1) Physical inventories.
- (2) Research of potential inventory adjustments.
- (3) Reversal of inventory adjustments.
- (4) Retention of accountable documentation.
- (5) Quality control.
- (6) Inventory effectiveness reporting. The special provisions for controlled inventory items are important in the control of ammunition and explosives.

6-4. Inventory losses

Accounting and inventory losses of AA&E will be processed per AR 735-5, chapter 13, as applicable.

6-5. Inventory effectiveness review

Inventory effectiveness reviews will be conducted by the MACOM concerned on an unannounced basis.

6-6. Disposal and demilitarization

Disposal of all excess and surplus arms, arm parts, ammunition, and explosives is governed by the provisions of DOD 4160.21-M-1 and the demilitarization of AA&E shall be accomplished in accordance with the aforementioned DOD instruction. AA&E undergoing demilitarization must be transported and stored in accordance with this regulation until demilitarization is completed. AA&E being disposed of without demilitarization (FMS, transfer to law enforcement agencies, and the like) will be transported and stored in accordance with this regulation until accountability is transferred. The following applies:

a. *Arms.* A report (transaction) by serial number will be made to the DOD Central Registry upon the demilitarization of each arm that has been previously entered into the DOD central registry.

(1) A report (transaction) will be furnished to the DOD Central Registry in the case of each arm disposed of other than by demilitarization.

(2) A demilitarization certificate will be completed by a technically qualified U.S. Government representative before residue from the demilitarization process is released from U.S. control.

b. Ammunition. Defense Reutilization Marketing Offices (DRMO) are not permitted to receive live ammunition items. DRMO may receive inert ammunition components.

(1) In the United States, ammunition will be demilitarized by a DOD Component activity having such a capability.

(2) Overseas, where U.S. forces do not have the capability to demilitarize ammunition items, demilitarization may be performed by approved contractors who are licensed or controlled by the government of the country in which the contractor operates.

(3) The Military Departments are responsible for the economical and effective demilitarization of ammunition under their accountability. A certificate will be executed by a technically qualified U.S. Government representative for all items demilitarized. (DOD 4160.21-M-1, chapter 2)

c. Explosives. In addition to the requirements above, sales of surplus explosives in the United States are limited to individuals and companies holding a valid user's or dealer's license issued by the Bureau of Alcohol, Tobacco and Firearms, U.S. Department of the Treasury. Overseas sales are limited to companies controlled or licensed by the respective government. Purchasers of explosives must provide a Certificate Regarding End Use of Explosive Materials. (DOD 4160.21-M, chapter 2) Each MACOM will establish procedures to ensure that accountability of items shipped to DRMOs are retained until documents from the DRMO and the transaction records are reconciled.

6-7. Disposal of abandoned and confiscated privately-owned firearms

The Anniston Army Depot, ATTN: SDSAN-DSP-PPC, Anniston, Alabama 36201, is the continental United States (CONUS) disposal facility for shipping abandoned and confiscated privately-owned firearms. The following procedures apply:

a. Prior to shipment, register firearms in the DOD Central Registry per TM 38-214.

b. Use DD Form 1348-1 (DOD Single Line Item Release/Receipt Document) to accomplish supply turn-in transactions with Anniston Army Depot.

c. Ship firearms via registered mail, return receipt requested.

d. Prior to shipment, clear firearms from provost marshal registry files.

Chapter 7 Transportation

7-1. General

This chapter prescribes transportation security standards and procedures to be used in safeguarding categorized AA&E as described in appendix B and for safeguarding uncategorized Class A and B ammunition and explosives. AA&E which are classified will be stored and transported in accordance with this regulation and per AR 380-5, chapters 5 and 8; where specific individual requirements differ between these two documents, the more stringent requirement will be followed.

a. MACOMs will establish security criteria for the intra-installation and unit training movement of AA&E consistent with the philosophy in this chapter.

b. Explosive ordnance disposal teams responding to off-station accidents or incidents will transport necessary explosive ingredients in accordance with requirements established by the MACOM concerned, based on the philosophy contained in this chapter.

c. Commanders will ensure that DOD-procured AA&E items transported from contractor facilities to DOD facilities are shipped in accordance with this chapter. Provisions of AR 55-355, chapter 33, apply concerning shipments of DOD-procured AA&E from contractor facilities to DOD facilities.

7-2. Responsibilities relating to transportation

a. Within their respective areas of responsibilities, overseas theater commanders, and the Commander, MTMC, are responsible for:

(1) Ensuring that the transportation protective measures used for AA&E items are established in applicable tariffs, government tenders, agreements or contracts.

(2) Negotiating with commercial carriers for establishment of transportation protective measures to meet shipper requirements.

(3) Determining the adequacy of the services provided by commercial carriers for movement of AA&E items.

(4) Routing when requested by shipper.

b. In addition, the Commander, MTMC, will—

(1) Develop, administer, and maintain joint transportation security procedures for the commercial movement of AA&E.

- (2) Serve as the DOD focal point for security and performance monitoring and oversight relative to the security of AA&E in transit in the custody of commercial carriers.
- c.* The Military Airlift Command (MAC) is responsible for ensuring the adequacy of the services provided for movement of AA&E items by military airlift, worldwide, and by commercial airlift procured by MAC.
- d.* The Military Sealift Command (MSC) is responsible for ensuring the adequacy of the services provided by military and commercial ocean carriage for movement of AA&E items.
- e.* This chapter does not relieve accountable officers of their responsibility to safeguard and account for property.

7-3. Standards

The following transportation security policy and standards for AA&E by category, as set forth in appendix B, are required to adequately protect such items during shipment. Follow minimum security provisions for commercial transportation of AA&E per AR 55-355, chapter 33. On the basis of threat determination and evaluation of the movement itself, AA&E may be given additional protection, but not less than that required by the category assigned to the item.

- a.* Use of commercial transportation services outside of the CONUS will adhere as closely as practicable to requirements per AR 55-355, chapter 33.
- b.* Overseas MACOMs will prescribe necessary commercial transportation security requirements and coordinate such requirements with host nation authorities. When such services cannot be obtained, compensatory measures will be taken to achieve equivalent security standards. Additionally, compensatory measures will be taken when waivers or exceptions are used.
- c.* The following factors also will be considered:
- (1) Every effort will be made to consolidate shipment into truckload (TL) or carload (CL) quantities. Less than truckload (LTL) shipments are considered more vulnerable to theft.
 - (2) Small arms repair technicians may travel to support facilities to effect on-site repairs instead of shipping of small arms for repair.
 - (3) When practical, arms and ammunition of the same caliber will not be shipped in the same container or conveyance.
 - (4) Where available, export and import shipments will be processed through military managed and operated air and ocean terminals.
 - (5) Shipments of arms and ammunition scheduled for demilitarization and retrograde shipments will receive the same protection as other shipments of AA&E.
 - (6) Missile rounds will be shipped separately from launch control equipment, when feasible.
 - (7) Security provided for AA&E at commercial and military terminals will conform to the standards set forth in appendixes C and D. The standards will be provided to the commercial carriers by MTMC. Follow minimum provisions for commercial transportation of AA&E contained in AR 55-355, chapter 33.
 - (8) When possible, strap cutters should not be attached to palletized unit loads of ammunition prior to arriving at ammunition storage areas. The strap cutters should be shipped separately from the palletized ammunition.
 - (9) Shipments must be checked immediately upon receipt to ensure that the seals are intact and for any signs of damage or tampering. If there are any such signs, there must be an immediate inventory to verify quantities received and to determine the extent of any damage or tampering on all Category I and II AA&E, and classified AA&E shipments. If the seals are intact, quantity verification must take place no later than the next working day. The requirement to check seals and verify quantities received includes shipments of all categories of sensitive or classified AA&E and uncategorized Class A and B ammunition and explosives.
 - (10) For rail shipments of Category I and II items, the carrier must advise the consignee immediately upon arrival of the shipment at the yard serving the consignee and/or immediately upon arrival at the consignee's activity.
 - (11) Uncategorized Class A and B ammunition and explosives shipped by all modes will be afforded the same protection as Categories III and IV, unless otherwise directed in writing by the military department service headquarters.
 - (12) Enhanced transportation security measures for use during terrorist threat conditions are set forth in appendix I.
 - (13) Provisions of AR 190-14, paragraph 3-3, apply to transportation of individual weapons aboard commercial aircraft.
 - (14) When weapons are required to accompany a unit movement by commercial transportation, the commander or person in charge of the unit movement will contact the provost marshal and transportation office concerned for technical advice and instructions relative to such shipments.
 - (15) Crew served weapons will not be left mounted or stowed inside vehicles during unit movement by commercial transportation. Such weapons will be shipped according to paragraph 7-19. When this requirement cannot be met due to unit contingency or operational readiness requirements, waivers may be requested (see para 2-4). Adequate compensatory security measures will be established. MACOMs concerned will coordinate such waiver requests with MTMC.

7-4. Special considerations for Category I items

a. In addition to minimum security standards prescribed in paragraph 7-19, shipments of Category I material by all modes shall provide a continuous audit trail from shipper to consignee with advance certification of serial numbers of individual items or certified items. Two-man certification is required; that is, each container must be checked by two responsible agents of the shipper, and sealed and locked in their presence before delivery to the carrier. This rule applies at transshipment points and terminals whenever the original shipment loses its original identity; for example, when two or more shipments are consolidated into another container for further movement or if repacking is required.

b. When moved by unit or organization transportation, Category I material will be placed in the custody of a commissioned officer, warrant officer, noncommissioned officer (E-5 and above or DOD civilian grade GS-5 or above). Shipments or movements will be under armed guard surveillance.

c. Overseas commands may use local national personnel for armed guard surveillance when status of forces agreement prohibit arming of U.S. personnel.

7-5. Physical security standards for sensitive AA&E

Shipments (as defined in chapter 1) by motor vehicle, railcar, ship, and aircraft are outlined in paragraph 7-19. Follow minimum security provisions for transportation of AA&E per AR 55-355, chapter 34.

7-6. Special considerations for water shipments

a. Security of shipments must be an integral part of prestowage planning. Considerations include:

- (1) Segregation of cargo.
- (2) Cargo in locked and sealed containers.
- (3) SEAVAN and MILVANS stowed so doors are not accessible to stevedores or ship's crew.
- (4) Break bulk cargo stowed in following order or priority; lockers, refrigerator boxes or deep tanks that can be locked and sealed; bins that can be boxed solidly with plywood or other appropriate materials and stowed in the upper tween decks of the hatches immediately fore and aft of the ship's house.

b. Specific locations of classified and protected sensitive shipments, with any special considerations, will be indicated on the final stow plan and given to the responsible ship's officer.

c. Vessel movements of U.S.-owned AA&E to and from overseas locations and intra-theater movements are normally limited to MSC controlled vessels; or when the above are not available, U.S. flag vessels or MSC approved local national chartered vessels.

7-7. Consideration for air movements

See paragraph 7-19.

7-8. Special consideration for small quantity shipments

Small quantity shipments for the purposes of these provisions shall be shipments of 200 pounds or less, or in the case of small arms, 15 or less individual weapons per shipment.

a. *Registered mail.* Arms and missile components (excluding ammunition and explosives) may be sent by registered mail (return receipt requested) when the size and weight meet U.S. Postal Service requirements.

b. *DOD Constant Surveillance Service (CSS).* Small amounts of unclassified Category IV AA&E and uncategorized Class A and B ammunition and explosives may be transported using only DOD CSS when loaded in an authorized container and size, weight, and safety factors otherwise meet commercial carrier requirements.

7-9. Organic and unit movements

Organic movements will adhere as closely as possible to the commercial standards set forth in paragraph 7-19. Where military personnel are employed in Armed Guard Surveillance (AGS), either in connection with organic or unit moves, or in connection with commercial carrier moves, such personnel may be armed with an individual weapon other than a shotgun at the discretion of the local commander.

7-10. Commercial movements

Shipments to be transported by commercial carriers will be per AR 55-355, chapter 33, and as summarized in paragraph 7-19. Carrier employees will meet the requirements of paragraph 2-12.

7-11. Overseas in-theater movements

Outside continental United States (OCONUS) commanders, based on host nation requirements, the local threat situation and personnel staffing, will use discretion in providing adequate security in theater when transporting AA&E cargo. Transportation service outside of CONUS will adhere as closely as possible to the established requirements for CONUS shipments. When such service cannot be obtained, compensatory measures will be taken to achieve equivalent security standards.

7-12. Foreign military sales (FMS) shipments

a. DOD officials authorized to approve an FMS transaction that involves the delivery of sensitive U.S. AA&E to a foreign purchaser will, at the outset of negotiation or consideration of proposal, consult with DOD transportation authorities (MTMC, MSC, MAC, or other) to determine whether secure shipments from the CONUS point of origin to the ultimate foreign destination is feasible. Normally, the United States will use the Defense Transportation System (DTS) to deliver sensitive AA&E to the recipient government.

(1) If, in the course of FMS case processing, the foreign purchaser proposes to take delivery and custody of the AA&E in the United States and use its own facilities for transportation for onward shipment to its territory, the foreign purchaser or its designated representative will be required to submit a transportation plan for DOD review and approval.

(2) This plan, as a minimum, will specify—

(*a.*) The storage facilities.

(*b.*) Delivery and transfer points.

(*c.*) Carriers, couriers or escorts.

(*d.*) Methods of handling to be used from the CONUS point of origin to the final destination and return shipment when applicable.

(3) Security officials of the agency that initiates the FMS transaction will evaluate the plan to determine whether the plan adequately ensures protection of the most sensitive category of AA&E involved.

(4) Unless the agency initiating the FMS transaction approved the transaction plan as submitted, or it is modified to meet U.S. security standards, shipment by other than DTS will not be permitted.

(5) Transmission instructions or the requirement for an approved transportation plan will be incorporated into the security requirements of the U.S. DOD letter of offer and acceptance.

(6) Requests for exception to policy will be per AR 12-1, paragraph 2-4, and forwarded to HQDA (DAMO-ODL-S). An information copy will be provided to CDR, MTMC, ATTN: MT-SS, and HQDA (DAMO-ODL-S).

b. Shipment will be made in accordance with this chapter, until released to an authorized representative of the purchasing government at the port of embarkation (POE) or port of debarkation (POD) as appropriate.

c. As indicated in paragraph 7-12, shipments of classified AA&E to foreign government will be per AR 380-5, chapter 8.

d. During the FMS negotiations, the purchasing government will be advised of the applicability of this regulation to the security sensitive AA&E to be procured. Shipments will be closely coordinated with the authorized representative of the purchasing government to ensure secure storage facilities that essentially meet the requirements of this regulation are available at the POE and POD before the shipments are delivered and released to the recipient country agent in CONUS.

e. For overseas movement, Category I AA&E will be under U.S. security control to POD unless waived by the Defense Security Assistance Agency in coordination with the Director, Security Plans and Programs, Office of the Deputy Under Secretary of Defense for Policy, and FMS agreements will be so written. Return of Category I shipments from overseas will be placed under U.S. security control upon arrival at customs territory of the U.S. (CTUS).

f. HQDA (DAMO-ODL-S) will task the appropriate MACOM to inspect CONUS and OCONUS storage sites at which AA&E for foreign military sales are stored. Results of inspections will be reviewed by DAMO-ODL-S and forwarded with concurrence or nonconcurrence to DCSLOG. Requirements for storage of AA&E in chapter 4 will apply.

7-13. Contract movements

a. DA contracts that procure arms, ammunition, and explosives requiring transportation protective service will normally be written to require free on board (FOB) origin only. For shipment of DOD-procured AA&E contracts will be written to require transportation security per AR 55-355, chapter 33. Contracts will also specify contractor involvement in emergency response procedures and provide compliance with the AR 55-355, chapter 33, concerning carrier employee identification requirements.

b. DOD AA&E cargo procured under third party contracts will be shipped in accordance with requirements as stated in this regulation. All such shipments are further restricted to military controlled ports or commercial ports safety-approved by the DOD Explosives Safety Board and security-approved by the MTMC, as applicable. These requirements are also applicable to DOD contracts involving foreign procured (OCONUS) AA&E.

c. For deliveries of AA&E to DOD or DOD contractors from foreign contractors, the contract monitor will coordinate with applicable theater commands to arrange equivalent in-country security for delivery only to the nearest U.S.-controlled port facility.

7-14. Security of commercial shipments at DOD installations and activities

a. For AA&E shipments arriving at a destination during other than normal delivery hours, consignees that have the

capability to secure the shipments will accept the vehicle on their facilities and secure the vehicle according to the level of transportation protection required for the applicable category.

b. For uncategorized Class A and B ammunition and explosives, consignees must be able to provide a safe haven in accordance with AR 55–355, chapter 33.

c. For emergency situations including breakdowns or other circumstances beyond the carrier's control, installations having safe havens will receive and secure the vehicle after the carrier has exhausted all other means to protect it. For deliveries of AA&E to DOD and DOD contractors from foreign contracts, the contract monitor will coordinate with applicable theater commands to arrange equivalent in-country security for delivery only to the nearest U.S.-controlled port facility.

7–15. Movement of AA&E by unit or organization transportation

a. It is prohibited to carry, move, or store AA&E in privately-owned vehicles (POVs) either on or off installations.

b. Commanders will ensure that enough security measures are taken to protect AA&E being moved by unit or organization transportation, on or off installations. Security measures established will be in accordance with the philosophy of this chapter. AA&E items will not be left unattended or unsecured at any time.

c. Categories I and II AA&E will be placed in the custody of a commissioned officer, warrant officer, noncommissioned officer (E–5 and above), or DOD civilian (GS–5 and above), or DOD contractor employee in a similarly responsive position. Categories I AA&E will be provided armed guard surveillance. Categories II AA&E will be provided armed guard surveillance provided State or territorial law does not prohibit the arming of the guards. In the event that State and territorial law prohibits arming of guards for Category II AA&E, a request for exception to this requirement along with the compensatory security measures will be submitted according to paragraph 2–4.

d. Category III and IV AA&E will be under the continuous positive control of designated, responsible personnel.

e. Movement security criteria does not apply to AA&E issued to individual soldiers or units performing mission requirements. See chapter 2 for physical security requirements of AA&E deployed in the field for training or operational purposes.

f. Bulk shipments of AA&E by unit transportation will be placed in approved shipping containers, for example, CONEX, MILVAN, SEAVAN. The container will be secured with approved locks.

(1) Containers will be placed door-to-door or door-to-immovable object to prevent unauthorized entry.

(2) A detailed packing list will be placed in the container for inventory purposes with serial numbered items listed by serial number.

(3) AA&E shall not be left unsecured in vehicles.

7–16. Provost marshal and security office support

The local or supporting provost marshal and security office will provide assistance to installation transportation officers in matters relating to physical security requirements for transportation and storage of AA&E.

7–17. Control of protective security seals

Protective security seals used to show the integrity of ammunition and explosives shipments (commercial and organizational) will be accounted for and secured at all times to prevent theft and unauthorized use. Additional pertinent considerations are contained in paragraph 7–3.

7–18. Transportation of marksmanship weapons and ammunition

Marksmanship weapons and ammunition may be transported to, from, and between ranges, matches, and authorized storage locations in POVs in a secure manner as possible, consistent with the design of the vehicle. Such items must be protected from view, and must not be left unattended during halts. Storage during overnight halts or matches must be in accordance with paragraphs 4–16 and 5–8.

7–19. Security standards for AA&E shipments

a. *Category I.*

(1) *Motor — TL:*

(a) Satellite Motor Surveillance Service (SM) and Dual Driver Protective Service with National Agency Check (DN/WAC).

(b) Exclusive use of vehicle.¹

(c) Locked and sealed by shipper.²

(d) Single-line haul required.

(e) Trip lease not authorized.

¹ When vehicle is loaded to full visible capacity, do not request exclusive use of vehicle.

² Shipper seal may be removed and replaced by carrier seal (DTMR, chapter 34).

³ Refer to AR 55–355, chapter 34, for additional mandatory transportation requirements.

- (f) When two or more vehicles are in convoy, drivers must be in sight of other vehicles at all times. Convoy will only require a single escort vehicle.
- (2) *Motor — LTL:*
- (a) SM and DN.³
- (b) CONEX, dromedary, or similar container authorized.
- (c) Locked and sealed by shipper.²
- (d) Single-line haul required.
- (e) Exclusive use of vehicle or authorized container.
- (3) *Rail.*
- (a) AGS.⁴
- (b) MTX⁴.
- (c) Locked and sealed by shipper.^{2/5}
- (d) Immediate notification to consignee of delivery.
- (e) Use appropriate Category I motor security for associated motor movement.
- (f) Use load divider doors when available.
- (4) *COFC.*
- (a) In rail phase, same as Category I rail, in motor phase, same as Category I motor.
- (b) Use only approved shipping containers and place on railcar door-to-door to prevent unauthorized access; e.g., MILVAN, SEAVAN.
- (5) *Air.*
- (a) SM and DDPS (w/NAC) during ground transport.
- (b) Shipments by Air Freight, Air Taxi, LOGAIR, QUICKTRANS, or MAC.
- (c) DOD CSS while aircraft on ground at commercial airports.
- (d) For air freight, banded or locked and sealed required. For all other methods, banded or locked and sealed required.
- (e) Seals applied by shipper.
- (6) *Water.*
- (a) SM and DDPS to POE and from POD.
- (b) Pier service only.
- (c) Written receipt from ship's officer at POE and written release to carrier at POD.
- b. *Category II.*
- (1) *Motor — TL:*
- (a) SM and DN (W/ANAC).³
- (b) Exclusive use of vehicle.¹
- (c) Locked and sealed by shipper.²
- (d) Single line-haul required.
- (e) Trip lease not authorized.
- (2) *Motor — LTL.^{6/7}*
- (a) SM and DD (W/NAC).³
- (b) CONEX, dromedary, or similar container authorized.
- (c) Cargo packed to a weight of at least 200 lbs. and banded (sealed if practicable) or container locked and sealed by shipper.^{2/8}
- (d) Single line-haul required.
- (e) Trip lease not authorized.
- (3) *Rail.*
- (a) RSS⁴.
- (b) MTX⁴.

⁴ When AGS and RSS apply, shipper must report railcar initials and numbers (for example, DODX 40000) to the appropriate MTMC area command to obtain MTX service.

⁵ Includes use of upper rail lock.

⁶ When practicable, consider sending 15 or fewer Category II, III, and IV small arms and missile components by registered mail (Return Receipt Requested).

⁷ Shipments of Category IV AA&E and uncategorized classes of A and B ammunition and explosives with gross weight of less than 200 pounds may be sent by commercial carriers offering DOD CSS without overpacking.

⁸ MILSTD 129 applies.

- (c) Locked and sealed by shipper.^{2/5}
- (d) Immediate notification to consignee of delivery.
- (e) Use appropriate Category III or IV motor security for any associated motor movement.
- (f) Use load divider when available.
- (4) *COFC*.
 - (a) In rail phase, same as Category III or IV; in motor phase, same as Category III or IV motor.
 - (b) Use only approved shipping containers and place on railcar door-to-door to prevent unauthorized access; e.g., MILVAN, SEAVAN.
- (5) *Air*.
 - (a) DOD CSS.
 - (b) Shipments by Air Freight, Air Taxi, LOGAIR, QUICKTRANS, or MAC.
 - (c) Shipper escort to carrier and immediate pickup at destination.
 - (d) For air freight, banded or locked and sealed required. For all other methods, banded or locked and sealed if practicable.
 - (e) Seals applied by shipper.⁹
- (6) *Water*.
 - (a) Pier Service only.
 - (b) Written receipt from ship's officer at POE and written release to carrier at POD.
- c. Categories III, IV and Uncategorized Classes A and B Ammunition and Explosives.*
- (1) *Motor — TL*:
 - (a) SM and DD (W/NAC).³
 - (b) Locked and sealed by shipper.²
 - (c) Trip lease not authorized.
 - (d) Single line-haul preferred.
- (2) *Motor — LTL*.^{6/7}
 - (a) SM and DD (W/NAC) ³.
 - (b) CONEX, dromedary, or similar container authorized.
 - (c) Cargo packaged to a weight of at least 200 lbs. and banded (sealed if practicable) or container locked and sealed by shipper.^{2/8}
 - (d) Trip lease not authorized.
 - (e) Single line-haul preferred.
- (3) *Rail*.
 - (a) RSS.⁴
 - (b) MTX.⁴
 - (c) Locked and sealed by shipper.^{2/5}
 - (d) Immediate notification to consignee of delivery.
 - (e) Use appropriate category III or IV motor security for any associated motor movement.
 - (f) Use load divider doors when available.
- (4) *Rail*.
 - (a) In rail phase, same as for rail category III and IV; in motor phase, same as motor category III and IV.
 - (b) Use only approved shipping containers and place on railcar door-to-door to prevent unauthorized access; e.g., MILVAN, SEAVAN.
- (5) *Air*.
 - (a) DOD CSS.
 - (b) Shipments by Air Freight, Air Taxi, LOGAIR, QUICKTRANS, or MAC.
 - (c) Shipper escort to carrier and immediate pickup at destination.
 - (d) For air freight, banded or locked and sealed required. For all other methods, banded or locked and sealed if practicable.
 - (e) Seals applied by shipper.⁹
- (6) *Water*.
 - (a) Pier service only.

⁹ Air carriers providing pickup and delivery service by motor vehicle must comply with all applicable motor security requirements for the risk category during the motor phase. These protective services must be specified in appropriate Uniform Tenders of Service.

- (b) Written receipt from ship's officer at POE and written release to carrier at POD.

Chapter 8 Reports, Investigative Aids, and Disposition of Records

8-1. General

The provisions of this chapter do not preclude the submission of other reports, such as the requirements in AR 55-38/NAVSUPINST 4610.33B/AFR 75-18; MCOP 4610.19C/DLAR 4500.15, chapters 2 and 3. The provisions of this chapter do not apply to privately-owned weapons.

8-2. Incident reports to components

a. Each MACOM will establish procedures to ensure receipt of a report of arms, ammunition, and explosives stolen, lost, unaccounted for, or recovered, including gains or losses due to inventory adjustments. Notification will be furnished in a manner commensurate with the seriousness or nature of the incident. The loss, theft, recovery, or inventory adjustment of the following will be reported:

- (1) Missiles, rockets, and arms as set forth in appendix B.
 - (2) One-thousand rounds or more of ammunition smaller than 40mm and 1,000 rounds or more of 40mm automatic weapon ammunition.
 - (3) Individual rounds of 40mm and larger nonautomatic weapon ammunition.
 - (4) Individual mortar, grenade, and missile rounds.
 - (5) Individual land mines, demolition charges, and blocks of bulk explosives.
 - (6) Other items with 10 or more pounds of net explosive weight.
 - (7) Any Category I or Category II item not otherwise included above.
 - (8) Commanders will—
 - (a) Submit a serious incident report (SIR) if required by AR 190-40, paragraph 4-9.
 - (b) Within 72 hours provide a report on DA Form 3056 (Report of Missing/Recovered Firearms, Ammunition, and Explosives) (RCS Just-1010)) on incidents meeting criteria in *a* above. Inventory and in-transit losses or discrepancies of AA&E, not due to theft, recovered within 12 days, need not be reported on DA Form 3056.
 - (c) Initiate a report of recovery on DA Form 3056 for AA&E items held as evidence by any local, State, or Federal law enforcement agency in the area. Notify the commander having lost the items.
 - (d) Promptly submit appropriate report to the NCIC and DOD Central Registry (see para 8-3).
 - (e) Ensure the dollar value of the loss or recovery is included in section H, DA Form 2819 (Law Enforcement and Discipline Report) per AR 190-45, paragraph 6-3.
 - (f) Conduct investigations per AR 15-6, chapters 3 through 5, as specified in paragraph 2-9 when losses equal or exceed the amounts shown in appendix E. AR 15-6 investigations may be conducted for lesser amounts.
 - (g) Reports will include incidents involving arms and ammunition meeting criteria in *a* above, in the custody of a nonappropriated fund activity (such as an exchange, rod and gun club, or recreational marksmanship activity).
- b. The Director, Security Plans and Programs, Office of the DUSDP (ODUSDP), will be provided advice by telephone from the HQDA of all significant incidents of theft, loss, or unaccounted for AA&E as soon as possible but not later than 72 hours after occurrence or discovery. Loss or theft of the following A&E will be considered significant (see AR 190-40, para 4-9, for further guidance).

- (1) One or more missile or rocket rounds.
 - (2) One or more machine guns.
 - (3) Five or more automatic or semiautomatic weapons.
 - (4) Five or more manually operated weapons.
 - (5) Ammunition.
 - (a) .50 caliber and smaller — 5,000 rounds or more, except 20,000 rounds or more of .38 caliber ammunition.
 - (b) Larger than .50 caliber — five rounds or more of nonautomatic weapon ammunition.
 - (c) Larger than .50 caliber — 1,000 rounds or more of automatic weapon ammunition.
 - (d) Five or more fragmentation, concussion, or high explosive grenades.
 - (e) One or more mines (antipersonnel and antitank).
 - (f) Demolition charges, blocks of explosives, and other explosives — 100 pounds or more net weight.
- c. Also reportable are:
- (1) Armed robberies or attempted armed robberies.
 - (2) Forced entries or attempted forced entries in which there is physical evidence of the attempt.
 - (3) Any evidence of terrorist involvement.

(4) Incidents that cause significant news coverage, or appear to have the potential to cause such coverage.

(5) Any evidence of trafficking, such as bartering for narcotics or taking AA&E across international borders, regardless of the quantity of AA&E involved.

d. Procedures for reporting significant loss, theft, and recovery of AA&E and for reporting of actual or attempted break-ins of AA&E storage facilities are per AR 190–40, paragraph 4–9. Commanders will ensure timely submission of SIR. Significant initial and follow-up data must be provided to answer questions who, what, where, when, how, and why concerning the incident. Provide information on physical security measures taken to prevent recurrence of similar incident. Additionally, if any loss or recovery involved inventory or accountability standards, list procedures in effect. If actual or attempted forced entry is involved, show—

(1) Time of discovery.

(2) Method of entry or attempted entry.

(3) Measures used to neutralize or bypass security measures.

(4) AA&E or other items missing, if any.

(5) Physical security posture of facility at time of incident, use of guards, IDS, barriers, and other security measures.

(6) Date of last survey or inspection.

(7) Compliance with regulatory physical security requirements.

e. MACOMs will maintain records including, at the very minimum, all instances of thefts, losses, and recoveries of AA&E, including any reported under a above. Requirement also applies to ARNG and Civilian Marksmanship Program (CMP). These records will include:

(1) A summary of the circumstances in each instance.

(2) Dates, locations, and units such as Regular, Reserve, National Guard, or Director of Civilian Marksmanship.

(3) A statement regarding the loss or recovery based on the investigation, such as inventory, theft, in-transit, training, operational, or other.

f. HQDA will provide the Director, Security Plans and Programs, ODUSP, follow-up information, in writing, of significant incidents until the investigation is complete. MACOMs, ARNG, and CMP will provide the follow-up information to HQDA (DAMO-ODL-S).

8–3. Investigative aids

HQDA will establish procedures to ensure that appropriate information is submitted to the NCIC and to the DOD Central Registry promptly upon the discovery of the loss or theft of DOD arms. Information also will be submitted to the NCIC and the DOD Central Registry upon recovery of DOD arms. Appropriate information on the theft or suspected theft of AA&E also will be provided to local Federal Bureau of Investigation (FBI) officers and local police. The following procedures apply:

a. Lost, stolen, or recovered weapons will be entered in the NCIC per AR 190–27, section 2, paragraph 6.

b. USACIDC will provide the Bureau of Alcohol, Tobacco and Firearms (BATF) Intelligence Division, BATF Headquarters, Department of the Treasury, Washington, DC 20226, information concerning theft or loss of AA&E falling within their investigative purview, within 72 hours of confirmed theft or loss.

c. CONUS installation commanders, provost marshals (PMs), or their designated representatives, will send DA Form 3056 to the NCIC Army Field terminal responsible for the geographical area in which the installation is located. Proper entry will be made in the NCIC. OCONUS installation commanders, PMs, or their designated representatives, will send the completed DA Form 3056 to Director, Crime Records Center (CRC), 2301 Chesapeake Avenue, Baltimore, MD 21222–4099. Lost, stolen, or recovered weapons entries into the NCIC from overseas commands will be made by Director, CRC.

d. CONUS Army field terminals, after making entry into the NCIC, will annotate Item 11 of DA Form 3056 and distribute the form per instructions on the form.

e. Ammunition and explosive losses or recoveries will not be entered in the NCIC files.

f. Lost, stolen, or recovered weapons will be promptly entered in the DOD Central Registry per AR 710–3, chapter 4. Information on the source of the weapon report will be included. Recovered weapons will be cleared from the NCIC files.

g. Military weapons will be accepted from civil (local, State, and Federal) law enforcement agencies. A weapon will be accounted for per AR 735–5, chapter 14, if both of the following apply:

(1) The weapon can be identified as a military weapon. If the weapon satisfies the general specifications for a military weapon, assume that it is a military weapon; a serial number or other identification is desirable, but not required.

(2) The weapon is no longer required for evidence in criminal or administrative proceedings.

h. To identify weapon ownership, personnel may contact the DOD Central Registry at: Commander, U.S. Army Armament Munitions and Chemical Command, ATTN: AMSMC–MMD–LW, Rock Island, Illinois 61299–6000, DSN 793–4678/4977/6519 or commercial (309) 782–4678/4977/6519. Recovered weapons identified as property of another DOD agency will be returned to that agency only upon request of the agency concerned. Normally, the weapons will

be considered Army property and treated as such. Serviceable weapons should be returned immediately to normal use if required by the activity. The weapon may be excess or not authorized to support the mission of the activity. If so, the weapon will be reported to the proper national weapons inventory manager for redistribution or reuse. If the national weapons inventory manager provides disposal instructions, the activity will dispose of the weapon according to existing disposal and demilitarization procedures.

- i.* Address inquiries on loss, theft, or recovery of firearms, ammunition, and explosives to HQDA (DAMO-ODL-S).

8-4. Disposition of records

a. DA Components (MACOMs, ARNG, and CMP) will establish procedures to ensure that records reflect the final disposition of investigative action, including recoveries and disciplinary action, as appropriate.

b. Information pertaining to the final disposition of investigative action will be made to the Director, Security Plans and Programs, ODUSDP, by HQDA, per paragraphs 8-2*b* and 8-2*c*. MACOMs, ARNG, and CMP will provide the information to HQDA (DAMO-ODL-S).

Appendix A References

Section I Required Publications

AR 12-1

Security Assistance—Policies, Objectives, and Responsibilities (Cited in para 7-12).

AR 15-6

Procedures for Investigating Officers and Boards of Officers Conducting Investigations (Cited in paras 2-9 and 8-2).

AR 50-6-1

Chemical Agent Security Program (Cited in para B-2).

AR 55-38

Reporting of Transportation Discrepancies in Shipments (NAVSUPINST 4610.33B/AFR 75-18/MCOP 4610.19C/DLAR 4500.15). (Cited in para 8-1).

AR 55-355

Defense Traffic Management Regulation (NAVSUPINST 4600.70/AFR 75-2/MCO P4600.14B/DLAR 4500.3). (Cited in paras 1-1, 4-5, 7-3, 7-5, 7-10, 7-13, and 7-14).

AR 190-13

The Army Physical Security and Crime Prevention Program. (Cited in paras 1-4, 1-5, 2-1, 2-6, 2-10, 3-1, 3-2, 3-5, 4-2, 4-7, 4-8, and 6-3).

AR 190-22

Searches, Seizures, and Disposition of Property. (Cited in para 4-5).

AR 190-27

Army Participation in National Crime Information Center (NCIC). (Cited in para 8-3).

AR 190-40

Serious Incident Report. (Cited in paras 1-4 and 8-2).

AR 190-45

Military Police Law Enforcement Reporting. (Cited in para 8-2).

AR 190-51

Security of Army Property at Unit and Installation Level. (Cited in paras 4-1, 3-13, and 4-6).

AR 190-56

The Army Civilian Police and Security Guard Program. (Cited in para 2-10).

AR 380-5

Department of the Army Information Security Program. (Cited in paras 1-1, 3-6, 3-8, 4-3, 5-6, 5-12, 7-1, 7-12, and F-1).

AR 380-67

Personnel Security Program. (Cited in paras 2-12, and 3-6).

AR 385-64

Ammunition and Explosives Safety Standards. (Cited in paras 1-1, 5-2, and 5-4).

AR 700-99

Acquisition, Accounting, Control, and Disposal of Captured Enemy Equipment and Foreign Materiel. (Cited in para 4-12).

AR 710-2

Supply Policy Below the Wholesale Level. (Cited in paras 2-6, 2-8, 4-1, 4-5, 6-1, and 6-3).

AR 710-3

Asset and Transaction Reporting System. (Cited in paras 4-13, 6-2, and 8-3).

AR 735-5

Policies and Procedures for Property Accountability. (Cited in paras 2-9, 6-4, and 8-3).

AR 740-26

Physical Inventory Control. (Cited in paras 2-6, 5-2, 6-1, and 6-3).

DA Pam 710-2-1

Using Unit Supply System Manual Procedures. (Cited in paras 2-1, 2-2, and 2-6).

Section II**Related Publications****AR 11-2**

Internal Control Systems

AR 708-1

Cataloging and Supply Management Data

AR 870-20

Museums and Historical Artifacts

CDA Pam 18-1

Code Reference Guide (This publication is available upon request from Chief, U.S. Army Materiel Command, Catalog Data Activity, ATTN: AMXCA-DL, New Cumberland Army Depot, New Cumberland, PA 17070-5010.)

DA Pam 385-64

Ammunition and Explosives Safety Standards

DA Pam 710-2-2

Supply Support Activity Supply System Manual Procedures

DOD 4000.25-8-M

Military Assistance Program Address Directory System (MAPAD)

DOD 4145.26-M

Department of Defense Contractors Safety Manual for Ammunition and Explosives

DOD 4160.21-M

Defense Utilization and Disposal Manual

DOD 4160.21-M-1

Defense Demilitarization Manual

DOD 4500.32-R

Military Standard Transportation and Movement Procedures (MILSTAMP), Volume I

DOD 5160.65-M

Single Manager for Conventional Ammunition Implementing Joint Conventional Ammunition Policies and Procedures

DOD 5200.1-R

Information Security Program Regulation

DOD 5200.2-R

Department of Defense Personnel Security Program

DOD 5220.22–M

Industrial Security Manual for Safeguarding Classified Information

DOD 5220.22–R

Industrial Security Regulation

DOD 6055.9–STD

DOD Ammunition and Explosives Safety Standards

DOD 7200.10–M

Department of Defense Accounting and Reporting of Government Property Lost, Damaged, or Destroyed

DOD Directive 3224.3

Physical Security Equipment: Assignment of Responsibility for Research, Engineering, Procurement, Installation, and Maintenance

DOD Directive 5100.76

Physical Security Review Board

DOD Directive 5210.65

Chemical Agent Security Program

DOD Instruction 4150.35

Physical Inventory Control for DOD Supply System Materiel

DOD Instruction 5200.30

Physical Security of Sensitive Conventional Arms, Ammunition, and Explosives at Contractor Facilities

FM 19–30

Physical Security

JCS Pub. 1

Department of Defense Dictionary of Military and Associated Terms

MIL–HDBK–1031/1

Military Handbook, Design Guidelines for Physical Security of Fixed Land–Based Facilities

18 USC 842(J)

Title 18, United States Code, 842(J) (27 CFR 55, subpart k, sections 207 and 208)

49 USC 1801 and 1805

Title 49, United States Code, Sections 1801–1805 (49 CFR 177)

TM 9–1300–206

Ammunition and Explosives Standards

TM 38–214

DOD Small Arms Serialization Program (DODSASP): Functional Users Procedures

Section III**Prescribed Forms**

Authority is given for the exact duplication of any DA or DD Forms prescribed in this regulation that are generated by the automated Military Police Management Information System in place of the official printed version of the form.

Forms that have been designated, “Approved for electronic generation (EG),” must replicate exactly the content (wording), format (layout), and sequence (arrangement) of the official printed form. The form number of the electronically generated form will be shown as “–R–E” and the date will be the same as the date of the current edition of the printed form.

DA Form 3056

Reporting of Missing/Recovered Firearms, Ammunition, and Explosives (Prescribed in paras 2-10, 7-2, and 7-3. Approved for EG.)

DA Form 4604-R

Security Construction Statement (Prescribed in para 2-2. Approved for EG.)

DA Form 4930-R

Alarm/Intrusion Detection Record (Prescribed in para 3-6. Approved for EG.)

DA Form 7281-R

Command Oriented Arms, Ammunition, and Explosives (AA&E) security Screening and Evaluation Record (Prescribed in para 2-11. Approved for EG.)

DA Form 5513-R

Key Control Register and Inventory. (Prescribed in para 3-8.)

Section IV**Referenced Forms****DA Form 2028**

Recommended Changes to Publications and Blank Forms

DA Form 2609

Historical Property Catalog

DA Form 2819

Law Enforcement and Discipline Report

DA Form 3749

Equipment Receipt

DD Form 1348-1

DOD Single Line Item Release/Receipt Document

SF 700

Security Container Information

Appendix B Sensitive Arms, Ammunition, and Explosives (AA&E) Security Risk Categorization

B-1. Application

The requirements of this regulation apply only to rounds of 40mm and larger, conventional, guided missile and rocket ammunition weighing 100 pounds or less per round, and 1,000 or more rounds of ammunition smaller than 40mm. Blank ammunition, .22 caliber rimfire ammunition, and inert training ammunition are excluded from the requirements of this regulation. Further, artillery, tank, mortar ammunition, 90mm and larger are excluded from the requirements of this regulation.

a. On the basis of their relative utility, attractiveness, and availability to criminal elements, all AA&E will be categorized according to the risks involved. As a general rule, only arms, missiles, rockets, explosive rounds, mines, and projectiles that have an unpacked unit weight of 100 pounds or less will be categorized as sensitive for purposes of this regulation. Any single container that contains a sufficient amount of spare parts that, when assembled, will perform the basic function of the end item will be categorized the same as the end item.

b. The categories of missiles, rockets, and arms will be as stated in paragraph B-2. Nonnuclear missiles and rockets similar to those listed under Category I will automatically be included in that category as they come into the inventory.

c. Identifications, codings, corollary plans, and actions for physical security accountability and transportation pertaining to sensitive conventional arms, rockets, missiles, ammunition, and explosives will be uniform throughout the DOD. These items will be integrated into standard catalog data by all services and will be included in applicable documents that address physical security, accountability, storage, transportation, and other related functional activities. The JOCG through tri-service coordination, will use the Decision Logic Formulas (tables B-1 to B-6), and will determine the appropriate categories for ammunition and explosives items. Those responsible for the physical security of facilities storing AA&E will look up the assigned categories in the Army Master Data File (AMDF). Examples of sensitive ammunition and explosive items are shown in paragraph B-2.

d. To ensure a uniform approach to sensitive item identification and coding, AMC will incorporate the criteria into their respective cataloging policies and procedures. The criteria will also become a part of the federal cataloging system. Sensitive AA&E items are identified by the controlled item codes per AR 708-1, chapter 7. These codes indicate the controls required for storing and transporting each category of AA&E and are listed in the AMDF. The AMDF is the official source of current security risk codification of all sensitive AA&E items. Codes assigned to specific AA&E items are shown in the monthly AMDF near the center of the microfiche under the column "(CIIC)." The AMDF microfiche for AA&E, and Catalog Data Activity (CDA) Pamphlet 18-1, Code Reference Guide, are available upon request from Chief, U.S. Army Materiel Command, Catalog Data Activity, ATTN: AMXCA-DL, New Cumberland Army Depot, New Cumberland, PA 17070-5010. The basic responsibility for the assignment and correction of the codes rests with the designated data proponent. Per AR 708-1, chapter 5, U.S. Army Armament, Munitions, and Chemical Command is primarily responsible for materiel management for weapons and ammunition; U.S. Army Missile Command is primarily responsible for materiel management of large rockets and guided missiles per AR 708-1, chapter 5. Further information or assistance regarding security risk codification may be obtained by contacting the AMC Logistics Assistance Offices which are located at selected installations Army-wide.

e. AMC will revise, as appropriate, ammunition and explosives codings by means of routine catalog data changes. The exception to applying the methodology in *c* above shall be when tri-Service agreement is reached on a case-by-case basis to place an item in a higher or lower security risk category than that indicated by the total numerical value.

B-2. Representative risk categories

a. Category I (missiles and rockets).

(1) Nonnuclear manportable missiles and rockets "in a ready to fire" configuration; for example, Hamlet, Redeye, Stinger, Dragon, Javelin, light antitank weapon (LAW) and Viper. The AT-4 antitank weapon is also included.

(2) This category also applies where the launcher tube and the explosive rounds are jointly stored or transported.

b. Arms.

(1) *Category II.* Light automatic weapons, including .50 caliber, M16A2 rifle, Squad Automatic Weapon (SAW), and 40mm MK 19 machine gun.

(2) *Category III.*

(a) Launch tube and gripstock for Stinger missile.

(b) Launch tube, sight assembly, and gripstock for Hamlet and Redeye missiles.

(c) Tracker for Dragon missiles.

(d) Mortar tubes up to and including 81mm.

(e) Grenade launchers.

(f) Rocket and missile launchers, unpacked weight of 100 pounds or less.

(g) Flame throwers.

(h) The launcher or missile guidance set or the optical sight for the ground mounted TOW.

(i) Launch control unit for Javelin missile.

- (3) *Category IV.*
- (a) Shoulder-fired weapons, other than manportable missiles, rockets, and grenade launchers, not fully automatic.
- (b) Handguns.
- (c) Recoilless rifles, including 90mm.
- c. *Ammunition and explosives.*
- (1) *Category I.* Explosive complete rounds for Category I missiles and rockets (See a(1) above).
- (2) *Category II.*
- (a) Hand or rifle grenades, high explosive, and white phosphorus.
- (b) Mines, antitank, or antipersonnel (unpacked weight of 50 pounds or less each).
- (c) Explosives used in demolition operations; for example, C-4, military dynamite, and TNT.
- (d) Critical binary munitions components containing “DF” and “QL” when stored separately from each other and from the binary chemical munition bodies in which they are intended to be employed (See AR 50-6-1, chap 5 and app D, Chemical Agency Security Program, for security requirements of other chemical agents).
- (3) *Category III.*
- (a) Ammunition, .50 caliber and larger, with explosive filled projectile (unpacked weight of 100 pounds or less each).
- (b) Grenades, incendiary, and fuzes for high explosive grenades.
- (c) Blasting caps.
- (d) Supplementary charges (uninstalled, or installed in projectiles in a manner allowing easy removal without special tools or equipment).
- (e) Bulk explosives.
- (f) Detonating cord.
- (4) *Category IV.*
- (a) Ammunition with nonexplosive projectile (unpacked weight of 100 pounds or less each).
- (b) Fuzes, except for (3)(b), above.
- (c) Grenades, illumination, smoke, and CS/CN (tear producing).
- (d) Incendiary destroyers.
- (e) Riot control agents, 100 pound package or less.
- (f) Ammunition for weapons in (3), above, not otherwise categorized.

Table B-1
Decision Logic Formulas (DLFs)

Factor: 1**Utility:** High**Casualty/Damage Effect:** High**Adaptability:** Without modification**Portability:** Easily carried or concealed by one person.**Factor: 2****Utility:** Moderate**Casualty/Damage Effect:** Moderate**Adaptability:** Slight modification**Portability:** Can be carried by one person for short distances.**Factor: 3****Utility:** Low**Casualty/Damage Effect:** Low**Adaptability:** Major modification**Portability:** Requires at least two persons to carry.**Factor: 4****Utility:** Impractical**Casualty/Damage Effect:** None**Adaptability:** Impractical**Portability:** Requires materials handling equipment (MHE) to move.

Table B-2
Risk Factors—Utility

Risk Factor: 1**Utility:** High**Description:** High explosive, concussion, and fragmentation devices.**Risk Factor: 2****Utility:** Moderate**Description:** Small arms ammunition.**Risk Factor: 3****Utility:** Low**Description:** Ammunition items not described above—NONLETHAL, civil disturbance chemicals, incendiary devices.**Risk Factor: 4****Utility:** Impracticable**Description:** Practice, inert, or dummy munitions; small electric explosive devices; fuel thickening compound; or items possessing other characteristics which clearly and positively negate potential use by terrorist, criminal, or dissident functions.

Table B-3
Risk Factors—Casualty/Damage Effect

Risk Factor: 1**Casualty/Damage Effect:** High**Description:** Extremely damaging or lethal to personnel; devices which will probably cause death to personnel or major material damage.**Risk Factor: 2****Casualty/Damage Effect:** Moderate**Description:** Moderately damaging or injurious to personnel; devices which could probably cause personnel injury or material damage.**Risk Factor: 3****Casualty/Damage Effect:** Low**Description:** Temporarily incapacitating to personnel.**Risk Factor: 4****Casualty/Damage Effect:** None**Description:** Flammable items and petroleum based products readily obtainable from commercial sources.

Table B-4
Risk Factors—Adaptability

Risk Factor: 1**Adaptability:** Without**Description:** Unusable as is; simple to function without modification use of other components.**Risk Factor: 2****Adaptability:** Slight Modification**Description:** Other components required; or can be used with slight modification.**Risk Factor: 3****Adaptability:** Major Modification**Description:** Requires the use of other components which are not available on the commercial market; or can be used with modification that changes the configuration.**Risk Factor: 4****Adaptability:** Impracticable**Description:** Requires specified functions or environmental sequences which are not readily reproducible, or construction makes it incapable of producing high order detonation; for example, gas generator grains, and impulse cartridges.

Table B-5
Risk Factors—Portability

Risk Factor: 1**Adaptability:** High**Description:** Items which easily can be carried by one person and easily concealed.**Risk Factor: 2****Adaptability:** Moderate**Description:** Items whose shape, size, and weight allows them to be carried by one person for a short distance.**Risk Factor: 3****Adaptability:** Low**Description:** An item whose shape, size, and weight requires at least two persons to carry.**Risk Factor: 4****Adaptability:** MHE Required**Description:** The weight, size, and shape of these items preclude movement without MHE.

Table B-6
Computation of risk factor numerical values¹

Evaluation: High Sensitivity**Numerical Values of Risk Factors:** (4-5)**Physical Security Risk Category Code:** II**Evaluation:** Moderate Sensitivity**Numerical Values of Risk Factors:** (6-8)**Physical Security Risk Category Code:** III**Evaluation:** Low Sensitivity**Numerical Values of Risk Factors:** (9-12)**Physical Security Risk Category Code:** IV**Notes:**¹ AMC shall use the logic formula in table B-1, to determine the numerical values and the physical security risk category codes as shown above. (Use only one factor value for each column and total the numbers for each column to obtain the security risk category.)

Appendix C Physical Security Standards for Commercial Terminals (Extracted from DOD 5100.76–M)

C–1.

Table C–1 lists levels physical security standards for commercial terminals carrier service on Government Bill of Lading (GBL). This information is an extract from DOD 5100.76–M.

C–2.

Table C–1
Physical Security Standard for Commercial Terminals

If the carrier service on the GBL is: Armed Guard Surveillance (AGS)

Equivalent terminal standards are: Stop must be at a carrier terminal, a State or local safe haven under 49 CFR or during emergencies, at a DOD safe haven or refuge location. The vehicle or shipment must be under constant surveillance by an armed guard specifically dedicated to the shipment or shipments secured in an adequately lighted area that is surrounded by a chain link fence, minimum height 6–feet, and continuously patrolled by an armed carrier or terminal employee who checks the shipment at least once every 30 minutes.

If the carrier service on the GBL is: Protective Security Service (PSS)

Equivalent terminal standards are: If the shipment is unloaded from a conveyance, it must be at a facility cleared under the Defense Industrial Security Program or at a DOD safe haven and be placed under constant surveillance by a qualified carrier representative. As an alternative, the shipment may be placed in a closed area, vault or strongroom approved by the Defense Investigative Service. Construction standards for closed areas, vaults, and strongrooms are contained in DOD 5220.22–M, appendixes IV and V.

If the carrier service on the GBL is: Dual Driver Protective Service (DDPS)

Equivalent terminal standards are: Stop must be at a carrier terminal, a State or local safe haven under 49 CFR or, during emergencies, at a DOD safe haven or refuge location. The vehicle or shipment must be under constant surveillance by a qualified carrier or terminal representative who must keep the shipment in unobstructed view at all times and stay within 10 feet of the vehicle or the shipment must be secured in a fenced and lighted area under the general observation of a qualified carrier or terminal representative at all times. As an alternative, the shipment may be placed in a security cage.

If the carrier service on the GBL is: DOD Constant Surveillance Service (CSS)

Equivalent terminal standards are: Stop must be at a carrier terminal, a State or local safe haven under 49 CFR or, during emergencies, at a DOD safe haven or refuge location. The vehicle or shipment must be under constant surveillance by a qualified carrier or terminal representative who must keep the shipment in view at all times and stay within 100 feet of the vehicle or the shipment must be secured in a fenced and lighted area under the general observation of a qualified carrier or terminal representative at all times. As an alternative, the shipment may be placed in a security cage.

If the carrier service on the GBL is: Rail Surveillance Service (RSS)

Equivalent terminal standards are: Within rail yards, RSS applies. Within other terminals, shipment shall be secured in a fenced and lighted area under the general observation of a qualified carrier or terminal representative at all times.

If the carrier service on the GBL is: Signature and Tally Record

Equivalent terminal standards are: Each person responsible for proper handling of a shipment during any terminal stop must sign the signature and tally record at the time they assume responsibility for a shipment. The shipment must always be in the custody of the last person signing the signature and tally record.

If the carrier service on the GBL is: Security Cage Requirements

Equivalent terminal standards are: Shall be in accordance with requirements identified in DOD 5220.22–M, appendixes IV and V.

Appendix D

Physical Security Standards for Military Terminals (Extracted from 5100.76–M)

D–1. Introduction

This appendix prescribes standards for protection of sensitive conventional AA&E military transportation terminals. It also applies to sensitive classified AA&E that meet requirements of DOD 5200.1–R, as implemented by AR 380–5. When a terminal has a separate, long–term storage mission, storage criteria of chapters 4 and 5 of this regulation apply to the long–term storage areas of the terminal. Criteria for commercially operated, in–transit transportation terminals are found in appendix B.

D–2. Security priorities

The provisions of this appendix are based on the following priorities for cargo and area security protection. Responsible MACOMs will ensure that security resources are allocated to meet the highest priority requirements first. The priorities, in descending order, are:

- a. Category I cargo protection.
- b. Pier and waterfront security.
- c. Category II cargo protection.
- d. Gates and perimeter security.
- e. Category III and IV cargo protection.
- f. Support activity security.

D–3. Risk category identification

Terminals will establish procedures to ensure prompt identification of the risk categories of arriving cargo in order to provide security protection required by this regulation. When cargo cannot be immediately identified upon arrival, it will be secured as Category I pending identification.

D–4. Temporary storage

a. Category I and II cargo.

(1) *Fencing.* Category I and II cargo will be stored only in fenced and lighted areas dedicated to cargo storage. Fencing requirements in DOD 5100.76–M, chapter 5, section C, apply.

(2) *Supplemental controls.*

(a) Category I temporary storage areas or individual conveyances will be equipped with IDS or provided constant surveillance. Pending installation of IDS, the intervals between checks may not exceed 1 hour. When IDS is used, patrol intervals may not exceed 8 hours.

(b) Category II temporary storage areas or individual conveyances will be equipped with IDS or checked by a guard patrol at irregular intervals not to exceed 1 hour while in storage. When IDS is used, patrol intervals may not exceed 16 hours.

b. Category III and IV munitions cargo.

(1) *Fencing.* Category III and IV cargo will be enclosed within barbed wire fencing where terminal perimeter fencing is not in place or does not meet the criteria of this regulation. New security lighting systems may not be programmed for Category III and IV storage areas unless determined necessary based on an assessment of the local threats and vulnerabilities.

(2) *Supplemental controls.* IDS may not be programmed for Category III or IV storage areas unless determined necessary based on an assessment of the local threats and vulnerabilities. Cargo that is protected by IDS will be checked by a guard patrol at irregular intervals not to exceed 48 hours. Unalarmed cargo will be checked at least once each 24 hours.

(3) *Placement of cargo.* Placement of cargo other than Category I and II in fenced or lighted areas will be in priority order based on the risk category of cargo.

D–5. Cargo movement

a. Category I and II.

(1) Each Category I conveyance or integrated grouping of five or fewer conveyances moved within the terminal will be under continuous surveillance of at least one terminal employee or selected contractor employee under contract to the terminal to handle cargo. Where the terminal area is physically separated from a long–term storage area, movement between these areas will be under continuous armed guard surveillance, with two drivers for each conveyance.

(2) Each Category II conveyance or integrated grouping of five or fewer conveyances moved within the terminal will be under continuous surveillance of at least one terminal employee or selected contractor employee under contract to the terminal to handle cargo. Where the terminal area is physically separated from a long–term storage area, movement between these areas will be under continuous employee surveillance, with two drivers for each conveyance.

b. Category III and IV cargo.

(1) Category III and IV cargo will be moved within the terminal under the general surveillance of the terminal or contractor employees moving the cargo. There is no distance requirement for general surveillance. However, procedures for movement will ensure cargo is either within sight of employees or is provided the required guard patrol checks for storage areas.

(2) Where the terminal area is physically separated from a long-term storage area, movement between these areas will be under continuous surveillance of at least one terminal employee or selected contractor employee for each conveyance.

D-6. Terminal area security

a. Waterfront and Ships at Berth. Piers and adjacent waterfront areas without cargo or ships will be patrolled at least hourly by an armed guard. When ships are at berth, piers will be patrolled by armed guard at irregular intervals not to exceed 30 minutes. IDS may be used at the terminal commander's discretion. When IDS is used, the patrol frequency may extend to 4 hours for piers or waterfront without ships or cargo. When cargo is present, armed guards, IDS surveillance, or patrol checks will be as prescribed for the highest category of cargo or at intervals not to exceed 30 minutes whichever is more stringent. Waterborne patrols will be used to augment land based patrols where feasible.

b. Terminal Gates and Perimeter Areas. Terminal gates require continuous armed guard protection or surveillance while in use. Secured gates and perimeter areas require IDS protection or patrol checks at least once each 4 hours. When IDS is used, patrol intervals may extend to 24 hours.

D-7. Seals and twists

Terminals will install an approved seal on all AA&E conveyances on which the original shipper seal is removed. Additionally, all conveyances will have a No. 5 steel wire twist installed on door openings if the seal does not provide equivalent protection. Seal and twist checks for evidence of breakage or tampering will be made a part of regular patrol or surveillance procedures and of pier loading procedures. Category I and II seals will be verified by number once each shift.

D-8. Guard protection and surveillance

The requirements in chapter 5, section E, this regulation apply.

D-9. Terminal entry controls

a. Terminals will be closed areas with strict vehicle and pedestrian entry controls. All pedestrians or vehicles will be subject to search, and a visitor control system will be established. When feasible, entry to the AA&E storage and processing areas will be separately controlled from the terminal administrative areas. privately-owned vehicles may not be allowed into AA&E storage and processing areas of the terminal without the Terminal Commander's permission. Hunting, if allowed, will be rigidly controlled and minimized.

b. Piers, waterfront, and AA&E storage and processing areas will be designated and posted as restricted areas.

Appendix E

Losses/Overages List for AR 15–6 Investigations

E–1. General

Appendix B describes in detail items that must be secured according to this regulation. When losses equal or exceed the amounts shown below, commanders will conduct investigations under AR 15–6, chapters 3 through 5, and as specified in chapter 2 of this regulation. AR 15–6 investigations may be conducted for lesser amounts.

a. Missiles and rockets. All nonnuclear missile systems in a ready-to-fire configuration or when the launcher tube and explosive rounds are jointly stored or transported.

b. Arms. One or more of the following:

- (1) Machineguns and automatic weapons up to and including .50 caliber.
- (2) Launch tube and gripstock for Stinger missile.
- (3) Launch tube, sight assembly, and gripstock for Hamlet and REDEYE missiles.
- (4) Tracker for Dragon Missiles.
- (5) Mortar tubes.
- (6) Grenade launchers.
- (7) Rocket and missile launchers, unpacked weight of 100 pounds or less.
- (8) Flame thrower.
- (9) Launcher and/or missile guidance set and/or the optical sight for the TOW.
- (10) Shoulder-fired weapons, other than grenade launchers, not fully automatic.
- (11) Handguns.
- (12) Recoilless rifles up to and including 90mm.
- (13) Major parts (e.g., barrels, frames, receivers, major subassemblies).
- (14) Subcaliber training aids capable of firing a projectile by means of a powder charge.
- (15) Other individually operated weapons that are:

(a) Portable and can be fired without special mounts or firing devices.

(b) Have potential use in civil disturbances.

(c) Vulnerable to theft.

c. Ammunition and explosives.

(1) One or more of the following:

(a) Explosive complete rounds or warheads for Category I missiles and rockets.

(b) Hand or rifle grenades (fragmentation, high explosive, concussion, white phosphorus, or incendiary).

(c) Mortar rounds up to and including 81mm.

(d) Mines, antitank, or antipersonnel.

(e) High-explosive complete rounds or war-heads for missiles and rockets other than Category I (unpacked weight of 50 pounds or less each).

(f) Safety and arming device.

(g) Incendiary destroyer.

(h) 40mm grenades for grenade launcher.

(i) Demolition kits.

(2) Ten pounds or more of explosives used in demolition operations (e.g., C-4; military dynamite, TNT, etc.).

(3) 100 or more blasting caps, detonators, destruction or firing devices, primers, squibs, and ignitors.

(4) 100 or more fuzes.

(5) 100 or more supplementary charges.

(6) 100 or more explosive bolts, explosive cartridges, and related devices.

(7) 50 pounds or more bulk explosives.

(8) 1000 feet or more detonating cord and safety fuse.

(9) Two or more riot control agents, 100-pound package or less.

(10) Two or more rounds of ammunition of 40mm and larger nonautomatic weapon.

- (11) One or more artillery, naval, tank, and mortar ammunition, 75mm and larger.
- (12) Ammunition for weapons in paragraph *b* above, not otherwise categorized.
- (13) One box or more (normally 16 or more) grenades, illumination, smoke, and CS/CN (tear producing).
- (14) End items of conventional and guided missile ammunition (except artillery rounds, bombs, and torpedoes) that:
 - (a) Have an individual item (for example, unit of issue) container or package weight of 60 pounds or less.
 - (b) Have potential use in civil disturbances.
 - (c) Are vulnerable to theft.

E-2. Title not used

Paragraph not used.

Appendix F

Specification for Intrusion Detection System Signs

F-1. Specification for Intrusion Detection System Signs

A sample intrusion detection system sign that may be used is shown below in figure F-1. The sign is flat with shape, size, and legend as shown. The sign face should consist of reflectorized sheeting bonded to an aluminum backing.

F-2. Sign Composition

Sign backing is flat, degreased, etched, and unpainted aluminum alloy, type 6061T6, not less than $\frac{1}{16}$ -inch thick. For interior posting, plastic or wood could be used.

F-3. Overseas Areas

In non-English speaking overseas areas, a sign in the language of the host country, should be mounted alongside the English language sign. In U.S. states and possessions where a major minority language is spoken, similar signs may be posted as a safety precaution.

Figure F-1. Sample Intrusion Detection System Sign

Appendix G Criteria for Facilities Storing Sensitive AA&E

G-1. New facility criteria

If Category II arms are to be stored in new facilities built for the principal purpose of storing arms, the facilities will meet the following facility criteria.

a. Walls. Walls will consist of 8 inches of concrete reinforced with No. 4 reinforcing bars at 9 inches on center in each direction, or 8-inch concrete block with No. 4 bars threaded through direction, or 8-inch concrete block with No. 4 bars threaded through block cavities filled with mortar or concrete and with horizontal joint reinforcement at each course.

b. Ceilings and roofs. Reinforcing bar spacing shall form a grid so that the area of any opening does not exceed 96 square inches using No. 4 bars or larger. The ceiling or roof shall be of concrete construction. The thinnest portion may not be less than 6 inches.

c. Floors. Floors, if on grade, will be a minimum of 6 inches concrete construction reinforced with 6 inches by 6 inches—W4 by W4 mesh or equivalent bars. Where the floor slab acts as the ceiling of an under-lying room or area, the ceiling standards apply.

d. Doors. Doors will be constructed of 1³/₄-inch thick solid or laminated wood with 12-gauge steel plate on the outside face, or will be standard 1³/₄-inch thick, hollow metal, industrial-type construction with minimum 14 gauge skin plate thickness, internally reinforced vertically with continuous steel stiffeners spaced 6 inches maximum on center. Doors used for access to arms storage facilities will meet the above structural standards. Double door protection for arms storage facilities is not required. When double-door protection on existing facilities provides protection equivalent to that of doors constructed according to above standards, modification to meet that requirement will not be undertaken.

(1) Door bucks, frames, and keepers will be rigidly anchored and provided with antispread space filler reinforced to prevent disengagement of the lock bolt by prying or jacking of the door frame. The frames and locks for both interior and exterior doors will be so designed and installed as to prevent sufficient removal of the frame facing or the built-in locking mechanism to allow disengagement of the lock bolt from outside a secured room when the door is closed and locked.

(2) Construction requirements for door frames and thresholds will be as exacting as those for the doors themselves. For example, where metal doors are used, the frame and thresholds will be of metal. A GSA approved class 5 armory door or GSA approved Class 5 vault door with a built-in, three-position, dial-type, changeable combination lock, may be used instead of other doors or locks.

(3) Various types of hinges are commercially available. When choosing the proper type of hinge for secure area doors, hinges will be of the fixed pin security hinge type or equivalent; exposed hinge pins will be pinned, spot welded, or otherwise secured to prevent removal; and hinge mounting screws may not be exposed to the outside of the arms room except for class 5 steel vault door hinges.

e. Windows and other openings. Windows and other openings will be sealed with material comparable to that forming the adjacent walls and otherwise limited to the minimum essential. Windows, ducts, vents, or similar openings of 96 square inches or more with the least dimension greater than 6 inches will be equipped with any of the following:

(1) Three-eighth inch or larger hardened steel bars, provided the vertical bars are not more than 4 inches apart with horizontal bars welded to the vertical bars so that the openings do not exceed 32 square inches.

(2) Number 8 gauge high carbon manganese steel mesh with 2-inch diamond grid.

(3) Number 6 gauge steel mesh with 2-inch diamond grid when number 8 in (2) above, is not available.

(4) Bars or steel mesh will be securely embedded in the structure of the building or welded to a steel frame that will be securely attached to the wall with fastenings inaccessible from the exterior of arms storage facility.

G-2. Criteria for facilities storing II through IV arms.

The following exceptions to the new facility criteria are permitted for storing Category II through IV arms in an existing facility located on or off a military installation.

a. Doors, windows and other openings.

(1) *Doors.* At a minimum, doors shall be constructed of 1 3/4-inch thick, solid, core wood with wood block cores on 1 3/4-inch thick hollow metal, with minimum 16-gauge skin plate thickness.

(a) Door frames will be a minimum of 16 gauge steel.

(b) Door hinges shall not be exposed to the outside of the arms storage area and hinge pins shall be secured to prevent removal.

(c) Doors shall be secured with authorized padlocks.

(2) *Windows and other openings.* Windows and other openings shall be kept to a minimum. When provided, windows and other openings will be secured as required in paragraph G-1e.

b. *Walls, ceilings, roofs, and floors.* Walls of existing 8-inch reinforced solid brick, 8-inch reinforced concrete block with voids filled with concrete, or 12-inch nonreinforced solid brick. Ceilings, roofs, and floors of existing facilities will be reinforced concrete at a minimum, the thinnest portion may not be less than 6 inches. Ceilings, roofs, and floors of ARNGUS arms rooms, built prior to 1 January 1997, will be at least 5 inches at the thinnest portion. Walls, ceilings, roofs, and floors that does not meet these structural criteria will be reinforced by one of the following methods:

(1) *Steel bars.* Three-eighth inch steel bars, 4 inches apart with horizontal bars welded to the vertical bars so that the openings do not exceed 32 square inches. Ends of the steel bars will be embedded securely in the structure of the building or welded to a steel frame securely fastened to the building.

(2) *Steel landing mat.* Marsten, Irving, or pierced steel planking.

(3) *Expanded metal.* Three-sixteenth-inch with a maximum grid opening of 1-inch by 3-inches and weighing a minimum of 4.27 pounds according to square foot.

(4) *Steel plate.* One-fourth-inch steel plate.

(5) *Steel mesh.* Number 8-gauge high carbon manganese steel, or for existing facilities, number 6-gauge cold drawn steel wire with a grid of not more than 2 inches center to center. The number 6-gauge material is not authorized for future upgrading.

(6) *Sheet metal.* For existing facilities, 16-gauge steel sheets or plates securely fastened together. This material is not authorized for future upgrading.

(7) *Reinforcing materials.* When the above reinforcing materials are used, they will be applied and fastened to the existing structure so that destruction of the existing and reinforcing materials is required to remove them.

c. *Doors, windows, and other openings.* At a minimum, doors will be constructed of 1³/₄-inch thick, solid, or laminated wood, or be of standard 1³/₄-inch thick hollow metal, industrial type construction with minimum 16-gauge skin plate thickness. At a minimum, windows and other openings will be constructed to provide equivalent penetration resistance as that provided by the walls.

d. *Other.* All other criteria listed in paragraph G-1 for new facilities will apply for facilities storing Category III arms.

G-3. Rescinded.

Appendix H

Physical Security Standards for DOD AA&E at contractor-owned, contractor-operated (COCO) Facilities (Extracted from DOD 5100.76–M)

A. Security Criteria

The following security criteria apply to AA&E in appendix B.

1. *Accountability.* The contractor shall be required to:
 - (a) Have or establish an accountability system for both explosive components and end items produced under a DOD contract, or furnished or released to a contractor by the Department of Defense. The records kept under the system shall reflect nomenclature and serial number; amounts produced, shipped, and on hand; and the location of explosive components and end items.
 - (b) Review accountability records and conduct quarterly inventories where bulk storage is involved. The contractor shall inventory uncrated items and items in unsealed crates by serial number, and sealed crated arms by counting of sealed crates and containers. At facilities where weapons are tested, there shall be daily inventories of weapons drawn from storage for testing purposes.
 - (c) Dispose of residual material in accordance with the instructions of the government contracting officer and DOD 4160.21–M–1 (reference (o)).
2. *Security.* The contractor shall be required to provide a security system which includes the following:
 - (a) *Isolated Area.* Risk category AA&E storage areas in an isolated area not under constant surveillance shall be physically checked on a random basis not less than once every four hours.
 - (b) *Perimeter Control.* Provide perimeter control through the application of procedures and barriers to ensure that unauthorized individuals are unable to enter sensitive areas.
 - (c) *Entry Control.* Provide positive access control through the application of equipment and procedures to ensure the following objectives are met:
 - (1) Limit access to authorized personnel.
 - (2) Require identification prior to entry.
 - (3) Require an established need for access.
 - (d) *Lighting.* Provide production and storage area exterior lighting of sufficient intensity for guards or other personnel in the area to recognize illegal or unauthorized activities. Locations appropriate for lighting include perimeters and entrances to storage areas, buildings, and corridors. Light switches on the outside of buildings shall be secured or inaccessible to unauthorized persons.
 - (e) *Facility Construction.* Construct facilities for unattended storage of sensitive AA&E as prescribed in attachments 1, 2, and 3 as applicable. Use Military Handbook MIL–HDBK 1013/1 (reference (t)) or other appropriate DOD security engineering guidelines for information.
 - (f) *Key and Lock Control.* Establish key and lock control systems that are compatible with the guidelines provided in chapter 3, section H of this Manual except that completed key control registers shall be kept on file for 180 days and inventory records shall be kept on file for two years. Records shall be disposed of in accordance with government contracting officer's instructions.
 - (g) *Response Force.* Provide an armed patrol capable of investigating local threats and which is available to respond to the detection of intruder(s). This force may include or consist entirely of local, state and/or federal law enforcement agencies; however, prior agreements or arrangements must be documented and coordinated as appropriate. Such agreements or arrangements must be kept current.
 - (h) *Additional Security Measures.* Review weapon system production lines before operations to identify potential diversion risks or pilferable items which may require adjunctive physical security measures to prevent theft. The identified vulnerabilities and implemented physical security measures shall be incorporated into the contractor's security procedures and be available for government review. Measures may include:
 - (1) Additional barriers.
 - (2) Use of metal detectors at exit control points.
 - (3) Separation of privately-owned vehicle parking from the production area, shipping and receiving areas, and refuse containers.
 - (4) Internal surveillance using closed circuit television.
 - (5) A determination must be made where and at what point in the production process a weapon should be protected as a risk category item. During periods when the production line is unattended weapons must be removed to storage areas, or the production line must be protected.
 - (i) *Classified AA&E.* Contractors manufacturing, storing, transporting, or otherwise holding classified AA&E will be cleared in accordance with reference(s).
3. *Storage Areas.* The contractor will be required to ensure the facilities in which AA&E are located during nonworking hours or while unattended for extended periods of time are:
 - (a) Constructed to meet the requirements of this appendix with appropriate attachments. In contractor facilities

where 30 or fewer arms are located, a class 5 safe or safe-type steel file container with built-in Group IR changeable combination lock may be used for storage. Such containers will provide forced entry protection as specified by GSA, or burglar resistance as listed by the Underwriters Laboratories (UL). Containers meeting UL certification for Class TL-15 may be used instead of GSA-approved class 5 containers.

(b) Protected by:

- (1) A security force available within 15 minutes of notification.
- (2) Intrusion detection system (IDS). This applies to all storage facilities containing sensitive arms, regardless of risk category, and Categories I and II nonnuclear missiles, rockets, ammunition and explosives.
- (3) Constant surveillance if an operational IDS is not present. This applies to Categories I and II AA&E.
- (4) Patrol checks by a security force at random intervals at least every 8 hours when IDS is present. This applies to Categories I and II AA&E. Patrol checks are not required for Categories III and IV AA&E storage protected by an operational IDS.

4. Intrusion Detection Systems.

(a) All materials and equipment used in the IDS must meet the criteria prescribed in UL Standards for Intrusion Detection Units, UL-639, and be listed with the UL. A list of manufacturers of UL Listed IDS equipment can be found in the UL Automobile, Burglary Protection, and Mechanical Equipment Directory under Intrusion Detection Units (ANSR). Copies of the directory may be obtained from Underwriters Laboratories, Inc., Publication Stock, 333 Pfingsten Road, Northbrook, IL 60062.

(b) All material and equipment used for the IDS will be installed in accordance with the criteria established for Extent No. 3 in the UL Standards for Installation and Classification of Mercantile Bank Burglar Alarm Systems, UL-681.

(c) The construction, performance and operation of equipment intended for the use in proprietary systems must be in accordance with the criteria established for Grade AA and Installation No. 3 systems in UL Standards for Proprietary Burglar Alarm Units and Systems, UL-1076. A list of UL Listed manufacturers who install proprietary systems can be found in the UL Automobile, Burglary Protection, and Mechanical Equipment Directory under Proprietary Alarm Systems (CVWX).

(d) The operation of electrical protection circuits and devices that are signaled automatically, recorded in, maintained in, and supervised from a central station having trained operators and alarm investigators in attendance at all times must be in accordance with the criteria established for Grade AA and Installation No. 3 systems in UL Standards for Control-Station, Burglar Alarm Systems, UL-611. Available UL certified central control stations can be located in the UL Automobile, Burglary Protection, and Mechanical Equipment Directory under Central Station (CPVX).

(e) IDS must be tested monthly and records maintained of these tests.

B. Incident Reports

Contractors are required to report all losses and thefts of Risk Category AA&E to the DIS cognizant industrial security office no later than 72 hours after initial discovery. Similar information should also be given to the FBI and DOD Component Major Command. Local law enforcement agencies will be notified.

C. Security Procedures

The contractor will be required to develop written procedures designed to ensure compliance with the physical security standards of this appendix. The procedures shall be available at the contractor's facility for review by Government representatives.

D. Security Surveys and Inspections

To ensure that a prospective contractor will satisfy physical security requirements of this appendix, a preaward security survey may be performed by government contracting agency security personnel. Regardless of whether such a preaward survey is conducted, security inspections will be performed by the DIS cognizant industrial security office at recurring 18 month intervals during the period of the contract to ensure compliance with this appendix.

E. Waivers

Requests for waivers to the DOD security requirements of this manual shall be submitted, in writing, by the contractor to the government procurement contracting officer who shall coordinate such requests with the DIS Cognizant Security Office. Requests for waivers with recommendations shall be forwarded to the DOD Component Major Command for decision. Waivers normally may be granted for a period of 1 year and may be extended only after a review of circumstances necessitating an extension. Each extension shall state first extension, second extension, etc. Requests for waivers shall include a statement as to why the contractor is unable to meet requirements and outline compensatory measures proposed by the contractor to provide equivalent or better protection than the original standard. Copies of approved waivers shall be furnished to the applicable DIS Cognizant Security Office and DOD Component Major Command. Copies of approved waivers applying to commercial carrier's transportation minimum security standards

with compensatory measures taken shall be forwarded to the Commander, Military Traffic Management Command, ATTN: MT-IN, Washington, DC 20315.

F. Exceptions

Requests for exceptions to the DOD security requirements of this manual shall be submitted, in writing, by the contractor to the Government procurement contracting officer who shall coordinate such requests with the DIS Cognizant Security Office. Requests for exceptions with recommendations shall be forwarded to the DOD component Major Command for decision. Requests for exceptions shall include a statement as to why the contractor is unable to meet the requirements and compensatory or equivalent protection measures proposed by the contractor to provided comparable security.

Attachments

1. Category I and II Nonnuclear Missiles, Rockets, Ammunition and Explosives — Storage.
2. Category II Arms — Storage.
3. Category III and IV Arms, Ammunition and Explosives — Storage.
4. Arms Parts — Storage.
5. Significant Incidents Pertaining to Arms, Ammunition and Explosives.
6. Cognizant DIS Industrial Security Offices

ATTACHMENT 1 CATEGORY I AND II NONNUCLEAR MISSILES, ROCKETS, AMMUNITION, AND EXPLOSIVES — STORAGE

A. New Construction

1. AA&E listed under Category I and II shall be stored in structures meeting construction requirements as specified in DOD 6055.9-STD (reference (g) or DOD 4145.26-M (reference (u))). Determinations of the suitability of new structures will be provided to the DIS cognizant security office by the DOD Component Major Command.

2. Storage areas shall be surrounded with chain link security fencing approved by the DOD Component Major Command. Minimum height of fencing shall be 6 feet.

3. Locks.

a. Doors shall be secured by a high security padlock (military specification MIL-P-43607G) and hasp (military specification MIL-H-43905B or H-29181/1 (YD)), or other comparable hasps and locking hardware approved by the DOD Component Major Command. Component approved hasps and locks shall be specified in the contract. Storage facilities equipped with a Class 5 GSA-approved steel vault door with a group 1R changeable combination lock, are authorized instead of other doors and locks. Doors that cannot be secured from the inside with locking bars or deadbolts shall be secured on the inside with padlocks which meet or exceed military specification MIL-P-17802D (Grade II, Class 1, Type A). Panic hardware, when required, shall be so installed as to prevent opening the door by manipulation from the outside. Panic hardware will be secured after close down and freed prior to facility occupancy by means which are acceptable to safety officials.

b. A Class 5 steel vault door with a built-in, group 1R changeable combination lock, or key operated high security padlock and hasp (above military specifications), shall be used on doors to structures housing classified AA&E.

B. Existing Construction

The DOD Component Major Command may permit storage of Category I and II items in existing types of structures if, in the opinion of the Major Command, equivalent security is provided and all other security requirements are met. Determinations of the suitability of existing structures will be provided to the DIS Cognizant Security Office by the DOD Component Major Command.

ATTACHMENT 2

CATEGORY II ARMS — STORAGE

A. New Construction

1. Category II arms shall be stored in facilities meeting the following design criteria:

a. *Walls.* Walls shall consist of 8 inches of concrete reinforced with No. 4 reinforcing bars at 9 inches on center in each direction and staggered on each face to form a grid approximately 4½ inches square, 8 inch concrete block with No. 4 bars threaded through block cavities filled with mortar or concrete and with horizontal joint reinforcement at every course, or at least 8 inches of brick interlocked between inner and outer courses.

b. *Ceilings and Roofs.* Reinforcing bar spacing shall form a grid so that the area of any opening does not exceed 96

square inches, using No. 4 bars or larger. If the ceiling or roof is of concrete pan-joint construction, the thinnest portion may not be less than 6 inches and the clear space between joints may not exceed 20 inches; the reinforcing grid requirements for flat slab construction also apply.

c. Floors. Floors, if on grade, shall be a minimum of 6 inch reinforced concrete construction. Where the floor slab acts as the ceiling of an underlying room or area, the ceiling standards apply.

d. Doors.

(1) Doors shall be constructed of 1¾-inch thick solid or laminated wood with 12-gauge steel plate on the outside face, or shall be of standard 1¾-inch thick, hollow metal, industrial-type construction with minimum 14 gauge skin plate thickness, internally reinforced vertically with continuous steel stiffeners spaced 6 inches maximum on center.

(a) Door bucks, frames, and keepers shall be rigidly anchored and provided with antispread space filler reinforcement to prevent disengagement of the lock bolt by prying or jacking of the door frames. The frames and locks for both interior and exterior doors shall be so designed and installed as to prevent sufficient removal of the frame facing or the built-in locking mechanism to allow disengagement of the lock from outside a secured room when the door is closed and locked.

(b) Construction requirements for door frames and thresholds shall be as stringent as those for the doors themselves. For example, where metal doors are used, the frame and thresholds shall be of metal. A class 5 steel vault door with a built-in, group 1R changeable combination lock may be used instead of other doors or locks.

(c) Various type of security hinges are available commercially. Hinges shall be of the fixed pin security hinge type or equivalent; exposed hinge pins shall be pinned, spot welded, or otherwise secured to prevent removal; and hinge mounting screws may not be exposed to the outside of the room.

e. Windows and Other Openings

(1) Window and other openings shall be sealed with material comparable to that forming the adjacent walls and otherwise limited to the minimum essential. Windows, ducts, vents, or similar opening of 96 square inches or more with the least dimension greater than 6 inches shall be equipped with one of the following:

(a) Three-eighth inch or larger hardened steel bars, provided the vertical bars are not more than 4 inches apart with horizontal bars welded to the vertical bars so that the openings do not exceed 32 square inches.

(b) Number 8 gauge high carbon manganese steel mesh with 2 inch diamond grid.

(c) Number 6 gauge steel mesh with 2 inch diamond grid when number 8 in subparagraph B.1.b(5), below, is not available.

(2) Bars or steel mesh shall be securely embedded in the structure of the building or welded to a steel frame that shall be securely attached to the wall with fastenings inaccessible from the exterior of the arms storage facility.

f. Locks.

(1) Access doors shall be secured by a high security padlock (military specification MIL-P-43607G) and hasp (military specification MIL-H-43905B or MIL-H-29181/1 (YD)), or other comparable hasps and locking hardware approved by the DOD Component Major Command. Approved locks and hasps will be specified in the contract. Storage facilities equipped with a class 5 GSA approved steel vault door with a built-in group 1R changeable combination lock are authorized in lieu of other doors and locks. Doors that cannot be secured from the inside with locking bars or deadbolts shall be secured on the inside with padlocks which meet or exceed military specification MIL-P-17802D. Panic hardware, when required, shall be installed to prevent opening the door by manipulation from the outside.

(2) A class 5 steel vault door with a built-in group 1R changeable combination lock or a key operated high security lock and hasp (above military specifications) shall be used on doors to structures housing classified AA&E.

B. Existing Construction

1. Existing facilities may be used for new contracts provided they meet the criteria indicated below and if determined by the DOD Component Major Command to be adequate. Determinations will be provided to the DIS Cognizant Security Office. The requirements for doors, windows and other openings and locks as prescribed in paragraphs A.1.d., e., and f., above, must be met at all times.

a. Walls of existing facilities at a minimum shall be 8 inch reinforced solid brick, 8 inch reinforced concrete block with voids filled with concrete, or 12 inch nonreinforced solid brick. Ceilings, roofs and floors of existing facilities shall be reinforced concrete at a minimum.

b. Walls, ceilings, roofs and floors that do not meet the structural criteria in subsection A.1., above shall be reinforced by one of the following methods.

(1) *Steel Bars.* Three-eighth inch diameter steel bars, four inches apart with horizontal bars welded to the vertical bars so that openings do not exceed 32 square inches. Ends of the steel bars shall be embedded securely in the structure of the building or welded to a steel frame securely fastened to the building.

(2) *Steel Landing.* Marsten, Irving or pierced steel planking.

(3) *Expanded Metal.* Three-sixteenth inch with a maximum grid opening of 1 inch by 3 inches and weighing a minimum of 4.27 pounds per square foot.

(4) *Steel Plate*. One-fourth inch steel plate.

(5) *Steel Mesh*. Number 8 gauge high carbon manganese steel, or for existing facilities, number 6 gauge cold drawn steel wire with a grid of not more than 2 inches, center to center. Number 6 gauge cold drawn steel wire is not authorized for future upgrading.

(6) *Sheet Metal*. Sixteen gauge steel sheets or plates securely fastened. This material is not authorized for future upgrading.

(7) *Other Materials*. Other materials approved by the DOD Component Major Command concerned that provide protection equivalent to the methods mentioned in paragraph B.1.b above.

2. When the above reinforcing materials are used, they shall be applied and fastened to the existing structure so that destruction of the existing structure is required to remove them.

ATTACHMENT 3 CATEGORY III AND IV ARMS, AMMUNITION, AND EXPLOSIVES — STORAGE

A. New Construction

1. AA&E listed under Category III and IV shall be stored in structures meeting construction requirements as specified in DOD 6055.9-STD (reference (g)) or DOD 4145.26-M (reference (u)). Determinations of suitability of new structures will be provided to the DIS Cognizant Security Office by the DOD component major command.

2. When operational requirements make it necessary, a Type 2 outdoor magazine (see Title 18, USC, 842(J) (27 CFR, 55, subpart K, sections 207 and 208) (reference (v)) is suitable for storing Category III and IV AA&E (see section C below) with approved DOD locking systems.

B. Existing Construction

The DOD component major command may permit storage of Category III and IV items in existing types of structures, if equivalent security is provided by the contractor and all other security requirements are met. Determinations of suitability of existing structures will be provided to the DIS Cognizant Security Office by the DOD component major command.

C. Type 2 Magazine Standards

1. A Type 2 magazine is a box, trailer, semitrailer, or other mobile facility, described as follows:

a. *General*. Outdoor magazines are to be bullet-resistant, fire-resistant, weather-resistant, theft-resistant, and ventilated. They are to be supported to prevent direct contact with the ground and, if less than one cubic yard in size, must be securely fastened to a fixed object. The ground around outdoor magazines must slope away for draining or other adequate draining provided. When unattended, vehicular magazines must have wheels removed or otherwise effectively immobilized by kingpin locking devices or other methods approved by the DOD Component Major Command.

b. *Exterior Construction*. The exterior and doors are to be constructed of not less than ¼ inch steel and lined with at least 2 inches of hardwood. Magazines with top openings will have lids with water-resistant seals or which overlap the sides by at least 1 inch when in closed position. (Doors, shall be in secured by a high security padlock (military specification MIL-H-43607G) and hasp (military specification MIL-H-430905B or MIL-H-219181/1 (YD)) with hinge side protection or other comparable locking system approved by the DOD component).

ATTACHMENT 4 ARMS PARTS—STORAGE

Major parts for arms, such as barrels and major subassemblies, shall be afforded at least the same protection as Category IV arms. The frame or receiver of an arm constitutes a weapon and such parts, therefore, must be stored according to the correct category; for example, the receiver of a .30 caliber machine gun shall be stored as a Category II arm.

ATTACHMENT 5 SIGNIFICANT INCIDENTS PERTAINING TO ARMS, AMMUNITION, AND EXPLOSIVES

Any armed robbery or attempted armed robbery; forced entry or attempted forced entry with physical evidence of the attempt; evidence of terrorist involvement; or illegal trafficking in sensitive AA&E shall be reported in accordance with the provisions of this appendix within 72 hours. In addition, the loss or theft of the following AA&E shall be reported:

- a. Any missile or rocket.
- b. Any machine gun.
- c. Any antipersonnel or antitank mine.
- d. Any automatic fire weapon.
- e. Twenty-five or more manually operated weapons.
- f. Demolition charges, blocks of explosives, and other explosives having a net weight of 100 pounds or more.
- g. Ammunition

1. Twenty thousand rounds or more of shotgun, .38 or .22 caliber ammunition, and 5,000 rounds or more of other .50 caliber or smaller ammunition.
2. Five rounds or more of nonautomatic weapon ammunition larger than .50 caliber.
3. One thousand rounds or more of automatic weapon ammunition larger than .50 caliber.
4. Any fragmentation, concussion, or high explosive grenade.

ATTACHMENT 6 COGNIZANT DIS INDUSTRIAL SECURITY OFFICES

New England Region:
Defense Investigation Service
Director of Industrial Security
New England Region (S1110)
Barnes Building
495 Summer Street
Boston, MA 02210-2192
Phone: Commercial: (617) 451-4914/6; DSN: 955-4914/6

Mid-Atlantic Region:
Defense Investigative Service
Director of Industrial Security
Mid-Atlantic Region (S1410)
Cherry Hill Office Center
1040 Kings Highway North
Cherry Hill, NJ 08034-1908
Phone: Commercial: (609) 482-6500; DSN: 444-4030

Capital Region:
Defense Investigative Service
Director of Industrial Security
Capital Region (S1510)
Hoffman Building #1
2461 Eisenhower Avenue
Alexandria, VA 22331-1000
Phone: Commercial: (202) 325-9634; DSN: 221-9634

Mid-Western Region:
Defense Investigative Service
Director of Industrial Security
Mid-Western Region (S3210)
610 S. Canal Street, Room 908
Chicago, IL 60607-4877
Phone: Commercial: (312) 886-5244

Southeastern Region:
Defense Investigative Service
Director of Industrial Security
Southeastern Region (S4110)
2300 Lake Park Drive, Suite 250
Smyrna, GA 30080-7606
Phone: Commercial: (404) 432-0826

Pacific Region:
Defense Investigative Service
Director of Industrial Security
Pacific Region (S5310)

3605 Long Beach Blvd., Suite 405
Long Beach, CA 90807-4013
Phone: Commercial: (213) 595-7251

Northwestern Region
Defense Investigative Service
Director of Industrial Security
Northwestern Region (S5210)
Presidio of San Francisco
San Francisco, CA 94129-7700
Phone: Commercial: (415) 561-3251/6; DSN: 586-3251/6

Southwestern Region:
Defense Investigative Service
Director of Industrial Security
Southwestern Region (S4210)
P.O. Box 88900
St. Louis, MO 63188-1900
Phone: Commercial: (314) 263-6580; DSN: 693-6580

Appendix I

Enhanced Transportation Security Measures During Terrorist Threat Conditions (Extracted from DOD 5100.76–M)

I-1.

This appendix prescribes specific additional transportation security measures for use in shipments to and from activities affected by or under terrorist threat conditions (THREATCONS). This guidance applies to all DOD activities that ship sensitive conventional AA&E, classified AA&E, or uncategorized Class A or B ammunition and explosives in the areas under THREATCONS. Detailed requirements shall be outlined in Service implementing instructions.

I-2. Actions

a. Implementation of each successive threat condition shall include the use of appropriate measures from the preceding condition.

(1) *THREATCON ALFA (Lowest THREATCON)*. General threat of possible terrorist activity against installations and personnel, nature and extent unpredictable. The measures in this threat condition must be capable of being maintained indefinitely.

(a) Conduct daily liaison with supporting intelligence and security organizations, in accordance with Service implementing instructions, to review specific local threat conditions.

(b) Convene a special meeting of the installation physical security council, to review the threat situation. Provide recommended actions to the installation commander.

(2) *THREATCON BRAVO*. (Increased and more predictable threat of terrorist activity exists. The measures in this THREATCON must be capable of being maintained for weeks without undue hardship.)

(a) Postpone nonessential surface shipments of risk Categories I, II and all classified AA&E, or ship by military air, if feasible.

(b) Commence use of Security Escort Vehicle Service (SEVS) for all risk Category II and classified AA&E shipments.

(c) Plan possible overtime requirements for anticipated increased use of installation as DOD “Safe Haven,” if applicable.

(d) In order to ensure the availability of sufficient “Safe Haven” areas, clear all holding yards and other temporary storage areas of sensitive conventional AA&E, classified ordnance, and uncategorized Class A or B ammunition and explosives by relocating material to permanent, secure storage to the maximum extent practicable. Additionally, consider shipping uncategorized and unclassified AA&E to ultimate destination.

(e) Review security facilities such as fencing, lighting, and communications equipment for all AA&E holding yards and other temporary storage areas.

(3) *THREATCON CHARLIE*. (Terrorist incident occurs or intelligence is received indicating action against installations or personnel is imminent. Implementation of these measures for more than a short time will probably create hardship and affect peacetime activities of unit and its personnel.)

(a) Require armed military escort in separate vehicles for all risk Categories I, II and classified AA&E shipments in lieu of commercial SEVs.

(b) Increase operations security of risk Category I shipments by sending at least one vehicle with a “decoy load” for each vehicle that carries actual risk Category I AA&E. The characteristics of the “decoy load” must duplicate those of the actual shipment to the maximum extent practicable.

(c) Direct truck shipments to stop only at DOD approved “Safe Havens.” The only exceptions shall be for food, fuel, or Motor Surveillance Service (MSS) reports. Such stops must not exceed 30 minutes in duration.

(d) Require MSS at 4-hour intervals for all risk Categories I and II and classified AA&E, and at 8-hour intervals for risk Categories III and IV and all uncategorized Class A and B ammunition and explosive shipments.

(e) Require single line haul and exclusive use of vehicle, dromedary, or approved container for all sensitive conventional AA&E, all classified AA&E, and all uncategorized Class A and B ammunition and explosive shipments.

(f) Conduct liaison with state and local law enforcement prior to any shipment of Categories I, II and classified AA&E to discuss support requirements, schedules, routes, and other information of mutual concern.

(g) Verify the seal serial numbers for all vehicles and other containers with classified AA&E and risk Categories I and II material in holding yards at least once every 4 hours. Seal serial number for risk Categories III and IV and all uncategorized Class A and B ammunition and explosives must be verified at least once every 8 hours.

(4) *THREATCON DELTA*. (Highest *THREATCON*. Applies in immediate area where terrorist attack has occurred or is expected against a specific installation. Normally this *THREATCON* is declared as a localized warning.)

(a) Temporarily suspend AA&E shipments in and out of the local area except for those needed to meet critical operational requirements.

(b) For shipments deemed critical, ship by military air, if feasible. Provide military transport and drivers with armed military escort in separate vehicles for all sensitive conventional AA&E, classified AA&E, and uncategorized Class A and B ammunition and explosives.

b. Paragraph not used.

Appendix J Arms, Ammunition, and Explosives Guidesheet

J-1. Application.

This appendix provides a guidesheet that may be used to quickly check for compliance with physical security requirements. The guidesheet—

- a. Is not intended to be used in place of applicable regulations.
- b. Is only a guide.
- c. Does not cover all security requirements for AA&E.

J-2. Physical Security Compliance

Location:

Unit:

Date:

a. Arms room

- (1) Was the arms storage facility designated as a mission essential/vulnerable area (AR 190-13, para 2-4d(1))?
- (2) Was the storage facility wherein arms were stored, designated and posted as a restricted area (AR 190-11, para 4-15 and AR 190-13, para 6-3 and 6-4)?
- (3) Was security lighting at the entrance or issue window of the arms room (AR 190-11, para 4-2d)?
- (4) Were switches for exterior lights located in such a place as to be inaccessible to unauthorized personnel (AR 190-11, para 4-2d(4))?
- (5) Was the most secured door to the arms storage facility secured with a high security padlock and hasp (AR 190-11, para 4-2e(1))?
- (6) Did the arms room maintaining IDS have signs displaying the fact that IDS was present (AR 190-11, para 4-16)?
- (7) Were physical security inspections conducted at least every 18 months (AR 190-11, para 2-6a; and AR 190-13, para 2-11b)?
- (8) Was the arms room, not continuously manned or under constant surveillance, protected by IDS (AR 190-11, para 4-2f)?
- (9) Was the arms room protected by at least two types of sensors, one of which is a volumetric sensor (AR 190-11, para 36a)? (Have armorer conduct test.)
- (10) Were bimonthly operational checks to IDS being conducted and recorded. (AR 190-11, para 3-6h(6)(a))?
- (11) Check the IDS agreement. Does it require either a response by security personnel or law enforcement authorities to respond within 15 minutes (AR 190-11, 3-6a&d)?
- (12) Have qualified engineer personnel verified the structural composition of the arms room on DA Form 4604-R, Security Construction Statement, indicating thereon the highest construction Category met (AR 190-11, para 2-2d)?
- (13) Is the AA&E storage facility approved for the storage of the highest category of AA&E stored therein? If not, has a waiver been approved (AR 190-11, para 4-2(a)(2))?
- (14) Was DA Form 4604-R, Security Construction Statement, posted in each AA&E storage facility and readily available for inspection (AR 190-11, para 2-2d)?
- (15) Was DA Form 4604-R, Security Construction Statement, revalidated by qualified engineer personnel at least every five years (AR 190-11, para 2-2d)?
- (16) In the arms room, a facility not continuously manned, were weapons stored in racks/containers weighing more than 500 pounds or were the racks/containers fastened to the structure or fastened together in groups totaling more than 500 pounds (AR 190-11, para 4-2c(2))?
- (17) Were locally fabricated racks in use certified by engineers as meeting construction specifications (AR 190-11, para 4-2c(3))?
- (18) Was ammunition authorized for retention in the unit arms room stored separately in banded or sealed cartons or locked containers (AR 190-11, para 5-8c(1)(a))?
- (19) Were ammunition containers in the unit arms room weighing less than 500 pounds fastened to the structure or fastened together, with bolts or chains equipped with secondary padlocks, in groups totaling more than 500 pounds (AR 190-11, para 5-8c(1)(a))?
- (20) Were weapons stored in the arms room inventoried by serial number monthly (AR 190-11, para 2-6d; AR 710-2, para 1-13d, para 2-12d, and table 2-1, para j; and DA Pam 710-2-1, para 9-11b)? As part of this inspection, check physical count of M-16 rifles with the armorer's hand receipt. If the count is off, conduct a 100% inventory of the weapons.
- (21) Had the same individual conducted consecutive inventories of weapons (AR 190-11, para 2-6d; AR 710-2, para 1-13d, 2-12d, and table 2-1, para j; and DA Pam 710-2-1, para 9-11b)?

- (22) Did records of monthly inventories reflect those weapons that were signed out or in maintenance at the time of the inventories (AR 190–11, para 2–6*d*; AR 710–2, para 1–13*d*; and DA Pam 710–2–1, para 9–11*b*(4))?
- (23) Were individuals drawing their weapons from the arms room turning in DA Form 3749 (AR 190–11, para 2–6*d*; AR 710–2, para 1–13*d*; and DA Pam 710–2–1, para 5–5*d* (3))?
- (24) When weapons were issued for periods of 24 hours, did individuals—
- Enter their signature in ink, as it appeared on DA Form 3749, Equipment Receipt?
 - Enter the nomenclature and serial number of the weapon drawn?
 - Enter the date/time of the transaction on the issue sheet/log (AR 190–11, para 2–6*d*; AR 710–2, para 1–13*d*; and DA Pam 710–2–1)?
- (25) When weapons were returned to the arms room, were entries on the issue sheet/log voided? Did the individual receiving the returned weapons enter the date/time, and his/her initials on the issue sheet/log (AR 190–11, para 2–6*d*; AR 710–2, para 1–13*d*; and DA Pam 710–2–1, para 5–5*d*(4))?
- (26) Had individuals authorized unaccompanied access to receive, store, or issue arms, undergone a command security screening/background check (AR 190–11, para 2–11*b* and *c* and 4–19)?
- (27) Had persons not authorized unaccompanied access to the arms room been allowed access to the IDS keys (AR 190–11, para 3–8*b*)?
- (28) Is the unaccompanied access list (by name, duty position) signed by the unit commander and posted inside the arms room (AR 190–11, para 4–19*a*)?
- (29) In the unit arms room, were privately-owned weapons or authorized war trophies stored in a locked container separate from military weapons (AR 190–11, para 4–5*a*(1))?
- (30) In the unit arms room, were privately-owned weapons inventoried in conjunction with, and at the frequency of the inventory of Government weapons (AR 190–11, para 4–5*a*(2)(*b*))?
- (31) Has a DA Form 3749 been issued for each privately owned weapon stored in the arms room (AR 190–11, para 4–5*a*(2)(*a*))?
- (32) Is the DA Form 3749 retained in the arms room when the weapon is in the possession of the individual owner (AR 190–11, para 4–5*b*(3))?
- (33) Are privately-owned weapons withdrawn from the unit arms room only upon approval of the unit commander or the commander's designated representative (AR 190–11, para 4–5*b*(4))?
- (34) Are applicable local regulations and State and local law information on ownership, registration, and possession of weapons and ammunition posted on unit bulletin boards (AR 190–11, para 4–5*a*(3))?
- (35) Is the retention and storage of incendiary devices and explosives prohibited in the unit arms room (AR 190–11, para 4–5*a*(6))?
- b. Ammunition and explosives storage areas.*
- (1) Are Category I and II ammunition and explosives (A&E) stored in earth-covered magazines and igloos (AR 190–11, para 5–2*a* (1))?
- (2) Are Category I and II A&E protected by an intrusion detection system (IDS) (AR 190–11, para 5–2*a*(2*a*))?
- (3) In the event of IDS failure, are armed guards posted 24 hours each day to maintain constant, unobstructed observation of the Category I and II storage facilities (AR 190–11, para 5–2*a*(2*a*))?
- (4) Are security checks conducted once every 2 hours for IDS protected Category I and II facilities (AR 190–11, para 5–2*a*(2*b*))?
- (5) Are security checks conducted at irregular hours not to exceed 48 hours for Category III and IV facilities (72 hours, IDS protected) (AR 190–11, para 5–2*b*)?
- (6) Are Category I and II storage facility protected by security fencing (AR 190–11, para 5–3)?
- (7) Are unmanned gates to A&E storage areas locked (AR 190–11, para 5–3*g*)?
- (8) Do clear zones extend 12 feet on the outside and 30 feet on the inside of the perimeter fence for Category I and II AA&E (para 5–3*j*)?
- (9) Are clear zones for Category I and II free of all obstacles, topographical features and vegetation exceeding 8 inches in height (AR 190–11, para 5–3*j*)?
- (10) Is security lighting provided for Category I and II storage facilities (AR 190–11, para 5–4)?
- Switches installed so that they are not accessible?
 - Lights covered with wire mesh screen?
- (11) Are the A&E storage facilities secured by a high security lock and hasp (AR 190–11, para 5–6*a*)?
- (12) Upon entering and exiting A&E storage areas, are personnel and vehicles checked for unauthorized material (AR 190–11, para 5–9*a*)?
- (13) Are Privately Owned Vehicles prohibited from A&E storage areas (AR 190–11, para 5–9*a*)?
- (14) Are persons requiring frequent recurring entrance to A&E areas listed on an entry control roster or issued a photographic security badge (AR 190–11, para 5–9*a*)?

(15) Are doors used for access to Category I storage facilities locked with two locking devices, one of which is a high security lock and hasp (AR 190-11, para 5-6c)?

(16) Are Category I missiles and rockets stored in open storage (AR 190-11, para 5-8d)?

(17) When Category I missiles in open storage at vehicle holding areas, aircraft cargo holding areas, or unit storage, are they stored in an approved container or in a totally enclosed storage structure (AR 190-11, para 5-8)?

c. Key and lock control

(1) Are keys to arms storage buildings, rooms, racks, and containers maintained separately from other keys and accessible only to those individuals whose official duties require access to them (AR 190-11, para 3-8)?

(2) Is a current roster of these individuals kept within the unit (AR 190-11, para 3-8)?

(3) Is the key control register kept in a locked container (AR 190-11, para 3-8a)?

(4) Are padlocks and their keys inventoried by serial number semi-annually (AR 190-11, para 3-8e)?

(5) Are combinations to locks on vault doors or GSA approved Class 5 or Class 6 security containers changed annually or upon change of custodian or armorer (AR 190-11, para 3-8g)?

(6) Is the key and lock custodian appointed in writing (AR 190-11, para 3-8c)?

(7) Is the DA Form 5513-R (Key Control Register and Inventory) being utilized to sign out keys and is the form properly filled out (AR 190-11, para 3-8a)?

(8) Are keys required for the maintenance and repair of IDS, including keys to the control unit door and monitor cabinet, kept separate from other operational IDS keys (AR 190-11, para 3-8b)?

Appendix K Joint–Services Interior Intrusion Detection System (J–SIIDS) Operational Checks

K–1. (J–SIIDS) OPERATIONAL TEST

ARMS ROOM ID NUMBER:

DATE:

a. The following test procedures have been developed specifically for the Joint–Services Interior Intrusion Detection System (J–SIIDS) and are directly applicable for J–SIIDS installations. For installations having commercial intrusion detection systems, it may be necessary to modify these procedures to reflect differences in commercial equipment operation.

b. Follow the basic test procedure below for each protected area.

(1) Basic test procedure:

(a) Contact the MP Desk prior to conducting the operational tests. Identify yourself, your location (for example, Building name/number and room number), and the purpose of the test. Inform them that multiple alarms will be generated during the test.

(b) Before conducting the J–SIIDS operability tests, it will be necessary to close all doors and openings equipped with balanced magnetic switches and it will be necessary to mask ultrasonic motion sensors, passive infrared motion sensors, and passive ultrasonic sensors so the tester can test each individual sensor without generating unintentional alarms from the other sensors in the protected area. Close doors/drawers or otherwise secure protected objects equipped with the capacitance proximity sensor. Allow 1 minute for the system to stabilize.

(c) Set the control unit mode switch to the TEST/RESET position.

(d) Conduct J–SIIDS Operational Tests #1 – #6 for applicable sensors.

(e) Unmask all sensors.

(f) Contact the MP Desk. Identify yourself, your location (for example, Building name/number and room number). Verify that they received multiple alarms during the test period. If the protected area is equipped with an alarm latching switch which must be tested, inform the MP Desk that this test will be conducted. Place the control unit mode switch in the ACCESS position. Verify with the MP Desk that the zone status is ACCESS.

(g) Conduct J–SIIDS Operational Test #7 for the alarm latching switch (If so equipped).

(h) Contact MP Desk. Verify that the zone status is ACCESS. Inform them of test completion.

(2) Test/inspection guidesheet:

(a) THIS ARMS ROOM PASSED:

(b) THIS ARMS ROOM FAILED: (contact maintainer for service)

(c) TESTER NAME:

(d) SIGNATURE:

K–2. (J–SIIDS) OPERATIONAL TEST #1—BALANCED MAGNETIC SWITCH (BMS)

a. The balanced magnetic switch consists of a magnet assembly and a reed switch assembly enclosed in individual housings. The switch assembly is mounted to the moveable door or window. With the door or window closed, the magnet assembly acts on the switch assembly holding it closed to complete a circuit. When the door or window is opened, the magnet moves away from the switch releasing it. As the switch is released, it opens the circuit causing an alarm. Balanced magnetic switches are used to detect the opening and closing of doors, windows, skylights, and other similar moveable entry–ways.

b. TEST PROCEDURE:

(1) Verify the control unit mode switch is in the TEST/RESET position.

(2) With the door/window closed and locked, attempt to rattle or move the door/window. Alarm should not activate. If an audible signal initiates from the control unit, contact maintainer for adjustment.

(3) Slowly open the door, gate, or window. An audible alarm should initiate immediately from the control unit when the latching edge of the opening has moved not more than 1–1/4 inches from the closed position.

(4) Close the door, gate, or window. After 10 seconds, the audible alarm will stop at the control unit.

(5) Repeat steps 2,3, and 4 for each BMS installed in the protected area.

c. TEST/INSPECTION GUIDESHEET:

(1) NUMBER OF BMS IN THIS ROOM:

(2) NUMBER OF BMS IN THIS ROOM PASSED:

(3) NUMBER OF BMS IN THIS ROOM FAILED (contact maintainer for service):

(4) TESTER NAME:

(5) SIGNATURE:

K–3. (J–SIIDS) Operational Test #2—CAPACITANCE PROXIMITY SENSOR (CPS)

a. The capacitance detection system establishes an electrical field around the protected objects, which must be

metallic and insulated from ground. An intruder approaching or touching the protected object disturbs the field causing a change in system capacitance, resulting in an alarm.

b. TEST PROCEDURE:

- (1) Verify the control unit mode switch is in the TEST/RESET position.
- (2) Slowly approach the protected area. An audible alarm should sound at the control unit immediately either just prior, or as you touch the object.
- (3) After the audible signal initiates, move away from the object. The control unit audible signal will stop within 1 minute.
- (4) Repeat steps 2 and 3 for each protected object.

c. TEST/INSPECTION GUIDESHEET:

- (1) NUMBER OF OBJECTS PROTECTED BY CPS IN THIS ROOM:
- (2) NUMBER OF OBJECTS PROTECTED BY CPS IN THIS ROOM PASSED:
- (3) NUMBER OF OBJECTS PROTECTED BY CPS IN THIS ROOM FAILED: (contact maintainer for service)
- (4) TESTER NAME:
- (5) SIGNATURE:

K-4. (J-SIIDS) OPERATIONAL CHECK #3—PASSIVE INFRARED MOTION SENSOR (PIMS)

a. All objects radiate infrared energy to some degree. The intensity of infrared energy emitted is dependent on the temperature, color, and surface texture of the object. Infrared energy is always present, and its intensity changes as the temperature of the object changes. The passive infrared motion detector is able to detect an intrusion because the entry of an intruder into the detection field abruptly changes the background level of infrared energy being sensed by the detector, and an alarm signal is generated.

b. TEST PROCEDURE:

- (1) Verify the control unit mode switch is in the TEST/RESET position.
- (2) Unmask the passive infrared motion sensor being tested.
- (3) Allow one minute for system to stabilize.
- (4) Conduct a walk test by beginning at a point outside the protected area or at the doorway to the protected area moving along likely intruder paths until audible alarm is activated at the control unit.
- (5) Remask the sensor.
- (6) Repeat steps 2, 3, 4 and 5 for each PIMS in the protected area.

c. TEST/INSPECTION GUIDESHEET:

- (1) NUMBER OF PIMS IN THIS ROOM:
- (2) NUMBER OF PIMS IN THIS ROOM PASSED:
- (3) NUMBER OF PIMS IN THIS ROOM FAILED (contact maintainer for service):
- (4) TESTER NAME:
- (5) SIGNATURE:

K-5. (J-SIIDS) OPERATIONAL TEST #4—PASSIVE ULTRASONIC SENSOR (PUS)

a. The passive ultrasonic sensor is a microphonic type device which detects the ultrasonic energy frequencies produced by breaking construction materials such as wood, glass, masonry, cinder block, brick, or metals. Different structural materials transmit different specific frequencies, thus, the range, detection characteristics, and effectiveness are variable from surface to surface.

b. TEST PROCEDURE:

- (1) Verify the control unit mode switch is in the TEST/RESET position.
- (2) Unmask the passive ultrasonic sensor to be tested.
- (3) Allow one minute for system to stabilize.
- (4) Use a set of metallic keys (6 or more) on a ring to generate noise. Jingle the keys four to six times at 1-second intervals. Testing should take place along the walls or other protected surfaces where intrusion is likely, not in the middle of the room. At the end of the fourth to six jingle, an audible signal should initiate immediately at the control unit. The audible alarm will stop at the control unit 10 seconds after the sensor is out of alarm.
- (5) Re-mask the sensor.
- (6) Repeat steps 2, 3, 4, and 5 for each passive ultrasonic sensor in the protected area.

c. TEST/INSPECTION GUIDESHEET:

- (1) NUMBER OF PUS IN THIS ROOM:
- (2) NUMBER OF PUS IN THIS ROOM PASSED:
- (3) NUMBER OF PUS IN THIS ROOM FAILED: (contact maintainer for service)
- (4) TESTER NAME:

(5) SIGNATURE:

K-6. (J-SIIDS) OPERATIONAL TEST #5—VIBRATION SIGNAL DETECTOR (VSD)

a. Vibration signal detectors are typically mounted directly on expanded metal cages, walls, and ceilings. Attempts to penetrate structural materials generate shock waves which are transmitted through the structural material to the sensor. Different structural materials transmit different specific frequencies, thus, the range, detection characteristics, and effectiveness are variable from surface to surface.

b. TEST PROCEDURE:

- (1) Verify the control unit mode switch is in the TEST/RESET position.
- (2) Allow one minute for system to stabilize.
- (3) Tap the protected surface with a solid object several times in succession. An audible signal should initiate from the control unit when the required number of taps or pulses have been received within the proper time interval. The audible signal will stop at the control unit 10 seconds after the detector is out of alarm.

(4) Repeat steps 2 and 3 for each vibration signal detector in the protected area.

c. TEST/INSPECTION CHECK LIST:

- (1) NUMBER OF VSD IN THIS ROOM:
- (2) NUMBER OF VSD IN THIS ROOM PASSED:
- (3) NUMBER OF VSD IN THIS ROOM FAILED:(contact maintainer for service)
- (4) TESTER NAME:
- (5) SIGNATURE:

K-7. (J-SIIDS) OPERATIONAL TEST #6—ULTRASONIC MOTION SENSOR (UMS)

a. Ultrasonic motion detection operates on the Doppler frequency shift principle. A pattern of inaudible sound waves, generally in the 20 to 45 kHz range are transmitted into the room and monitored by the system receiver(s). Intruder motion within the room disturbs the sound wave pattern, altering its frequency. The change in frequency or Doppler shift is detected and an alarm is generated.

b. Numerous configurations of the sensor and detection pattern are available, including wall mounts, ceiling mounts, and covert mounts where the sensor is disguised as an everyday office or home object. Sensors are available as transceivers where both transmitter and receiver are mounted in the same housing, or as "split head" systems where individual transmitters and receivers are utilized. The type and location of the transmitters and receivers determine the detection pattern and extent of coverage.

c. TEST PROCEDURE:

- (1) Verify the control unit mode switch is in the TEST/RESET position.
- (2) Unmask the ultrasonic motion sensor to be tested.
- (3) Allow one minute for system to stabilize.
- (4) Conduct a walk test by beginning a point outside the protected area or at the protected area boundary and moving along likely intruder paths until an audible signal is initiated at the control unit. The audible alarm will stop at the control unit 10 seconds after the sensor is out of alarm.

(5) Re-mask the sensor.

(6) Repeat steps 2, 3, 4, and 5 for each ultrasonic motion sensor installed in the protected area.

d. TEST/INSPECTION GUIDESHEET:

- (1) NUMBER OF UMS IN THIS ROOM:
- (2) NUMBER OF UMS IN THIS ROOM PASSED:
- (3) NUMBER OF UMS IN THIS ROOM FAILED: (contact maintainer for service)
- (4) TESTER NAME:
- (5) SIGNATURE:

K-8. (J-SIIDS) OPERATIONAL CHECK #7—ALARM LATCHING SWITCH (ALS)

a. The alarm latching switch is incorporated into the intrusion detection system to provide individuals with a means of signaling, in a covert manner, that they have been placed under duress. Is intended to be foot operated and located in such a way that it can be easily reached and covertly operated during duty hours. For the protection of the user, the alarm latching switch must never annunciate in the area where they are located.

b. TEST PROCEDURE:

(1) Activate the alarm latching switch to be tested. Test should be accomplished with the control unit in the access position.

(2) Call the MP Desk and verify that they received an alarm from the zone under test. If no alarm was received, contact the maintainer for service.

(3) Reset the sensor by removing the switch cover and depressing the red reset switch. Install the cover.

(4) Reset the control unit by placing the control unit mode switch to the SECURE position momentarily and then setting the mode switch to the ACCESS position.

(5) Contact MP Desk and verify that the zone status is ACCESS.

(6) Repeat steps I through 5 for each alarm latching switch to be tested. </subpara2></subpara1>

a. TEST/INSPECTION GUIDESHEET:

(1) NUMBER OF ALS IN THIS ROOM:

(2) NUMBER OF ALS IN THIS ROOM PASSED:

(3) NUMBER OF ALS IN THIS ROOM FAILED: (contact maintainer for service)

(4) TESTER NAME:

(5) SIGNATURE:

Glossary

This is the consolidated glossary for the Physical Security Handbook.

**Section I
Abbreviations****AA&E**

arms, ammunition, and explosives

AC

Active Component

ACSI

Assistant Chief of Staff for Intelligence

ADP

automatic data processing

AE

ammunition and explosives

AFB

Air Force Base

AFH

Army family housing

AFI

annual formal inspection

AFSPA

Air Force Security Police Agency

AG

Adjutant General

AGS

Armed Guard Surveillance

AIF

Army Industrial Funds

AMC

U.S. Army Material Command

AMDF

Army Master Data File

AP

acquisition plan

APSEAG

Army Physical Security Equipment Action Group

AR

Army regulation

ARDEC

U.S. Army Armament Research, Development and Engineering Center

ARNG

Army National Guard

ARSTAF

Army Staff

ASA (IL&E)

Assistant Secretary of the Army (Installations, Logistics, and Environment)

ASA (RDA)

Assistant Secretary of the Army (Research, Development, and Acquisition)

ASI

additional skill identifier

ASI H3

ASI for physical security inspector

ASI P7

ASI for patrol/narcotics or contraband detector dog handler

ASI Z6

ASI for patrol/explosives detector dog handler

ASL

authorized stockage list

ASP

ammunition supply point

AT

antiterrorism

ATC

Air Training Command

ATCOM

U.S. Army Aviation and Troop Command

BASOPS

base operations

BATF

Bureau of Alcohol, Tobacco, and Firearms

BCU

battery coolant unit

BRDEC

Belvoir Research & Development Engineering Center

CB

close boundary

CBT/T

combatting terrorism

CCI

controlled cryptographic items

CCP

circulation control point

CCTV

closed circuit television

CDR

commander

CE

U.S. Army Corps of Engineers

CECOM

U.S. Army Communications-Electronics Command

C-E

communications-electronics

CFM

cubic feet per minute

CG

commanding general

CL

carload

CMP

Civilian Marksmanship Program

COA

Comptroller of the Army

COCO

contractor-owned, contractor-operated

COE

Chief of Engineers

COFC

container-on-flatcar

COMDT

commandant

COMSEC

communications security

CONEX

container express

CONUS

continental United States

CONUSA

the numbered armies in the Continental United States

CPA

Chief of Public Affairs

CPCO

Central Port Call Office

CPR

civilian personnel regulation

CQ

charge of quarters

CRC

U.S. Army Crime Records Center

CSS

Constant Surveillance Service

CT

counterterrorism

CUCV

commercial utility and cargo vehicle

DA

Department of the Army

DAPSRB

Department of the Army Physical Security Review Board

DCSINT

Deputy Chief of Staff for Intelligence

DCSLOG

Deputy Chief of Staff for Logistics

DCSOPS

Deputy Chief of Staff for Operations

DCSPER

Deputy Chief of Staff for Personnel

DDPS

Dual Driver Protective Service

DEA

Drug Enforcement Administration

DEFCON

defense readiness condition

DEH

Director of Engineering and Housing

DLA

Defense Logistics Agency

DNA

Defense Nuclear Agency

DOD

Department of Defense

DODD

Department of Defense directive

DOL

Director of Logistics

DPDO

Defense Property Disposal Office

DRMO

Defense Reutilization Marketing Offices

DTS

Defense Transportation System

DUSD(P)

Deputy Under Secretary of Defense for Policy

EDD

explosives detector dog

ENTNAC

Entrance National Agency Check

EOC

Emergency Operations Center

EOD

explosive ordnance disposal

FAA

Federal Aviation Administration

FBI

Federal Bureau of Investigation

FISO

Force Integration Staff Officer

FM

field manual

FMS

foreign military sales

FOA

field operating agency

FOB

free on board

FSC

Federal supply classification

FY

fiscal year

GBL

Government bill of lading

GOCO

Government-owned, contractor-operated

GOGO

Government-owned, Government-operated

GS

greater security

GSA

General Services Administration

GT

general technical aptitude area

GTR

Government transportation request

HQDA

Headquarters, Department of the Army

HQMC

Headquarters, United States Marine Corps

HSP

high security padlock

HUMINT

human intelligence

ID

identification

IDS

intrusion detection system

IED

improvised explosive device

IES

Illuminating Engineering Society

ILS

integrated logistic support

INSCOM

U.S. Army Intelligence and Security Command

ITO

installation transportation office(r)

JCS

Joint Chiefs of Staff

JMSNS

Justification for Major System New Start

JROTC

Junior Reserve Officers' Training Corps

JRWG

Joint Requirements Working Group

J-SIDS

Joint-Service Interior Intrusion Detection System

JTAG

Joint Test Advisory Group

LAW

light antitank weapon

LCC

life cycle cost

LEA

law enforcement activity

LEC

law enforcement command

LIN

line item number

LOA

letter of agreement

LOI

Letter of Instruction

LR

letter requirement

LTC

lieutenant colonel

LTL

less than truckload

MAC

Military Airlift Command

MACOM

major Army command

MAJ

major

MATCU

military air traffic coordinating unit

MCA

major construction, Army

MEDCEN

U.S. Army Medical Center

MEDDAC

medical department activity

MEVA

mission essential or vulnerable area

MHE

materials handling equipment

MI

military intelligence

MILPO

military personnel office

MILSPEC

military specification

MILSTRIP

military standard requisitioning and issue procedures

MILVAN

military-owned demountable container

MIPR

military interdepartmental purchase request

MOS

military occupational specialty

MP

military police

MPA

military personnel, Army

MPI

Military Police Investigator

MSC

major subordinate command; Military Sealift Command

MSD

maximum stress diet

MSR

main supply route

MTOE/TDA

modified table of organization and equipment/table of distribution and allowances

MTMC

Military Traffic Management Command

MTX

Military Traffic Expediting Service

MUSAREC

major U.S. Army Reserve command

MWD

military working dog

NAF

non-appropriated fund

NATO

North Atlantic Treaty Organization

NBC

nuclear, biological, and chemical

NBS

National Bureau of Standards

NCDD

narcotics/contraband detector dog

NCEL

Naval Civil Engineering Laboratory

NCIC

National Crime Information Center

NCO

noncommissioned officer

NCOIC

noncommissioned officer in charge

NDA

National Defense Area

NDI

nondevelopmental item

NGR

National Guard regulation

NIS

Naval Investigative Service

NSN

national stock number

OACSI

Office of the Assistant Chief of Staff for Intelligence

OCE

Office of the Chief of Engineers

OCIE

organizational clothing and individual equipment

OCONUS

outside continental United States

OCPA

Office of the Chief of Public Affairs

ODCSLOG

Office of the Deputy Chief of Staff for Logistics

ODCSOPS

Office of the Deputy Chief of Staff for Operations

ODCSPER

Office of the Deputy Chief of Staff for Personnel

ODUSDP

Office of the Deputy Under Secretary of Defense for Policy

OJT

on-the-job training

OMA

Operation and Maintenance, Army

OMAR

Operation and Maintenance, Army Reserve

OPA

Other Procurement, Army

OPLAN

operation plan

OPM

Office of Personnel Management

OPSEC

operations security

OSD

Office of the Secretary of Defense

pam

pamphlet

PAO

public affairs officer

PAP

personnel assistance point

PARR

Program Analysis Resource Review

PCP

phencyclidine

PCS

permanent change of station

PDIP

Program Development Increment Package

PECIP

Productivity Enhancing Capitol Investment Program

PERSCOM

U.S. Total Army Personnel Command

PIF

productivity investment funding

PM

product manager; program manager; project manager; provost marshal

POC

point of contact

POD

port of debarkation

POE

port of embarkation

POL

petroleum, oils, and lubricants

POV

privately-owned vehicle

PPBES

Planning, Programming, Budgeting, and Execution System

PS

physical security

psi

pounds per square inch

PSC

physical security councils

PSE

physical security equipment

PSEAG

Physical Security Equipment Action Group

PSI

physical security inspector

PSS

Protective Security Service

PT

physical training

QPL

qualified products list

QRIP

Quick Return on Investment Program

RAM

reliability, availability, and maintainability

RAM-D

reliability, availability, maintainability, and durability

RC

Reserve component

RCS

reports control symbol

RDA

research, development, and acquisition

RDT&E

research, development, test, and evaluation

RDX

research department explosive

RESHIP

report of shipment

RF

radio frequency, response forces

RFP

request for proposal

ROC

required operational capability

ROTC

Reserve Officers' Training Corps

RSS

Rail Surveillance System

SCIF

sensitive compartmented information facilities

SECDEF

Secretary of Defense

SF

standard form

SFC

sergeant first class

SGA

standards of grade authorization

SJA

Staff Judge Advocate

SIR

serious incident report

SOFA

Status of Forces Agreement

SOP

standing operating procedure

SQT

skills qualification test

SRT

special reaction team

SSG

staff sergeant

SSN

social security number

SSS

Signature Security Service

SSSC

self-service supply center

TAADS

The Army Authorization Documents System

TAG

The Adjutant General

TASA

television audio support activity

TASC

training and audiovisual support center

TB

technical bulletin

TC

training circular

TCE

Technical Center of Expertise

TCP

traffic control point

TDA

tables of distribution and allowances

TDP

technical data package

TDY

temporary duty

THC

tetrahydrocannabinol

THREATCON

terrorist threat condition

TISA

Troop Issue Subsistence Activity

tl

truckload

TM

technical manual

TMDE

test, measurement, and diagnostic equipment

TMF

threat management force

TNT

trinitrotoluene

TOFC

trailer-on-flatcar

TOVEX

water gel (explosive)

TRADOC

U.S. Army Training and Doctrine Command

TSG

The Surgeon General

TSRWG

Tri-Service Requirements Working Group

TTS

technical training squadron

TTG

technical training group

TTW

technical training wing

UCMJ

Uniform Code of Military Justice

UL

Underwriter Laboratories

USACE

U.S. Army Corps of Engineering

USACIDC

United States Army Criminal Investigation Command

USAF

United States Air Force

USAISC

U.S. Army Information Systems Command

USAMPS

U.S. Army Military Police School

USAR

U.S. Army Reserve

USAREUR

U.S. Army, Europe, and Seventh Army

USC

United States Code

USMA

United States Military Academy

USS

United States standard

WSM-PSE

Weapons Systems Manager-Physical Security Equipment

WSN

weapon serial number

WTCA

Water Terminal Clearance Authority

Section II**Terms****Access (when pertaining to a restricted area or CCI)**

Personnel movement within a restricted area that allows the chance for visual observation of, or physical proximity to, either classified or protected materiel. It is also the ability and opportunity to obtain detailed knowledge of CCI through uncontrolled physical possession. External viewing or escorted proximity to CCI does not constitute access.

Aggressor

Any person seeking to compromise an asset. Aggressor categories include criminals, terrorists and protestors.

Ammunition

A device charged with explosives, propellants, pyrotechnics, initiating composition, riot control agents, chemical herbicides, smoke and flame, for use in connection with defense or offense, including demolition. Excluded from this definition are devices charged with chemical agents defined in JCS Pub. 1 and nuclear or biological materiel. Ammunition includes cartridges, projectiles, including missile rounds, grenades, mines, and pyrotechnics together with bullets, shot and their necessary primers, propellants, fuses, and detonators individually or having a unit of issue, container, or package weight of 100 pounds or less. Blank, inert training ammunition and caliber .22 ammunition are excluded.

Antiterrorism

Defensive measure used to reduce the vulnerability of individuals and property to terrorist acts, to include limited response and containment by military forces.

Armed Guard Surveillance

A service that provides armed guards to maintain constant and specific surveillance of shipments for which the service is requested. "Armed" is defined as having a firearm and appropriate ammunition readily available for immediate use. (DOD 5100.76-M)

Arms

A weapon included in AR 190-11, appendix A, that will or is designated to expel a projectile or flame by the action of the explosive, and the frame or receiver of any such weapon.

Asset

Any resource requiring protection.

Aviation Facility

A department of the Army activity or area collocated with facilities for the takeoff and landing of aircraft. The facility has the mission of command and control of administrative, operational, training, and/or logistical support of Army aviation.

Badge

A security credential that is worn on the possessor's outer garment and validates (his or her) authority for access to a restricted area.

Bulk Storage

Storage in a facility above the using or dispensing level specifically applicable to logistics warehouse and depot stocks. This applies to activities using controlled medical substances and items (such as pharmacies, wards, or clinics) only when a separate facility (building or room) is used to store quantities that exceed normal operating stocks.

Cable Seal Lock

A seal in which the cable is passed through the locking hardware of a truck trailer or railcar door and the bullet nose is inserted into the barrel and the end of the cable until securely anchored. Once locked any force exerted to separate the lockpoint from the lockbody will strengthen its connection. (DOD 5100.76-M)

Carrier Custodian

An employee who has been assigned responsibility for controlled shipments containing SECRET material by the carrier and who has been issued a personnel security clearance by the Government. (DOD 5100.76-M)

Certification

The process whereby a patrol or detector dog's and handler's proficiency is verified to be in compliance with minimum training standards.

Chains

Chains used to secure racks or containers will be of heavy-duty, hardened steel chain, welded, straight-link steel. The steel will be galvanized of at least 5/16-inch thickness or of equal resistance required to force, to cut, or break an approved low security padlock. An example of such a chain is Type 1, Grade C, Class 4 NSN 4010-0-149-5583, NSN 4010-00-149-5575, or NSN 4010-00-171-4427.

Closed Circuit Television

Television that serves a number of different functions, one of which is physical security. As it pertains to the field of physical security, CCTV is used to augment, not replace, existing intrusion detection systems (IDS) or security patrols. It is not used as a primary sensor, but rather as a means of assessing alarms. CCTV also may be used as a surveillance means, but if used in this way, it will augment, not replace, existing IDS.

Closed post

An army installation or activity to which ground and water access is controlled at all times by perimeter barriers with limited, manned entry control points.

Closed vehicle or equipment

A conveyance that is fully enclosed with permanent sides and a permanent top, with installed doors that can be locked and sealed. (DOD 5100.76-M)

Combatting Terrorism

Actions, including AT and CT, taken to oppose terrorism throughout the entire threat spectrum.

Commercial-type vehicle

A vehicle designed to meet civilian requirements, and used without major modifications, for routine purposes in connection with the transportation of supplies, personnel, or equipment.

Constant Surveillance Service

A service that is an integral part of the provisions of 49 CFR 397 (reference (b)) that a carrier must apply when transporting hazardous or Class A and B explosive materials. It provides constant surveillance over a shipment. The transporting conveyance containing the shipment must be attended at all times by a qualified representative of the carrier. A motor vehicle is "attended" when the person in charge of the vehicle is awake and not in a sleeper berth and

is within 100 feet of the vehicle, provided the vehicle is within the person's obstructed field of vision. The qualified representative "attending" the vehicle must:

- a. Be aware of the nature of the material contained in the vehicle.
- b. Have been instructed on procedures to follow in case of emergency.
- c. Be authorized to move the vehicle and have the means and capability to do so.

Note. CSS does not include a signature and tally service as provided under Signature Security Service (SSS). (DOD 5100.76-M)

Container Express

A reusable container for shipment of troop support cargo, quasi-military cargo, household goods, and personal baggage.

Containerization

A box or other device in which a number of packages are stored, protected, and handled as a unit in transit; for example, CONEX, MILVAN, and SEAVAN. This term also refers to the shipping system based on large cargo-carrying containers that can be easily interchanged between trucks, trains, and ships, without rehandling of contents. (DOD 5100.76-M)

Container on a flat car

A large box-like demountable body without undercarriage used to transport cargo that is mounted on a railroad flat car. (DOD 5100.76-M)

Constant Surveillance

Observing or protecting a storage facility containing AA&E by a human, intrusion detection system, closed circuit television, or combination, to prevent unobserved access, or make known any unauthorized access to the protected facility.

Continuous Surveillance

Constant unobstructed observance of items or an area to prevent unauthorized access. Continuous surveillance may be maintained by dedicated guards, other on-duty personnel, or intrusion detection systems and those enhanced by closed-circuit television.

Controlled Area

See restricted area.

Controlled cryptographic item

A secure telecommunications or information handling equipment ancillary device, or associated cryptographic component, which is unclassified but is controlled.

Controlled medical substance

A drug or other substance, or its immediate precursor, listed in current schedules of 21 USC 812 in medical facilities for the purpose of military treatment, therapy, or research. Categories listed in this section are narcotics, amphetamines, barbiturates, and hallucinogens.

Counterterrorism

Offensive measures taken to prevent, deter, and respond to terrorism.

Crime analysis

The process used to determine the essential features of a criminal act. It is a mandatory part of any crime prevention program.

Crime prevention

The anticipation, recognition, and appraisal of a crime risk, and initiation of some action to remove or reduce it. Crime prevention is a direct crime control method that applies to before-the-fact efforts to reduce criminal opportunity, protect potential human victims, and prevent property loss.

Crime prevention inspection

An on-site evaluation of the crime prevention program of a unit, section, office, or other facility.

Crime risk management

The development of systematic approaches to reduce crime risks.

Crisis management team

A team found at a major command or installation level. A crisis management team is concerned with plan, procedures, techniques, policies, and controls for dealing with terrorism, special threats, or other major disruptions occurring on Government installations and facilities. A crisis management team considers all aspects of the incident and establishes contact with the AOC.

Critical communications facility

A communications facility that is essential to the continuity of operations of the National Command Authority during the initial phases of national emergencies, and other nodal points or elements designated as crucial to mission accomplishment.

Cryptographic component

The embodiment of a cryptographic logic in either hardware or firmware form, such as a modular assembly, a printed circuit board, a microcircuit, or any combination of these.

Cryptographic equipment

Any equipment employing a cryptographic logic.

Cryptographic logic

A deterministic logic by which information may be converted to an unintelligible form and reconverted to an intelligible form. Logic may take the form of engineering drawings, schematics, hardware, or firmware circuitry.

Day gate

Any barriers, used in a doorway or entrance to pharmacy or medically sensitive item storage areas, that prevents unauthorized personnel access during operating hours. Such barriers normally are not the sole protection afforded the entrance during nonoperating hours; however, during operating hours, the barrier ensures positive entry control by on-duty personnel (for example, electronic buzzer control entry to the area after positive identification by receptionist or on-duty personnel).

Dedicated guards

Individuals charged with performing the primary task of safeguarding designated facilities, material, and personnel within a defined area during a tour of duty. A dedicated guard may perform this function as a static post. He or she remains within or on the perimeter of a protected area and maintains continuous surveillance over that which is being protected during the tour of duty.

Defense Transportation System

Consists of military controlled terminal facilities, Military Airlift Command (MAC) controlled airlift, Military Sealift Command (MSC) controlled or arranged sealift, and Government controlled air or land transportation. (DOD 5100.76-M)

Demilitarization

The act of destroying the offensive or defensive characteristics inherent in certain types of equipment and materiel. The term comprehends mutilation, scrapping, burning, or alteration designed so as to prevent the further use of such equipment and materiel for its originally intended military or lethal purpose.

Double-locked container

A steel container of not less than 26 gauge which is secured by an approved locking device and which encases an inner container that also is equipped with an approved locking device. Cabinet, medicine, combination with narcotic locker, NSN 6530-00-702-9240, or equivalent, meets requirements for a double-locked container.

Dromedary

A freight box carried on and securely fastened to the chassis of the tractor or on a flat-bed trailer. The dromedary is demountable by the use of a forklift truck, is protected by a plymetal shield, and is equipped with doors on each side that may be locked with seals or padlocks. All explosive items carried in the dromedary must be compatible and in compliance with 49 CFR 177 (ref (c)) or host nation regulations. (DOD 5100.76-M)

Dual Driver Protective Service

A service requiring SSS plus continuous attendance and surveillance of the shipment through the use of two drivers.

- a. The vehicle containing the shipment must be attended at all times by one of the drivers. A vehicle is attended

when at least one of the drivers is in the cab of the vehicle, awake, and not in a sleeper berth or is within 10 feet of the vehicle.

b. SSS signature and tally requirements are not required between the same pair of drivers for a particular movement. (DOD 5100.76–M)

Duress alarm system

A method by which authorized personnel can covertly communicate a situation of duress to a security control center or to other personnel in a position to notify a security control center. (DOD 5100.76–M)

Duress or holdup alarms

Devices which allow personnel on duty to transmit a signal to the alarm monitoring station from which an armed response force can be dispatched if a holdup or a duress situation occurs.

Emergency Aircraft

An aircraft designated by the commander to respond to emergency situations and provide life-saving and property-saving services. Normally, such aircraft has special equipment and markings. Air Ambulances and firefighting aircraft are examples.

Emergency vehicle

A vehicle designated by the commander to respond to emergency situations and provide life-saving and property-saving services. Normally, the vehicle has special equipment and markings. Ambulances and firefighting and military or security police vehicles are examples.

Enclosed vehicle or equipment

A conveyance that is fully enclosed with permanent sides and permanent top, with installed doors that can be locked and sealed.

Entry control (when pertaining to a restricted area)

Security actions, procedures, equipment, and techniques, employed within restricted areas to ensure that persons who are present in the areas at any time have authority and official reason for being there.

Escorted personnel (when pertaining to a restricted area)

Those persons authorized access to a restricted areas who are escorted at all times by a designated person.

Escorts and couriers

Military members, U.S. civilian employees, or DOD contractor employees responsible for the continuous surveillance and control over movements of classified material. Individuals designated as escorts and couriers must possess a Government-issued security clearance at least equal to that of the material being transported.

Exception

An approved permanent exclusion from specific requirements of this regulation. Exceptions will be based on a case-by-case determination and involve unique circumstances which make conformance to security standards impossible or highly impractical. An exception can also be an approved permanent deviation from the provisions of this regulation. There are two types of exceptions:

a. *Compensatory Measures Exception.* This is a deviation in which the standards are not being met, but the DOD component (HQDA(DAMO–ODL–S) concerned determines it is appropriate, because of physical factors and operational requirements. Compensatory measures are normally required.

b. *Equivalent Protection Exception.* This is a deviation in which nonstandard conditions exist, but the totality of protection afforded is equivalent to or better than that provided under standard criteria.

Exclusion area

See restricted area.

Exclusive use

A conveyance unit or vehicle that is used only for a shipment from origin to destination without transfer of lading, and that permits locking of the unit and use of seals. (DOD 5100.76–M)

Explosives

Any chemical compound, mixture or device, the primary or common purpose of which is to function by explosion. The term includes, but is not limited to, individual land mines, demolition charges, blocks of explosives (dynamite,

trinitrotoluene (TNT), C-4, and other high explosives), and other explosives consisting of 10 pounds or more; for example, gunpowder or nitroguanidine.

Facility

Any single building, project, or site.

Force Protection

Security program developed to protect soldiers, civilian employees and family members, facilities and equipment, in all locations and situations. This is accomplished through the planned integration of combatting terrorism, physical security, operations security, protective services and law enforcement operations, all supported by foreign intelligence, counterintelligence and other security programs.

Greater security (GS)

A seal tracing and inspection rail service for unclassified sensitive cargo that includes a military traffic expending (MTX) service and provides:

- a. Inspection of railcars at major terminals by railroad personnel for evidence of forced entry or tampering with seals or security devices.
- b. Name of carrier reporting.
- c. Time of inspection; that is, a.m. or p.m.
- d. Actual arrival and actual departure time from inspection terminal. (DOD 5100.76-M)

Handler

A military police person or DOD civilian guard or police person who has been qualified by training and certification to care for, train, and employ a military working dog.

Handling

Controlled physical possession without access.

High risk personnel

Personnel who, by their grade, assignment, value, location, or specific threat, are more likely to be attractive or accessible terrorist targets.

Independent power source

A power source, normally battery, independent of any other source (DOD 5100.76-M)

Industrial and utility equipment

Equipment used in the manufacture or in support of the manufacture of goods and equipment used to support the operation of utilities such as power and water distribution and treatment.

In flight

The condition of an aircraft from the moment when all external doors are closed following embarkation until the moment when one such door is opened for disembarkation.

Installations

Such real properties as reserve centers, depots, arsenals, ammunition plants (both contractor- and Government-operated, hospitals, terminals, and other special mission facilities, as well as those used primarily by troops. (See also JCS Pub. 1)

Internal controls (when pertaining to a restricted area)

Security actions, procedures, and techniques employed within restricted areas to ensure persons who are present in these areas at any time have authority and official reason.

Intrusion detection system

The combination of electronic components, including sensors, control units, transmission lines, and monitoring units integrated to be capable of detecting one or more types of intrusion into the area protected by the system and reporting directly to an alarm monitoring station. The IDS will be an approved DOD standardized system, such as the Joint Service Interior Intrusion Detection System or MACOM-approved commercial equipment.

Justification for Major System New Start

A requirement document that the combat developer prepares with the material developer, training developer, manpower

and personnel planner, and logistician. A JMSNS is prepared to describe the mission need and justifies the acquisition of a major new system at program initiation in the acquisition cycle.

Kennel facilities

The buildings, the kennels, the runs, and the exercise and training areas which are used to house, care for, and train military working dogs.

Key and lock control system

A system of identifying both locks and their locations and personnel in possession of keys and/or combinations.

Keying

The process of establishing a sequence of random binary digits used to initially set up and periodically change permutations in cryptographic equipment for purpose of encrypting or decrypting electronic signals, for controlling transmission security processes, or for producing other keys.

King Tut block

A King Tut block is a specially designed large concrete block. It is placed in front of an igloo or magazine entrance with a fork lift. Access to the igloo or magazine therefore requires a fork lift to move the block. The King Tut block is of sufficient weight to prevent removal without a fork lift.

Letter of agreement

A document jointly prepared and signed by the combat and materiel developers when a potential materiel system need has been identified and it has been determined that one or more technological approaches may satisfy the need. Even though it may be in an early stage of development, the LOA will address the materiel system from the Total System Management standpoint. The LOA describes operational, technical, training, personnel, and logistical system unique events that must be undertaken to produce the total system.

Letter requirement

An abbreviated procedure for acquisition of low-unit cost, low-risk developmental, or commercial items. It will be used instead of the ROC when applicable. The total system definitive requirements for training, personnel, and logistics requirements are the same for the LR as for the ROC. The LR is jointly prepared by TRADOC and AMC.

Lightweight construction

Building construction other than reinforced concrete or masonry (concrete block or clay brick) such as wood or metal siding.

Limited access post

An Army installation or activity that meets one of the criteria below:

- a.* No permanent fences or other physical barriers exist, but entry can be temporarily closed to vehicular traffic and other movements using roads and other conventional points of entry.
- b.* Permanent perimeter barriers exist and access is controlled only after normal duty hours; for example, gates are secured or manned with guards after dark.
- c.* No permanent perimeter barriers exist, but vehicular traffic and other movements using roads and other conventional points of entry are continuously controlled.

Limited area

See restricted area.

Locked container

A container or room of substantial construction secured with an approved locking device. For pharmacy operating stocks, lockable automated counting systems meet requirements for a locked container.

Locking devices

- a.* Padlocks, military specifications MIL-P-43607 (High Security Padlock); shrouded shackle, NSN

5340-01-217-5068 or horizontal sliding bolt, NSN 5340-00-799-8248) or MIL-P-43951 (medium security padlock; regular shackle, NSN 5340-00-799-8016).

b. Padlocks, Commercial Item Description A-A-1927 (low security padlock) having a hardened steel shackle and body; NSN 5340-00-158-3807 (with chain), NSN 5340-00-158-3805 (without chain).

c. GSA-approved changeable three-position padlock, Federal Specification FF-P-110.

d. High security hasps. Military Specifications MIL-H-43905 or MIL-H-29181A.

e. Hasps and staples for low-security padlocks which are of heavy pattern steel, securely fastened to the structure with smooth-headed bolts, rivets, or welding to prevent removal.

Locks

Locks should be considered as delay devices only, not as positive bars to unauthorized entry, since any lock can be defeated by expert manipulation or force.

a. Padlocks

High security padlocks: Military Specification MIL-P-43607, shrouded shackle with clevis and chain, NSN 5340-01-217-5068 or NSN 5340-00-188-1560; horizontal sliding bolt with clevis and chain, NSN 5340-00-799-8248.

Medium security padlocks: Military Specification MIL-P-43951, open shackle with clevis and chain, NSN 5340-00-799-8016. Authorized for continued use to secure Categories III and IV AA&E only until stocks are depleted or replaced.

Low security padlocks: Commercial Item Description A-A-1927, hardened steel shackle and case, without chain: NSN 5340-00-158-3805; with chain: NSN 5340-00-158-3807.

(Any questions regarding the above specifications will be addressed to the DOD Lock Program Technical Manager, Naval Facilities Engineering Service Center, Code C66, 560 Center Drive, Port Hueneme, CA 93043-4328 (DSN 551-1567 or -1212).

b. Certain locks, such as high or medium security padlocks, provide excellent protection when used in conjunction with a high security hasp. Hasps installed for protection of AA&E will provide protection comparable to that given by the lock used. Determination of "comparable protection" will be addressed to the DOD Lock Program Technical Manager, Naval Civil Engineering Laboratory, Code L56, 560 Center Drive, Port Hueneme, CA 93043-4328 (DSN 551-1567 or -1212).

NAPEC high security shrouded hasp (MIL-H-29181A) is approved for use with the high security padlock to secure all categories of AA&E. The hasp has a cover that protects the lock from cutting or hammer tools and inclement weather. It should be used to secure Category I and II AA&E storage facilities. When replacement of a hasp on Category III, IV or uncategorized AA&E is necessary, this hasp should also be used. The Natick high security hasp (MIL-H-43905) is a high security hasp that also is approved for protection of Category III and IV AA&E when used with an approved high security padlock.

Hasp, pin-type, locking "T" is a hasp that was authorized previously to secure ammunition storage magazines. Magazines were secured using the installed locking bar in conjunction with a "T" pin and high security padlock. The locking "T" hasp does not provide adequate security for sensitive AA&E. It must be replaced with a high security hasp to enhance security. It will not be used to secure Category I and II ammunition storage facilities.

c. Another lock is the cable seal lock. Once locked, any force exerted to separate the lockpoint from the lockbody strengthens the connection. Such locks are not approved for use in securing storage facilities containing AA&E. The same restriction applies to d below.

d. A complementary device to locks is the No. 5 American Wire Gauge wire twist. This is a U-shaped wire place in the hasp along with the shackle and twisted tightly in place. Another device is a wire cable of a thickness equivalent to or larger than No. 5 wire. This is placed through the hasp, a metal sleeve slipped over it, and crimped into place.

e. Built-in combination locks, meeting Underwriters Laboratories Standard 768, Group 1 (NSN 5340-01-375-7593) are approved for use on GSA-approved Class 5 vault doors and GSA-approved Class 5 weapons containers storing unclassified material and unclassified AA&E.

LOGAIR

Long-term contract airlift service within the continental United States for the movement of cargo in support of the logistics system of the Military Services (primarily the Army and Air Force) and Defense Agencies. (DOD 5100.76-M)

Major disruption on installations

Acts. Threats, or attempts to commit such acts as kidnapping, extortion, bombings, hijackings, ambushing, major weapons thefts, arson, assassination, and hostage taking on a military installation. These acts that have potential for widespread publicity require special response, tactics, and management.

Medically sensitive items

Standard and nonstandard medical items designated by medical commanders to be sufficiently sensitive to warrant a

stringent degree of physical security and accountability in storage. Included within this definition are all items subject to misappropriation and/or misuse such as needles and syringes.

Military Traffic Expediting (MTX) Service

A service providing for movement from origin to destination in the shortest time possible for specifically identified rail shipments, and which is required for the shipment of firearms and other sensitive shipments. This service uses electrical communications between members of the Association of American Railroads, is available for either single line haul or jointline movements, and provides progress reports as required. (DOD 5100.76-M)

Military van (MILVAN)

Military-owned demountable container, conforming to U.S. and international standards, operated in a centrally controlled fleet for movement of military cargo. (DOD 5100.76-M)

Military working dog

Dogs required by the using DOD component for a specific purpose, mission, or combat capability. MWDs include patrol, patrol and narcotic/contraband, and patrol and explosive detector dogs.

Military working dog team

The MWD and its appropriately qualified, assigned handler.

Mission-critical personnel

Personnel who are essential to the operation of an organization of function.

Mission essential and vulnerable areas

Facilities or activities within the installation that, by virtue of their function, are evaluated by the commander as vital to the successful accomplishment of the installation's State National Guard, or MUSARC mission. This includes areas nonessential to the installation's/facility's operational mission but which, by nature of the activity, are considered vulnerable to theft, trespass, damage, or other criminal activity.

Motor pool

A group of motor vehicles used as needed by different organizations or individuals and parked in a common location when not in use. On an Army installation, a nontenant Army activity with 10 or less assigned commercial-type vehicles but no local organizational maintenance support does not have a motor pool, under this regulation, even though the vehicles are parked together.

Motor vehicle

A self-propelled, boosted, or towed conveyance used to transport a burden on land. This includes all Army wheeled and track vehicles, trailers, and semitrailers, but not railroad locomotives and rolling stock.

National Defense Area

An area set up on non-Federal lands located within the United States, its possessions or territories, to safeguard classified defense information or DOD equipment or materiel. Establishment of a National Defense Area temporarily places such non-Federal lands under the effective control of DOD and results only from an emergency event.

Negotiations

A dialogue between authorities and offenders which has as the ultimate goal for the safe release of hostages and the surrender of the offenders.

Note C controlled medical items

Sets, kits, and outfits containing one or more component Note Q or Note R items.

Note Q controlled medical items

All standard drug items identified as Note Q in the Federal Supply Catalog, Nonstandard Drug Enforcement Administration (DEA) Schedule III, IV, V Controlled Substances.

Note R controlled medical items

All items identified as Note R in the Federal Supply Catalog, Nonstandard DEA Schedule II Controlled Substances.

One dog-one handler

The concept that each MWD will have only one handler. Personnel shortages may necessitate assigning a handler responsibility for more than one dog. However, two or more handlers cannot handle the same dog.

Open post

Installations or activities that do not qualify as closed or limited access posts. Access to the installation or activity is not controlled during or after normal duty hours.

Perimeter fence

Fences for the security of unclassified, non-sensitive items that meet the requirements of U.S. Army Corps of Engineers Drawing Code STD 872-90-00 Series. The minimum height will be 6 feet. Use of NATO Standard Design Fencing is also authorized.

Perimeter wall

Any wall over 6 feet tall which delineates a boundary and serves as a barrier to personnel and/or vehicles. These walls may be constructed of reinforced concrete, masonry, or stone.

Physical protective measures

Physical security measures used to counter risk factors that usually do not change over a period of time such as mission impact, cost, volume, and criticality of resources and vulnerabilities. The measures are usually permanent and involve expenditure of funds.

Physical security

That part of the Army security system, based on threat analysis, concerned with procedures and physical measures designed to safeguard personnel, property, and operations; to prevent unauthorized access to equipment, facilities, materiel, and information; and to protect against espionage, terrorism, sabotage, damage, misuse, and theft. Operations security (OPSEC) and security targeted against traditional criminal activity are included.

a. Physical security procedures include, but are not limited to, the application of physical measures to reduce vulnerability to the threat; integration of physical security into contingency, mobilization, and wartime plans; the testing of physical security procedures and measures during the exercise of these plans; the interface of installation OPSEC, crime prevention and physical security programs to protect against the traditional criminal; training of guards at sensitive or other storage sites in tactical defense against and response to attempted penetrations; and creating physical security awareness.

b. Physical security measures are physical systems, devices, personnel, animals, and procedures employed to protect security interests from possible threats and include, but are not limited to, security guards; military working dogs; lights and physical barriers; explosives and bomb detection equipment; protective vests and similar equipment; badging systems; electronic entry control systems and access control devices; security containers; locking devices; electronic intrusion detection systems; standardized command, control, and display subsystems; radio frequency data links used for physical security; security lighting; delay devices; artificial intelligence (robotics); and assessment and/or surveillance systems to include closed-circuit television. Depending on the circumstances of the particular situation, security specialists may have an interest in other items of equipment such as armored sedans.

Physical security equipment

A generic term for any item, device, or system that is used primarily to protect Government property, including nuclear, chemical, and other munitions, personnel, and installations, and to safeguard national security information and material, including the destruction of such information and material both by routine means and by emergency destruct measures.

a. Interior physical security equipment. Physical security equipment used internal to a structure to make that structure a secure area. Within DOD, DA is the proponent for those functions associated with development of interior physical security systems.

b. Exterior physical security equipment. Physical security equipment used external to a structure to make the structure a secure area. Within DOD, the Department of the Air Force is the proponent for those functions associated with the development of external physical security systems; however, the Army will develop lights, barriers, and robotics.

c. Intrusion detection system. See previous definition.

Physical security inspection

A formal, recorded assessment of physical procedures and measures implemented by a unit or activity to protect its assets.

Physical security measures

See physical security.

Physical security plan

A comprehensive written plan providing proper and economical use of personnel, land, and equipment to prevent or minimize loss or damage from theft, misuse, espionage, sabotage, and other criminal or disruptive activities.

Physical security procedures

See physical security.

Physical security program

The interrelationship of various components that complement each other to produce a comprehensive approach to security matters. These components include, as a minimum, the physical security plan; physical security inspections and surveys; participation in combatting terrorism committees and fusion cells; and a continuing assessment of the installation's physical security posture.

Physical security resource plan

Plan developed by the physical security officer that identifies physical security needs, and shows proposed programmed procurement of those needs.

Physical security survey

A formal, recorded assessment of the installation physical security program.

Physical security system architecture

A system ensuring that IDS components designed by the various services are compatible when used together. The Air Force is responsible for systems architecture.

Pier service

Ocean carrier booking is restricted over ocean movement from port of embarkation (POE) to port of debarkation (POD). It precludes prearranged-through-booking employing surface transportation to inland destinations. (DOD 5100.76-M)

Pilferable assets

Any asset which can be stolen and which does not fall under the other asset categories discussed in this publication.

Pilferage-coded items

Items with a code indicating that the material has a ready resale value or civilian application and, therefore, is especially subject to theft.

Portable

Capable of being carried in the hand or on the person. As a general rule, a single item weighing less than 100 pounds (45.34 kilograms) is considered portable.

Primary electrical power source

That source of power, either external (commercial) or internal, that provides power to site facilities on a daily basis. (DOD 5100.76-M)

Protection in depth

A system providing several supplementary security barriers. For example, a perimeter fence, a secure building, a vault, and a locked container provide four layers of protection. (DOD 5100.76-M)

Protective layer

Any envelope of building components which surrounds an asset and delays or prevents aggressor movement toward the asset or which shields the asset from weapons and explosives effects.

Protective Security Service

A service to protect shipments. PSS involves a transporting carrier that must be a "cleared carrier" under provisions of DOD 5220.22-R, paragraph 1-702.a (ref (d)). A shipment must be under the constant surveillance of designated carrier employees, unless it is stored in containers or an area approved by the cognizant Defense Investigative Service regional

office. The designated carrier employees providing constant surveillance when PSS is required must possess a Government-issued SECRET clearance and a carrier-issued identification. (DOD 5100.76–M)

QUICKTRANS

Long-term contract airlift service within the continental United States (CONUS) for the movement of cargo in support of the logistic system for the Military Services (primarily the Navy and Marine Corps) and Defense agencies. (DOD 5100.76–M)

Rail Surveillance Service

An inspection service of rail shipments. An inspection is made within one hour after each stop, if the trailer containing a shipment remains at a halt. Reinspection is made a minimum of once each hour, as long as the railcar containing the shipment remains at a halt. (DOD 5100.76–M)

Report of Shipment

An advanced report furnished by message or telephone immediately upon dispatch of a shipment within CONUS for domestic shipments. A report goes to both Water Terminal Clearance Authority (WTCA) and the water port transshipping facility for surface export shipments, or to the Military Air Traffic Coordinating Officer (MATCO) for air export shipments. The advance notice of shipments shall include the following applicable data:

a. For domestic shipments, see AR 55–355/NAVSUPINST 4600.70/AFM 75–2/MCO P4600.14A/DLAR 4500.3, Routing Instruction Note (RIN) 146, Appendix L (reference (e)).

b. For export shipments, see chapter 4, DOD 4500.32–R (reference (f)). (DOD 5100.76–M)

Required operational capability

A requirements document that the combat developer prepares with input from the training developer in coordination with the material developer, logistician, and manpower and personnel planner. The ROC is a concise statement of the minimum essential operational, RAM, technical, personnel and manpower, training, safety, health, human factors engineering, logistical, and cost information to start full scale development or procurement of a material system.

Restricted area

Any area to which entry is subject to special restrictions or control for security reasons or to safeguard property or material. This does not include those designated areas over which aircraft flight is restricted. Restricted areas may be of different types. The type depends on the nature and varying degree of importance, from a security standpoint, of the security interest or other matter contained therein.

a. *Exclusion area.* A restricted area containing—

(1) A security interest or other matter of such nature that access to the area constitutes, for all practical purposes, access to such security interests or matter; or—

(2) A security interest or other matter of such vital importance that proximity resulting from access to the area is treated equal to (1) above.

b. *Limited area.* A restricted area containing a security interest or other matter, in which uncontrolled movement will permit access to such security interest or matter; access within limited areas may be prevented by escort and other internal restrictions and controls.

c. *Controlled area.* That portion of a restricted area usually near or surrounding an exclusion or limited area. Entry to the controlled area is restricted to authorized personnel. However, movement of authorized personnel within this area is not necessarily controlled. Mere entry to the area does not provide access to the security interest or other matter within the exclusion or limited area. The controlled area is provided for administrative control, safety, or as a buffer zone for security in depth for the exclusion or limited area. The proper commander establishes the degree of control of movement.

Ride awhile-walk awhile method

A law enforcement or security patrolling technique. The MWD team patrols for a period of time in a vehicle and then dismounts for an appropriate period of time to patrol an area on foot. This method increases the potential area the team can cover, as well as allowing the team to concentrate their foot patrols in especially critical areas.

Risk

The degree or likelihood of loss of an asset. Factors that determine risk are the value of the asset to its user in terms of mission criticality, replaceability, and relative value and the likelihood of aggressor activity in terms of the attractiveness of the asset to the aggressor, the history of or potential for aggressor activity, and the vulnerability of the asset.

Risk analysis

Method of examining various risk factors to determine the risk value of likelihood of resource loss. This analysis will be used to decide the level of security warranted for protection of resources.

Risk factors

Elements that make up the total degree of resource loss liability. Factors to be considered in a risk analysis include the importance of the resource to mission accomplishment; the cost, volume, criticality and vulnerabilities of the resources; and the severity of threats to the resources.

Risk level

An indication of the degree of risk associated with an asset based on risk analysis. Risk levels may be Levels I, II, or III, which correspond to low, medium, and high.

Risk value

Degree of expectation or likelihood of resource loss. The value may be classified as low, medium, or high.

Safe

A GSA Class 5 Map and Plans Security Container, Class 6 Security Filing Cabinet or refrigerator or freezer, secured with an approved locking device and weighing 500 pounds or more, or secured to the structure to prevent removal.

Schedule I drug

Any drug or substance by whatever official name (common, usual, or brand name) listed by the DEA in Title 21 of the Code of Federal Regulations, chapter II, Section 308.11, intended for clinical or non-clinical use. A list of Schedule I drugs and substances is contained in AR 40-7, appendix A.

Seal

A device to show whether the integrity of a shipment has been compromised. Seals are numbered serially, are tamperproof, and shall be safeguarded while in storage. The serial number of a seal shall be shown on Government Bills of Lading (GBL). A cable seal lock provides both a seal and locking device.

Sealed containers

Wooden boxes, crates, metal containers, and fiber containers sealed in a way to show when the containers are tampered with after sealing. The method of sealing depends of the type of construction of the containers. Sealing may be by metal banding, nailing, airtight sealing, or wax dripping (for fiber containers). In key control, a sealed container is also a locked key container or a sealed envelope containing the key or combination to the key container.

Sealed protection

A container or an area enclosed by a plastic or soft metal device which is opened easily without the use of a key or combination.

SEAVAN

A commercial, Government-owned or leased shipping container and without bogey wheels attached that is moved by ocean transportation and must be lifted on and off the ship. (DOD 5100.76-M)

Security card

An official distinctive identification (pass or card) that identifies and authorizes the possessor to be physically present in a U.S. Army designated restricted area.

Security engineering

The application of engineering principles to the protection of assets against various threats through the application of construction and equipment application.

Security lighting

The amount of lighting necessary to permit visual surveillance by security police or by supervisory personnel.

Security procedural measures

Physical security measures to counter risk factors that will periodically change over a period of time such as criminal, terrorist, and hostile threats. The procedures can usually be changed within a short amount of time and involve manpower.

Sensitive conventional arms, ammunition, and explosives

See categorization of such items in appendix A, AR 190–11.

Sensitive items

Material requiring a high degree of protection to prevent unauthorized acquisition. This includes arms, ammunition, explosives, drugs, precious metals, or other substances determined by the Administrator, Drug Enforcement Administration to be designated Schedule Symbol II, III, IV, or V under the Controlled Substance Act of 1970.

Signal intelligence

Intelligence derived from communications means (such as telephone, telegraph, radio), electronic signal emitters (such as navigation radar, identification friend or foe, and weapons guidance devices) and instrumentation signals (such as telemetry and beaconry).

Signature Security Service

A service designed to provide continuous responsibility for the custody of shipments in transit. A signature and tally record is required from each person responsible for the proper handling of the shipment at specified stages of its transit from origin to destination.

a. The initial signature on the signature and tally record should be the same as that of the carrier's agent on the GBL. When SSS is used in conjunction with DDPS, both drivers in each pair of drivers shall sign the signature and tally record when that pair assumes responsibility for the shipment.

b. Commercial carriers offering SSS must be able to trace a shipment in less than 24 hours. The following forms shall be used to obtain SSS:

(1) *Surface shipments.* DD Form 1907 (Signature and Tally Record) shall accompany every surface shipment of classified or protected material accorded a signature and tally service by surface commercial carriers. Carrier tariffs and tenders may describe this type of service under different titles for example, Hand-to-Hand Signature Service or Signature Service.

(2) *Commercial air shipments.* The air industry internal Form AC–10 (Airlines Signature Service Record) shall be used by regulated and nonscheduled airlines to obtain the signature and tally record. Air taxi operators and air freight forwarders providing SSS may use DD Form 1907 instead of AC–10. No receipt is required from the flight crew or attendants while the aircraft is in flight. A signature and tally record is required; however, from air carrier personnel whenever the aircraft is on the ground and access to the cargo compartment containing the sensitive arms, ammunition, and explosives (AA&E) is available for any purpose. A signature and tally record is also required from pickup and delivery carriers used by the airlines for such purposes.

(3) *Military air shipments.* The AF Form 127 (Traffic Transfer Receipt) or similar document, will be used to provide hand-to-hand receipt control for sensitive and classified shipments being transferred in the DTS. (DOD 5100.76–M)

Steel bar

A flat bar, 3/8 inch by one inch minimum; or round bar 1/2 inch diameter minimum.

Steel mesh

High carbon, manganese steel not less than 15/100 inch (8-gauge) in thickness, and a grid of not more than two inches center to center.

Storage

Any area where AA&E are kept. Storage does not include items in process of manufacture, in use, or being transported to a place of storage or use.

Survivability

The ability to withstand or repel an attack, or other hostile action, to the extent that essential functions can continue or be resumed after the hostile action.

Tactics

The specific methods of achieving the aggressor's goals to injure personnel, destroy Army assets, or steal Army materiel.

Tactical vehicle

A vehicle with military characteristics designed primarily for use by forces in the field in direct connection with, or support of, combat or tactical operations, or the training of troops for such operations.

Tenant activity

A unit or activity of one Government agency, military department, or command that occupies facilities on an installation of another military department or command and that receives supplies or other support services from that installation.

Terrorism

The calculated use of violence or the threat of violence to inculcate fear; intended to coerce or to intimidate governments or societies in the pursuit of goals, that are generally political, religious, or ideological.

Terrorism counteraction measures

Term used previously for combatting terrorism (see definition of this term).

Terrorist group

A politically, religious, or ideologically oriented group which uses terrorism as its prime mode of operations.

Threat management force

An action force from the installation that responds to major disruptions on installations. The TMF should be of sufficient size to manage the disruption and will usually involve a command element, security element, negotiation team, SRT, and logistical element.

TOW

A tube-launched, optically traced, wire-command missile designed as an antitank weapon system. (DOD 5100.76-M)

Upper rail loc

A set screw operated variation of a "C" clamp designed for gripping the upper sliding rail which supports or guides the weight of some styles of railroad boxcar doors. Gripping the upper sliding rail, the "loc" blocks and prevents the door's roller hangers or carriers from sliding past, thereby effectively preventing the door from being moved. (DOD 5100.76-M)

Waiver

Temporary relief from specific standards imposed by this manual (regulation) pending actions accomplishment of actions that will conform to the standards required. Compensatory measures are required.

Section III**Special Abbreviations and Terms**

There are no entries in this section.

Index

This index is organized alphabetically by topic and subtopic within a topic. Topics and subtopics are identified by paragraph number.

Access control (See also two-person rule.)**Accountability, Disposition, Disposal and Demilitarization**

- DOD Central Registry, 6-2
- of ammunition and explosives, 6-3
- of arms, 6-2
- of nonnuclear missiles and rockets, 6-1

Alarms

- Alarm Intrusion Detection Record, 3-6
- Computer printouts, 3-6
- Daily log, 3-6

Ammunition

- Covered by regulation, 1-1
- Definition, 1-1
- Excluded from regulation, 1-1

Anniston Army Depot, 6-7**Armament, Munitions, and Chemical Command, U.S. Army (AMCC), 4-2, 8-3****Arms**

- Covered by regulation, 1-1
- Defined, 1-1
- Excluded from regulation, 1-1
- Protection of, 4-1

Arms parts

- Protection of, 4-14

Arms racks

- Instructions for fabrication, 4-2

Audits (See Inspections)**Basic load ammunition**

- Security procedures for, 5-8

Battery coolant units

- Storage of, 5-8

Bureau of Alcohol, Tobacco and Firearms

- Liaison for security threats, 3-4

Chief, National Guard Bureau

- Responsibilities 1-6

Clear zones

- Requirements, 5-3

Commercial ammunition

- For display, 4-7
- Protection of, 4-7

Commercial arms (See commercial ammunition)**Commercial shipments (See also transportation)**

- Security for, 7-14

Communications

- Required for security personnel, 5-7
- Consolidated arms rooms, 4-4
- Contingency plans, 3-3

Construction of storage facilities

- Construction programming documents, 1-4
- Engineer personnel responsibilities, 1-7, 2-2
- Security personnel responsibilities, 1-11, 1-12, 1-13, 2-2

Countermeasures, 3-5

Criminal Investigation Division Command, U.S. Army (USACIDC) (See also Lost, Stolen, or Missing AA&E)

1-9

Decision Logic Tables, tables B-1 through B-6**Declaration of war**

Suspended security provisions, 1-1

Defense Reutilization Marketing Office (DRMO) (See disposal and demilitarization)**Defense Transportation System (DTS), 7-12****Demilitarized weapons**

Storage of, 4-11

Deputy Chief of Staff for Operations and Plans (DCSOPS)

Responsibilities of, 1-4

Director Civilian marksmanship

Prohibitions, 2-7

Disciplinary action

Violations of regulation, 2-11

Disposal and demilitarization

Ammunition, 6-6

Arms, 6-6

Defense Reutilization Marketing Office (DRMO), 6-6

Explosives, 6-6

DOD Central Registry (See also Accountability, Disposition, Disposal and Demilitarization; Physical inventory control; serial number; Small Arms Serialization Program)

Anniston Army Depot, 6-7

Disposal of privately owned firearms, 6-7

Excluded arms, 6-2

Identifying weapon ownership, 8-3

Inter-Service transfer of weapons, 6-2

Investigative aids, 8-3

Reporting loss, 8-2

Small Arms Serialization Program, 4-13

Small arms shipments, 6-2

DOD Explosives Safety Board, 7-13**Doors, locks and locking devices**

Approved doors, 4-2

Approved locks and locking devices, 5-6

Double doors, 4-2

Panic hardware, 4-2

Drainage structures (See also Fences), 5-3**Engineers, Chief of**

Responsibilities, 1-7

Entry control (See also Fences; Guards)

Clearances required, 5-9

Gates, 5-9

Roster, 5-9

Storage areas, 5-9

Two-person rule, 5-9

Vehicle inspections, 5-9

Explosives

Covered by regulation, 1-1

Defined, 1-1

Explosive Ordnance Disposal Team, 7-1**Facilities**

Requirements, 1-1

contractor-owned, contractor operated (COCO), 1-1, app H

Government-owned, contractor operated (GOCO), 1-1, app H

Federal Bureau of Investigation (FBI)

- Liaison for security threats, 3-4
- Losses from Civilian Marksmanship Program, 2-9
- Reporting losses, 8-2, 8-3

Fences (See also drainage structures; entry control)

- Construction criteria, 5-3
- Evaluating need for, 5-3
- Gates, 5-3
- Surrounding storage areas, 4-17

Foreign Military Sales, 7-12**Guards**

- Armed guards, 7-9
- At entrance and exit points, 5-5
- For missiles and rockets, 5-8
- Igloos, security measures, 5-13

Incident reports (See also serious incident reports)

- Commander responsibilities, 1-10, 1-11, 1-12, 8-2
- HQDA responsibilities, 1-5, 8-2
- Items and amounts reported, 8-2
- Investigations, 1-9, 2-8, 2-9

Inspections

- Acceptance of IDS, 3-6
- Physical security inspections, 1-11, 2-6
- Procedures, 2-6
- Status of waivers and exceptions, 2-4, 2-6
- Supply operations, 2-6
- Unannounced inspections, 1-11*d*

Installation planning board, 1-12*c***Intrusion Detection System (IDS)**

- Acceptance inspection, 3-6
- Access to wiring diagrams, 3-6
- Backup power supply, 3-6
- Central control station, 3-6
- Clearance of civilian contractor employees, 3-6
- Components of IDS, 3-6
- Computer printout of alarms, 3-6
- Considered for security classification, 3-6
- Daily log of alarms, 3-6
- Facilities in civilian communities, 3-6
- Facilities off installation, 3-6
- Failure of IDS, 4-2
- Physical security inspections, 3-6
- Reserve component facilities, 3-6
- Response force, 3-6
- Security checks, 3-6
- Signs announcing IDS, 3-6, 4-16, 5-11, app F
- System operational checks, 3-6
- Transmission lines, 3-6

Inventory (See also museums)

- Adjustments, 2-9
- Control, 6-2, 6-3
- Effectiveness review, 6-5
- Losses, 6-4

Joint Ordnance Commanders Group (JOCG), 1-1**Keys**

- AA&E, 3–8
- Broken, 3–8
- Containers, 3–8
- Controls, 4–2, 5–6
- Custodian, 3–8
- Depository, 3–8
- IDS, 3–6, 3–8
- Lost, misplaced or stolen, 3–8
- Safeguarding, 3–6

Key Control Registry and Inventory, 3–8**King Tut blocks, 5–13****Lanyards, 4–1****Lighting, 4–2, 5–4****Locks**

- Approved, list of, 5–6
- Combination locks, 3–8
- Cylinders, replacement of, 3–8
- Padlocks, 3–8

Losses (See also Inventory, Investigations; Marksmanship Weapons; Reports)

- Disposition of records, 8–4
- Due to discrepancies, 2–9
- Due to negligence, 2–9
- Due to theft, 2–9
- Notification requirements, 1–4, 8–2
- Property overages, 2–9
- Transportation losses, 2–9

Marksmanship weapons

- Exceptions for, 4–6
- Lost, stolen or missing, 2–9
- Protection for, 4–6

Materiel Command, U.S. Army (AMC), Responsibilities, 1–8**Military Airlift Command (MAC), 1–14, 7–2c, 7–12****Military Sealift Command, 1–14, 7–2d, 7–12****Military Traffic Management Command**

- Responsibilities, 1–14, 7–2a, 7–2b
- Waivers and exceptions to policy, 2–4

Museums

- Accountability of weapons, 4–13
- Inventory, 4–13
- Procedures, 4–13

National Agency Check, 3–6**National Crime Information Center (NCIC), 3–6, 8–2, 8–3****National Firearms Act of 1968, 4–5****Naval Civil Engineering Laboratory (NCEL), 3–8****Peacetime conditions, 1–1****Personnel selection**

- Disqualifying factors, 2–12
- National Agency Check, 3–6

Procedures, 2–12**Physical security planning**

- Contingency plans, 3–3
- Coordination requirements, 3–2
- Implementation instructions, 3–5
- Phases of security operations, 3–5
- Requirements assessment, 3–1

Policy

- Consolidation of AA&E, 2-1
- Construction of facilities, 2-2
- Cost, 2-1
- Disposal of AA&E, 2-1
- Physical security equipment, 2-1
- Removal of AA&E from storage, 2-1
- Storage area's size, 2-1
- Unusual activities, 2-1
- Unusual facilities, 2-1

Priority lists, 2-3**Priority of installation of physical security equipment, 2-3****privately-owned weapons and ammunition**

- Abandoned, 6-7
- Confiscated, 6-7
- Protection of, 4-5
- Storage of, 4-5

Prohibitions

- Against civilian marksmanship, 2-7
- Against gun clubs, 2-7
- Against National Guard units, 2-7
- Against reserve units, 2-7
- Against Reserve Officer Training Corp units, 2-7

Property overages, 2-9**Protection of Arms**

- During maintenance operations, 4-1
- Individual responsibilities, 4-1
- Mounted weapons, 4-1, 4-2

Protection of Missiles, rockets, ammunition and explosives

- Requirements, 5-8

Purpose of regulation, 1-1**Quantity verification, 7-2****Recovered property**

- Accountability, 2-9
- Return to owner, 8-3
- Rendering weapons inoperable, 4-2

Reports (See also incident reports; serious incident reports)

- Criminal investigation reports, 2-9

Report of missing/recovered firearms, ammunition and explosives, 2-9**Report of survey, 2-9****Requisition**

- Rejecting requisitions, 2-8
- Required instructions, 2-8
- Verification of requisition, 2-8

Restricted area, 4-15, 5-10**Sales**

- Sales in United States, 6-6
- Overseas sales, 6-6

Screening of personnel (See Personnel)**Security of AA&E**

- Aboard ships, 2-5
- During training, 2-5
- For deployment, 2-5

In museums, 4-13

Security construction statement, 2-2

Security forces (See also Guards)

Annual review of procedures, 3-7

Armed personnel, 3-7

Law enforcement patrol plans, 3-7

Records of guard checks, 3-7

Required training, 2-10

Sensitive items aboard ships or aircraft, 4-2

Serial number (See also DOD Central Registry; Small Arms Serialization Program)

Duplicate numbers, 6-2

Format, 6-2

Two-man certification, 7-4

Serious incident report (See also incident reports; reports)

Reporting responsibilities, 8-2

Shipments of AA&E, 7-1

Small Arms Serialization Program (See also DOD Central Registry; serial number)

Registering serial numbers, 4-13

Small quantity shipments, 7-8

Storage area at unit level, 5-8

Storage containers, 4-2

Storage facility criteria, 4-2

Storage of weapons (See weapons, storage of)

Surveys (See Inspections)

Suspension of transportation physical security requirements, 1-1

Terrorist conditions, 7-2

Tools and high-value items, 4-18

Training

Commander's responsibilities, 2-10

Required subjects, 2-10

Transportation (See also commercial shipments)

Air movements, 7-7

Commercial aircraft, 7-2

Commercial movements, 7-10

Contract movements, 7-13

Criteria, 7-1

Duties, 7-2

Foreign military sales (FMS) shipments, 7-12

Intra-installation movements, 7-1

Losses during, 2-9

Marksmanship weapons and ammunition, 7-18

Military Airlift Command (MAC), 7-2

Military Sealift Command (MSC), 7-2

Military Traffic Management Command (MTMC), 7-2

Organic unit movements, 7-9

Overseas in-theater movements, 7-11

Physical security standards, 7-3, 7-5

Small quantity shipments, 7-8

Unit training movements, 7-1

Water shipments, 7-6

Transportation Protective Service, 7-12

Two-person rule, 4-19

Wartime conditions, 1-1

Waivers and exceptions

Blanket waivers, 2-4

For commercial carriers, 2-4

From construction standards, 2-4

Weapons, Storage of (See also Museums; Protection of arms)

Contract guard weapons and ammunition, 4-8

Foreign weapons and ammunition, 4-12

General officer weapons and ammunition, 4-9

Guidance, 4-1

Procedures, 5-8, 5-12

Retained in private quarters, 4-1, 4-5

U.S. Military Academy weapons, 4-10

Weapons Trainers

Storage of classified, 4-3

RESERVED

M TAB

TAB

SECURITY CONSTRUCTION STATEMENT

For use of this form, see AR 190-11; the proponent agency is ODCSOPS

INSTRUCTIONS

This form will be prepared in three copies. The original will be maintained permanently in the files of the individual signing the form. The first copy will be maintained permanently in the using unit/organizational files. The second copy will be filed permanently in the arms/ammunition storage facility. All entries except item 7 will be typewritten.

1. THE CONSTRUCTION OF THIS FACILITY CONFORMS TO THE CRITERIA OF AR 190-11 WHICH IS IN EFFECT ON THIS DATE EXCEPT AS INDICATED HEREON

2. ROOM AND BUILDING NUMBER, STREET AND INSTALLATION ADDRESS

3. THIS APPLIES TO

- a. AN EXISTING STRUCTURE
- b. CONSTRUCTION OF NEW FACILITY
- c. MODIFICATION OF EXISTING FACILITY (*Explain*)

4. NAME OF OFFICIAL SIGNING IN ITEM 7 BELOW

GRADE

6. ADDRESS OF OFFICIAL

5. ORGANIZATION

7. SIGNATURE

DATE SIGNED

DA FORM 4604-R, 1 MAR 77

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Army Regulation 190-51

Military Police

**Security of
Unclassified
Army Property
(Sensitive and
Nonsensitive)**

**Headquarters
Department of the Army
Washington, DC
30 September 1993**

UNCLASSIFIED

SUMMARY of CHANGE

AR 190-51

Security of Unclassified Army Property (Sensitive and Nonsensitive)

This revision--

- o Consolidates paragraphs 6 through 9, 11, 13, 15 through 17, and 19 of AR 190-18 into chapter 5 and AR 190-50 into chapter 4.
- o Consolidates all responsibilities, to include controlled substances and museums (chap 1).
- o Adds requirements for conducting risk analyses during construction planning for assets of units or activities that will occupy new or renovated facilities or facility additions (para 2-2).
- o Adds some minimum security measures and terrorism counteraction measures asset categories. Security measures now consist of physical protective measures, security procedural measures, and terrorism counteraction measures (sections II and III, chap 3).
- o Broadens asset categories and adds security measures for assets not previously in the regulation (for example, mission-critical and high-risk personnel (para 3-19), general civilian and or military personnel (para 3-20), and industrial and utility equipment (para 3-21)).
- o Consolidates all storage structure requirements and allows for alternative construction based on delay time for the different construction being equal to or greater than the response time (app B).
- o Adds intrusion detection system requirements in some situations to increase delay after detection (para B-1).
- o Consolidates all marking requirements (app C).
- o Authorizes exact replication of any DA or DD forms prescribed in this regulation generated by the automated Military Police Information Management System in place of the official printed version of the form (app A, sec III).

Headquarters
Department of the Army
Washington, DC
30 September 1993

*Army Regulation 190-51

Effective 30 October 1993

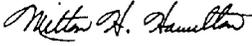
Military Police

Security of Unclassified Army Property (Sensitive and Nonsensitive)

By Order of the Secretary of the Army:

GORDON R. SULLIVAN
General, United States Army
Chief of Staff

Official:


MILTON H. HAMILTON
Administrative Assistant to the
Secretary of the Army

History. This UPDATE printing publishes a consolidation of three regulations pertaining to physical security; AR 190-18, AR 190-50, and AR 190-51. Because the structure of the revised text has been reorganized, no attempt has been made to highlight changes from earlier printings.

Summary. This regulation implements DODD 5200.8, Security of DOD Installations and Resources, and sets forth physical security policies, procedures, and standards for the safeguarding of U.S. Army property. It provides guidance for protection of both sensitive and nonsensitive supplies and equipment, controlled cryptographic items, controlled medical substances and sensitive items, and historically significant items in the care of the U.S. Army museum system. It gives commanders the flexibility to enhance physical security by adapting invested

resources to meet local needs based on risk analysis results. Actual physical security posture will be based on local conditions; however, it must not be less than the minimum standards for the categories of U.S. Army property specified in this regulation.

Applicability. This regulation applies to elements of the Active Army, the Army National Guard, the U.S. Army Reserve, the Reserve Officers' Training Corps, and U.S. Army contractors which use or handle both sensitive and nonsensitive unclassified U.S. Army property. This publication applies during partial and full mobilization.

Proponent and exception authority. The proponent of this regulation is the Deputy Chief of Staff for Operations and Plans. The Deputy Chief of Staff for Operations and Plans has the authority to approve exceptions to this regulation that are consistent with controlling law and regulation. The Deputy Chief of Staff for Operations and Plans may delegate this authority, in writing, to a division chief within the proponent agency in the grade of colonel or the civilian equivalent. The approval authority will coordinate all questions regarding the scope of authority to approve exceptions with HQDA (DAJA-AL), Washington, DC 20310-2200.

Army management control process. This regulation is subject to the requirements of AR 11-2. It contains internal control provisions but does not contain

checklists for conducting internal control reviews. These checklists are contained in Department of the Army Circular 11-89-2.

Supplementation. Supplementation of this regulation and establishment of command and local forms are prohibited without prior approval from HQDA (DAMO-ODL-S), 400 Army Pentagon, Washington, DC 20310-0400.

Interim changes. Interim changes to this regulation are not official unless they are authenticated by the Administrative Assistant to the Secretary of the Army. Users will destroy interim changes on their expiration dates unless sooner superseded or rescinded.

Suggested Improvements. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to HQDA (DAMO-ODL-S), 400 Army Pentagon, Washington, DC 20310-0400.

Distribution. Distribution of this publication is made in accordance with the requirements on DA Form 12-09E, block 2568, intended for command levels A, B, C, D, and E for the Active Army, Army National Guard, and the U.S. Army Reserve.

Contents (Listed by paragraph and page number)

Chapter 1

Introduction, page 1

Purpose • 1-1, page 1

References • 1-2, page 1

Explanation of abbreviations and terms • 1-3, page 1

Responsibilities • 1-4, page 1

*This regulation supersedes paragraphs 6 through 9, 11, 13, 15 through 17, and 19 of AR 190-18, 1 April 1984; AR 190-50, 31 March 1986; and AR 190-51, 31 March 1986.

Contents—Continued

Security measures and standards • 1–5, *page 2*

Waivers and exceptions • 1–6, *page 2*

Chapter 2

Risk Analysis, *page 2*

General • 2–1, *page 2*

Use of risk analysis • 2–2, *page 3*

Implementation of risk analysis • 2–3, *page 3*

Chapter 3

Physical Security Standards by Category of Army Property, *page 3*

Section I

Security overview, *page 3*

General • 3–1, *page 3*

Categories of Army property • 3–2, *page 4*

Section II

Minimum Security Standards for Categories of Army Property Using Risk Analysis, *page 4*

Aircraft and components at Army aviation facilities • 3–3, *page 4*

Aircraft and components not at Army aviation facilities • 3–4, *page 6*

Vehicles and carriage–mounted/towed weapons systems and components • 3–5, *page 6*

Communications and electronics equipment and night vision devices • 3–6, *page 8*

Organizational clothing and individual equipment (OCIE) stored at central issue facilities • 3–7, *page 9*

OCIE not stored at central issue facilities • 3–8, *page 9*

Subsistence items stored at commissaries, commissary warehouses, and troop issue subsistence activities (TISAs) • 3–9, *page 10*

Subsistence items not at commissaries, commissary warehouses, and troop issue subsistence activities • 3–10, *page 11*

Repair parts at installation level supply support activities and direct support units with an authorized stockage list (ASL) • 3–11, *page 11*

Repair parts not at installation level support activities and direct support units • 3–12, *page 11*

Petroleum, oils, and lubricants (POL) at bulk storage facilities • 3–13, *page 11*

POL not at bulk storage facilities • 3–14, *page 12*

Facility engineering supply and construction material storage areas • 3–15, *page 13*

Audiovisual equipment, training devices, and subcaliber devices at training and audiovisual support centers (TASCs) • 3–16, *page 14*

Audiovisual equipment, training devices, and subcaliber devices at units or activities that are not training and audiovisual support centers • 3–17, *page 14*

Aircraft and vehicles with classified onboard equipment or components • 3–18, *page 14*

Mission–critical and high–risk personnel • 3–19, *page 15*

General civilian and or military personnel • 3–20, *page 15*

Industrial and utility equipment • 3–21, *page 16*

Section III

Minimum Security Standards for Other Categories of Army Property, *page 16*

Hand tools, tool sets and kits, and shop equipment • 3–22, *page 16*

Administrative and housekeeping supplies and equipment • 3–23, *page 17*

Controlled cryptographic items (CCI) • 3–24, *page 17*

Unit supply rooms • 3–25, *page 18*

Postal unique items • 3–26, *page 18*

Chapter 4

Security of Medical Supplies and Equipment, *page 18*

Contents—Continued*Section I**Policy and Personnel Selection, page 18*General • 4-1, *page 18*Security policy • 4-2, *page 18*Personnel selection • 4-3, *page 19*In-transit security of controlled medical substances and other medically sensitive items • 4-4, *page 19*Disposal of controlled medical substances and items • 4-5, *page 19**Section II**Structural Standards for Bulk Storage Facilities, page 19*Storage of Notes R, Q, and C items • 4-6, *page 19*Note R items • 4-7, *page 19*Note Q items • 4-8, *page 20*Note C items • 4-9, *page 20*Controlled medical substances or sensitive medical items • 4-10, *page 20**Section III**Physical Security Measures and Control Procedures, page 20*Safeguards during nonduty hours • 4-11, *page 20*Security checks • 4-12, *page 20*Intrusion detection system and security lighting • 4-13, *page 20*Lock and key control • 4-14, *page 21**Section IV**Physical Security Standards for Pharmacy Storage, page 21*Pharmacy storage structural standards • 4-15, *page 21*Physical security measures and control procedures • 4-16, *page 21**Section V**Medical Treatment Facilities and Research, Development, Test, and Evaluation (RDT&E) Laboratory Facilities, page 21*Medical treatment facilities and RDT&E laboratory structural standards • 4-17, *page 21*Physical security measures and control procedures • 4-18, *page 22*Crash carts, emergency trays, and ambulances • 4-19, *page 22*Medically sensitive items • 4-20, *page 22***Chapter 5****Physical Security of U.S. Army Museums, page 22***Section I**Inspections and Personnel Selection, page 22*General • 5-1, *page 22*Inspections • 5-2, *page 22*Museum personnel selection • 5-3, *page 23**Section II**Museum Structures and Indoor and Outdoor Displays, page 23*Structural requirements • 5-4, *page 23*Locks and keys • 5-5, *page 23*Security lighting • 5-6, *page 23*Intrusion detection systems • 5-7, *page 24*Exhibit or display cases • 5-8, *page 24*Museum workshops • 5-9, *page 24*Security forces • 5-10, *page 24*Museum parks • 5-11, *page 24*Museums in civilian communities • 5-12, *page 24*

Contents—Continued

Reporting loss of property • 5-13, *page 24*
Accountability of equipment • 5-14, *page 24*
Museum weapons and ammunition • 5-15, *page 24*

Appendixes

- A. References, *page 25*
- B. Storage Structure Security, *page 29*
- C. Marking of Army Property, *page 33*
- D. Keys, Locks, Locking Devices (including Hasps and Chains), and Protective Seals, *page 33*

Glossary

Index

Chapter 1 Introduction

1-1. Purpose

This regulation prescribes policies, procedures, and responsibilities for safeguarding unclassified U.S. Army property, both sensitive and nonsensitive. Its policy objectives are to—

- a. Establish standardized, minimum acceptable security requirements for specified categories of U.S. Army property.
- b. Provide a risk analysis method that allows commanders the flexibility to tailor physical security posture and resources to meet local needs.
- c. Reduce loss, theft, misuse, and damage of Army assets cost effectively.

1-2. References

Required and related publications and prescribed and referenced forms are listed in appendix A.

1-3. Explanation of abbreviations and terms

Abbreviations and special terms used in this regulation are explained in the glossary.

1-4. Responsibilities

- a. Deputy Chief of Staff for Operations and Plans (DCSOPS) will—
 - (1) Provide overall staff responsibility for the security of unclassified Army property (sensitive and nonsensitive).
 - (2) Coordinate with the Army Staff (ARSTAF) and major Army commands (MACOMs) to establish policy, procedures, and standards pertaining to security of Army property.
- b. The Director of Information Systems for Command, Control, Communications, and Computers will resolve any conflicts in U.S. Army policy concerning the control of controlled cryptographic items (CCI).
- c. Installation commanders, major United States Army Reserve Commands (MUSARC), and state adjutants general (AG) will—
 - (1) Ensure a risk analysis is conducted for the assets of all assigned and tenant units and activities maintaining specified facilities for particular categories of Army property under this regulation and for any other assets which have been designated mission essential or vulnerable as indicated in Army Regulation (AR) 190-13.
 - (2) Ensure a risk analysis is conducted for the assets of units and activities which are to occupy new or renovated facilities or facility additions. Risk analyses for assets to be located in such facilities will be performed during the planning stages of the facility construction or renovation so that security measures can be incorporated at the project's inception.
 - (3) Determine security requirements for museum activities in their commands and comply with this and other related regulations and directives.
- d. The numbered armies in the continental United States (CONUSA), installation, division, MUSARC, separate brigade commanders, and state AGs, upon declaration of war or when operating in a designated hostile area, may prescribe procedures suspending specific provisions of this regulation to account for local conditions while ensuring maximum practical security for Government personnel and property. This authority may be delegated to commanders in the grade of lieutenant colonel.
- e. Unit commanders or activity chiefs will control and safeguard all supply and equipment areas within their command or activity. They will—
 - (1) Promptly report to the provost marshal or equivalent organization, investigate, and resolve incidents involving loss, theft, misuse, or damage of Army resources.
 - (2) Establish end-of-day security checks using Standard Form (SF) 701 (Activity Security Checklist).
 - (3) Implement security measures associated with the conduct of risk analysis using this regulation and Department of the Army (DA) Pamphlet 190-51.
 - (4) Ensure physical security officers are appointed, in writing, to perform, as a minimum, the duties outlined in AR 190-13.
 - (5) Ensure security plans outlining responsibilities and procedures for the proper control and accountability of assets are written and appropriately disseminated.
 - (6) Ensure assets are secured by approved locking devices (locks, chains, seals, etc.) as outlined in appendix D.
- f. Units, activities, and installations involved in supply operations will protect their own supplies and equipment as indicated in this regulation.
- g. Facility commanders will ensure physical security inspections are conducted per AR 190-13. In addition, commanders may request the U.S. Army Criminal Investigation Command (USACIDC) to conduct crime prevention surveys for the purpose of detecting crime, evaluating the possibilities of easy criminal activity, and identifying procedures conducive to criminal activity.
- h. Commanders and individuals who are assigned custody of controlled medical substances cited in this regulation

are responsible for implementing the measures to safeguard them required by this regulation. These responsibilities include:

- (1) Ensuring physical security responsibilities are fixed in the receipt, storage, issue, transportation, use, disposal, turn-in, and accounting for all controlled medical substances and sensitive items.
- (2) Providing specific security instructions to individuals who are in the possession and control of, or who are responsible for, controlled medical substances and sensitive items.
- (3) Ensuring the careful selection of personnel, including volunteer workers, who are assigned duties that require access to controlled medical substances and sensitive items storage areas or who have custodianship or possession of keys and combinations to locks securing these areas.
- (4) Taking action to deny access to controlled substances by individuals undergoing investigation, treatment, rehabilitation, judicial or nonjudicial processes, or administrative action as a result of actual or suspected drug abuse or as a result of suspected illegal activity involving controlled drugs (for example, theft, wrongfully prescribing, inventory manipulation, etc.).
- (5) Establishing appropriate escort procedures and designating escort personnel, by name or duty position, to escort unauthorized people into storage areas.
- (6) Ensuring a physical security officer is appointed, in writing, by the medical facility commander to assure that appropriate protection is provided for all controlled medical substances and sensitive items.
 - i.* The museum curator is the authority who decides if a weapon is antique or unique and if it should be made inoperable for display purposes.

1-5. Security measures and standards

- a.* Physical security measures or standards more stringent than those contained in this regulation, as appropriate, will be developed jointly by the tenant activity commander, the installation physical security officer, and host installation commander. Such measures will be based on a threat analysis developed from the risk analysis in DA Pam 190-51 using Technical Manual (TM) 5-853-1. These measures will be incorporated into the installation physical security plan as an annex.
- b.* Provisions for security and necessary funding will be included in normal budget documents. Tenant activities must identify their security requirements to the host installation.
- c.* Installation of intrusion detection systems (IDS) will be according to the applicable Office of the U.S. Army Corps of Engineers guide specifications and with applicable Army regulations (to include AR 190-13).
- d.* Provision of security measures beyond those required by this regulation will be per TM 5-853-1.

1-6. Waivers and exceptions

- a.* Waivers and exceptions for all unclassified Army property discussed in this regulation will be considered individually.
 - (1) Requests for waivers and exceptions will be submitted, in writing, with complete justification and a statement of compensatory measures in effect through command channels and through the MACOM commander or appropriate staff element having staff cognizance to HQDA (DAMO-ODL-S), 400 ARMY PENTAGON, WASH, DC 20310-0400. Waivers will not be granted for periods exceeding 12 months. Exceptions will be regarded as permanent; however, they will be reviewed and revalidated every 2 years by HQDA (DAMO-OL-S), which retains the authority to revoke exceptions.
 - (2) Requests for waivers or exceptions will be coordinated with the law enforcement activity, provost marshal, or security officer. When structural deficiencies exist, requests also will be coordinated with the supporting Director of Engineering and Housing (DEH) or equivalent organization.
 - (3) Active and reserve component provost marshals will submit through command channels and their MACOM to HQDA (DAMO-ODL-S) a list of exceptions to physical security requirements and indicate whether the exceptions are to be continued or canceled.
 - b.* Waivers and exceptions to the requirements of this regulation will be kept to a minimum.
 - (1) Authority to grant waivers and exceptions is delegated to HQDA (DAMO-ODL-S).
 - (2) Requests for waivers and exceptions will include an adequate description of circumstances requiring the action and a description of compensatory measures. Requests will be submitted, in writing, through command channels to HQDA (DAMO-ODL-S) for individual evaluation. Blanket waivers or exceptions are not authorized.
 - (3) Waivers normally will be valid up to but not to exceed 1 year. A permanent exception from the specific requirements of this regulation will be permitted only under the conditions described below.
 - (a)* Unique circumstances at a given unit, facility, or installation are such that conformance to the established standards is impossible, highly impracticable, or unnecessary.
 - (b)* Security afforded is equal to or greater than that provided by the standard criteria.

Chapter 2 Risk Analysis

2-1. General

a. To provide the most practical protection for Army assets, commanders must identify the assets to be protected and analyze the risks to those assets from espionage, sabotage, terrorism, damage, misuse, and theft. Analysis of these risks will assist in determining the type and minimum level of protection needed to safeguard the identified resources adequately and economically.

b. The objectives of risk analyses are to—

- (1) Provide commanders a tool with which to design a physical security system based on local needs.
- (2) Allow commanders the flexibility to adapt the use of physical security resources to local risk conditions.
- (3) Obtain the maximum security return from invested fiscal and manpower resources.
- (4) Serve as a basis for an asset-specific threat analysis.

2-2. Use of risk analysis

a. The background and explanation of step-by-step procedures for determining security requirements and conducting a risk analysis for categories of Army property are in DA Pam 190-51.

b. A risk analysis will be conducted for those installations or facilities that the installation or MUSARC commanders or the State AGs determine mission essential or vulnerable as indicated in AR 190-13 and which include one or more of the categories of U.S. Army property addressed in this regulation. A risk analysis will be conducted on all mission essential and vulnerable areas (MEVAs)—

- (1) When a unit or activity is activated.
- (2) When a unit permanently relocates to a new site or facility.
- (3) When no formal record exists of a prior risk analysis.
- (4) At least every 3 years or more frequently at the discretion of the unit or activity commander.
- (5) During the planning stages of new facilities, additions to facilities, and facility renovations.
- (6) When an incident occurs in which an asset is compromised.

c. The risk analysis will be conducted jointly by designated representatives of the installation commander, the using unit or activity, and the supporting installation provost marshal or equivalent security officer representative.

2-3. Implementation of risk analysis

a. Based on the risk analysis results, the unit commander or activity chief will implement the physical protective measures and security procedures described in chapters 3, 4, or 5 of this regulation, as appropriate.

b. Results of the risk analysis and physical protective measures, security procedural measures, and terrorism counteraction measures to be implemented will be recorded on DA Form 7278-R (Risk Level Worksheet), with all attachments as necessary. Instructions for the use of DA Form 7278-R are in DA Pamphlet 190-51. Copies of these records will be kept by the supporting provost marshal or equivalent security officer at the unit or activity concerned and at the reserve component provost marshal's office where applicable. The results will be used in planning and assessing physical security programs under AR 190-13.

c. The risk analysis may be reviewed and portions of the results changed at the discretion of the installation CONUSA or MUSARC commander or State AG. This could be based on a significant change in risk factors to a specific category of Army property, to a particular unit or activity, or to the overall installation. Any discretionary changes made by the installation commander will be coordinated with the installation provost marshal or equivalent security officer.

Chapter 3 Physical Security Standards by Category of Army Property

Section I Security overview

3-1. General

a. In this chapter, common types of U.S. Army property are classified in readily understandable categories for quick reference. Guidance for each category of property listed includes references to the primary directives for management and accountability of that category of property and minimum security standards to be implemented.

b. Section II of this chapter outlines physical protective, security procedural, and terrorism counteraction measures for particular categories of property maintained at U.S. Army installations or facilities. The measures are categorized according to their risk levels established using the risk analysis procedure in DA Pam 190-51. Risk Level I physical

protective and security procedural measures will be treated as minimums. Physical protective and security procedural measures primarily address threats related to theft of the asset. Additional terrorism counteraction measures address terrorist threats related to the killing of people or the destruction of assets. Such measures are only included for asset categories for which they apply.

c. Section III of this chapter outlines minimum required security measures to be implemented for other specified categories of property. Although these categories of Army property do not require the conduct of risk analysis using DA Pam 190–51, the principles of risk analysis should be applied and risk factors considered.

d. For those categories of U.S. Army property where perimeter fencing is required as a protective measure, the type and quantity of fencing, including the height (6 or 7 feet) and whether a top guard or other features are required, will be based on the judgment of the installation commander and the guidance found in Field Manual (FM) 19–30. Unless otherwise specified, perimeter fence will meet the requirements of U.S. Army Corps of Engineers Drawing No. 40–16–08, Type FE–5. Copies of this drawing normally may be obtained from the installation engineer. If the drawing is not available locally, requests may be forwarded to the Commander, U.S. Army Corps of Engineers, Huntsville, Division, ATTN: CEHND–ED–ES–1, P.O. Box 1600, Huntsville, Alabama 35807–4301. The minimum height will be 6 feet. Use of North Atlantic Treaty Organization (NATO) standard design fencing is also authorized. Modifications to existing perimeter fences should not be made solely to conform to the requirements of this regulation if the existing fencing provides a similar deterrent to penetration.

e. In those instances where security lighting is required, FM 19–30 will be used as a guide in deciding lighting patterns and minimum protective lighting intensities and requirements.

f. Conflicts between security and safety requirements must be identified in writing. Waiver or exception requests must list compensatory measures and be forwarded through the local provost marshal and MACOM to HQDA (DAMO–ODL–S) for approval.

3–2. Categories of Army property

Items of property will not always correspond exactly to the categories listed in sections II or III. Some items may fall into two categories. When this situation occurs, the unit commander directly responsible for the asset is responsible for determining the most appropriate category for the item in question. If none is appropriate, the commander will develop and carry out those security procedures and physical protective measures necessary to safeguard the property.

Section II

Minimum Security Standards for Categories of Army Property Using Risk Analysis

3–3. Aircraft and components at Army aviation facilities

a. *Property management and accountability directives.*

- (1) AR 95–1.
- (2) AR 190–16.
- (3) AR 710–2.
- (4) AR 735–5.
- (5) DA Pam 710–2–1.

b. *Aircraft with arms, ammunition, and explosives (AA&E) aboard.* Army aircraft with AA&E aboard will be secured as indicated in AR 190–11 and this regulation. Army National Guard aircraft with AA&E aboard will be secured as indicated in NGR 190–11 and this regulation.

(1) When not in use, aircraft containing weapons will be parked inside an aircraft parking area. The parking area will be lighted and will have either continuous surveillance or IDS.

(2) When operational readiness permits, weapons mounted on aircraft that are accessible and easily removable will be removed and stored in a secure location. Weapons that remain installed on the aircraft will be made inoperable by removing barrels or firing mechanisms when practicable. Removed components will be stored in a secured location. A secured location is an arms room, an ammunition supply point, an area under continuous armed surveillance, or any structure meeting the requirements for storage of category I or II AA&E in AR 190–11 or NGR 190–11.

c. *Accessible and easily removable components.* Additional security for accessible and easily removable components will be by storage in a secure structure (app B).

d. *Aircraft with classified equipment.* U.S. Army aircraft with classified equipment aboard will be secured as indicated in AR 380–5, Technical Bulletin (TB) 380–41, and paragraph 3–18 of this regulation. Classified components which can be readily removed without damage to them should be placed in secure storage as indicated in AR 380–5.

e. *Physical protective measures.*

(1) *Risk Level I.*

(a) Army aircraft at Army aviation facilities will be secured with manufacturer–installed or approved modification work order ignition and door–locking security devices when not in use. Aircraft undergoing maintenance with duty personnel present and aircraft employed in tactical exercises are exempt.

(b) Keys to locking devices and ignitions will be controlled. Key control and accountability must be established per

appendix D. Aircraft keys will not be issued for personal retention. Duplicate keys will not serve as operational keys at maintenance facilities.

(c) When not in use, aircraft and aircraft components, to include crew member equipment at Army aviation facilities, will be placed in the most secure hangars or structures available. If adequate hangar space is not available, this equipment may be stored on the ramp nearest the facility.

(d) When aircraft are not stored in storage structures and when operational requirements permit, keep them in proximity to each other for ease of monitoring and away from the perimeter of the parking area.

(2) *Risk Level II.*

(a) All measures required for Risk Level I will be implemented.

(b) Aviation facility aircraft parking areas will be protected by a perimeter fence.

(3) *Risk Level III.*

(a) All measures required for Risk Levels I and II will be implemented.

(b) Aviation facility aircraft parking areas will be lighted at night sufficiently to allow security personnel to detect intruders. Airfield lighting will be coordinated with the aviation facility commander for consideration of safety and training issues.

(c) IDS should be added to hangars and, where practical, around aircraft parking areas.

f. *Security procedural measures.*

(1) *Risk Level I.*

(a) Each Army aviation facility will have a written physical security plan. FM 19–30 will be used as a guide. Aviation facilities located on or close to an Army installation will include the physical security plan as an annex to the installation physical security plan. Aviation facilities located on other than Army property will coordinate the physical security plan with the appropriate host authorities. A copy of the physical security plan will be maintained by the State AG or MUSARC provost marshal for reserve component aviation facilities.

(b) Each Army aviation facility will have a physical security officer. Responsibilities of the physical security officer are defined in AR 190–13.

(c) For aircraft parked at Active Army aviation facilities and for U.S. Army Reserve (USAR) and Army National Guard (ARNG) activities where guards or roving patrols are available, aircraft will be checked at least every 4 hours by a roving guard.

(d) At USAR and ARNG activities where guards or roving patrols are not available, local law enforcement agencies will be requested, in writing, to include the aviation facilities in their patrol areas and to check aircraft parking areas at intervals not exceeding once every 4 hours during nonoperational hours.

(e) Access to aviation facility aircraft and aircraft components will be controlled at all times. The airfield will be designated as a restricted area as specified in AR 190–13. Measures such as badges, passes, or similar identification credentials are encouraged.

(f) Privately-owned vehicles will be prohibited from the flight line or other areas where aircraft are parked, except when authorized, in writing, by the aviation facility or airfield commander.

(g) Aviation facility auxiliary power units for starting aircraft, vehicle tugs, forklifts, aircraft boarding ladders, and other items that might be used to circumvent existing security measures will be secured during nonduty hours to prevent unauthorized use.

(2) *Risk Level II.*

(a) All measures required for Risk Level I will be implemented.

(b) Entry to and exit from all buildings associated with the aviation facility, aircraft parking areas, and support equipment storage areas will be controlled at all times. Entry and exit can be controlled through manpower and procedural means, mechanical means, or electronic means.

(c) Aircraft parked at Active Army aviation facilities will be checked at least once every hour by a roving guard.

(3) *Risk Level III.*

(a) All measures required for Risk Levels I and II will be implemented.

(b) Guards will provide continuous surveillance of aircraft parked at Active Army aviation facilities. Aviation unit personnel working on or near aircraft may be considered to be equivalent to continuous surveillance.

(c) IDS may be installed as an alternative to providing continuous surveillance.

(d) At USAR and ARNG facilities where guards or roving patrols are available, aircraft will be checked at least every 2 hours. Where guards or roving patrols are not available, local law enforcement agencies will be requested, in writing, to include USAR and ARNG aviation facilities in their patrol areas, and to check the parking areas at least once every 2 hours during nonoperational hours.

g. *Terrorism counteraction measures.* Due to the likely form of a terrorist attack against these assets, the physical protective measures and security procedural measures established above will also be applicable for protection against terrorist threats. Aviation facilities will develop a terrorism counteraction contingency plan.

3-4. Aircraft and components not at Army aviation facilities

The property accountability requirements outlined in the references in paragraph 3-3a will be followed and paragraphs 3-3b, c, and d will be implemented. Physical protective measures for Risk Level I in paragraph 3-3 will also be implemented. In addition, the security procedures indicated below will apply.

a. Aircraft will be parked, whenever practical, at a Government airfield or civilian airport with an active security program. If a location has no security program and a crew member cannot remain with the aircraft, the aircraft commander will advise aviation facility and local law enforcement authorities of the aircraft location, identification, length of stay, and ways to contact crew members.

b. The aircraft will be checked at least once daily by a crew member for tampering, sabotage, and loss or damage.

3-5. Vehicles and carriage-mounted/towed weapons systems and components

a. *Property management and accountability directives.*

- (1) AR 58-1.
- (2) AR 710-2.
- (3) AR 735-5.
- (4) DA Pam 710-2-1.
- (5) DA Pam 738-750.

b. *Army vehicles with weapons or ammunition aboard.* These vehicles will be secured per AR 190-11. When operational readiness permits, weapons mounted on vehicles that are accessible and easily removable will be removed and stored in a secure location. Unless there is an operational necessity determined by battalion or higher level commanders, firing mechanisms on weapons that are not easily removable will be removed from combat vehicle weapon systems and stored in the unit arms room or be under continuous surveillance.

c. *Army vehicles with classified equipment.* These vehicles will be secured per AR 380-5 and paragraph 3-18 of this regulation. Classified components that can be readily removed without damage should be placed in secure storage as indicated in AR 380-5.

d. *Army vehicles when not in use.* These vehicles will be parked in motor pools to the maximum extent practicable. The motor pool will be protected by a perimeter fence or dedicated guards. FM 19-30 will be used as a guide for determining fencing requirements.

e. *Physical protective measures.*

(1) *Risk Level I.* Army vehicles parked in noncombat areas will be secured with a locking mechanism. These vehicles will be locked as follows:

(a) *Commercial-design vehicles.* Activate manufacturer installed door and ignition-locking device(s).

(b) *Tactical vehicles and M880 series vehicles.* Immobilize steering wheel with a chain and a U.S. Government approved padlock as specified in TB 9-2300-422-20. Activate installed door and ignition-locking devices. Hood, spare tires, and fuel tank should also be secured with approved locking devices if the local environment warrants this action. Brass padlocks supplied with vehicles may be used to secure vehicles, except those uploaded with AA&E or other sensitive items, and as long as other security measures required by applicable regulations and directives are followed.

(c) *Other Army vehicles.* M1008, 1009, and 1010 series vehicles and commercial utility and cargo vehicles (CUCV) will be secured by activating installed door and ignition locks and immobilizing the steering wheel with chain and U.S. Government approved padlock as specified in TB 43-001-39-7. Alternatively, such vehicles may be stored in a secure structure.

(d) *Material handling equipment.* Material handling equipment (MHE) and other Army vehicles which cannot be secured as indicated in (a) through (c) above should have the steering mechanism immobilized or transmission lever locked in the neutral position. Alternatively, these vehicles may be stored in secure structures.

(e) *Signs.* "Off Limits To Unauthorized Personnel" signs will be posted at the activity entrances.

(2) *Exceptions.* Exceptions to this policy are as follows:

(a) Vehicles actively employed in tactical exercises and field operations, undergoing test and evaluation, or pending turn-in through property disposal channels.

(b) Dispatched emergency, military or security police, courtesy patrol, and interior guard vehicles for brief periods when response time is critical for the successful performance of the operator's or crew's duties. Ignition keys should be removed from unaccompanied vehicles.

(c) Trailers, semitrailers, towed weapons systems, and other non-self-propelled vehicles.

(d) Inoperable, unserviceable vehicles. Procedures will be implemented to protect these vehicles from cannibalization.

(e) Vehicles, without installed locking mechanisms, under the continuous surveillance of a guard or located in a secure storage structure (app B).

(f) Vehicles of specific units outside the United States when so designated by the MACOM commander. Basis for a

unit exemption will be an impact on readiness. The commander will decide whether locking the unit's vehicles would adversely affect readiness to the extent of jeopardizing the unit's contingency mission.

(g) Fuel tanker vehicles when, in the judgment of the installation commander, locking would create a potential unacceptable hazard to life or property. In this case, compensatory security measures as outlined in paragraph 3-14 will be taken.

(h) Administrative use vehicles, as defined in AR 58-1, when dictated by safety requirements within an ammunition or explosives production or storage area.

(3) *Accessible and easily removable components.* These components, vulnerable to theft because of value or utility, will be removed and secured separately. Additional security for components will be provided by one of the following methods:

(a) Storing in a secure storage structure (app B).

(b) Storing in a locked, totally enclosed armored vehicle or truck van.

(c) Storing in a locked equipment box or similar container secured to an open bed vehicle; for example, in a locked ammunition or tool box chained to the bed of a 2½-ton truck.

(d) Securing the item directly to the vehicle by a locally fabricated method.

(4) *Master-keyed locksets.* Use of master-keyed locksets to secure Army vehicles or motor pools will be prohibited except under the following conditions:

(a) When the lockset is used within one vehicle to secure the vehicle and its various storage compartments. Master-keyed locksets will not be used to secure more than one vehicle.

(b) When the lockset is used to secure the manifold access doors and hatches of petroleum, oil and lubricants (POL) trucks (one set per truck) and, if they have hardened steel shackles, for the storage compartments of wreckers, heavy equipment, etc. (one set per vehicle). The same set will not be used on more than one vehicle. Master-keyed locks will not be used to secure vehicle steering wheels.

(5) *Keys and locks.* Keys and locks will be controlled according to appendix D.

(6) *Items used to defeat security measures.* Items that can be used to defeat security measures, such as bolt cutters, hacksaws, oxyacetylene torches, axes, or steel rods or bars, will be secured in respective tool kits or other secure locations when not in use.

(7) *Risk Level II.*

(a) All measures required for Risk Level I will be implemented.

(b) Vehicle parking areas, except those for empty trailers, will be lighted during the hours of darkness.

(c) Vehicles will be parked at least 20 feet from the perimeter of the parking area or as far from the perimeter as possible.

(8) *Risk Level III.*

(a) All measures required for Risk Levels I and II will be implemented.

(b) Ground anchors will be constructed for trailers, semitrailers, and other towed equipment or a cable will be run through all items of such equipment and a lock will be affixed to one end.

(c) Vehicles particularly vulnerable to theft, misappropriation, or damage will be placed in secured garages and motor sheds to the maximum extent practicable.

f. Security procedural measures.

(1) *Risk Level I.*

(a) For Active Army installations and for USAR and ARNG units and activities at locations where guards or roving patrols are available, motor pools will be checked for tampering, sabotage, loss, and damage not less than once every 4 hours.

(b) USAR and ARNG units and activities at locations where guards are not available will request, in writing, that the local law enforcement agency check the security of the motor pool at intervals not exceeding 4 hours during nonoperational hours.

(c) Privately-owned vehicles will not be permitted in motor pools except that units engaged in deployment exercises may store privately-owned vehicles in the motor pool at the discretion of the installation or MUSARC commander, provided security measures are taken to safeguard Army vehicles and components remaining in the motor pool.

(2) *Risk Level II.*

(a) Measures required for Risk Level I will be implemented.

(b) Entry to and exit from motor pools will be controlled. Control of entry and exit may be by guards or locks on gates. Unit personnel working within the motor pool may be considered an alternative to guards. Consolidated motor pools will have memorandums of understanding to establish joint security procedures.

(c) Types of vehicles particularly vulnerable to theft, misappropriation, or damage in the motor pool will be segregated. These vehicles will be placed where guards or unit personnel can see them during operating hours and where roving guards can see them during nonoperating hours.

(d) On Active Army installations, guards will check the motor pool on an irregular basis, but perform security checks not less than once every 2 hours.

(3) *Risk Level III.*

- (a) All measures required for Risk Levels I and II will be implemented.
- (b) The motor pool will be designated a restricted area under AR 190–13.
- (c) Unit commanders, or their specifically designated representatives, will give written authorization before vehicles are dispatched.
- (d) Drivers will be checked for possession of a valid dispatch and operator’s permit by unit personnel or guards before they depart the motor pool.
- (e) Continuous surveillance will be made of the motor pool by guards on Active Army installations.
- (f) IDS may be installed as an alternative to providing continuous surveillance.
- (g) At USAR and ARNG activities where guards or roving patrols are available, motor pools will be checked for tampering, sabotage, loss, or damage not less than once every 2 hours. Where guards or roving patrols are not available, local law enforcement agencies will be requested, in writing, to include USAR and ARNG motor pools in their patrol areas, and to check the parking areas at least once every 2 hours during nonoperational hours.
- g. *Terrorism counteraction measures.* Due to the likely nature of a terrorist attack against these assets, the physical protective measures and security procedural measures established above will also be applicable for protection against terrorist threats.

3–6. Communications and electronics equipment and night vision devices

Communications and electronics test, measurement, and diagnostic equipment (TMDE) and other high-value precision equipment, night vision devices that are not part of a weapons system, and tool kits are protected as follows:

- a. *Property management and accountability directives.*
 - (1) AR 710–2.
 - (2) AR 735–5.
 - (3) DA Pam 710–2–1.
- b. *Physical protective measures (Risk Level I).*
 - (1) Portable items will be provided double barrier protection when not in use, to include training environments and while in transit. Examples of double barrier protection include—
 - (a) A locked or guarded separate building or an enclosed van, trailer, or armored vehicle protected by a perimeter fence.
 - (b) A locked steel cage located in a secure storage structure (app B).
 - (c) A locked, built-in container (bin, drawer, cabinet) or a free-standing locked container located in a secure storage structure (app B).
 - (d) Securely affixing the item to an internal structure of a secure storage structure (apps B and D).
 - (e) Securely affixing the item to a locked vehicle which is under continuous surveillance or in a motor pool (app D).
 - (2) Nonportable items will be secured in a building with doors and windows locked during the hours the facility is nonoperational. Particularly bulky or heavy items stored outside will be protected by a perimeter barrier.
 - (3) “Off Limits to Unauthorized Personnel” signs will be posted at the activity entrances.
 - (4) Equipment will be located in the interior of the facility as far from the exterior as possible.
 - (5) Tactical communications equipment remaining on vehicles will be secured to the vehicle with a medium security padlock. Vehicles will be secured per paragraph 3–5 of this regulation.
 - (6) Tool kits will be secured as specified in paragraph 3–22.
- c. *Physical protective measures (Risk Level II).*
 - (1) Measures required for Risk Level I will be implemented.
 - (2) Portable, pilferage-coded items will be separated from other equipment and stored in a separate, locked, secure room, area, or container with controlled access. Secure rooms will be constructed per secure structure guidance in appendix B of this regulation.
- d. *Physical protective measures (Risk Level III).*
 - (1) All measures required for Risk Levels I and II will be implemented.
 - (2) The activity will be lighted during the hours of darkness.
 - (3) Landscaping features greater than 1 foot in height and other features which may obstruct views around the facility and provide concealment for aggressors will be eliminated within 20 feet of the facility.
 - (4) IDS will be installed around or on the storage room, area, or container.
- e. *Security procedural measures (Risk Level I).*
 - (1) Access to the equipment storage area will be controlled.
 - (2) Access to keys, padlocks, and protective seals protecting assets will be controlled per appendix D.
 - (3) Portable, pilferage-coded items temporarily assigned to a user will be issued on a hand receipt or a locally devised temporary receipt.
- f. *Security procedural measures (Risk Level II).*

- (1) Measures required for Risk Level I will be implemented.
- (2) Privately-owned vehicles will not be permitted to park within 50 feet of the storage facility.
- (3) Periodic command-directed inventories will be made as indicated in AR 710-2. A copy of the inventory will be kept until the next inventory is conducted.

g. Security procedural measures (Risk Level III).

- (1) Measures required for Risk Levels I and II will be implemented.
- (2) Stock accounting records for portable pilferage-coded items will be reviewed at least monthly by an officer, noncommissioned officer (NCO) (sergeant or above), or civilian employee of equivalent grade. A record of such review will be maintained until completion of the next monthly review.
- (3) The activity will be checked at least every 2 hours after normal duty hours by guards on Active Army installations.
- (4) Local law enforcement agencies will be requested, in writing, to include USAR and ARNG facilities storing communications and electronics equipment in their patrol areas and to check the facilities at least every 4 hours during nonoperational hours.

3-7. Organizational clothing and individual equipment (OCIE) stored at central issue facilities

a. Property management and accountability directives.

- (1) AR 710-2.
- (2) AR 735-5.
- (3) DA Pam 710-2-1.

b. Physical protective measures.

- (1) *Risk Level I.*
 - (a) Stocks will be secured in a separate building or room meeting the security standards in appendix B.
 - (b) "Off Limits To Unauthorized Personnel" signs will be posted at facility entrances.
- (2) *Risk Level II.*
 - (a) Measures required for Risk Level I will be implemented.
 - (b) High-value or small, easily pilferable items will be separated from other OCIE and stored in a secure, separate container, room, or building with controlled access.
- (3) *Risk Level III.*
 - (a) Measures required for Risk Levels I and II will be implemented.
 - (b) The facility exterior will be lighted during the hours of darkness.
 - (c) IDS will be installed in the facility.
 - (d) Rooms or buildings will be constructed per secure storage structure guidance for at least Risk Level II in appendix B of this regulation.
 - (e) Landscaping features greater than 1 foot in height and other features which may obstruct views around the facility and provide concealment for aggressors will be eliminated within 20 feet of the facility.

c. Security procedural measures.

- (1) *Risk Level I.*
 - (a) Access to the facility and to keys, padlocks, and protective seals protecting assets will be controlled per appendix D.
 - (b) Periodic command-directed inventories will be conducted per AR 710-2.
- (2) *Risk Level II.*
 - (a) Measures required for Risk Level I will be implemented.
 - (b) The joint inventory check-out point will be placed next to the facility exit to preclude personnel from remaining in the facility once the OCIE has been inventoried. A copy of the inventory will be retained until the next inventory is conducted.
 - (c) Privately-owned vehicles will not be parked within 50 feet of the storage facility.
 - (d) Trash receptacles will not be located within 50 feet of the facility.
- (3) *Risk Level III.*
 - (a) Measures for Risk Levels I and II will be implemented.
 - (b) The facility will be checked at least once every 2 hours by roving guards.

3-8. OCIE not stored at central issue facilities

- a.* Risk Level I physical protective measures and the security procedures in paragraph 3-7 will be implemented for OCIE stored centrally in units.
- b.* Issued clothing will be marked as indicated in AR 700-84.
- c.* Individual clothing and equipment of personnel living in troop billets and reserve component personnel will be secured by one of the following means to be determined by the commander:

- (1) In a locked wall locker or footlocker.
- (2) In a locked duffel bag, further secured to the building structure, or a separate locked room.
- (3) Access to reserve component OCIE will be controlled by designated individuals. Locked duffel bags, wall lockers, or footlockers will be placed in a separate locked room or cage. In lieu of a separate room, access to wall lockers may be controlled by modifying the lockers to accept a locking bar or by adding a second hasp and securing the locker with a second lock. Keys to access reserve component OCIE will be placed in the unit key depository and access will be controlled by the unit key custodian.
- d. Consideration should be given to marking items as indicated in appendix C.

3–9. Subsistence items stored at commissaries, commissary warehouses, and troop issue subsistence activities (TISAs)

- a. *Property management accountability directives.*
 - (1) AR 30–1.
 - (2) AR 30–18.
 - (3) AR 30–19.
 - (4) AR 735–5.
- b. *Physical protective measures.*
 - (1) *Risk Level I.*
 - (a) Commissaries, commissary and subsistence warehouses, and TISAs will meet the construction requirements for secure storage structures in appendix B.
 - (b) “Off Limits to Unauthorized Personnel” signs will be posted at entrances to subsistence storage facilities (see AR 420–70).
 - (c) Refrigeration units will be secured with approved locking devices or kept in a room or building meeting the standards for secure storage structures in appendix B.
 - (d) Subsistence items temporarily stored outside the facility, such as in secured vans and reefer trucks, will have protective lighting. Use FM 19–30 as a guide to determine the type of protective lighting.
 - (e) Break areas will be located away from the storage areas.
 - (f) Personal lockers will be in a designated area away from loose or broken containers of subsistence items.
 - (2) *Risk Level II.*
 - (a) Measures required for Risk Level I will be implemented.
 - (b) Highly pilferable items such as cigarettes, coffee, and health and beauty aids will be placed in a separate locked room, cage, or container under the control of a designated property custodian.
 - (c) Protective seals will be placed on doors and other operable openings into secured vans and reefer trucks in which subsistence items are stored outside the facility.
 - (3) *Risk Level III.*
 - (a) Measures required for Risk Levels I and II will be implemented.
 - (b) The facility will be lighted during the hours of darkness.
 - (c) IDS will be installed in the facility.
 - (d) Landscaping features greater than 1 foot in height and other features which may obstruct views around the facility and provide concealment for aggressors will be eliminated within 20 feet of the facility.
- c. *Security procedural measures.*
 - (1) *Risk Level I.*
 - (a) Access to the facility and to keys and padlocks and protective seals protecting assets will be controlled according to appendix D.
 - (b) Subsistence storage facilities will always be secured when entrances or exits are not under the surveillance of personnel assigned to the facility.
 - (c) Personal packages will be prohibited in ration breakdown and subsistence storage areas.
 - (d) Shipping containers and cases will be inspected to ensure that they are empty prior to being disposed of and cardboard boxes will be flattened before disposal.
 - (2) *Risk Level II.*
 - (a) Measures required for Risk Level I will be implemented.
 - (b) Personnel entering the storage facility who are not assigned to the activity will be logged in and out or, when practical, escorted. When using the log system, designate the destination of the unassigned person.
 - (c) Accuracy of scales will be tested monthly with known weights or by using a second set of calibrated scales. A written record of the monthly tests will be maintained for a period of 3 months.
 - (d) Highly pilferable items will be spot-checked daily by supervisors to ensure that all items are accounted for. These items will also be inventoried each quarter and a copy of the inventory kept until the next inventory.
 - (e) Trash receptacles will not be located within 50 feet of the facility.

- (f) Privately-owned vehicles will not be parked within 50 feet of the storage facility.
- (3) *Risk Level III.*
- (a) Measures required for Risk Levels I and II will be implemented.
- (b) Highly pilferable items will be inventoried once each month. A copy of the inventory will be kept until the next inventory.
- (c) The facility will be checked at least every 2 hours after normal operating hours by roving guards.

3-10. Subsistence items not at commissaries, commissary warehouses, and troop issue subsistence activities

Risk Level I physical protective measures and the security procedures in paragraph 3-9 will be implemented.

3-11. Repair parts at installation level supply support activities and direct support units with an authorized stockage list (ASL)

- a. Property management and accountability directives.*
 - (1) AR 708-1.
 - (2) AR 710-2.
 - (3) AR 735-5.
 - (4) DA Pam 710-2-1.
- b. Classified repair parts.* Secured under AR 380 series requirements and paragraph 3-18 of this regulation.
- c. Physical protective measures (Risk Level I).*
 - (1) Portable repair parts will be secured in the following manner:
 - (a) In a locked, separate building or room, meeting the secure storage structure standards in app B.
 - (b) In a locked, steel cage.
 - (c) In a locked, built-in container (bin, drawer, cabinet) or a free-standing container (desk, wall locker, container express (CONEX)) large and heavy enough to be nonportable with stored parts.
 - (d) To the building in which located or other permanent structure.
 - (2) Nonportable repair parts will be secured in a building with doors and windows locked during those hours the facility is nonoperational. When bulky or heavy items are stored outside, they will be protected by a perimeter barrier.
 - (3) "Off Limits to Unauthorized Personnel" signs will be posted at the storage facility entrance (see AR 420-70).
- d. Physical protective measures (Risk Level II).*
 - (1) Measures required for Risk Level I will be implemented.
 - (2) Portable, pilferage-coded items will be separated from other stock and stored in a separate room, building, or container with controlled access.
 - (3) Rooms or buildings will be constructed per secure storage structure standards in appendix B.
- e. Physical protective measures (Risk Level III).*
 - (1) Measures required for Risk Levels I and II will be implemented.
 - (2) The storage facility will be lighted during the hours of darkness.
 - (3) IDS will be installed in the storage facility.
 - (4) Landscaping features greater than 1 foot in height and other features which may obstruct views around the facility and provide concealment for aggressors will be eliminated within 20 feet of the facility.
- f. Security procedural measures (Risk Levels I and II).*
 - (1) Access to storage areas and to keys and padlocks and protective seals protecting these items will be controlled.
 - (2) Periodic command-directed inventories will be conducted per AR 710-2.
 - (3) Used parts will be processed as indicated in Department of Defense (DOD) 4160.21-M to recover parts when prescribed and protect and dispose of nonrecoverable parts, and will be protected and disposed of to preclude recycling.
- g. Security procedural measures (Risk Level III).*
 - (1) Measures required for Risk Levels I and II will be implemented.
 - (2) The facility will be checked at least every 2 hours after normal operating hours by guards.
 - (3) Access for pilferage-coded items will be separately controlled.

3-12. Repair parts not at installation level support activities and direct support units

- a.* Risk Level I physical protective measures and the security procedures in paragraph 3-11 will be implemented.
- b.* Unit and activity repair parts will be stored in a single area, readily accessible to designated maintenance or supply personnel only.

3-13. Petroleum, oils, and lubricants (POL) at bulk storage facilities

- a. Property management and accountability directives.*
 - (1) AR 703-1.

- (2) AR 710–2.
- (3) AR 735–5.
- (4) DA Pam 710–2–1.

b. Physical protective measures.

(1) *Risk Level I.*

(a) Construction of storage facilities will be per DOD 4270.1–M.

(b) When not under the surveillance of personnel authorized to dispense the products, POL pumps will be locked and electrical power will be turned off. The electrical power shutoff will be secured. Hoses to pumps will be secured to prevent loss of POL through gravity feed. These measures are not required if pumps are activated by a credit card type device. Use of such devices will be approved by the MACOM concerned.

(c) Packaged POL will be stored in structures under secure storage structure standards in appendix B. Large POL packages (for example, 55–gallon drums) will be stored to preclude their use as hiding places for pilfered items.

(d) Keys to POL storage areas, equipment, and buildings will be controlled per appendix D.

(2) *Risk Level II.*

(a) Measures required for Risk Level I will be implemented.

(b) Storage facilities will be bound by a perimeter fence. Gates and openings will be closed and locked.

(c) “Off Limits to Unauthorized Personnel” signs will be posted at the perimeter.

(3) *Risk Level III.*

(a) Measures required for Risk Levels I and II will be implemented.

(b) Storage facilities will be lighted during the hours of darkness.

(c) Seals will be placed on all points of fuel storage that may allow extraction of fuel by any means. A broken seal may indicate tampering.

c. Security procedural measures.

(1) *Risk Level I.*

(a) Written instructions to POL–dispensing personnel will include procedures for determining if patrons entering the facility are authorized and military vehicles have valid dispatches.

(b) When unattended, the facility will be checked at least once every 4 hours.

(c) POL credit cards, identification plates, and aviation fuel plates will be centrally controlled by a custodian, preferably at Director of Logistics (DOL) level. Credit cards, identification plates, and aviation fuel plates will be secured in a locked container with controlled access. They will be controlled through a log book with the signature and rank of the individual to whom issued, credit card and identaplate serial number, aircraft or vehicle number or U.S. Army registration number, and date and time signed out and returned.

(d) Privately–owned vehicles will not be permitted in storage facilities.

(e) All issues of fuel will be accounted for and supervised by authorized personnel.

(f) Hoses or other devices to siphon fuel will be secured. All containers that can be used to carry fuel also will be secured.

(g) Containers storing used POL will be marked and stored separately.

(h) Keys to POL storage areas, equipment, buildings, and protective seals will be controlled per appendix D.

(2) *Risk Level II.*

(a) Measures required for Risk Level I will be implemented.

(b) Facility attendants will verify all POL quantities issued by personally reading the meter.

(c) When unattended, the facility will be checked at least once every 2 hours.

(3) *Risk Level III.*

(a) Measures required for Risk Levels I and II will be implemented.

(b) The storage facility will be designated a restricted area (see AR 190–13).

(c) Continuous surveillance will be made of the facility by guards.

(d) Intrusion detection systems may be installed as an alternative to continuous surveillance by guards.

(e) Unannounced audits of POL will be conducted at least quarterly.

d. Terrorism counteraction measures. Due to the likely nature of a terrorist attack against this asset, the physical protective measures and security procedural measures established above will also be applicable for protection against terrorist threats.

3–14. POL not at bulk storage facilities

Property management and accountability directives in paragraph 3–13 will be followed. Risk Level I physical protective measures and security procedures in paragraph 3–13 will be implemented. In addition, the following security procedures will be implemented:

a. POL tank trucks that contain fuel and that are not under the surveillance of the operator or a dedicated guard force will have:

- (1) Locked hatch covers where possible.
- (2) Locked manifold access doors.
- (3) Each manifold valve secured with a transportation seal if a manifold access door cannot be locked.
- (4) Approved padlocks as specified in nonsparking brass locks for safety, if available.
- b. Fuel pods on vehicles and fuel vehicle tanks will be secured with approved padlocks as specified in AR 190–13 when the vehicles or tanks are carrying fuel and are not under the surveillance of the operator.
- c. Fuel-carrying vehicles will be parked in lighted areas of airfields or in motor pools protected by locked perimeter barriers or guards, whenever possible.
- d. Dome covers and manifold system shutoff valves of tanker rail cars with POL products aboard will be locked when they are located on an installation for unloading and when POL handling personnel do not have the equipment under surveillance. Rail cars with packaged POL products aboard will be secured by locking all doors.
- e. Packaged POL not onboard a vehicle or rail car will be safeguarded in a structure meeting the standards in appendix B. To increase the security posture above minimum, the area may be protected by lighting, a perimeter fence, guards, or IDS. The need for implementing these additional measures will be determined by local threat and vulnerability.
- f. Keys to POL storage areas, equipment, buildings, and protective seals will be controlled per appendix D.

3–15. Facility engineering supply and construction material storage areas

- a. *Property management and accountability directives.*
 - (1) AR 420–17.
 - (2) AR 735–5.
- b. *Physical protective measures.*
 - (1) *Risk Level I.*
 - (a) Buildings storing supply and portable construction material will meet the secure storage structure requirements in appendix B.
 - (b) Outside storage areas will be enclosed by a perimeter fence.
 - (c) Points of issue for supplies and construction material will be kept to a minimum.
 - (d) “Off-Limits to Unauthorized Personnel” signs will be posted at facility entrances.
 - (2) *Risk Level II.*
 - (a) Measures required for Risk Level I will be implemented.
 - (b) Portable, easily pilferable items will be separated from other supplies and construction material and stored in a separate room, building, or container with controlled access.
 - (c) Outside storage areas will be lighted during the hours of darkness.
 - (3) *Risk Level III.*
 - (a) Measures required for Risk Levels I and II will be implemented.
 - (b) Buildings storing supplies and portable construction material will be lighted during the hours of darkness.
 - (c) An IDS will be installed in the storage building if it is fully enclosed.
 - (d) Landscaping features greater than 1 foot in height and other features which may obstruct views around the facility and provide concealment for aggressors will be eliminated within 20 feet of the facility.
- c. *Security procedural measures.*
 - (1) *Risk Level I.*
 - (a) Access to the facility and to keys, padlocks, and protective seals protecting access will be controlled.
 - (b) Supplies will be issued only to authorized personnel for whom signature authorization cards, DA Form 1687 (Notice of Delegation of Authority–Receipt for Supplies), are on file.
 - (c) Incoming shipments of supplies will be checked upon receipt.
 - (d) Work orders will be reviewed to determine if the recipient has requested excessive supplies for the job to be done.
 - (e) Entry of privately-owned vehicles into the storage building or outside storage areas will be prohibited.
 - (f) Entry of packages into the storage area will be prohibited.
 - (g) Annual inventories of all stocks will be made. A copy of the inventory will be kept until the next inventory.
 - (2) *Risk Level II.*
 - (a) Measures required for Risk Level I will be implemented.
 - (b) Small, easily pilferable supplies and construction material and other items showing unexplained inventory loss will be inventoried once each month. A copy of the inventory will be kept until the next inventory.
 - (c) Bulk packaged items securely crated, banded, or sealed will remain in their original configuration and not broken until they are issued.
 - (3) *Risk Level III.*
 - (a) Measures required for Risk Levels I and II will be implemented.

- (b) Access to storage areas will be limited to facility personnel authorized to issue the stockage.
- (c) The storage building and outside storage areas will be checked at least every 2 hours by a roving guard during hours that the facility is not operational.

3-16. Audiovisual equipment, training devices, and subcaliber devices at training and audiovisual support centers (TASCs)

- a. *Property management and accountability directives.*
 - (1) AR 108-2.
 - (2) AR 190-11.
 - (3) AR 710-2.
 - (4) AR 735-5.
 - (5) DA Pam 710-2-1.
- b. *Physical protective measures.* Any training device that can be used to fire a projectile or explosive will be protected according to AR 190-11.
 - (1) *Risk Level I.* Equipment will be secured in a separate building or room under storage structure security standards stated in appendix B.
 - (2) *Risk Level II.*
 - (a) Measures required for Risk Level I will be implemented.
 - (b) Audiovisual equipment and portable, high-value subcaliber devices and training aids will be separated from other equipment and stored in a secure, separate container, room, or building with controlled access, meeting the security standards in appendix B.
 - (c) "Off-Limits to Unauthorized Personnel" signs will be posted at facility entrances.
 - (d) Equipment will be located in the interior of the facility as far from the exterior as possible.
 - (3) *Risk Level III.*
 - (a) Measures required for Risk Levels I and II will be implemented.
 - (b) The facility will be lighted during the hours of darkness.
 - (c) An IDS will be installed in the facility.
 - (d) Landscaping features greater than 1 foot in height and other features which may obstruct views around the facility and provide concealment for aggressors will be eliminated within 20 feet of the facility.
- c. *Security procedural measures.*
 - (1) *Risk Level I.*
 - (a) Access to the facility and to keys, padlocks, and protective seals protecting the assets will be controlled.
 - (b) Audiovisual equipment and portable, high-value subcaliber devices and training aids will be inventoried as indicated in AR 710-2. A copy of the inventory will be kept until the next inventory.
 - (2) *Risk Level II.*
 - (a) Measures required for Risk Level I will be implemented.
 - (b) The inventory check-out point will be next to the TASC exit to preclude personnel from remaining in the center when equipment has been checked out.
 - (c) Access to the equipment storage area will be limited to TASC personnel authorized to issue the equipment.
 - (d) The TASC will maintain separate property book accountability for all equipment.
 - (3) *Risk Level III.*
 - (a) Measures required for Risk Levels I and II will be implemented.
 - (b) The TASC will be checked at least once every 2 hours by a roving guard after normal duty hours.

3-17. Audiovisual equipment, training devices, and subcaliber devices at units or activities that are not training and audiovisual support centers

Risk Level I physical protective measures and the security procedures in paragraph 3-16 will be implemented.

3-18. Aircraft and vehicles with classified onboard equipment or components

Active Army, USAR, and ARNG vehicles and aircraft with classified components or onboard equipment will be secured per this regulation, AR 380-5, TB 380-41, and applicable security classification guides.

- a. Army vehicles or aircraft with CONFIDENTIAL or SECRET components or equipment mounted either internally or externally on the vehicle or aircraft, on Active Army, USAR, or ARNG installations or facilities will be secured with Risk Level I physical protective and security procedural measures in paragraphs 3-3 and 3-5.
- b. When the CONFIDENTIAL or SECRET component or equipment is mounted externally on the vehicle or aircraft, the vehicle or aircraft will be secured with the physical security measures in paragraph 3-3.
- c. When located at other than Active Army, USAR, or ARNG facilities, Army vehicles or aircraft with CONFIDENTIAL or SECRET components or equipment mounted internally or externally will be secured with at least the

minimum physical security measures. These vehicles and aircraft will be guarded at all times by an appropriately cleared crew member, dedicated military, DA civilian, or contract guards.

d. Army vehicles or aircraft with TOP SECRET components onboard equipment will be under constant surveillance by appropriately cleared armed guards regardless of location.

e. Equipment or components should not be removed from vehicles or aircraft solely to fulfill a secure storage requirement. Frequent removal may cause increased equipment maintenance and may degrade operational readiness. However, classified equipment or components that can be readily dismantled without probable damage may be dismantled and placed in secure storage meeting the requirements of AR 380-5, TB 380-41, and this regulation.

f. In environments or unusual circumstances not clearly defined as requiring specific security measures under this regulation, the commander will designate proper equivalent security measures to protect those vehicles or aircraft that contain classified equipment or components.

g. Army vehicles or aircraft with classified equipment or components will be included in all aspects of the physical security program.

3-19. Mission-critical and high-risk personnel

a. Security procedural measures. MACOM commanders assigned the responsibility for designated geographical areas will designate mission-critical and high-risk personnel. Refer to AR 190-58 and AR 525-13 for additional guidance.

(1) *Risk Level I.* Access to those areas of the facility where mission-critical and high-risk personnel are located will be controlled continuously when the facility is occupied.

(2) *Risk Level II.* Access to the entire facility will be controlled continuously when the facility is occupied.

(3) *Risk Level III.*

(a) Access to the entire facility will be controlled at all times.

(b) Access to the area surrounding the facility will be controlled during times when the facility is occupied.

(c) Personnel not assigned to the facility who enter areas of the facility in which mission-critical or high-risk personnel are located will be searched for weapons and explosives on at least a random basis.

(d) Continuous surveillance of the area surrounding the facility will be provided at all times when the facility is occupied.

b. Terrorism counteraction measures.

(1) *Risk Level I.*

(a) Parking beneath facilities will be eliminated where possible.

(b) Parking will be kept as far away from the facility as possible, but at least 30 feet.

(c) Trash receptacles, landscaping features, and other features greater than 1 foot in height which potentially provide concealment for aggressors or bombs will be kept at least 30 feet from the facility.

(d) Locate mission-critical or high-risk personnel in the interior of the facility as far from the exterior as possible where feasible.

(2) *Risk Level II.*

(a) Windows into areas occupied by mission-critical or high-risk personnel will be covered by reflective 4-mil fragment retention film which will be backed up by heavy drapes.

(b) Windows and doors into areas occupied by mission-critical or high-risk personnel will be locked such that any attempt to enter through them when the facility is unoccupied will require forced entry, whose effects will be noticeable.

(c) Exterior walls will be constructed of reinforced concrete or reinforced concrete masonry.

(d) Duress alarms will be installed in areas occupied by mission-critical and high-risk personnel.

(3) *Risk Level III.*

(a) The facility will be surrounded by a perimeter fence at a distance from the facility of at least 50 feet.

(b) The facility will be constructed to resist the applicable weapons and explosives effects according to TM 5-853-1.

3-20. General civilian and or military personnel

a. Security procedural measures.

(1) *Risk Level I.* No such measures apply at this risk level.

(2) *Risk Level II.* Access to the facility will be controlled at all times that the facility is occupied.

(3) *Risk Level III.* Access to the facility and the area surrounding it will be controlled continuously when the building is occupied.

b. Terrorism counteraction measures.

(1) *Risk Level I.*

(a) Parking beneath facilities will be eliminated where possible.

- (b) Parking will be kept as far away from the facility as possible, but at least 30 feet.
- (c) Trash receptacles, landscaping features, and other features greater than 1 foot in height which potentially provide concealment for aggressors or bombs will be kept at least 30 feet from the facility.
- (2) *Risk Level II.*
 - (a) Windows in the facility will be covered with 4-mil reflective fragment retention film which will be backed up by heavy drapes.
 - (b) Exterior walls will be constructed of reinforced concrete or reinforced concrete masonry or brick.
- (3) *Risk Level III.*
 - (a) The facility will be surrounded by a perimeter fence at a distance from the facility of at least 50 feet.
 - (b) The facility will be constructed to resist the applicable weapons and explosives effects per TM 5-853-1.

3-21. Industrial and utility equipment

- a. *Security procedural measures.*
 - (1) *Risk Level I.*
 - (a) Access into the area where the equipment is located will be controlled.
 - (b) Keys to facilities and equipment will be controlled per appendix D.
 - (c) The area will be designated a restricted area (see AR 190-13).
 - (2) *Risk Level II.* Measures for Risk Level I will be applied and equipment will be checked by roving patrols at intervals not to exceed every 4 hours when the facility is unattended.
 - (3) *Risk Level III.* Measures for Risk Levels I and II will be applied except that checks by roving patrols will be every 2 hours when the facility is unattended.
- b. *Terrorism counteraction measures.*
 - (1) *Risk Levels I and II.*
 - (a) If the equipment is not located within a structure, the area will be surrounded by a perimeter fence.
 - (b) If the equipment is stored within a structure, the structure will meet the requirements of a secure storage structure for the appropriate risk level according to appendix B.
 - (2) *Risk Level III.*
 - (a) If the equipment is not located within a structure, the area or vulnerable items of equipment will be surrounded with an 8-foot-high reinforced concrete or masonry perimeter wall.
 - (b) If the equipment is located within a structure, the structure will meet the requirements of a secure storage structure for this risk level according to appendix B. The structure will be further enhanced to resist the applicable weapons and explosives effects according to TM 5-853-1.

Section III

Minimum Security Standards for Other Categories of Army Property

3-22. Hand tools, tool sets and kits, and shop equipment

- a. *Property management and accountability directives.*
 - (1) AR 710-2.
 - (2) AR 735-5.
 - (3) DA Pam 710-2-1.
- b. *Tool sets and kits with lockable tool boxes.* These items, when not in use, will be secured with a U.S. Government approved key-operated tumbler-type lock, consisting of either a padlock (including brass padlocks issued with the tool boxes) or a factory installed built-in key-operated tumbler type lock. The individual who signed for the set or kit will retain the key. A duplicate key may be held by the supervisor or commander if it is stored in a locked container with controlled access.
- c. *Portable hand tools, tool sets or kits, and shop equipment.* These items, when not in use and not under the surveillance of a responsible person (user, tool room keeper, or guard), will be stored in a secure location. Nonportable items will be secured in the building or van in which they are located. Doors and windows will be closed and locked. Secure locations for portable items include:
 - (1) A locked building or room meeting the requirements for a secure storage structure in appendix B or a locked metal cage in a secured building.
 - (2) A locked built-in cabinet, bin, or drawer in a secure room or building.
 - (3) A locked drawer or compartment of a furniture item (wall locker, desk, etc.) in a secure room or building.
 - (4) Attached to the building structure with a 5/16-inch chain or equivalent cable and a low security padlock or permanently fastened to a working surface.
 - (5) Locally fabricated, lockable racks that, when locked, prevent tool box lids from being opened or individually placed larger tools from being removed.

- (6) A locked enclosed truck, van, armored vehicle, or vehicle trunk.
- (7) A locked vehicle equipment box or secured, either directly or in a locked container, to the vehicle itself.
- (8) A locked CONEX container.

d. Common tools and portable shop equipment. These items, when not on hand receipt to a user, will be controlled through a locally devised receipt, sign-in/sign-out log, or exchangeable tag system. Tool checks (metal disks that can be stamped or etched with a mechanic's identification) are available in supply channels under national stock number (NSN) 9905-00-473-6336.

e. Access. Access to tools and shop equipment will be controlled to the maximum extent practical. If possible, access will be limited to the user, the individual designated as responsible for security items when not in use, and supervisory or command personnel.

f. Keys and locks used to safeguard tools. Keys, locks, and protective seals used to safeguard hand tools, tool sets or kits, shop equipment, and the facilities on which they are stored or located will be controlled and accounted for per appendix D. Master-keyed or keyed-alike locksets will not be used to secure these items.

g. Special accountability. Hand tools with a nonmilitary application that are particularly subject to improper use will be placed under special accountability. Consideration should be given to marking these items as indicated in appendix C of this regulation.

3-23. Administrative and housekeeping supplies and equipment

a. Property management and accountability directives.

- (1) AR 210-6.
- (2) AR 230-1.
- (3) AR 230-65.
- (4) AR 380-19.
- (5) AR 710-2.
- (6) AR 735-5.
- (7) DA Pam 710-2-1.

b. Minimum security standards for furniture and mess equipment.

(1) Work buildings or rooms in which these items are located will be secured when no responsible member permanently assigned to that particular activity is present.

(2) Furniture in day rooms or similar common areas used mainly during nonduty hours, and not normally staffed, will be protected by controlling access to these areas to the maximum extent practical. This may be done by requiring an individual desiring to use the facility to sign for the keys or having a charge-of-quarters duty officer, NCO, or other designated individual periodically check the facility.

(3) Occupants will secure Government furniture located in their quarters.

c. Minimum security standards for office machines.

(1) Buildings, rooms, and offices in which office machines are located will be secured whenever an individual permanently assigned to the activity is not present. Security will consist of closing and locking appropriate doors and windows, as a minimum.

(2) Automated systems, including word processing systems, will be secured per AR 380-19.

(3) When size and weight allow, small office machines such as hand-held calculators and portable computers will be locked in a desk or cabinet.

d. Minimum security standards for expendable and consumable supplies.

(1) At unit and office levels, items not issued for actual use will be centrally stored in secure cabinets, containers, rooms, or buildings. Keys, locks, protective seals, and access to storage facilities will be controlled.

(2) Self-service supply center (SSSC) account cards or plastic credit cards will be stored in a locked container when not in use. Access to these items will be controlled and access will be limited to the fewest individuals feasible, consistent with efficient operations.

(3) Pilferable items will be stored in the SSSC and issued from a security area such as a cage. The SSSC will be protected by physical measures meeting the secure storage structure standards in appendix B.

3-24. Controlled cryptographic items (CCI)

a. Property management and accountability directives.

- (1) AR 710-2.
- (2) AR 710-3.
- (3) AR 725-50.
- (4) AR 735-5.
- (5) AR 740-26.

b. CCI protective measures. CCI are high-value, sensitive U.S. Army property which require protection against unauthorized access because they contain an embedded logic which performs cryptographic functions. Access in this

instance means uncontrolled physical possession which gives the opportunity to obtain detailed knowledge of the CCI. The security protective measures and procedures addressed in paragraphs *c* and *d* below establish minimum standards for controlling access to CCI (installed or uninstalled) to protect against tampering, loss, and unauthorized use and apply only to unkeyed CCI which are unclassified. Installed CCI, for the purposes of this regulation, means the equipment on hand has been set up and is available for use to perform its design function for authorized users. Uninstalled means on hand but not set up for use. Keyed CCI are classified and will be protected per AR 380–40. DA Pam 25–380–2 will be used for additional guidance for safeguarding and handling CCI. Commanders should provide security protection for unclassified CCI as is given to other high–value unclassified U.S. Army assets and should apply the risk analysis principles in DA Pam 190–51 to assist in determining appropriate acceptable risks and safeguards.

c. Physical protective measures for unattended CCI.

(1) CCI which is not under continuous surveillance by an individual permanently assigned to the activity will be provided protection consisting of—

(a) A building or room where the doors, windows, and other means of entry and exit can be locked or secured and physical access controlled.

(b) A locked, enclosed van, trailer, armored vehicle, or aircraft protected by a perimeter fence.

(c) Securing the items directly to tactical vehicles by a locally fabricated method and providing perimeter fencing when removal and storage in a secure room or building is impractical.

(2) Aircraft and vehicles containing CCI will be parked and protected as indicated in paragraphs 3–3, 3–4, and 3–5.

(3) When commanders select double–barrier protection for CCI, the building or room being used as one barrier does not have to be a secure storage structure as indicated in appendix B.

(4) “Off Limits to Unauthorized Personnel” signs will be posted at the activity entrances.

(5) At Risk Level II, lighting will be provided for the exterior of the building or the site perimeter.

(6) At Risk Level III, IDS or continuous surveillance is required.

d. Attended. CCI which is under continuous surveillance and control of an individual permanently assigned to the activity does not require any additional physical protective measures as safeguards.

e. Security procedural measures.

(1) Access to the facility or area will be controlled per TB 380–40–22 and this regulation. Physical access will be limited only to authorized individuals.

(2) Access to keys and locks protecting CCI will be controlled per appendix D.

(3) Periodic command–directed inventories will be conducted per AR 710–2.

(4) The facility or vehicle parking area will be checked by guards at least every 2 hours.

(5) A standing operating procedure (SOP) which includes instructions for safeguarding CCI, controlling access to and use of CCI, and reporting of incidents of loss or tampering, as a minimum, will be published.

3–25. Unit supply rooms

A unit supply room will be a locked room which, as a minimum, meets the secure storage structure standards in appendix B or will be a locked metal cage in a secured building. Security lighting, fencing, or other protective measures may be warranted based on risk analysis. Access to items stored in the supply room will be controlled at all times by the supply NCO or other designated individual. Lock and key control procedures as indicated in appendix D apply.

3–26. Postal unique items

Minimum security standards are in DOD 4525.6–M, Volumes I and II.

Chapter 4 Security of Medical Supplies and Equipment

Section I Policy and Personnel Selection

4–1. General

This chapter establishes policy, procedures, and minimum physical security standards for the safeguarding and storage of controlled medical substances and medically sensitive items.

4–2. Security policy

a. Facilities, vaults, and containers used for storage of controlled medical substances or medically sensitive items will not be used for storage of classified material.

b. A Category 2 Serious Incident Report will be submitted per AR 190–40 for significant theft, loss, or recovery of

Government-owned or possessed narcotics; dangerous drugs; controlled substances; precious metals; radioactive or other sensitive materials, including sensitive medical material or equipment; or mismanagement of stock records or recovery procedures for those items that prevent a determination of loss.

c. Schedule I drugs and substances (see glossary) will be secured in the same manner prescribed for Note R (Schedule II) controlled substances.

4-3. Personnel selection

Personnel who are assigned duties that require access to controlled medical substances and sensitive items storage areas, including volunteers or those who have custodianship or possession of keys and combinations to locks securing such areas, will be carefully selected.

a. *Selection criteria.* Criteria for selection of these personnel include moral character, prior employment or military service history, maturity, and trustworthiness. Prior to assuming these duties—

(1) Designated persons will have satisfactorily undergone a local file check with area provost marshals, local civilian police, if not prohibited by law and per AR 190-27, and other agencies which might have information on file which would reflect on the honesty or stability of the individual. The National Crime Information Center (NCIC) cannot be used for this purpose. It can only be used to determine if the person has any outstanding warrants. NCIC warrant checks will be requested, in writing, from the supporting installation provost marshal office. Personnel exhibiting financial irresponsibility will be excluded from consideration. Non-Government workers (for example, volunteer workers) will not be given unescorted access to controlled medical substances and sensitive items. For new Government employees, results of investigations such as the National Agency Check and Inquiry required by DOD 5200.2-R should be known prior to granting them unescorted access.

(2) An interview with the lowest level commander having command responsibility for the security of subject items is required. The purpose of the interview is to appraise the individual's character, judgment, reliability, attitude, emotional or mental maturity, and sense of responsibility. DA Pam 611-1 may be used as a guide for conducting the interview. The interview will be documented in writing.

(3) The names and duty positions of personnel authorized unaccompanied access to controlled medical substances and medically sensitive items storage areas will be depicted on a roster, which will be posted inside the storage area.

b. *Access reinstatement.* Access to controlled substances denied to individuals undergoing investigation, treatment, rehabilitation, judicial or nonjudicial processes, or administrative action as a result of actual or suspected drug use may be reinstated when—

(1) Suspicions or allegations against the individual are determined to be unfounded.

(2) Rehabilitation is successful under the provisions of AR 40-66.

(3) Commander approves medical treatment facility credentials committee recommendations for reinstatement under the provisions of AR 40-66.

4-4. In-transit security of controlled medical substances and other medically sensitive items

Physical security during shipments of controlled medical substances and medically sensitive items listed in the glossary will be per the appropriate provisions of AR 40-61 or other appropriate Army regulations and command directives. In any event, in-transit security must be such that the spirit and intent of this regulation are not violated and that controlled medical substances and medically sensitive items are protected from unauthorized possession, use, and theft.

4-5. Disposal of controlled medical substances and items

Disposal of controlled medical substances and items will be per the provisions of AR 40-2, AR 40-61, and this regulation.

Section II

Structural Standards for Bulk Storage Facilities

4-6. Storage of Notes R, Q, and C items

Bulk storage for Notes R, Q, and C controlled medical items (see glossary) will conform to the physical security standards established in this chapter. Protection of containers of Notes R, Q, and C medical items in bulk storage or the vault, room, or structure in which the containers are located will include IDS (para 4-13) which will be in operation at all times when supervisory or duty personnel are not present within or at the area or container. The criteria prescribed for the review of IDS in AR 190-13 apply. Bulk storage facilities will be designated and posted as restricted areas. In overseas commands and in continental United States border locations, areas will be posted both in English and in the host or bordering nation's language.

4-7. Note R items

Items identified as Note R will be stored in an approved safe or vault secured with a Class 5 vault door.

- a.* Small quantities of controlled medical substances may be stored in any General Services Administration (GSA) approved safe.
- b.* Minimum structural standards for a vault at a new facility are detailed in appendix B.
- c.* At an existing facility where it is not feasible to construct the type of vault described in appendix B, a storage site will be selected according to the alternate vault criteria described in appendix B.

4-8. Note Q items

Items identified as Note Q will be stored as provided in paragraph 4-7; however, dual door protection (although desirable) may be eliminated provided the entrance door is as specified in appendix B. Restricted area protection will be provided. General medical items or supplies will not be stored with Note Q items.

4-9. Note C items

Depending on content, Note C chests, kits, outfits, other assemblages, or withdrawn controlled medical items will be stored as provided in paragraphs 4-7 and 4-8.

4-10. Controlled medical substances or sensitive medical items

Controlled medical substances or sensitive items will be considered by the facility commander for storage in secure storage structures (app B) or in locked containers. Containers will be locked at all times except during restocking, inventory, or dispensing operations. As a minimum, storage should be in a restricted area and protection provided should be consistent with the type of item and perceived local threat of theft or diversion to unauthorized use.

Section III

Physical Security Measures and Control Procedures

4-11. Safeguards during nonduty hours

a. At the close of business, designated duty personnel will perform a security check prior to departure from rooms or facilities in which Notes R, Q, and C items and other controlled substances and sensitive medical items are stored. These security checks will be documented daily on SF 701 and, as a minimum, will ensure that—

- (1) No Note R, Q, and C items remain unprotected or exposed and that they are secured in designated containers.
- (2) Containers are locked and checked properly with such action recorded on SF 702 (Security Container Check Sheet).
- (3) All windows, doors, and other openings are secured to deter access to rooms in which containers are located.
- (4) Other vulnerable equipment or property is stored properly and secured.

b. When duty personnel are not present, continuous surveillance will be provided for all bulk storage areas, buildings, and facilities in which Notes R, Q, and C items are stored. This will be provided by guard personnel or by IDS. A lock and key control program will be established per appendix D to enhance the protection of all storage containers and facilities.

4-12. Security checks

a. Military or security police or interior guards will make checks every 2 hours of all isolated structures. Facilities within hospitals or other medical or research, development, test, and evaluation (RDT&E) facilities, complexes, or structures may be checked by duty officers or other duty, medical, or unit personnel.

b. When the medical or RDT&E facility is not occupied, security checks will be conducted at irregular intervals not to exceed every 4 hours to avoid establishing a pattern. The frequency of checks will be increased to every 2 hours during nights, weekends, and holidays to provide for deterrence and early detection of entry.

c. Particular attention will be directed to windows, doors, other points of possible entry, and locking devices.

d. All instances of suspected theft, loss, illegal entry, open or unlocked facilities or containers, and other incidents of a suspicious origin will be reported immediately to designated authorities. Surveillance will be maintained until responding personnel arrive at the scene.

e. Records of security checks will be made and will be maintained in activity files for 90 days.

4-13. Intrusion detection system and security lighting

a. To meet minimum requirements for a storage area, the IDS will consist of at least two types of intrusion sensors, a means of alarm annunciation at a monitoring location from which an armed response force can be dispatched, and electronically supervised circuitry between the two.

(1) If the substances are entirely within a container, detection may include a capacitance sensor on the container itself.

(2) If the substances are not entirely within a container, IDS sensors will be installed such that they detect intruders before they breach any components of the vault, room, or building that are associated with providing delay to the

intruders. The vault, room, or building will provide delay greater than or equal to the time required for the response force to respond to the alarm.

b. Installation of IDS equipment will be per the applicable U.S. Army Corps of Engineers guide specifications. When local conditions dictate, a duress switch or holdup button may be added. The design review requirements of AR 190–13 apply.

c. An SOP for the activation, deactivation, and daily testing of the IDS will be published by the security office or the provost marshal office. The SOP will include instructions for maintaining an accurate IDS log.

d. Storage areas will be provided with interior and exterior lighting operational at all times during the hours of darkness.

4–14. Lock and key control

Commanders will establish procedures for the protection of locks, keys, and combinations used to secure facilities, vaults, and containers in which controlled medical substances and sensitive items are stored. The number of people with access to keys and combinations will be the minimum necessary for efficient operations. Provisions of appendix D and FM 19–30 will be followed in establishing procedures.

Section IV

Physical Security Standards for Pharmacy Storage

4–15. Pharmacy storage structural standards

Pharmacy storage facilities will conform to the following physical security standards:

a. Pharmacy Note R items will be stored per paragraph 4–7 and as noted in appendix B.

b. Pharmacy Note Q items will be stored per paragraph 4–8 and as noted in appendix B. As a minimum, Note Q items will be stored in locked cells of automatic counting machines or in locked metal containers inside the pharmacy.

c. Depending on the content, pharmacy Note C items will be stored per requirements for Note Q or Note R items above.

d. The pharmacy structure will be constructed as a vault as detailed in appendix B except as noted.

4–16. Physical security measures and control procedures

The following are minimum standards and controls considered necessary to ensure that positive security is provided for pharmacies:

a. All storage in pharmacies will be designated as restricted areas. When operationally feasible, containers of Note R and Note Q items will be positioned so their locations are not visible to the public during operating hours.

b. Within reasonable limits, containers will be locked when access is not required for operational use. Lock and key control security procedures prescribed in paragraph 4–14 are applicable and will be adhered to in pharmacy operations.

c. Pharmacies and their storage areas (if containing controlled substances) will be provided with both interior and exterior lighting of sufficient intensity to enable visual surveillance by security forces, duty officers, or other designated personnel. Security checks will be conducted and documented every 4 hours during nonoperational hours. Particular attention will be directed to doors, windows, and other possible points of entry. Entrance doors will be locked at all times, except when authorized personnel are entering or exiting the pharmacy.

d. IDS will be provided for all U.S. Army Medical Center (MEDCEN) and medical department activity (MEDDAC) pharmacies. The minimum standards for intrusion detection equipment described in paragraph 4–13 apply. In addition, a duress switch or holdup button will be provided in a hidden location at the dispensing window to permit pharmacy personnel to notify the supporting police agency from which an armed response force can be dispatched. Personnel on duty will have access to the duress alarm actuator at all times during periods of operation. Coordination will be made with the installation police to schedule a test of the system at intervals not to exceed 90 days.

e. All instances of suspected theft, illegal entry, unlocked facilities or containers, and other suspicious incidents will be reported immediately to designated personnel, and action will be taken as indicated in paragraph 4–12*e*.

Section V

Medical Treatment Facilities and Research, Development, Test, and Evaluation (RDT&E) Laboratory Facilities

4–17. Medical treatment facilities and RDT&E laboratory structural standards

Clinics; hospital wards; clinical nursing units; medical specialty, dental, and veterinary facilities; and RDT&E laboratory facilities will conform to the physical security standards listed below.

a. When duty personnel are in attendance 24 hours a day, normal operating quantities of Note R items will be stored in double-locked containers. Containers must be constructed so that forced entry is readily apparent to visual examination. When duty personnel are not present 24 hours a day, normal operating quantities of Note R items will be stored in a GSA-approved safe and an additional barrier will be provided, such as securing safes inside a locked room.

b. Normal operating quantities of Note Q items will be stored according to the criteria in paragraph *a* above. If this is not possible, containers constructed of a minimum of 26-gauge steel with a single lock may be used, provided additional security measures are taken (for example, increased surveillance or improved lighting) and provided the steel container is secured inside a locked room.

c. Precious metals and fabricated dental appliances containing precious metals will be secured against theft, loss, or damage consistent with their monetary value and the difficulty of replacement.

4-18. Physical security measures and control procedures

a. All storage containers for Note R and Q items will be located in restricted areas.

b. Keys and combinations to containers of controlled medical substances, sensitive items, and precious metals will be issued only to individuals authorized access to these items. Containers will be secured after duty hours. To prevent loss or theft during operating hours, containers will be unlocked only when property is being inserted, removed, or when the container is under the observation of designated personnel. Lock and key control procedures prescribed in paragraph 4-14 will be followed.

c. Unit dose carts containing controlled substances will be kept in restricted areas when not in use.

d. To prevent loss or theft during the administration of medications, unit dose carts will be kept under the physical control or unobstructed observation of designated personnel.

e. Storage areas will be provided with interior and exterior lighting operational at all times during the hours of darkness.

4-19. Crash carts, emergency trays, and ambulances

a. The number of crash carts and emergency trays (essential emergency assemblages) that contain controlled substances will be kept to a minimum and will be provided with maximum security consistent with requirements for immediate availability. When controlled medical substances or items are issued to emergency medical team personnel assigned to ambulance or emergency vehicle response duties, the controlled substances or items will not be stored in the vehicle while it is unattended. Controlled substances and items must remain under control or observation of responsible personnel at all times and will be stored in restricted areas when possible.

b. Locking devices on emergency assemblages hinder immediate availability to controlled medical substances and sensitive items by medical treatment personnel and will not be used. Appropriate sealing devices will be used to indicate tampering and to assist in inventory, but they must be easily opened without the use of a key, combination, or other time-delaying device.

c. Emergency assemblages containing controlled medical substances will be sufficiently protected, but must not hamper ready and authorized visual inspection and immediate removal for use.

d. Accountability and control requirements of AR 40-2 also apply and will be met.

4-20. Medically sensitive items

a. Unused needles and syringes and other medically sensitive items will be stored in a locked container. Keys to these cabinets will be controlled as indicated in paragraph 4-14.

b. Used and unused needles and syringes will not be stored in the same cabinet or container. Pending final destruction, used needles and syringes may be temporarily stored in closed one-way puncture resistant receptacles ("Sharps" containers). Sharps containers must be of a tamper-resistant design and must be either:

- (1) Locked to a mounting device which is securely fastened to the building structure.
- (2) Located in a room or area which is locked or under continuous visual surveillance of ward or clinic personnel.

Chapter 5 Physical Security of U.S. Army Museums

Section I Inspections and Personnel Selection

5-1. General

This chapter prescribes specific physical security standards, policies, procedures, and guidance to safeguard historically significant items in the care of the Army museum system. Historically significant items will be protected to deter theft and vandalism without damaging the item or affecting the educational, training, and aesthetic value of the items. All AA&E not rendered inoperable and not on display will be stored, secured, and inspected according to AR 190-11. Arms in storage may remain in operable condition. All other items will be secured and inspected as indicated in this regulation.

5-2. Inspections

Physical security inspections of museum facilities will be conducted per AR 190-13 and the criteria outlined in this regulation. Inspections of museum arms storage facilities will be per AR 190-11.

5-3. Museum personnel selection

Military or civilian personnel assigned or attached (including special duty personnel) to staff an Army museum must be honest, responsible, and emotionally stable. Local file checks will be made by the provost marshal in response to a written request before personnel are assigned or attached (including special duty personnel) to museum duties. NCIC checks can only be used to determine if the person has any outstanding warrants. Temporarily detailed, contracted, and volunteer personnel will work under close supervision of the permanently assigned staff. Those museum personnel considered for unaccompanied access to operable and inoperable museum AA&E will be processed and granted access per AR 190-11.

Section II**Museum Structures and Indoor and Outdoor Displays****5-4. Structural requirements**

Museum facilities traditionally house one-of-a-kind, irreplaceable items of historical significance. Such items are generally considered invaluable because they are irreplaceable and should be considered sensitive property. They should be reasonably protected. The degree of protection necessary must be determined locally and in partnership between the museum curator, provost marshal or equivalent security officer, and supporting facility engineers. Museum buildings and apertures providing access to the building should be modified or constructed so as to delay a determined intruder long enough for a security force to respond. Museum facilities will meet the minimum standards of this regulation. Security measures will be implemented for those facilities protected under the National Preservation Act of 1966 to the extent possible. Consistent with this act, IDS coverage should be included for all unbarred windows and doors other than those at arms storage facilities.

5-5. Locks and keys

Key and lock control for museum AA&E and other museum items will be per appendix D for AA&E that is rendered inoperable. Keys to AA&E that cannot be rendered inoperable due to value, uniqueness, etc., will be secured per AR 190-11.

a. Key custodian. The museum director will be designated the key custodian, whenever feasible. The commander or designated deputy will appoint the primary and an alternate key custodian in writing.

b. Locks.

(1) Exterior doors used for access to museum facilities will be secured with U.S. Government-approved padlocks (procured under MIL-A-A-1927 (NSN 5340-00-158-3807 or NSN 5340-00-158-3805), grade II, hardened steel shackle and body) or deadbolt or other locks equal to these devices as determined by the servicing facility engineer if installation does not detract from the aesthetic value of the facility. Approved locking devices are contained in appendix D. The number of exterior doors with exterior exposed padlocks will be kept to the absolute minimum. All other exterior doors will be secured on the inside.

(2) Vehicles and facilities in which vehicles are stored will be secured as stated in paragraph 3-5.

c. Keys.

(1) Museum facility keys will be maintained separately from arms storage, high-value item storage, and IDS keys.

(2) Keys will not be left unattended or unsecured at any time.

(3) The use of a master or multiple key system is prohibited.

(4) Where an Army museum or exhibit is protected by an approved IDS and the IDS is operational, museum personnel, as authorized by the museum curator or director, may remove the keys to the museum or exhibit from the installation at which the museum or exhibit is located. Unless authorized by the commander, where an approved IDS is not installed, the museum keys will not be removed from the installation, but will be locked in a secure strongbox in a secured location on post, such as the central military police station. Museum personnel, as authorized by the museum curator or director, will retain custody of the keys in this strongbox.

(5) Where combination locking devices are used to secure items such as containers and display cases, the combination will be controlled and safeguarded according to appendix D.

(6) Duplicate keys will not be kept with operational keys. They will be maintained by the museum director, unless the director is also the key custodian. In the latter case, the keys will be maintained by the supporting facility engineers.

5-6. Security lighting

Interior and exterior lighting will be provided in all museum buildings in which sensitive property is located. Sensitive property is property requiring a high degree of protection and control because of its vulnerability to theft or potential

for use in an illegal activity. As a minimum, all entrances will be lighted during hours of darkness. Use FM 19–30 to determine specific lighting requirements.

5–7. Intrusion detection systems

Installation of IDS may supplement existing security measures or provide a commensurate degree of protection. Requirements for IDS for AA&E are in AR 190–11. Procedures for obtaining IDS are outlined in AR 190–13. Additional guidance may be found in FM 19–30.

5–8. Exhibit or display cases

The viewing surfaces of exhibit or display cases will be constructed of at least 1/4 inch–thick plate glass, transparent acrylic plastic, or transparent polycarbonate plastic, securely fastened into frames or into the container. Where plate surfaces join at an angle, the edges will be bonded and rounded to prevent insertion of a pry tool. Cases with hinged openings must have all hinge butts concealed or spot welded or use a comparable security measure. Nonviewing surfaces of cases will be constructed to offer a higher degree of protection than the viewing surface.

5–9. Museum workshops

Workshops used by museum personnel for maintenance or restoration work will be secured at the close of each business day. Workshops containing AA&E will be secured as stated in paragraph 5–1.

5–10. Security forces

a. Each museum will be attended by at least one member of the museum staff, who will be tasked with museum security while it is open to the public. (This function can be combined with other duties.) Museums that are organized within several separate, nonconnecting buildings will have museum or security personnel in each facility or an electronic monitoring system. The museum attendant will be especially alert to detect pilferage, damage, or theft. To ensure adequate surveillance of all parts of the museum, the installation of one–way mirrors and electronic sensing devices should be considered. Museum parks and exterior displays will be provided electronic surveillance where practical and checked periodically by security patrols.

b. Commanders must ensure that all museums are on an assigned security patrol route and that special orders include an unscheduled check at least once every 8 hours by that patrol during nonduty hours on a daily basis.

5–11. Museum parks

Large items of historical property that are displayed outdoors in museum parks will be anchored to prevent theft. Pilferable component parts will be secured to a display or removed.

5–12. Museums in civilian communities

When museum facilities are located in civilian communities, the commander or his or her designated representative will establish liaison with local civil police agencies to ensure that—

a. Security checks are conducted by local police.

b. A coordinated plan for security exists.

5–13. Reporting loss of property

Loss of historical property other than AA&E will be reported by the provost marshal or equivalent security officer according to AR 190–40. See AR 870–20 for reporting requirements for loss of appropriated and nonappropriated fund property.

5–14. Accountability of equipment

Accountability of historical properties will be per AR 870–5.

5–15. Museum weapons and ammunition

Security of museum weapons and ammunition will be accomplished per the requirements of AR 190–11. Marking of museum weapons and ammunition will be per appendix C.

Appendix A References

Section I Required Publications

AR 40-2

Army Medical Treatment Facilities; General Administration. (Cited in paras 4-5 and 4-19.)

AR 40-61

Medical Logistics Policies and Procedures. (Cited in paras 4-4 and 4-5.)

AR 40-66

Medical Record and Quality Assurance Administration. (Cited in para 4-3.)

AR 190-11

Physical Security of Arms, Ammunition, and Explosives. (Cited in paras 3-3, 3-5, 3-16, 5-1, 5-2, 5-3, 5-5, 5-7, 5-15, and D-1.)

AR 190-13

The Army Physical Security Program. (Cited in paras 1-4, 1-5, 2-2, 2-3, 3-3, 3-5, 3-14, 4-6, 4-13, 5-2, and 5-7.)

AR 190-40

Serious Incident Report. (Cited in paras 4-2 and 5-13.)

AR 190-58

Personal Security. (Cited in para 3-19.)

AR 380-5

Department of the Army Information Security Program Regulation. (Cited in paras 3-3, 3-5, and 3-18.)

AR 380-19

Information Systems Security. (Cited in para 3-23.)

AR 380-40

Policy for Safeguarding and Controlling Communications Security (COMSEC) Material. (Cited in para 3-24.)

AR 525-13

The Army Terrorism Counteraction Program. (Cited in para 3-19.)

AR 700-84

Issue and Sale of Personal Clothing. (Cited in para 3-8.)

AR 710-2

Supply Policy Below the Wholesale Level. (Cited in paras 3-3, 3-5, 3-6, 3-16, 3-22, 3-23, and 3-24.)

AR 710-3

Asset and Transaction Reporting System. (Cited in para 3-24.)

AR 870-5

Military History: Responsibilities, Policies, and Procedures. (Cited in para 5-14.)

AR 870-20

Historical Properties and Museums (Cited in para 5-13.)

DA Pam 25-380-2

Security Standards for Controlled Cryptographic Items. (Cited in para 3-24.)

DA Pam 190-51

Risk Analysis for Army Property. (Cited in paras 1-4, 1-5, 2-2, 3-1, and 3-24.)

DA Pam 611-1

The Army Interview. (Cited in para 4-3.)

DOD 4160.21-M

Defense Disposal Manual. (Cited in para 3-11.)

DOD 4270.1-M

Construction Criteria. (Cited in para 3-13.)

DOD 5200.2-R

Personnel Security Program. (Cited in para 4-3.)

DODD 5200.8

Security of Installations and Resources. (Cited in the Summary.)

FM 19-30

Physical Security. (Cited in paras 3-1, 3-3, 3-5, 3-9, 4-14, 5-6, and 5-7.)

TB 9-2300-422-20

Security of Tactical Wheeled Vehicles. (Cited in para 3-5.)

TB 43-001-39-7

Equipment Improvement Report and Maintenance Digest. (Cited in para 3-5.)

TB 380-40-22

Security Standards for Controlled Cryptographic Items (CCI). (Cited in para 3-24.)

TB 380-41 (series)

Procedures for Safeguarding, Accounting and Supply Control of COMSEC Material. (Cited in paras 3-3 and 3-18.)

TM 5-853-1

Security Engineering, Designing for Security. (Cited in paras 1-5, 3-19, 3-20, 3-21 and B-1.)

Drawing No. 40-16-08

U.S. Army Corps of Engineers Drawing No. 40-16-08, Type FE-5. (Cited in para 3-1d.)

(If drawing is not available from the installation engineer, requests may be forwarded to the Commander, U.S. Army Corps of Engineers, Huntsville Division, ATTN: CEHND-ED-ES-1, P.O. Box 1600, Huntsville, Alabama 35807-4301.)

Section II**Related Publications**

The National Guard regulation listed applies only to Army National Guard personnel.

AR 30-1

The Army Food Service Program.

AR 30-18

Army Troop Issue Subsistence Activity Operating Procedures.

AR 30-19

Army Commissary Store Operating Policies.

AR 40-7

Use of Investigational Drugs in Humans and the Use of Schedule I Controlled Drug Substances.

AR 58-1

Management, Acquisition and Use of Administrative Use Motor Vehicles.

AR 95-1

General Provisions and Flight Regulations.

AR 108-2

Army Training and Audiovisual Support.

AR 190-16

Physical Security.

AR 190-27

Army Participation in National Crime Information Center (NCIC).

AR 210-6

Furniture and Household Equipment Support for Family Housing and Bachelor Housing.

AR 230-1

The Nonappropriated Fund System.

AR 230-65

Nonappropriated Funds: Accounting and Budgeting Procedures.

AR 420-17

Real Property and Resource Management.

AR 420-70

Buildings and Structures.

AR 703-1

Coal and Petroleum Products Supply and Management Activities.

AR 708-1

Cataloging and Supply Management Data.

AR 725-50

Requisitioning, Receipt, and Issue System.

AR 735-5

Policy and Procedures for Property Accountability.

AR 740-26

Physical Inventory Control.

DA Pam 710-2-1

Using Unit Supply Systems Procedures Manual.

DA Pam 738-750

The Army Maintenance Management System (TAMMS).

DOD 4525.6-M

DOD Postal Manual, Volumes I and II.

NGR 190-11

Physical Security of Arms, Ammunition, and Explosives

TB 43–0209

Color, Marking, and Camouflage Painting of Military Vehicles, Construction Equipment, and Materials Handling Equipment.

Section III**Prescribed Forms**

This section contains no entries.

Section IV**Referenced Forms**

Forms that have been designated “approved for electronic generation (EG)” must replicate exactly the content (wording), format (layout), and sequence (arrangement) of the official printed form. The form number of the electronically generated form will be shown as –R–E and the date will be the same as the date of the current edition of the printed form.

Exact replication of any DA or DD forms prescribed in this regulation that are generated by the automated Military Police Management Information System may be used in place of the official printed version of the form.

DA Form 1687

Notice of Delegation of Authority–Receipt for Supplies.

DA Form 2028

Recommended Changes to Publications and Blank Forms.

DA Form 5513–R (approved for EG)

Key Control Register and Inventory.

Standard Form 700

Security Container Information.

Standard Form 701

Activity Security Checklist.

Standard Form 702

Security Container Check Sheet.

Appendix B Storage Structure Security

B-1. General

This appendix includes construction standards for secure storage structures and vaults to be used in securing the assets covered by this regulation. The construction standards for each type of storage structure vary according to the risk level associated with the assets stored. These standards will provide the minimum acceptable security for the assets stored according to their associated risk levels. Fully effective protection of assets against forced entry requires providing building components which delay aggressors for a time at least equal to the time required for a response team to arrive at the facility in response to an alarm. This further requires IDS to detect aggressors before they breach the surface of the secure storage structure or vault. Refer to TM 5-853-1 for further guidance on delay times and complementary installation of IDS. The measures required by this appendix may be replaced with compensatory measures where the required measures are infeasible. The servicing facility engineer will make all determinations of equivalent construction and delay time provided by construction.

B-2. Secure storage structures standards

Buildings, areas, and rooms may be considered secure storage structures if they meet the following standards for doors, windows, walls, ceilings, and floors. All building components within the secure storage structure should provide an equivalent degree of security.

a. Doors.

(1) *Risk Level I.* Doors will be a minimum of 1 3/4-inch thick solid core wood or hollow steel. Hollow steel doors will be industrial type construction with at least 20-gauge skin plate thickness and will be internally reinforced with continuously spaced stiffeners. Door frames will be constructed of a minimum of 18-gauge steel. Doors with locking systems exposed to the outside will be kept to the absolute minimum number needed based on operational considerations. In addition, the doors will meet the following installation requirements:

(a) Door hinge mounting screws should not be exposed to the exterior of the facility. If screws are exposed, they will be spot welded, peened, covered, or filled with material in a way to prevent easy removal. Nails will not be used to mount hinges or any other door hardware.

(b) Door hinge pins should not be exposed to the exterior of the facility. If they are, they will be spot welded, covered, filled, or otherwise secured to prevent easy removal.

(c) Doors secured from the inside will be secured with a deadbolt locking device, crossbar, or similar locking device resistant to jimmying and manipulation from the outside. Latch style door locks will not be used. Locking devices will conform to U.S. Army Corps of Engineers guide specifications.

(d) Doors secured from the outside will have locking devices conforming to U.S. Army Corps of Engineers guide specifications for the type of structure or with U.S. Government approved tumbler-type, key-operated padlocks. The servicing facility engineer will verify lock conformance with the guide specification.

(2) *Risk Level II.* Doors will be a minimum of 16-gauge minimum hollow steel construction with a minimum of frame construction of 16-gauge steel. Installation requirements for Risk Level I also apply. Alternatively, doors or pairs of doors will provide delay time equal to or greater than the response time.

(3) *Risk Level III.* Doors will be a minimum of 1 3/4-inch solid core wood with wood block cores and 12-gauge minimum steel plate on both sides or doors will be 12-gauge minimum hollow steel doors reinforced with vertical stiffeners at 6 inches on center. Door frames will be constructed of 16-gauge steel minimum and will be grouted full. Alternatively, doors or pairs of doors will provide delay time equal to or greater than the response time.

b. *Windows.* The following apply to all first floor openings, except doors, in excess of 96 square inches that are located less than 12 feet from the ground level and to similar openings above the first floor which can be reached from an elevated portion of the structure or an adjacent structure which provides ground level access. Long narrow openings with the shortest dimension measuring less than 6 inches are exempt from these requirements. If window air conditioning is used, bar, mesh, or fence fabric assemblies will completely enclose the air-conditioning unit protruding from the building or storage room exterior. If the window air conditioner is mounted through the wall, measures will be taken to ensure that it cannot be removed from the outside.

(1) *Risk Level I.* Operable windows will have adequate individual locking devices. Windows will also be covered with 1/2-inch diameter bars spaced at 6 inches on center each way, with 1/16-inch expanded metal mesh, or with 9-gauge chain link fabric.

(2) *Risk Level II.* Windows will be inoperable. They will be covered with bars or mesh as for Risk Level I and the glass will be covered with 4-mil fragment retention film or they will have 1/2-inch thick laminated glass or plastic security glazing. Alternatively, windows will provide delay time equal to or greater than the response time.

(3) *Risk Level III.* Windows will be inoperable and they will be covered with bars or mesh as for Risk Level I and will have ½-inch thick laminated glass or plastic security glazing. Alternatively, windows will provide delay time equal to or greater than the response time.

c. Walls.

(1) *Risk Level I.* Walls will be constructed of at least ½-inch plywood, 1-inch tongue-in-groove wall boards, or 26-gauge steel siding.

(2) *Risk Level II.* Walls will be constructed of 4-inch minimum thickness brick and stud construction or of 8-inch minimum thickness concrete masonry (unreinforced). Alternatively, walls will provide delay equal to or greater than the response time.

(3) *Risk Level III.* Walls will be constructed of 8-inch minimum thickness reinforced concrete masonry or 4-inch minimum thickness reinforced concrete. Alternatively, walls will provide delay equal to or greater than the response time.

d. Floors and ceilings. The following requirements do not apply to slab on grade floors. No special requirements apply for such floors.

(1) *Risk Level I.* Floors and ceilings will be constructed of at least ½-inch plywood, 1-inch tongue-in-groove wall boards, or 24-gauge steel deck.

(2) *Risk Level II.* Floors and ceilings will be constructed as for Risk Level I with the addition of 5/16-inch expanded metal mesh or 10-gauge 6x6 woven wire fabric. Alternatively, floors and ceilings will provide delay equal to or greater than the response time.

(3) *Risk Level III.* Floors and ceilings will be constructed of 4-inch minimum thickness reinforced concrete. Alternatively, floors and ceilings will provide delay equal to or greater than the response time.

B-3. Controlled substance storage vault structural standards

Vaults for storage of controlled medical substances will meet the following construction standards for doors, windows, walls, ceilings, and floors as appropriate for the applicable risk level. These standards apply for both Note Q and Note R controlled medical substances except as noted. Separate standards are established for new construction and existing construction. Prefabricated modular vaults which provide similar resistance to forced entry may also be used.

a. New construction.

(1) *Doors.* Doors will be limited to the minimum number required. Doors for all risk levels will be Class 5 vault doors. Alternatively, doors or pairs of doors will provide delay equal to or greater than the response time.

(a) If the vault is required to remain open for frequent access, it must be equipped with a self-closing and self-locking "day gate" or its equivalent.

(b) If the vault is required to be open only briefly and infrequently, and if it is relocked immediately after use, a "day gate" is not required.

(c) Dual door protection is not required for storage of Note Q items provided the entrance door is of solid wood, a minimum of 1 3/4 inches thick, and covered on the exterior with sheet steel not less than 12 gauge United States standard (USS) secured with a high-security padlock and a high-security hasp and hung on security hinges.

(d) Doors will be secured with a Group 1R changeable combination lock, a high-security padlock (Military Specification MIL-P-43607 or NSN 5340-01-188-1560 or 5340-00-799-8248) and hasp (Military Specification MIL-H-43905 or MIL-H-29181A (YD)), or other comparable hasps and locking hardware as verified by the servicing facility engineer.

(2) *Windows.* Windows will not be allowed in vaults in new facilities.

(3) *Walls.*

(a) *Risk Levels I and II.* Walls will be constructed of a minimum of 8-inch-thick concrete reinforced vertically and horizontally on each face with ½-inch diameter reinforcing bars placed 9 inches on center and staggered to form a grid approximately 4½-inches square or with 8-inch thick reinforced concrete masonry with ½-inch diameter reinforcing bars placed at 8 inches on center in block cells filled with grout or mortar and with horizontal joint reinforcement at every course. Alternatively, walls may be constructed to provide delay equal to or greater than the response time.

(b) *Risk Level III.* Walls will be constructed of a minimum of 8-inch thick reinforced concrete as described above. Reinforced masonry will not be used for new construction at this risk level. Alternatively, walls may be constructed to provide delay equal to the response time.

(4) *Floors and ceilings.* Floors and ceilings for all risk levels will be constructed of a minimum of 8-inch thick concrete reinforced in both directions with ½-inch diameter reinforcing bars placed 9 inches on center and staggered to form a grid approximately 4½-inches square. This requirement does not apply to reinforced concrete floor slabs on grade, which may be constructed of 6-inch thick reinforced concrete. Alternatively, floors and ceilings may be constructed to provide delay equal to the response time.

b. Existing construction.

(1) *Doors.* Doors will be limited to the minimum number required. Door hinges will not be removable from outside of the vault. Security hinges are preferred, but if conventional hinges are used, hinge pins will be spot welded, peened, covered, or otherwise secured to prevent removal. Primary doors will be secured with a Group 1R changeable combination lock, a high-security padlock (Military Specification MIL-P-43607G or NSN 5340-01-188-1560 or 5340-00-799-8248) and hasp (Military Specification MIL-H-43905 or MIL-H-29181A (YD)), or other comparable hasps and locking hardware. Other doors will be secured from the inside with deadbolt locking devices, crossbars, or similar locking devices resistant to jimmying and manipulation from the outside.

(a) *Risk Level I.* Doors will be Class 5 vault doors or will consist of a two-door back-to-back system whose outer door is at least 1 3/4-inch solid core wood with wood block cores and 16-gauge minimum steel plate on the exterior side or a 12-gauge minimum hollow steel door reinforced with vertical stiffeners at 6 inches on center. The inner door will be constructed of a minimum of 1/2-inch steel bars welded to form a grid with openings that do not exceed 32 square inches or to be of construction comparable to the outer door. Door frames for doors other than Class 5 vault doors will be constructed of 16-gauge steel minimum and will be grouted full. Dual door construction may be eliminated for Note Q controlled medical substances. Alternatively, doors or pairs of doors will provide delay equal to or greater than the response time.

(b) *Risk Levels II and III.* Doors will be as for Risk Level I, except that where a two-door back-to-back system is used, the inner door will be of the same construction as the outer door. Dual door construction may be eliminated for Note Q controlled medical substances. Alternatively, doors or pairs of doors will provide delay equal to or greater than the response time.

(2) *Windows.* The number of windows or other openings (such as vents or ducts) greater than 96 square inches in area will be limited to the minimum number which is essential. All window and other openings over 96 square inches will be completely blocked with construction equivalent to that of the wall in which the opening is located where possible.

(a) *Risk Levels I and II.* Windows which cannot be blocked will be inoperable and they will be covered with bars or mesh and will have 1/2-inch thick laminated glass or plastic security glazing. The bars or mesh will be secured to a steel channel frame fastened to the wall with smooth-headed bolts or embedded into the structure to prevent removal. Bar assemblies will be constructed with vertical bars spaced at not more than 4 inches on center and horizontal members welded together, to the vertical bars, and to the frame and spaced so that openings between bars do not exceed 32 square inches. Mesh assemblies will consist of 5/16-inch expanded metal with openings of not more than 2 inches in any direction. Alternatively, windows will provide delay time equal to or greater than the response time. If window air conditioners are used, the bar or mesh assemblies will completely enclose the air-conditioning unit protruding from the storage vault and measures will be taken to ensure that the unit cannot be removed from the outside.

(b) *Risk Level III.* All windows will be completely blocked. If equivalent wall construction is not feasible for use in blocking windows, steel plate at least 1/4-inch thick may be bolted to the wall to block the window openings. Alternatively, windows will provide delay equal to or greater than the response time.

(3) *Walls.* Walls will be constructed according to the risk level as specified below. Walls will be securely affixed to the floor and ceiling of the vault.

(a) *Risk Level I.* Walls will be constructed of at least 1/2-inch plywood, 1-inch tongue-in-groove wall boards, or 26-gauge steel siding. The interior of the walls will be lined with 5/16-inch expanded metal mesh. Alternatively, walls will provide delay equal to or greater than the response time.

(b) *Risk Level II.* Walls will be constructed of 8-inch thick reinforced concrete masonry with 1/2-inch diameter reinforcing bars placed at 8 inches on center in block cells filled with grout or mortar and with horizontal joint reinforcement at every course or of brick in an inner and outer course interlocked to provide 8 inches of thickness. Alternatively, walls may be constructed to provide delay equal to or greater than the response time.

(c) *Risk Level III.* Walls will be constructed of reinforced concrete masonry as described for Risk Level II. Brick construction will not be used. Alternatively, walls may be constructed to provide delay equal to or greater than the response time.

(4) *Floors and ceilings.*

(a) *Risk Level I.* Floors and ceilings will be constructed of at least 1/2-inch plywood, 1-inch tongue-in-groove wall boards, or 24-gauge steel deck. The underside of the floor and ceiling will be lined with 5/16-inch expanded metal mesh with a maximum opening of 2 inches in any direction suspended with smooth-headed bolts to prevent removal. These requirements do not apply for existing concrete floors on grade. Alternatively, floors and ceilings will be constructed to provide delay equal to or greater than the response time.

(b) *Risk Levels II and III.* Floors and ceilings will be constructed of reinforced concrete. Alternatively, floors and ceilings may be constructed to provide delay equal to or greater than the response time.

B-4. Pharmacy storage structure standards

Pharmacy construction will meet the requirements of paragraph B-3 for new and existing construction with the following exceptions and additions.

a. Doors. Doors may be a minimum of 1 3/4-inch solid wood with security hinges, hinges on the inside face, or hinges which are spot welded, peened, covered, or otherwise secured to prevent easy removal. Locks will be as specified in paragraph B-3b.

b. Exterior windows. Windows, as a minimum, will be covered with bars or mesh as specified in paragraph B-3b.

c. Dispensing windows. During nonduty hours, dispensing windows will be secured from the inside (so that locks or bolts are inaccessible from the outside) with a solid wood door at least 1 3/4 inches thick, a steel roll-up door, steel mesh or steel bars as specified for windows in paragraph B-3b, or a means which provides equivalent security.

Appendix C Marking of Army Property

C-1. Purpose of marking property

a. Many items of Army property cannot be distinguished from similar civilian items and are attractive targets for pilferage. These items can be easily disposed of and detection is difficult.

b. Marking individual items of Army property will enhance the security of the property by—

- (1) Detering the theft or pilferage of the items.
- (2) Increasing the difficulty of disposing of the property because illegal possession can result in prosecution and because markings are not always easily removed.
- (3) Increasing the chances of recovery of the property and prosecution of the criminal perpetrator by providing a positive means of identifying the property and tracking it.

C-2. Determining whether to mark property

a. The decision to mark Army property rests with the commander and is not mandatory except for museum AA&E. In making the decision to mark Army property other than museum AA&E, the commander should consider such risk factors as—

- (1) Vulnerabilities and threat to property losses.
- (2) Monetary replacement value of the property.
- (3) Criticality of the property to include effects of loss and mission performance.

b. If the property has no serial number and is reported lost, the chances of return will depend on the ability of the recovering agency to determine the owner through the reporting system. If there is no identifying data on the property, the chances of return are virtually nonexistent.

C-3. Marking museum weapons and ammunition

Weapons, with or without serial numbers, will be marked with a catalog number as follows:

a. *Location of catalog number.* The numbers should be placed on the inside of the trigger guard or on the breach of the barrel opposite the lock.

b. *Marking methods.*

(1) *Semipermanent markings.* Semipermanent markings can be applied by using a rapidograph or quill pen and non-waterproof black India ink or oil paint (watercolors are not recommended as they may not adhere). After the paint has dried, apply a coat of varnish over the numbers. See paragraph (2) below regarding records maintenance.

(2) *Permanent markings.* Permanent markings can be applied with a scribe or engraving tool. Such labeling, which can never be removed from the object, should be made only by specific arrangement with the responsible curator and written permission of the Center of Military History. This type of labeling is discouraged if the historical value of the item will be impaired through its application; however, if this is the case, a detailed description of the item should be kept. This includes recording potentially unique characteristics such as scratches and discoloration and their dimensions and location. The description will be retained on file by curators. Photographs, especially color, are extremely useful.

C-4. Marking other Army property

a. *Standard marking system.* Marking property is worthwhile only if it identifies a specific item as belonging to a particular organization. The recommended standard marking of Army property should—

- (1) Use a “USA” prefix which alerts the recovering agency that the property belongs to the U.S. Army.
- (2) Have a unit identifier. Use the unit identification code. An abbreviation of the office, unit, or activity designation, such as vehicle bumper markings outlined in TB 43-0209, may also be provided.
- (3) Include as the last item in the code a sequential number or letter that identifies the specific item from like items in the using organization. This procedure could be used if more than one item of a type exists and no serial numbers exist to distinguish between these items.

b. *Recording marked items.* Records of marked items including a brief description, serial number, and name of individual to whom hand receipted, preferably the user, should be retained on file.

c. *Identifying and locating owning units of Army property.* Usually the installation or unit provost marshal or security officer will be the initiator of action to identify and locate the property owner. The provost marshal or security officer maintains liaison with civilian law enforcement agencies to ensure they are aware of the standard Army

Appendix D Keys, Locks, Locking Devices (including Hasps and Chains), and Protective Seals

D-1. General

a. Guidance on procedures for keys, locks, and locking devices (including hasps and chains), and protective seals is contained in this appendix. Additional requirements for AA&E are in AR 190-11.

b. Only approved locks and locking devices (including hasps and chains) will be used. All questions regarding the identity of approved commercial equivalent locks and locking devices (including hasps and chains) meeting military specifications shall be addressed to the Naval Civil Engineering Laboratory (NCEL), ATTN: Code L56, Port Hueneme, CA 93043-4328. Personnel can obtain the most current version of these specifications by contacting the NCEL.

c. Under no circumstances will any keys, locks, or alternate keys or locks be placed in a security container that contains or stores classified material.

D-2. Key custodian and alternate custodian

A primary or alternate key custodian is the person who will—

a. Be appointed, in writing, to issue and receive keys and maintain accountability for office, unit, or activity keys.

b. Ensure that individuals designated to issue, receive, and account for keys in his or her absence, clearly understand local key control procedures.

c. Maintain a key control register at all times to ensure continuous accountability for keys of locks used to secure Government property.

d. Be listed on an access roster.

D-3. Key control register

Keys will be signed out to authorized personnel, as needed, on a key control register. The key control register, DA Form 5513-R (Key Control Register and Inventory), is approved for use to meet the requirements of this regulation. When not in use, the key control register will be kept in a locked container that does not contain or store classified material and to which access is controlled.

D-4. Key depository

a. A lockable container, such as a safe or filing cabinet, or a key depository made of at least 26-gauge steel, equipped with a tumbler-type locking device and permanently affixed to a wall, will be used to secure keys.

b. The key depository will be located in a room where it is kept under 24-hour surveillance or in a room that is locked when unoccupied.

D-5. Locks

a. The use of any master key system or multiple key system is prohibited except as noted elsewhere in this regulation.

b. U.S. Government key-operated, pin-locking deadbolts which project at least 1 inch into the door frame or tumbler-type padlocks will be used to safeguard unclassified, nonsensitive Army supplies and equipment if a lock is required. Selection will be based on the value of items protected, mission essentiality, and vulnerability to criminal attack. All questions regarding approved locks and locking devices will be addressed to the NCEL as indicated in paragraph D-1 above.

c. Padlocks and keys not in use will be secured in a locked container that does not contain or store classified material. Access to the container will be controlled.

D-6. Key and lock accountability

a. Keys and combinations to locks will be accounted for at all times. Keys to locks in use which protect the property of an office, unit, or activity will be checked at the end of each duty day. Differences between keys on hand and the key control register will be reconciled.

b. Padlocks and their keys will be inventoried by serial number semiannually. A written record of the inventory will be retained until the next inventory is conducted.

c. When a key to a padlock is lost or missing, an inquiry will be conducted and the padlock replaced or recored immediately.

d. A key and lock inventory will be maintained which includes a list of all of the following:

- (1) *Keys.*
- (2) *Locks.*
- (3) *Key serial numbers.*
- (4) *Lock serial numbers.*
- (5) *Location of locks.*
- (6) *The number of keys maintained for each lock.* This list will be secured in the key depository.

e. Padlocks and keys which do not have a serial number will be given one. This number will be inscribed on the lock or key as appropriate.

D-7. Additional key and lock controls for IDS and key containers

a. Keys to IDS (operational or maintenance) or key containers will not be removed from the installation except to provide for protected storage elsewhere. Keys to locks securing key containers will be afforded physical protection equivalent to that provided by the key container itself. Keys to containers and IDS will be maintained separately from other keys, and will be accessible only to those individuals whose official duties require access to them.

- (1) A current roster of these individuals will be kept within the unit, agency, or organization.
- (2) The roster will be protected from public view.
- (3) The roster will be signed by the designated official and will contain the names of those individuals authorized to receive keys from the key custodian (para *d* below).
- (4) At no time will keys be in the custody of a person not listed on the roster.

b. Keys to containers and IDS may be secured together in the same key container. However, under no circumstances will keys and locks or alternate keys or locks be placed in any security container that contains or stores classified material.

(1) When arms and ammunition are stored in the same areas, keys to those storage areas may be maintained together, but separately from other keys that do not pertain to AA&E storage. The number of keys will be held to the minimum essential. Keys may not be left unattended or unsecured at any time.

(2) Keys required for maintenance and repair of IDS, including keys to the control unit door and monitor cabinet, will be kept separate from other IDS keys. Access will be permitted only to authorized maintenance personnel.

(3) IDS operational keys will be stored in containers of at least 20-gauge steel equipped with GSA-approved low security padlocks or GSA-approved built-in three-position changeable combination locks, or in GSA-approved Class 5 or Class 6 containers that do not contain or store classified material. Combinations will be recorded on SF 700 (Security Container Information), sealed in the envelope provided, and stored in a container per AR 380-5.

(4) Containers weighing less than 500 pounds will be fastened to the structure with bolts or chains equipped with secondary padlocks to preclude easy removal.

c. In the event of lost, misplaced, or stolen keys, an investigation will be conducted immediately. The affected locks or cores to locks will be replaced immediately. Replacement or reserve locks, cores, and keys will be secured to preclude access by unauthorized individuals.

d. A key and lock custodian will be appointed in writing. Only the commander and the key custodian (or alternate, if appointed) will issue keys to those individuals on the key access roster (para *a* above). Personnel listed on the roster may transfer custody, in writing, among themselves.

(1) The key and lock custodian's duties will also include procurement and receipt of keys and locks and investigation of lost or stolen keys. The key and lock custodian will maintain a record to identify each key and lock and combinations to locks used by the activity, including replacement or reserve keys and locks. The record will show the current location and custody of each key and lock.

(2) A key control register will be maintained at the unit level to—

- (a) Ensure continuous accountability for keys.
- (b) Ensure positive control of keys.

(c) Establish responsibility for the custody of stored AA&E. DA Form 5513-R may be used for this purpose. Completed key control registers will be retained in unit files for a minimum of 90 days and then disposed of per established MACOM procedures.

e. When individuals are charged with the responsibility for safeguarding or otherwise having keys immediately available, they will sign for a sealed container of keys.

(1) A sealed container is a locked and sealed key container or a sealed envelope (SF 700, per AR 380-5) containing the key or combination to the key container.

(2) When the sealed container of keys is transferred from one individual to another, the unbroken seal is evidence that the keys have not been disturbed. The seal need not be broken for inventory of keys. However, evidence of tampering with a sealed container will require an inventory of the keys and such other action as may be required by the commander concerned.

(3) If the keys are not placed in a sealed container, an inventory of keys will be made by serial number or other

identifying information of the key (for example, stamped number on key). The inventory and change of custody will be recorded.

(4) Inventory records will be retained in unit files for a minimum of 1 year and then disposed of per established MACOM procedures.

f. Combination to locks on vault doors or GSA-approved Class 5 or Class 6 security containers will be changed annually or upon change of custodian, or other person having knowledge of the combination, or when the combination has been subject to possible compromise. Combinations will also be changed when a container is first put into service. The combination shall be recorded using SF 700, sealed in the envelope provided, and stored in a container meeting storage requirements indicated in AR 380-5. No other written record of the combination will be kept. Controls will be established to ensure that the envelopes containing combinations to locks are not made available to unauthorized personnel.

g. Replacement of lock cylinders and broken keys for high-security locks may be requested through normal supply channels. Requests will be coordinated through the key control custodian. MACOMs are designated as approval authorities for any deviation in key procurement procedures.

D-8. Additional lock and key requirements for aircraft and vehicle storage

Facilities in which vehicles or aircraft are stored with sensitive items aboard will be secured by approved secondary padlocks. Aircraft will be secured with manufacturer-installed or approved modification work order door-locking devices when not in use. All hatches and other openings to track vehicles which cannot be secured from the inside will be secured on the outside with approved secondary padlocks.

D-9. Chains

When a chain is required for security of unclassified, nonsensitive equipment and supplies, specifications for approved chains will be obtained from the NCEL as indicated in paragraph D-1 above.

D-10. Use and control of protective seals

a. Purpose of the seal. The purpose of the seal is to show whether the integrity of a storage facility, vehicle, rail shipment, or container has been compromised. A plain seal is not a lock, although combination items referred to as "seal-locks" are available. The purpose of a seal, no matter how well-constructed, is defeated if strict accountability and disciplined application are not maintained.

b. Ordering and storing seals. Seal construction specification should include—

- (1) *Durability.* Seals must be strong enough to prevent accidental breakage during normal use.
- (2) *Design.* Seals must be sufficiently complex to make unauthorized manufacture of a replacement seal difficult.
- (3) *Tamperproof.* Seals must readily provide visible evidence of tampering and be constructed in a way that makes simulated locking difficult once the seal has been broken.
- (4) *Individually identifiable.* Seals must have embossed serial numbers and owner identification.
- (5) *Ordering and issuing.* A single office on an installation will be responsible for ordering and issuing seals. The source for the seals will be instructed to ship the seals to the attention of a seal custodian in that office.
- (6) *Unused seals.* Seals not issued for actual use will always be secured in a locked, metal container with controlled access. Only seal custodians and alternates will have access. Recorded monthly inventories will be conducted to preclude undetected loss of seals.

c. Accounting for seals. Seal custodians will maintain seal logbooks, preferably in hard cover, rather than in loose-leaf books.

(1) Issue of seals to a using office, unit, or activity custodian will reflect date of issue, name of recipient, and seal serial numbers.

(2) Issue of a seal for actual use by a custodian will reflect the seal number, date and time applied, identification of items to which applied (and location on item if other than main door(s)), and the name of the person applying the seal. For outbound loaded trailers, railcars, and container shipments, the appropriate trailer, railcar, or container number and load destination will be noted.

d. Application of seals.

- (1) Seal all doors and openings, not merely the main one.
- (2) Run seal straps through hasp only once. Seals wrapped around several times become illegible.
- (3) Listen for "click" when inserting point of seal into sheath.
- (4) To ensure positive closure, tug down on strap and twist the point section inserted into the locking mechanism.

e. Checking seals. Commands using seals will develop procedures for checking them. These procedures will include actions to be taken to break a seal and actions to be taken upon finding a broken seal.

f. Disposition of used seals.

(1) All shipping documents will reflect seal number(s). All seals will be verified with seal log, shipping documents, or other appropriate documents before removal and disposal.

(2) Seals must be defaced sufficiently upon removal so that they cannot be used to simulate a good seal. They may be disposed of in normal trash.

(3) If the user seal log is located on the same installation, the custodian will be advised of the destruction of the seal, or the seal will be returned to the custodian. The custodian will annotate the date and time removed and the name of the individual removing the seal across from the original entry on the seal log.

g. Changing seals. The colors of seals will be changed periodically as an additional physical security measure.

Glossary

This is the consolidated glossary for the Physical Security Handbook.

**Section I
Abbreviations****AA&E**

arms, ammunition, and explosives

AC

Active Component

ACSI

Assistant Chief of Staff for Intelligence

ADP

automatic data processing

AE

ammunition and explosives

AFB

Air Force Base

AFH

Army family housing

AFI

annual formal inspection

AFSPA

Air Force Security Police Agency

AG

Adjutant General

AGS

Armed Guard Surveillance

AIF

Army Industrial Funds

AMC

U.S. Army Material Command

AMDF

Army Master Data File

AP

acquisition plan

APSEAG

Army Physical Security Equipment Action Group

AR

Army regulation

ARDEC

U.S. Army Armament Research, Development and Engineering Center

ARNG

Army National Guard

ARSTAF

Army Staff

ASA (IL&E)

Assistant Secretary of the Army (Installations, Logistics, and Environment)

ASA (RDA)

Assistant Secretary of the Army (Research, Development, and Acquisition)

ASI

additional skill identifier

ASI H3

ASI for physical security inspector

ASI P7

ASI for patrol/narcotics or contraband detector dog handler

ASI Z6

ASI for patrol/explosives detector dog handler

ASL

authorized stockage list

ASP

ammunition supply point

AT

antiterrorism

ATC

Air Training Command

ATCOM

U.S. Army Aviation and Troop Command

BASOPS

base operations

BATF

Bureau of Alcohol, Tobacco, and Firearms

BCU

battery coolant unit

BRDEC

Belvoir Research & Development Engineering Center

CB

close boundary

CBT/T

combatting terrorism

CCI

controlled cryptographic items

CCP

circulation control point

CCTV

closed circuit television

CDR

commander

CE

U.S. Army Corps of Engineers

CECOM

U.S. Army Communications-Electronics Command

C-E

communications-electronics

CFM

cubic feet per minute

CG

commanding general

CL

carload

CMP

Civilian Marksmanship Program

COA

Comptroller of the Army

COCO

contractor-owned, contractor-operated

COE

Chief of Engineers

COFC

container-on-flatcar

COMDT

commandant

COMSEC

communications security

CONEX

container express

CONUS

continental United States

CONUSA

the numbered armies in the Continental United States

CPA

Chief of Public Affairs

CPCO

Central Port Call Office

CPR

civilian personnel regulation

CQ

charge of quarters

CRC

U.S. Army Crime Records Center

CSS

Constant Surveillance Service

CT

counterterrorism

CUCV

commercial utility and cargo vehicle

DA

Department of the Army

DAPSRB

Department of the Army Physical Security Review Board

DCSINT

Deputy Chief of Staff for Intelligence

DCSLOG

Deputy Chief of Staff for Logistics

DCSOPS

Deputy Chief of Staff for Operations

DCSPER

Deputy Chief of Staff for Personnel

DDPS

Dual Driver Protective Service

DEA

Drug Enforcement Administration

DEFCON

defense readiness condition

DEH

Director of Engineering and Housing

DLA

Defense Logistics Agency

DNA

Defense Nuclear Agency

DOD

Department of Defense

DODD

Department of Defense directive

DOL

Director of Logistics

DPDO

Defense Property Disposal Office

DRMO

Defense Reutilization Marketing Offices

DTS

Defense Transportation System

DUSD(P)

Deputy Under Secretary of Defense for Policy

EDD

explosives detector dog

ENTNAC

Entrance National Agency Check

EOC

Emergency Operations Center

EOD

explosive ordnance disposal

FAA

Federal Aviation Administration

FBI

Federal Bureau of Investigation

FISO

Force Integration Staff Officer

FM

field manual

FMS

foreign military sales

FOA

field operating agency

FOB

free on board

FSC

Federal supply classification

FY

fiscal year

GBL

Government bill of lading

GOCO

Government-owned, contractor-operated

GOGO

Government-owned, Government-operated

GS

greater security

GSA

General Services Administration

GT

general technical aptitude area

GTR

Government transportation request

HQDA

Headquarters, Department of the Army

HQMC

Headquarters, United States Marine Corps

HSP

high security padlock

HUMINT

human intelligence

ID

identification

IDS

intrusion detection system

IED

improvised explosive device

IES

Illuminating Engineering Society

ILS

integrated logistic support

INSCOM

U.S. Army Intelligence and Security Command

ITO

installation transportation office(r)

JCS

Joint Chiefs of Staff

JMSNS

Justification for Major System New Start

JROTC

Junior Reserve Officers' Training Corps

JRWG

Joint Requirements Working Group

J-SIDS

Joint-Service Interior Intrusion Detection System

JTAG

Joint Test Advisory Group

LAW

light antitank weapon

LCC

life cycle cost

LEA

law enforcement activity

LEC

law enforcement command

LIN

line item number

LOA

letter of agreement

LOI

Letter of Instruction

LR

letter requirement

LTC

lieutenant colonel

LTL

less than truckload

MAC

Military Airlift Command

MACOM

major Army command

MAJ

major

MATCU

military air traffic coordinating unit

MCA

major construction, Army

MEDCEN

U.S. Army Medical Center

MEDDAC

medical department activity

MEVA

mission essential or vulnerable area

MHE

materials handling equipment

MI

military intelligence

MILPO

military personnel office

MILSPEC

military specification

MILSTRIP

military standard requisitioning and issue procedures

MILVAN

military-owned demountable container

MIPR

military interdepartmental purchase request

MOS

military occupational specialty

MP

military police

MPA

military personnel, Army

MPI

Military Police Investigator

MSC

major subordinate command; Military Sealift Command

MSD

maximum stress diet

MSR

main supply route

MTOE/TDA

modified table of organization and equipment/table of distribution and allowances

MTMC

Military Traffic Management Command

MTX

Military Traffic Expediting Service

MUSAREC

major U.S. Army Reserve command

MWD

military working dog

NAF

non-appropriated fund

NATO

North Atlantic Treaty Organization

NBC

nuclear, biological, and chemical

NBS

National Bureau of Standards

NCDD

narcotics/contraband detector dog

NCEL

Naval Civil Engineering Laboratory

NCIC

National Crime Information Center

NCO

noncommissioned officer

NCOIC

noncommissioned officer in charge

NDA

National Defense Area

NDI

nondevelopmental item

NGR

National Guard regulation

NIS

Naval Investigative Service

NSN

national stock number

OACSI

Office of the Assistant Chief of Staff for Intelligence

OCE

Office of the Chief of Engineers

OCIE

organizational clothing and individual equipment

OCONUS

outside continental United States

OCPA

Office of the Chief of Public Affairs

ODCSLOG

Office of the Deputy Chief of Staff for Logistics

ODCSOPS

Office of the Deputy Chief of Staff for Operations

ODCSPER

Office of the Deputy Chief of Staff for Personnel

ODUSDP

Office of the Deputy Under Secretary of Defense for Policy

OJT

on-the-job training

OMA

Operation and Maintenance, Army

OMAR

Operation and Maintenance, Army Reserve

OPA

Other Procurement, Army

OPLAN

operation plan

OPM

Office of Personnel Management

OPSEC

operations security

OSD

Office of the Secretary of Defense

pam

pamphlet

PAO

public affairs officer

PAP

personnel assistance point

PARR

Program Analysis Resource Review

PCP

phencyclidine

PCS

permanent change of station

PDIP

Program Development Increment Package

PECIP

Productivity Enhancing Capitol Investment Program

PERSCOM

U.S. Total Army Personnel Command

PIF

productivity investment funding

PM

product manager; program manager; project manager; provost marshal

POC

point of contact

POD

port of debarkation

POE

port of embarkation

POL

petroleum, oils, and lubricants

POV

privately-owned vehicle

PPBES

Planning, Programming, Budgeting, and Execution System

PS

physical security

psi

pounds per square inch

PSC

physical security councils

PSE

physical security equipment

PSEAG

Physical Security Equipment Action Group

PSI

physical security inspector

PSS

Protective Security Service

PT

physical training

QPL

qualified products list

QRIP

Quick Return on Investment Program

RAM

reliability, availability, and maintainability

RAM-D

reliability, availability, maintainability, and durability

RC

Reserve component

RCS

reports control symbol

RDA

research, development, and acquisition

RDT&E

research, development, test, and evaluation

RDX

research department explosive

RESHIP

report of shipment

RF

radio frequency, response forces

RFP

request for proposal

ROC

required operational capability

ROTC

Reserve Officers' Training Corps

RSS

Rail Surveillance System

SCIF

sensitive compartmented information facilities

SECDEF

Secretary of Defense

SF

standard form

SFC

sergeant first class

SGA

standards of grade authorization

SJA

Staff Judge Advocate

SIR

serious incident report

SOFA

Status of Forces Agreement

SOP

standing operating procedure

SQT

skills qualification test

SRT

special reaction team

SSG

staff sergeant

SSN

social security number

SSS

Signature Security Service

SSSC

self-service supply center

TAADS

The Army Authorization Documents System

TAG

The Adjutant General

TASA

television audio support activity

TASC

training and audiovisual support center

TB

technical bulletin

TC

training circular

TCE

Technical Center of Expertise

TCP

traffic control point

TDA

tables of distribution and allowances

TDP

technical data package

TDY

temporary duty

THC

tetrahydrocannabinol

THREATCON

terrorist threat condition

TISA

Troop Issue Subsistence Activity

tl

truckload

TM

technical manual

TMDE

test, measurement, and diagnostic equipment

TMF

threat management force

TNT

trinitrotoluene

TOFC

trailer-on-flatcar

TOVEX

water gel (explosive)

TRADOC

U.S. Army Training and Doctrine Command

TSG

The Surgeon General

TSRWG

Tri-Service Requirements Working Group

TTS

technical training squadron

TTG

technical training group

TTW

technical training wing

UCMJ

Uniform Code of Military Justice

UL

Underwriter Laboratories

USACE

U.S. Army Corps of Engineering

USACIDC

United States Army Criminal Investigation Command

USAF

United States Air Force

USAISC

U.S. Army Information Systems Command

USAMPS

U.S. Army Military Police School

USAR

U.S. Army Reserve

USAREUR

U.S. Army, Europe, and Seventh Army

USC

United States Code

USMA

United States Military Academy

USS

United States standard

WSM-PSE

Weapons Systems Manager-Physical Security Equipment

WSN

weapon serial number

WTCA

Water Terminal Clearance Authority

Section II**Terms****Access (when pertaining to a restricted area or CCI)**

Personnel movement within a restricted area that allows the chance for visual observation of, or physical proximity to, either classified or protected materiel. It is also the ability and opportunity to obtain detailed knowledge of CCI through uncontrolled physical possession. External viewing or escorted proximity to CCI does not constitute access.

Aggressor

Any person seeking to compromise an asset. Aggressor categories include criminals, terrorists and protestors.

Ammunition

A device charged with explosives, propellants, pyrotechnics, initiating composition, riot control agents, chemical herbicides, smoke and flame, for use in connection with defense or offense, including demolition. Excluded from this definition are devices charged with chemical agents defined in JCS Pub. 1 and nuclear or biological materiel. Ammunition includes cartridges, projectiles, including missile rounds, grenades, mines, and pyrotechnics together with bullets, shot and their necessary primers, propellants, fuses, and detonators individually or having a unit of issue, container, or package weight of 100 pounds or less. Blank, inert training ammunition and caliber .22 ammunition are excluded.

Antiterrorism

Defensive measure used to reduce the vulnerability of individuals and property to terrorist acts, to include limited response and containment by military forces.

Armed Guard Surveillance

A service that provides armed guards to maintain constant and specific surveillance of shipments for which the service is requested. "Armed" is defined as having a firearm and appropriate ammunition readily available for immediate use. (DOD 5100.76-M)

Arms

A weapon included in AR 190-11, appendix A, that will or is designated to expel a projectile or flame by the action of the explosive, and the frame or receiver of any such weapon.

Asset

Any resource requiring protection.

Aviation Facility

A department of the Army activity or area collocated with facilities for the takeoff and landing of aircraft. The facility has the mission of command and control of administrative, operational, training, and/or logistical support of Army aviation.

Badge

A security credential that is worn on the possessor's outer garment and validates (his or her) authority for access to a restricted area.

Bulk Storage

Storage in a facility above the using or dispensing level specifically applicable to logistics warehouse and depot stocks. This applies to activities using controlled medical substances and items (such as pharmacies, wards, or clinics) only when a separate facility (building or room) is used to store quantities that exceed normal operating stocks.

Cable Seal Lock

A seal in which the cable is passed through the locking hardware of a truck trailer or railcar door and the bullet nose is inserted into the barrel and the end of the cable until securely anchored. Once locked any force exerted to separate the lockpoint from the lockbody will strengthen its connection. (DOD 5100.76-M)

Carrier Custodian

An employee who has been assigned responsibility for controlled shipments containing SECRET material by the carrier and who has been issued a personnel security clearance by the Government. (DOD 5100.76-M)

Certification

The process whereby a patrol or detector dog's and handler's proficiency is verified to be in compliance with minimum training standards.

Chains

Chains used to secure racks or containers will be of heavy-duty, hardened steel chain, welded, straight-link steel. The steel will be galvanized of at least 5/16-inch thickness or of equal resistance required to force, to cut, or break an approved low security padlock. An example of such a chain is Type 1, Grade C, Class 4 NSN 4010-0-149-5583, NSN 4010-00-149-5575, or NSN 4010-00-171-4427.

Closed Circuit Television

Television that serves a number of different functions, one of which is physical security. As it pertains to the field of physical security, CCTV is used to augment, not replace, existing intrusion detection systems (IDS) or security patrols. It is not used as a primary sensor, but rather as a means of assessing alarms. CCTV also may be used as a surveillance means, but if used in this way, it will augment, not replace, existing IDS.

Closed post

An army installation or activity to which ground and water access is controlled at all times by perimeter barriers with limited, manned entry control points.

Closed vehicle or equipment

A conveyance that is fully enclosed with permanent sides and a permanent top, with installed doors that can be locked and sealed. (DOD 5100.76-M)

Combatting Terrorism

Actions, including AT and CT, taken to oppose terrorism throughout the entire threat spectrum.

Commercial-type vehicle

A vehicle designed to meet civilian requirements, and used without major modifications, for routine purposes in connection with the transportation of supplies, personnel, or equipment.

Constant Surveillance Service

A service that is an integral part of the provisions of 49 CFR 397 (reference (b)) that a carrier must apply when transporting hazardous or Class A and B explosive materials. It provides constant surveillance over a shipment. The transporting conveyance containing the shipment must be attended at all times by a qualified representative of the carrier. A motor vehicle is "attended" when the person in charge of the vehicle is awake and not in a sleeper berth and

is within 100 feet of the vehicle, provided the vehicle is within the person's obstructed field of vision. The qualified representative "attending" the vehicle must:

- a. Be aware of the nature of the material contained in the vehicle.
- b. Have been instructed on procedures to follow in case of emergency.
- c. Be authorized to move the vehicle and have the means and capability to do so.

Note. CSS does not include a signature and tally service as provided under Signature Security Service (SSS). (DOD 5100.76-M)

Container Express

A reusable container for shipment of troop support cargo, quasi-military cargo, household goods, and personal baggage.

Containerization

A box or other device in which a number of packages are stored, protected, and handled as a unit in transit; for example, CONEX, MILVAN, and SEAVAN. This term also refers to the shipping system based on large cargo-carrying containers that can be easily interchanged between trucks, trains, and ships, without rehandling of contents. (DOD 5100.76-M)

Container on a flat car

A large box-like demountable body without undercarriage used to transport cargo that is mounted on a railroad flat car. (DOD 5100.76-M)

Constant Surveillance

Observing or protecting a storage facility containing AA&E by a human, intrusion detection system, closed circuit television, or combination, to prevent unobserved access, or make known any unauthorized access to the protected facility.

Continuous Surveillance

Constant unobstructed observance of items or an area to prevent unauthorized access. Continuous surveillance may be maintained by dedicated guards, other on-duty personnel, or intrusion detection systems and those enhanced by closed-circuit television.

Controlled Area

See restricted area.

Controlled cryptographic item

A secure telecommunications or information handling equipment ancillary device, or associated cryptographic component, which is unclassified but is controlled.

Controlled medical substance

A drug or other substance, or its immediate precursor, listed in current schedules of 21 USC 812 in medical facilities for the purpose of military treatment, therapy, or research. Categories listed in this section are narcotics, amphetamines, barbiturates, and hallucinogens.

Counterterrorism

Offensive measures taken to prevent, deter, and respond to terrorism.

Crime analysis

The process used to determine the essential features of a criminal act. It is a mandatory part of any crime prevention program.

Crime prevention

The anticipation, recognition, and appraisal of a crime risk, and initiation of some action to remove or reduce it. Crime prevention is a direct crime control method that applies to before-the-fact efforts to reduce criminal opportunity, protect potential human victims, and prevent property loss.

Crime prevention inspection

An on-site evaluation of the crime prevention program of a unit, section, office, or other facility.

Crime risk management

The development of systematic approaches to reduce crime risks.

Crisis management team

A team found at a major command or installation level. A crisis management team is concerned with plan, procedures, techniques, policies, and controls for dealing with terrorism, special threats, or other major disruptions occurring on Government installations and facilities. A crisis management team considers all aspects of the incident and establishes contact with the AOC.

Critical communications facility

A communications facility that is essential to the continuity of operations of the National Command Authority during the initial phases of national emergencies, and other nodal points or elements designated as crucial to mission accomplishment.

Cryptographic component

The embodiment of a cryptographic logic in either hardware or firmware form, such as a modular assembly, a printed circuit board, a microcircuit, or any combination of these.

Cryptographic equipment

Any equipment employing a cryptographic logic.

Cryptographic logic

A deterministic logic by which information may be converted to an unintelligible form and reconverted to an intelligible form. Logic may take the form of engineering drawings, schematics, hardware, or firmware circuitry.

Day gate

Any barriers, used in a doorway or entrance to pharmacy or medically sensitive item storage areas, that prevents unauthorized personnel access during operating hours. Such barriers normally are not the sole protection afforded the entrance during nonoperating hours; however, during operating hours, the barrier ensures positive entry control by on-duty personnel (for example, electronic buzzer control entry to the area after positive identification by receptionist or on-duty personnel).

Dedicated guards

Individuals charged with performing the primary task of safeguarding designated facilities, material, and personnel within a defined area during a tour of duty. A dedicated guard may perform this function as a static post. He or she remains within or on the perimeter of a protected area and maintains continuous surveillance over that which is being protected during the tour of duty.

Defense Transportation System

Consists of military controlled terminal facilities, Military Airlift Command (MAC) controlled airlift, Military Sealift Command (MSC) controlled or arranged sealift, and Government controlled air or land transportation. (DOD 5100.76-M)

Demilitarization

The act of destroying the offensive or defensive characteristics inherent in certain types of equipment and materiel. The term comprehends mutilation, scrapping, burning, or alteration designed so as to prevent the further use of such equipment and materiel for its originally intended military or lethal purpose.

Double-locked container

A steel container of not less than 26 gauge which is secured by an approved locking device and which encases an inner container that also is equipped with an approved locking device. Cabinet, medicine, combination with narcotic locker, NSN 6530-00-702-9240, or equivalent, meets requirements for a double-locked container.

Dromedary

A freight box carried on and securely fastened to the chassis of the tractor or on a flat-bed trailer. The dromedary is demountable by the use of a forklift truck, is protected by a plymetal shield, and is equipped with doors on each side that may be locked with seals or padlocks. All explosive items carried in the dromedary must be compatible and in compliance with 49 CFR 177 (ref (c)) or host nation regulations. (DOD 5100.76-M)

Dual Driver Protective Service

A service requiring SSS plus continuous attendance and surveillance of the shipment through the use of two drivers.

- a. The vehicle containing the shipment must be attended at all times by one of the drivers. A vehicle is attended

when at least one of the drivers is in the cab of the vehicle, awake, and not in a sleeper berth or is within 10 feet of the vehicle.

b. SSS signature and tally requirements are not required between the same pair of drivers for a particular movement. (DOD 5100.76–M)

Duress alarm system

A method by which authorized personnel can covertly communicate a situation of duress to a security control center or to other personnel in a position to notify a security control center. (DOD 5100.76–M)

Duress or holdup alarms

Devices which allow personnel on duty to transmit a signal to the alarm monitoring station from which an armed response force can be dispatched if a holdup or a duress situation occurs.

Emergency Aircraft

An aircraft designated by the commander to respond to emergency situations and provide life-saving and property-saving services. Normally, such aircraft has special equipment and markings. Air Ambulances and firefighting aircraft are examples.

Emergency vehicle

A vehicle designated by the commander to respond to emergency situations and provide life-saving and property-saving services. Normally, the vehicle has special equipment and markings. Ambulances and firefighting and military or security police vehicles are examples.

Enclosed vehicle or equipment

A conveyance that is fully enclosed with permanent sides and permanent top, with installed doors that can be locked and sealed.

Entry control (when pertaining to a restricted area)

Security actions, procedures, equipment, and techniques, employed within restricted areas to ensure that persons who are present in the areas at any time have authority and official reason for being there.

Escorted personnel (when pertaining to a restricted area)

Those persons authorized access to a restricted areas who are escorted at all times by a designated person.

Escorts and couriers

Military members, U.S. civilian employees, or DOD contractor employees responsible for the continuous surveillance and control over movements of classified material. Individuals designated as escorts and couriers must possess a Government-issued security clearance at least equal to that of the material being transported.

Exception

An approved permanent exclusion from specific requirements of this regulation. Exceptions will be based on a case-by-case determination and involve unique circumstances which make conformance to security standards impossible or highly impractical. An exception can also be an approved permanent deviation from the provisions of this regulation. There are two types of exceptions:

a. Compensatory Measures Exception. This is a deviation in which the standards are not being met, but the DOD component (HQDA(DAMO–ODL–S) concerned determines it is appropriate, because of physical factors and operational requirements. Compensatory measures are normally required.

b. Equivalent Protection Exception. This is a deviation in which nonstandard conditions exist, but the totality of protection afforded is equivalent to or better than that provided under standard criteria.

Exclusion area

See restricted area.

Exclusive use

A conveyance unit or vehicle that is used only for a shipment from origin to destination without transfer of lading, and that permits locking of the unit and use of seals. (DOD 5100.76–M)

Explosives

Any chemical compound, mixture or device, the primary or common purpose of which is to function by explosion. The term includes, but is not limited to, individual land mines, demolition charges, blocks of explosives (dynamite,

trinitrotoluene (TNT), C-4, and other high explosives), and other explosives consisting of 10 pounds or more; for example, gunpowder or nitroguanidine.

Facility

Any single building, project, or site.

Force Protection

Security program developed to protect soldiers, civilian employees and family members, facilities and equipment, in all locations and situations. This is accomplished through the planned integration of combatting terrorism, physical security, operations security, protective services and law enforcement operations, all supported by foreign intelligence, counterintelligence and other security programs.

Greater security (GS)

A seal tracing and inspection rail service for unclassified sensitive cargo that includes a military traffic expending (MTX) service and provides:

- a. Inspection of railcars at major terminals by railroad personnel for evidence of forced entry or tampering with seals or security devices.
- b. Name of carrier reporting.
- c. Time of inspection; that is, a.m. or p.m.
- d. Actual arrival and actual departure time from inspection terminal. (DOD 5100.76-M)

Handler

A military police person or DOD civilian guard or police person who has been qualified by training and certification to care for, train, and employ a military working dog.

Handling

Controlled physical possession without access.

High risk personnel

Personnel who, by their grade, assignment, value, location, or specific threat, are more likely to be attractive or accessible terrorist targets.

Independent power source

A power source, normally battery, independent of any other source (DOD 5100.76-M)

Industrial and utility equipment

Equipment used in the manufacture or in support of the manufacture of goods and equipment used to support the operation of utilities such as power and water distribution and treatment.

In flight

The condition of an aircraft from the moment when all external doors are closed following embarkation until the moment when one such door is opened for disembarkation.

Installations

Such real properties as reserve centers, depots, arsenals, ammunition plants (both contractor- and Government-operated, hospitals, terminals, and other special mission facilities, as well as those used primarily by troops. (See also JCS Pub. 1)

Internal controls (when pertaining to a restricted area)

Security actions, procedures, and techniques employed within restricted areas to ensure persons who are present in these areas at any time have authority and official reason.

Intrusion detection system

The combination of electronic components, including sensors, control units, transmission lines, and monitoring units integrated to be capable of detecting one or more types of intrusion into the area protected by the system and reporting directly to an alarm monitoring station. The IDS will be an approved DOD standardized system, such as the Joint Service Interior Intrusion Detection System or MACOM-approved commercial equipment.

Justification for Major System New Start

A requirement document that the combat developer prepares with the material developer, training developer, manpower

and personnel planner, and logistician. A JMSNS is prepared to describe the mission need and justifies the acquisition of a major new system at program initiation in the acquisition cycle.

Kennel facilities

The buildings, the kennels, the runs, and the exercise and training areas which are used to house, care for, and train military working dogs.

Key and lock control system

A system of identifying both locks and their locations and personnel in possession of keys and/or combinations.

Keying

The process of establishing a sequence of random binary digits used to initially set up and periodically change permutations in cryptographic equipment for purpose of encrypting or decrypting electronic signals, for controlling transmission security processes, or for producing other keys.

King Tut block

A King Tut block is a specially designed large concrete block. It is placed in front of an igloo or magazine entrance with a fork lift. Access to the igloo or magazine therefore requires a fork lift to move the block. The King Tut block is of sufficient weight to prevent removal without a fork lift.

Letter of agreement

A document jointly prepared and signed by the combat and materiel developers when a potential materiel system need has been identified and it has been determined that one or more technological approaches may satisfy the need. Even though it may be in an early stage of development, the LOA will address the materiel system from the Total System Management standpoint. The LOA describes operational, technical, training, personnel, and logistical system unique events that must be undertaken to produce the total system.

Letter requirement

An abbreviated procedure for acquisition of low-unit cost, low-risk developmental, or commercial items. It will be used instead of the ROC when applicable. The total system definitive requirements for training, personnel, and logistics requirements are the same for the LR as for the ROC. The LR is jointly prepared by TRADOC and AMC.

Lightweight construction

Building construction other than reinforced concrete or masonry (concrete block or clay brick) such as wood or metal siding.

Limited access post

An Army installation or activity that meets one of the criteria below:

- a.* No permanent fences or other physical barriers exist, but entry can be temporarily closed to vehicular traffic and other movements using roads and other conventional points of entry.
- b.* Permanent perimeter barriers exist and access is controlled only after normal duty hours; for example, gates are secured or manned with guards after dark.
- c.* No permanent perimeter barriers exist, but vehicular traffic and other movements using roads and other conventional points of entry are continuously controlled.

Limited area

See restricted area.

Locked container

A container or room of substantial construction secured with an approved locking device. For pharmacy operating stocks, lockable automated counting systems meet requirements for a locked container.

Locking devices

- a.* Padlocks, military specifications MIL-P-43607 (High Security Padlock); shrouded shackle, NSN

5340-01-217-5068 or horizontal sliding bolt, NSN 5340-00-799-8248) or MIL-P-43951 (medium security padlock; regular shackle, NSN 5340-00-799-8016).

b. Padlocks, Commercial Item Description A-A-1927 (low security padlock) having a hardened steel shackle and body; NSN 5340-00-158-3807 (with chain), NSN 5340-00-158-3805 (without chain).

c. GSA-approved changeable three-position padlock, Federal Specification FF-P-110.

d. High security hasps. Military Specifications MIL-H-43905 or MIL-H-29181A.

e. Hasps and staples for low-security padlocks which are of heavy pattern steel, securely fastened to the structure with smooth-headed bolts, rivets, or welding to prevent removal.

Locks

Locks should be considered as delay devices only, not as positive bars to unauthorized entry, since any lock can be defeated by expert manipulation or force.

a. Padlocks

High security padlocks: Military Specification MIL-P-43607, shrouded shackle with clevis and chain, NSN 5340-01-217-5068 or NSN 5340-00-188-1560; horizontal sliding bolt with clevis and chain, NSN 5340-00-799-8248.

Medium security padlocks: Military Specification MIL-P-43951, open shackle with clevis and chain, NSN 5340-00-799-8016. Authorized for continued use to secure Categories III and IV AA&E only until stocks are depleted or replaced.

Low security padlocks: Commercial Item Description A-A-1927, hardened steel shackle and case, without chain: NSN 5340-00-158-3805; with chain: NSN 5340-00-158-3807.

(Any questions regarding the above specifications will be addressed to the DOD Lock Program Technical Manager, Naval Facilities Engineering Service Center, Code C66, 560 Center Drive, Port Hueneme, CA 93043-4328 (DSN 551-1567 or -1212).

b. Certain locks, such as high or medium security padlocks, provide excellent protection when used in conjunction with a high security hasp. Hasps installed for protection of AA&E will provide protection comparable to that given by the lock used. Determination of "comparable protection" will be addressed to the DOD Lock Program Technical Manager, Naval Civil Engineering Laboratory, Code L56, 560 Center Drive, Port Hueneme, CA 93043-4328 (DSN 551-1567 or -1212).

NAPEC high security shrouded hasp (MIL-H-29181A) is approved for use with the high security padlock to secure all categories of AA&E. The hasp has a cover that protects the lock from cutting or hammer tools and inclement weather. It should be used to secure Category I and II AA&E storage facilities. When replacement of a hasp on Category III, IV or uncategorized AA&E is necessary, this hasp should also be used. The Natick high security hasp (MIL-H-43905) is a high security hasp that also is approved for protection of Category III and IV AA&E when used with an approved high security padlock.

Hasp, pin-type, locking "T" is a hasp that was authorized previously to secure ammunition storage magazines. Magazines were secured using the installed locking bar in conjunction with a "T" pin and high security padlock. The locking "T" hasp does not provide adequate security for sensitive AA&E. It must be replaced with a high security hasp to enhance security. It will not be used to secure Category I and II ammunition storage facilities.

c. Another lock is the cable seal lock. Once locked, any force exerted to separate the lockpoint from the lockbody strengthens the connection. Such locks are not approved for use in securing storage facilities containing AA&E. The same restriction applies to d below.

d. A complementary device to locks is the No. 5 American Wire Gauge wire twist. This is a U-shaped wire place in the hasp along with the shackle and twisted tightly in place. Another device is a wire cable of a thickness equivalent to or larger than No. 5 wire. This is placed through the hasp, a metal sleeve slipped over it, and crimped into place.

e. Built-in combination locks, meeting Underwriters Laboratories Standard 768, Group 1 (NSN 5340-01-375-7593) are approved for use on GSA-approved Class 5 vault doors and GSA-approved Class 5 weapons containers storing unclassified material and unclassified AA&E.

LOGAIR

Long-term contract airlift service within the continental United States for the movement of cargo in support of the logistics system of the Military Services (primarily the Army and Air Force) and Defense Agencies. (DOD 5100.76-M)

Major disruption on installations

Acts. Threats, or attempts to commit such acts as kidnapping, extortion, bombings, hijackings, ambushing, major weapons thefts, arson, assassination, and hostage taking on a military installation. These acts that have potential for widespread publicity require special response, tactics, and management.

Medically sensitive items

Standard and nonstandard medical items designated by medical commanders to be sufficiently sensitive to warrant a

stringent degree of physical security and accountability in storage. Included within this definition are all items subject to misappropriation and/or misuse such as needles and syringes.

Military Traffic Expediting (MTX) Service

A service providing for movement from origin to destination in the shortest time possible for specifically identified rail shipments, and which is required for the shipment of firearms and other sensitive shipments. This service uses electrical communications between members of the Association of American Railroads, is available for either single line haul or jointline movements, and provides progress reports as required. (DOD 5100.76-M)

Military van (MILVAN)

Military-owned demountable container, conforming to U.S. and international standards, operated in a centrally controlled fleet for movement of military cargo. (DOD 5100.76-M)

Military working dog

Dogs required by the using DOD component for a specific purpose, mission, or combat capability. MWDs include patrol, patrol and narcotic/contraband, and patrol and explosive detector dogs.

Military working dog team

The MWD and its appropriately qualified, assigned handler.

Mission-critical personnel

Personnel who are essential to the operation of an organization of function.

Mission essential and vulnerable areas

Facilities or activities within the installation that, by virtue of their function, are evaluated by the commander as vital to the successful accomplishment of the installation's State National Guard, or MUSARC mission. This includes areas nonessential to the installation's/facility's operational mission but which, by nature of the activity, are considered vulnerable to theft, trespass, damage, or other criminal activity.

Motor pool

A group of motor vehicles used as needed by different organizations or individuals and parked in a common location when not in use. On an Army installation, a nontenant Army activity with 10 or less assigned commercial-type vehicles but no local organizational maintenance support does not have a motor pool, under this regulation, even though the vehicles are parked together.

Motor vehicle

A self-propelled, boosted, or towed conveyance used to transport a burden on land. This includes all Army wheeled and track vehicles, trailers, and semitrailers, but not railroad locomotives and rolling stock.

National Defense Area

An area set up on non-Federal lands located within the United States, its possessions or territories, to safeguard classified defense information or DOD equipment or materiel. Establishment of a National Defense Area temporarily places such non-Federal lands under the effective control of DOD and results only from an emergency event.

Negotiations

A dialogue between authorities and offenders which has as the ultimate goal for the safe release of hostages and the surrender of the offenders.

Note C controlled medical items

Sets, kits, and outfits containing one or more component Note Q or Note R items.

Note Q controlled medical items

All standard drug items identified as Note Q in the Federal Supply Catalog, Nonstandard Drug Enforcement Administration (DEA) Schedule III, IV, V Controlled Substances.

Note R controlled medical items

All items identified as Note R in the Federal Supply Catalog, Nonstandard DEA Schedule II Controlled Substances.

One dog-one handler

The concept that each MWD will have only one handler. Personnel shortages may necessitate assigning a handler responsibility for more than one dog. However, two or more handlers cannot handle the same dog.

Open post

Installations or activities that do not qualify as closed or limited access posts. Access to the installation or activity is not controlled during or after normal duty hours.

Perimeter fence

Fences for the security of unclassified, non-sensitive items that meet the requirements of U.S. Army Corps of Engineers Drawing Code STD 872-90-00 Series. The minimum height will be 6 feet. Use of NATO Standard Design Fencing is also authorized.

Perimeter wall

Any wall over 6 feet tall which delineates a boundary and serves as a barrier to personnel and/or vehicles. These walls may be constructed of reinforced concrete, masonry, or stone.

Physical protective measures

Physical security measures used to counter risk factors that usually do not change over a period of time such as mission impact, cost, volume, and criticality of resources and vulnerabilities. The measures are usually permanent and involve expenditure of funds.

Physical security

That part of the Army security system, based on threat analysis, concerned with procedures and physical measures designed to safeguard personnel, property, and operations; to prevent unauthorized access to equipment, facilities, materiel, and information; and to protect against espionage, terrorism, sabotage, damage, misuse, and theft. Operations security (OPSEC) and security targeted against traditional criminal activity are included.

a. Physical security procedures include, but are not limited to, the application of physical measures to reduce vulnerability to the threat; integration of physical security into contingency, mobilization, and wartime plans; the testing of physical security procedures and measures during the exercise of these plans; the interface of installation OPSEC, crime prevention and physical security programs to protect against the traditional criminal; training of guards at sensitive or other storage sites in tactical defense against and response to attempted penetrations; and creating physical security awareness.

b. Physical security measures are physical systems, devices, personnel, animals, and procedures employed to protect security interests from possible threats and include, but are not limited to, security guards; military working dogs; lights and physical barriers; explosives and bomb detection equipment; protective vests and similar equipment; badging systems; electronic entry control systems and access control devices; security containers; locking devices; electronic intrusion detection systems; standardized command, control, and display subsystems; radio frequency data links used for physical security; security lighting; delay devices; artificial intelligence (robotics); and assessment and/or surveillance systems to include closed-circuit television. Depending on the circumstances of the particular situation, security specialists may have an interest in other items of equipment such as armored sedans.

Physical security equipment

A generic term for any item, device, or system that is used primarily to protect Government property, including nuclear, chemical, and other munitions, personnel, and installations, and to safeguard national security information and material, including the destruction of such information and material both by routine means and by emergency destruct measures.

a. Interior physical security equipment. Physical security equipment used internal to a structure to make that structure a secure area. Within DOD, DA is the proponent for those functions associated with development of interior physical security systems.

b. Exterior physical security equipment. Physical security equipment used external to a structure to make the structure a secure area. Within DOD, the Department of the Air Force is the proponent for those functions associated with the development of external physical security systems; however, the Army will develop lights, barriers, and robotics.

c. Intrusion detection system. See previous definition.

Physical security inspection

A formal, recorded assessment of physical procedures and measures implemented by a unit or activity to protect its assets.

Physical security measures

See physical security.

Physical security plan

A comprehensive written plan providing proper and economical use of personnel, land, and equipment to prevent or minimize loss or damage from theft, misuse, espionage, sabotage, and other criminal or disruptive activities.

Physical security procedures

See physical security.

Physical security program

The interrelationship of various components that complement each other to produce a comprehensive approach to security matters. These components include, as a minimum, the physical security plan; physical security inspections and surveys; participation in combatting terrorism committees and fusion cells; and a continuing assessment of the installation's physical security posture.

Physical security resource plan

Plan developed by the physical security officer that identifies physical security needs, and shows proposed programmed procurement of those needs.

Physical security survey

A formal, recorded assessment of the installation physical security program.

Physical security system architecture

A system ensuring that IDS components designed by the various services are compatible when used together. The Air Force is responsible for systems architecture.

Pier service

Ocean carrier booking is restricted over ocean movement from port of embarkation (POE) to port of debarkation (POD). It precludes prearranged-through-booking employing surface transportation to inland destinations. (DOD 5100.76-M)

Pilferable assets

Any asset which can be stolen and which does not fall under the other asset categories discussed in this publication.

Pilferage-coded items

Items with a code indicating that the material has a ready resale value or civilian application and, therefore, is especially subject to theft.

Portable

Capable of being carried in the hand or on the person. As a general rule, a single item weighing less than 100 pounds (45.34 kilograms) is considered portable.

Primary electrical power source

That source of power, either external (commercial) or internal, that provides power to site facilities on a daily basis. (DOD 5100.76-M)

Protection in depth

A system providing several supplementary security barriers. For example, a perimeter fence, a secure building, a vault, and a locked container provide four layers of protection. (DOD 5100.76-M)

Protective layer

Any envelope of building components which surrounds an asset and delays or prevents aggressor movement toward the asset or which shields the asset from weapons and explosives effects.

Protective Security Service

A service to protect shipments. PSS involves a transporting carrier that must be a "cleared carrier" under provisions of DOD 5220.22-R, paragraph 1-702.a (ref (d)). A shipment must be under the constant surveillance of designated carrier employees, unless it is stored in containers or an area approved by the cognizant Defense Investigative Service regional

office. The designated carrier employees providing constant surveillance when PSS is required must possess a Government-issued SECRET clearance and a carrier-issued identification. (DOD 5100.76–M)

QUICKTRANS

Long-term contract airlift service within the continental United States (CONUS) for the movement of cargo in support of the logistic system for the Military Services (primarily the Navy and Marine Corps) and Defense agencies. (DOD 5100.76–M)

Rail Surveillance Service

An inspection service of rail shipments. An inspection is made within one hour after each stop, if the trailer containing a shipment remains at a halt. Reinspection is made a minimum of once each hour, as long as the railcar containing the shipment remains at a halt. (DOD 5100.76–M)

Report of Shipment

An advanced report furnished by message or telephone immediately upon dispatch of a shipment within CONUS for domestic shipments. A report goes to both Water Terminal Clearance Authority (WTCA) and the water port transshipping facility for surface export shipments, or to the Military Air Traffic Coordinating Officer (MATCO) for air export shipments. The advance notice of shipments shall include the following applicable data:

a. For domestic shipments, see AR 55–355/NAVSUPINST 4600.70/AFM 75–2/MCO P4600.14A/DLAR 4500.3, Routing Instruction Note (RIN) 146, Appendix L (reference (e)).

b. For export shipments, see chapter 4, DOD 4500.32–R (reference (f)). (DOD 5100.76–M)

Required operational capability

A requirements document that the combat developer prepares with input from the training developer in coordination with the material developer, logistician, and manpower and personnel planner. The ROC is a concise statement of the minimum essential operational, RAM, technical, personnel and manpower, training, safety, health, human factors engineering, logistical, and cost information to start full scale development or procurement of a material system.

Restricted area

Any area to which entry is subject to special restrictions or control for security reasons or to safeguard property or material. This does not include those designated areas over which aircraft flight is restricted. Restricted areas may be of different types. The type depends on the nature and varying degree of importance, from a security standpoint, of the security interest or other matter contained therein.

a. *Exclusion area.* A restricted area containing—

(1) A security interest or other matter of such nature that access to the area constitutes, for all practical purposes, access to such security interests or matter; or—

(2) A security interest or other matter of such vital importance that proximity resulting from access to the area is treated equal to (1) above.

b. *Limited area.* A restricted area containing a security interest or other matter, in which uncontrolled movement will permit access to such security interest or matter; access within limited areas may be prevented by escort and other internal restrictions and controls.

c. *Controlled area.* That portion of a restricted area usually near or surrounding an exclusion or limited area. Entry to the controlled area is restricted to authorized personnel. However, movement of authorized personnel within this area is not necessarily controlled. Mere entry to the area does not provide access to the security interest or other matter within the exclusion or limited area. The controlled area is provided for administrative control, safety, or as a buffer zone for security in depth for the exclusion or limited area. The proper commander establishes the degree of control of movement.

Ride awhile-walk awhile method

A law enforcement or security patrolling technique. The MWD team patrols for a period of time in a vehicle and then dismounts for an appropriate period of time to patrol an area on foot. This method increases the potential area the team can cover, as well as allowing the team to concentrate their foot patrols in especially critical areas.

Risk

The degree or likelihood of loss of an asset. Factors that determine risk are the value of the asset to its user in terms of mission criticality, replaceability, and relative value and the likelihood of aggressor activity in terms of the attractiveness of the asset to the aggressor, the history of or potential for aggressor activity, and the vulnerability of the asset.

Risk analysis

Method of examining various risk factors to determine the risk value of likelihood of resource loss. This analysis will be used to decide the level of security warranted for protection of resources.

Risk factors

Elements that make up the total degree of resource loss liability. Factors to be considered in a risk analysis include the importance of the resource to mission accomplishment; the cost, volume, criticality and vulnerabilities of the resources; and the severity of threats to the resources.

Risk level

An indication of the degree of risk associated with an asset based on risk analysis. Risk levels may be Levels I, II, or III, which correspond to low, medium, and high.

Risk value

Degree of expectation or likelihood of resource loss. The value may be classified as low, medium, or high.

Safe

A GSA Class 5 Map and Plans Security Container, Class 6 Security Filing Cabinet or refrigerator or freezer, secured with an approved locking device and weighing 500 pounds or more, or secured to the structure to prevent removal.

Schedule I drug

Any drug or substance by whatever official name (common, usual, or brand name) listed by the DEA in Title 21 of the Code of Federal Regulations, chapter II, Section 308.11, intended for clinical or non-clinical use. A list of Schedule I drugs and substances is contained in AR 40-7, appendix A.

Seal

A device to show whether the integrity of a shipment has been compromised. Seals are numbered serially, are tamperproof, and shall be safeguarded while in storage. The serial number of a seal shall be shown on Government Bills of Lading (GBL). A cable seal lock provides both a seal and locking device.

Sealed containers

Wooden boxes, crates, metal containers, and fiber containers sealed in a way to show when the containers are tampered with after sealing. The method of sealing depends of the type of construction of the containers. Sealing may be by metal banding, nailing, airtight sealing, or wax dripping (for fiber containers). In key control, a sealed container is also a locked key container or a sealed envelope containing the key or combination to the key container.

Sealed protection

A container or an area enclosed by a plastic or soft metal device which is opened easily without the use of a key or combination.

SEAVAN

A commercial, Government-owned or leased shipping container and without bogey wheels attached that is moved by ocean transportation and must be lifted on and off the ship. (DOD 5100.76-M)

Security card

An official distinctive identification (pass or card) that identifies and authorizes the possessor to be physically present in a U.S. Army designated restricted area.

Security engineering

The application of engineering principles to the protection of assets against various threats through the application of construction and equipment application.

Security lighting

The amount of lighting necessary to permit visual surveillance by security police or by supervisory personnel.

Security procedural measures

Physical security measures to counter risk factors that will periodically change over a period of time such as criminal, terrorist, and hostile threats. The procedures can usually be changed within a short amount of time and involve manpower.

Sensitive conventional arms, ammunition, and explosives

See categorization of such items in appendix A, AR 190–11.

Sensitive items

Material requiring a high degree of protection to prevent unauthorized acquisition. This includes arms, ammunition, explosives, drugs, precious metals, or other substances determined by the Administrator, Drug Enforcement Administration to be designated Schedule Symbol II, III, IV, or V under the Controlled Substance Act of 1970.

Signal intelligence

Intelligence derived from communications means (such as telephone, telegraph, radio), electronic signal emitters (such as navigation radar, identification friend or foe, and weapons guidance devices) and instrumentation signals (such as telemetry and beaconry).

Signature Security Service

A service designed to provide continuous responsibility for the custody of shipments in transit. A signature and tally record is required from each person responsible for the proper handling of the shipment at specified stages of its transit from origin to destination.

a. The initial signature on the signature and tally record should be the same as that of the carrier's agent on the GBL. When SSS is used in conjunction with DDPS, both drivers in each pair of drivers shall sign the signature and tally record when that pair assumes responsibility for the shipment.

b. Commercial carriers offering SSS must be able to trace a shipment in less than 24 hours. The following forms shall be used to obtain SSS:

(1) *Surface shipments.* DD Form 1907 (Signature and Tally Record) shall accompany every surface shipment of classified or protected material accorded a signature and tally service by surface commercial carriers. Carrier tariffs and tenders may describe this type of service under different titles for example, Hand-to-Hand Signature Service or Signature Service.

(2) *Commercial air shipments.* The air industry internal Form AC–10 (Airlines Signature Service Record) shall be used by regulated and nonscheduled airlines to obtain the signature and tally record. Air taxi operators and air freight forwarders providing SSS may use DD Form 1907 instead of AC–10. No receipt is required from the flight crew or attendants while the aircraft is in flight. A signature and tally record is required; however, from air carrier personnel whenever the aircraft is on the ground and access to the cargo compartment containing the sensitive arms, ammunition, and explosives (AA&E) is available for any purpose. A signature and tally record is also required from pickup and delivery carriers used by the airlines for such purposes.

(3) *Military air shipments.* The AF Form 127 (Traffic Transfer Receipt) or similar document, will be used to provide hand-to-hand receipt control for sensitive and classified shipments being transferred in the DTS. (DOD 5100.76–M)

Steel bar

A flat bar, 3/8 inch by one inch minimum; or round bar 1/2 inch diameter minimum.

Steel mesh

High carbon, manganese steel not less than 15/100 inch (8-gauge) in thickness, and a grid of not more than two inches center to center.

Storage

Any area where AA&E are kept. Storage does not include items in process of manufacture, in use, or being transported to a place of storage or use.

Survivability

The ability to withstand or repel an attack, or other hostile action, to the extent that essential functions can continue or be resumed after the hostile action.

Tactics

The specific methods of achieving the aggressor's goals to injure personnel, destroy Army assets, or steal Army materiel.

Tactical vehicle

A vehicle with military characteristics designed primarily for use by forces in the field in direct connection with, or support of, combat or tactical operations, or the training of troops for such operations.

Tenant activity

A unit or activity of one Government agency, military department, or command that occupies facilities on an installation of another military department or command and that receives supplies or other support services from that installation.

Terrorism

The calculated use of violence or the threat of violence to inculcate fear; intended to coerce or to intimidate governments or societies in the pursuit of goals, that are generally political, religious, or ideological.

Terrorism counteraction measures

Term used previously for combatting terrorism (see definition of this term).

Terrorist group

A politically, religious, or ideologically oriented group which uses terrorism as its prime mode of operations.

Threat management force

An action force from the installation that responds to major disruptions on installations. The TMF should be of sufficient size to manage the disruption and will usually involve a command element, security element, negotiation team, SRT, and logistical element.

TOW

A tube-launched, optically traced, wire-command missile designed as an antitank weapon system. (DOD 5100.76-M)

Upper rail loc

A set screw operated variation of a "C" clamp designed for gripping the upper sliding rail which supports or guides the weight of some styles of railroad boxcar doors. Gripping the upper sliding rail, the "loc" blocks and prevents the door's roller hangers or carriers from sliding past, thereby effectively preventing the door from being moved. (DOD 5100.76-M)

Waiver

Temporary relief from specific standards imposed by this manual (regulation) pending actions accomplishment of actions that will conform to the standards required. Compensatory measures are required.

Section III**Special Abbreviations and Terms**

There are no entries in this section.

Index

This index is organized alphabetically by topic and by subtopic within topic. Topics and subtopics are identified by paragraph number.

Abbreviations, See glossary

Arms, 3-3

Army property categories

Aircraft/components, 3-3, 3-4, and 3-18

Clothing, 3-7

Controlled cryptographic items, 1-4 and 3-24

Equipment

Audiovisual, 3-16

Communications, 3-6

Electronic, 3-6

High-value precision, 3-6

Individual, 3-7

Industrial, 3-21

Utility, 3-21

General, 3-2

Lubricants, 3-13 and 3-14

Oil, 3-13 and 3-14

Personnel

Civilian, 3-20

High-risk, 3-19

Military, 3-20

Mission-critical, 3-19

Petroleum, 3-13 and 3-14

Postal items, 3-26

Repair parts, 3-11 and 3-12

Shop equipment, 3-22

Subsistence items, 3-9 and 3-10

Subcaliber devices, 3-16

Supplies

Administrative, 3-23

Housekeeping, 3-23

Medical, see Medical below

Unit, 3-25

Training devices, 3-16

Tools

Accountability, 3-22

Hand, 3-22

Kits, 3-22

Sets, 3-22

Vehicles, 3-5 and 3-18

Weapons systems

Carriage-mounted, 3-5

Towed, 3-5

Ammunition, 3-3

Chains, 3-5 and app D

Classified equipment, 3-3, 3-5, and 3-18

Exceptions, 1-6, 3-1f, 3-5e(2), B-4, and glossary

Keys, see app D.

Intrusion detection systems, 1-5 and 4-13

Investigations, 1-4

Locks/locking devices, 1-4, 3-3, 3-5, 3-6, 3-8, 3-9, 3-13, 3-14, 3-16, 3-22, 4-14, and appendix D

Loss, 1-4 and 5-13**Marking, see app c****Medical supplies**

- Ambulances, 4-19
- Crash carts, 4-19
- Disposal, 4-5
- Emergency trays, 4-19
- In-transit security, 4-4
- Personnel selection, 4-3
- Physical security
 - Checks, 4-12
 - Control procedures, 4-16, and 4-18
 - Intrusion detection system, 4-13
 - Lighting, 4-13
 - Lock and key control, 4-14
 - Measures, 4-11 and 4-18
- Storage structural standards
 - Controlled substances, 4-10
 - Medical treatment facilities, 4-17
 - Note items
 - C, 4-6, and 4-9
 - Q, 4-6 and 4-8
 - R, 4-6 and 4-7
 - Policy, 4-2
 - Pharmacy items, 4-15 and 4-16
 - Laboratories, 4-17
- Sensitive items, 4-10 and 4-20

Museums

- Arms, 5-15
- Ammunition, 5-15
- Control measures
 - Keys, 5-5
 - Locks, 5-5
 - Workshops, 5-9
- Display items
 - Cases, exhibit/display, 5-8
 - Parks, 5-11
- General, 1-4 and 5-1
- Inspections, 5-2
- Intrusion detection systems, 5-7 and 5-10
- Lighting, 5-6
- Personnel selection, 4-3 and 5-3
- Property
 - Accountability, 5-14
 - Losses, 5-13
- Security
 - Checks, 5-10
 - Civilian police agencies, 5-12
 - Attendant, 5-10
- Structural standards, 5-4

Physical protective measures by risk level

- Aircraft/aircraft components, 3-3, 3-4, and 3-18
- Clothing (organizational), 3-7
- Controlled cryptographic items, 3-24
- Equipment

- Audiovisual, 3-16 and 3-17
- Communications, 3-6
- Electronics, 3-6
- High-value precision, 3-6
- Individual, 3-7
- Night vision devices, 3-6
- Lubricants, 3-13 and 3-14
- Medical supplies, see medical above
- Oil, 3-13 and 3-14
- Petroleum, 3-13 and 3-14
- Portable/pilferable, 3-6, 3-7, 3-9, 3-11, 3-15, and 3-16
- Repair parts, 3-11 and 3-12
- Subcaliber devices, 3-16 and 3-17
- Subsistence items, 3-9 and 3-10
- Tool kits, 3-6
- Training devices, 3-16 and 3-17
- Weapons systems
 - Carriage-mounted/components, 3-5
 - Towed/components, 3-5
- Vehicles, 3-5 and 3-18

Physical security

- Access control, 3-22
- Checks, 1-4, 3-6, and 4-12
- Fencing, 3-1, 3-3, 3-5, 3-6, 3-13, 3-14, 3-15, and 3-24
- Funds, 1-5
- Guards, 3-3, 3-13, and 3-14
- Inspections, 1-4
- Intrusion detection systems, 1-5, 3-3, 3-5, 3-6, 3-7, 3-9, 3-11, 3-13, 3-15, and 3-16
- Inventories, 3-6, 3-7, 3-11, and 3-15
- Lighting, 3-1, 3-3, 3-5, 3-6, 3-7, 3-9, 3-11, 3-13, 3-14, 3-15, 3-16, 3-24, 3-25, and 4-13
- Officers, 1-4, 3-3
- Restricted area, 3-3, 3-13, and see terms
- Plans, 1-4
- Safety, 3-1
- Seals, 3-9, 3-13, 3-14, 3-16, and app D
- Signs, 3-5, 3-6, 3-7, 3-9, 3-11, 3-13, 3-15, 3-16, and 3-24

Purpose, 1-1**References. See app A****Responsibilities**

- Activity chiefs, 1-4e
- DISC4, 1-4
- Division commanders, 1-4d and 1-4h
- Facility commanders, 1-4g and 1-4h
- Individuals, 1-4h
- Installation commanders, 1-4c, 1-4d, and 1-4h
- Major United States Army Reserve Commands, 1-4c and 1-4d
- Numbered armies in continental United States, 1-4d
- Separate brigade commanders, 1-4d and 1-4h
- State adjutants general, 1-4c
and 1-4d
- Unit commanders, 1-4e and 1-4g

Risk analysis

- Assets, 1-4
- Implementation, 2-3
- Levels, 3-3 and see terms
- Mission essential/vulnerable installations, 2-2

Objectives, 2–1

Procedures, see DA Pam 190–51

Security overview, 3–1

Security procedural measures by risk level

Aircraft/aircraft components, 3–3, 3–4, and 3–18

Controlled cryptographic items, 3–24

Equipment

Audiovisual, 3–16 and 3–17

Communications, 3–6

Electronics, 3–6

High-value precision, 3–6

Individual, 3–6 and 3–7

Industrial, 3–21

Utility, 3–21

Lubricants, 3–13 and 3–14

Oil, 3–13 and 1–14

Personnel

Civilian, 3–20

High-risk, 3–19

Military, 3–20

Mission-critical, 3–19

Petroleum, 3–13 and 3–14

Portable, pilferable, 3–6, 3–11, and 3–16

Night vision devices, 3–6

Repair parts, 3–11 and 3–12

Subsistence items, 3–9 and 3–10

Subcaliber devices, 3–16 and 3–17

Training devices, 3–16 and 3–17

Tool kits, 3–6

Vehicles, 3–5 and 3–18

Weapons systems

Carriage-mounted/components, 3–5

Towed/components, 3–5

Storage areas

Audiovisual support centers, 3–16

Aviation facilities, 3–3

Central issue facilities, 3–7

Commissaries, 3–9

Direct support units, 3–11

Engineer supply areas, 3–15

Construction material areas, 3–15

General, 3–4, 3–5, 3–6, 3–8, and 3–10

Installation level supply support activities, 3–11

Medical facilities, see Medical above

Training centers, 3–16

Troop issue subsistence activities, 3–9

Unit supply room, 3–25

Warehouses, 3–9

Storage structures, see app B

Terms, see glossary

Terrorism counteraction measures

Aircraft/aircraft components, 3–3, 3–4, and 3–18

Clothing (organizational), 3–7

Equipment

Communications, 3–6

- Electronic, 3-6
- High-value precision, 3-6
- Individual, 3-7
- Industrial, 3-21
- Utility, 3-21
- General, 3-1
- Lubricants, 3-13 and 3-14
- Oil, 3-13 and 3-14
- Personnel
 - Civilian, 3-20
 - High-risk, 3-19
 - Military, 3-20
 - Mission-critical, 3-19
- Petroleum, 3-5, 3-13, and 3-14
- Night vision devices, 3-6
- Tool kits, 3-6
- Vehicles, 3-5 and 3-18
- Weapons systems
 - Carriage-mounted/components, 3-5
 - Towed/components, 3-5
- Thefts, 1-4**
- Vehicles, privately-owned, 3-5, 3-7, and 3-13**
- Waivers, 1-6**
- Weapons, 3-3 and 3-5**

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Wet Utility SOPs

Information Briefing for the water and wastewater systems on Fort Jackson

Reference: Contract SP0600-07-C-8251

Table of Contents

	<u>Page</u>
1. Important Information	2
2. Points of Contact	2
3. Service Orders for Routine or Emergency O & M	2
4. Line Locates (Dig Permits)	2
5. Construction Standards	3
6. Wet Utility Work Performed by PSUS	3
7. Wet Utility Work Performed by others	3
a. Preparatory Phase	3
b. New Connections Procedures	3
c. Inspection Requirements	4
d. Post Construction Close-out	4
e. Temporary Water Service	6
8. Wet Utility Costs to Others	7
9. Lessons Learned	7
Appendix A: Water Distribution Sys - Points of Demarcation	8
Appendix B: Wastewater Collection Sys - Points of Demarcation	10
Appendix C: PSUS Request For Action (RFA) form	12
Appendix D: Temporary Water Service Request	13
Appendix E: Tapping Fee Schedule	14

1. Important Information

- a. Palmetto State Utility Services, Inc. (PSUS) owns the water and wastewater systems. As the owner of the water and wastewater infrastructure, PSUS will perform or approve all work on and any connections to/ disconnects from their systems.
- b. No one may operate valves, hydrants, or other appurtenances to the water or sewer systems without express approval from PSUS.
- c. PSUS normally receives notification of routine O&M service requests through the Fort Jackson Service Order system (803-751-7684). Two weeks prior notice is required in order to properly coordinate work and trial shutdowns.
- d. Please contact the Contract Officer Representative (COR) anytime a customer may have contract questions, need additional guidance, or have feedback on the PSUS contract performance.
- e. Points of demarcation
 - i. Water distribution system – generally speaking, it is the point on the downstream side of the last apparatus (backflow preventer, valve, etc.) or at the five foot line from the structure, whichever is closest to the structure. Please see Appendix A for more detail.
 - ii. Wastewater collection system – generally speaking, it is the mid-point of a dual clean-out, the upstream side of a single clean-out or the five foot line from the structure, whichever is closest to the structure. Please see Appendix B for more detail.

2. Points of Contact:

- a. Palmetto State Utility Services, Inc. (PSUS)
 - i. David R. Wiman, Utility Manager, 803-790-7288, dwiman@psus.asusinc.com
 - ii. PSUS On-Call representative: 803-394-0966.
- b. COR – Georges Dib, 803-751-3823, georges.dib@us.army.mil

3. Service Orders for routine or emergency operation and maintenance:

- a. Call 803-751-7684 (Fort Jackson Service Order Desk)
- b. During duty hours (0700 – 1600), the service order clerks will contact PSUS.
- c. After duty hours, the duty officer answers 803-751-7684 and will contact PSUS.
- d. Response time during normal duty hours is 30 minutes in the cantonment area. After hours, the response time is normally 1.5 hours. If during an after-hours emergency situation you have not received contact from a PSUS employee within an hour after calling the Service Order Desk, then call the PSUS On-Call representative directly at 803-394-0966.

4. Line Locates (Dig Permits)

- a. To obtain a dig permit call PUPS (Public Utility Protection Service) at 888-721-7877. Separately, submit a service order request with a map/drawing clearly identifying the dig area boundaries to the Fort Jackson Service Order Desk at 803-751-7684. PSUS required locates are completed within three working days. PSUS will respond to emergency locates as quickly as possible. Please note that by South Carolina law, in order for an emergency to exist there must be “a substantial likelihood that loss of life, health or property will result (within three working days).”

PSUS – Wet Utility SOPs

- b. If the customer desires a meeting at the site when the line is being located, the meeting should be requested when the service order is submitted. Likewise, the customer should also indicate on the service order whether the line locate is an emergency.

5. Construction Standards

- a. PSUS Technical Pipeline Installation Specifications, Potable Water Material Guidelines and Standard Construction Drawings – dated 11 June 2008, are the Post approved documents that govern all work to the wet utility systems at Fort Jackson.
 - i. The standards and specs can be requested by contacting PSUS directly.
 - ii. The standards and specs are also on file with the USACE, Ft. Jackson DPW and South Carolina Department of Health and Environmental Controls (DHEC).
- b. PSUS standards prevail in any conflict unless other wise approved in writing by the PSUS Utility Manager or Manager’s designee.

6. Wet Utility Work performed by PSUS

- a. Complete a Request For Action (RFA) for **all** projects. See Appendix C for an example of the form.
- b. As owner of the wet utility systems, PSUS is solely responsible for the work completed on its systems. PSUS will design the project based on the supplied scope of work. PSUS is responsible to correct at their cost any deficiencies with their design or construction. Please see section 8. for associated costs.

7. Wet Utility Work performed by others

a. Preparatory Phase

- i. Complete a Request For Action (RFA) for **all** projects. See Appendix C for an example of the form.
- ii. Provide all material submittals, work procedures, design plans, equipment submittals and design calculations associated with the wet utilities project approved by the design engineer to PSUS. Note: PSUS requires compliance with the Government’s “Buy America” requirement.
- iii. Obtain and have on file all required construction permits from DHEC and other entities including the Fort Jackson Fire Department.
 - 1) Wastewater per SC R61-67 Standards for Wastewater Facility Construction, part 67.300, p.1
 - 2) Water per SC R61-58 State Primary Drinking Water Regulation, part 58.1 B(1)

b. New Connection Procedures

- i. Provide a formal maintenance of operations plan, as defined herein, for review and approval prior to scheduling any new connections or any required water or sewer service shutdowns. At a minimum, the plan should detail construction phases; show locations of isolation valves required for shutdown; indicate continuity of service to downstream (water) or upstream (sewer) facilities and the associated remaining capacities; provide calculations or modeling results showing required capacities are met; and provide a schedule of needed shutdowns.

PSUS – Wet Utility SOPs

- ii. Provide a minimum of 14 days advance notice to PSUS prior to the desired date for new connections to the existing facilities. This will allow PSUS the time necessary to conduct trial shutdowns for isolation of the existing facilities.
- iii. Perform all work relating to water and sewer in the presence of a PSUS representative (see: c. iii)
- iv. Provide a minimum of 48-hour notice to PSUS before cleaning, flushing and pressure testing new water/sewer pipelines and sanitary sewer manholes. Testing shall be conducted in accordance with Section 7 of the PSUS Technical Pipeline Specifications.
- v. Provide a minimum of 48-hour notice to PSUS before conducting disinfection of new potable water lines. Disinfection shall be completed in accordance with Section 8 of the PSUS Technical Pipeline Specifications.

Note: As soon as a valve is connected to the PSUS system, it shall be operated by PSUS crews only.

c. Inspection Requirements

- i. Water and sewer infrastructure construction shall be inspected by PSUS inspectors. The cost of this inspection shall be covered by the project and will be determined by the length of time spent on wet utility work. See section 8. below.
- ii. Water and sewer material deliveries may be inspected by PSUS prior to installation to determine if materials are in accordance with those specified in PSUS standard drawings and specifications.
- iii. Contractor to provide a 48-hour notice to PSUS prior to conducting any water and/or sewer work including pipeline and appurtenances installations, service connections, backfilling of structures, pressure testing, disinfection, pouring of thrust blocks, abandonments, application of protective coatings and as otherwise required in the PSUS Technical Pipeline Specifications.
Note: failure to provide this notification may result in the requirement for contractor to expose such work for confirmation of compliance.
- iv. Provide updated copies of the project schedule to PSUS on a weekly basis.
- v. Provide schedule of regular progress meetings. PSUS may attend these meetings as required. Provide 48-hour notice to request PSUS attendance at a meeting.

d. Post Construction Close-out

- i. Pre-Final Acceptance Inspection – Schedule at least 48 hours prior to pre-final job walk required for all non-buried infrastructure for generation of punch list items.
- ii. Provide all test results and the Permit to Operate, issued by DHEC (as required), to PSUS upon request for activation of new services.
- iii. Required operation and maintenance data include, but are not limited to sub-sections a. – h. below. This data should be clearly identifiable with the project it is associated with including the Government project number.
 - a. **Equipment Summary.** The CONTRACTOR completes an Equipment Record Form provided by PSUS for each item of mechanical, electrical and instrumentation equipment installed at the facility.
 - b. **Mechanical Operational Procedures.** The CONTRACTOR describes mechanical operational procedures for all installed equipment, as appropriate, including installation

- instructions, adjustment, startup, operation, load changes, calibration, shutdown, troubleshooting, disassembly, reassembly, realignment and testing.
- c. **Preventive Maintenance Procedures and Schedules.** The CONTRACTOR provides two copies (2) preventive maintenance procedures and schedules based on Manufacture’s recommendation for the environment of use for all installed equipment, including periodic inspection, lubrication and calibration. Such procedures and schedules detail maintenance that can be performed on installed equipment, including its removal and replacement, and repairs that can be performed with the equipment in place.
 - d. **Parts List.** The CONTRACTOR provides a complete parts list for all installed equipment, including a list of recommended spare parts for two years of continuous operation, a generic description and identification number for each part, addresses and telephone numbers of vendors from whom parts can be purchased, and cross-sectional or assembly-type drawings. Any instructions, parts lists or other items packed with or attached to the equipment when delivered are also provided.
 - e. **Wiring Diagrams.** The CONTRACTOR provides complete internal and connection wiring diagrams for each installed component, if applicable.
 - f. **Machine Shop Fabrication Drawings.** The CONTRACTOR provides approved machine shop fabrication drawings, complete with dimensions, for all installed component.
 - g. **Safety.** The CONTRACTOR provides safety instructions and precautions to be taken when working on all installed equipment items.
 - h. **Documentation.**
 - i. The CONTRACTOR provides all warranties, affidavits and certifications required for all installed equipment items. The CONTRACTOR provides two hard copies of the as-built plans/record drawings and electronic copies in PDF and Auto CAD format.
- iv. Start-Up, Training and Testing on any system or piece of equipment shall not occur until the CONTRACTOR’s submittal of Operation and Maintenance Information has been incorporated into project O & M Manuals by the Design Consultant, the CONTRACTOR’s Lesson Training Plans are approved by PSUS, and the approved Operation and Maintenance Manuals have been turned over to PSUS. Requirements are as follows:
- a. Start-up Plan:
 1. Provide a Systems Start-up Plan addressing all aspects of this Section for acceptance not less than 15 calendar days prior to start-up.
 2. The Systems Start-up Plan is the responsibility of the CONTRACTOR who is solely responsible for its means, methods, techniques, sequences, procedures, coordination, completeness, accuracy, and validity.
 3. Identify each person or organization that will have a functional part in the start-up, and identify their duties and responsibilities.
 4. Provide contingency plans for operational failure modes.
 - b. Temporary connections:
 1. Provide complete information on temporary connections in the form of shop drawings and complete written descriptions.

- c. Validation procedures: Provide a complete written description of each test, simulation, and start-up, including:
 - 1. Schedule.
 - 2. Listing of components included.
 - 3. Listing of individuals or organizations involved and assigned responsibilities.
 - 4. Test equipment required, accuracy, and calibration information.
 - 5. Detailed listing of procedures necessary to demonstrate compliance with performance requirements specified in this Section and the technical Sections.
 - d. Validation reports: Provide certified validation reports indicating compliance with the requirements of this Section for PSUS certification.
 - e. Provide operations and maintenance training to PSUS staff for all new mechanical infrastructures. Note: PSUS normally requires 7 days notice prior to scheduled training.
 - f. Submit all warranty documentation.
 - v. Final Acceptance Inspection - 48 hour notice prior to final job walk required for all non-buried infrastructure.
- e. Temporary Water Service**
- i. Temporary Hydrant Service
 - a. For temporary water service from a hydrant, complete a PSUS Temporary Water Service Request. See Appendix D. Along with this request submit a location map of the areas where service is being requested. Maps can be obtained at the PSUS office. **Note:** for temporary service to a construction trailer, see: sub-section ii.
 - b. Once the payment terms (sec. iii) are satisfied, PSUS will issue a Temporary Hydrant Permit to the contractor and install the backflow preventer (bfp) and construction meter at each hydrant location requested. **This permit terminates one year from date of issuance** (see Note 2.)
 - c. Only PSUS utility operators are allowed to connect/disconnect the bfp assembly from the hydrant. Any change in location request must be communicated to PSUS via a service order.
 - ii. Temporary Water Service to a Construction Office
 - a. Submit a request for service via the Fort Jackson Service Order system (803-751-7684).
 - b. Follow up with a direct request to PSUS for service; this should include a location map of the areas where service is being requested. (Also include whether temporary sewer service is being requested.)
 - c. PSUS will provide the contractor with a cost proposal to provide the service connection(s).
 - iii. Payment(s):
 - 1) For use of a hydrant, contractor will be required to submit two checks to PSUS in the amounts of \$300 (annual service charge) and \$1200 (for deposit). The deposit check will be returned upon the return in good working order of the equipment (bfp, meter, etc.) **Note:** another \$300 check will be required to receive an annual permit renewal. Following payment PSUS will issue the new permit and install a currently certified bfp.
 - 2) For temporary service to a construction trailer, PSUS will provide the contractor with a cost proposal to provide this service connection. Upon the contractor's written acceptance of the proposal to include a PO # or payment, PSUS will proceed with the work. **Note:**

PSUS – Wet Utility SOPs

another \$300 check will be required to receive an annual permit renewal. Following payment PSUS will issue the new permit and install a currently certified bfp.

8. Wet Utility Costs to Others

- a. **Temporary Water Service** – see section (e.) above.
- b. **Tap Fees** – these fees are for the physical tapping of the water and/or sewer mains. See Appendix E for cost breakdown.
- c. **New Project Fees** - charges based on engineering review & operational evaluation of the project's impact on the wet utility systems. Current rates: Engineer @ \$120/hour; Utility Operator @ \$45/hour. The number of hours is determined on a project by project basis. Any costs incurred by PSUS due to additional needs of the project will be the responsibility of the contractor.
 - i. This fee is waived when PSUS provides the wet utility construction.
- d. **Inspection Fees** – Current rate: Inspector @ \$100/hour. The number of hours are based on the wet utility construction schedule for the project. If the actual inspection hours go beyond the schedule provided, the contractor will be responsible for the additional costs incurred by PSUS.
 - i. This fee is waived when PSUS provides the wet utility construction.

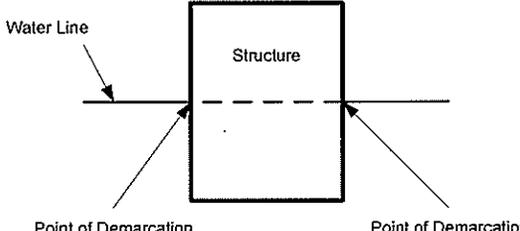
9. Lessons Learned

- a. PSUS must participate in the preliminary pre-design or pre-construction meetings, including site visits. This will expedite the process and insure a smoother project timeline and support.
- b. Include the proper language and pricing in the prime contractor's contract.
- c. Call the COR with any contract questions, if additional guidance is required, or have a positive or negative comment regarding PSUS.

APPENDIX A
WATER DISTRIBUTION SYSTEM POINTS OF DEMARCATION

SCENARIO	POINT OF DEMARCATION	VISUAL REPRESENTATION
Residential Service	Point where the downstream side of the facility cutoff valve. (If there is not a cutoff valve, the POD is a point 5 feet from the building footprint.)	
Where the service line enters the building	Point where the downstream side of the meter, BPD, or valve (whichever is closest to the building) that is within 5 feet of the building exterior. <i>Note: PRVs are included or are to be in the location of the BPD</i>	
Where the service line enters the building and no valve exists within 5 feet of the building footprint.	Point where the five-foot line exterior to building footprint. <i>Note: Service valve may be installed at or within 5 feet of the structure at any time. Downstream side of service valve would then become the point of demarcation.</i>	
Irrigation system fed directly from distribution system or backflow prevention device exists on the service line entering the structure.	Point where the downstream side of the backflow prevention device or service valve.	
City of Columbia water delivery points.	Point where the upstream side of the Army-owned meters.	None

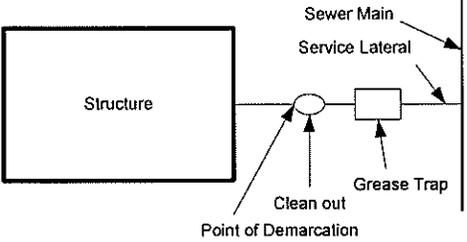
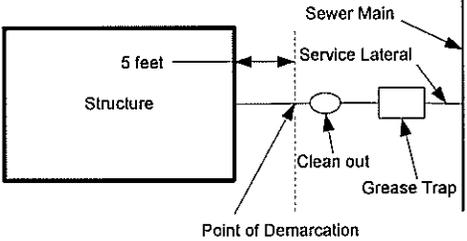
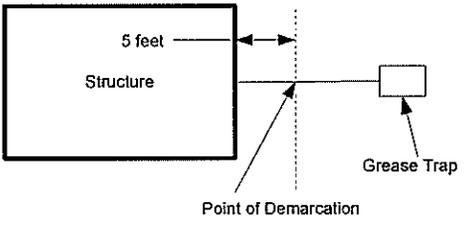
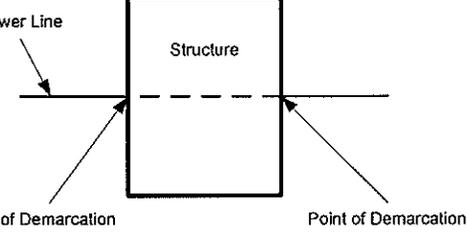
APPENDIX A (continued)

SCENARIO	POINT OF DEMARICATION	VISUAL REPRESENTATION
<p>Non-residential service, appurtenance is located inside the building in a mechanical room. <i>Note: Point of demarcation may change as Contractor-owned components are moved outside.</i></p>	<p>Point where the downstream side of interior water meter, backflow prevention device, or valve (whichever is farther downstream of the appurtenance yet still inside the mechanical room).</p>	<p>None</p>
<p>Water distribution pipe buried inside building footprints.</p>	<p>Points where the pipe enters and exits the building footprint. (Government will retain ownership of the pipe segments until such time as these segments are relocated.)</p>	
<p>Isolated potable water fixtures (outside fountains, yard hydrants, spigots, etc.).</p>	<p>Point where the downstream side of the first upstream appurtenance from the fixture (i.e., valve or backflow device).</p>	<p>None</p>

APPENDIX B
WASTEWATER COLLECTION SYSTEM POINTS OF DEMARCATION

SCENARIO	POINT OF DEMARCATION	VISUAL REPRESENTATION
Clean out located within 5 feet of structure wall	Upstream side of clean out	
Grease trap located within 5 feet of structure wall	Upstream side of grease trap	
Clean out not located within 5 feet of structure wall	5 feet from structure wall	
Grease trap not located within 5 feet of structure wall	5 feet from structure wall	
No sewer apparatus located within 5 feet of structure wall NOTE: If no clean out exists on service lateral, contractor shall install a clean out within 5 feet of structure wall when required to work on the service lateral	5 feet from structure wall	

APPENDIX B (continued)

SCENARIO	POINT OF DEMARCATION	VISUAL REPRESENTATION
Multiple sewer apparatus located on service lateral within 5 feet of structure wall	Upstream side of apparatus closest to structure wall	 <p>The diagram shows a rectangular structure on the left. A horizontal line representing the sewer main runs from the structure to the right. A vertical line representing the service lateral connects the main to the structure. On the service lateral, there is a circular clean out and a rectangular grease trap. The clean out is closer to the structure than the grease trap. A vertical dashed line labeled 'Point of Demarcation' is positioned at the clean out. Labels include 'Structure', 'Sewer Main', 'Service Lateral', 'Clean out', 'Grease Trap', and 'Point of Demarcation'.</p>
Multiple sewer apparatus located on service lateral, none within 5 feet of structure wall	5 feet from structure wall	 <p>The diagram is similar to the first one, but the clean out and grease trap are further from the structure. A horizontal dimension line indicates a distance of 5 feet from the structure wall to the point of demarcation, which is a vertical dashed line located between the clean out and the grease trap. Labels include 'Structure', 'Sewer Main', 'Service Lateral', 'Clean out', 'Grease Trap', and 'Point of Demarcation'.</p>
Grease Trap not connected to sanitary sewer system	5 feet from structure wall or inflow side of grease trap, whichever is closest to structure wall	 <p>The diagram shows a structure on the left connected to a sewer main. A service lateral connects the main to a grease trap. The grease trap is not connected to the main. A vertical dashed line labeled 'Point of Demarcation' is positioned 5 feet from the structure wall. Labels include 'Structure', 'Sewer Main', 'Service Lateral', 'Grease Trap', and 'Point of Demarcation'.</p>
Collection line under existing structure	Point where collection line enters and exits structure footprint	 <p>The diagram shows a rectangular structure. A horizontal line representing a sewer line passes through the structure. A vertical dashed line labeled 'Point of Demarcation' is positioned at the entry point of the sewer line into the structure. Another vertical dashed line labeled 'Point of Demarcation' is positioned at the exit point of the sewer line from the structure. Labels include 'Sewer Line', 'Structure', and 'Point of Demarcation'.</p>

APPENDIX C
PSUS REQUEST FOR ACTION (RFA)



Palmetto State
 Utility Services, Inc.
A Subsidiary of American Water Works Service, Inc.

REQUEST FOR ACTION (RFA)
 SP0600-07-C-8251 - Ft. Jackson, SC

RFA No. xx-09

Date: xx/xxxx 2009

Project Description: xx

Location: xx

Work Order/Line Item No.: xx

Funding Source: xx

Points of Contact (knowledgeable of this effort):

Customer	PSUS
Name: xxx	Name: xxx
Telephone No. xxx-xxxx	Telephone No. xxx-xxxx
Email: xxxxx	Email: xxxxx

Scope of Work: (if more than one page add additional pages)

Sketch Included: Yes or No

1 - Do not exceed 6 lines of type at 10 point.

- 2
- 3
- 4
- 5
- 6

Cost of Action (as listed in the 1391 form or equivalent): \$

Approved 1391 & any other cost support attached: Yes or No

Start Date: xx

End Date: xx

or

Period of Performance: xx

APPROVAL

Project Manager

(Print name & org./dept.) _____

(Signature) _____ Date _____

Note: Signature validates scope of work and that costs are agreed upon.

PSUS

(Print name) _____

(Signature) _____ Date _____

Note: Signature validates scope of work and that costs are agreed upon.

COR/Gov't POC

(Print name & org./dept.) _____

(Signature) _____ Date _____

Note: Signature verifies funds available to issue modification or task order.

Date Customer Contacted PSUS: xxx

Date of Site Visit: xxx

Date Estimate to Customer: xxx

Modification/Task Order (TO) _____

Inspected by Govt

(Print name) _____

(Signature) _____ Date _____

Note: Signature verifies proper material used.

Accepted by Govt

(Print name) _____

(Signature) _____ Date _____

Note: Signature verifies project completed to satisfaction. PSUS can be paid.

PSUS Invoice Date: _____

Building 2576 ~~Estimate~~ Way, Fort Jackson, SC 29207

Tel: (803) 790-7268 Fax: (803) 787-2054

APPENDIX D
TEMPORARY WATER SERVICE REQUEST



Palmetto State
Utility Services, Inc.
A Subsidiary of American States Utility Services, Inc.

Temporary Water Service Request

Business Name: _____

Address: _____

Office phone: _____

Representative: _____

Phone: _____

Service Order Number: _____

\$1,500 deposit provided: ___ yes ___ no

Initial PSUS approval: _____

Date that hydrant-bfp hook-up was provided: _____

Initial Meter Reading: _____

Meter serial #: _____

BackFlow Preventer (bfp) serial #: _____

Hydrant location: _____

Expected date of job completion: _____

Date that hydrant-bfp hook-up was returned: _____

Return Meter Reading: _____

PSUS representative authorizing acceptable condition of returned equip:

Building 2576 Essayons Way, Fort Jackson, SC 29207
Tel: (803) 790-7288 Fax: (803)787-2054

APPENDIX E
TAPPING FEE SCHEDULE

Tap Size	\$ Price for PSUS to perform construction	Price if tapping construction is done by others
2 x 2	839.00	350.00
4 x 2	1183.00	350.00
4 x 3	1849.00	350.00
4 x 4	1891.00	350.00
6 x 2	1117.00	350.00
6 x 3	2097.00	350.00
6 x 4	2321.00	350.00
6 x 6	2920.00	350.00
8 x 2	1165.00	350.00
8 x 3	2224.00	350.00
8 x 4	2387.00	350.00
8 x 6	3023.00	350.00
8 x 8	3404.00	350.00
10 x 2	1274.00	350.00
10 x 3	2369.00	350.00
10 x 4	2575.00	350.00
10 x 6	3259.00	350.00
10 x 8	3888.00	350.00
10 x 10	4196.00	350.00
12 x 2	1286.00	350.00
12 x 4	2599.00	350.00
12 x 6	3476.00	350.00
12 x 8	3864.00	350.00
12 x 10	4311.00	350.00
12 x 12	4765.00	350.00

Note: the above prices are to tap the main ONLY and do not reflect any other construction costs, such as roadway patching, pipe fittings, etc.

IMSE-JAC-ESP

25 August 2009

SUBJECT: Provost Marshal Office (PMO) Contract Briefing

FOR Contractors Working on Fort Jackson

1. The Directorate of Contracting Office (DOC) Contract Administrator notifies this office when initial contract briefings are scheduled for awarded contracts. The Physical Security Section of the Provost Marshal Office (PMO) then makes every effort to have a representative in attendance to brief you first hand on those items of interest to us and of importance to you; however, a personal briefing may not always be possible. This written briefing is designed to cover such situations.
2. EO 12989 as amended states: "Sec. 5. (a) Executive departments and agencies that enter into contracts shall require, as a condition of each contract, that the contractor agree to use an electronic employment eligibility verification system designated by the Secretary of Homeland Security to verify the employment eligibility of: (i) all persons hired during the contract term by the contractor to perform employment duties within the United States; and (ii) all persons assigned by the contractor to perform work within the United States on the Federal contract."
3. Fort Jackson Regulation 190-5, titled Motor Vehicle Traffic Supervision, contains ALL pertinent information regarding operation of motor vehicles on Fort Jackson. It may be reviewed in its entirety at the PMO Police Services Section located in the Emergency Services Center Building 5499, located on Jackson Boulevard, Monday thru Friday, 0730-1600 hours. The following pertinent data is extracted for you:
 - a. The vehicle laws of the State of South Carolina apply on post. Infractions such as speeding incur ticket/fine/points and such cases are handled thru the off-post U.S. Magistrate Court.
 - b. Vehicles must be mechanically safe. Tailgates must be installed/closed on trucks and care taken not to litter when transporting any material(s).
 - c. Construction traffic is prohibited within the housing areas unless absolutely necessary to perform the job. Vehicle/equipment operations require drivers to use extreme care near troop and other personnel movements including movements through school zones.
 - d. Speed Restrictions:
 - (1) 25 MPH unless otherwise posted.
 - (2) 10 MPH when passing marching troops or troops in formation.

- (3) 10 MPH in parking lots.
 - (4) 20 MPH in housing areas, hospital areas and school zones.
 - (5) 20 MPH through flashing yellow signal lights.
 - (6) 25 MPH on unpaved roads.
 - (7) 15 MPH when operating tracked vehicles.
- e. Stopping, Standing or parking laws-same as off post.
- f. Restraint systems must be worn by all drivers and riders in/on all vehicles on Fort Jackson if the vehicle is so equipped.
- g. The use of any hand held electronic device while driving on Fort Jackson is PROHIBITED. This includes cell phones, portable CD/DVD players, etc. To use these devices, you must pull over and park in an authorized parking area.
4. Construction sites must be secured at all times, as these sites are susceptible to criminal activity. Since construction site work normally requires workers on the job site Monday thru Friday, 0700-1800 hours, the Military Police (when on routine patrol) may stop and question people on site during other than normal hours, ascertain their right/need to being there and complete a Field Interview Card. HOWEVER, YOU should realize that YOU'RE ultimately responsible for the actions of your employees and the SECURITY of your job site/s. Items you need to consider:
- a. Control all keys to buildings and vehicles.
 - b. Access Control-who's on site (authorized/visitors).
 - c. Equipment-how accounted for/how secured after working hours.
 - d. Vehicles-keys, locked doors/steering.
 - e. Site Lighting-adequate for hours of darkness and operational.
 - f. Wearing of items of military apparel such as camouflage fatigues is prohibited.
 - g. NO ONE involved in any construction project on Fort Jackson is allowed to carry or transport any type of weapon or concealed weapon while on Fort Jackson.
5. You may contact the MPs on a 24-hour basis in Building 5499 (Emergency Services Center) on Jackson Boulevard by dialing 751-3113/3114/3115/3116 from a commercial phone or 4-3113/3114/3115/3116 from a Fort Jackson office phone. For emergencies on post dial 911 to get police, fire and ambulance services. If using a commercial phone (not a post 751 prefixed number), you'll get an off post 911 dispatcher and you'll need to explain that the emergency is on Fort Jackson and you'll be transferred to the 911 dispatcher on post..
6. All contractors (to include sub-contractors) must provide to the PMO Physical Security Section a listing of employees including full Name, Date of Birth, Place of Birth (City, County, State, Country), and Social Security Number prior to work start date. Names WILL be subjected to an MP Police Check and check of the Post Bar Roster. If work is to be performed in a sensitive area such as arms, ammunition and explosive areas, the contractor is responsible for requesting/paying for a State Law Enforcement Division (SLED) check of criminal history on ALL personnel, including Foreign Workers, providing the personal information listed above on company stationery to SLED

headquarters, and returning the Police Checks to the Directorate of Contracting. NO ONE barred from Fort Jackson or who has committed serious crimes such as felonies will be allowed to enter/work on post. Furthermore, IAW EO 12989 (9 June 2008), Contractors agree to use an electronic employment eligibility verification system designated by the Secretary of Homeland Security to verify the employment eligibility of: (i) all persons hired during the contract term by the contractor to perform employment duties within the United States; and (ii) all persons assigned by the contractor to perform work within the United States on the Federal contract. All Foreign Workers MUST possess all proper/legal paperwork for Identification/entry on post and must be a LEGAL Immigrant or have a worker's Visa.

7. Fort Jackson is a controlled access installation. All personal and company vehicles must be registered to enter post. All pertinent information regarding registration along with other pertinent information is included in the attachment.
8. Again, it is our intent that you will receive a personal briefing from a PMO Physical Security Representative. However, in those rare instances when personal contact is impossible due to prior commitments, this information is provided for your use. Please direct any questions you might have either in person or by calling the 24-hour location/phone #s listed above in para 4. You may also contact personnel assigned to the PMO Physical Security Section, located in Building 5499, at 751-2006/2005/6019/7076 directly or leave a voice mail message.

FOR THE PROVOST MARSHAL:

Attach: Vehicle Registration and other
Helpful Information

Original Signed
BYRON K. JONES
Chief, Physical Security Section
DAC, YC-02

VEHICLE REGISTRATION AND OTHER HELPFUL INFORMATION

AS OF 27 August 2008

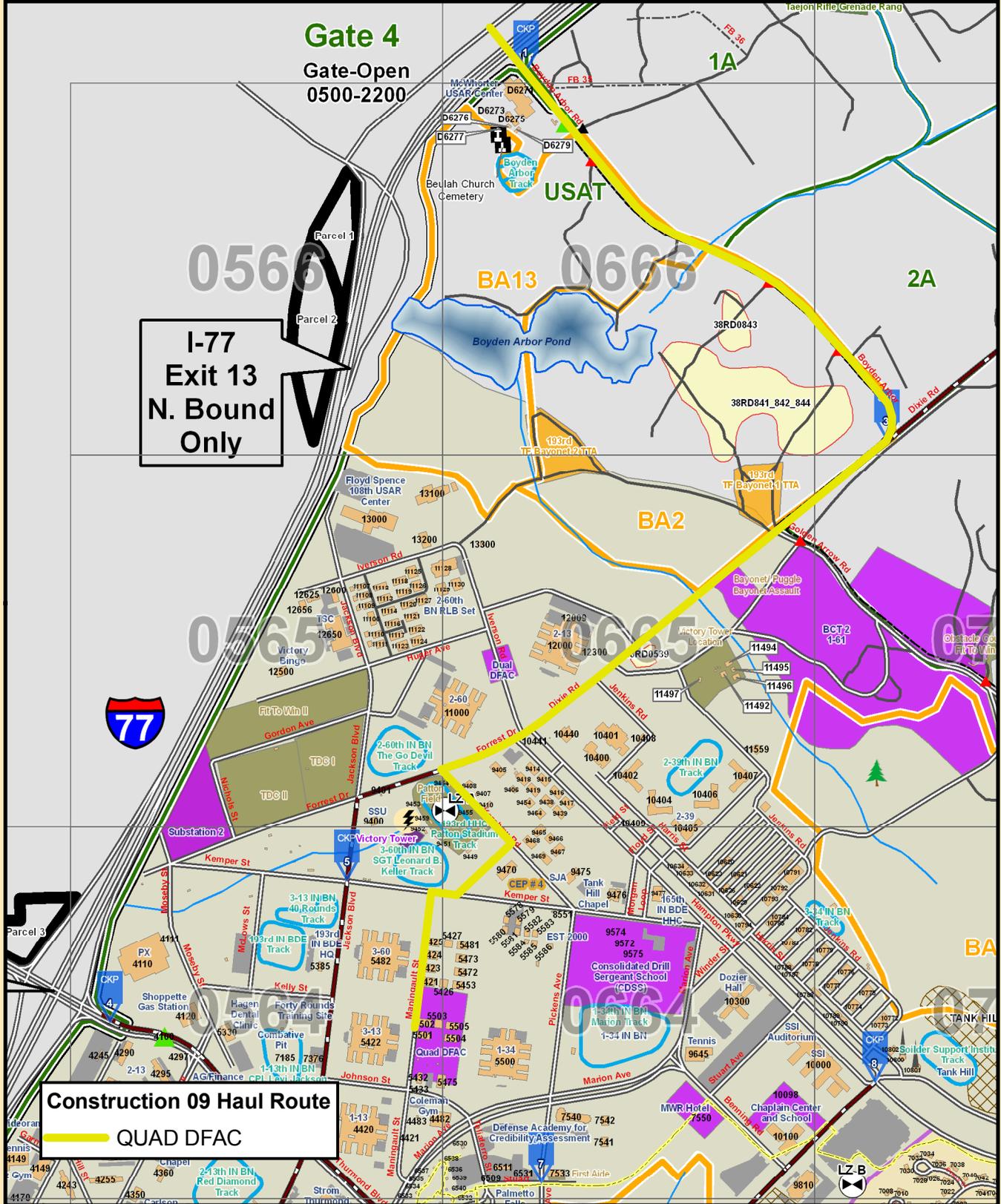
Contractors: IAW EO 12989 (9 June 2008), Contractors agree to use an electronic employment eligibility verification system designated by the Secretary of Homeland Security to verify the employment eligibility of: (i) all persons hired during the contract term by the contractor to perform employment duties within the United States; and (ii) all persons assigned by the contractor to perform work within the United States on the Federal contract.

Contractors must provide a letter on company letterhead addressed to the Directorate of Emergency Services/Provost Marshal Office, ATTN: Vehicle/Weapons Registration Section, giving the contract number, the expiration date of the contract, and sponsoring activity's endorsement. This letter should also state the name of the company representative who is authorized to register company vehicles, as well as the names of ALL employees of the company who will be required to enter the post to complete the requirements of the contract. If a subcontractor is required, the subcontractor's company name must be included. The primary contractor must notify the subcontractor that the above requirements must be completed for the subcontractor as well. In order to register a contractor company vehicle or a contractor's POV, the following current information is required in addition to the above letter: Vehicle Registration, Proof of Insurance, Drivers License, and endorsement from sponsoring activity. Temporary Passes will reflect the expiration date of the contract unless the contract exceeds one year, then the pass will expire 31 December of that calendar year and will have to be renewed each year until the contract is complete. The type of POV pass or decal is determined by the length of the contract; 6 months or less – Temporary Pass; More than 6 months – DOD contractor's decal; which will expire 31 December of every calendar year. **All contractors are responsible for removing decals from company vehicles when a contract is completed or terminated and turning them in to the Vehicle Registration Office. Decals on the vehicles of their employees must also be confiscated when the employee leaves or is terminated. These must also be turned in to the Vehicle Registration Office. Contractors ARE NOT AUTHORIZED to bring weapons onto Fort Jackson to include holders of concealed weapon permits issued by the state of South Carolina.** The Vehicle Registration Office is located in Room #114 of the Strom Thurmond Building #5450 located at the Intersection of Strom Thurmond Boulevard and Marion Avenue. Once vehicles have the proper registration, entry to the post can be gained thru Gates #1 (Fort Jackson Boulevard), Gate #2 (Forest Drive Boulevard), Gate #5 (Leesburg Road). Commercial vehicles and oversized vehicles/loads need to use Gate #4 (Percival Road and Boyden Arbor Road) as they cannot negotiate the barriers which are always in place at the other 3 gates and vehicle searches are conducted at Gate 4. Gates 4 and 5 are open 7 days a week. Gate 5 opens at 0445 hours AM and Gate 4 opens at 0500 hours AM. Both gates close at 2200 hours-10 PM. The 24 hour Military Police Station is located on Jackson Boulevard in Building #5499 at the intersection of Hill Street and Jackson Boulevard. For emergencies on-post dial 911 to get police, fire and ambulance services. If using your civilian access phone number, you'll get an off-post 911 dispatcher and you'll need to explain that the emergency is on-post (Fort Jackson) and you'll be transferred to the 911 dispatcher on-post.

QUAD DFAC Haul Route

1:15,000

Edition 1



Although proper GIS data development procedures have been followed in accordance with federal and industry standards, we make no guarantee or warranty, either expressed or implied, concerning the accuracy of any information contained on or any other matter whatsoever, including, without limitation, the condition of the product, or its fitness for any particular purpose. The burden for determining fitness for use lies entirely with the user. No part of this map may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or by any information storage or retrieval system, except as expressly permitted in writing by Fort Jackson DPW, ENV.

Date Published: June 2010
 Map POC: Mr. Philip Claus
 POC Number: 803-751-3836
 Software: ArcGIS (Arcinfo) 9.2 SP5

WGS 1984 UTM Zone 17N
 Projection: Transverse Mercator
 Linear Unit: Meter
 GCS: WGS_1984
 D_WGS_1984

Compliments of:
 DPW ENVIRONMENTAL DIV



Appendix II

Adapt-Build Model Design

The Adapt-Build Model design files will be delivered by separate DVD or CD Rom.

The Adapt-Build Model design files consist of:

- Standard Drawing files Volumes 1-6
- Specifications
- Interior Design products CID & SID
- Design Analysis & Cut sheet information
- Lighting Requirements, Calculations & Cut sheets
- Mechanical Calculations & Cut sheets
- Ft Benning Sample Energy Analysis

Note: The FIO design information provided was developed for Ft Benning Starship projects. This information will specifically be adapted to the B-4420 design at Ft Jackson, SC. (See Section 01 10 00, 3.1.1)