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Savannah District

Design-Build Request for Proposal

108th ADA Brigade Headquarters

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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
Battalion/Brigade Headquarters (BH)	Office

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. BRIGADE HEADQUARTERS (Bde HQ)

Provide BRIGADE HEADQUARTERS (Bde HQ). This project type is to house Brigade administrative and command operations. It is intended to be similar to office type buildings in the private sector community. Assume 20 percent of personnel are female unless otherwise indicated.

The project will include a stand alone Brigade Headquarters building for a 0 extra small (18,000 SF), 0 small (31,200 SF), 0 medium (34,500 SF), 1 large (40,100 SF), and 0 extra large (55,300 SF) Brigade Headquarters for 108 Air Defense Artillery. The maximum gross area for the Brigade Headquarters in the project is limited to 40,100 square feet.

2.2. SITE:

Provide all site design and construction within the Headquarters limits of construction necessary to support the new building facilities. Supporting facilities include, but are not limited to, utilities, electric service, exterior and security lighting, fire protection and alarm systems, security fencing and gates, water, gas, sewer, and site improvements. Provide accessibility for individuals with disabilities. Include Antiterrorism/Force Protection measures in the facility design in accordance with applicable criteria.

Maintain the construction site and haul route. Repair/replace damage to existing sidewalks, pavements, curb and gutter, utilities, and/or landscaping within the construction limit, adjacent to the construction site, and along the Contractor's haul route resulting from the Contractor's construction activities at no additional cost to the Government. Prior to construction activities, the Contractor and Contracting Officer Representative shall perform an existing condition survey. At the completion of the Task Order, the Contractor and Contracting Officer representative shall perform a final condition survey to determine repair/replacement requirements.

Approximate area available for this (these) facility(ies) is shown on the drawings.

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

Approximate area available 2 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. All Computers and related hardware, copiers, faxes, printers, video projectors, VCRs and TVs are GFGI.

The following are also GFGI items: No additional requirements.

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 BRIGADE HEADQUARTERS

3.1. GENERAL

Provide Brigade Headquarters (HQ) Facility. This project shall provide facilities to accommodate Brigade administration and command operations. It is intended to be similar to office type buildings in the private sector community. The Brigade Headquarters and its function are more fully described in paragraph 3.2.1. BRIGADE HEADQUARTERS - DESIGN REQUIREMENTS. The preferred functional layouts are depicted in the drawings included with this RFP. The extent to which the drawings represent required features and the allowable latitude for changes is as noted on the drawings.

3.1.1. ADAPT-BUILD MODEL

An Adapt-Build Model for a Brigade (HQ) , which contains a fully developed design, including a Building Information Model (BIM), 2-D CADD files, and specifications, can be downloaded from the following FTP site: ftp://ftp.usace.army.mil/pub/sas/BDE-BN_HQ/. This design is provided as a guide that exemplifies a technically suitable product and incorporates mandatory functional/operational requirements for a similar (although perhaps not an exact) facility to be constructed under this solicitation. It will be left to the offerors' discretion if, and how, they will use the sample design provided to satisfy the requirements of this Request for Proposal. This model is not intended to modify or over-ride specific requirements of this RFP and, under all circumstances, it will be incumbent upon the successful offeror to adhere to the site specific scope and functional/operational requirements specified within the RFP. Neither this statement of work, nor the adapt-build model, are intended to diminish the offeror's responsibilities under the clauses titled "Responsibility of the Contractor for Design," "Warranty of Design," and "Construction Role During Design." The successful offeror shall be the designer-of-record and shall be responsible for the final design and construction product, including but not limited to, adherence to the installation architectural theme, building code compliance and suitability of the engineering systems provided. The government assumes no liability for the model design provided and, to the extent it is used by an offeror, the offeror will be responsible for all aspects of the design as designer-of-record.

3.1.2. FACILITY RELATIONSHIPS

Brigade (HQ) Headquarters shall be located within an operations complex along with Company Operations Facilities (COF) and Tactical Equipment Maintenance Facilities (motor pools). The facilities within this complex shall be oriented to support deployment and daily operations, and should also be located within walking distance of associated community facilities such as barracks and dining facilities.

3.1.3. GROSS BUILDING AREA:

Gross areas of facilities shall be computed according to subparagraphs below. Maximum gross area limits indicated in Paragraph 2.0, SCOPE, may not be exceeded. A smaller overall gross area is permissible if all established net area program requirements are met.

(1) Enclosed Spaces. The gross area includes the total area of all floors, including basements, mezzanines, penthouses, usable attic or sloping spaces used to accommodate mechanical equipment or for storage with an average height of 6'-11" measured from the underside of the structural system and with the perimeter walls measuring a minimum of 4'-11" in height, and other enclosed spaces as determined by the effective outside dimensions of the building.

(2) One-Half Spaces. One-half of the area will be included in the gross area for balconies and porches; exterior covered loading platforms or facilities, either depressed, ground level, or raised; covered but not enclosed passageways or walks; covered and uncovered but open stairs; and covered ramps.

(3) Excluded Spaces. Crawl spaces; exterior uncovered loading platforms or facilities, either depressed, ground level, or raised; exterior insulation applied to existing buildings; open courtyards; open paved terraces'; roof overhangs and soffits for weather protection; uncovered ramps; uncovered stoops; and utility tunnels and raceways will be excluded from the gross area.

3.1.4. FUNCTIONAL SPACES:

Net area requirements for functional spaces are included in the drawings. If net area requirements are not indicated, the space shall be sized to accommodate the required function, comply with code requirements, comply with overall gross area limitations and other requirements of the RFP (for example, area requirements for corridors, stairs, and mechanical rooms will typically be left to the discretion of the Offeror).

3.1.5. ADMINISTRATIVE FACILITIES:

Provide centralized areas for photocopier, laser printer and fax machine with waste and paper recycling receptacles and supply cabinet for paper storage in each office area. Hours of operation are normal business hours except where indicated otherwise.

3.1.6. HANDICAPPED ACCESS:

Brigade (HQ) Headquarters are to be handicapped accessible.

3.1.7. ADAPT-BUILD GUIDANCE:

See Appendix entitled ADAPT-BUILD MODEL, which contains a proposal selected as the best value submission for a similar facility to be constructed in the region encompassed by this contract. The functional layout and design approach it demonstrates is provided as a guide for subsequent task orders to be issued against this contract. However, the Contractor must adhere to the specific direction and unique project requirements included within this Request For Proposal. Also, the Contractor shall be responsible for the final design and construction product, including but not limited to, building code compliance and suitability of the engineering systems provided.

3.2. FUNCTIONAL AND OPERATIONAL REQUIREMENTS

3.2.1. BRIGADE HEADQUARTERS - FUNCTIONAL REQUIREMENTS

3.2.1.1. General:

The Brigade Headquarters facility is comprised of administrative, special functions and secure section components as described in paragraph Functional Spaces Descriptions and Performance Requirements. Secure section components consisting of a Brigade Operations Center (BOC), Secure Compartmented Information Facility (SCIF) and Network Operations Center (NOC). In conjunction with these, each site-specific project shall include necessary site amenities such as vehicle service yards, access drives, and exterior utilities. Space will be provided for a command section, S-1, S-2, S-3, S-4, S-6, S-7, utilities and support services. Private offices will be provided for the commanding officer, executive officer, command sergeant major, S-1 officer, S-2 officer, S-3 officer, S-4 officer, S-6 officer, S-7 officers, Human Resources NCO, re-enlistment, surgeon, Legal Staff

Offices, chaplain, and assistant chaplain. Space will also be provided for clerical and central files, conference room, staff duty station, message center and mail sorting, reception, secure documents room, secure documents room, showers, supplies and vending. A staff duty station shall be provided at primary entrances to the building, whether the brigade headquarters is located in a combined Battalion/Brigade Headquarters or as a stand-alone building. The stand-alone Brigade Headquarters facility is a two story facility with secure zone 1 spaces on the ground floor and secure zone 2 spaces on the second floor. Secure zone 3 spaces are provided on the first floor and consist of a SCIF, BOC and NOC. The secure zone 3 spaces are separated from the rest of facility with card-reader doors.

3.2.1.2. Brigade Headquarters Program Requirements

The programmatic requirements for the Brigade Headquarters are as indicated on the drawings. See the Room Size and Furnishings Chart for other room and office layout information.

BDE HQ Adjacency Matrix	Zone 1	Zone 2	Zone 3

Activity or Element	COMMAND GROUP	S1 PERSONNEL	S1/PAC	S4 LOGISTICS	S8 RESOURCE MANAGEMENT	CHAPLAIN	SURGEON/MEDICAL	INSPECTOR GENERAL	PUBLIC AFFAIRS	LEGAL	SAFETY	S2 INTELLIGENCE	S3 OPERATIONS	S5 PLANS	S6 COMMUNICATIONS	S7 INFORMATION OPS	S9 CIVIL AFFAIRS	SUPPORT OPERATIONS	FIRE AND EFFECTS	AVIATION	AIR DEFENSE	CBRNE	ENGINEER	PROTECTION	SCIF	BOC	NOC
COMMAND GROUP		P	A			X		X	P	P																	
S1 PERSONNEL (note 1)	P		P																								
S1/PAC (note 2)	A	P																									
S4 LOGISTICS																											
S8 RESOURCE MANAGEMENT																											
CHAPLAIN	X																										
SURGEON/MEDICAL																											
INSPECTOR GENERAL	X																										
PUBLIC AFFAIRS	P																										
LEGAL	P																										
SAFETY																											
S2 INTELLIGENCE																									P		
S3 OPERATIONS														P				P	P	P	P	P	P	P		P	
S5 PLANS (note 3)													P														
S6 COMMUNICATIONS																											P
S7 INFORMATION OPS																	P										
S9 CIVIL AFFAIRS																P							P				
SUPPORT OPERATIONS (note 4)													P														
FIRE AND EFFECTS													P							A	A						
AVIATION													P						A		A						
AIR DEFENSE													P						A	A							
CBRNE (note 5)													P										P	P			
ENGINEER													P				P					P		P			
PROTECTION (note 7)													P									P	P				
SCIF (note 6) (note 8)												P															
BOC (note 8)													P														
NOC (note 8)															P												

A = Required Adjacency
P = Proximity Desirable
X = Separation Needed
"blank" no functional relationship or adjacency requirements

Security Zone 1	Limited Access for physical and personal security purposes
Security Zone 2	Controlled access for operational and information security purposes
Security Zone 3	Restricted access

Brigade Headquarters adjacency matrix notes:

1. S-1 Personnel: Combined with S4 as a sustainment section.

2. S1/PAC: Personnel Action Center. Provides customer service. Location should avoid cross traffic with the command group.

3. S5 Plans: combined with S3.

4. Support Operations or SPO is a major separate staff element in Sustainment brigades.

5. Chemical, Biological, Radiological, Nuclear and Explosives: collocated with S3.

6. Sensitive Compartmented Information Facility (SCIF). Associated with S2. The SCIF will be adjacent to an exterior parking area for tactical SCIF vehicles. The exterior Tactical SCIF Vehicle Area (TSVA) will need vehicle interconnectivity with the internal building SCIF. The TSVA will be in a secured, screened, fenced yard with controlled access. Allowance should be made for two vehicles to park side-by-side within the enclosure.

7. 'Protection' is the MP section in the Combat Support Brigade (Maneuver Enhancement): collocated with S2 or S3.

8. A variance is permitted for the desired proximity between the SCIF, BOC, and NOC and the Brigade staff sections. The intent is to allow for the consolidation of the SCIF, BOC, and NOC on the ground floor for ease of deployment and to accommodate the adjacency requirement between the SCIF and TSVA.

9. In the consolidated Battalion/Brigade HQ concept, the staff sections for each battalion headquarters shall be consolidated on a single floor, and the brigade staff sections shall be physically separated from battalion staff sections.

10. Security Zone areas shall be segregated from one another by space separation, physical barriers, or placement of spaces on separate floors of the building.

3.2.2. Omitted

3.2.3. Functional Space Descriptions and Performance Requirements

Command Section	Zone 1	The command section corresponds to the office of the CEO of a corporation. It needs to be located away from heavy traffic activities and must provide a means for support personnel to control the flow of visitors. It also needs to be located with proximity to the main entrance that allows visitors to have access to the reception area without moving through operational areas of the building such as SCIF, BOC, and the work areas of the S-2 and S-3. The legal staff, public affairs staff and the chaplain are outside the area controlled by the commander's assistants. They need ready access to the commander on a recurring basis, but they also have their own visitors who normally should not come inside the command suite.
S-1	Zone 1	The S-1 office (Human Resources) is equivalent to the human resources department of a corporation. While the S-1 has representatives who support operational activities in the building, they serve a clientele that often does not have a requirement for access to operational areas. While it corresponds to the human resources department, it generally does not provide customer service to individual soldiers. Rather, the S-1 serves human resource specialists from subordinate organizations and agencies. The S-1 section frequently provides the personnel who control access to the commander and so proximity to the command suite is recommended as long as traffic to the S-1 does not invade the privacy of the command suite.
S-2	Zone 2	The S-2 office (Intelligence Surveillance and Reconnaissance) supports the commander in the areas of opposition research, terrain analysis and weather. The activity of the S-2 section involves a variety of secure communications capabilities and much of their workspace is inside of

		the SCIF (Brigade Headquarters only) portion of the building and requires strict access control. They also require direct access to a secure exterior vehicle compound adjacent to the SCIF. It should be located away from areas that have customer service activities related to other sections.
S-3	Zone 2	The S-3 (Coordinating Staff Office – Operations, Plans and Training) officer's functions are similar to those of the chief of operations officer of a corporation. The S-3 section is responsible for planning, coordinating and supervising the mission functions of the brigade. Because the S-3 integrates the operational functions of the other staff sections as they relate to the mission, it should be as centrally located as possible consistent with other requirements and constraints. The S-3 is responsible for managing the brigade operations center (BOC) (Brigade Headquarters Only), which is a restricted area. Much of the work of the S-3 involves dealing with classified information and communications means and, as such, it should be isolated from activities that generate traffic that is not related to the operational function of that section.
S-3	Zone 2	The S-3 Special Staff Office houses a variety of staff elements that are generally autonomous from one another, but which work under the direction of the S-3 office. Each section is aligned with a special function that directly supports the operations of the brigade or battalion and which must be carefully integrated into the S-3 office. Each section is aligned with a special function that directly supports the operations of the headquarters and which must be carefully integrated into the overall operations of the command. When the BOC is active each of these sections provides support staff inside the BOC. Within the section the aviation, fires and effects, and air defense elements have a high degree of interaction. The engineer and chemical elements are more independent of the other sections. Like the S-3 coordinating staff they should be located in a manner that isolates them from activities that generate traffic that is not related to the operational function of that section such as the S-1 and S-4.
S-4	Zone 1	The logistics operations office is responsible for the administration of the logistics, transportation and maintenance functions and programs within the brigade. It does not perform any industrial type functions. It generates traffic that should be excluded from operational areas. It does not provide direct customer service. Most of the traffic it generates will be logistics, transportation and maintenance managers from subordinate organizations.
S-6	Zone 2	The S-6 Information Management office operates the NOC (Brigade Headquarters only) with personnel assigned to the Brigade Signal Company. The S-6 is similar to the IT section of a corporation. At the brigade level, it performs policy and management functions but is not necessarily involved in the day to day operation of the networks or communications systems. Similarly it does not provide help desk or hardware and software management. Rather, it provides plans and policies for the organization as a whole and exercises staff supervision of the IT specialist who provides direct support to users.
S-7	Zone 2	The S-7 Information Operations office plans and conducts sensitive operations involving the relationship between the military and the civilian populations when the brigade is deployed. They have a high

		correlation to the S-3 Operations and Plans officers, the BOC and the SCIF. They should be located away from high traffic areas. The S-7 section needs to have ready access to the SCIF and the BOC. The personnel spaces in this section are from other organizations.
BOC	Zone 3	The brigade operations center BOC Brigade Headquarters only is similar to an emergency operations center in a local city or county. It provides a venue for interdisciplinary collaboration by specialists from the various staff elements. It is a secure area with restricted access. Only personnel on approved rosters or those who have a verified clearance and need to know are admitted to the BOC. Complimentary technological such as card access and procedural methods are used to control access. a The BOC does not normally operate at full capacity except during an exercise or during preparation for deployments. While the duration of its intense use may be limited, it is also possible that it will be the site of extended operations at full capacity as military preparations continue in anticipation of a political decision to employ military forces. It has work stations connected to all critical networks that are manned by representatives of the various staff agencies. Each of the representatives is "on loan" to the BOC and therefore has another permanently assigned work area. In addition to the main floor, the BOC may provide areas adjacent to the floor for smaller collaborative meetings. The BOC should be located with proximity to the S-3 and isolated from non-operational traffic to the extent possible.
SCIF	Zone 3	The Sensitive Compartmented Information Facility (SCIF) (Brigade Headquarters only) is the portion of the facility that is supervised by and primarily supports the S-2 staff section. It is a restricted space that needs to have ground level access to an enclosure capable of containing up to 9 HMMWVs (High-Mobility Multipurpose Wheeled Vehicles) or other large tactical vehicles with trailers in a controlled area. Complimentary technological and procedural methods are used to control access.
NOC	Zone 3	The Network Operations Center (NOC) (Brigade Headquarters only) is the area where S-6 personnel and personnel from supporting activities perform network control operations. It includes workstations for each individual working within the area. It is a restricted access area that directly supports the SCIF and the BOC as well as providing general support to the internal communications of the rest of the headquarters building. Complimentary technological and procedural methods are used to control access.

3.3. TECHNICAL REQUIREMENTS

3.3.1. Site Design

The following site design requirements are applicable to the design of the Brigade Headquarters (HQ) Facility. :

(1) Tactical SCIF Vehicle Operation Areas (TVSA) at Brigade Headquarters. A parking area for 9 HMMWV vehicles or other large tactical vehicles, as utilized by the unit, with trailers shall be located in the secure area and immediately adjacent to the interior SCIF. This area shall have an unobstructed exposure to the southwestern sky for direct satellite communication. The area shall be provided with the following features: 1) a perimeter fence consisting of a 6-foot high chain link fabric topped by a single outrigger with three-strand barbed wire designed in accordance with STD 872-90-03, FE-6, chain link security fence details. Provide organizational vehicle and

personnel gates that are manually operated and manually secured. 2) Provide approximately 13,000 square feet of rigid concrete pavement designed to support HMMWV vehicles or other large tactical vehicles, as utilized by the unit,with trailers 3) A 10-foot wide zone clear of trees and shrubs is required on each side of the fence. The clear zone should require minimal maintenance, and the area 5 feet each side of the fence should be provided with gravel and treated to discourage vegetation growth. Provide 6-inch high concrete wheel stops for each parking stall 6 feet from the exterior wall of the Brigade Headquarters to prevent damage to the building by vehicle impact. No above ground transformers, generators, or mechanical equipment shall be located in this area

(2) Exterior Lighting. Sidewalks, service yards and parking areas shall have exterior lighting. See Chapter 6 for additional information and requirements.

(3) Privately Owned Vehicles (POV) Parking. POV parking to be provided by others.

3.3.2. Architecture Design

Exterior architectural features of the building shall be designed based on the following and in accordance with the Installation Design Guide.

(1) Natural Lighting. Provide windows for natural lighting and ventilation in all office areas, ensuring compliance with Anti-Terrorism/Force Protection requirements.

(2) Building Entrance. Provide attractive entry features such as canopies and large glass wall surfaces, ensuring compliance with Anti-Terrorism/Force Protection requirements.

(3) Sound Insulation. Provide sound insulation to meet a minimum rating at doors, walls and floor/ceiling assemblies of STC 45 in the Command Conference Room for the Brigade (HQ) Headquarters and at all secure Brigade Headquarters areas such as the Brigade Operations Center (BOC), Network Operations Center (NOC), and Sensitive Compartmented Information Facility (SCIF) as required per ASTM E413-04, Classification for Rating Sound Insulation. Provide sound insulation in all other areas of the Brigade (HQ) Headquarters to meet a minimum rating of STC 42 at walls and floor/ceiling assemblies, and a rating of STC 33 for doors, which are to be solid core wood in a metal frame. In addition to the sound insulation required, video teleconferencing areas shall meet a Noise Criteria (NC) 30 rating in accordance with ASHRAE Fundamentals Handbook.

(4) Office and Administrative Areas. The open office areas for staff sections (S-1, and S-2, etc.) in different security zones should be separated from one another by physical separation, walls, or floors. The intent is to provide visual separation between staff sections within a headquarters, with maximum flexibility for future change within open office areas. A similar preference exists for private offices within the staff section, with the exception that they will require doors for privacy. The command section offices shall be constructed to provide privacy and sound control in accordance with SOUND INSULATION paragraph above. The intent for the command section offices is to provide a more permanent type of construction, but still to minimize load-bearing walls so as to accommodate future reconfiguration. This same construction requirement exists for walls between headquarters in a consolidated headquarters facility.

(5) Message Center. Construct the Message Center / Mail Sorting Room to provide adequate security for mail storage and distribution. Structural requirements are as follows: Provide doors with suitable locks and door hinges. Lock shall be a key-operated, mortised, or rim-mounted lock; have a dead bolt throw of one inch; be of double cylinder design; have five pin tumbler cylinders; with two of mushroom or spool-type drive pin design; have 10,000 key changes; have no master key and contain hardened saw resistant steel inserts if the bolt is visible when locked. The strike shall be made of steel. A high security padlock and hasp may be used in lieu of above. Mount the hinges inside to prevent their removal from the outside. Door hinges mounted on the outside shall have non-removable or spot welded pins. Access doors shall be of sheet metal material not less than 16 gauge in thickness, or a solid wooden door covered on the outside with a steel plate not less than 12 gauge in thickness. Ground level windows shall have bars. Cover above ground level windows with wire mesh security screen. Walls and ceilings shall be constructed of material to prevent forcible entry. Minimum requirements shall be to provide expanded steel fabric behind gypsum board walls and ceiling. Provide provisions for ICIDS (Internal Commercial Intrusion Detection System) in facilities that are not operational on a 24-hour basis. AT/FP requirements for Mail Rooms as specified in UFC 4-010-01 are not applicable for the Message Center / Mail Sorting Room.

(6) Secure Documents Room. The Secure Documents Room in the S-2 area shall bedesigned and constructed in accordance with AR 380-5 and classified for Open Storage.

(7) NOC (Network Operations Center) The NOC shall be designed and constructed as a secure room in accordance with AR 380-5 and classified for open storage.

(8) BOC (Brigade Operations Center). The BOC will need to accommodate Government-furnished television screens (wall of knowledge) and monitors. The BOC will be designed and constructed as a secure room in accordance with AR 380-5 and classified for open storage.

(9) SCIF (Sensitive Compartmented Information Facility. The SCIF shall be designed and constructed for accreditation in accordance with DCI Directive 6-9 and Office of the Director of National Intelligence – Intelligence Community Standard Number 2009-705-1. The SCIF shall be and classified for open storage.

3.3.3. Fire Protection

(1) Standards and Codes. All fire protection and life safety features shall be in accordance with UFC 3-600-01 and the criteria referenced therein. Brigade (HQ) Headquarters Facilities shall be classified as mission essential and shall be provided with complete sprinkler protection.

(2) Fire Protection and Life Safety Analysis. A fire protection and life safety design analysis shall be provided for all buildings in the project. The analysis shall be submitted with the interim design submittal. The analysis shall include classification of occupancy (both per the IBC and NFPA 101); type of construction; height and area limitations (include calculations for allowable area increases); life safety provisions (exit travel distances, common path distances, dead end distances, exit unit width required and provided); building separation or exposure protection; specific compliance with NFPA codes and the IBC; requirements for fire-rated walls, doors, fire dampers, etc.; analysis of automatic suppression systems and protected areas; water supplies; smoke control systems; fire alarm system, including connection to the base-wide system; fire detection system; standpipe systems; fire extinguishers; interior finish ratings; and other pertinent fire protection data. The submittal shall include a life safety floor plan for all buildings in the project showing occupant loading, occupancy classifications and construction type, egress travel distances, exit capacities, areas with sprinkler protection, fire extinguisher locations, ratings of fire-resistive assemblies, and other data necessary to exhibit compliance with life safety code requirements.

(3) Sprinkler System. The Facility shall be fully protected with automatic sprinkler systems. All floors and all areas of the facilities shall be protected. The sprinkler system design shall be in accordance with UFC 3-600-01 and NFPA 13. The sprinkler hazard classifications shall be in accordance with UFC 3-600-01, NFPA 13, and other applicable criteria. Design densities, design areas and exterior hose streams shall be in accordance with UFC 3-600-01. The sprinkler systems shall be designed and all piping sized with computer generated hydraulic calculations. The exterior hose stream demand shall be included in the hydraulic calculations. A complete sprinkler system design, including sprinklers, branch lines, floor mains and risers, shall be shown on the drawings. The sprinkler system plans shall include node and pipe identification used in the hydraulic calculations. All sprinkler system drains, including main drains, test drains, and auxiliary drains, shall be routed to a 2-foot by 2-foot splash block at exterior grade.

(a) Sprinkler Service Main and Riser. The sprinkler service main shall be a dedicated line from the distribution main. Sprinkler service and domestic service shall not be combined. The sprinkler service main shall be provided with an exterior post indicator valve with tamper switch reporting to the fire alarm control panel (FACP). The ground floor entry penetration shall be sleeved per NFPA 13 requirements for seismic protection. The sprinkler entry riser shall include a double check backflow preventer, a fire department connection, and a wall hydrant for testing of backflow preventer. The sprinkler system shall include an indicating control valve for each sprinkler system riser, a flow switch reporting to the FACP, and an exterior alarm bell. All control valves shall be OS&Y gate type and shall be provided with tamper switches connected to the FACP. Facilities with multiple floors shall be provided with floor control valves for each floor. The floor control valve assembly shall be in accordance with UFC 3-600-01, Figure 4-1..

(b) Exterior Hose Stream. Exterior hose stream demand shall be in accordance with UFC 3-600-01. Exterior hose stream demand shall be included in the sprinkler system hydraulic calculations.

(c) Backflow Preventer. A double check backflow preventer shall be provided on the fire water main serving each building. This shall be located within the building. An exterior wall hydrant with dual hose connections with OS&Y valve shall be provided to allow testing of backflow preventer at design flow as required by NFPA 13.

(d) Fire Department Connection. A fire department connection shall be provided for each building with sprinkler protection. These shall be located to be directly accessible to the fire department.

(4) Elevators. The fire protection features of elevators, hoist ways, machine rooms and lobbies shall be in accordance with UFC 3-600-01, ASME A17.1, NFPA 13 and NFPA 72.

(5) System Components and Hardware. Materials for the sprinkler system, fire pump system, and hose standpipe system shall be in accordance with NFPA 13 and NFPA 20.

(6) Protection of Piping Against Earthquake Damage. Sprinkler and fire pump piping systems shall be protected against damage from earthquakes. Seismic protection shall include flexible and rigid couplings, sway bracing, seismic separation assemblies where piping crosses building seismic separation joints, and other features as required by NFPA 13 for protection of piping against damage from earthquakes.

(7) Fire Water Supply. Fire flow test data is provided in Appendix D.

(8) Fire Pump. The requirement for a fire pump installation shall be determined by the Contractor based on fire flow test data from the project site and fire protection system design requirements for the project. If required a complete fire pump installation shall be provided for the facility. It shall comply with the requirements of UFC 3-600-01, NFPA 13 and NFPA 20. The Contractor shall submit fire pump design analysis and drawings in the design requirements.

(9) Fire Alarm and Detection: Refer to 3.3.5, Electrical and Communication Systems, for requirements.

(10) Building Construction. Construction shall comply with requirements of UFC 3-600-01, the International Building Code and NFPA 101.

(a) Fire Extinguishers Cabinets and Brackets. Fire Extinguisher cabinets and brackets shall be provided when fire extinguishers are required by UFC 3-600-01 and NFPA 101. Placement of cabinets and brackets shall be in accordance with NFPA 10. Semi-recessed cabinets shall be provided in finished areas and brackets shall be provided in non-finished areas (such as utility rooms, storage rooms, shops, and vehicle bays). Fire extinguishers shall not be provided in this contract.

(b) Interior Wall and Ceiling Finishes. Interior wall and ceiling finishes and movable partitions shall conform to the requirements of UFC 3-600-01 and NFPA 101.

3.3.4. Mechanical

(1) Exterior Equipment

No aboveground mechanical equipment (i.e. chillers, refrigeration equipment, condensers, air-handling equipment, etc.) and miscellaneous equipment (including transformers and generators) shall be physically located within Secure Vehicle Parking Areas.

(2) Design Data

(a) Actual internal equipment loads (i.e. heat dissipation) for finalized HVAC system sizing purposes shall be acquired from the USER or applicable point-of-contact (POC), and is the responsibility of the Design/Build Contractor. For baseline purposes, estimated internal equipment loads (i.e. heat dissipation) shall be as follows: For the NOC, BOC, and SCIF areas, use 250 square foot per ton; for the Server Room areas, use 150 square foot per ton; for Communication-type rooms/areas (Tele/Comm, SIPRNet, etc), use 300 square foot per ton. For all rooms/areas with the exception of the SCIF area, it shall be assumed that each personnel/workstation area, cubicle, and office space is assigned a personal computer (desktop) for HVAC load calculation purposes. For the SCIF area, it shall be assumed that each personnel/workstation area, cubicle and office space is assigned three (3) desktop computers for HVAC load calculation purposes. The quantity of personnel within each Conference room/area shall also be based on one person per 20 square feet of floor area.

TABLE I: INDOOR DESIGN DATA

Heating	
General Indoor Design Temperature	70°F
Unoccupied Space Design Temperature	55°F
BOC, NOC, SCIF, Communication Room	72°F
*Server Room	*72°F/50%RH plus/minus 5%
Mechanical Rooms (freeze protection)	40°F
Cooling	

General Indoor Design Temperature	75°F
BOC, NOC, SCIF, Communication Room	72°F
*Server Room	*72°F/50%RH plus/minus 5%

* Areas in which humidity control (i.e. humidifcation, reheat, etc.) is required.

(3) HVAC System Requirements for Critical Areas and UPS System

(b) The Brigade Operations Center (BOC), the Network Operations Center (NOC), and the Sensitive Compartmented Information Facility (SCIF) will be served by an independent and dedicated air-handling system. These areas are allowed to be combined on a common system depending on the load profile and zoning requirements for each space. Equipment redundancy shall be provided per Table II Redundancy/Reliability Matrix.

(c) Communications room will each be served by an independent and dedicated air-handling system. Air handling unit system(s) shall not be floor-space mounted within the actual space served. Communications rooms for the Brigade Headquarters shall be provided with equipment redundancy per Table II Redundancy/Reliability Matrix.

(d) Server room(s) will each be served by an independent and dedicated air handling system. Air handling unit system(s) are allowed to be floor-space mounted within the actual space served. Equipment redundancy shall be provided per Table II. Computer room type air conditioning units shall be provided to condition server rooms

(e) The BOC, NOC, and SCIF areas are located on raised floors. The use of an Under Floor Air Distribution (UFAD) system for these areas is not mandatory, nor a requirement.

(f) Omitted.

(g) A UPS system which serves the BOC, NOC, SCIF, server rooms, and communications rooms is required to be provided (see electrical requirements). HVAC system(s) shall be designed and provided to maintain appropriate interior environmental conditions (i.e. temperature, humidity, pressure, etc.), and to limit hydrogen gas accumulation to less than an explosive mixture. Design of HVAC system(s) shall meet the system manufacturer's requirements and applicable code requirements such as OSHA, NFPA 1, NFPA 111, NFPA 70, etc. Ventilation/exhaust system shall be provided as required and shall be an independent and dedicated system which is separate from all other building systems. Air recirculation within the battery area is not allowed, and where required, mechanical components of the ventilation system shall be explosion-proof. Appropriate alarms and automatic controls shall be provided to automatically detect and sound audible(s) alarm upon malfunction of ventilation system. A malfunction of ventilation system shall prevent the battery charging system from operating. Design features of the battery area/room shall address all requirements such as ventilation, fire protection, hazardous material reporting and disposal, and spill control.

Table II: Redundancy/Reliability Matrix

REDUNDANCY/RELIABILITY MATRIX			
Category	**Area Served**	**Emergency Power**	**Requirement**
Cooling Equipment and Associated Controls	BOC	Yes	100% Dedicated redundancy required for cooling equipment.
	NOC		
	SCIF		
	Server Rooms		
	Communications Rooms		
Air-handling Equipment and Associated Controls	BOC	Yes	100% Dedicated redundancy is required
	NOC		
	SCIF		
	Server Rooms		
	Communications Rooms		
Piping	BOC	Yes	Provide 100% redundant cooling and heating piping feeds to air-handling
	NOC		
	SCIF		

	Server Rooms Communications Rooms		equipment serving these areas

Notes:

1. Provide all required equipment, components, controls, and other appurtenances on emergency power such that 100% cooling capacity is available and provided to the BOC, NOC, SCIF, Server Rooms, and Communication Rooms.SCIF and Server/Communication Rooms.
2. Where redundancy requirements dictate the use of packaged equipment for an area or combination of areas, two (2) separate sets of packaged equipment, each at 100% capacity, are required to be provided.
3. The above categorized equipment requiring emergency power is not required to be on UPS.
4. For equipment requiring emergency power, controls must have battery back-up or non-volatile memory to facilitate automatic re-start upon restoration of emergency or normal power.facilitate automatic re-start upon restoration of emergency or normal power.
5. Where centralized underground piping distribution system is utilized as a cooling and heating fuel source, it must be available year-round, 24-hrs/day, 7-days/week, and an additional and separate cooling system shall be provided to serve as the required 100% capacity backup.
6. System redundancy requirements for the BOC, NOC, SCIF, Server and Communication Rooms include the capability of automatic monitoring and automatic system switch-over in the event of a system operational failure or malfunction, and also to equalize systems run time. System operational failure or malfunction shall produce an audible and visual alarm for the occupants.

(4) HVAC System Requirements for Administrative Areas

The capability of extending the regularly-scheduled operating hours of the HVAC systems (Administrative and Classroom areas) shall be provided. Provide HVAC provisions for accommodating the Duty Officer's 24/7 occupancy pattern. Provisions shall consider the normal after-hour shut-down of the main building heating/cooling system. Administrative areas shall be temperature-controlled by the DDC System. Temperature setpoint adjustment shall be accomplished via DDC System by authorized personnel.

(5) Plumbing Systems

An emergency eyewash station shall be provided and located within the area of the UPS system.

3.3.5. Electrical and Communication System

See Paragraph 6 for clarifications and additional requirements for the electrical and communication systems.

(1) Exterior Electrical

(a) Exterior Generator (Brigade Headquarters Only). One automatic start-stand-by power generator to serve mission essential areas and life safety systems as defined by paragraph Stand-by Power System (Brigade Headquarters Only) shall be provided. Locate in a secure area outside of the building in a weatherproof enclosure. A fuel tank shall be provided to serve the generator for 48 hours of operation at full load.

(b) Power Connections for Tactical SCIF Vehicle Area (TSVA). Provide underground systems for power connectivity to the TSVA. Power shall be capable of accommodating user power requirements to each tactical SCIF vehicle tactical SCIF vehicles, as determined by the Government for manned and unmanned platform support without using the platform's onboard power. Connection points shall be designed to service and prevent damage from the vehicles.

(c) Security Infrastructure for Tactical SCIF Vehicle Area (TSVA). Security infrastructure systems shall be installed to support Government-furnished equipment including ICIDS systems, CCTV surveillance systems, and restricted access systems. Provisions shall include dedicated power circuits, communications connections, raceways, and signal wiring for user installed devices. System requirements shall be coordinated with the installation security office.

(2) Exterior Communication

(a) Outside Plant Telecommunications Systems. The project's facilities shall connect to the Installation telecommunications (voice and data) system through the outside plant (OSP) underground infrastructure per I3A Criteria. Connections to the OSP cabling system shall be from each facility main cross connect located in the main telecommunications room to the closest OSP access point. Components include the physical cable plant and the

supporting structures. Items included under OSP infrastructure encompass, but are not limited to, maintenance hole and duct infrastructure, copper cable, fiber optic cable, cross connects, terminations, splices, cable vaults, and copper and FO entrance facilities.

(b) Data Connections for Tactical SCIF Vehicle Area (TSVA). Provide underground pathway systems for telecommunications connectivity from the SCIF in the main building toeach TSVA vehicle. Connection points shall be designed to service and prevent damage from the vehicles. Connection to NIPRNet and SIPRNet shall be established through fiber optic cabling provided by others. Pathways terminating in the SCIF shall terminate in the server rooms.

(3) Interior Electrical and Communications

(a) Electrical

i. Characteristics. Select electrical characteristics of the power system to provide a safe, efficient, and economical distribution of power, 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.

ii. Nonlinear Loads. The effect of nonlinear loads such as computers and other electronic devices shall be considered and accommodated as necessary. These loads generate harmonics, which can overload conventionally sized conductors or equipment and thereby cause safety hazards and premature failures. Circuits serving such devices shall be equipped with a separate neutral conductor not shared with other circuits. Panelboards and any dry type transformers shall be rated accordingly.

iii. Lightning Protection System and Transient Voltage Surge Protection. Design shall be in accordance with NFPA 780 and other referenced criteria. Provide transient voltage surge protection.

iv. Receptacles. Power receptacles shall be provided per NFPA 70 and in conjunction with the proposed equipment and furniture layouts. Provide power, data and telecommunications connectivity to each workstation. A duplex receptacle shall be accessibly located adjacent to each voice, data and CATV outlet. Power poles shall not be used.

v. Stand-by Power System (Brigade Headquarters Only). Stand-by generator(s) and automatic transfer switch (with internal isolation/bypass capabilities for maintenance) shall be provided. System shall serve all mission essential areas including the BOC, NOC, SCIF, TSVA Vehicles, communications rooms, SIPRNet rooms, and server rooms. (HVAC in these areas shall also be included.) In addition, system shall serve life safety and emergency loads that include, but shall not be limited to, elevator, emergency egress and exit lighting, fire alarm system, mass notification system, security systems, and other emergency circuits.

vi. UPS Systems (Brigade Headquarters Only). UPS to serve the BOC, NOC, SCIF, server rooms, SIPRNET and communication rooms shall be provided. Unit(s) shall have a minimum of 5 minutes of capacity at full load to allow for generator override or orderly shut down of critical loads if the generator power fails to go on line. Unit(s) shall have isolation/bypass capabilities for maintenance and shall utilize leak proof maintenance-free sealed lead-acid batteries with suspended electrolyte.

vii. Provide a minimum of 20% spare circuit and load capacity at all levels of the power distribution system.

(b) Lighting. Lighting and lighting controls shall comply with the recommendations of the Illumination Engineering Society of North America (IESNA) and the requirements of ASHRAE 90.1. Lighting shall be compatible with security cameras and security requirements.

i. Interior Lighting. Interior ambient illumination shall provide a generally glare free, high quality lighting environment and conform to IESNA RP-1-04.

ii. Interior Lighting Controls. Local manual controls shall supplement automatic controls in offices and specialized areas including all conference rooms, and the BOC, NOC, and SCIF areas in the Brigade Headquarters. Occupancy sensor controls shall be provided in restrooms, electrical rooms, telecommunications rooms, and similar spaces.

iii. Special Lighting Circuits. All classrooms and conference rooms shall have a circuit for general lighting, a circuit, to focus light on the speaker, and a dimmable circuit to focus light over student desks (or conference table) without glare on audio-video displays. The BOC, NOC, and SCIF areas in the Brigade Headquarters shall have a circuit for general lighting and a dimmable circuit to focus light over the general work area without glare on audio-video displays. Dimming ballasts shall be capable of dimming to 5 percent. A single lighting system with control capability of meeting all these requirements may be used.

(c) Telecommunications

An acceptable building telecommunications system encompasses, but is not limited to, copper and fiber optic (FO) entrance cable, protectors, termination equipment, racks, cable management, patch panels, copper and fiber backbone cable, conduits, cable tray, cable ladder, copper and/or fiber horizontal distribution cable, outlets, grounding, and labeling. Telecommunications infrastructure shall meet the Installation Information Infrastructure Architecture (I3A) Criteria and ANSI/TIA/EIA requirements

i. Telecommunications Rooms (TR)

Telecommunications rooms and telecommunications entrance facilities shall be provided for the network and voice equipment, and cabling infrastructure. There shall be a minimum of one telecommunications room on each floor, located near the center of the building, and preferably stacked between floors. Additional telecommunication rooms shall be provided as necessary to insure that the horizontal copper cable length does not exceed the 295 foot limitation. The telecommunications rooms shall be designed and provisioned in accordance with I3A and ANSI/TIA/EIA-569-B. A main TR with telecommunications entrance capability shall be provided for each facility, and shall be located on the first floor. The main TR shall serve as the hub for the interior backbone single mode fiber cable and copper riser cable to each of the other TRs, and the Brigade Headquarters SCIF Server room (single mode fiber only), BOC AV Server room and NOC server rooms. Backbone cabling shall be provided in accordance with I3A. Telecommunications within the Brigade Headquarters SCIF, and BOC, NOC shall be distributed from the respective Server Room.

Each TR shall also have the following requirements:

- Access shall be from a centralized corridor within the building: (No exterior access shall be allowed).
- Door shall be three foot wide opening outward.
- Room shall be a minimum of 8 feet wide to accommodate working clearances around data equipment and racks. Odd shaped TR's (e.g. "L" shaped) that decreases the useable area for backboards, racks, etc. shall be avoided.
- A fire-rated A-C plywood backboard (3/4 inch thick) around interior perimeter.
- Illumination shall be 50 foot-candles (average).
- Dedicated emergency/UPS power panel for all active equipment.

Brigade Headquarters				
	Main TR (1st Floor)		TR (2nd Floor)	
Building	Width Feet (min)	Square Feet (min)	Width Feet (min)	Square Feet (min)
Extra Small	8	125	8	100
Small	8	125	8	100
Medium	8	125	8	130
Large	8	150	8	140
Extra Large	8	295	8	150
Additional TR (If Required)	8	80	8	80

Notes

1. Width is a minimum inside edge of wall to inside edge of wall dimension inside the room. Length shall be greater than or equal to width.

2. Standard Drawings may be adjusted as needed, but the Telecommunications rooms shall not be less than the minimum width and square feet indicated above.

3. Telecommunications rooms shall be rectangular in shape.

ii. Telecommunications Outlets. Telecommunications outlets shall be provided per I3A based on functional purpose of the various spaces with the facility as modified by user special operational requirements and herein. Each headquarters workstation shall have voice and data connection capability. Each conference room shall have voice capability (minimum one outlet per room) and data connection capability (minimum one outlet per person) in accordance with I3A. A data outlet shall be provided at each copier location. A wall mounted telephone outlet with a single jack shall be provided in each mechanical, electrical, telecommunication rooms, and secure storage rooms. For controlled access areas, provide outlets for wall mounted (GFGI) phones at access points. Additional locations

shall be provided based on coordination with the facility user and where required for HVAC, other equipment and as required by I3A.

iii. Cable Trays. Provide cable tray pathways through-out the facility to support the systems required for the construction of the facility as well as user's computer networks, video integration system, telecommunication systems and other specialized electronic systems.

iv. Raised Access Flooring. Areas with high concentrations of cabling will have raised access flooring to accommodate flexibility and growth. Signal grounds shall be provided in a grid pattern under all raised floor areas in accordance with MIL-HDBK 419A. Minimum height of raised flooring shall be 6 inches.

(d) Secure Communications

i. Secure Communications Rooms. The SIPNET room(s) shall be designed and constructed in accordance with the "Building SIPRNET Communications Room – New Construction Guidance", paragraph on the Technical Guide for the Integration of the Secret Internet Protocol Router Network (SIPRNET). These rooms shall be separate dedicated rooms (minimum size shall be 6'X6') and shall include a communication signal ground busbar, connected to the main telecom room signal busbar via properly sized ground wire (see MIL-HDBK-419-A), and one dedicated 20-amp circuit for the SIPRNet rack/safe, in addition to convenience outlets. The connection to the main telecommunications room will be via a single 2-inch trade size steel conduit in accordance with the I3A Criteria.

ii. Secret Internet Protocol Router Network (SIPRNet). The distribution infrastructure shall be designed and constructed in accordance with the Technical Guide for the Integration of the Secret Internet Protocol Router Network (SIPRNET). The word "shall" shall be substituted for the word "should" or "will" in the paragraph "Protective Distribution System" and the referenced publication NSTISSI 7003. A secure outlet box shall be provided in each private office, conference room, and other areas as directed. Distribution shall include the SCIF, BOC, and NOC in the Brigade Headquarters. A Protective Distribution System (PDS) shall be provided in all limited and uncontrolled access areas. Specifications Section 27 05 28.39, Surface Raceways for Communications Systems shall be incorporated into this project. . (This section can be obtained at the following URL: ftp://ftp.usace.army.mil/pub/sas/Surface_Raceways/). Surface mounted raceway shall be used instead of the surface mounted conduit unless otherwise directed by the local DOIM or Physical Security Officer. Category 6 UTP copper cables with red cable jacket shall be included and shall be terminated at both ends in accordance with the I3A Technical Guide for data cables. Where cable runs exceed 295 feet, see guidance in SIPRNET Tech Guide, paragraph "Building SIPRNET Communication Room – New Construction Guidance".

iii. Secure Videoteleconferencing (VTC). Secure VTC shall be provided in each , and each Brigade Headquarters Command Conference Room, BOC, and SCIF. Provisions generally consist of a power connection and two RJ45 SIPRNET outlets (in a secure outlet box).

(e) Cable Television (CATV). CATV shall be provided in all private offices, and conference rooms. Additionally, CATV shall be provided in the Brigade Headquarters BOC, NOC, and SCIF. The cable television system shall consist of cabling, pathways, and outlets. All building CATV systems shall conform to APPLICABLE CRITERIA to include I3A Criteria and the UFC 3-580-01 Telecommunications Bldg Cabling Systems Planning/Design.

(f) Audio/Visual Systems

i. GFGI Projectors. Provisions (consisting of a power receptacle and conduit for signal wiring) for a GFGI projector shall be provided in each conference room.

ii. Paging systems. A zoned paging system shall be provided throughout eachfacility and integrated with the telephone system.

iii. Video Teleconferencing (VTS) provisions. Video teleconferencing (non-secure) provisions shall be provided in all conference rooms and classrooms. Provisions generally consist of a power connection and two RJ45 data outlets in a double gang outlet faceplate.

(g) Security Infrastructure (Security Equipment NIC). The security infrastructure shall be installed to support Government-furnished equipment including cameras, door alarms, and motion sensors. ICIDS systems, CCTV surveillance systems, and restricted access systems. Provisions shall include dedicated power circuits, communications connections, raceways, and signal wiring for user installed devices. System requirements shall be coordinated with the installation security office.

i. Intrusion Detection and Security Systems. Provision for user provided ICIDS intrusion detection and security systems are required for secure and restricted areas including the Secure Document vaults and the SIPRNet rooms. The Brigade headquarters BOC, NOC, and SCIF shall also have provisions. As a minimum, provisions for a CCTV surveillance system shall be provided at the Brigade Headquarters SCIF corridor, and rear exit.

ii. TEMPEST Requirements. TEMPEST requirements shall be met on a per site basis dependent on the facility zone type and the equipment NSTISSAM level. All unclassified telecommunications systems and associated infrastructure shall be electrically and physically isolated from all classified telecommunications systems in accordance with NSTISSAM requirements.

(h) Mass Notification System (MNS). A mass notification system shall be provided as required by UFC 4-010-01.

(i) Grounding. The ground counterpoise shall be provided around the building perimeter and shall be utilized for grounding incoming service, building steel, telephone service, piping, lightning protection, and internal grounding requirements. Ground straps shall be provided where required by function and will be connected to the building grounding system. A grounding point shall be provided under each raised access floor. Additional grounding may be provided based on project requirements. Systems shall conform to NFPA 70 National Electrical Code, local codes, and the US Army I3A Criteria.

(j) Fire Detection and Alarm

i. A fire alarm and detection system shall be provided for this facility. It shall comply with the requirements of UFC 3-600-01 and NFPA 72. The system shall be addressable and fully compatible with and integrated with the local installation wide central monitoring system.

ii. All initiating devices shall be connected to signal line circuits (SLC), utilizing Class A, Style 6 wiring . All alarm appliances shall be connected to notification appliance circuits (NAC), Class A. A looped conduit system shall be provided so that if the conduit and all conductors within are severed at any point, all NAC and SLC shall remain functional.

iii. Breakglass pull stations shall not be used.

iv. Over-voltage and surge protection shall be provided at the input power of all panels.

3.3.6. Structural Design

(1) Structural Floor Load Requirement for Brigade Secure Documents Room. The floor system for the Secure Documents room of the Brigade Headquarters Facility shall be designed to store up to 12 safe/file-cabinets. The empty shipping dead load of the cabinet is approximately 1021 lbs each. The live load of the safe/file-cabinet will be based on the latest approved addition of IBC for a “Heavy Storage” of 250 psf.

3.3.7. Compliance with the ENERGY POLICY ACT OF 2005 (EPACT 2005)

(1) EPACT 2005 Requirement. The building, including the building envelope, HVAC, ventilation and exhaust 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)

(2) Target Energy Consumption Budget. The target energy consumption budget (excluding process loads) for this facility located in DOE Climate Zone 3A is 23 kBTU per ft^2 per year or less. The use of the Prescriptive Technology Solution Set, shown below, will result in an annual energy consumption less than or equal to the target energy budget figure, will meet life cycle cost effectiveness requirements, and will not require any calculations to demonstrate compliance with the EPACT 2005, 30% better requirement utilizing the methodology described in ASHRAE 91.1, Appendix G.

(3) EPACT Methodology. See below for two paths (Prescriptive and Compliance) for demonstrating compliance with EPACT.

a. Prescriptive Path (use of technology solution set). The technology solution set shown in the table below, in combination with mandatory requirements for Battalion and Brigade headquarters (Bn-Bde hqs), stated in paragraph 3.3 and its subparagraphs, achieves the above energy performance and life cycle cost effectiveness requirements for Bn-Bde hqs facilities in the indicated DOE climatic zone. The use of the prescriptive technology solution set is optional. The contractor may elect to develop his own unique solution as described under the Compliance Path.

List of Army Bases by County in the United States.

State	County	DOE Climate Zone	Army Bases
Alabama	Calhoun	3A	Anniston Army Depot
Alabama	Dale	3A	Fort Rucker

State	County	DOE Climate Zone	Army Bases
Alabama	Madison	3A	Redstone Arsenal
Alaska	Southeast Fairbanks	8A	Fort Greely
Alaska	Anchorage	7A	Fort Richardson
Alaska	Fairbanks North Star	8A	Fort Wainwright
Arizona	Cochise	3B	Fort Huachuca
Arizona	Yuma	2B	Yuma Proving Ground
Arkansas	Pulaski	3A	Camp J. T. Robinson
Arkansas	Jefferson	3A	Pine Bluff Arsenal
California	San Luis Obispo	3C	Camp Roberts
California	Monterey	3C	Fort Hunter Liggett, Camp Roberts, Presidio of Monterey
California	San Bernardino	3B	Fort Irwin
California	Alameda	3C	Oakland Army Base, Camp Parks Pleasonton
California	Lassen	5B	Sierra Army Depot
California	San Joaquin	3B	Tracy Army Depot, Sharpe Army Depot
Colorado	El Paso	5B	Fort Carson
Colorado	Adams	5B	Rocky Mountain Arsenal
Georgia	Chatahoochee	3A	Fort Benning
Georgia	Clayton	3A	Fort Gillem
Georgia	Augusta-Richmond	3A	Fort Gordon
Georgia	Fulton	3A	Fort McPherson
Georgia	Liberty	2A	Fort Stewart
Georgia	Bryan	2A	Fort Stewart
Georgia	Chatam	2A	Hunter Army Airfield
Hawaii	Hawaii	1A	Pohakuloa Training Area
Hawaii	Honolulu	1A	Schofield Barracks, Kunia Field Station, Fort Shafter
Idaho	Elmore	5B	Idaho Launch Complex, TS Edgemeade Mtn Home
Idaho	Ada	5B	MTA Gowen Field Boise (ANG), Orchard Range TS Boise
Illinois	Madison	4A	Charles M. Price Support Center
Illinois	Rock Island	5A	Rock Island Arsenal
Indiana	Bartholomew	5A	Camp Atterbury
Indiana	Johnson	5A	Camp Atterbury
Indiana	Ripley	4A	Jefferson Proving Ground
Kansas	Leavenworth	4A	Fort Leavenworth
Kansas	Geary	4A	Fort Riley
Kansas	Riley	4A	Fort Riley
Kansas	Saline	4A	Nickell Hall
Kentucky	Christian	4A	Fort Campbell
Kentucky	Hardin	4A	Fort Knox
Kentucky	Meade	4A	Fort Knox
Louisiana	Vernon	3A	Fort Polk
Maine	Penobscot	6A	MTA Deepwoods
Maine	Oxford	6A	MTA Riley-Bog Brook
Maine	York	6A	TS Hollis Plains
Maryland	Harford	5A	Aberdeen Proving Ground
Maryland	Frederick	5A	Fort Detrick

State	County	DOE Climate Zone	Army Bases
Maryland	Ann Arundel	5A	Fort Meade
Massachusetts	Middlesex	5A	Fort Devens
Massachusetts	Worcester	5A	Fort Devens
Michigan	Crawford	6A	Camp Grayling
Michigan	Macomb	5A	Detroit Arsenal
Minnesota	Morrison	6A	Camp Riley
Mississippi	Forrest	3A	Camp Shelby
Missouri	Vernon	4A	Camp Clark
Missouri	Newton	4A	Camp Crowder
Missouri	McDonald	4A	Camp Crowder
Missouri	Pulaski	4A	Fort Leonard Wood
Nevada	Mineral	5B	Hawthorne Army Depot
New Jersey	Burlington	4A	Fort Dix
New Jersey	Monmouth	4A	Fort Monmouth
New Jersey	Sussex	5A	Picatinny Arsenal
New Mexico	Otero	3B	White Sands Missile Range
New York	Jefferson	6A	Fort Drum
New York	Kings	4A	Fort Hamilton
New York	Seneca	5A	Seneca Army Depot
New York	Orange	5A	United States Military Academy (West Point)
North Carolina	Cumberland	3A	Fort Bragg
Ohio	Ottawa	5A	Camp Perry
Oklahoma	Comanche	3A	Fort Sill
Pennsylvania	Cumberland	5A	Carlisle Barracks
Pennsylvania	Allegheny	5A	Charles E. Kelly Support Facility
Pennsylvania	Lebanon	5A	Fort Indiantown GAP
Pennsylvania	Dauphin	5A	Harrisburg Military Post
Pennsylvania	Franklin	5A	Letterkenny Army Depot
Pennsylvania	Susquehanna	5A	New Cumberland Army Depot
Pennsylvania	Monroe	5A	Tobyhanna Army Depot
South Carolina	Richland	3A	Fort Jackson
Texas	El Paso Hudspeth	3B	Fort Bliss
Texas	Bell	2A	Fort Hood
Texas	Bexar	2A	Fort Sam Houston
Texas	San Patricio	2A	Ingleside Army Depot
Texas	Bowie	3A	Red River Army Depot
Utah	Tooele	5B	Dugway Proving Ground
Virginia	Caroline	4A	Fort A.P. Hill
Virginia	Fairfax	4A	Fort Belvoir
Virginia	York	4A	Fort Eustis
Virginia	Newport News	4A	Fort Eustis
Virginia	Prince George	4A	Fort Lee
Virginia	Chesapeake	4A	Fort Monroe
Virginia	Arlington	4A	Fort Myer
Virginia	Nottoway	4A	Fort Pickett
Washington	Pierce	4C	Fort Lewis
Washington	Yakima	5B	Yakima Training Center
Washington	Kittitas	5B	Yakima Training Center

State	County	DOE Climate Zone	Army Bases
Wisconsin	Monroe	6A	Fort McCoy

Climate Zones for Army Facilities in Japan and South Korea.

Army installation	Location	Climate Zone
Japan:		
Hardy Barracks	Tokyo	3A
Camp Zama	Zama, Kanagawa	3A
Yokohama North Dock	Yokohama, Kanagawa	3A
Sagami General Depot	Sagamihara, Kanagawa	3A
Sagamihara Housing Area	Sagamihara, Kanagawa	3A
Akizuki Ammunition Depot	Hiroshima Prefecture	2A
Hiro Ammunition Depot	Hiroshima Prefecture	2A
Kawakami Ammunition Dock	Hiroshima Prefecture	2A
Gesaji Communication Site	Okinawa Prefecture	1A
Army POL Depots	Okinawa Prefecture	1A
White Beach Area	Okinawa Prefecture	1A
Naha Port	Okinawa Prefecture	1A
Fort Buckner	Okinawa Prefecture	1A
Korea: (All Army installations except those below are in climate zone)		4A
Kunsan POL Terminal		3A
Masan Ammunition Depot		3A
Yong Pyong		5A

One can use the target energy budgets shown below (column labeled “EPACT 2005 30% Better Target Energy Budget”) for eight selected Army facility types to directly determined the maximum energy consumption (not including plug or process loads) allowed which will comply with the EPACT 2005 30% Better requirement. No further analysis is required for these eight facility types to determine the target energy consumption that complies with EPACT 2005.

Climate Zone 3A EPACT 2005 Target Energy Budgets For Selected Army Facility Types

Army Facility Type	ASHRAE 90.1-2004 Baseline Target Energy Budget including Process/Plug Loads KBtu/Ft^2/yr	ASHRAE 90.1-2004 Baseline Target Energy Budget without Process/Plug Loads KBtu/Ft^2/yr	EPACT 2005 30% Better Target Energy Budget KBtu/Ft^2/Yr	Govt Prescriptive Solution Energy Budget KBtu/Ft^2/Yr
Training Barracks	125	122	85	60
UEPH	91	71	50	35
TEMF	63	56	39	25
BHQ	43	33	23	17
COF	34	28	19	15
CDC	72	59	42	31
DFAC	375	161	113	92
ARC	34	24	17	15

BHQ Climate Zone 3A, Prescriptive Solution Table(6)

Item	Component	Baseline (1)	Recommendation	
			Assembly Max (2)	Min R-Value (2)
Roof	Insulation Entirely Above Deck	R-15	U-0.0388	R-25ci
	Attic and Other			R-38
	Solar Reflectance (3)			Cool Roof for Low Slope & Light color all others
Walls	Mass		U-0.1242	R-6.5ci
	Steel Framed	R-13		R-13
	Wood Framed and Other			R-13
Floors Over Unconditioned Space	Mass		0.0739	R-10.4ci.
	Steel Joist			R-13
	Wood Framed and Other			R-13
Slab-on-Grade	Unheated	NR (4)		NR (4)
Doors	Swinging	U-0.70	U-0.70	Uninsulated
	Non-Swinging	U-1.45	U-1.45	Uninsulated
Infiltration		0.4 cfm/ft^2 @ 75 Pa	0.25 cfm/ft^2 @ 75 Pa (5)	
Vertical Glazing	Window to Wall Ratio (WWR)	Uniform Distribution	10% to 20% – east/west 10% to 40% – north/south	
	Thermal transmittance	U-0.57	U-0.45	
	Solar heat gain coefficient (SHGC)	0.37	0.37	
	South Overhangs	None	Yes; Projection Factor = 0.4	
Interior Lighting	Lighting Power Density (LPD)	1.0 W/ft2	≤ 0.9 W/ft^2	
	Occupancy Controls		Manual On/Auto Off (all periodically occupied spaces)	
	Daylighting Controls	None	Perimeter Zones	
	Plug Load Lighting		Compact Fluorescent (CFL) with electronic ballast	
	All Ballasts		Electronic	
HVAC	Air Conditioner	PSZ-AC 12.0 SEER	PSZ-AC 14.0 SEER(7)	
	Gas Furnace	80% E_t	90% E_t	
	ERV	None	None	
	All equipment		Variable Speed pumps, fans, etc.	
Economizer		NR	NR	
Ventilation	Outdoor Air Damper	Motorized Control	Motorized Control	
	Damper Control	NR	NR	
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 hot water storage	80% Et	90% Et	
	Pipe Insulation(d < 1.5in. / d ≥ 1.5 in.)		1 in. / 1.5 in. (6)	

Notes:

Baseline requirements are from ANSI/ASHRAE/IESNA Standard 90.1-2004.

1. **U-values and R-values** for assemblies and their definitions, requirements, and determinations can be found in ANSI/ASHRAE/IESNA Standard 90.1-2007, Normative Appendix A.
2. **Light colored and cool roofs**: reflect and emit the sun's heat back to the sky instead of transferring it to the building below. "Coolness" is measured by two properties, solar reflectance and thermal emittance. Both properties are measured from 0 to 1 and the higher the value, the "cooler" the roof. A high reflectance keeps much of the sun's energy from being absorbed, while a high thermal emittance radiates away any solar energy that is absorbed, allowing the roof to cool more rapidly. Cool roofs are typically white and have a smooth surface. Commercial roof products that qualify as cool roofs fall into three categories: single-ply, liquid-applied, and metal panels. The solar reflectance and thermal emittance property values represent initial conditions as determined by a laboratory accredited by the Cool Roof Rating Council.

   Cool roofs are cost effective over air-conditioned spaces for buildings located in climate zones 1 - 5. In these locations, a minimum of 75% of the entire roof surface not used for roof penetrations shall be covered with roofing products that comply with one or more of the following:

   - Have a minimum initial SRI of 78 for a low-sloped roof (a slope less than or equal to 2:12) and a minimum initial SRI of 29 for a steep-sloped roof (a slope of more than 2:12).
   - Comply with the criteria for the US EPA's Energy Star Program Requirements for Roof Products – Eligibility Criteria.

   For industrial buildings with only heating and ventilation, cool roofs can improve the comfort conditions (and hence productivity) in the space.

   In order to be considered a cool roof, a solar reflectance of 0.67 when tested in accordance with ASTM C1549, ASTM E903, or ASTM E1918 and, in addition, a minimum thermal emittance of 0.75 when tested in accordance with ASTM C1371 or ASTM E408, or a minimum Solar Reflective Index of 78 when determined in accordance with the Solar Reflectance Index method in ASTM E1980 where standard white is SRI = 100 and standard black has SRI = 0. An SRI can be determined by the following equations:

$$SRI = 123.97 - 141.35(x) + 9.655(x^2)$$

   Where

$$x = \frac{20.797 \times \alpha - 0.603 \times \varepsilon}{9.5205 \times \varepsilon + 12.0}$$

   Where α is the solar absorptance (= 1 – solar reflectance) and ε is the thermal emissivity, which were derived from ASTM E1980 assuming a medium wind speed.

   The limited color choices available for cool roofs may not be acceptable to the installation. When this conflict cannot be resolved, the designer shall use the highest reflectance available in the roofing type/color acceptable to the installation.

Characteristics of reflective roofing materials.

Roofing Type	Color	New Solar Reflectance	Aged Solar Reflectance	New Thermal Emittance	SRI (ASTM E1980
Roof Coatings	White	0.70 – 0.85	0.50 –0.65	0.85	84 – 106
Roof Coatings	Grey or Tan	0.70	0.50	0.85	84
Roof Coatings	Terra Cotta or Brown	0.40	0.30	0.85	43
Roof Coatings	Aluminized	0.50	0.40	0.50	42
Metal Paint	Red	0.25	0.25	0.83	22
Metal Paint	Terra Cotta	0.35	0.35	0.83	36
Metal Paint	Bright Red	0.35	0.35	0.83	36
Metal Paint	Beige/Off White	0.55	0.55	0.83	63

Roofing Type	Color	New Solar Reflectance	Aged Solar Reflectance	New Thermal Emittance	SRI (ASTM E1980
Metal Paint	Tan	0.45	0.45	0.83	49
Metal Paint	Dark Blue	0.25	0.25	0.83	22
Metal Paint	Medium to Light Blue	0.32	0.32	0.83	32
Metal Paint	Dark Brown	0.25	0.25	0.83	22
Metal Paint	Medium to Light Brown	0.32	0.32	0.83	32
Metal Paint	Dark Green	0.25	0.25	0.83	22
Metal Paint	Medium to Light Green	0.32	0.32	0.83	32
Metal Paint	White	0.65	0.65	0.83	77
Metal Paint	Bright White	0.70	0.70	0.83	84
Metal Paint	Black	0.25	0.25	0.83	22
Metal Paint	Dark Grey	0.25	0.25	0.83	22
Metal Paint	Medium to Light Grey	0.35	0.35	0.83	36
Metal Paint	Pearlescent Colors	0.35	0.35	0.75	32
Galvalume	Unpainted	0.65	0.55	0.05	45
Copper Metal	Unpainted	0.85	0.18	0.03	89
Galvanized Steel	Unpainted	0.40	0.20	0.50	26
EPDM Membrane	Black	0.05	0.10	0.85	0
TPO Membrane	White	0.80	0.60	0.85	99
TPO Membrane	Grey	0.50	0.40	0.85	57
PVC Membrane	White	0.80	0.60	0.85	99
PVC Membrane	Grey	0.50	0.40	0.85	57
Asphalt Shingle	Dark Color	0.10	0.10	0.85	4
Asphalt Shingle	Light Color	0.25	0.25	0.85	23
Modified Bitumen Cap Sheet	Dark Color	0.10	0.10	0.85	4
Modified Bitumen Cap Sheet	Light Color	0.25	0.25	0.85	23
Modified Bitumen Cap Sheet	White	0.50-0.60	0.40 – 0.45	0.85	57 - 71

3. **NR** means there is no requirement or recommendation for a component in this climate zone.
4. **Increased Building Air tightness**. Building air leakage (measured in cfm/ft^2) 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). ASHRAE has proposed a building air tightness requirement of 0.4 cfm/ft^2 @ 75 Pa as an addendum to Standard 90.1-2004. ASHRAE has also proposed an approach to complying with the new requirement with a pressurization test to show that the building leakage does not exceed 0.4 cfm/ft^2 at 75 Pa. This air tightness requirement provides a number that can be used for the energy simulations and was assumed to be the baseline leakage rate. The air tightness requirement adopted by the U.S. Army for new construction is more stringent than the one proposed by ASHRAE and requires that the leakage rate must not exceed 0.25 cfm/ft^2 at 75 Pa, and was assumed for the energy efficient building models. To convert the values used for building leakage tests at the pressure difference of 75Pa to the values which can be used to calculate required excessive outdoor air supply rates, the following equation can be used $\Delta Q = Q75 * (5/75)^{0.65} = 0.172 * Q75$. The excessive airflow rate for the building complying with the new ASHRAE 90.1 Standard air leakage requirement is 0.069 cfm/ft^2. Respective number for the building built to the Army model RFP requirement is 0.043cfm/ft^2.
5. **Duct and pipe insulation,** values are from the ASHRAE Advanced Energy Design Guide for Small Offices.
6. **Prescriptive solution tables.** The tables above apply to Battalion and Brigade Headquarters buildings.

7. **HVAC system.** For the recommended HVAC system, PVAV may be used in lieu of PSZ-AC, provided the PVAV system, including the reheat load, is proven to be more energy efficient than the PSZ-AC.

b. Compliance Path (unique design solution). When the "Compliance Path" is selected, the facility design shall include a uniquely developed technology solution set which can be shown by the design analysis (using facility energy simulation software) not to exceed the target energy consumption budget stated in Paragraph 3.3.7 (2) above and meet all the criteria in the DOE interim final rule: "Energy Conservation Standards for New Federal Commercial and Multi-Family High-Rise Residential Buildings and New Federal Low-Rise Residential Buildings"

(4) Schedules. If a unique technology solution set method of compliance is chosen then the following load schedules must be used in all facility energy simulations for purposes of showing compliance with Paragraph 3.3.7 (3) b. The plug loads in the following schedules shall be included in the energy simulation program but shall be manually subtracted from the calculations to compare the calculated budget to the target energy consumption budget in paragraph 3.3.7 (2). Additionally, for simulation of a baseline building model, the "baseline values" for each component shown in the "Prescriptive Technology Solution Table" shall be used.

Battalion Headquarters Internal Load Schedules

Hr	Occupancy			Lighting			Plug Loads			Service Hot Water		
	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun
1	0.00	0.00	0.00	0.05	0.05	0.05	0.30	0.30	0.30	0.00	0.00	0.00
2	0.00	0.00	0.00	0.05	0.05	0.05	0.30	0.30	0.30	0.00	0.00	0.00
3	0.00	0.00	0.00	0.05	0.05	0.05	0.30	0.30	0.30	0.00	0.00	0.00
4	0.00	0.00	0.00	0.05	0.05	0.05	0.30	0.30	0.30	0.00	0.00	0.00
5	0.00	0.00	0.00	0.05	0.05	0.05	0.30	0.30	0.30	0.00	0.00	0.00
6	0.00	0.00	0.00	0.05	0.05	0.05	0.30	0.30	0.30	0.00	0.00	0.00
7	0.00	0.00	0.00	0.10	0.05	0.05	0.30	0.30	0.30	0.00	0.00	0.00
8	0.20	0.00	0.00	0.30	0.05	0.05	0.30	0.30	0.30	0.00	0.00	0.00
9	0.95	0.00	0.00	0.90	0.05	0.05	0.90	0.30	0.30	0.00	0.00	0.00
10	0.95	0.00	0.00	0.90	0.05	0.05	0.90	0.30	0.30	0.00	0.00	0.00
11	0.95	0.00	0.00	0.90	0.05	0.05	0.90	0.30	0.30	0.00	0.00	0.00
12	0.95	0.00	0.00	0.90	0.05	0.05	0.90	0.30	0.30	0.00	0.00	0.00
13	0.50	0.00	0.00	0.90	0.05	0.05	0.80	0.30	0.30	0.00	0.00	0.00
14	0.95	0.00	0.00	0.90	0.05	0.05	0.90	0.30	0.30	0.00	0.00	0.00
15	0.95	0.00	0.00	0.90	0.05	0.05	0.90	0.30	0.30	0.00	0.00	0.00
16	0.95	0.00	0.00	0.90	0.05	0.05	0.90	0.30	0.30	0.00	0.00	0.00
17	0.95	0.00	0.00	0.90	0.05	0.05	0.90	0.30	0.30	0.00	0.00	0.00
18	0.30	0.00	0.00	0.50	0.05	0.05	0.50	0.30	0.30	0.00	0.00	0.00
19	0.00	0.00	0.00	0.30	0.05	0.05	0.30	0.30	0.30	0.00	0.00	0.00
20	0.00	0.00	0.00	0.30	0.05	0.05	0.30	0.30	0.30	0.00	0.00	0.00
21	0.00	0.00	0.00	0.20	0.05	0.05	0.30	0.30	0.30	0.00	0.00	0.00
22	0.00	0.00	0.00	0.20	0.05	0.05	0.30	0.30	0.30	0.00	0.00	0.00
23	0.00	0.00	0.00	0.10	0.05	0.05	0.30	0.30	0.30	0.00	0.00	0.00
24	0.00	0.00	0.00	0.05	0.05	0.05	0.30	0.30	0.30	0.00	0.00	0.00
Peak	53 occupants			1.0 W/ft^2 (10.8 W/m^2)			0.75 W/ft^2 (8.1 W/m^2)			0 gal/hr (0 L/hr)		

Battalion Headquarters West Zone Internal Load Schedules
(2 occupants continuously)

Hr	Occupancy			Lighting			Plug Loads			Service Hot Water		
	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun	Wk	Sat	Sun

Hr	Occupancy			Lighting			Plug Loads			Service Hot Water		
1	0.417	0.417	0.417	0.50	0.50	0.50	0.30	0.30	0.30	0.00	0.00	0.00
2	0.417	0.417	0.417	0.50	0.50	0.50	0.30	0.30	0.30	0.00	0.00	0.00
3	0.417	0.417	0.417	0.50	0.50	0.50	0.30	0.30	0.30	0.00	0.00	0.00
4	0.417	0.417	0.417	0.50	0.50	0.50	0.30	0.30	0.30	0.00	0.00	0.00
5	0.417	0.417	0.417	0.50	0.50	0.50	0.30	0.30	0.30	0.00	0.00	0.00
6	0.417	0.417	0.417	0.50	0.50	0.50	0.30	0.30	0.30	0.10	0.10	0.10
7	0.417	0.417	0.417	0.50	0.50	0.50	0.30	0.30	0.30	0.40	0.40	0.40
8	0.417	0.417	0.417	0.50	0.50	0.50	0.30	0.30	0.30	0.20	0.20	0.20
9	0.95	0.417	0.417	0.90	0.50	0.50	0.90	0.30	0.30	0.00	0.00	0.00
10	0.95	0.417	0.417	0.90	0.50	0.50	0.90	0.30	0.30	0.00	0.00	0.00
11	0.95	0.417	0.417	0.90	0.50	0.50	0.90	0.30	0.30	0.00	0.00	0.00
12	0.95	0.417	0.417	0.90	0.50	0.50	0.90	0.30	0.30	0.00	0.00	0.00
13	0.50	0.417	0.417	0.90	0.50	0.50	0.80	0.30	0.30	0.00	0.00	0.00
14	0.95	0.417	0.417	0.90	0.50	0.50	0.90	0.30	0.30	0.00	0.00	0.00
15	0.95	0.417	0.417	0.90	0.50	0.50	0.90	0.30	0.30	0.00	0.00	0.00
16	0.95	0.417	0.417	0.90	0.50	0.50	0.90	0.30	0.30	0.00	0.00	0.00
17	0.95	0.417	0.417	0.90	0.50	0.50	0.90	0.30	0.30	0.00	0.00	0.00
18	0.417	0.417	0.417	0.50	0.50	0.50	0.50	0.30	0.30	0.10	0.10	0.10
19	0.417	0.417	0.417	0.50	0.50	0.50	0.30	0.30	0.30	0.10	0.10	0.10
20	0.417	0.417	0.417	0.50	0.50	0.50	0.30	0.30	0.30	0.10	0.10	0.10
21	0.417	0.417	0.417	0.50	0.50	0.50	0.30	0.30	0.30	0.00	0.00	0.00
22	0.417	0.417	0.417	0.50	0.50	0.50	0.30	0.30	0.30	0.00	0.00	0.00
23	0.417	0.417	0.417	0.50	0.50	0.50	0.30	0.30	0.30	0.00	0.00	0.00
24	0.417	0.417	0.417	0.50	0.50	0.50	0.30	0.30	0.30	0.00	0.00	0.00
Peak	5 occupants			1.0 W/ft^2 (10.8 W/m^2)			0.75 W/ft^2 (8.1 W/m^2)			6.4 gal/hr (24 L/hr)		

3.4. BRIGADE HEADQUARTERS BUILDINGS – FURNITURE REQUIREMENTS

3.4.1. Furniture Systems

The criterion contained on the following pages describes the furnishing requirements for all room types and for all headquarters building(s). Furnishings, other than installed equipment, are to be GFGI unless otherwise specified in this document. The following furnishings list is provided for coordination of room and office layouts to ensure suitability for their intended function. Large interior spaces such as open office areas can be subdivided into smaller areas by using office partitions, storage units and file cabinets or similar devices. In general, the interior design shall provide a comfortable, efficient and flexible work environment. All open office workstations in the headquarters are predicated on 6-foot by 8-foot cubicles.

3.4.2. Room Size and Furnishings Chart

Room Size and Furnishings Chart			
ROOM TYPE	MIN. SF	COMMENTS	FURNITURE REQUIRED
Senior Executive Office	200	Private Office	U-shaped desk unit executive single pedestal desk w/ center drawer, box/box/file pedestal, full modesty panel; executive bridge 42” min.; credenza unit w/ two drawer lateral file and hutch unit w/ door storage, 4-drawer lateral files, one conference table, four conference chairs, two guest chairs, one executive chair.

Room Size and Furnishings Chart			
ROOM TYPE	MIN. SF	COMMENTS	FURNITURE REQUIRED
Executive Office	150	Private Office	L-shaped executive desk unit with single pedestal desk w/ center drawer and storage pedestal w/ box/box/file configuration, full modesty panel; executive return with storage pedestal box/box/file configuration, two 4-drawer lateral files, two guest chairs, one executive chair.
Office	110	Private Office	L-shaped executive desk unit with single pedestal desk w/ center drawer and storage pedestal w/ box/box/file configuration, full modesty panel; executive return with storage pedestal box/box/file configuration, one 4-drawer lateral file, one guest chairs, one task chair.
Open Workstation	48	Open Workstation	Systems furniture workstation, approx. 48 SF, with work surfaces, file drawers and overhead storage.
Brigade Command Conference Room	600		Conference table with 18 chairs and 18 side chairs.
Battalion Command Conference Room	330		Conference table with 14 chairs and 8 side chairs.
Medium Conference Room	300 - 200		Conference table with 12 chairs and 4 side chairs.
Small Conference Room	180 - 110		Conference table with 8 chairs and 2 side chairs.
Reception Area	Varies	Executive Reception Area	Systems furniture open office area for one staff member and 5 visitors (5 guest chairs).
Classroom	Varies		1 desk and chair for each 20 SF. Provide movable partitions to divide large classroom space into three equally-sized spaces.
Lobby	Varies	Building Reception Area	Lounge seating if space allows. Provide one recessed building directory near each main entrance, and in a multiple-story building, provide one recessed building directory near elevators doors above the first floor. Provide one 4'-0" x 6'-0" wall mounted bulletin board for each headquarters unit. Provide one glass front 4'-0" wide min. built in display cabinet for unit memorabilia, awards, trophies, etc.
Message Center	Varies		Provide 24" wide, 36" high counter equivalent to the length of the room.
File Room	Varies		Minimum of 1 linear foot of 4-drawer horizontal file cabinet for every 4 SF of room (250 SF room = min 62.5 LF 4-drawer horizontal base files)
Break Room	Varies		Contractor furnished, contractor installed minimum 20 LF base and wall cabinets, dishwasher and space for a full size refrigerator with ice-maker. Note that in BG HQ- S-1 Break Room also supports Command group. Provide recessed space for two vending machines per building (machines are not in the contract) not in view of the lobby.
Shower	Varies		Contractor furnished, contractor installed lockers with benches will be provided on a 3:1 ration of lockers/shower. Minimum locker size shall be 12"(w) x 18"(d) x 36"(h).

Room Size and Furnishings Chart			
ROOM TYPE	MIN. SF	COMMENTS	FURNITURE REQUIRED
Secured Documents Room	Varies	Secure Documents Room conforming to requirements in AR 380-5	2 four drawer safes per authorized company within each battalion secure document room. 2 four drawer safes per coordinating staff section within each battalion and/or brigade secure documents room, not to exceed a total of 12 safes per the battalion document room.
BOC	Varies	Brigade Operations Center	Provision for Government-Furnished, Government-Installed television monitors (wall of knowledge). Computer tables and chairs for 15 persons. Modular conference tables and chairs for 10 persons with 3 side chairs.
SCIF	Varies	Sensitive Compartmented Information Facility conforming to DCID Manual 6/9	52 each open office workspaces, modular conference tables and chairs for 12 persons with 4 side chairs, as indicated on standard floor plans. Contractor furnished, contractor installed raised flooring to accommodate weight of 9 four drawer safes.
NOC	Varies	Network Operations Center	8 each Open office workstations. Space for GFGI communication racks, equipment., and 3 each work benches in server room.

3.5. REFERENCES

(1) Applicable Industry Criteria

American National Standards Institute (ANSI/Telecommunications Industry Association (TIA/Electronic Industry Association (EIA)

ANSI/EIA/TIA 568A Commercial Building Telecommunications Cabling Standard and all applicable Addendums)

EIA/TIA 568-B Commercial Building Telecommunications Cabling Standards (Addendums 561-B.1, 568-B.2, 568-B.2-1)

ANSI/EIA/TIA 606A Administration Standard for Commercial Telecommunications Infrastructure

ASHRAE 55 Thermal Environmental Conditions for Human Occupancy

ASHRAE Hdbk-IP Handbook, Refrigeration I-P Edition

ASHRAE Hdbk-IP Handbook, HVAC Applications I-P Edition

ASHRAE Hdbk-IP Handbook, HVAC Systems and Equipment I-P Edition

ASME B31.1 Power Piping

ASHRAE Underfloor Air Distribution (UFAD) Design Guide, 2003

ASTM E413-04, Classification for Rating Sound Insulation

Clean Air Act Amendment of 1990

Discount Factors for Life-Cycle Cost Analysis, Annual Supplement to NIST Handbook 135

Memorandum of Agreement (MOA) on Criteria/Standards for Economic Analyses/Life Cycle

Costing for MILCON Design (March 1996)

NIST Handbook 135 (with the annual supplement of discount factors)

National Electrical Manufacturers Association (NEMA)

NEMA PE 1 Uninterruptible Power Systems

National Fire Protection Association (NFPA)

NFPA 110 Emergency and Standby Power Systems

SMACNA Seismic Restraint Manual: Guidelines for Mechanical Systems

Testing and Balancing Bureau (TABB)

Underwriters Laboratories (UL)

UL 1008 Transfer Switch Equipment

UL 1440 Transient Voltage Surge Suppressors

UL 1778 Uninterruptible Power Systems

(2) Applicable Military Criteria

Army Regulation (AR)

AR 190-51, Security of Unclassified Army Property (Sensitive and Nonsensitive), 30 September 1993

AR 380-381 Special Access Programs (SAPS) and Sensitive Activities

AR 380–5, Information Security Program

Director of Central Intelligence Directive (DCID)

DCID 6/9 Physical Security Standards for Sensitive Compartmented Information Facilities– Manual June 17, 2003

Department Of Defense (DOD)

DOD MIL-HDBK-419A Grounding, Bonding, and Shielding for Electronic Equipment and Facilities

DOD 5105.21-M-1 Sensitive Compartmented Information Administrative Security Manual

DoD Regulation 5200.1-R, Information Security Program, dated January 1997, Appendix 7 –Physical Security for Vault and Secure Room Construction Standards

Information Systems Engineering Command (ISEC)

National Security Telecommunications and Information Systems Security (NSTISS)

NSTISSAM Tempest 2-95 Red/Black Installation Guidance

NSTISSI 7003 Protective Distribution Systems (PDS)

Office of the Director of National Intelligence – DRAFT Intelligence Community Standard Number 2009-705-1

Technical Guide for the Integration of Secret Internet Protocol Router Network (SIPRNet)

Unified Facilities Criteria UFC

UFC 3-580-01 Telecommunications Bldg Cabling Systems Planning/Design Manual 22 June 2007

UFC 4-140-01, Brigade Operations Complex, Brigade and Battalion Headquarters

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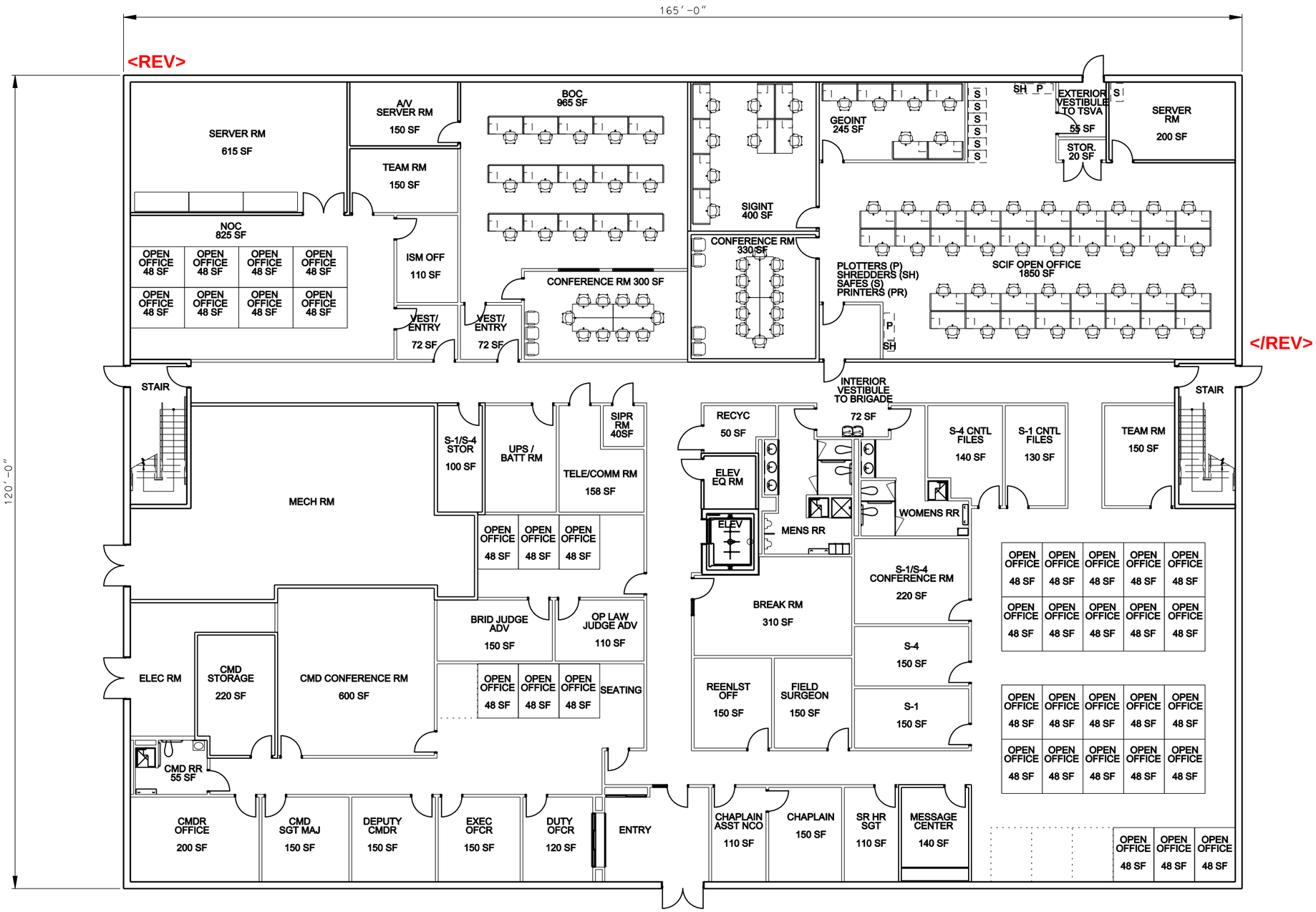

FLOOR PLAN INDICATES THE ARMY STANDARD SOLUTION IN SCHEMATIC FORM. THE DESIGNER-OF-RECORD IS ALLOWED TO MAKE ADJUSTMENTS FOR EXTERIOR FACADE/ARCHITECTURAL THEME; AND/OR TO ACCOMMODATE SPECIFIC BUILDING ENGINEERING SYSTEMS (STRUCTURAL, MECHANICAL, ELECTRICAL, FIRE PROTECTION, AND SUSTAINABLE DESIGN). THESE ADJUSTMENTS WILL BE EVALUATED BY THE SPECIFIC STANDARD FOR COMPLIANCE, COST SAVING, INNOVATIVE, COST SAVING SOLUTIONS WILL BE GIVEN PROPER CONSIDERATION BY THE COS, AND WILL BE ADOPTED AS APPROPRIATE.

AREAS SHOWN ON THE FLOOR PLAN ARE TO BE CONSIDERED NET PROGRAM REQUIREMENTS. THE MAXIMUM ALLOWABLE GROSS BUILDING AREA IS THE MAXIMUM GROSS SPACE PERMISSIBLE FOR THE FACILITY. A REDUCED OVERALL GROSS AREA IS ACCEPTABLE IF ALL NET PROGRAM REQUIREMENTS AND ADJACENCIES ARE MET.

LARGE BRIGADE FIRST FLOOR PLAN

SCALE: 1/8"=1'-0"

FIRST FLOOR	19800 GSF
SECOND FLOOR	19800 GSF
TOTAL SF SHOWN	39600 GSF
MAXIMUM ALLOWABLE GROSS AREA	40100 GSF

SCALE: 1/8" = 1'-0"

0 4' 8' 16' 24'

US ARMY CORPS OF ENGINEERS SAVANNAH

SYMBOL	DESCRIPTION	DATE	BY

DESIGNED BY: | DATE:
DWN BY: | CKD BY: | SOLICITATION NO.:
SUBMITTED BY: | CONTRACT NO.:
FILE NAME: | CATEGORY CODE:
SIZE: | PLOT SCALE: | PLOT DATE:

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
SAVANNAH DISTRICT

ANY PROJECT
ANYWHERE

FIRST FLOOR PLAN

PLATE REFERENCE NUMBER
A–101
SHEET

$$DGNSPEC$$
$$SYSTIME$$
$$USERNAME$$

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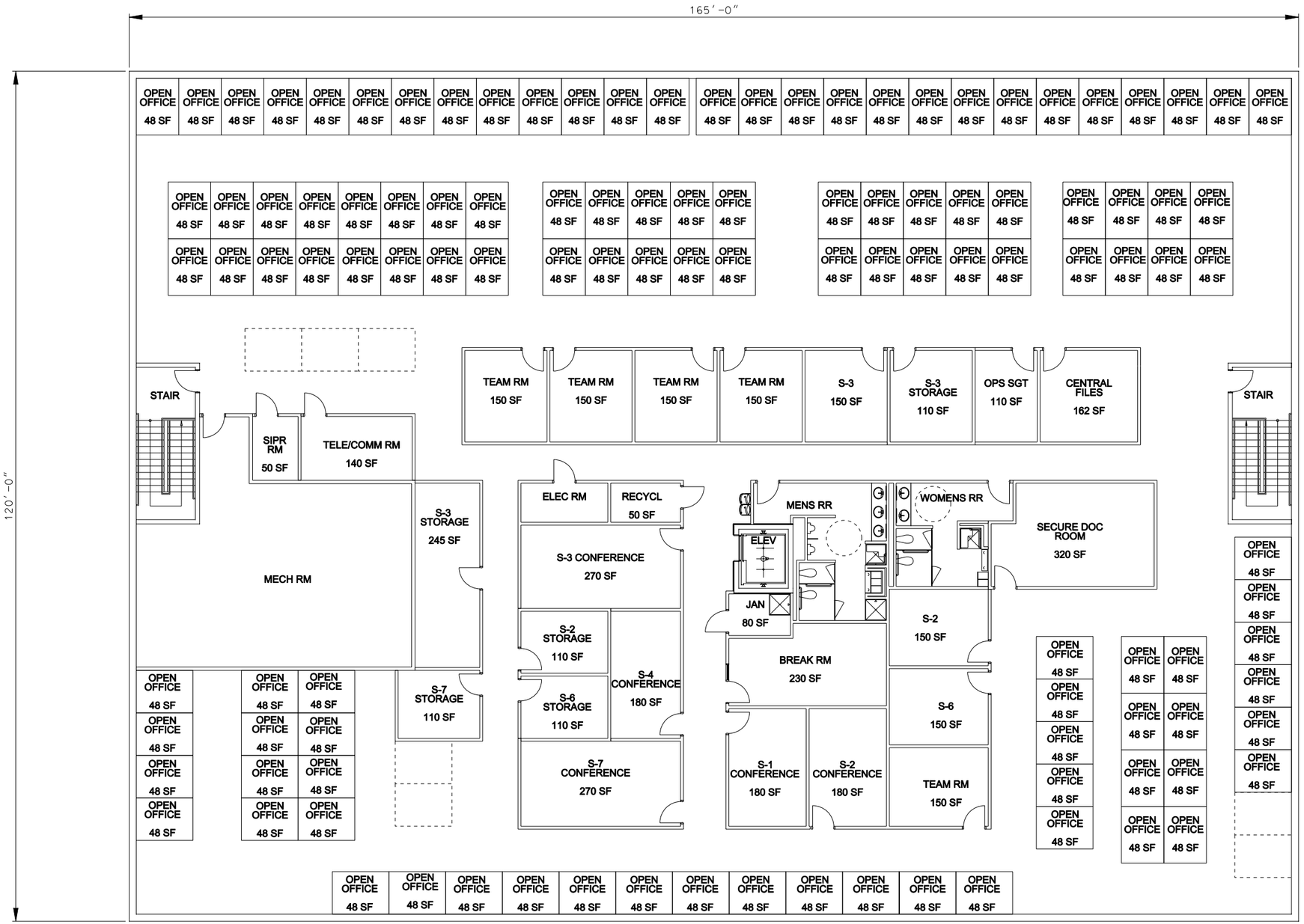
FOR OFFICIAL USE ONLY



FLOOR PLAN INDICATES THE ARMY STANDARD SOLUTION IN SCHEMATIC FORM. THE DESIGNER-OF-RECORD IS ALLOWED TO MAKE ADJUSTMENTS FOR EXTERIOR FACADE/ARCHITECTURAL THEME, AND/OR TO ACCOMMODATE SPECIFIC BUILDING ENGINEERING SYSTEMS (STRUCTURAL, MECHANICAL, ELECTRICAL, FIRE PROTECTION, AND SUSTAINABLE DESIGN). THESE ADJUSTMENTS WILL BE REVIEWED BY CONSTRUCTION AGENT STAFF FOR COST EFFECTIVENESS, COMPLIANCE TO ARMY STANDARDS, INNOVATIVE, COST SAVING SOLUTIONS WILL BE GIVEN PROPER CONSIDERATION BY THE COS, AND WILL BE ADOPTED AS APPROPRIATE.

AREAS SHOWN ON THE FLOOR PLAN ARE TO BE CONSIDERED NET PROGRAM REQUIREMENTS. THE MAXIMUM ALLOWABLE GROSS BUILDING AREA IS THE MAXIMUM GROSS SPACE PERMISSIBLE FOR THE FACILITY. A REDUCED OVERALL GROSS AREA IS ACCEPTABLE IF ALL NET PROGRAM REQUIREMENTS AND ADJACENCIES ARE MET.

LARGE BRIGADE SECOND FLOOR PLAN

SCALE: 1/8"=1'-0"

FIRST FLOOR	19800 GSF
SECOND FLOOR	19800 GSF
TOTAL SF SHOWN	39600 GSF
MAXIMUM ALLOWABLE GROSS AREA	40100 GSF

SCALE: 1/8" = 1'-0"

0 4' 8' 16' 24'

US ARMY CORPS OF ENGINEERS SAVANNAH

SYMBOL	DESCRIPTION	DATE	BY

DESIGNED BY: DATE:
DWN BY: CKD BY: SOLICITATION NO.:
SUBMITTED BY: CONTRACT NO.:
FILE NAME: CATEGORY CODE:
SIZE: PLOT SCALE: PLOT DATE:

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
SAVANNAH DISTRICT

ANY PROJECT
ANYWHERE

SECOND FLOOR PLAN

PLATE REFERENCE NUMBER
SHEET A–102

$$DGNSPEC$$
$$SYSTIME$$
$$USERNAME$$

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 315	Details and Detailing of Concrete Reinforcement
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 – 13th Edition (or latest version)
American Iron and Steel Institute	
AISI/COS NASPEC 2001	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
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, Liquified 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, 169	Food Equipment Standards

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	ABA Accessibility Standard for DoD Facilities Derived from the ADA and ABA Accessibility Guidelines: Specifically includes: ABA Chapters 1 and 2 and Chapters 3 through 10. Use this reference in lieu of IBC Chapter 11. Excluded are: (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). (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).
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. UFC 3-580-01 Telecommunications Bldg Cabling Systems Planning/Design

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: DetrickISECI3Aguide@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. Dumpsters 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 expectance 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 50 percent using LEED credit WE1.1 baseline, 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 20 percent using IPC 2006 fixture performance requirements baseline except where precluded by other project requirements.

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: Lighting shall comply with the recommendations of the Illumination Engineering Society of North America (IESNA).

5.7.5.1. Interior Lighting: Interior lighting shall utilize electronic ballast and energy efficient fluorescent lamps with a Correlated Color Temperature of 4100K. Compact fluorescent fixtures shall have a Color Rendering Index of (CRI) of 82 or higher. Linear fluorescent fixtures shall have a CRI of 85 or higher. Fluorescent lamps shall be the low mercury type qualifying as non-hazardous waste upon disposal. Surface mounted fixtures shall not be used on acoustical tile ceilings. An un-switched fixture with emergency ballast shall be provided at each entrance to the building.

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 and the UFC 3-580-01 Telecommunications Bldg Cabling Systems Planning/Design. 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.

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 setforward. 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.

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 Fundamental 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. The Contractor shall 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 contractor and not an employee or subcontractor of the Contractor or any other subcontractor on this project, including the design professionals (i.e., the DOR or their firm(s)). 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.

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 30% 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 or FEMP designated products. 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 tracked 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 FORT BRAGG, NC

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.

None

6.3. SITE PLANNING AND DESIGN

6.3.1. General: Fort Braggs' strategic goal is to achieve a "sustainable community - meeting the needs of the Soldier today, tomorrow and forever." To achieve this goal, Fort Bragg's philosophy is to apply systematic considerations of environmental impact, energy use, natural resources, economy, and quality of life so the end result is a sustainable community by:

(a) Creating and enhancing sustainable training and urban areas to ensure military readiness and promote compatible growth of the surrounding community

(b) Becoming the model sustainable military community by using sustainable principles throughout the life cycle of all facilities and supporting infrastructure

(c) Achieving zero waste through acquisition and management of materials and commodities which throughout their lifecycle creates no additional waste nor requires resources for disposal

(d) Supplying reliable services and infrastructure with no negative impacts while aggressively reducing overall demand.

(e) Building a sustainable world-class ground transportation network providing seamless transition between multiple modes of travel while reducing harmful emissions

(f) Creating a culture which fosters sustainable life style to enhance the quality of life of the Fort Bragg community. This encompasses the social, mental, physical and spiritual well-being of its members.

(g) Minimize environmental impacts to natural resources using strategic planning and sustainable design to reduce project footprint ("clearing limits").

6.3.1.1. Fort Bragg's sustainable community objectives are energy savings, water savings/reuse; low-emitting, nontoxic materials, reusable/recyclable building materials, tie in to "community" sustainability features (e.g. continuance of bikes lanes/walking paths), minimize turf areas/water intensive landscapes, use of native plants, and use low-impact development strategies for stormwater management.

6.3.1.2. Design Principles

(a) Plan and design site in a sustainable manner in accordance with all applicable references. The planning and design shall incorporate appropriate measures to address endangered, threatened, and special concern species; energy efficiency and renewable generation; materials reuse; multimodal transportation; native wildlife habitat protection and restoration; pollution prevention; public health and safety; water resources protection and restoration; and water use efficiency.

(b) Sustainable site plan, planning, design and development will address the need to conserve green space, preserve remnant old-growth trees, protect endangered species and wetlands, provide for greenways and link corridors of existing natural habitat for recreational value, quality of life and for wildlife/plants conservation. Sustainable site planning should include green space planning, and corridor development for recreational use and wildlife benefits Construction footprint shall minimize disturbance to soils to the maximum extent practicable in support of the installation sustainability goals.

(c) Base site design on the Beaux-Arts principles of balance, axial arrangements, symmetry, and site lines.

(d) Plant native trees, shrubs and grasses in accordance with Fort Bragg's plant list palette. See Appendix I. Theme tree emphasis will favor longleaf pine to support ecosystem management policy, sustainability, endangered species conservation, and sustainable communities.

(e) Historic District Facilities within the Old Post Historic District and/or the view shed of the Old Post Historic District are subject to the Old Post Historic District Design Guidelines. Facility construction in the Old Post Historic District or view shed of the Old Post Historic District will require SHPO consultation which requires a minimum of 30 days.

6.3.2. Site Structures and Amenities

6.3.2.1. Supporting site structures shall preferentially include EPA-designated recovered materials products, USDA-designated bio-based products, and environmentally preferable products.

6.3.2.2. Supporting site structures shall utilize the same building materials and characteristics as the adjacent buildings. Provide the following site structures and amenities:

(a) Dumpster Screening shall match or compliment the surrounding facilities and current dumpster systems in the area. Locate dumpster pad to minimize backing of trash transfer vehicles. Locate dumpster pads and screening in accordance with setbacks in UFC 4-010-01. Access to dumpster pads should not be thru parking lots whenever possible to preclude mixing of large trucks, POVs, and GOVs. BRIGADE HQS – provide two (2) dumpster capacity pad with screening

(b) Provide one C130/PLF Mock Up Training Site per Bde HQ consisting of a combination C130/C17 mockup and PLF platform per attached drawings

6.3.2.3. Exterior Signage

6.3.3. Site Functional Requirements:

6.3.3.1. Stormwater Management Systems. The project shall be meet National Pollutant Discharge Elimination System (NPDES) requirements for stormwater Management and Quality.

(a) Follow the NPDES General stormwater permit requirements and all other associated NPDES permit requirements.

(b) Comply with Ft. Bragg's NPDES Phase II permit requirements for stormwater Management and Quality and meet the NPDES Phase II requirements for Post Construction.

(c) Comply with the Fort Bragg stormwater management plan; copy in effect at the time of award.

(d) Comply with the NPDES General stormwater permit (temporary for construction) which includes the requirements to record rainfall events at the site, visually monitor and maintain records of the stormwater discharge, and maintain a log of the corrective actions required to remain in compliance.

(e) Employ Low Impact Design (LID) to the Maximum Extent Practicable within the Contract Cost Limitation. Stormwater management shall focus on infiltration of stormwater runoff. The stormwater management system design, construction, and operation should facilitate the site post-development hydrologic response mimicking the site predevelopment hydrologic response. This hydrologic response parameters of focus are the character, constituents, and quantity of stormwater runoff; character (shape/form, magnitude) of the runoff hydrograph, constituents (nutrients/sediments/pollutants) of the runoff flow, quantity (volume) of stormwater discharge.-

(f) Post development infiltration of stormwater in excess of predevelopment infiltration of stormwater is acceptable and encouraged. If above or below ground detention/retentions basins are employed, locate them within the limits of construction for each area and do not locate under proposed future construction (i.e. buildings footprints and parking areas).

(g) Do not use the following structural stormwater management measures without prior approval of the Water Management Branch, Directorate of Public Works: permeable/pervious pavements, green roofs, non-vegetated/subsurface infiltration chambers, curb inlets, subsurface conduits, and sand filters.

(h) The following structural stormwater management measures are highly encouraged: vegetated infiltration cells, vegetated filter strips/buffers, and vegetated swales.

6.3.3.2. Erosion and Sediment Control

6.3.3.2.1. Prepare an Erosion Control Plan (ECP) in accordance with the North Carolina Erosion and Sediment Control Planning and Design Manual, latest revision, and any Fort Bragg regulations (see Appendices).

6.3.3.2.2. The North Carolina Sedimentation Control Pollution Act of 1973, decrees that any land disturbing activity over an acre must have approved sediment and erosion control plan before construction begins.

(a) The Fort Bragg Water Management Branch must approve the sediment and erosion control plan before it is submitted to the North Carolina Department of Environment and Natural Resources (NCDENR). Both agencies will review the plan(s) to ensure that all measures to retain sediment on the site during construction and all measures to prevent erosion after construction have been designed into the construction drawings. Agencies will review sediment control measures such as silt fence, temporary sediment traps, and construction entrances/exits for the proper sizing and installation.

(b) Once the plan(s) is approved, the Ft. Bragg Water Management Branch and the NCDENR will inspect construction to ensure that all work is performed in adherence to the approved plan.

(c) The site shall meet the High Density Design Requirements as described in the July 2007 edition of North Carolina Stormwater Best Management Practices Manual.

6.3.4. Site Structures and Amenities

Display Area: Provide area near main entrance to building for "mission display" of monuments or memorials pertaining to the 108th ADA to be provided by the User.

6.4. SITE ENGINEERING

6.4.1. Existing Topographical Conditions

6.4.1.1. See Appendix J for a topographic survey and the site plan showing this project for information only. Coordinate the design with tie in points provided. Verify the information provided and any discrepancies that are found in the furnished survey and bring this information to the immediate attention of the Contracting Officer for clarification. Any additional survey required for the complete design and construction of this project shall be the responsibility of the Contractor.

[Not Supplied - PS_SiteEngineering_Topo : SITE_EXIST_TOPO]

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

6.4.2.1. Verify the results of the Government supplied information provided and any bring discrepancies found in the finished survey to the immediate attention of the Contracting Officer for clarification. The provided site layout drawings are for guidance but the Contractor proposed site layout shall be similar in design

6.4.2.2. Locate primary facilities to avoid existing above and below ground utilities, government and privatized, traversing the site whenever possible.

6.4.2.3. Locate primary facilities in accordance with all AT/FP requirements.

6.4.2.4. Coordinate the new construction activities and erosion control measures with the adjacent facilities and erosion control measures.

6.4.2.5. Limits of Construction:

(a) The Limits of Construction are shown on the provided drawings. Confine all work within the Limits of construction except as needed to tap into existing utility lines or manholes.

(b) Provide drawings to Fort Bragg to coordinate locator service outside of construction limits prior to conducting any digging outside of the construction limits.

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.

6.4.4. Pavement Engineering and Traffic Estimates:

6.4.4.1. A professional engineer, licensed in the State of North Carolina, shall design all rigid and flexible pavements in accordance with the Contractor's final geotechnical report.

6.4.4.2. Vehicular Parking Areas

(a) Do not use permeable pavements, including segmented pavers, pervious concrete or pervious asphalt in vehicular parking and other pavements.

(b) Design parking areas surface slopes between 0.5% and 2% with a maximum of 3% in the parking stalls. Layout parking lots so that drainage conforms to the existing general site contours to provide the maximum utilization of water gardening or bio-retention ponds on site.

(c) Hardstand slopes shall be between 0.5% and 2.0%. Slope all hardstands away from readiness and covered hardstands.

(d) Design parking lots to avoid ponding of water.

(e) Parking Area access lanes shall be a 24 ft wide minimum from the edge of pavement.

(f) Motorcycle parking spaces shall be concrete, 9' x 18' long with appropriate signage.

6.4.4.3. Emergency Vehicle Access and Service Drives. Design emergency vehicle access with NFPA, UFC 3-600-01, and as required by the Installation (FB Fire Dept is AHJ).

6.4.4.4. Vehicle Crash Barriers (as applicable to certain facility types)

(a) Locate vehicle crash barriers at all emergency vehicle access and service drives to barracks and battalion headquarters buildings and all service drives leading to the company operation facilities service yard.

(b) Vehicular crash barriers shall be pad lockable in the open and closed position and meet the minimum crash certification of K1.1/L3. Barrier arm surface shall have a rust inhibiting painted surface and shall be furnished with 4-inch wide reflective paint spaced at every 20 inches.

(c) Drop arm barrier shall be counter weighted for ease of lifting by a single person.

(d) The use of removable, bollard type barriers is not allowed. Locate AT/FP measures in accordance with applicable criteria.

6.4.4.5. Sidewalks

(a) Sidewalks shall provide an ample functional system of walks connecting structures, parking areas, streets, and other walks as pedestrian traffic demands. In addition, carefully review paths of travel between buildings within this and adjacent complexes to determine a layout of sidewalks that is sufficient to meet the likely paths of travel.

(b) Locate sidewalks a minimum of 5 feet from main roads and streets. Slope sidewalks to meet all requirements for ADAAG. Construct sidewalks of Portland Cement Concrete.

(c) Emergency vehicle access and service drives shall be a concrete sidewalk designed to support multi-story ladder trucks weighing 75,500 pounds on three axles; two axles are double tired.

6.4.4.6. Flexible Pavement Design

(a) Design heavy duty flexible pavements to support H-20 loading.

(b) Design light duty flexible pavements to support 5,000 lb axial loading.

(c) Pavement designs over cohesive soil subgrades require under-drain systems.

(d) The flexible pavement design shall be larger of the calculated flexible design thickness and the minimum flexible design thickness.

6.4.4.7. Rigid Pavement Design

(a) Design rigid pavements to support H-20 loading.

(b) The minimum pavement section shall be 6 inches rigid concrete pavement over 6 inches of compacted aggregate base course.

(c) Pavement designs over cohesive soil subgrades require under drain systems.

(d) Provide a concrete joint layout plan for all concrete pavements. Show joint spacing, joint types, and joint grading.

6.4.4.8. Additional Requirements:

[Not Supplied - PS_SiteEngineering_Pavement : SITE_PAVEMENT_ENGINEERING_AND_TRAFFIC]

6.4.5. Traffic Signage and Pavement Markings

6.4.5.1. A Professional Engineer (PE) licensed in the State of North Carolina, qualified and experienced in traffic engineering and signal design must perform traffic signalization plans and design work to include road closure plans.

6.4.5.2. All pavement marking and road way signage shall be in compliance with the Manual of Uniform Traffic Control Devices (MUTCD) and Federal Highway Administration (FHWA) policies.

6.4.5.3. Four (4) inch thermoplastic white reflective material is the only authorized material for stripping.

6.4.6. Base Utility Information

6.4.6.1. General.

(a) Prior to interim (or final if no interim package) site design, coordinate and validate with the survey on the locations and sizes of all existing utility services, above and below ground.

(b) Install and reconnect temporary utilities for buildings which are supported by utilities which will be demolished/or relocated during construction. Coordinate service interruption two weeks in advance with the DPW.

6.4.6.2. Storm drainage service and natural gas on this installation is not privatized.

6.4.6.3. Water and Sanitary Sewer Services:

(a) Water and Sanitary Sewer services on this installation are privatized. Contact Old North Utility Services, Inc. (ONUS), 110 N. Fourth St., Spring Lake, North Carolina 28390, 910-495-1311.

(b) Provide one separate fire sprinkler service connection and one separate service connection and one separate sanitary sewer service connection per building.

(c) ONUS will act as a Prime Contractor (in a separate contract between the Government and ONUS) for design and construction of exterior potable water, fire water and exterior sanitary sewer to points of connection identified in Appendix C.

(d) Coordinate water requirements and connections with ONUS.

(e) Coordinate sewer requirements and connections with ONUS. No tapping of the existing water distribution or sanitary sewer system is authorized without prior approval of ONUS.

(f) ONUS is responsible for filing, maintaining and closing water permits and sanitary sewer permits for the project. Contact ONUS for a copy of the latest approved installation standards and specifications.

(g) Model the fire flows and inlet pressures for this facility in concert with ONUS to construct a water distribution model. Verify that the fire flow and pressure requirements for the new facility are less than or equal to the modeled flows and pressures.

6.4.6.4. Natural Gas: The existing underground gas distribution system at Fort Bragg is not privatized.

(a) [Not Supplied - PS_SiteEngineering_BaseUtility : SITE_GAS]

(b) Honeywell manages gas utility service laterals that feed individual buildings on Fort Bragg. The point-of-contact (POC) for information is John Gallagher at 910-436-0440 (cell 910-391-7357).

(c) Natural Gas – Simmons AAF: Honeywell also manages gas utility service on Simmons Army Air Field. The point-of-contact (POC) for information is John Gallagher.

(d) The distribution system pressure is approximately 22 psig to 30 psig. If gas is determined to be the most life-cycle cost effective alternative, the system design shall comply as follows:

(1) Contractor shall design, tie-in, layout/route and install gas distribution system up to and within the facility (including the gas meter/regulator assembly.

(2) Coordinate and field verify of site conditions prior to performing any work. See Appendix C (Utility Connection) and the site plans for additional information.

(3) Install copper or other metallic tracer wire all new non-metallic gas lines (natural and LP). Install the tracer wire below the pipe and connect from manhole to manhole (valve to valve, etc) with enough additional length for the end to reach the ground surface for the attachment of energizing equipment. Wire shall enter the manhole so it is not cut or severed during installation. Also install metallic marking tape, approximately 18 inches below ground surface.

6.4.6.5. Chilled and Hot Water. Honeywell manages Chilled and Hot Water: Chilled Water (CW), and High Temperature Water (HW) utility services on Fort Bragg. The point-of-contact (POC) for information is John Gallagher. See Appendix C, (Utility Connection) for additional information.

6.4.6.6. Communications System (Government)

(a) Communication service on this installation is owned by the Government. Design and install the Outside plant (OSP) communication infrastructure including cabling from a designated manhole into the facility main telecommunications room.

(b) Complete the design and full construction of the work including all cable taps and splicing.

(c) Provide all outside plant infrastructure including duct lines, manholes, and cabling under this contract. Extend three-way-4 inch encased service duct lines from each building's main communications room to the existing infrastructure in the site vicinity.

6.4.6.7. Cable Television (CATV) Service

(a) Extend one 4-inch duct from the CATV backboard to the building 5 foot line and cap. Coordinate stub out location with privatized company and space required within the telecommunications room with the local cable TV company, Time Warner Cable (TWC), if approved by DOIM. If not approved, the CATV provider will require space inside a ground floor electrical or mechanical room to make connections. CATV is not a DOIM managed service and therefore CATV distribution pathways throughout the building shall be separate from the data or telecommunications distribution system.

(b) TWC will provide and install service cabling throughout the project site, terminating in the main electrical or mechanical room of each primary facility. Coordinate site/facility interfaces with TWC.

(c) See Appendix C: UTILITY CONNECTIONS for additional information and requirements

6.4.6.8. Telephone Service (Private Company)

The local telephone company, EMBARQ, will design and install outside plant (OSP), local (private) telephone service (e.g., subscription service to permanent party barracks). Coordinate with EMBARQ to assure duct line entry into the building.

6.4.6.9. Underground Utility – Road Crossings. Use under-ground boring systems for all underground utilities that cross active road crossings to tie into existing utilities. Do not use open trench methods to cross roads unless a last resort and specifically approved by the FB Director of Public Works. Support all piping, using spider spacers. Supporting with oak boards is not allowed.

6.4.7. Cut and Fill

6.4.7.1. Limit earth cut and fill slopes to no steeper than 3 horizontal to 1 vertical. Retaining or segmented walls are an option to limit the cut and fill. These slopes include the borrow pit.

6.4.7.2. Rough and possibly no cut/fill or grading in construction areas. Fill depression/holes from the removal building foundations and basements.

6.4.7.3. Compaction requirements shall be in accordance with ASTM D1557 (modified proctor), not ASTM D698 (standard proctor). The licensed geotechnical engineer or his authorized representative shall inspect, evaluate and approve all subgrades (pavements, floor slab, or foundation) prior to placement of overlying construction materials, as appropriate.

6.4.7.4. Ensure that the licensed project design geotechnical engineer oversees and directs proof rolling operations (for subgrade suitability); fill placement and compaction operations, including associated soil properties, compaction, and field density testing; and footing inspections on a full time basis. A Corps of Engineers validated geotechnical testing firm shall inspect, test, and document earthwork construction

6.4.8. Borrow Material: Presently there IS an available Borrow Pit(s) on Ft. Bragg. See location Plan. A permit is required to use the Fort Bragg soil borrow material pits per Section Borrow Pit permit.

6.4.9. Haul Routes and Staging Areas

6.4.9.1. See Location Plan for haul routes. Utilize only those haul routes identified on the drawing set included in this RFP.

6.4.9.2. Additional Site Requirements

(a) Identification of Employees. Provide to each employee and require each employee engaged on the work site to display identification as approved and directed by the Contracting Officer. Deliver prescribed identification to the Contracting Officer for cancellation upon release of any employee. When required, obtain and provide fingerprints of persons employed on the project. All personnel shall wear identifying markings on hard hats to clearly identify the company for whom the employee works.

(b) Employee parking. Employees shall park privately owned vehicles in an area designated by the Contracting Officer. This area will be within reasonable walking distance of the construction site (equal to or less than ¼ mile straight line distance). Employee parking shall not interfere with existing and established parking requirements of the Installation.

(c) Temporary Facilities. Administrative Field Offices: Provide and maintain administrative field office facilities within the construction area of the designated site unless approved by the Contracting Officer and the Installation. Government office and warehouse facilities are not available to the Contractor's or subcontractors' employees.

(d) Storage Area. Trailers, equipment, or materials shall not be open to public view with the exceptions of those items which are in support of ongoing work on any given day. Do not stockpile materials outside the fence in preparation for the next day's work. Park mobile equipment, such as tractors, wheeled lifting equipment, cranes, trucks, and like equipment within the fenced area at the end of each work day. Locate construction trailer(s) within limits of construction. Locate the laydown yard/storage area within the limits of the construction area unless previously approved by the Contracting Officer and the Installation.

(e) Temporary Utilities. All temporary utilities (water, sewer, electrical, telecommunications, etc) will be at the Contractor's expense and subject to Fort Bragg regulations. In the case of privatization utility Contractors, the Utility cost information is at Appendix K. Contractor must negotiate and contract with the privatization utility directly without benefit of the Government

(1) Coordinate with ONUS for any temporary water and sanitary sewer service. ONUS will provide estimate for connection costs.

(2) Coordinate with Sandhills Utilities Services for any temporary electrical services. Sandhills Utilities Services will provide estimate for connection costs.

(f) Appearance of Trailers, Storage Spaces, and Other Facilities within the Laydown Yard. Storage equipment and facilities used for administrative or material storage purposes shall present a clean and neat exterior appearance and shall be in a state of good repair. Trailers, which, in the opinion of the Contracting Officer, require exterior painting or maintenance, will not be allowed on the Installation.

(g) Maintenance of Storage Area. Keep fencing in a state of good repair and proper alignment. Should the Contractor elect to traverse, with construction equipment or other vehicles, grassed or unpaved areas, which are not established roadways, cover such areas with a layer of gravel as necessary to prevent rutting and the tracking of mud onto paved or established roadways. Gravel gradation shall be at the Contractor's discretion. Mow grass located within the boundaries of the construction site for the duration of the project. Trim grass and vegetation along fences, buildings, under trailers, and in areas not accessible to mowers and edge neatly.

(h) Security Provisions. Provide adequate outside security lighting at all temporary facilities. The Contractor shall be responsible for the security of its own equipment. Notify the appropriate law enforcement agency requesting periodic security checks of the temporary project field office

(i) Temporary Project Safety Fencing. As soon as practical, but not later than 15 days after the date established for commencement of work, furnish and erect temporary project safety fencing around the construction site. This fencing shall remain the property of the Contractor. The safety fencing shall be 9 gauge chain link fence, a minimum of 72 inches high, supported and tightly secured to steel posts located on a maximum of 10 foot centers, constructed at the approved location. Maintain the safety fencing during the life of the contract and upon completion and acceptance of the work remove all fencing from the work site. Prior to erection of any temporary project safety fencing, coordinate with Fort Bragg DPW Transportation Engineer, Ray Goff; 910-907-1759 to check appropriate traffic safety sight lines. Installation and locating of project safety fencing shall consider sight triangles at intersections, curves, and construction entrances.

(j) Temporary Hazard Safety Fencing. Furnish and erect safety fencing at temporary hazards and work site areas considered to be hazardous to the general public. This fencing shall remain the property of the Contractor. The safety fencing shall be high visibility orange, high density polypropylene grid or approved equal, a minimum of 42 inches high, supported and tightly secured to steel posts located on maximum 10 foot centers, constructed at the approved location. Maintain the safety fencing during the life of the hazard and remove all fencing upon completion and acceptance of the work.

(k) Cleanup. Remove construction debris, waste materials, packaging material and the like from the work site daily. Clean up any dirt or mud which is tracked onto paved or surfaced roadways. Store materials resulting from demolition activities which are salvageable within the fenced area described above or at a supplemental storage area. Neatly stack stored materials, not in trailers, whether new or salvaged.

(l) Restoration of Storage Area. Restore areas used by the Contractor for storage of equipment or material, or other use, to the original or better condition. Remove gravel used to traverse grassed areas and restore the area to original condition, including top soil and seeding, as necessary.

(m) Building and Crane Height Restrictions. Verify construction activities do not interfere with Simmons Army Airfield or Pope Air Force Base aircraft glide slopes and FAA height restrictions. Submit FAA Form 7460-1 for all cranes to be used on each building and for each building in the project to the FAA. Submit this form to the FAA a minimum of 60 days before the cranes arrive on site and the vertical construction of the buildings start. FAA Form 7460-1 is available from the Contracting Officer's Representative (COR) at the area office.

6.4.10. Clearing and Grubbing:

6.4.10.1. Clear and grub all brush and vegetation from the designated site area.

6.4.10.2. Tree Removal Plan. Develop a Tree Removal and Restoration Plan. Include a pre-existing tree survey (drawing) that clearly depicts: removed and retained trees; a table containing type tree, size range (dbh) and number of trees to be removed and a functional replacement value for each size range, as outlined by the Fort Bragg Tree Replacement Policy and Table, Appendix AA.

(a) For projects under one acre, the tree survey will document tree size (by dbh), species, and location on the pre-existing tree survey drawing. Include the table identified above.

(b) For projects >1 acre determine tree functional tree replacement value is at a ratio of 1:1 (acre for acre) to eliminate negative forest fragmentation effects.

(c) Restoration plans must attempt functional replacement value by replanting trees on-site. If not applicable, replace trees off-site or a combination of both on-site and off-site may apply.

(d) Restoration plan must consider providing species diversity, green space planning, corridor development, wildlife value, etc. Plantings must consider "natural community" (i.e., aggregate clumping and composition, and structural layers (ground, mid-story and over-story). Green space areas should be juxtaposed to preexisting natural habitat to facilitate dispersal pathways (e.g., population demographics) for animals and plants, as well as, provide for recreational value.

6.4.10.3. Ft Bragg will notify contractor if merchantable tree sales are required and arrange appropriate disposal of said timber. Allow the Government 60 calendar days to remove merchantable timber once the Contractor has flagged the trees to be removed. Merchantable timber sales do not include stump or limb removal.

Remove all stumps and limbs from the project site. A valid NCDENR sediment and erosion control permit is required prior to removal of stumps from the project site.

6.4.10.4. If merchantable tree sales are not required, stockpile tree and land clearing debris at the designated recycling area at the Fort Bragg Lamont Road Landfill Facility. Tree and land clearing debris shall be free of as much dirt as possible.

6.4.10.5. Cut trees and limbs to manageable size, 4 to 6 feet length. Note: if the tree has a large diameter (example – 3 feet in diameter) cut it to lengths of 3 feet or less.

6.4.10.6. Cut trees close to the stump for safe handling at the landfill facility.

6.4.11. Landscaping:

6.4.11.1. Develop a sustainable landscape plan in accordance with the Installation sustainable communities' goals and priority.

6.4.11.2. Plant native trees, shrubs and grasses in accordance with Fort Bragg's plant list palette (Appendix I). Theme tree emphasis favors longleaf pine to support ecosystem management policy, sustainability, endangered species conservation, and sustainable communities.

(a) Place dense native evergreen mass vegetation (such Yaupon Holly, *Ilex vomitoria*, shrubbery) along all concrete, gravel, soil, and other pathway intersections to prevent 'short-cutting' outside the designated pathway surface. The length of dense native evergreen mass vegetation plantings shall generally extend at least 15 feet from the intersection edge along each pathway

(b) Do not specify invasive and/or exotic species (plant materials) in the Landscape Plan.

(c) Consider site utilities when developing the landscape plan to prevent conflicts. Avoid placing trees under light fixtures or shrubs in front of equipment doors and fire hydrants.

6.4.11.3. The source water for all areas receiving irrigation shall be from rainwater harvesting, process water recovery, or other non-potable source. This does not include water wells.

6.4.12. Turf:

(a) Use centipede grass (Eremochloa ophiuroides) for low traffic grass turf areas.

(b) Use zoysia grass (Zoysia spp) for high traffic grass turf areas.

(c) The Fort Bragg preferred turf and seeding requirements are in Appendix I.

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 Fort Bragg'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 Bragg'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 indentified 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 features that are sympathetic to the style and context of the Installation. The Installation's intent for this area is as indicated in Appendix F. Site and architectural conceptual drawings that meet this objective are shown in Appendix F.

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 Bragg. 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) Provide a Knox 4400 Series (single lock model) recessed wall mounted key vault for Fire Department use at each building exterior. Locate adjacent to the main building entrance. Coordinate purchase of key vault through the Installation Fire Department for purchase order information and forms.

(c) In addition to building number signage on building as indicated in paragraph 5, provide freestanding exterior building signage in accordance with Appendix H.

(d) No building shall be over six stories or penetrate identified air space management zones.

(e) Exterior Wall Protection: Construct the bottom five feet of exposed exterior walls of a durable material resistant (masonry or equivalent) to moisture damage and decay as well as impact damage caused during day-to-day soldier activities expected for the function of the facility. Material shall be easily maintained and/or repaired.

(f) Prepare and present for approval an exterior building finishes scheme no later than at interim design submittal. Present original samples of this scheme to reviewers no later than at the interim design review conference for each facility included in the contract.

(g) See Appendix L for Installation LEED preferences relating to exteriors.

6.5.3. Programmable Electronic Key Card Access Systems:

6.5.3.1. Programmable Electronic Key Card Access Systems: The existing Installation key card access system is SAFLOK with short core, manual key override, and manufacturer's longest lasting magnetic strip card.

6.5.3.2. Installation Key System: Installation keying system for non-card locks is Best Lock Corporation. Cores for locksets other than those for mechanical, electrical and communications rooms only shall extend the existing Installation Keying System. Key locksets for mechanical, electrical and communications rooms to the existing Post Utilities Master Keying System. All locksets and exit devices shall accept the same interchangeable cores.

6.5.4. INTERIOR DESIGN

6.5.4.1. Prepare and present for approval an interior building finishes scheme no later than at interim design submittal. Present original samples of this scheme to reviewers no later than at the interim design review conference for each facility included in the contract. Interior color scheme for each facility shall comply with one of the color schemes indicated for the facility type in Appendix F.

6.5.4.2. Acoustic ceiling tiles, if used, shall be two foot by two foot Omni-directional mildew/moisture resistant units. Interior paint shall be semi-gloss in wet areas and flat in all other areas.

6.5.4.3. Provide a State of North Carolina licensed elevator inspector to inspect the installation, test all new elevators, applicable to project, and certify in writing that they meet all requirements.

6.6. STRUCTURAL DESIGN

6.6.1. Treat subgrades under all facility foundations to resist subterranean and other wood destroying insects known to exist in the vicinity of the site. Treatment shall be in accordance with the environmental criteria referenced in this document.

6.6.2. Slabs on Grade. All interior slabs on grade, including storage and mechanical rooms, garages and carports, shall be underlain by a moisture vapor barrier consisting of lapped polyethylene sheeting having a minimum thickness of 6 mil and a minimum 4-inch thick capillary water barrier of open graded, washed pea gravel, or crushed stone, such as Nos. 57, 67, 78 or 89, except where a passive vapor intrusion mitigation system is required.

6.6.3. Structural Loading. Design building structures for the following types of minimum site specific live loads per most recent versions of ASCE-7 and IBC.

6.6.3.1. Roof live loads – (20 psf)

6.6.3.2. Snow load – (pg – snow ground load – 10 psf)

6.6.3.3. Wind load – 95 mph

6.6.3.4. Seismic loading - Use applicable references. Seismic design also includes the various systems, piping, hangars, etc.

6.7. THERMAL PERFORMANCE

No additional requirements.

6.8. PLUMBING

6.8.1. Reduce potable water use for building sewage conveyance by 50 percent through the use of water conserving or non-potable water fixtures. This can be accomplished through the implementation of high-efficiency and very high efficiency toilets, rainwater harvesting/use, sensing low flow and very-low flow faucets, and other appropriate technologies.

6.8.2. Non-Water Using Urinals – Install with urinal rim 17 inches AFF. Provide concealed chair carriers. If urinals use a replaceable cartridge, provide four (4) additional cartridges for each urinal installed along with any tools necessary to remove/install cartridge, and an additional quart of biodegradable liquid for each urinal installed.

6.8.3. Wall hung water closets are not preferred. Tank type (6-liter) water closets are preferred.

6.8.4. Wall hung lavatories are preferred.

6.8.5. Floor mounted water coolers are not preferred.

6.8.6. All fixtures shall be white and exposed fittings polished chrome.

6.8.7. Piping

(a) Plastic pipe (Sch 40 PVC) shall be used for drainage and venting including under concrete slabs or inside buildings.

(b) No cellular foam core piping is allowed.

(c) CPVC and Type L (or above) copper shall be sued for water supply above slabs.

(d) Type K (copper) for water supply under slabs.

(e) Provide wall hydrants at a maximum spacing interval of 200 feet around the exterior wall of the building. Hydrant will be box type, freeze proof, with an integral vacuum breaker/backflow preventer.

(f) Elevator Sump Pump. Terminate waste discharge from elevator sump into the sanitary sewer system (where elevators are provided). Provide an oil separator to accept the waste discharge prior to emptying into the sanitary sewer system. When an “approved alarm system “ is provided and installed, an oil separator is not required and as a minimum, the alarm should provide a local audible and visual alarm, and shall provide a remote indication to the Building UMCS or similar monitoring system.

6.9. SITE ELECTRICAL AND TELECOMMUNICATIONS SYSTEMS

6.9.1. General. Site development work shall include selected exterior electrical demolition, construction of secondary service, communications service, Cable TV, as shown on the drawings and as described in the contract or task order.

6.9.2. Building Electrical Site Work and Coordination. Conduct electrical site coordination meetings at the start of design and when necessary thereafter. Meetings shall include government representatives (DPW and DOIM), privatized electric utility company (Sandhills Utilities Services), the local cable TV company (Time-Warner) and all other utilities involved in the site work, and the Corps of Engineers Contracting Officers Representative.

6.9.3. Exterior Electrical Distribution System

6.9.3.1. The privatized electrical system contractor, Sandhills Utilities Services (SUS), will design and construct site electrical primary distribution to and within the project site. The SUS point of contact is Jeff Brown, 910-497-7399, jeffbrown@sandhillsutility.com. See Appendix C (Utility Connection) for additional information.

6.9.3.2. Design and construct the site electrical secondary distribution. Coordinate with SUS through the Contracting Officer, regarding primary routing and transformer locations, sizes, and impedances.

6.9.3.3. Design and construct exterior circuits connected beyond the Meter for sump pumps, irrigation pumps and other electrical and mechanical equipment. Stand alone circuits should be beyond a meter and SUS end at the line side of the meter socket. .

6.9.3.4. Do not locate above ground distribution equipment within 33 feet of buildings, including transformers. Small pedestrian lights, less than 4” base diameter, are excluded from this requirement.

6.9.3.5. SUS will demolish any existing exterior SUS above ground equipment no longer required on project site. Any below ground demo will need to be negotiated due to depth and location of underground facilities.

6.9.3.6. All work done by SUS shall be under a separate contract with the Government. THIS WORK IS NOT PART OF THIS CONTRACT.

6.9.3.7. Low voltage secondary service ductlines shall be direct burial, thick wall type minimum. Concrete encase in vehicular traffic areas.

6.9.3.8. Provide rigid galvanized steel conduit, for transitions from below to above grade. Fittings for steel conduit shall be steel threaded or compression type. Screw, clamp or other type fittings are not acceptable.

6.9.3.9. Provide secondary service cables to the secondary compartment of the transformer. The cables shall be clearly marked [color coded or taped] and sufficient of length to facilitate their connection to the secondary lugs of the transformer. SUS will install the cable terminators and connect to the transformer.

6.9.3.10. See Appendix C: UTILITY CONNECTIONS for additional information and requirements.

6.9.4. Exterior Lighting

6.9.4.1. Lighting within the Old Post Historic District must meet the requirements of the Old Post Historic District Design Guidelines

6.9.4.2. Design the site lighting for installation by SUS (under separate contract). Supply the site design to SUS for them to plan installation of supporting conduits, exterior lighting bases, and other equipment.

6.9.4.3. See Appendix C: UTILITY CONNECTIONS for additional information and requirements.

6.9.5. Site Telecommunications

6.9.5.1. Connect to the OSP, extending a new duct line, manhole and cable system to the building main communications room. Each ductline between manholes shall be minimum 4-way 4-inch, Schedule 40 PVC conduits. Coordinate design, construction and connection point location with the installation DOIM. Typical drawings required for design can be found in I3A figures C2 thru C6.

6.9.5.2. Do not use the last remaining duct in any pathway system/ductbank. Include one spare duct for maintenance purposes in any segment of pathway or duct bank design.

6.9.5.3. Coordinate planning and design of outside plant communications systems on Fort Bragg with the Fort Bragg DOIM. DOIM will provide the following information and assistance for the proposed communication design

(a) Location of nearest fiber optic service and available strand count

(b) Location of the nearest copper service and available cable count

(c) Location of nearest manhole, hand hole, or installation cable support infrastructure that can provide a duct tie-in point.

6.9.5.4. When no existing outside plant communications infrastructure is available near the proposed facility, the following requirements apply:

(a) Provide outside plant communications infrastructure from the nearest Area Distribution Node (ADN) or Remote Switch Unit (RSU).

6.9.5.5. Provide a 3-way 4-inch duct line to the building main communications room. Provide one strand optical fiber (SM) in a second duct. The remaining duct(s) shall be spare. Terminate cables on protected entrance terminal blocks in each building's main communications room.

6.9.5.6. In addition to Para 2.5.6 in the I3A, cover no less than two walls with fire rated plywood.

6.9.5.7. In reference to I3A Para 3.8.8, use Fabric Mesh Innerduct for duct and cable installations. Install 3 each, 3 inch, 3 cell fabric mesh with each fiber cable installation and in one of four newly installed ducts.

6.9.5.8. Per I3A Fig C-5, Manholes shall be 38YJ4 on Ft Bragg and shall include a moveable ladder.

6.9.5.9. Size 30" maintenance hole lids are required unless otherwise specified or approved. Maintenance hole lids larger than the standard 30" size are extremely cumbersome when providing maintenance on cable infrastructure. Ref. I3A, paragraph 3.8.1.3 (a).

6.9.5.10. When considering System Furniture for admin spaces, take the different classified systems into consideration. Power, SIPR, and NIPR could potentially be housed within the systems furniture channels. Stringent separation restrictions must be adhered to for this practice. A systems furniture module, figure 13-0B, must have a separate channel for each cable category. They must enter the piece typically through a ceiling mounted power pole or underneath via a raised floor system and then channeled through the furniture. Power is typically directed to the floor channel and is then terminated. NIPR enters through a separate power pole and is channeled to the mid

"Beltline" channel and SIPR, if installed, enters in through its own power pole system and is channeled through the top channel. This configuration will provide all separation necessary to comply with Tempest requirements.

Because of the nature of this furniture, infrastructure space is a valuable commodity that is somewhat overlooked. Extended Depth faceplates, figure 13-0A, when installed, ensure the proper bend radius is provided to make sure specifications are met for connectivity.

6.9.5.11. In regards to the I3A Technical Guide, paragraph 2.3.3.1, regarding copper outlets and connectors, wire all outlet/connectors per T568A.

6.9.5.12. Use the following Cable Jacket and RJ-45 Color Code:

Green **-** The standard wire and jack color for UNCLASSIFIED.
Red **-** The standard wire and jack color for CLASSIFIED (SECRET)
Yellow **-** The standard wire and jack color for CLASSIFIED (TOP SECRET)

6.9.5.13. Label in accordance with the Fort Bragg standard labeling scheme shown below:

6.9.5.14. Outside Plant (OSP) Voice and Fiber Optic Service Cables: Provide OSP Voice and Fiber building service cables as follows:

(a) Extend all service cables through the new building service duct line.

(b) Terminate all OSP Voice Only service entrance cables on protected terminal blocks and all Fiber Optic cables on service entrance termination hardware located in the main communications room.

(c) Provide service entrance termination hardware for fiber optics service cables. Terminate the facility service data fiber optic cables on a patch panel, on 19-inch floor mounted standard racks. Terminate cables with 'SC' connectors at facility service entrance. Terminate the facility's data communication at an RJ45 patch panel in this rack. Provide patch cables (fiber and copper) and connect as required by DOIM to meet I3A requirements.

(d) Demolish and remove any existing OSP cabling and communications duct bank no longer required on the project site.

6.9.6. Lightning Protection. Lightning risk assessment calculations shall be in accordance with NFPA 780, Appendix L, utilizing the following variables:

6.9.6.1. Fort Bragg Lightning Flash Density Index "Ng" Value = 4

6.9.6.2. Determination of Environmental Coefficient Index "C1" = 1 (Isolated structure, no other structures located within a distance of 3H)

6.9.6.3. Determination of Structure Contents Coefficient Index "C3" Minimum value = 1 (Use larger if applicable)

6.9.6.4. Determination of Structural Occupancy Coefficient "C4" = 1 (Normally occupied)

6.9.6.5. Determination of Lightning Consequences Coefficient Index "C5" = 5 (Continuity of facility services required, no environmental impact

6.10. FACILITY ELECTRICAL AND TELECOMMUNICATIONS SYSTEMS

6.10.1. Coordinate all work with Fort Bragg DOIM.

6.10.2. Voice/Data Communications

6.10.2.1. LAN Hubs shall be Government Furnished/Government Installed.

6.10.2.2. Provide a quadplex power outlet and voice/data communications outlet every eight (8) feet of open wall space to support modular training in one classroom.

6.10.3. Elevators

Install conduit, wiring, and a telephone device as the emergency phone in the elevator cab. Government is responsible for making telephone operable including coordinating with the Ft Bragg DOIM for service and connection to the Ft Bragg DES 911 Emergency Call Center.

6.11. HEATING, VENTILATING, AND AIR CONDITIONING

6.11.1. Integrate the control system to the installation's existing UMCS. The existing UMCS is an LCS-8520 that utilizes the LonWorks® Technology to integrate LNS databases into a single front-end. The UMCS is based on UFGS 25-10-10.

6.11.1.1. Fort Bragg's System Integration (SI) Contractor will integrate the building's BAS in accordance with UFGS 25-10-10 and the Fort Bragg UMCS Integration SOW, under separate contract with the Government. Coordinate through Fort Bragg's UMCS System Manager.

6.11.1.2. General Requirements

(a) Do not modify the chiller microprocessor supplied with the equipment. Control and safety functions should be the chiller manufacture's responsibility.

(b) Do not modify the boiler microprocessor supplied with the equipment. Control and safety functions should be the chiller manufacture's responsibility. If heating water systems are used, then design such systems to maintain the boiler manufacture's minimum temperature when in operation but vary the heating water supply temperature as required to meet the buildings requirements.

(c) Provide all DDC software, equipment and devices from a single common manufacturer whenever possible.

6.11.2. Mechanical Equipment Maintenance and Accessibility Requirements

6.11.2.1. Selected mechanical systems must be compatible with the existing systems and composed of standard commercially available items with readily available service and repair parts.

6.11.2.2. Any mechanical rooms above the first floor shall have an external access (door, removable louvers, etc of ample size such that the largest piece of installed equipment could be removed through the opening.

6.11.2.3. Install all piping, except individual fixture pipes, to permit access without requiring removal of permanent walls, floor, or ceilings.

6.11.2.4. Arrange all equipment, piping, etc in mechanical rooms so that each piece of equipment can be removed without having to remove any other piece of equipment. Consider things such as coil pull areas in the mechanical room layouts.

6.11.2.5. Chillers: Chillers shall include as a minimum the following features

(a) Scroll or screw type compressors with 5-year parts warranty

(b) Microprocessor controllers with self-diagnostic capabilities

(c) Low ambient controls to zero (0) degrees F.

6.11.2.6. Fuels

Natural gas is the preferred fuel source for heating.

6.11.2.7. Pumps

(a) Hot Water and Chilled Water pumps shall operate at 1,750 rpm or less

(b) Mechanical Rooms: Heat to 40 F for freeze protection where piping may be subject to freezing.

6.11.3. Site Mechanical Equipment. Design all exterior mechanical equipment to be compatible with existing mechanical equipment within the surrounding area. This includes color and screening.

6.12. ENERGY CONSERVATION

6.12.1. 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

6.13. FIRE PROTECTION

6.13.1. Provide fire extinguisher cabinets and brackets when fire extinguishers are required by UFC 3-600-01 and NFPA 101. Place cabinets and brackets shall in accordance with NFPA 10.

6.13.2. Provide semi-recessed cabinets in finished areas and brackets in non-finished areas (such as utility rooms, storage rooms, shops and vehicle bays).

6.13.3. Fire Extinguishers are Government Furnished/Government Installed for this project. Advise Government of required size and type Fire Extinguisher for each type building and service location

6.13.4. Fire Alarm System. Fire alarm panels must be addressable and must be able to communicate alarms to the Honeywell Enterprise Building Integrator System (EBI) located at the Fort Bragg 911 Center.

6.13.5. Mass Notification System

6.13.5.1. Provide a combined system that performs both as an individual building MNS and as the building Fire Alarm voice evacuation system.

6.13.5.2. In addition to the applicable references and design criteria in paragraphs 4 and 5, see Appendix AF for Fort Bragg Implementation Directions to Building Mass Notifications Specifications and Installation Guidelines

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 meets the criteria for this credit.

SS Credit 3 Brownfield Redevelopment.

Project site DOES NOT meets 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 28310.

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. For all Fort Bragg projects using LEED Online, invite thomas.s.blue@us.army.mil to join the LEED online project at beginning of project. No team assignment is needed once he joins, as he is a reviewer.

6.14.8.1. Additional Information

[Not Supplied - PS_SustDesign_Additional : MR2]

6.15. ENVIRONMENTAL

6.15.1. Spill Response Procedure and Plan

6.15.1.1. Notify the Fire Department immediately in the event of a hazardous spill. The first person on-scene that identifies the hazard must notify the Fire Department – this may or may not be the designated POC.

6.15.1.2. After notifying the Fire Department, call the DPW Environmental Compliance Branch and the Contracting Officer.

6.15.1.3. The Fort Bragg Fire Department and DPW Environmental Compliance Branch are responsible for any off-installation notification.

6.15.1.4. Provide a Spill Response Plan for review. Include a list of reporting channels, telephone numbers, a listing of the hazardous materials stored on site, copies of Material Safety Data Sheets for the hazardous materials, and a site diagram outlining where the storage sites are located. Train all supervisors on site in the execution of the Spill Plan. Document all training.

6.15.2. Wetlands and Stream Crossing

6.15.2.1. Do not enter, disturb, or allow any discharge (soil, sediment, and/or pollutants) into any wetlands.

6.15.2.2. Comply with all local, state, and federal laws and regulations pertaining to the protection of wetlands under the CWA Section 404/401 regulatory program and North Carolina DENR Division of Water Quality.

6.15.2.3. If wetland impacts are unavoidable, abide by CWA Section 404 regulatory program and apply for applicable wetland permits. All wetland permit costs, delineations, and compensatory mitigation costs will be the contractor's responsibility.

6.15.2.4. Comply with avoidance, minimization strategies prior to approval of any wetland impact in accordance with CWA Section 404 (CWA 33 USC 1344).

6.15.2.5. All stream crossings will avoid impacts to navigable waters and wetlands. Do not enter, disturb, destroy, or allow discharge (fill) of soil, sediment, or contaminants into the stream.

6.15.2.6. Comply with all local, State, and Federal laws and regulations pertaining to the protection of surface waters to include but not limited to lakes, ponds, streams, creeks, rivers, and bayous.

6.15.3. Safety and Health Requirements for Construction Activities

6.15.3.1. Work performed under this contract shall comply with EM 385-1-1, specifically 28.A, applicable Federal, State, and local safety and occupational health laws and regulations. This includes, but is not limited to, Occupational Safety and Health Administration (OSHA) standards, CFR 29 Part 1910, especially Section .120, "Hazardous Waste Site Operations and Emergency Response" and CFR 29 Part 1926, especially Section .65, "Hazardous Waste Site Operations and Emergency Response". Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting work. Where the requirements of this contract, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements shall apply.

6.15.3.2. Ensure that all subsurface disturbing activities are monitored by a competent person using a direct reading instrument capable of detecting any VOCs that may be released.

6.15.3.3. Develop a Site Safety and Health Plan (SSHP) to cover the safety and health aspects of the subsurface contamination detailed in Section 6.12.1, which may be encountered during the execution of this project. In some areas the Contractor may encounter contaminated groundwater which may need to be dewatered to execute construction activities. Although the contamination is in the soil, VOC vapors may also be released during excavation of footers, utility trenches, and other subsurface disturbing activities.

6.15.3.4. The Savannah District Safety and Occupational Health Office are required to review and accept the Site Safety and Health Plan. In addition to the requirements detailed in 385-1-1 28.A, submit the following as part of the SSHP: Certifications of Hazard Waste Site Training and Experience, Medical Clearances, and Licenses. Do not submit materials with full social security numbers or personal medical data. Black out this information.

6.15.4. Dewatering

6.15.4.1. If dewatering of excavations is required, the water being removed shall be considered as contaminated with SVOCs and/or VOCs and pumped it through piping to the stormwater/detention/retention basin that the Contractor is required to build under 6.5.6 stormwater Management and Quality.

6.15.4.2. Fort Bragg Directorate of Public Works Environmental Compliance Branch (DPW-ECB) and Water Management Branch (WMB) must approve the specific structural stormwater management measures.

6.15.4.3. All stormwater management requirements apply to dewatering activities, materials, and water. All OSHA health and safety requirements apply to dewatering activities.

6.15.5. Vapor Mitigation Design Requirements

6.15.5.1. Design and install a passive vapor intrusion mitigation system under all buildings that have soil and/or groundwater contamination. The system shall follow the guidelines presented in U.S. Environmental

Protection Agency Radon Mitigation Standards (EPA 402-R-93-078) and Radon Prevention in the Design and Construction of Schools and Other Large Buildings (EPA/625/R-92/016).

6.15.5.2. Although this guidance addresses radon mitigation, the same principles can be applied to volatile organic compound (VOCs) and semi-volatile organic (SVOCs) vapors.

(a) Ensure that all materials used shall be compatible with VOCs and SVOCs. This includes but is not limited to the liner, caulking, sealants, piping and all other materials.

(b) Ensure that the system installed meets or exceeds the expected life-use of the buildings it is installed in. The design shall consider protection of roof-top venting from the elements such as heavy rains, winds, etc., and locate a safe distance from all fresh air intakes.

(c) Leak test or construct the system in such a manner that leaks cannot occur within the building. Submit documentation of system integrity to the Contracting Officer's Representative.

6.15.6. Existing Monitoring Wells

6.15.6.1. Should any wells be damaged, or found to be placed in an area where they will become damaged, contact the USACE project manager for directions on how to close and where to re-install the wells. Close and reinstall GW monitoring wells at no additional cost to the Government. For further information, reference Fort Bragg's Standing Operating Procedure (SOP) #6003.

6.15.6.2. Protect all groundwater monitoring wells at construction sites with known contaminated areas.

6.15.6.3. Raise the tops of or lower existing monitoring wells located in pavements and sidewalks to meet new finished grades and replace the tops with vehicle rated tops.

6.15.6.4. Relocate ground-water monitoring wells located within building footprints only after written approval from the State and the Contracting Officer.

6.15.6.5. Repair or replace any monitoring wells damaged as a result of construction at the Contractor's expense.

6.15.7. Contractor Generated Spills

(a) Manage, store, dispose and dispense petroleum products, hazardous materials, and hazardous wastes according to all Federal, state, and local regulations (including Fort Bragg Regulations 200-1, 200-2, and 200-3).

(b) Transport generated hazardous waste off Government property to a permitted transportation, storage, and disposal facility (TSDF).

(c) Coordinate with the DPW Environmental Compliance Branch Hazardous Waste Program Manager to obtain the EPA ID number for the standard manifest. Hazardous waste cannot leave the installation without the designated representative from the DPW Environmental Office signing and obtaining a copy of the manifest.

6.15.8. Historic Properties. Stop work immediately and notify the Contracting Officer and the Fort Bragg Cultural Resources Program Manager if unidentified/unanticipated cultural resources are discovered/found during excavation or other construction activities.

6.16. PERMITS

6.16.1. The Government has not obtained any permits/licenses related to this project.

6.16.2. The Contractor shall be responsible for obtaining ALL applicable permits as part of the design process and shall secure ALL permits necessary for construction of the project. Determine fee basis and pay all filing fees at no additional cost to the Government.

6.16.3. Comply with provisions of the Installation permits, compliance agreements, and plans with regulating authorities/agencies.

6.16.4. Submit copies of permits to the Contracting Officer and Ft Bragg Environmental Division in sufficient time to allow for review and revision with ultimate submittal 10 days prior for the associated permitted activity. Provide copies of permit amendments to the Contracting Officer representative and Ft Bragg Environmental Division.

6.16.5. Water and Sanitary Sewer Permit. ONUS, as the Fort Bragg water and sewer privatization contractor, is responsible for all aspects of obtaining and closing the potable water and sanitary sewer permits for this project.

6.16.6. Borrow Pit Permit. A permit is required to use the Fort Bragg soil borrow material pits. Process soil borrow pit permits with the Environmental Branch of the Directorate of Public Works Environmental Sustainment Division through the Contracting Officer Representative.

(a) Permits are issued for the life of the contract only.

(b) Borrow material may only be used on the project for which the permit(s) are issued.

(c) Keep a copy of the signed permit with the borrow hauling vehicle throughout the borrow operation period.

(d) Copies of the borrow permit can be found in Appendix AD.

6.16.7. Construction and Demolition (C&D) Waste

6.16.7.1. Obtain and pay for all permits associated with demolition.

6.16.7.2. Landfill tipping fees for construction debris [Not Supplied - PS_Permits : PERMITS_CHARGED] be charged to the Contractor at time of award contract. The landfill tipping fees are identified in Appendix AC.

6.16.7.3. Construction and Demolition (C&D) permit is required to use the Fort Bragg LaMont Road Construction and Demolition Landfill Facility (Permit No 26-08). Follow requirements identified at http://www.bragg.army.mil/envbr/solidwaste.aspx regarding disposal of inert construction and demolition waste in the Ft Bragg C& D landfill sites.

(a) Process the Construction and Demolition (C&D) permit with the Environmental Branch of the Directorate of Public Works Environmental Sustainment Division through the Contracting Officer Representative.

(b) Permits are issued for the life of the contract only.

(c) Only materials produced on the project for which the permit(s) are issued may be disposed of in the land clearing and inert debris/demolition landfills.

(d) Keep a copy of the signed permit with the hauling vehicle(s) throughout the borrow operation period.

(e) Copies of the disposal permit can be found in Appendix AC.

(f) Obtain and pay for all permits associated with demolition.

(g) The contractor is encouraged to recycle commodities through the Ft. Bragg QRP.

6.16.8. Fort Bragg Excavation (Dig) Permits

6.16.8.1. Present an Excavation Permit, FB Form 1605, to the Resident Engineer for approval by the Facilities Engineer prior to any excavation that penetrates the ground by 6 or more inches. A sample of this form is included at Appendix AH or can be obtained from the Resident Office upon request.

6.16.8.2. Spot all utility lines using an independent spotting service prior to beginning excavation. Keep a signed copy of the digging permit on site at all times. Fort Bragg may conduct back check spotting excavation during the excavation portion of this contract.

6.16.9. Title V Air Permits

6.16.9.1. Coordinate with Fort Bragg's Environmental Branch, point-of-contact (POC) Gary Cullen (910-907-3645), Air Program Manager, in obtaining all required and applicable permits as part of the design process. Secure

all permits necessary for construction of this project to include the purchase of any add-on emission control devices (if applicable) associated with this project, and at no additional cost to the Government.

6.16.9.2. Fort Bragg operates under a Title V Air Permit for air quality requirements. Perform a regulatory review of all air sources in the project and submit for approval to the Environmental Compliance Branch (ECB).

(a) New sources must be reviewed for Prevention of Significant Deterioration (PSD) applicability. Each Congressional Appropriation is defined as one project. Additionally, new sources must be reviewed for NESHAP (National Emissions Standards for Hazardous Air Pollutants) applicability.

(b) Develop required air permit application(s) and/or coordinate with ECB on any on-going permit applications.

(c) Pay all Air Permitting fees to NCDENR (North Carolina Department of Environment and Natural Resources). Obtain all required permits prior to construction of any new sources.

(d) Comply with all State regulatory requirements for boilers fired by either natural gas or distillate oil. Ensure that the boiler(s) is included in the Installations Title V Air Permit.

(e) New boilers with input greater than 10 million BTU/hr shall meet 40 CFR Part 60, New Source Performance Standards.

(f) All new boilers shall include low NOx burners.

(g) Obtain an air permit for each type of material (i.e. concrete, rock crushing, and asphalt batch plants) that will produce dust and other harmful particulates within the boundaries of the installation.

(h) The Contractor may not unilaterally change the Installation's Title V Air Permit. Coordinate any and all changes/modifications through the designated Environmental Branch staff.

6.16.9.3. 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, submit the following to the installation's environmental office, point-of-contact (POC) Gary Cullen (910-907-3645), Air Program Manager:

(a) A listing of boilers and domestic hot water heaters that will be fired by natural gas, propane, and/or fuel oil

(b) The fuel or fuels (primary and backup, if applicable) that will be utilized for each piece of equipment

(c) The quantity of each particular size

(d) The respective input firing rate.

(e) 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.

(f) Send two copies of the document to the Savannah District: one to the Project Manager for placement in Central Files, and another to the Mechanical Section.

6.16.9.4. Document Changes

(a) Do not send the Air Permit prematurely, since any increase in boiler sizing subsequent to submission of the document will require revision to the permitting process,

(b) If there is a change in equipment sizing during refinement of the design process, submit an updated copy of said document.

6.16.9.5. Incorporate the equipment accessories required for compliance with the governing environmental laws into the design. This includes, but is not limited to, determining the need for individual metering and the level of emissions monitoring required.

6.16.9.6. The interim 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.

6.16.9.7. Normally, for fast track design-build contracts, the Air Permit construction permit will not have been obtained prior to award of the design-build contract.

(a) 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.

(b) 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).

6.16.9.8. If the use of temporary rental or leased equipment is required during demolition, renovation, or construction of the project, the emissions from those pieces of equipment need to be qualitatively and quantitatively reviewed for air quality permitting requirements.

(a) Assess those needs and any permitting required will be the responsibility of the contractor.

(b) Contractor is responsible for any permitting fees or resulting permit compliance associated with the temporary equipment. Examples include the use of temporary electrical generators, boilers, painting operations, abrasive blasting operations etc. to support the project. Per 15A NCAC 2D .0300

6.16.10. State of North Carolina Required Applications and Permits. Prepare, sign, and submit the following list of commonly required State of North Carolina applications and permits for Fort Bragg projects

6.16.10.1. North Carolina State Demolition Permits

6.16.10.2. North Carolina State Asbestos Removal Permit

[Not Supplied - PS_Permits : PERMITS]

6.16.10.3. North Carolina Erosion and Sedimentation Control Permit. Create and implement an Erosion and Sedimentation Control (ESC) Plan that conforms to the Fort Bragg EPA Construction General Permit, and local erosion and sedimentation control standards/ codes in effect at the time of award.

6.16.10.4. North Carolina General Permit to Discharge Stormwater under the National Pollutant Discharge Elimination System

6.16.10.5. North Carolina Stormwater Management Permit Application Form

6.16.10.6. North Carolina Notice of Intent (NOI) and Notice of Termination (NOT) Documents. Prepare, sign, and submit the NOI and NOT documents to the State of North Carolina.

6.16.10.7. Obtain any North Carolina additional applications and permits not listed as required for the construction of this project.

6.17. DEMOLITION

6.17.1. Demolish building(s)and other demolition work within the construction footprint to include demolition, asbestos containing materials (ACM) abatement and hazardous building materials (HBM) removal, removal of foundations, capping underground utilities (water, sewer, natural gas, heating and chilled water, etc.) and other site improvements. Comply with Federal, State and local statutes, ordinances agreements and as described in this RFP.

(a) The Contractor [Not Supplied - PS_Demolition_Additional : DEMOLITION_AUTHORIZED] authorized to perform a full remediation of the site under this Contract.

6.17.2. Copies of ACM and HBM surveys are included in the RFP in Appendix AI.

6.17.3. The construction and waste management plan shall identify the materials to be diverted from disposal and sorted onsite.

6.17.4. In the case of buildings that are in the direct footprint of the project, the Government will move demolition building occupants and furnishings prior to the Contract NTP date except where movement is not in the best interests of the Government. Such cases will be identified in the Contract.

6.17.5. Notify Directorate of Public Works (DPW) through service orders (Telephone 910-396-0321) to disconnect all utilities to demolition buildings to include electricity, natural gas, propane gas, and fuel oil.

6.17.6. Either self perform or contact ONUS regarding disconnection and capping of potable water, fire water, and sanitary sewer lines. ONUS will determine the Contractors level of demolition of all sanitary sewer and water mains.

6.17.7. If the Contractor plans to use a demolition building for administrative or storage:

6.17.7.1. Notify the Government through the Corps of Engineers in writing of their intent during contract negotiations.

6.17.7.2. DPW will disconnect utility services, but not remove them.

6.17.7.3. The Contractor is responsible for installing appropriate electrical, water, and gas meters for the building. If connecting to privatized utility (water, gas, or sewer), contractor must coordinated with privatized utility company for installation of services. All costs associated with the connection shall be paid for by the contractor

6.17.7.4. DPW will reconnect the metered services upon notification by Corps of Engineers.

6.17.7.5. The government bears no responsibility for the condition of the demolition buildings between the Request for Proposal (RFP) and the contract or task order Notice to Proceed (NTP) date.

6.17.7.6. The Government maintains the right to salvage all materials from the building until the NTP date.

6.17.8. Contact ONUS regarding disconnection and capping of potable water, fire water, and sanitary sewer lines. ONUS will determine the Contractors level of demolition of all sanitary sewer and water mains.

6.17.9. Assume that all demolition buildings will have no salvage value.

6.17.10. Do not assume that any building within the project footprint can be an administrative or storage building. If a building is missing structural components (windows, doors, etc), equipment (commodes, sinks, HVAC units, etc) or utilities (electricity, water, natural gas, fuel oil), it is the Contractor's responsibility to restore these components to make the building habitable for their use.

6.17.11. DPW will notify DOIM to disconnect government telephone and CATV service to buildings.

6.17.12. DPW will notify EMBARQ / Time Warner to disconnect privately owned telephone and CATV service to buildings.

6.17.13. Fort Bragg DPW charges three hundred dollars ($300.00) per building to disconnect utilities.

6.17.14. Fill depressions caused by the removal of demolished materials such as building foundations, pavements, sidewalks, utility lines and pad, etc., to grade, compacted per soil compaction requirements, and slope to drain towards the nearest appropriate structural stormwater management measure.

6.17.15. If fuel contaminated soils are found during the demolition or cut/fill operations, cease work immediately and notify either the Contracting Officer representative or the Contracting Officer for resolution that can include removal of contaminated soil, filling and capping area with clean, uncontaminated soil.

6.17.16. Asbestos/Hazardous Material Removal

6.17.16.1. The Contracting Officer representative will provide copies of all asbestos inspection reports, permits and disposal documents and Asbestos Removal, Transportation, and Disposal Documentation Forms to the ECB Asbestos Program Manager. North Carolina accredited personnel must perform all asbestos activities.

6.17.16.2. Dispose of all abated friable and non-friable ACM in accordance with all Federal, State, and local regulations at the Fort Bragg Landfill on LaMont Road.

6.17.16.3. If asbestos/ lead based paint/ hazardous materials are positively identified during building or site demolition, cease work immediately and notify either the Contracting Officer representative or the Contracting Officer for resolution.

6.17.17. Utility Demolition

6.17.17.1. Coordinate with the privatized electrical company (Sandhills Utilities Services), privatized water/sewer company (Old North Utility Service), Directorate of Information Management, and Directorate of Public Works during design phase and before construction.

6.17.17.2. Completely remove and cap existing utilities located beneath new building footprints (if abandoned) or reroute if utilities are being used by existing buildings. Coordinate demolition of existing utilities serving occupied buildings with construction of new utilities so that utilities to occupied buildings remain in service at all times.

6.17.18. AST/UST Demolition

6.17.18.1. The project area may be located in a [Not Supplied - PS_Demolition_Additional : DEMOLITION_CONTAMINATION] contaminated area. Typical contamination constituents are from former heating oil and diesel underground storage tanks (USTs). Other sources of soil and groundwater contamination are old unlined dump sites and aboveground storage tank (AST) spill sites.

6.17.18.2. The location of USTs removed by others is provided to the Contractor as "Information Only", and may not be complete. If an unknown underground storage tank is discovered during construction, please adhere to Appendix AE. If an unknown tank meets the criteria for a Differing Site Condition under said contract clause, the clause provides an equitable adjustment for increased costs and/or delays associated with discovery and removal.

6.17.18.3. Remove and dispose of Underground Storage Tanks (UST) identified as “closed in place”. Remove and dispose of tanks and all remaining appurtenances, preferably, at a recycling center.

6.17.18.4. Fort Bragg requires that all tanks have a closure report stating the size, condition, and final disposition of the tank.

6.17.18.5. Non-leaking heating tanks are not regulated by the State of North Carolina. However, should it be discovered that there were leaks or that free product is present, complete and submit to the Contracting Officer a closure report that is in accordance with North Carolina regulations.

6.17.18.6. Although the Government will furnish all site investigations and reports documenting project area contamination, the possibility exists that soils with previously-unknown contamination may be discovered. Appendix AE addresses this situation.

6.17.18.7. Pump out and dispose of any free product/sediment that is in the tank and remove up to 140 cubic yards of contaminated soil per UST. All fill must be clean and replaced to grade. Clean fill is defined as any soil removed from the excavation that is less than 10 pap (North Carolina UST action level).

6.17.18.8. Where applicable, remove Above Ground Storage Tanks (AST) and deliver to DPW for re-issue. Contact DPW to arrange for removal of any fuel that may be remaining in the tank. Render the tank safely inert for explosive hazard prior to removal. Address inerting and moving procedures as an Appendix in the Accident Prevention Plan. Up to 10 cubic yards of contaminated soil can be removed from an AST site.

6.17.18.9. Dispose of all contaminated soils and contaminated wash waters at a licensed facility.

6.17.18.10. Remove all contaminated soils and wash waters within 15 days of stockpiling.

6.17.18.11. Secure contaminated soils and prevent run-off by adequate containment practices. The Contractor is responsible for any surface contamination caused by inadequate site protection.

6.17.18.12. Provide Disposal receipts to the Contracting Officer Representative within 10 days of removal from the site.

6.17.19. Demolition Material Disposal. Contractor See Appendix AC for information on disposing of demolition materials in Fort Bragg’s Landfill.

6.18. ADDITIONAL FACILITIES

6.18.1 Bid Options. Provide the following improvements to the existing site communications infrastructure.

6.18.1(1) Bid Option One. Extend 1800pr of copper communications cabling in existing underground ductbank from the communications manhole on Chicken Road to the existing communications manhole MH12. (See Appendix J Drawing C104). Install in accordance with requirements of the "Contractor Design Guide for Ft. Bragg Specific Communications Infrastructure" in Appendix BB.

6.18.1(2) Bid Option Two. Extend 600pr of copper communications cabling in existing underground ductbank from the communications manhole MH 12 to the existing communications manhole MH24. (See Appendix J Drawing C104). Install in accordance with requirements of the "Contractor Design Guide for Ft. Bragg Specific Communications Infrastructure" in Appendix BB.

6.18.2 Bid Option for TVSA Hardstand Expansion. Enlarge Tactical SCIF Vehicle parking area (paragraph 3.3.1) as indicated on Drawing C-102 in Appendix J. Extend enclosure fence and clear zone as required. Provide power and communications connectivity for up to nine total vehicles per paragraphs 3.3.5(1)(b) and 3.3.5(2)(b).

End of Section 01 10 00.0

SECTION 01 33 00.0
SUBMITTAL PROCEDURES
(DESIGN-BUILD TASK ORDERS)

1.0 GENERAL

1.13. GOVERNMENT APPROVED OR CONCURRED WITH 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 three (3) copies of the submittal and return three (3) copy(ies) of the submittal.

End of Section 01 33 00.0

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 ACTIVIES & 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 (jambs, 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. 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://cadbim.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) **Full Size** 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 Attach F)
Commander, U.S.Army Engineer District **Savannah District**	0/0	6/0	6/0	6	0	0	1
Commander, U.S.Army Engineer District, Center of Standardization **Savannah Distict**	0/0	3/0	3/0	3	2	1	1
Installation	1/0	12/0	12/0	12	2	2	0
U.S.Army Corps of Engineers Construction Area Office	0/0	4/0	4/0	2	1	1	1
Information Systems Engineering Command (ISEC)	0/0	0/1	0/0	1	1 (Electronic only)	N/A	1
Other Offices	0/0	0/0	0/0	0	0	0	0

***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

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 four (4) 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 STRUCURAL 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 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 v,/iew 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 componentsShow 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 fort 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 manufactures 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 castered 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 Section712, 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		Date Submitted (to be filled in by Contractor)	Government Reviewer's Use
PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**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 of GBCI for purposes of compliance with project requirement to obtain LEED certifiaction.						
	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 buiding, statement indicating distance from building entrance		CIV

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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 interiorfixtures 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 façade/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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			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
			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 convyance 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
			**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 lising, 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 lising, 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	X	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	X	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 anufacturer 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	X	Manufacturer published product data or certification confirming material VOCs in spreadsheet		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	X	Manufacturer published product data or certification confirming material VOCs in spreadsheet		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	X	Manufacturer published product data or certification confirming material compliance label in spreadsheet		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	X	Manufacturer published product data or certification confirming material urea formaldehyde in spreadsheet		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 MEC

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PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**DATE**	**REV**
			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 withcompliant daylight zone. Percentage calculation of areas withcompliant 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							

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PAR		**FEATURE**	**DUE AT**		**REQUIRED DOCUMENTATION**	**DATE**	**REV**
IDc1.1		Innovation in Design	Final Design		Narrative decribing 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 responsiblilities 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 Full Size 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 V8/Triforma 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 Savannah District 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-Builts 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 done 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 Manager, 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 TBD. 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 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:

  U S Army Engineer District, Savannah

  Environmental & Materials Lab (EN-DGE)

  200 North Cobb Parkway, Building 400

  Marietta, GA 30062
- For other deliveries:

  N/A

N/A

N/A

N/A

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 02.0
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 500 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 one lavatory and 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 10 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 10 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 02.0

Appendix A - Geotechnical Information

The attached geotechnical data for the total 108th ADA Complex site is provided for informational purposes only. The Design/Builder is responsible for obtaining the geotechnical information required for the Brigade HQ building design.

Data includes:

- F & R Subsurface Investigation dated March 4, 2010

SINCE 1881

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March 4, 2010

Mr. Jim Spady
Clark Nexsen
6160 Kempsville Circle – Suite 200A
Norfolk, Virginia 23502

Reference: **Report of Preliminary Subsurface Exploration**
3372 – 108th ADA Complex Roundout (Brigade HQ)
Fort Bragg, North Carolina
F&R Record No. 63L-0338

Dear Mr. Spady:

Froehling and Robertson, Inc. (F&R) has completed the subsurface exploration and preliminary geotechnical engineering evaluation for the above referenced project in Fort Bragg, North Carolina. This preliminary report contains a description of the project information provided to us, a discussion of the general subsurface soil conditions encountered during our subsurface exploration as well as general site and subsurface soil conditions revealed during our preliminary geotechnical study. This preliminary subsurface exploration was performed in general accordance with F&R Proposal No. 1064-096G dated December 15, 2009. Should you have any questions regarding this preliminary report or if we may be of further assistance, please feel free to contact us at your convenience.

Sincerely,

FROEHLING & ROBERTSON, INC.

Erik H. Freeburg, P.E.
Geotechnical Engineer

Michael J. Walko, P.E.
Senior Geotechnical Engineer
N.C. Registration No. 26917

NORTH CAROLINA PROFESSIONAL SEAL 026917 ENGINEER MICHAEL J. WALKO
3/4/10

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Boring Location Plan, Drawing No. 2

APPENDIX III: Soil Classification Chart
Boring Logs

1.0 PURPOSE AND SCOPE OF SERVICECS

The purpose of this preliminary subsurface exploration was to obtain information regarding the general subsurface conditions at the proposed site, conduct pertinent field and laboratory testing to assess the engineering characteristics of the subsurface materials, and to provide preliminary recommendations regarding the geotechnical aspects of site development and general design considerations.

F&R's scope of services included:

- Completion of 2 soil test borings to depths of approximately 25 and 50 feet below existing grades;
- Preparation of typed Boring Logs;
- Performing laboratory testing of representative soil samples;
- Performing a preliminary geotechnical engineering evaluation of the subsurface conditions with regard to their suitability for the planned construction; and
- Preparation of this preliminary geotechnical report by professional engineers.

The scope of this geotechnical exploration did not include an environmental site assessment (ESA), wetlands delineation, etc. Consequently, this report does not include any information regarding the presence or absence of toxic or hazardous waste or information regarding wetland issues.

2.0 PROJECT INFORMATION

The proposed 108th Air Defense Artillery (ADA) facilities are located along the north and south side of "A" Street in Fort Bragg, North Carolina. The site planned for the Roundout (Brigade HQ) will be located south of "A" Street and between the 3-4 Battalion HQ and the 1-7 Battalion HQ. Please refer to the "Site Location Plan" (Drawing No. 1) included in Appendix II for the approximate location of the site.

Based on information provided to us, we understand that the project will consist of a two-story building having an approximate footprint of 156 feet by 184 feet with a concrete slab-on-grade first floor. Asphalt parking and drive areas will be constructed south of the Brigade HQ building.

Design loads for the proposed structure have not been provided to us at this time; however, based on our experience with similar projects, we assume the maximum column loads will not exceed 200 kips and wall loadings will be on the order of 4 kips per linear foot (klf). For floor loadings, we assume the maximum loading will not exceed 125 pounds per square foot (psf).

A topographic site plan has not been provided; however, based on our site reconnaissance, the site has been recently cleared and is relatively flat. A finished floor elevation (FFE) of the proposed structure has not been provided to us at this time; therefore, we assume the FFE of the new building will be at or near existing grades and mass grading will consist of cut and fill depths less than 3 feet.

Should any of this information be incorrect or if additional information is or becomes available, please contact us so we may review the proposed scope of services and make any appropriate changes.

3.0 EXPLORATION PROCEDURES AND LABORATORY TESTING

3.1 Exploration Procedures

Two soil test borings (B-1 and B-2) were performed at the approximate locations shown on the attached "Boring Location Plan" (Drawing No. 2) included in Appendix II. Borings B-1 and B-2 were drilled to depths of approximately 25 and 50 feet, respectively, below existing grades.

The borings were located in the field by a geotechnical engineer from our office by scaling distances from the provided site plan and using existing aerial photography and site features as reference points. Please note that the boring locations were not surveyed and should be considered approximate. Ground surface elevations were not provided to us at this time and therefore, are not included on our Boring Logs.

A rubber-tired ATV CME-550X drill rig with an automatic hammer was used to advance the borings into the ground to obtain samples for our engineering evaluation. The soil test borings were performed using hollow-stem, continuous-flight auger drilling techniques in general compliance with ASTM standards. Representative soil samples were obtained using a standard two-inch outside diameter (O.D.) split barrel sampler in general accordance with ASTM D-1586, Penetration Test and Split-Barrel Sampling of Soils (Standard Penetration Test). The number of blows required to drive the split barrel sampler three consecutive 6-inch increments was recorded and the blows of the last two 6-inch increments were added together to obtain the Standard Penetration Test (SPT) N-value representing the penetration resistance of the soil. Standard Penetration Tests were performed continuously in the upper 6 feet and at a nominal interval of approximately 3 to 5 feet thereafter.

3.2 Laboratory Testing

A representative portion of the soil was obtained from each SPT sample, sealed, labeled and transported to our laboratory for classification and analysis by a geotechnical engineer. The soil samples were visually classified in general accordance with the Unified Soil Classification System (USCS), using visual-manual identification procedures (ASTM D-2488). A Boring Log for each soil test boring is presented in Appendix III.

During our geotechnical exploration, we collected split spoon samples from the SPT borings. The split spoon samples are small, relatively undisturbed samples that represent isolated soil conditions at a specific depth/location. The results of our laboratory testing are presented in Section 4.4 of this report titled "Laboratory Test Results".

4.0 REGIONAL GEOLOGY AND SUBSURFACE CONDITIONS

4.1 Regional Geology

According to the Geologic Map of North Carolina, (1985), the site is reportedly underlain mainly by the Middendorf Formation (Km) which is typically comprised of fine and medium-grained sand and clayey sand interbedded with clay or sandy clay layers.

Fort Bragg is situated in the Sand Hills area of the Coastal Plain physiographic province of North Carolina. The Coastal Plain province extends westward from the Atlantic Ocean to the Fall Line, a distance of approximately 130 miles. The Fall Line is the boundary between the Coastal Plain province and the Piedmont physiographic provinces. The Coastal Plain Physiographic Province is composed mainly of unconsolidated and lithified sedimentary strata overlying a basement complex of igneous and metamorphic rocks. The total thickness of strata underlying the site is approximately 100 to 200 feet.

Coastal plain deposits consist of lithified and unlithified sands, silts, clays, and biochemical deposits, such as limestone. The sediments of the coastal plain were deposited during transgressive-regressive cycles caused by sea level fluctuations. High sea levels allowed deposition of a sequence of marine and strandline sediments on the emerged coastal plain. Positions of maximum transgression are indicated by wave-cut scarps. Falling sea levels caused a regression of strandlines, eventual entrenchment of streams and erosion of coastal plain deposits. Multiple transgression and regression cycles often erode and rework previously deposited sediments.

4.2 Subsurface Conditions

General subsurface conditions encountered at the site during our subsurface exploration are described herein. For more detailed soil descriptions and stratifications at a particular boring location, the respective Boring Log contained in Appendix III should be reviewed. The horizontal stratification lines designating the interface between various strata on the Boring Logs represent approximate boundaries. The transition between different strata in the field are typically gradual in both the horizontal and vertical directions.

4.2.1 Ground Surface: Organic laden soils, approximately 6 to 8 inches in thickness, were encountered at the ground surface at Borings B-1 and B-2.

The surficial organic laden soil is typically a dark-colored soil material containing roots, fibrous matter, and/or other organic components, and is generally unsuitable for engineering purposes. F&R has not performed any laboratory testing to determine the organic content or other horticultural properties of the observed surficial organic laden soils. Therefore, the

phrase "surficial organic laden soil" is not intended to indicate suitability for landscaping and/or other purposes. The surficial organic laden soil depths provided in this report and on the individual Boring Logs are based on driller observations and should be considered approximate. Please note that the transition from surficial organic laden soils to underlying materials may be gradual, and therefore the observation and measurement of the surficial organic laden soil depth is subjective. Actual surficial organic laden soil depths should be expected to vary and generally increases with the amount of vegetation present over the site.

4.2.2 Existing Fill: Existing fill soils were encountered beneath the surficial materials at Borings B-1 and B-2 and extend to depths of approximately 3 feet below existing grades. In general, the existing fill consists of loose clayey SAND (SC), loose silty SAND (SM), and loose clayey/silty SAND (SC/SM). Standard Penetration Resistances (N-values) in the existing fill were 6 blows per foot (bpf).

4.2.3 Coastal Plain Soils: Coastal plain soils were encountered below the existing fill at Borings B-1 and B-2 and generally consist of firm to stiff CLAY (CL), stiff fat CLAY (CH), loose to medium dense clayey SAND (SC), and loose to very dense silty SAND (SM). N-values in the coastal plain soils ranged from 8 to 59 blows per foot. Borings B-1 and B-2 were terminated in the coastal plain soils at depths of approximately 25 and 50 feet below existing grades.

4.3 Groundwater Conditions

At the termination of drilling activities, groundwater was encountered at Boring B-1 at a depth of approximately 16 feet below existing grades; however, Boring B-2 was dry at the time of drilling. The borings were backfilled with the auger cuttings prior to mobilizing from the site, making stabilized groundwater readings unobtainable. Based on our visual classification of the soil samples, a majority of the split-spoon samples observed were generally moist, indicating at or near the soils optimum water content. In Boring B-2, wet soils were typically encountered at depths below 33 feet.

Please keep in mind that groundwater levels, including perched water, tend to fluctuate with seasonal and climatic variations as well as with some types of construction operations.

Generally, the highest groundwater levels occur in late winter and early spring and the lowest levels occur in late summer and early fall. Depending on time of construction, groundwater may be encountered at shallower depths and locations not explored during this study. If encountered during construction, engineering personnel from our office should be notified immediately.

4.4 Laboratory Test Results

Laboratory tests were performed on representative samples obtained from the soil test borings. The laboratory testing consisted of Atterberg limits, percent fines and water contents. The test results are used to confirm the visual classification of the soil samples. The results of our laboratory testing performed are presented in Table 1 as well as on the individual Boring Logs.

Table 1: Atterberg Limits, Percent Fines and Water Contents

Boring No.	Sample Depth (feet)	Water Content (%)	Passing No. 200 Sieve (%)	USCS Classification	ATTERBERG LIMITS		
					Liquid Limit	Plastic Limit	Plasticity Index
B-1	1.5 - 3.0	16.9	---	SC*	---	---	---
B-1	8.5 - 10.0	11.6	---	SM*	---	---	---
B-1	18.5 - 20.0	16.0	---	SC*	---	---	---
B-2	3.0 - 4.5	16.0	36.6	SC	43	20	23
B-2	4.5 - 6.0	16.0	---	SC*	---	---	---
B-2	13.5 - 15.0	13.4	---	SM*	---	---	---
B-2	23.5 - 25.0	21.5	---	CL*	---	---	---
B-2	33.5 - 35.0	18.9	---	SM*	---	---	---

** USCS soil classification based on visual/manual methods*

5.0 FINAL GEOTECHNICAL EVALUATION REPORT

We recommend that a more detailed (supplemental) subsurface exploration be prepared by the contractor's licensed geotechnical engineer once the building location, geometry, structural loading conditions and final design grades have been finalized to further evaluate the geotechnical aspects of the proposed project.

The supplemental geotechnical report shall summarize the subsurface conditions and provide recommendations for the design of appropriate foundations, floor slabs, retaining walls, embankments, roadways and pavements. The report shall recommend the type of foundation system to be used, the allowable bearing elevations for footings, grade beams, slabs, etc. An assessment of post-construction settlement potential including total and differential settlement shall be provided. Recommendations regarding lateral earth pressures to be used in the design of retaining walls shall also be provided. Additionally, the report should include the seismic site classification along with an evaluation of any seismic hazards and recommendations for mitigation, if required.

Calculations shall be included to support the recommendations for bearing capacity, settlement and pavement design. Documentation shall be included for all recommended design parameters such as Seismic Site Classification, modified Proctor compaction testing, California Bearing Ratio (CBR) tests, subgrade modulus, etc. The report shall provide recommendations for earthwork, frost penetration, groundwater levels, dewatering if required, and the possible presence of deleterious materials that will affect construction such as undocumented fill, soft or very loose soils, boulders, old structures, shallow rock, etc.

6.0 LIMITATIONS

This preliminary report has been prepared for the exclusive use of Clark Nexsen, or its agents, for the specific application to the proposed 3372 – 108th ADA Complex Roundout project in Fort Bragg, North Carolina. No other warranty, expressed or implied, is made. There are important limitations to this and all geotechnical studies. Some of these limitations are discussed in the

information prepared by ASFE, which is included in Appendix I. We ask that you please review this ASFE information.

Regardless of the thoroughness of the subsurface exploration, there is the possibility that conditions between borings will differ from those at the boring locations, that conditions are not as anticipated by the designers, or that the construction process has altered the soil conditions. Therefore, an experienced staff professional working under the supervision of a geotechnical engineer should evaluate earthwork and foundation construction to verify that the conditions anticipated in design actually exist.

If this report is copied or transmitted to a third party, it must be copied or transmitted in its entirety, including text, attachments and enclosures. Interpretation based on only a part of this report may not be valid.

Important Information About Your Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

The following information is provided to help you manage your risks.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you ASFE-member geotechnical engineer for more information.

ASFE
The Best People on Earth

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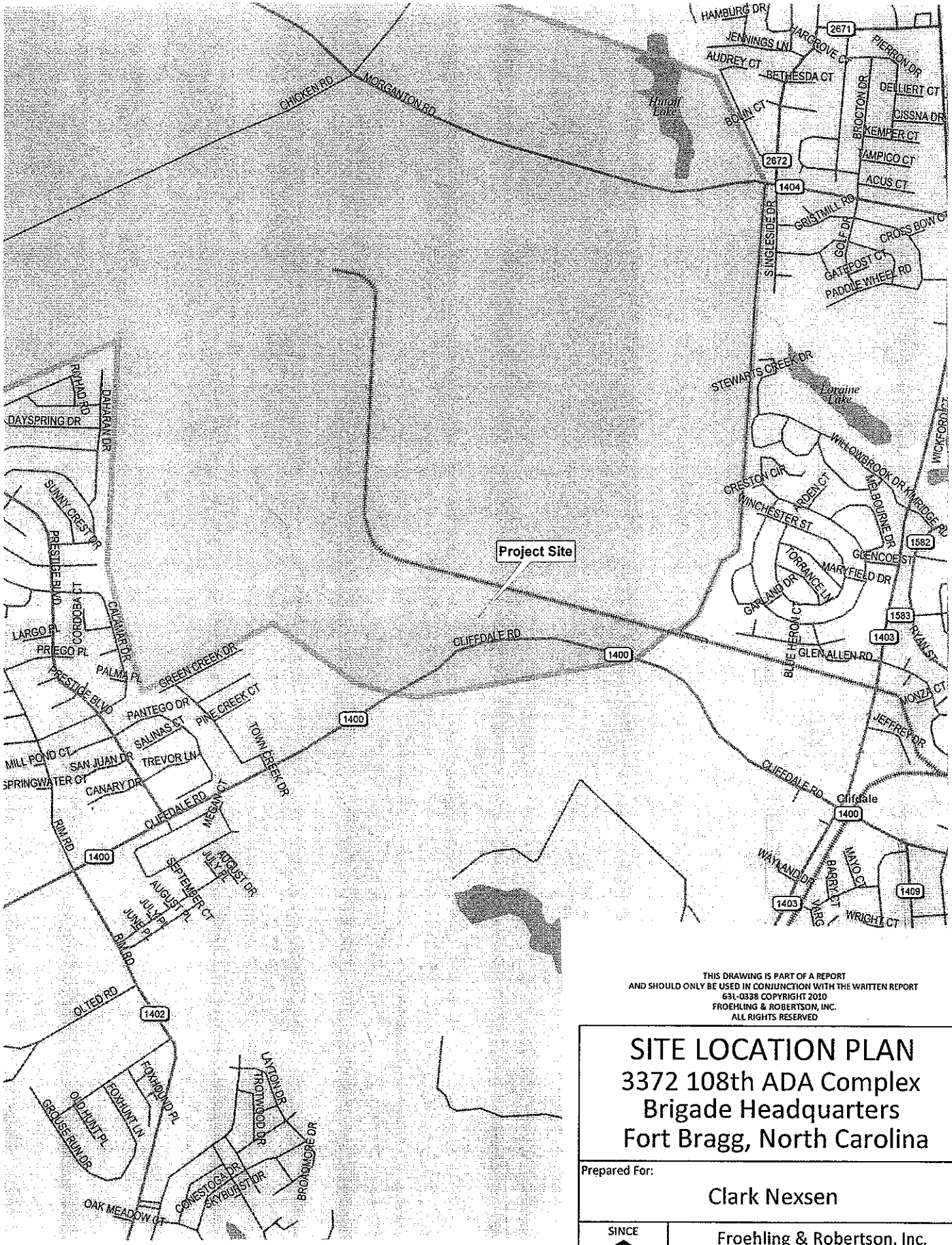

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SITE LOCATION PLAN
3372 108th ADA Complex
Brigade Headquarters
Fort Bragg, North Carolina

Prepared For:

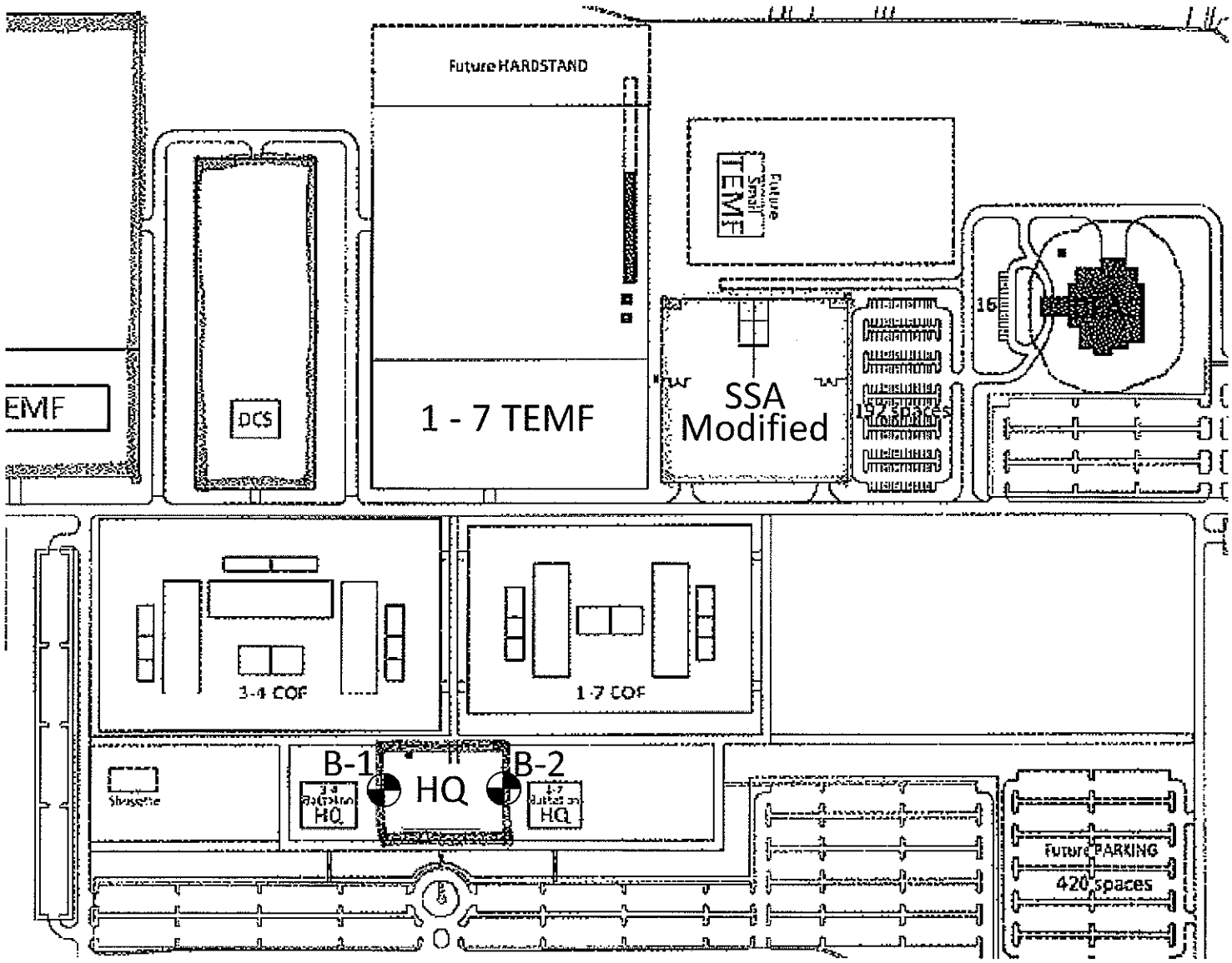
Clark Nexsen

SINCE 1881

Froehling & Robertson, Inc.
2505 Hutchison-McDonald Road
Charlotte, North Carolina 28269

Thursday, April 08, 2010

Proj.: 63L-0338	Date: 03/04/10	Drawing No. 1



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BORING LOCATION PLAN
3372 108th ADA Complex
Brigade Headquarters
Fort Bragg, North Carolina

Prepared For:

Clark Nexsen

SINCE 1881

Froehling & Robertson, Inc.
2505 Hutchison-McDonald Road
Charlotte, North Carolina 28269

Proj.: 63L-0338	Date: 03/04/10	Drawing No. 2

LEGEND

◐ Approximate Location of Soil Test Boring

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		(LITTLE OR NO FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		(LITTLE OR NO FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES		SM	SILTY SANDS, SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

BORING LOG

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FROEHLING & ROBERTSON, INC.
GEOTECHNICAL • ENVIRONMENTAL • MATERIALS
ENGINEERS • LABORATORIES
"OVER ONE HUNDRED YEARS OF SERVICE"

Report No.: **63L-0338** Date: **March 2010**

Client: **Clark Nexsen**

Project: **3372 108th ADA Complex Roundout, Fort Bragg, North Carolina**

Boring No.: **B-1** **(1 of 1)** Total Depth **25.0'** Elev: Location: **See Drawing No. 2**

Type of Boring: **2.25" HSA** Started: **2/25/10** Completed: **2/25/10** Driller: **D. Webb**

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows	Sample Depth (feet)	N Value (blows/ ft)	REMARKS
	0.7	Organic Laden Soil (8")	3-3-3	0.0		
		FILL - Loose moist brown clayey fine to medium SAND (SC)	2-3-3	1.5	6	% water = 16.9
	3.0	COASTAL PLAIN SOILS - Loose to medium dense moist tan and brown silty fine to medium SAND (SM) trace clay	3-4-5	3.0	6	
			7-7-8	4.5	9	
				6.0	15	
			6-7-10	8.5		% water = 11.6
				10.0	17	
	12.0	Medium dense moist tan, gray and red clayey fine to medium SAND (SC)	6-9-10	13.5		
				15.0	19	
						0-hr water level - 16 feet
			6-8-8	18.5		% water = 16.0
				20.0	16	
	23.0	Stiff moist tan, gray and brown silty CLAY (CL)	5-7-7	23.5		
	25.0			25.0	14	
		Boring terminated at a depth of approximately 25 feet below existing grades.				

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the second and third increments of penetration is termed the standard penetration resistance, N.

BORING_LOG 63L-0338.GPJ F&R.GDT 3/4/10

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"OVER ONE HUNDRED YEARS OF SERVICE"

Report No.: **63L-0338** Date: **March 2010**

Client: **Clark Nexsen**

Project: **3372 108th ADA Complex Roundout, Fort Bragg, North Carolina**

Boring No.: **B-2** **(1 of 2)** Total Depth **50.0'** Elev: Location: **See Drawing No. 2**

Type of Boring: **2.25" HSA** Started: **2/26/10** Completed: **2/26/10** Driller: **D. Webb**

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows	Sample Depth (feet)	N Value (blows/ ft)	REMARKS
	0.5	Organic Laden Soil (6")	2-3-3	0.0	6	
	1.5	FILL - Loose moist brown clayey/silty fine to medium SAND (SC/SM)	3-3-3	1.5	6	
	3.0	FILL - Loose moist tan and brown silty fine to medium SAND (SM)	4-4-5	3.0	9	%fines=36.6 %water=16.0 LL=43 PL=20 PI=23
		COASTAL PLAIN SOILS - Loose to medium dense moist tan, brown, red and gray clayey fine to medium SAND (SC)	8-8-11	4.5	19	% water = 16.0
				6.0		
			6-10-12	8.5	22	
				10.0		
	12.0	Medium dense moist brown and orange silty fine to medium SAND (SM)	6-8-9	13.5	17	% water = 13.4
				15.0		
	18.0	Stiff moist red and gray fat CLAY (CH)	8-6-4	18.5	10	
				20.0		
	23.0	Firm moist red and gray sandy CLAY (CL)	5-3-5	23.5	8	% water = 21.5
				25.0		
	28.0	Medium dense to very dense moist to wet tan and orange silty fine to medium SAND (SM)	10-12-16	28.5	28	
		* Wet below 33.5 feet		30.0		
			13-20-23	33.5	43	% water = 18.9
				35.0		
			14-17-31	38.5	48	

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the second and third increments of penetration is termed the standard penetration resistance, N.

BORING_LOG 63L-0338.GPJ F&R.GDT 3/4/10

BORING LOG

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GEOTECHNICAL • ENVIRONMENTAL • MATERIALS
ENGINEERS • LABORATORIES
"OVER ONE HUNDRED YEARS OF SERVICE"

Report No.: **63L-0338** Date: **March 2010**

Client: **Clark Nexsen**

Project: **3372 108th ADA Complex Roundout, Fort Bragg, North Carolina**

Boring No.: **B-2** **(2 of 2)** Total Depth **50.0'** Elev: Location: **See Drawing No. 2**

Type of Boring: **2.25" HSA** Started: **2/26/10** Completed: **2/26/10** Driller: **D. Webb**

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Blows	Sample Depth (feet)	N Value (blows/ ft)	REMARKS
	40.0	(Continued) Medium dense to very dense moist to wet tan and orange silty fine to medium SAND (SM)		40.0		
			15-19-40	43.5	59	
				45.0		
			17-18-41	48.5	59	
	50.0	Boring terminated at a depth of approximately 50 feet below existing grades.		50.0		Boring was dry at the time of drilling

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the second and third increments of penetration is termed the standard penetration resistance, N.

BORING_LOG 63L-0338.GPJ F&R.GDT 3/4/10

Appendix B – List of Drawings

Not Used: Refer to Appendix J for drawings relevant to this project.

Appendix C – Utility Connections

Not Used: Refer to the drawings in Appendix J for utility connection information.

Appendix D – Results of Fire Flow Tests

Actual Fire Flow Data is not available at the time this RFP is issued. The Design Build Contractor shall utilize the following data for the fire protection design.

CEMS Engineering, Inc.
3509 Iron Horse Drive
Ladson, SC 29456
http://www.cemsengineering.com
PHONE: (843) 875-3637
FAX: (843) 875-4509

Contract No: W912HN-07-D-0009
Solicitation No: W912HN-08-X-XXXX
108th ADA Complex
Fort Bragg, NC

Water Supply Design Narrative

General

The basis of the Civil Design is to provide the necessary improvements for the 108th ADA to meet the requirements of the RFP for the project. Fort Bragg is planning to make improvements to their water system to accommodate the addition of the 108th ADA Brigade west of the City of Fayetteville. The brigade will house approximately 2,136 permanent troops and staff.

Water Supply and Distribution

To achieve the fire protection and domestic water supply to the 108th ADA as required by the RFP, an elevated tank and a series of new twelve inch (12"), ten-inch (10") and eight- inch (8") pvc water mains will be installed within the complex. Two supply lines will be extended from the existing water system to the new elevated tank. The first supply line will be a new twelve-inch main that will be extended from an existing twelve inch (12") water main located on the south side of Chicken Road near the intersection of Chicken and MacRidge Road to the site. The second supply line will be a new 8-inch main that will be extended from an existing 8-inch line located near the entrance of the ASP and Chicken Road. The new water mains will be installed in steel casing where lines cross under future or existing roads. The Hazen-Williams "C" value of 140 (PVC) was used to determine the pipe sizes with a maximum velocity not to exceed 10ft/sec. All pipes are designed to provide a flushing velocity of 2.5 ft/sec.

Valves will be provided at the tie-ins to the existing water mains, where new water mains connect at tee's and on all hydrant legs. Thrust blocks will be provided at all turns and fittings.

Fire hydrants will be installed around the perimeter of the TEMF and COF at a spacing not to exceed 300 feet and Barracks site's at a spacing not to exceed 500 feet. Hydrants will be installed around the Battallion and Brigade Headquarters and the Dining Facility at a spacing not to exceed 500 feet. Fire

requirements dictate that all locations within a protected area between hydrants be reached with a 350-foot hose since the locations of the buildings have not been design additional hydrants within the COF, TEMF and Barracks areas may be required.

Fire flow test results are as follows:

Hydrant X-01 (Flow) / 0-203 (Test) (8" line) (Dead end)

Flow :	1200 gpm
Static:	110 psi
Residual:	87 psi

Hydrant 0-203 (Flow) / 0-25 (Test) (8" line)

Flow :	1350 gpm
Static:	110 psi
Residual:	110 psi

Hydrant 0-25 (Flow) / 0-26 (Test) (8" line)

Flow:	1250 gpm
Static:	110 psi
Residual:	67 psi

A 500,000 Gallon Elevated Storage Tank was determined to be necessary to provide the necessary daily demand and fire protection for the 108th ADA and a future Brigade. The Storage Tank will be located behind the small TEMF. The tank high water level will be 172 feet from the ground (HGL= 415 feet). The tank bowl will have a 30 foot head range. An altitude valve will be located at the tank site to prevent the tank from overflowing.

The required fire flow for the 108th ADA was determined to equal 1,400 gpm for a 90 min duration (per UFC 3-600-01). The minimum pressure will be greater than 20 psi at peak fire flow per UFC 3-600-01,

References

Solicitation W912HN-04-D-0033 - 108th ADA Master Charrette Plan
TM 5-813-4 - Water Supply, Water Storage
TM 5-813-5/AFM 88-10, Vol. 5 - Water Supply, Water Distribution
UFC 3-600-01 - Design: Fire Protection Engineering for Facilities

Appendix E - Environmental Information

The following document is the Executive Summary from the Grow the Army Final Environmental Assessment that includes the 108th ADA Complex sites. The study indicates a finding of No Significant Impact for this project. The full study is available upon request.

GROW THE ARMY FINAL ENVIRONMENTAL ASSESSMENT

FORT BRAGG, NC

June 2008

prepared for

U.S. Army Corps of Engineers

Mobile District

P.O. Box 2288

Mobile, AL 36628

FINAL

FINDING OF NO SIGNIFICANT IMPACT

GROW THE ARMY ACTIONS AT FORT BRAGG, NORTH CAROLINA

On 12 October, 1999, the Secretary of the Army and the Chief of Staff proposed a new initiative to help ensure that the Army would remain an effective and relevant operational force in the 21st Century. The national security threats that the United States currently face are different from those confronted in the Cold War Era, and the Transformation of the Army initiative was intended to address these unconventional modern-day threats. The Army has completed the first phases of this 30-year Transformation initiative and will continue to move toward a full-spectrum force that is best suited to meet the strategic security and defense needs of the changing 21st Century world.

The U.S. Army Corps of Engineers, Mobile District, has prepared an Environmental Assessment (EA) which identifies, documents, and evaluates the environmental effects of the Army growth and restructuring actions at Fort Bragg. The EA has been developed in accordance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.) and implementing regulations issued by the President's Council on Environmental Quality (CEQ)[1] and Environmental Analysis of Army Actions, 32 CFR Part 651. The purpose of the EA is to inform decision makers and the public of the likely environmental consequences of the proposed action and alternatives.

1.0 PROPOSED ACTION

Fort Bragg is one of several installations being considered to receive units and facilities as part of GTA. The Combat Support (CS) and Combat Service Support (CSS) units proposed at Fort Bragg would include conversion of the 1st Theater Sustainment Command to an Active Component unit; two Air Defense Artillery (ADA) Batteries; one Sustainment Brigade; one Explosive Ordnance Disposal Battalion with four Companies; one Military Intelligence Battalion; and other CSS units. As part of the Preferred Alternative for this proposed action, Fort Bragg would relocate its Ammunition Supply Point (ASP) and use the land at its existing ASP to provide space for future construction to support new growth at the installation, including facilities to accommodate the incoming 108th ADA Brigade.

In order to accommodate these units and their missions, Fort Bragg's Preferred Alternative would decommission and relocate the existing ASP and construct facilities on the existing ASP site to house the incoming and growing units. This would accomplish several objectives, since buildable land on the installation is in short supply. Existing bunkers at the Fort Bragg ASP are in need of modernization and replacement, and encroaching development at the ASP perimeter, particularly the proposed I-295 spur to the east, makes movement of the ASP highly desirable for reasons of safety and security.

The proposed action at Fort Bragg would necessitate the construction of new facilities; the projects proposed to accommodate and support the GTA action are as follows:

> **Project Number (PN) 67107 Brigade HQ Complex (EAB – 108th ADA).** Under PN 67107, the existing ASP would be decommissioned and relocated. The 108th ADA would then be relocated to the ASP site on Fort Bragg. The proposed project would include the construction of a 227,800 square foot (sf) Company Operations Building, a 164,500 sf Vehicle Maintenance Shop (VMS), a 15,400 sf Brigade Headquarters Building, a 36,400 sf Battalion Headquarters Building, 25,900 sf of Deployment Equipment Storage and a 13,800 sf Organizational Classroom. An additional 96,100 sf of supporting facilities at the relocated ASP would be required, including a surveillance workshop, material handling equipment building, guard building, inspection building, inert storage building, and an oil storage building. Privately-Owned Vehicle (POV) and additional paving requirements would equal 147,000 square yards (sy) of paving.

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1 Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act, 40 CFR Parts 1500–1508.

PN 68773 Training Support Center. The facilities associated with this project include a 118,700 sf Training Support Center, including 34,200 sf of Training Aids Center/Admin space and 84,500 sf of General Purpose Storage, and a 4,000 sf Storage Shed.

PN 68798 Notional Barracks Complex. PN 68798 would require construction a barracks complex for the 108th ADA at the current ASP on Fort Bragg. This facility would include a 399,000 sf Barracks Complex for enlisted unaccompanied personnel. The complex would also include 19,100 sy of Non-Organizational Parking and road improvements.

PN 68818 Unit Operation and Maintenance Facility. PN 68818 would expand the ASP once it is relocated. The facility would include a 150,800 sf VMS, 26,500 sf of Deployment Equipment Storage, a 2,500 sf Oil Storage Building, and 161,200 sy of Organizational Vehicle Parking as well as an ASP.

PN 68921 Unit Operation Facilities. Construction associated with PN 68921 would provide additional facilities for the 108th ADA at Fort Bragg's existing ASP location. The primary buildings for the project would include 194,000 sf of Company Operations Facilities, a 33,600 sf Battalion Headquarters, and a 55,200 sf Brigade Headquarters. POV parking and Petroleum, Oil, and Lubricant (POL) Truck Company would be provided.

PN 69353 Medical Clinic and ADD/ALT Dental Clinic. This project would construct a new building to provide supplemental administrative space for offices and functions currently located within the hospital, in order to allow a medical and dental facility to be placed in the hospital proper. Once these functions are relocated to the new administrative offices, which would occupy approximately 69,700 sf adjacent to the existing hospital, the vacated space clinic space within the hospital would be filled with a medical clinic and a dental clinic; 60,000 sf of POV parking would be provided.

2.0 ALTERNATIVES CONSIDERED

CEQ regulations require inclusion of the No Action Alternative. The No Action Alternative serves as a baseline against which the impacts of the proposed action and alternatives can be evaluated. Under the No Action Alternative, Fort Bragg would not implement the proposed action. Organizations presently assigned to Fort Bragg would continue to train at and operate from the post. No units would relocate from overseas locations. No new units would be established. Fort Bragg would use its current inventory of facilities, though routine replacement or renovations actions could occur, through normal military maintenance and construction procedures, as circumstances independently warrant. The No Action Alternative is evaluated in detail in this EA to provide the baseline prescribed by CEQ regulations.

The U.S. Army considered and analyzed one other alternative, the "Preferred" Alternative. Under the Preferred Alternative, Fort Bragg would utilize the existing ASP at Pope Air Force Base (AFB) to accommodate components of the existing Fort Bragg ASP. Real property accountability at Pope AFB will transfer to the Army at Fort Bragg as part of BRAC. The construction of new ammunition storage bunkers at the Pope AFB ASP is the Army's Preferred Alternative for the location of the new Fort Bragg ASP. The Preferred Alternative would be implemented through the decommissioning of the existing ASP at Fort Bragg, which is outdated and being encroached upon by development. Once the ASP is decommissioned, its supplies and equipment would be moved up to new facilities at Pope AFB, once they are completed. Once movement of the ASP is complete, new construction would then take place at the Fort Bragg ASP site to accommodate incoming or expanding units at Fort Bragg under the proposed action.

Other alternatives were considered, but not analyzed in the EA. These included (1) use of existing facilities at Fort Bragg, (2) acquisition of new property; and (3) leasing existing space off-base. These other alternatives were considered not feasible to implement the proposed action and were therefore dismissed from further analysis.

3.0 FACTORS CONSIDERED IN DETERMINING THAT AN ENVIRONMENTAL IMPACT STATEMENT IS NOT REQUIRED

The EA, which is incorporated by reference into this Final Finding of No Significant Impact (FNSI), identified and examined potential effects of the alternatives. The EA evaluated 12 resource areas and areas of environmental and socioeconomic concern: land use, aesthetic and visual resources, air quality, noise, geology and soils, water resources, biological resources, cultural resources, socioeconomics, transportation, utilities, and hazardous and toxic substances.

The EA determined that implementation of the proposed action would not have any significant adverse effects or impacts on any of the environmental or related resource areas at Fort Bragg or on areas surrounding the Installation. Potential effects associated with implementation of the Preferred Alternative are expected to be negligible or minor. These impacts would be experienced in the following areas: land use, aesthetic and visual resources, air quality, noise, soils, water resources, biological resources, cultural resources, socioeconomics, transportation, utilities, hazardous materials, and cumulative effects.

Based on the findings of the EA, none of the predicted effects of the proposed action would result in significant impacts; therefore, mitigation is not required, and implementation of the proposed action will not require the preparation of an Environmental Impact Statement. Therefore, preparation of a FNSI is appropriate.

4.0 PUBLIC COMMENT

Interested parties were invited to review and comment on the EA and Draft FNSI from June 24, 2008 through July 23, 2008. An additional two days was requested by the North Carolina State Clearinghouse with a final comment period ending on July 25, 2008. A Notice of Availability was published on June 24, 2008 in *The Fayetteville Observer* newspaper.

The EA and Draft FNSI were also available for review during the public comment at the following local libraries:

Cumberland County Public Library & Information Center
Local & State History
300 Maiden Lane
Fayetteville, NC 28301-5000

John L. Throckmorton Library & Command Reference Center
ATTN: AFZA-CAS-EL
Bldg. 1-3346, Randolph St.
Fort Bragg, NC 28310-5000

Reviewers were invited to submit comments on the EA and Draft FNSI during the public comment period via mail or telephone to:

Miss Christie Lowery
Environmental Division at Directorate of Public Works Fort Bragg
Garrison Command; Installation Management Agency
Fort Bragg, NC 28310
Phone: (910) 432-8479

There were no comments received from the general public and only standard comments from North Carolina state agencies, with the exception of NCDENR/Division of Water Quality (DWQ). The state agency comments and applicable responses have been attached to this FNSI and included in the Final EA as Appendix J in the form of an Errata Sheet and a comment/response form. The Errata Sheet was developed to address any comments that Fort

Bragg concurred with and includes the appropriate corrections and wording. All DWQ comments, including those not accepted by Fort Bragg, are listed with the applicable Fort Bragg responses on the comment/response form. None of the comments made by DWQ would warrant a mitigated FNSI. Following the public review period, this final FNSI was prepared, signed by the Garrison Commander of Fort Bragg, and released to the appropriate local, state, and federal repositories.

5.0 CONCLUSION

Based on the EA, it has been determined that implementation of the proposed action will have no significant direct, indirect, or cumulative adverse effects on the quality of the natural or human environment. Because no significant environmental impacts will result from implementation of the proposed action, an Environmental Impact Statement is not required and will not be prepared.

Date: 22 AUG 08

David G. Fox
COL, SF
Garrison Commander

ENVIRONMENTAL ASSESSMENT

GROW THE ARMY
FORT BRAGG, NC

Prepared by:

CHRISTIE LOWREY
NEPA Analyst

Date: 22 May 08

Environmental Review:

DAVID A. HEINS
Chief, Environmental Division

Date: 22 May 08

Proponent:

GREGORY G. BEAN
Director of Public Works

Date: 30 May 08

Legal Review:

GARY A. LOXLEY
COL, JA
Acting Staff Judge Advocate

Date: 11 June 08

Approval:

DAVID G. FOX
Colonel, Special Forces
Garrison Commander

Date: 20 June 08

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EXECUTIVE SUMMARY

ES.1 INTRODUCTION

On 12 October, 1999, the Secretary of the Army and the Chief of Staff proposed a new initiative to help ensure that the Army would remain an effective and relevant operational force in the 21st Century. The national security threats that the United States currently face are different from those confronted in the Cold War Era, and the Transformation of the Army initiative was intended to address these unconventional modern-day threats. The Army has completed the first phases of this 30-year Transformation initiative and will continue to move toward a full-spectrum force that is best suited to meet the strategic security and defense needs of the changing 21st Century world.

The Army has evaluated its existing force size and structure, and determined that its overall size must increase as it restructures its forces in accordance with the Transformation initiative so that it may continue to meet security and defense needs while maintaining its training and operational readiness levels, as well as a high quality of life for soldiers and their families. These changes in structure are intended to enhance operational readiness through increased training and equipment maintenance time, and enhance quality of life by providing more at-home stationing time for soldiers and their families. The end result will be an Army with a greater capability to meet the challenging demands of the modern national defense and security environment.

The goal of the Grow the Army (GTA) initiative is to realign existing forces and increase its end strength as part of overall Army Transformation. Under this initiative, the Army would grow in a way that would enable it to meet its multiple security and defense objectives, implement recommendations contained in the Quadrennial Defense Review (QDR), ensure that unit equipment and training readiness level may be maintained, and ease the burden of deployment on soldiers and their families. This growth would alter force structure and composition to accommodate Transformation objectives and meet existing critical manpower needs within the Army. Mission requirements currently exceed personnel authorizations for several types of units, such as military police and explosive ordnance disposal, therefore soldiers in these units are being called upon more frequently, having a negative impact on their quality of life. A key goal of GTA is sustainable force development through Transformation that will meet these urgent needs.

ES.2 PROPOSED ACTION

Fort Bragg is one of several installations being considered to receive units and facilities as part of GTA. The Combat Support (CS) and Combat Service Support (CSS) units proposed at Fort Bragg would include conversion of the 1st Theater Sustainment Command to an Active Component unit; two Air Defense Artillery (ADA) Batteries; one Sustainment Brigade; one Explosive Ordnance Disposal Battalion with four Companies; one Military Intelligence Battalion; and other CSS units. As part of the Preferred Alternative for this proposed action, Fort Bragg would relocate its Ammunition Supply Point (ASP) and use the land at its existing ASP to provide space for future

construction to support new growth at the installation, including facilities to accommodate the incoming 108th ADA Brigade.

Fort Bragg's Preferred Alternative would decommission and relocate the existing ASP and construct facilities on the existing ASP site to house the incoming and growing units. This would accomplish several objectives, since buildable land on the installation is in short supply. Existing bunkers at the Fort Bragg ASP are in need of modernization and replacement, and encroaching development at the ASP perimeter, particularly the proposed Interstate (I)-295 spur to the east, makes movement of the ASP highly desirable for reasons of safety and security.

The proposed action at Fort Bragg would necessitate the construction of new facilities; the projects proposed to accommodate and support the GTA action are as follows (Fort Bragg, 2007a):

Project Number (PN) 67107 Brigade HQ Complex (EAB – 108th ADA). Under PN 67107, the existing ASP would be decommissioned and relocated. The 108th ADA would then be relocated to the ASP site on Fort Bragg. The proposed project would include the construction of a 227,800 square foot (sf) Company Operations Building, a 164,500 sf Vehicle Maintenance Shop (VMS), a 15,400 sf Brigade Headquarters Building, a 36,400 sf Battalion Headquarters Building, 25,900 sf of Deployment Equipment Storage and a 13,800 sf Organizational Classroom. An additional 96,100 sf of supporting facilities at the relocated ASP would be required, including a surveillance workshop, material handling equipment building, guard building, inspection building, inert storage building, and an oil storage building. Privately-Owned Vehicle (POV) and additional paving requirements would equa1 147,000 square yards (sy) of paving. Additionally, an extensive road system would be required. Backup power would be necessary for all facilities, systems, and equipment. Extensive demolition would be required. Associated needs and infrastructure would include water, sewer, and electrical utilities, and storm water drainage and retention.

PN 68773 Training Support Center. The facilities associated with this project include a 118,700 sf Training Support Center, including 34,200 sf of Training Aids Center/Admin space and 84,500 sf of General Purpose Storage, and a 4,000 sf Storage Shed. No site demolition is required. Associated needs and infrastructure would include electric service, water, sewer, paving and site improvements.

PN 68798 Notional Barracks Complex. PN 68798 would require construction a barracks complex for the 108th ADA at the current ASP on Fort Bragg. This facility would include a 399,000 sf Barracks Complex for enlisted unaccompanied personnel. The complex would also include 19,100 sy of Non-Organizational Parking and road improvements. Associated needs and infrastructure would include anti-terrorism/force protection, walks, curb and gutter, information systems, and site accessories including a basketball court and a Physical Training area. Extensive demolition would be required.

PN 68818 Unit Operation and Maintenance Facility. PN 68818 would expand the ASP once it is relocated. The facility would include a 150,800 sf VMS, 26,500 sf of Deployment Equipment Storage, a 2,500 sf Oil Storage Building, and 161,200 sy of Organizational Vehicle Parking as well as an ASP. Site preparation will include

removal of underground fuel tanks, pavements, sidewalks, water lines and fire hydrants; sewer lines; storm drainage; electrical/telecommunications lines; chain link fencing; and tree removal. Associated needs and infrastructure include water, sewer, gas, and electric utilities, storm water drainage, detention and bio-retention ponds, and secondary containment for the oil storage facilities.

PN 68921 Unit Operation Facilities. Construction associated with PN 68921 would provide additional facilities for the 108th ADA at Fort Bragg's existing ASP location. The primary buildings for the project would include 194,000 sf of Company Operations Facilities, a 33,600 sf Battalion Headquarters, and a 55,200 sf Brigade Headquarters. POV parking and Petroleum, Oil, and Lubricant (POL) Truck Company would be provided. Associated needs and infrastructure would include detention ponds, bio-retention ponds, secondary containment for oil storage facilities, and heating and air conditioning from self-contained units. Site demolition would be required and include the removal of underground fuel tanks, impervious surfaces, and utility lines.

PN 69353 Medical Clinic and ADD/ALT Dental Clinic. This project would construct a new building to provide supplemental administrative space for offices and functions currently located within the hospital, in order to allow a medical and dental facility to be placed in the hospital proper. Once these functions are relocated to the new administrative offices, which would occupy approximately 69,700 sf adjacent to the existing hospital, the vacated space clinic space within the hospital would be filled with a medical clinic and a dental clinic; 60,000 sf of POV parking would be provided. Site preparation would include tree removal.

ES.3 PERSONNEL INCREASES AT FORT BRAGG

As part of the proposed action, Fort Bragg would implement actions associated with Army growth and Transformation, as well as add CS and CSS units, and would be considered for additional Brigade Combat Team (BCT) stationing. In order to accomplish this, Fort Bragg would see several existing units increase in size. In addition, there would be several new units arriving at Fort Bragg, for a total of 2,195 additional military personnel and 41 civilians. Fort Bragg currently employs approximately 43,000 military personnel; therefore the proposed action would represent an increase in personnel of approximately 5.2 percent. Personnel and associated units are listed in Table ES.1.

The FY09 Force Structure Actions (hereinafter referred to as stationing action), which includes the 525th Battlefield Surveillance Brigade (1-38 Military Battalion) and the 20th Engineer Brigade (133rd Construction Management Detachment) have been classified as Grow the Army actions for funding purposes only. The stationing of these units was initially included in the scoping for GTA even though these units are not an essential part of the action. The stationing of these units was removed from GTA planning and placed in a Record of Environmental Consideration (REC) titled *FORSCOM Units Special Operations Forces AR 5-10 Package for FY 09 Force Structure Actions on Fort Bragg, North Carolina,* dated 25 April 2008, which is attached to the document as Appendix H. While the stationing of these actions and the associated construction is captured in the cumulative effects section of this

document (Section 4.14), the environmental effect of the incoming personnel associated with the stationing action was not removed from the traffic and socioeconomic analysis of this document.

TABLE ES.1: PERSONNEL CHANGES AT FORT BRAGG/POPE AIR FORCE BASE

Action	Organization	From	Total Estimated Incoming Personnel	Total Estimated Incoming Civilians
Incoming	1st Theater Sustainment Command	New Unit Activation	112	
Incoming	108th Air Defense Artillery Brigade	New Unit Activations, Incoming units from Fort Bliss and Kadena AFB, Japan	1,231	35
Incoming	82nd Sustainment	Unit Increase/Activation	111	
Incoming	Special Operations Command (USASOC)	New Unit Activation	61	
Incoming	192nd Explosive Ordnance Disposal	New Activation	1	
Incoming	28th Explosive Ordnance Disposal	New Activation	44	
Incoming	767th Explosive Ordnance Disposal	Fort McNair	44	
Incoming	737th Explosive Ordnance Disposal	Fort Belvoir	44	
Incoming	21st Chemical Command	New Activation	6	
Incoming	525th Battlefield Surveillance Brigade	New Activation	348	
Incoming	20th Engineer Brigade	Unit Increase	137	6
Incoming	Various units	Multiple Locations	56	
		TOTAL	**2,195**	**41**

ES.4 TACTICAL VEHICLE INCREASES AT FORT BRAGG

As part of the proposed action, the units proposed to arrive at Fort Bragg would bring with them vehicles and equipment necessary to their mission to ensure continued mission readiness. This would include approximately 607 high mobility multipurpose wheeled vehicles (HMMWV), 211 heavy trucks, and 146 other light-duty vehicles as listed below in Table ES.2. Additional equipment would include various trailers and water and fuel tankers.

TABLE ES.2: FORT BRAGG GROW THE ARMY ACTIONS: INCOMING VEHICLES

Vehicle Type	Quantity
HMMWV	607
Cargo Truck – Heavy Duty	15
Tractor Trailer	160
Cargo Truck – Light Duty	113
Dump Truck	16
Wrecker	20
Van	33
TOTAL	964

Source: Fort Bragg, 2007c

ES.5 SCREENING CRITERIA AND ALTERNATIVES

Considering alternatives helps to avoid unnecessary impacts and allows analysis of reasonable ways to achieve the stated purpose. To warrant detailed evaluation, an alternative must be reasonable. To be considered reasonable, an alternative must be "ripe" for decision-making (any necessary preceding events having taken place), affordable, capable of implementation, and satisfactory with respect to meeting the purpose of and need for the action; e.g. it must meet mission requirements.

In forming alternatives to implement the proposed action at Fort Bragg, screening criteria were used to determine which alternatives might be feasible, and which would not. Potential alternatives to the proposed action have been examined for their applicability according to four screening criteria:

- Support national security and defense policy, decisions made within the QDR, and support Army Transformation
- Training capacity
- Quality of life and garrison support infrastructure
- Siting of new construction
- Costs

The resulting Preferred Alternative, developed through the screening criteria, utilizes more than one method of accommodating GTA units.

ES.6 NO ACTION ALTERNATIVE

Council on Environmental Quality (CEQ) regulations require inclusion of the No Action Alternative. Although the No Action Alternative is not considered viable for implementation, it is included in this analysis to serve as a baseline against which the impacts of the proposed action and alternatives can be evaluated.

Under the No Action Alternative, Fort Bragg would not implement the proposed action. Organizations presently assigned to Fort Bragg would continue to train at and operate from the Installation. No units would relocate from overseas locations. No new units would be established. Fort Bragg would use its current inventory of facilities, though routine replacement or renovations actions could occur, through normal military maintenance and construction procedures, as circumstances independently warrant.

ES.7 ENVIRONMENTAL CONSEQUENCES

A summary of impacts by resource area for the No Action Alternative and the Preferred Alternative, which are detailed by location in Chapter 4 and largely involve the construction and operation of the required facilities, is provided in Table ES.3.

ES.8 MITIGATION RESPONSIBILITY AND PERMIT REQUIREMENTS

As no significant impacts are expected, mitigation would not be required. Though not required to reduce impacts to less than significant, Fort Bragg has also identified a number of Best Management Practices and reasonable and prudent measures that would be implemented in association with the proposed action, regardless of the implementation alternative selected. These measures are designed to protect, maintain, restore or enhance environmental conditions.

TABLE ES.3: SUMMARY OF EFFECTS OF THE NO ACTION ALTERNATIVE, THE PREFERRED ALTERNATIVE, AND ADDITIONAL ALTERNATIVE

Resource	No Action Alternative	Preferred Alternative	Western Gate Alternative
Land Use			
Regional Geographic Setting and Location	No Effect.	No Effect.	No Effect.
Installation Land	No Effect.	No Significant Effect; Generally complies with Master Plan and existing land use.	No Significant Effect; Generally complies with Master Plan and existing land use.
Surrounding Land	No Effect.	No Effect.	No Effect.
Current and Future Development in the Region of Influence	No Effect.	No Significant Effect; Off Post land use is expected to follow existing trend.	No Significant Effect; Off Post land use is expected to follow existing trend.
Aesthetic and Visual Resources	No Effect.	No Significant Effect; Projects in historic viewsheds would be compatible.	No Significant Effect; Projects in historic viewsheds would be compatible.
Air Quality			
Ambient Air Quality Conditions	No Effect.	No Significant Effect.	No Significant Effect.
Air Pollutant Emissions at Installation	No Effect.	No Significant Effect.	No Significant Effect.
Regional Air Pollutant Emissions Summary	No Effect.	No Significant Effect.	No Significant Effect.
Noise	No Effect.	No Significant Effect during construction or facility operation.	No Significant Effect during construction or facility operation.
Geology and Soils			
Geologic and Topographic Conditions	No Effect.	No Significant Effect from leveling and grading.	No Significant Effect from leveling and grading.

Resource	No Action Alternative	Preferred Alternative	Western Gate Alternative
Soils	No Effect.	No Significant Effect from removal of vegetative cover, leveling, and grading.	No Significant Effect from removal of vegetative cover, leveling, and grading.
Prime Farmland	No Effect.	No Effect.	No Effect.
Water Resources			
Surface Water/Wetlands	No Effect.	No Significant Effect. Preliminary site designs have been altered to avoid and minimize impacts to surface waters and wetlands in accordance with Section 404 (Clean Water Act, 33 USC 1344).	No Significant Effect. Preliminary site designs have been finalized to avoid and minimize impacts to surface waters and wetlands in accordance with Section 404 (Clean Water Act, 33 USC 1344).
Hydrogeology/ Groundwater	No Effect.	No Significant Effect; groundwater would be protected by implementation of groundwater and surfacewater protection strategies.	No Significant Effect; groundwater would be protected by implementation of groundwater and surfacewater protection strategies.
Floodplains	No Effect.	No Significant Effect; Impacts to the floodplain will be avoided through site design and project area layout, as well as minimized by minimal construction within the 100-year floodplain.	No Effect; no floodplain development planned in accordance with federal FEMA regulations and state regulations as determined by the North Carolina floodplain mapping program.
Coastal Zone	Does Not Apply.	Does Not Apply.	Does Not Apply.
Biological Resources			
Vegetation/Forest	No Effect	No Significant Effect. Existing open habitats were targeted for development over forested areas and forest fragmentation will be minimized through project site design and layout.	No Significant Effect. Existing open habitats were targeted for development over forested areas and forest fragmentation will be minimized through project site design and layout.
Wildlife	No Effect	No Significant Effect.	No Significant Effect.

Resource	No Action Alternative	Preferred Alternative	Western Gate Alternative
Threatened & Endangered Species	No Effect.	Based on the results of a Biological Assessment in accordance with section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 USC 1531 et seq.), it concluded the project will have a "no effect" determination on four federally endangered species (Saint Francis' Satyr, Rough-leaved loosestrife, American chafseed, and Michaux's sumac) and a "not likely to adversely affect" determination for the Red-cockaded woodpecker at Fort Bragg.	Based on the results of a Biological Assessment in accordance with section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 USC 1531 et seq.), it concluded the project will have a "no effect" determination on four federally endangered species (Saint Francis' Satyr, Rough-leaved loosestrife, American chafseed, and Michaux's sumac) and a "not likely to adversely affect" determination for the Red-cockaded woodpecker at Fort Bragg.
Wetland Habitat	No Effect.	No Significant Effect. Preliminary site designs have been altered to avoid and minimize impacts to wetland habitat.	No Significant Effect. Preliminary site designs have been altered to avoid and minimize impacts to wetland habitat.
Cultural Resources			
Built Environment	No Effect.	No Significant Effect.	No Significant Effect.
Archaeology	No Effect.	No Significant Effect; archaeological sites determined eligible for the NRHP must be avoided or the adverse effects mitigated in accordance with 36 Code of Federal Regulations (CFR) 800.	No Significant Effect; archaeological sites determined eligible for the NRHP must be avoided or the adverse effects mitigated in accordance with 36 CFR 800.
American Indian Resources	No Effect.	No Effect.	No Effect.
Socioeconomics			
Economic Development	No Effect.	No Significant Effect; Beneficial short-term effects from construction spending expected, but not significant.	No Significant Effect; Beneficial short-term effects from construction spending expected, but not significant.
Demographics	No Effect.	No Significant direct or indirect Effect.	No Significant direct or indirect Effect.

Resource	No Action Alternative	Preferred Alternative	Western Gate Alternative
Housing	No Effect.	No Significant direct or indirect Effect; minor increase in demand for on and off Post housing expected.	No Significant direct or indirect Effect; minor increase in demand for on and off Post housing expected.
Quality of Life and Public Services	No Effect.	No Significant Adverse Direct or Indirect Effect; minor increase in demand for school services may occur.	No Significant Adverse Direct or Indirect Effect; minor increase in demand for school services may occur.
Environmental Justice	No Effect.	No Significant Effect.	No Significant Effect.
Protection of Children	No Effect.	No Effect.	No Effect.
Transportation			
Roadways and Traffic	No Effect.	No Significant Effect. Preferred alternative will not increase LOS E or F intersections by 20%.	No Significant Effect. Preferred alternative will not increase LOS E or F intersections by 20%.
Installation Transportation	No Effect.	Preferred alternative will not increase LOS E or F intersections by 20%.	Preferred alternative will not increase LOS E or F intersections by 20%.
Public Transportation	No Effect.	No Significant Effect.	No Significant Effect.
Utilities			
Potable Water Supply	No Effect.	No Significant Effect.	No Significant Effect.
Wastewater System	No Effect.	No Significant Effect.	No Significant Effect.
Stormwater System	No Effect.	No Significant Effect.	No Significant Effect.
Energy Sources	No Effect.	No Significant Effect.	No Significant Effect.
Communications	No Effect.	No Significant Effect.	No Significant Effect.
Solid Waste	No Effect.	No Significant Effect.	No Significant Effect.
Hazardous and Toxic Substances			
Use/Storage/Handling of Hazardous Materials	No Effect.	No Significant Effect expected.	No Significant Effect expected.
Hazardous Waste Disposal	No Effect.	No Significant Effect expected.	No Significant Effect expected.
Site Contamination and Cleanup, including Special Hazards	No Effect.	No Significant Effect expected.	No Significant Effect expected.

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Appendix F – Conceptual Aesthetic Considerations

Style and materials for the exterior of the Brigade Headquarters shall complement the adjacent buildings within the complex.

21-JAN-2010

108th ADA Complex - 3-4 Battalion Headquarters

(This Building is positioned just to the left of the site for the Proposed Large Brigade HQ. The 1-7 Battalion Headquarters building was at the same level of construction at the time this photo was taken, and will be to the right of the Large Brigade HQ.)

21-JAN-2010

108th ADA Complex - 3-4 Battalion Headquarters

21-JAN-2010

108th ADA Complex - Unaccompanied Enlisted Personnel Housing (UEPH)

21-JAN-2010

108th ADA Complex - Unaccompanied Enlisted Personnel Housing (UEPH)

21-JAN-2010

108th ADA Complex - Tactical Equipment Maintenance Facility (TEMF)

Brick:
"Bragg Blend" by Palmetto Brick Co.

Roof and Wall Panels:
"Light Stone" by Architectural Integrated metals (AIM)

Exterior Doors, and Door & Window Frames:
"Bronze" (Federal Standard #20059)

21-JAN-2010

108th ADA Complex - Tactical Equipment Maintenance Facility (TEMF)

INTERIOR DESIGN:

On the interior, careful consideration should be given not only to the quality of the aesthetic, but also to creating a collaborative and productive environment that is easily maintained and will provide superior performance in terms of its materials and furnishings. The color palette must be functional and practical but also interesting and stimulating for the building's population. A combination of primarily neutral tones to enhance available daylight and limited quantities of stronger accent colors for energy should work together in support of the architectural design and result in a scheme that best represents the intended use of the facility. Trendy or dull colors should be avoided.

Following is a breakdown of functional areas with specific criteria for materials and aesthetics:

OFFICE, ADMINISTRATIVE AREAS, BOC and SCIF

These spaces should create an invigorating and energizing work environment for personnel. Finishes should be consistent with the expectations for a typical corporate office. Expected level of finishes would include high grade carpet tile, painted gypsum walls, rubber wall base and tegular tile acoustical panel ceilings. Materials should reflect quality and value without appearing either cheap or extravagant.

TOILET AND SHOWER AREAS

These spaces should have a bright, clean appearance consistent with the overall color palette. Materials should be selected with quality, value, durability and maintenance in mind. Examples would be matte finish porcelain tile flooring, full height gloss finish ceramic tile walls in frequently wet areas, and moisture resistant gypsum walls with epoxy paint in areas with periodic moisture. Shower areas should have moisture resistant gypsum ceilings.

SUPPORT SPACES

The finishes in these spaces should be functionally appropriate. Selections should regard quality, durability, and maintenance. These would include sealed concrete, rubber base, painted walls and exposed ceilings in mechanical and electrical spaces. Finishes for Secure Documents room, NOC, telecommunications, storage, and copy spaces would include resilient floor tile, rubber base, painted walls, and acoustical panel ceilings.

INTERIOR SIGNAGE

The interior signage package should be an extension of the overall interior color scheme. The signage system should have characteristics that allow for easily changeable copy inserts for both titles and personnel names in offices and workstations.

Appendix G – GIS Data

APPENDIX G

GIS Data

Mapping

1. Plans shall be prepared according to the following specifications:

    a. A single map of the entire site indicating the location of all existing and proposed utilities and other constructions to include the footprint of structures, paving (including curbing), sidewalks, and other relevant planimetric features.
    b. The map will be registered to the North Carolina State Plane Coordinate System – Zone 3200 – NAD83 -- U.S. Survey Feet. Elevation units will be MSL GRS80 U.S. Survey Feet.
    c. Due north on the map will be as viewed from the bottom of the map. Rotations will not be allowed nor will orientation to Magnetic North.
    d. The map will contain a labeled coordinate grid with spacing appropriate to the map extents. For instance, a map scale of 1"=30' will have coordinates labeled at 100' intervals north/south and east/west.
    e. A minimum of four tie-in points will be labeled on the map located near the four corners of the map. The tie-in points will show a symbol at the location of the point and a label indicating the Northing and Easting of each point.
    f. All utilities on the map will be clearly labeled as to size and material. Where utilities are to be enclosed in conduits or duct work, a section of the duct will be shown clearly indicating the dimensions and material of the duct, the contents of the duct such as wire size and type of conductor, whether conductor is primary or neutral, number of conductors, hot water supply or return, pipe size, insulation type and thickness, etc.
    g. The map will show the invert elevation of all manholes as well as the invert of each pipe joining a manhole as well as the invert and character of all outfalls.

2. The contractor shall provide a pre-work map prior to site disturbance prepared according to the specifications in paragraph 2. The contractor shall modify the pre-work map at construction completion to indicate the as-built character of all site components:

    a. This map will conform to the specifications of the pre-work map and be free of any superfluous construction detail. The intent is to show As-Built conditions and should not include any components that are not as-built, i.e., if the pre-work map showed a water line 3' from a curb and was constructed 4' from the curb, the as-built map will show only the final location of the water line.
    b. The map will clearly indicate the final grade of the site at a contour interval not greater than one foot.
    c. The final inverts of all utilities will be shown. Where utilities were installed which follow the surface of the ground, the depth of that utility will be indicated. Where there is a variance in the depth of the utility, the break point and character of variance will be shown.
    d. The map will clearly show any utilities installed with a trace wire and/or cathodic protection.
    e. The map will show a minimum of two tie points for all subsurface control devices to include valves, manholes, handholes, switches, etc. The tie-points will be directed such that they form a triangle with no inclusive angle less than 30° or greater than 150°. No leg of the triangle will be longer than 100'. Valid tie-points will run to identifiable above ground objects such as poles or building corners as is in keeping of good survey practice for the recovery of monuments.
    f. The map will clearly indicate the entry point and character of all utilities running to or from structures.

Appendix H – Exterior Signage

2.2.6 Signage

Signs are used to visually communicate information and are a highly visible feature of the installation. Careful consideration must be given to their appearance and relation to the surroundings. Signs should be an attractive and harmonious part of the visual environment. The creation of a coordinated signage system will enhance Fort Bragg's visual image and improve the efficiency of movement.

Signage Reflects the Importance of the Activity Relative to the Installation

A sign system must communicate information effectively and efficiently. It must present a sequence and hierarchy of information that is logical and responsive to user needs. The system should provide a sense of consistency and continuity to the installation's overall visual image. It must be designed to be adaptable, compatible and integrated into the design of other site features.

The following criteria provides recommendations for the design and location of all signs at Fort Bragg. Signs not in compliance with these guidelines are not permitted unless approved by the DPW.

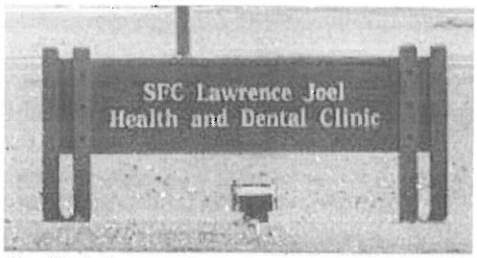
2.2.6.1 General Provisions

This section regulates all exterior signs and interior signs positioned for exterior observance. Signs should be used only as necessary. Redundant, unreadable, and outdated signs should be moved.

DPW approval is required prior to installing, painting, remodeling, relocating, or expanding any sign. No approval is required to perform normal maintenance and repair of a conforming sign or to change a message on a sign or marquee specifically designed for this purpose.

Other general sign provisions include the following:

- Public safety signs not exceeding two square feet do not require site approval. Examples include emergency telephone, restroom, and underground utilities.
- Street signs, not located in state rights-of-ways, do not require site approval.
- Signs placed for less than 30 days do not require site approval. These shall be removed by those placing them.
- Signs conforming to previous regulations, but not conforming to this guide, will be removed and replaced.
- Nonconforming signs shall not be enlarged, repaired, reconstructed, changed, including wording or graphics changes, except to comply.
- Signs not specifically outlined in this IDG are not authorized unless approved by the Garrison Commander. Examples include signs identifying S1, S2, S3, S4, classroom, motor pool, etc.
- Signs itemized in this section shall be placed at the appropriate buildings regardless of its real property category, unless specified otherwise.



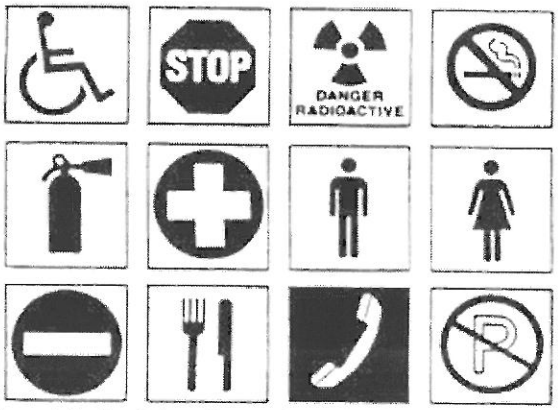
Simplified Signs are Easy to Read

- No signs shall interfere with or confuse traffic or other aspects of safe driving conditions through use of improper wording, graphics, location, size, shape, or color. No sign shall use the words "Stop", "Go", "Caution", Yield", etc., when such would be confused with traffic signs or devices.

2.2.6.2 Sign Details

The following details shall apply to all signs at Fort Bragg:

- All signs will either be pre-manufactured from materials meeting or exceeding the EPA required minimum recycled content or fabricated by DPW. Low quality and "homemade" signs are prohibited.
- Any sign that is mechanically animated (i.e., revolves, rotates, or moves in any way) is prohibited.
- Signs will be brown Federal Specification Color Number 20059 and white (i.e., Park Service colors).



Acceptable Symbology Commonly used as Signage Graphics

- Locate signs where they are visible and unobstructed.
- Signs will not indicate building numbers, hours of operation, or names of individuals (commander, first sergeant, OIC, manager, etc.).
- Sign wording shall be brief and limited to essential information. Words may be abbreviated if the message remains easily understood.
- Commercial symbols are allowed only on MWR signs.
- Unit Insignias and logos are not allowed on signs.
- Signs generally are not landscaped; however, if ornamental planting occurs in the vicinity of the sign, locate the sign in the planting bed.
- Temporary signs do not require landscaping; changeable signs are not considered temporary.
- Any exposed lighting tubes, strings of lights, spotlights, or any illumination that causes direct glare upon an unrelated building are prohibited.
- Any flashing signs, traveling lights, or signs animated by lights of changing degrees of intensity or color are prohibited.

Caution should be used when Locating Signs to Avoid Obstructed Views

- Signs may be lit by remote lamps or backlit where nighttime identification is required such as at clubs, shopping areas, and post entry points.

- Internally lit signs must have an opaque message surface displayed at all times, and at no period will views be allowed to the inside of the sign regardless of whether a message is on the sign or not.
- Use of neon is allowed for entertainment/food-type uses. Approval is required by DPW.
- Typically, signs are single-sided if parallel to traffic flow. Signs that cannot be located parallel to the direction of traffic may be located perpendicular to traffic.
- Kiosks, informational signs, and "You Are Here" maps are to be centrally located in "Activity Nodes" as defined by the District Plate graphics.
- For military building signs, quantities are limited to one of each type allowed.
- For MWR Building signs, facilities shall use no more than two of the specified signs.
- Quantities are limited regardless of whether facilities are located on corners, have exposure to multiple roads/drives, or have building entrances visually separated from roads/parking lots.

Planting Beds can be Utilized to Accentuate Signage

ABCDEFGHIJKLMN
OPQRSTUVWXYZ

Use Helvetica Type Style Unless an Approved Alternative is Noted

ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmn
opqrstuvwxyz

Clarendon - The Alternative Type Style

- All signs, except as mentioned below, use Helvetica.
- Sign Types C, D and E Series use Clarendon medium.
- Traffic signs will follow guidelines in the Federal Highway Administration's "Standard Alphabets for Highway Signs and Pavement Markings" standards.

2.2.6.3 Sign Mounting and Location

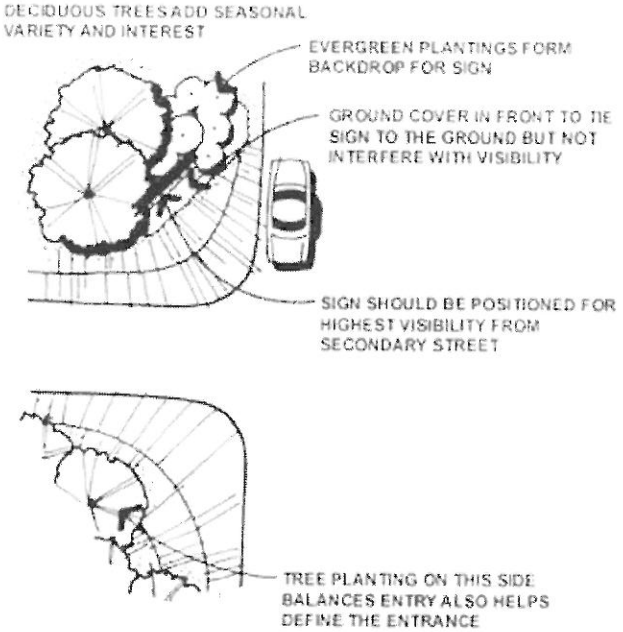
Locate identification signs typically at building entrances and/or other parts of the building visible from the main access street. Building signs should be visible from the main circulation paths to the building (vehicular or pedestrian).

Place building and/or facility identification signs within the first 20 percent of the distance closest to the road between the road and the building. These signs shall be placed so as not to obscure any other identification, information or vehicular regulatory signs.

Signs that cannot be located parallel to the direction of traffic may be located perpendicular to traffic.

The minimum distance between sign and driveway or intersection should normally be 100 feet. One identification sign for each building is sufficient unless vehicular access occurs on two or more sides of the building.

Provide signs to identify facilities dedicated to or accessible to the handicapped, such as parking spaces, building entrances, and restroom facilities.



Consider Basic Planning and Design Objectives in Sign Placement

Mounting Signs on Buildings

When signs are mounted on buildings, the following requirements shall apply:

- No sign may be mounted on the outside of the door, except small signs (one square foot or less) that indicate required use of an alternate entrance.
- Signs such as “Escort Required” or changeable signs are not permitted.
- No sign may be attached or mounted to roofs and parapets.
- No sign shall be painted or applied directly onto the surface of a building.
- No permanent signs shall obstruct any window, door, fire escape, ladder, or opening intended for light, air, or egress.
- No temporary sign in windows or glass walls is allowed to cover more than 20 percent of the glass area.
- No signs shall interrupt the vertical and horizontal features of the facade.
- No sign may be tacked, posted, painted, or otherwise affixed to site elements such as sheds, trees, or structures.
- No sign may be attached to utility poles except for pole identification or warning.
- Fasten projecting signs directly to the supporting building wall and integrate the frame into the sign. These signs shall intersect at right angles to the building front and shall not extend above the roof line or the parapet wall.
- Signs may not project more than five feet from a wall or two-thirds the width of the sidewalk, whichever is less.
- In no case may signs be closer than 18 inches to the curb line. A minimum clear height of 8 feet 6 inches above the ground is required.

Mounting Multiple Signs

Mount multiple signs on a shared frame when it is necessary to site these signs in the same vicinity. Two Type A Series signs may be stacked vertically on one frame. Three Type A Series may be mounted side by side. Other signs may not ordinarily share a frame unless otherwise described.

2.2.6.4 Sign Descriptions

Type A1, Medium Metal - 36-inch by 30-inch metal panel colored brown with 3/4-inch white border and white reflective upper and lower-case letters. The sign is mounted on two metal "U-channel" posts colored brown (Fed. Std. 595B - #20059)

Type A2, Small Metal - 12-inch by 18-inch metal panel colored brown with 1/2-inch white border and white reflective letters. The sign is mounted on one metal "U-channel" post, horizontally or vertically.

Type A3, Small Metal - 18-inch by 24-inch metal panel colored brown with 1/2-inch white border and white reflective letters. The sign is mounted on one metal "U-channel" post or fence or wall, horizontally or vertically.

Type B, Large Metal Panel - 48, 60, or 72-inch by 36-inch metal panel colored brown (Fed. Std. 595B - #20059) with white ¾-inch border and white reflective upper and lower-case letters. Mount on two pressure treated wooden 4-inch by 4-inch posts.

Type C, Medium Redwood - 2-foot 6-inch by 8-foot 6-inch high-density urethane with 2-inch smooth border and sandblasted raised white reflective centered uppercase and lowercase letters. The sign is mounted on 6-inch by 6-inch pressure treated wooden posts, three on each end.

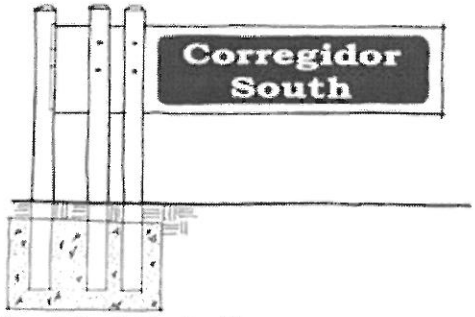
Type D1, Large Redwood Sign

Type D1, Large Redwood - 6-foot by 19-foot, 6-inch wide high-density urethane with 2-inch smooth border and sandblasted raised white reflective centered upper and lower case letters. The sign is mounted on 6-inch by 6-inch treated wooden posts, three on each end.

Type D2, Large Redwood - 7-foot by 24-foot high-density urethane panel with 3-inch smooth border and sandblasted raised white reflective centered upper and lower case letters. The sign is mounted on ten, 8-inch by 8-inch pressure treated wooden posts, five on each end.

Type D2, Large Redwood

Type E, Family Housing - 2-foot - 6-inch by 9-foot 6-inch high-density urethane panel with 2-inch smooth border and sandblasted, raised, white, reflective, centered, upper and lower case letters. The sign is cantilevered from five, 6-inch by 6-inch pressure treated wooden posts.



Type E, Family Housing Sign

Type F1, Building - 28-inch by 8-inch metal panel colored brown with white reflective letters and no border.

Type F2, House Number - 14-inch by 7-inch metal panel colored brown with white reflective letters and no border and mount in vicinity of the front door.

Type G, Chapel Sign - 5-foot by 3-foot-6 inches

synthetic panel colored white with black letters. The chapel name panel is one-foot high, white synthetic, with black letters lit internally. The sign is mounted on two 2 ½ -inch square, metal posts colored brown and capped with a finial.

Type H1, Large Synthetic - 10-foot by 6-foot prefabricated synthetic panel with colors complementary to the district colors within which it is placed. The sign is mounted on a brown 10- or 12-inch diameter pole. The overall sign height is limited to 22 feet. This sign may be affixed to a wall or lit internally.

Type H2, Individual Letter Signs - These are signs which consist of individual letters mounted directly onto a wall exclusive of any sign surface. Total area of the minimum imaginary rectangle or square of vertical and horizontal lines which fully encloses all sign words or message is ten feet by six-feet. Letters shall be professionally manufactured, reflective metal letters. Letter color shall be of high contrast to its mounting background. Faceted or sloped letter surfaces are optional. Letter style may be either Helvetica or Clarendon depending on the district character.

Type H3, School Signs - Variable message board 3-foot by 8-foot with surface mounted text may be used by schools. Sign may be single school color, will be internally lighted and may have a graphic of the school mascot. Mount on red brick base. Top of sign may not be higher than four feet above ground.

Type I, Variable Message Signs - Variable message board 4-foot by 8-foot with internal electronic text and graphics shall be brown (20059) on all sides with white letters and may have a graphic of the proponent. Mount on red brick base. Top of sign may not be higher than seven feet above ground.

2.2.6.5 Sign Categories

Military Building Signs

Any land use not mentioned below will use a sign that most closely matches one mentioned.

See Sign Description (Section 2.2.6.4) for sign type descriptions.

• Battalion-Level Commands	Type B
• Brigade/Group Regiment	Type C
• Company/Battery/Detachment	Type A1
• Corps Headquarters	Type D1
• Business Centers	Type C
• Education Centers and Annexes	Type A1
• "G-Level" Staff Sections	Type A1
• Medical and Health Care Facilities	Type C (except small clinics
• Offices/Activities Frequented by non-Fort Bragg Personnel (e.g., Defense Reutilization & Marketing Office, Central Receiving, I.D. Card Facility)	Type B
• Special Administration Offices Sections (e.g., Personnel Services Center, Enlisted Records, Officer Records, etc.)	Type A1
• Reenlistment Offices	Type A1
• "Flag-Level" Tenant Units	Type C

Morale/Recreation Building Signs

Any land use not mentioned below will use a sign that most closely matches one mentioned.

See Sign Description (Section 2.2.6.4) for sign type descriptions.

• Arts and Crafts	Type A1
• Auto Craft Shop	Type A1
• Automatic Teller Machine	Type A1
• Bakeries	Type H1, H2
• Banks	Type H1, H2
• Barbershop	Type H1, H2
• Bowling Alley	Type H1, H2
• Car Rental	Type H1, H2
• Car Wash	Type H1, H2
• Chapel	Type G
• Child Care Center	Type C
• Clubs in Permanent Buildings	Type C
• Clubs in Temporary Buildings	Type A1
• Commissary	Type H1, H2
• Gas Station	Type H1, H2
• Guest Quarters	Type E
• Laundromat	Type H1, H2
• Library	Type C
• Movie Theater/Playhouse	Type H1, H2
• Museum	Type C
• Rent-All	Type H1, H2
• Restaurant	Type H1, H2
• Schools	Type H3
• Snack Bar/Shop	Type A1
• Telephone Center	Type A1
• Thrift Shop	Type A1
• Youth Center	Type I
Recreation Signs	
• Golf Course	Type C
• Gymnasium/Physical Fitness Center	Type C
• Horse Stable	Type A1
• Motorcycle Track	Type A1
• Parade Field	Type C
• Skating Rink	Type H1, H2
• Sports Field	Type A1
• Stadium	Type A1
• Recreational (All uses not listed)	Type A1

Building Numbers Signs

Use Type F1 for all facilities, temporary and permanent. These signs are required for emergency identification and/or real property management purposes. These also include sports fields, lift stations, shelters, and fuel dispensing buildings.

Excluded from this requirement are family housing units, contractor trailers/buildings, relocatable/port-able structures, utilities, fences and transportation systems such as roads, sidewalks, and railroads.

Family Housing Building Numbers

Use Type F1 for all facilities.

Other Signs

- Billboards

  Use billboards at parade fields only. Any other sign that directs attention to a business attraction, or entertainment conducted at a location other than the premises where the sign is located, must be combined with other signs of similar character or type and requires specific site and design approval by DPW.

- Contractor Facilities

  Use Sign Type A1.

- Directional Signs

  Use these signs only for facilities frequented by non-Fort Bragg personnel. Typical examples, include post exchange, commissary, contracting, hospital, information center, and museum.

  These are to be located only on major thoroughfares. Use the Federal Highway Administration's "Standard Alphabets for Highway Signs and Pavement Markings" standards.

- Historic Facilities

  Upon approval from Cultural Resources historical plaques may be used for any facility properly listed on the State or National Register of Historic Places.

- Memorialized Facilities

  Upon approval of the Memorialization Board, special facilities may be identified by a Type C sign.

- Parking Lot Signs

  These signs include handicapped, General Officer, Command Sergeant Major, Mayor, Military Vehicle, Mother with Child, and Visitor spaces. One type A2 for every two spaces.

  No reserve parking signs, besides those already mentioned, are allowed for any commanding officer, noncommissioned officer, or executive officer. No "Permit Parking Only" signs are authorized.

- Portable Signs

  These signs are prohibited. Portable is defined as signs designed to be transported from one location to another, with or without wheels or trailer, and typically have a changeable message area.

- Residential Business Signs

  These signs are prohibited. Examples include home day-care identification.

- Restricted Area Signs

Use Type A2 when authorized by the Provost Marshal. Sign color will be brown 20059.

- Supplemental Building/Structures Signs

These signs are prohibited. Examples include paint or storage shed and kiosk or shelter identification. Safety/Warning signs specifically associated with a supplemental building/structures are allowed.

- Temporary Signs

Signs placed for less than 30 days do not require DPW approval.

- Advertisement/Business Announcement

One sign per location not exceeding 20 square feet. Examples include "Grand Opening", "Under New Management" and similar announcements. Sign display period limited to 30 days and only once per year per vendor.

- Banner

Limited to a maximum of 3-foot by 25-foot fabric material.

Banners mounted on or attached to buildings, structures, and utility poles must have DPW site approval. Sign display period limited to 30 days.

- Construction Signs

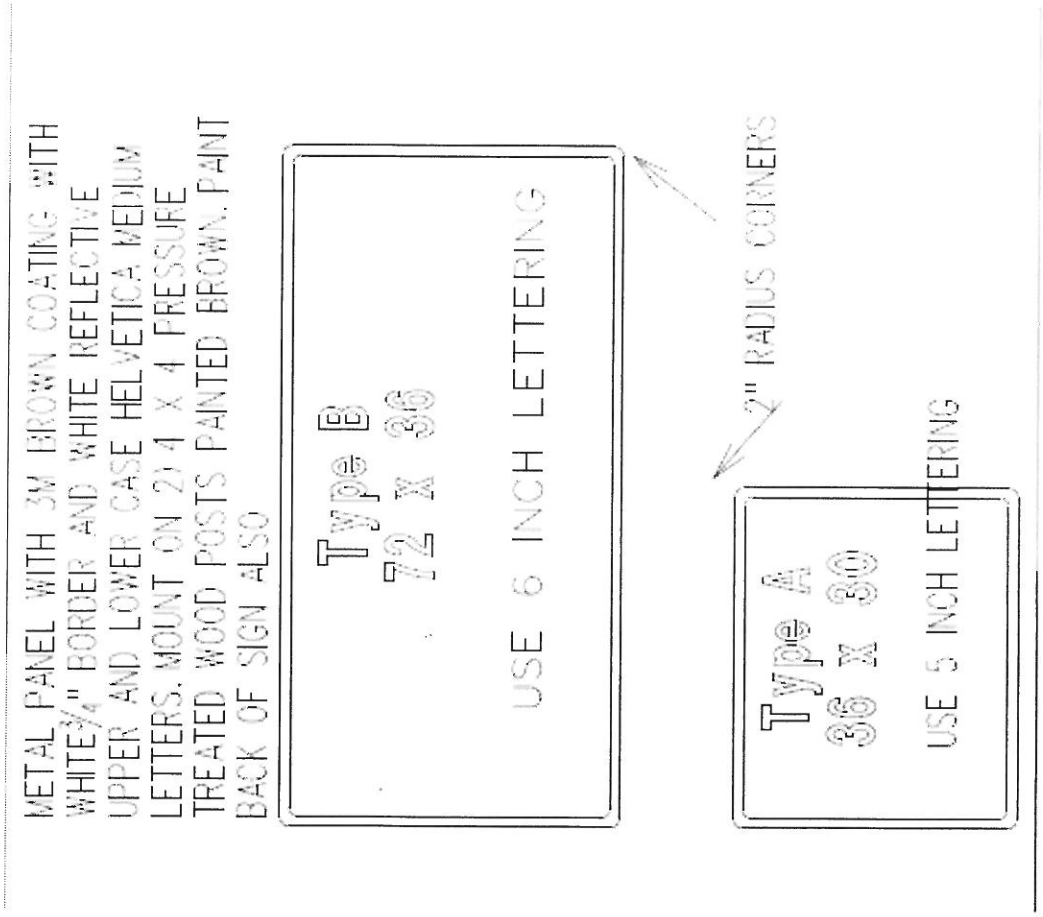
One sign per location not exceeding 32 square feet.

- Official Notices, Fairs, and Special Programs

Two per building or location and/or two per intersection. Sign display period limited to 30 days.

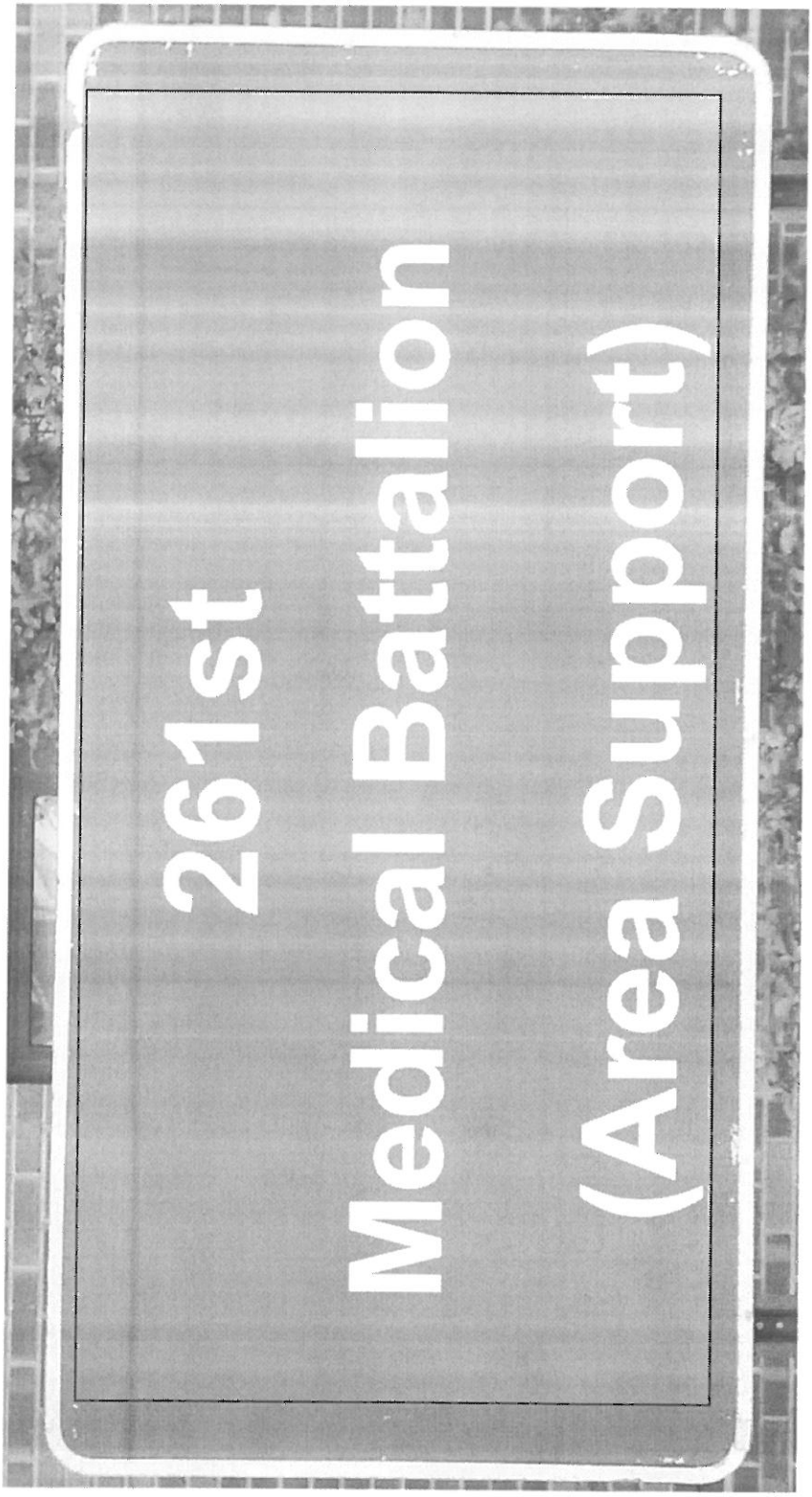
- Seasonal Displays

Displays not advertising a product, service, or entertainment require no DPW approval and will be treated as temporary signs.

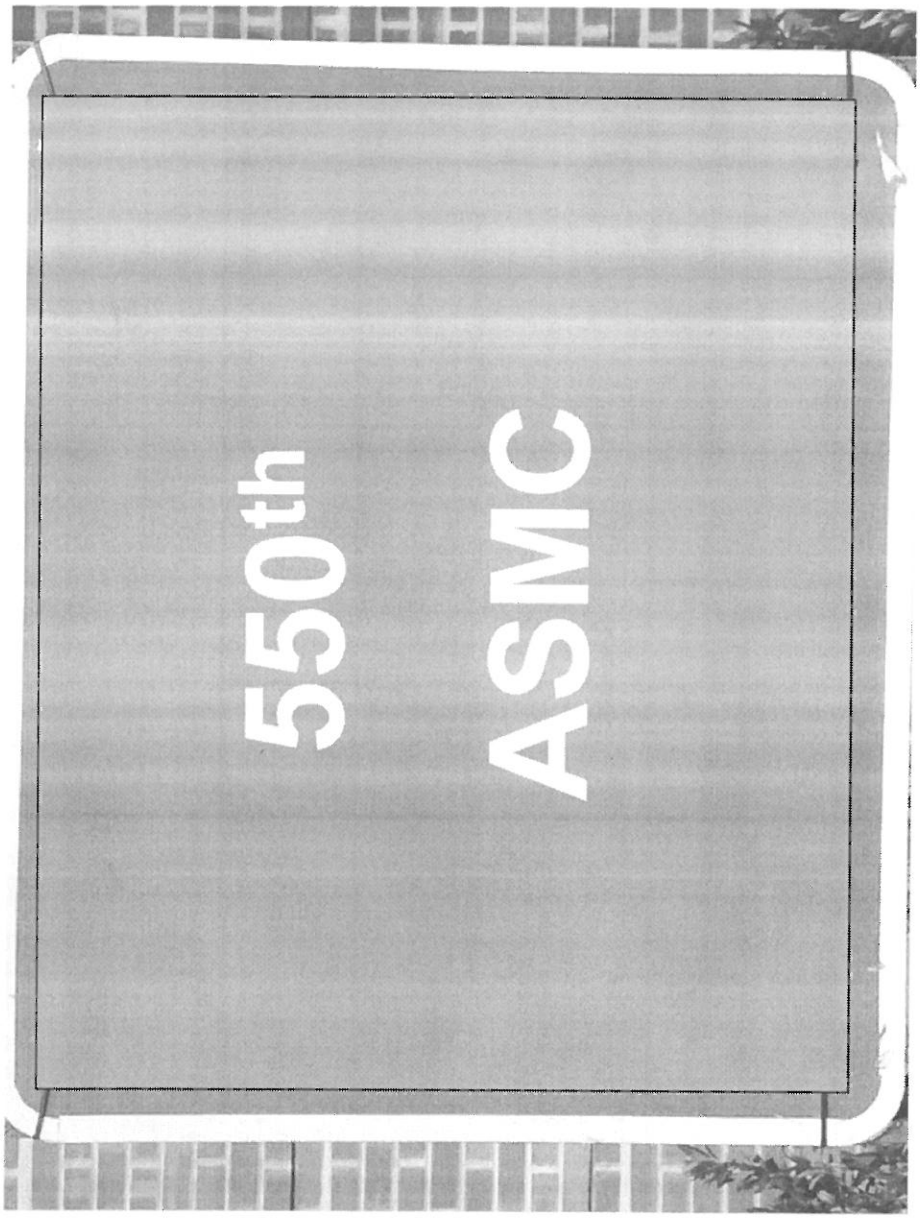

METAL PANEL WITH 3M BROWN COATING WITH
WHITE 3/4" BORDER AND WHITE REFLECTIVE
UPPER AND LOWER CASE HELVETICA MEDIUM
LETTERS. MOUNT ON 2 1/4 X 4 PRESSURE
TREATED WOOD POSTS PAINTED BROWN. PAINT
BACK OF SIGN ALSO
Type B
72 X 36
USE 6 INCH LETTERING
2" RADIUS CORNERS
Type A
36 X 30
USE 5 INCH LETTERING

Type B

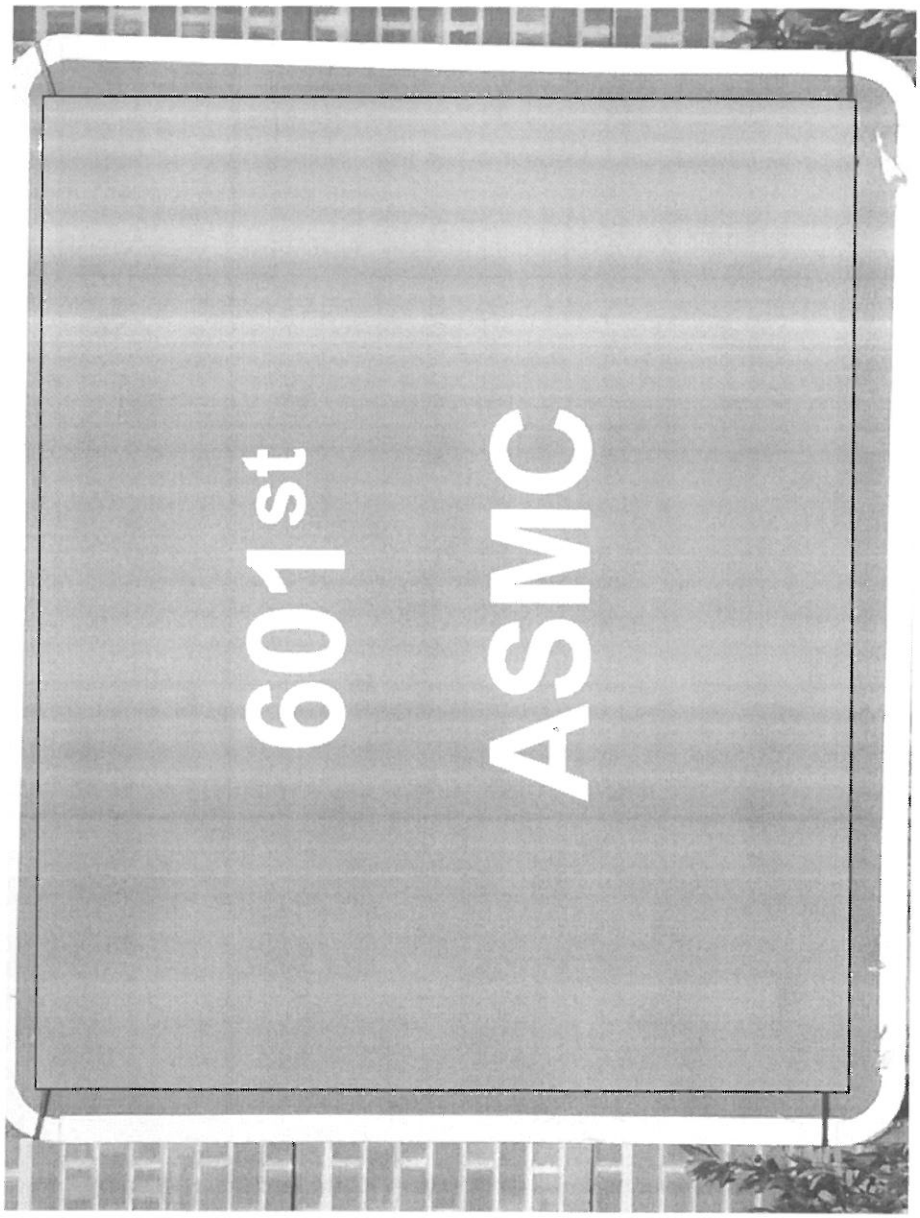
Type B



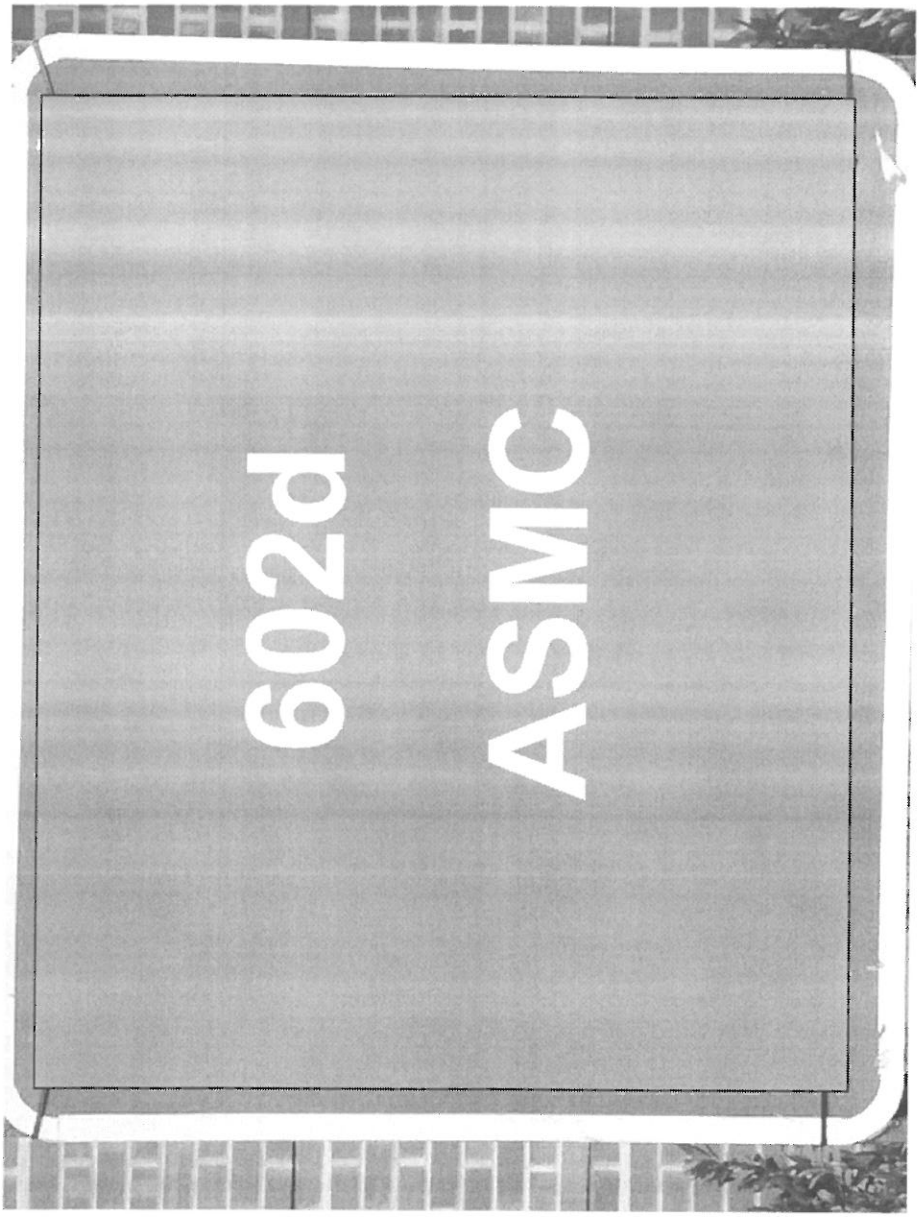
Type A



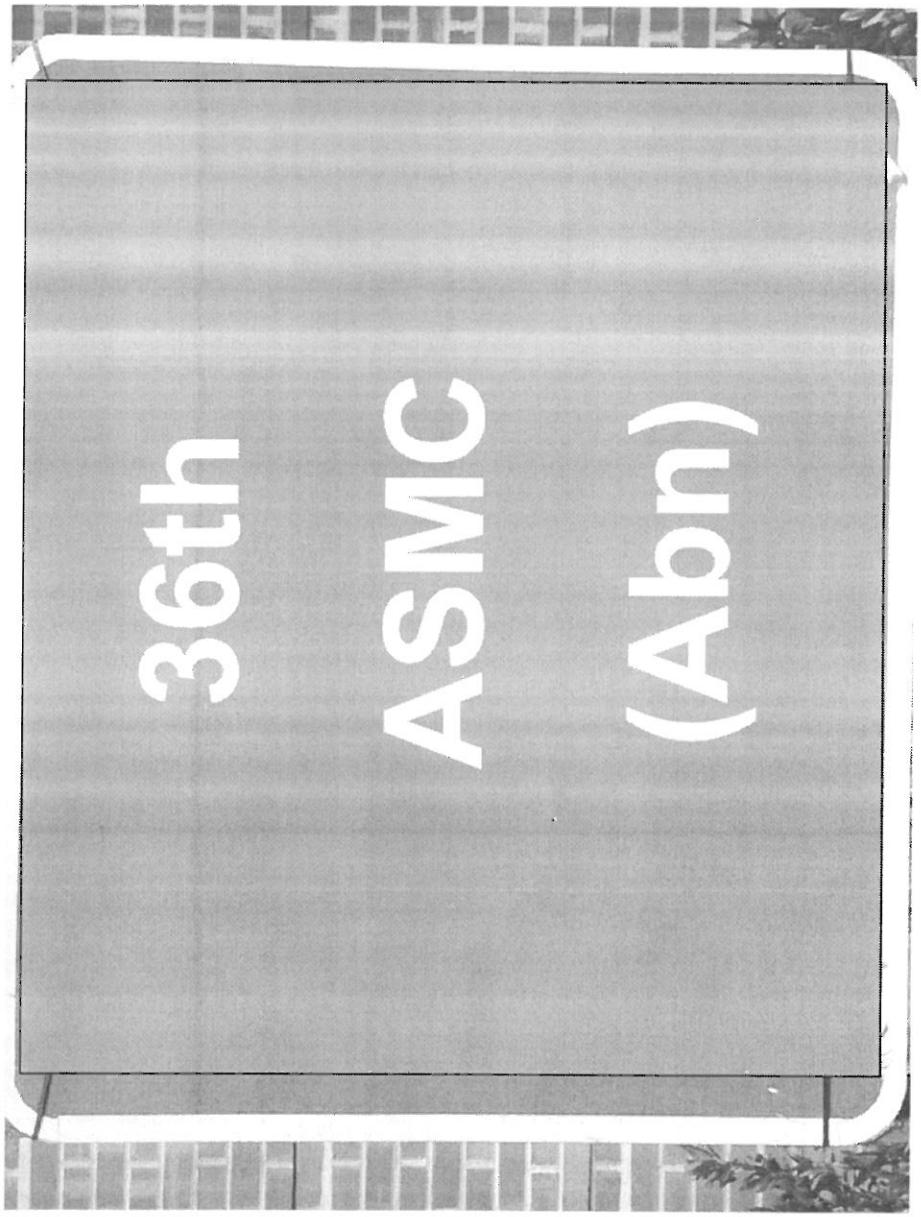
Type A



Type A



Type A



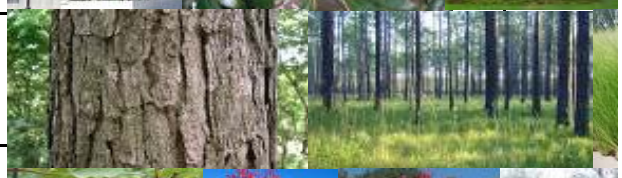
Appendix I – Acceptable Plants List

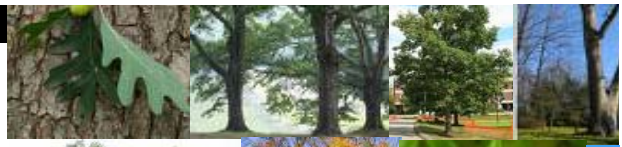
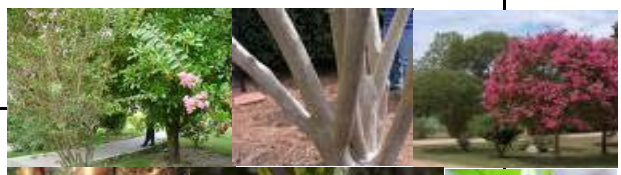
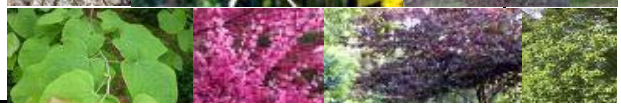
IDG Practical Plantings

Common Name	Scientific Name	Zone			Type		Function				Light			Moisture Level			Bloom Color					Bloom Season				Plant Density		Maintenance Issue	
		Natural	Urban	Historical	Evergreen	Deciduous	Habitat	Shade	Screen	Erosion Control	Full Sun	Part Sun	Shade	Wet	Medium	Dry	White/Green	Red	Purple/Blue	Yellow/Orange	Pink	Spring	Summer	Fall	Winter	Massing	Stand Alone	Yes	No
Trees	**>20' Tall**																												
American Holly	Ilex opaca	●	●	●	●		●	●	●	●	●	●	●	●	●		●					●		●		●	●		●
Atlantic white cedar	Chamaecyparis thyoides	●	●	●	●		●	●	●	●	●	●	●	●	●									●		●	●		●
Darlington Oak	Quercus laurifolia	●	●	●	●	●	●	●		●	●	●			●	●						●		●			●		●
Live Oak	Quercus virginiana	●	●	●	●	●	●	●		●	●	●			●	●						●		●			●		●
Longleaf pine	Pinus palustris	●	●	●	●		●	●	●	●	●	●		●	●	●						●		●		●	●		●
Red Maple	Acer rubrum	●	●	●		●	●	●		●	●	●		●				●				●			●		●		●
Southern Magnolia	Magnolia grandiflora	●	●	●	●		●	●	●	●	●			●	●		●					●		●		●		●	
Tulip poplar	Liriodendron tulipifera	●	●	●		●	●	●		●	●	●		●	●					●		●		●			●		●
White Oak	Quercus alba	●	●	●		●	●	●		●	●	●			●	●						●		●		●	●		●
Willow Oak	Quercus phellos		●	●		●	●	●			●	●			●	●						●		●			●		●
Small Trees	**8' to 20' Tall**																												
Crepe Myrtle*	Lagerstroemia indica			●		●	●	●	●	●	●	●				●	●	●	●		●		●			●	●	●	●
Chokeberry	Sorbus arbutifolia	●	●	●		●	●	●		●		●	●	●	●		●				●	●		●		●	●		●
Dogwood	Cornus florida	●	●	●		●	●	●	●	●	●	●	●		●	●	●				●	●	●			●	●		●
Easter red cedar	Juniperus virginiana	●	●	●	●		●	●	●	●	●	●			●	●						●		●			●		●
Persimmon	Diospyros virginiana	●	●	●		●	●	●		●		●	●		●	●		●		●	●	●	●	●		●	●		●
Redbud	Cercis canadensis	●	●	●		●	●	●		●	●	●			●	●			●			●				●	●		●
Sassafras	Sassafras albidum	●	●	●		●	●			●	●	●			●	●	●	●			●	●	●			●	●		●
Sourwood	Oxydendrum arboreum	●	●	●		●	●	●	●	●		●	●		●	●	●						●	●			●		●
Yaupon tree	Ilex vomitoria	●	●	●	●		●	●	●	●	●	●	●	●	●			●				●		●		●	●		●
Large Shrub	**4' to 8' Tall**																												
Camellia*	Camellia japonica		●	●	●		●	●	●	●	●							●			●				●	●	●		●
Kalmia	Kalmia latifolia	●	●	●	●		●	●		●		●		●	●	●	●				●	●		●		●	●		●
Oakleaf hydrangea	Hydrangea quercifolia	●	●	●		●	●			●			●			●	●									●			●
Oleander*	Nerium oleander			●	●		●			●																	●		
Redbay	Persea borbonia	●	●	●	●		●	●	●	●		●	●	●	●		●						●			●	●		●
Rhododendron	Rhododendron spp.	●	●	●	●		●			●	●	●			●		●				●		●	●		●	●		●
Rose of Sharon*	Hibiscus syriacus	●	●	●		●	●		●	●	●	●					●		●		●		●	●		●			●
Serviceberry	Amelanchier arborea	●	●	●		●	●	●	●	●	●	●					●					●	●			●			●
Wax myrtle	Myrica cerifera	●	●	●	●	●	●	●	●	●	●	●		●	●	●						●			●	●	●		●
Medium Shrub	**2' to 4' Tall**																												
Acuba variegated*	Acuba spp.			●	●		●			●		●	●			●	●					●		●		●	●		●
Azalea*	Rhododendron spp.		●	●			●			●			●			●	●	●	●		●	●	●			●			●
Gardenia*	Gardenia spp.		●	●			●			●			●		●	●	●									●			●
Mapleleaf viburnum*	Viburnum acerifolium	●	●	●		●	●			●	●	●		●	●		●					●	●			●			●
Strawberry bush	Euonymus americanus	●	●	●	●	●	●			●				●	●			●		●		●		●		●			●
Sweet Pepperbush	Clethra alnifolia	●	●	●		●	●			●	●	●		●	●		●						●	●		●	●		●
Small Shrub	**0' to 2' Tall**																												
Azalea evergreen*	Rhododendron spp.		●	●	●		●			●		●	●		●		●				●		●	●		●			●
Big Hosta*	Hosta lancifolia		●	●		●	●	●		●		●	●		●											●			●
Dwarf Gardenia*	Gardenia spp.		●	●	●		●			●		●	●		●	●	●									●			●
Dwarf Nandina*	Nandina domestica		●	●		●	●		●	●	●	●			●	●										●			●
Dwarf Yaupon	Ilex vomitoria 'Nana'	●	●	●	●		●			●	●	●		●	●			●				●		●		●			●
Hawthorne	Crataegus spp.	●	●	●			●	●	●	●	●	●			●	●	●					●				●			●
Purple Muhly grass	Muhlenbergia capillaris		●	●		●		●	●	●	●	●			●	●				●						●			●
Groundcover	**<1' Tall**																												
Ajuga*	Ajuga reptans			●	●		●			●		●							●			●				●			●
Blue fescue*	Festuca ovina `Glauca'		●	●	●		●	●		●	●	●			●	●			●				●			●			●
Creeping juniper*	Juniperus horizontalis		●	●	●		●			●	●	●			●	●	●						●			●			●
Dwarf Huckleberry	Gaylussacia dumosa	●	●	●		●	●			●	●	●			●	●	●					●	●			●			●
Liriope*	Liriope spp.		●	●			●	●		●		●			●	●	●		●							●			●
Periwinkle spp.*	Vinca major	●	●	●	●		●			●		●			●	●	●		●		●	●				●			●
Periwinkle spp.*	Vinca minor			●	●	●	●			●		●			●	●			●			●	●			●			●
Phlox	Phlox spp.			●	●		●			●		●			●	●	●		●			●	●			●			●
Well's delight	Vaccinium crassifolium	●	●	●	●		●			●	●	●			●		●					●	●			●			●
Wintercreeper*	Euonymus fortunei	●	●	●	●		●			●	●	●		●												●			●
Wiregrass	Aristida stricta	●	●	●	●		●	●	●	●	●	●			●	●				●				●		●			●

* Non-native plant to Sandhills region; discontinue use of planting by FY 2013.

Photographs of IDG Practical Plantings

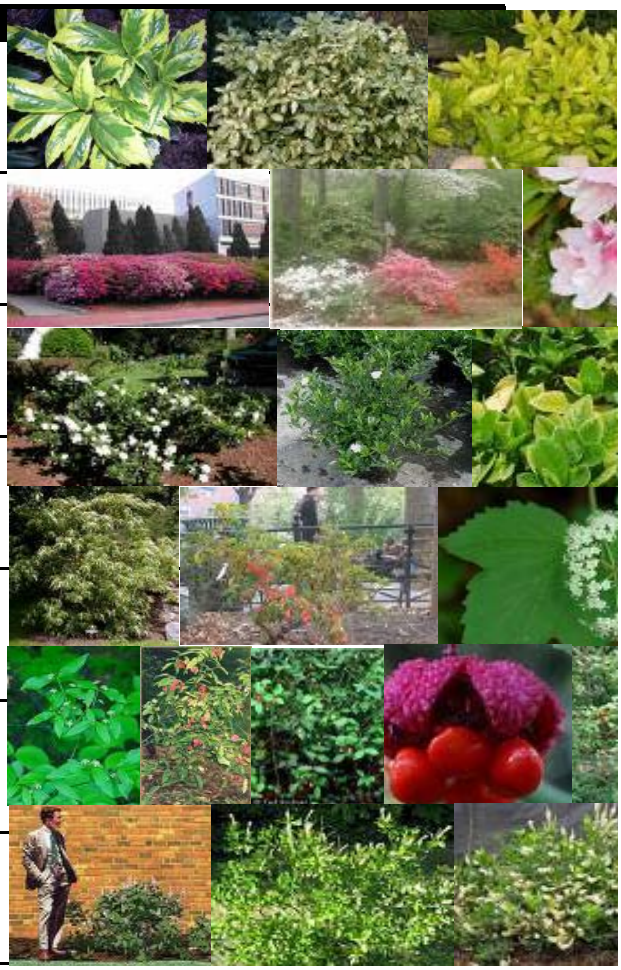
Trees	>20' Tall	**Photos** (Click on photo to englarge)
American Holly	Ilex opaca	
Atlantic white cedar	Chamaecyparis thyoides	
Darlington Oak	Quercus laurifolia	
Live Oak	Quercus virginiana	
Longleaf pine	Pinus palustris	
Red Maple	Acer rubrum	
Southern Magnolia	Magnolia grandiflora	
Tulip poplar	Liriodendron tulipifera	
White Oak	Quercus alba	
Willow Oak	Quercus phellos	

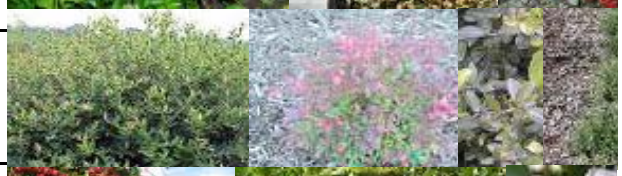
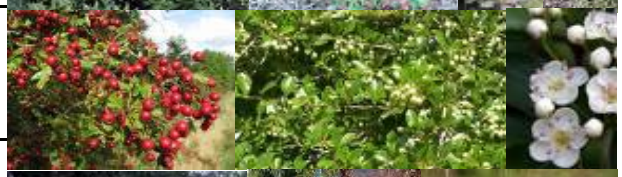
Small Trees	8' to 20' Tall	
Crepe Myrtle	Lagerstroemia indica	
Chokeberry	Sorbus arbutifolia	
Dogwood	Cornus florida	
Easter red cedar	Juniperus virginiana	
Persimmon	Diospyros virginiana	
Redbud	Cercis canadensis	
Sassafras	Sassafras albidum	
Sourwood	Oxydendrum arboreum	
Yaupon tree	Ilex vomitoria	

Large Shrub	4' to 8' Tall
Camellia	Camellia japonica
Kalmia	Kalmia latifolia
Oakleaf hydrangea	Hydrangea quercifolia
Oleander	Nerium oleander
Redbay	Persea borbonia
Rhododendron	Rhododendron spp.
Rose of Sharon	Hibiscus syriacus
Serviceberry	Amelanchier arborea
Wax myrtle	Myrica cerifera

Medium Shrub	2' to 4' Tall	
Acuba variegated	Acuba spp.	
Azalea	Rhododendron spp.	
Gardenia	Gardenia spp.	
Mapleleaf viburnum	Viburnum acerifolium	
Strawberry bush	Euonymus americanus	
Sweet Pepperbush	Clethra alnifolia	

Small Shrub	0' to 2' Tall	
Azalea evergreen	Rhododendron spp.	
Big Hosta	Hosta lancifolia	
Dwarf Gardenia	Gardenia spp.	
Dwarf Nandina	Nandina domestica	
Dwarf Yaupon	Ilex vomitoria 'Nana'	
Hawthorne	Crataegus spp.	
Purple Muhly grass	Muhlenbergia capillaris	



Ground Cover	< 1' Tall	Photos (Click on photo to englarge)
Ajuga	Ajuga reptans	
Blue fescue	Festuca ovina `Glauca'	
Creeping juniper	Juniperus horizontalis	
Dwarf Huckleberry	Gaylussacia dumosa	
Liriope	Liriope spp.	
Phlox	Phlox spp.	
Periwinkle spp.	Vinca major	
Periwinkle spp.	Vinca minor	
Well's delight	Vaccinium crassifolium	
Wintercreeper	Euonymus fortunei	
Wiregrass	Aristida stricta	

Fort Bragg Seeding Specs 7 May 2009 (short version)

1. AREA WILL BE TILLED TO 4"DEPTH

2. APPLY LIME AT 70 POUNDS PER 1000 SQUARE FEET OR 1.5 TONS PER ACRE

3. APPLY 10-20-20 FERTILIZER AT A RATE OF 850 POUNDS PER ACRE OR 20 POUNDS PER 1000 SQUARE FEET. THE FERTILIZER SHOULD BE EITHER SLOW TIME RELEASE OR APPLIED IN TWO APPLICATIONS, HALF AT TIME OF PLANTING AND THE SECOND HALF AFTER PERMANENT SEED GERMINATES.

4. THE LIME AND FERTILIZER WILL BE WORKED INTO THE TOP 2 TO 4 INCHES OF SOIL PRIOR TO SEEDING.

5. SEED MIX AND RATE
   PERMANENT SEEDING:
   "COOL SEASON": PLANTED BETWEEN 1 SEPTEMBER AND FEBRUARY 28
   50 POUNDS PER ACRE SOFT RED WINTER WHEAT (TRITICUM SPELTA). NO RYE GRASS.
   25 POUNDS PER ACRE COMMON BERMUDA (CYNODON DACTYLON), HULLED
   25 POUNDS PER ACRE COMMON BERMUDA (CYNODON DACTYLON), UNHULLED

   "WARM SEASON": PLANTED BETWEEN 1 MARCH AND 31 AUGUST
   50 POUNDS PER ACRE GERMAN (SETARIA ITALICA), BROWN TOP (SETARIA ITALICA), OR FOX TAIL MILLET (BRACHIARIA RAMOSUM)
   50 POUNDS PER ACRE COMMON BERMUDA (CYNODON DACTYLON), HULLED

   TEMPORARY SEEDING:
   "COOL SEASON": PLANTED BETWEEN 1 SEPTEMBER AND FEBRUARY 28
   120 POUNDS PER ACRE SOFT RED WINTER WHEAT (TRITICUM SPELTA)

   "WARM SEASON": PLANTED BETWEEN 1 MARCH AND 31 AUGUST
   65 POUNDS PER ACRE GERMAN (SETARIA ITALICA), BROWN TOP (SETARIA ITALICA), OR FOX TAIL MILLET (BRACHIARIA RAMOSUM)

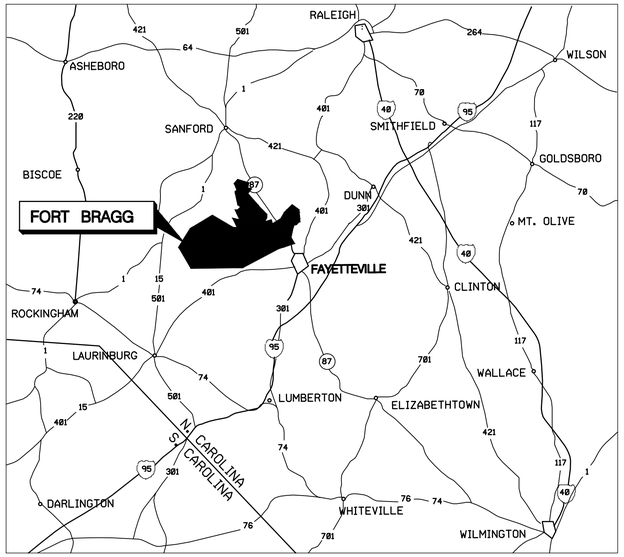
   STRAW MULCH: 4,000 POUNDS PER ACRE. THE GROUND SHOULD BECOMPLETELY COVERED WITH NO BARE SPOT LARGER THAN A QUARTER, THEN TACKED WITH EMULSIIFED ASPHALT. EMULSIFIED ASHALT SHALL BE APPLIED AT A RATE HEAVY ENOUGH THAT THE ENTIRE AREA APPEARS BLACK IN COLOR

   HYDROSEEDING: HRDROSEEDING SHALL BE ALLOWABLE ONLY ON SLOPES STEEPER THAN 1 HORIZONTAL TO 1 VERTICAL. STEPS 1 THROUGH 4 MUST BE COMPLETED PRIOR TO HYDROSEEDING. HYDROSEEDING SHOULD BE APPLIED IN 2 APPLICATIONS. THE FIRST APPLICATION WILL CONSIST OF 1/3 OF MULCH AND 2/3 OF THE SEED AND THE SECOND APPLICATION WILL CONSIST OF 2/3 OF MULCH AND 1/3 OF SEED. THE MULCH WILL INCLUDE A TACKIFIER AND WILL BE APPLIED AT A RATE OF 2,000 POUNDS PER ACRE OR THE MANUFACTURER'S RECOMMENDATION, WHICHEVER IS HIGHER.

6. UPON COMPLETION OF THE PROJECT, PRIOR TO LEAVING THE SITE, THE WATER MANAGEMENT BRANCH SHALL BE NOTIFIED TO INSPECT THE PROJECT. POC MR. JACK WILSON ATT 910 396-2301 EXT 224.

Appendix J – Drawings

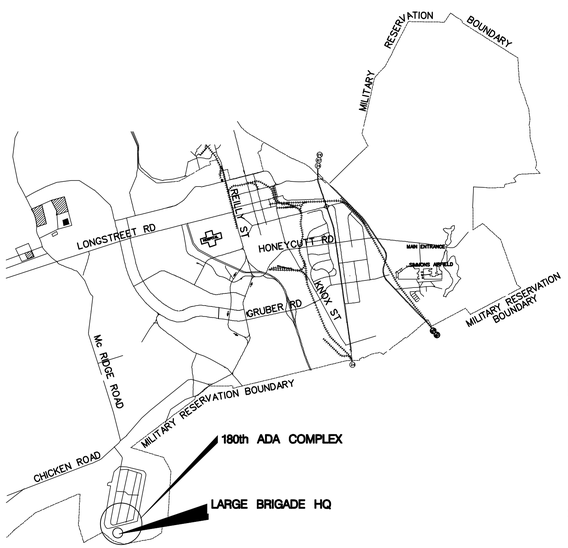
C100	OVERALL 108TH ADA COMPLEX
C101	EXISTING CONDITIONS
C102	SITE & UTILITIES PLAN
C103	SITE & UTILITIES PLAN
C104	EXISTING COMMUNICATIONS MANHOLE LOCATIONS



PLAN NORTH

VICINITY MAP

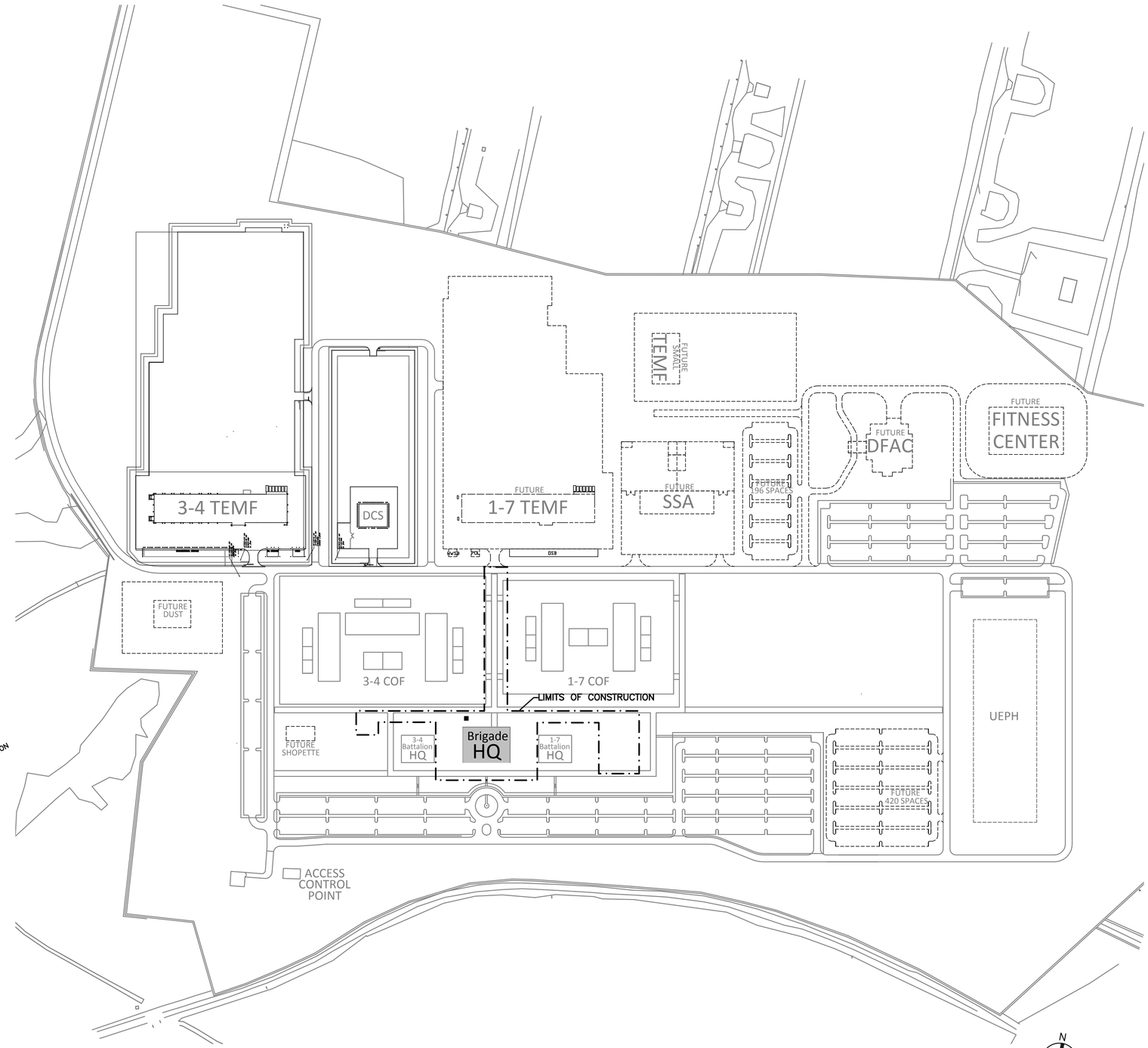
NOT TO SCALE



PLAN NORTH

LOCATION MAP

NOT TO SCALE



OVERALL 108th ADA COMPLEX LAYOUT PLAN

1" = 200'

SCALE:1"=200'

200' 0 200'

US ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT

SYMBOL	DESCRIPTION	DATE	BY

DESIGNED BY: WS
DWN BY: WLB
CKD BY:
SUBMITTED BY:
FILE NAME:
DATE: 07/28/10
SOLICITATION NO.:
CONTRACT NO.:
CATEGORY CODE:
PLOT SCALE: AS SHOWN
PLOT DATE:
SIZE: D 22"x34"

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
SAVANNAH DISTRICT

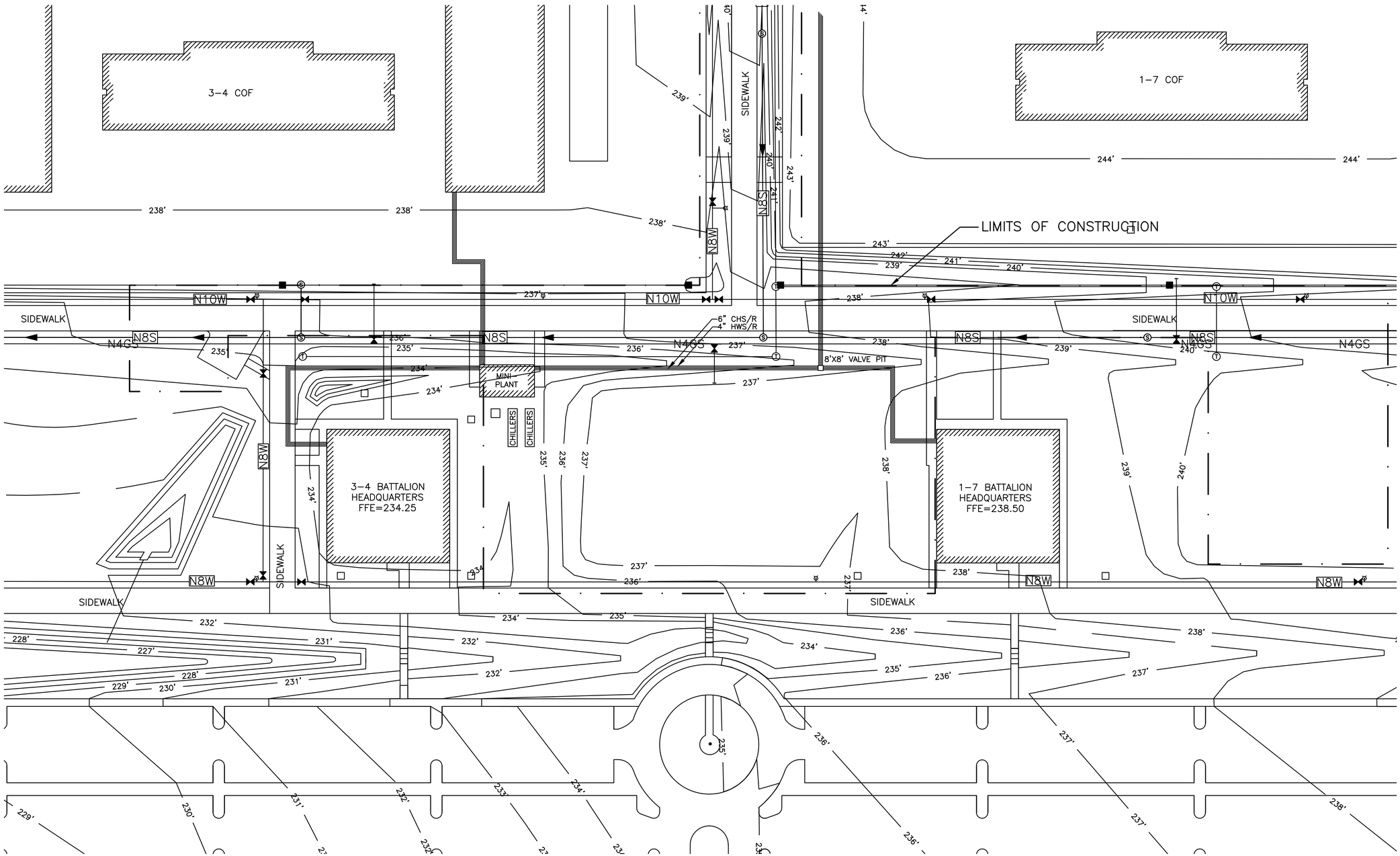
CLARK NEXSEN
Architecture & Engineering
4508 Walcott Blvd., Suite 280
Raleigh, NC 27609
P 919.828.1876 F 919.828.1877
http://www.clarknexsen.com

108th ADA ROUNDOUT
FT BRAGG, NORTH CAROLINA

OVERALL 108TH ADA COMPLEX

PLATE REFERENCE NUMBER

C-100



BRIGADE HQ EXISTING CONDITIONS PLAN

1" = 40'

SCALE:1"=40'

US ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT

SYMBOL	DESCRIPTION	DATE	BY

DESIGNED BY: CKD BY: DWN BY: WLB SUBMITTED BY: FILE NAME: DATE: 12/15/09 SOLICITATION NO.: CONTRACT NO.: CATEGORY CODE: PLOT DATE: PLOT SCALE: AS SHOWN SIZE: D 22"X34"

U. S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS SAVANNAH DISTRICT

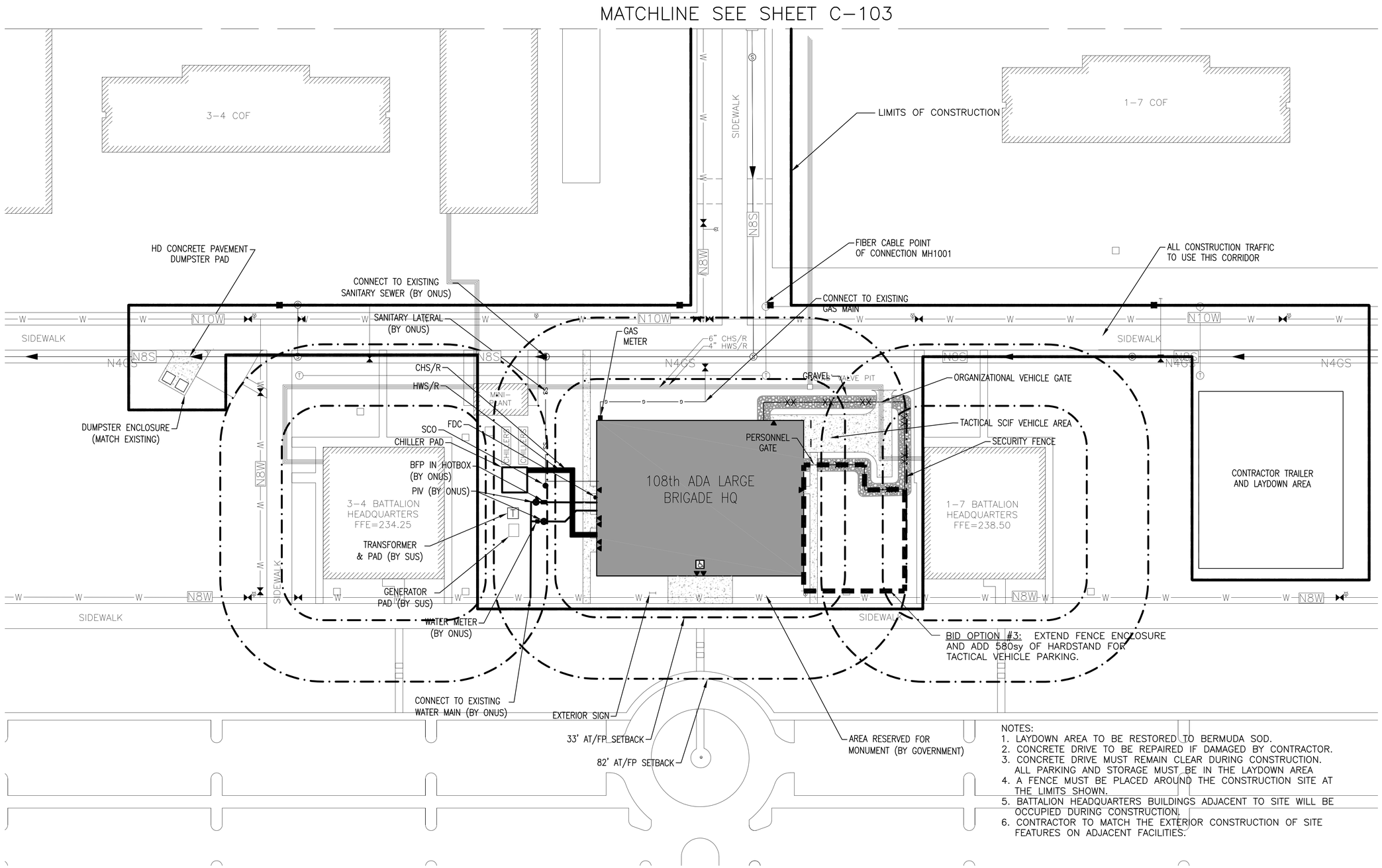
GARRAN-VAN 4000 Wallace Blvd., Suite 200 Wilmington, NC 28403 T 910.426.1875 F 910.426.1877 http://www.garranvan.com Architecture & Engineering

108th ADA ROUNDOUT FT BRAGG, NORTH CAROLINA

EXISTING CONDTIONS

PLATE REFERENCE NUMBER

C-101



NOTES:
1. LAYDOWN AREA TO BE RESTORED TO BERMUDA SOD.
2. CONCRETE DRIVE TO BE REPAIRED IF DAMAGED BY CONTRACTOR.
3. CONCRETE DRIVE MUST REMAIN CLEAR DURING CONSTRUCTION. ALL PARKING AND STORAGE MUST BE IN THE LAYDOWN AREA
4. A FENCE MUST BE PLACED AROUND THE CONSTRUCTION SITE AT THE LIMITS SHOWN.
5. BATTALION HEADQUARTERS BUILDINGS ADJACENT TO SITE WILL BE OCCUPIED DURING CONSTRUCTION.
6. CONTRACTOR TO MATCH THE EXTERIOR CONSTRUCTION OF SITE FEATURES ON ADJACENT FACILITIES.

HQ 108th ADA COMPLEX LAYOUT PLAN

1" = 40'

US ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT

SYMBOL	DESCRIPTION	DATE	BY

DESIGNED BY: CHS
DATE: 01/28/10
DWN BY: WLB
CKD BY:
SOLICITATION NO.:
SUBMITTED BY:
CONTRACT NO.:
FILE NAME:
CATEGORY CODE:
SIZE: D 22"X34"
PLOT SCALE: AS SHOWN
PLOT DATE:

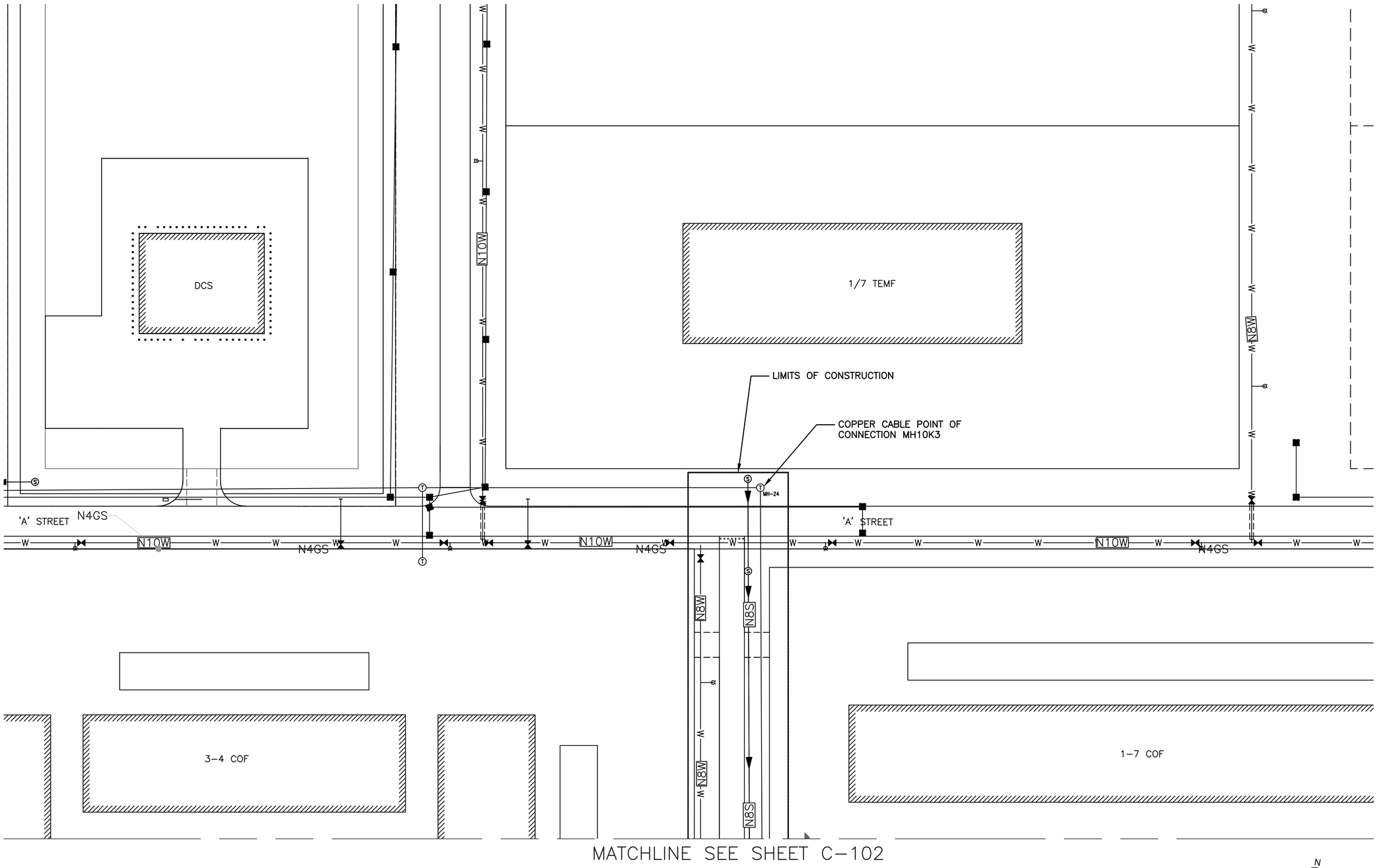
U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
SAVANNAH DISTRICT

CLARK NEXSEN
Architecture & Engineering
4600 Fayetteville Rd., Suite 200
Raleigh, NC 27603
Phone: 919.828.1977 Fax: 919.828.4177
http://www.clarknexsen.com

108th ADA ROUNDOUT
FT BRAGG, NORTH CAROLINA

SITE & UTILITIES PLAN

PLATE REFERENCE NUMBER
C-102



MATCHLINE SEE SHEET C-102

HQ 108th ADA COMPLEX LAYOUT PLAN

1" = 40'

SCALE: 1"=40'

40' 0 40"

US ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT

SYMBOL	DESCRIPTION	DATE	BY

DESIGNED BY: FOYOS
DWN BY: WILB
CKD BY:
SUBMITTED BY:
FILE NAME:
DATE: 12/15/09
SOLICITATION NO.:
CONTRACT NO.:
CATEGORY CODE:
PLOT DATE:
PLOT SCALE: AS SHOWN
SIZE: D 22"X34"

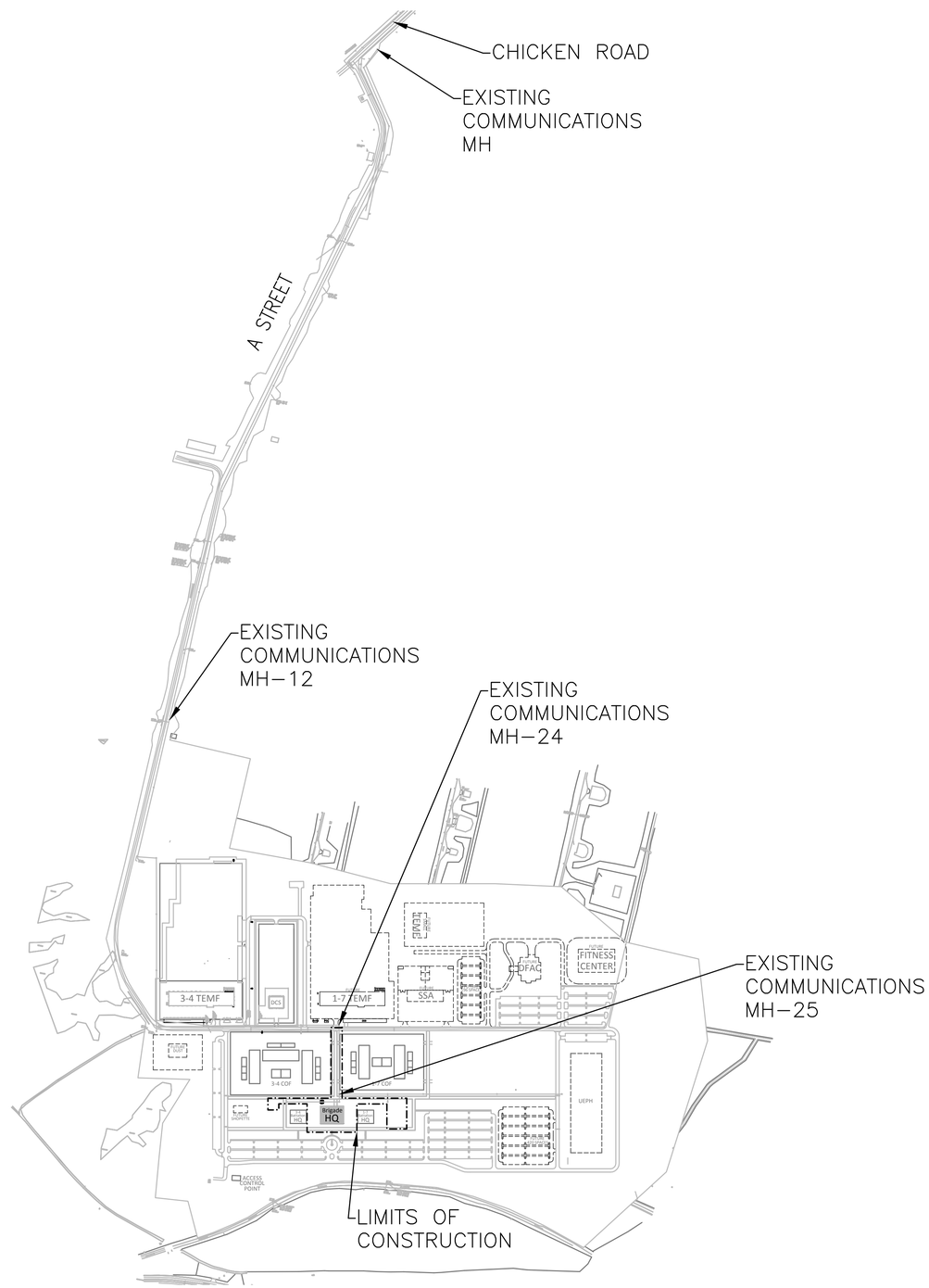
U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
SAVANNAH DISTRICT

CARDNO ATKINS
4700 Westlake Blvd., Suite 200
Raleigh, NC 27607
T 919.424.1476 F 919.424.1477
Architecture & Engineering http://www.cardnoatkins.com

108th ADA ROUNDOUT
FT BRAGG, NORTH CAROLINA

SITE & UTILITIES PLAN

PLATE REFERENCE NUMBER
C-103



EXISTING COMMUNICATIONS MH LOCATIONS

1" = 500'

SCALE:1"=500'

500' 0 500'

US ARMY CORPS OF ENGINEERS SAVANNAH DISTRICT

SYMBOL	DESCRIPTION	DATE	BY

DESIGNED BY: CWS | DATE: 07/28/10
DWN BY: WLB | CKD BY:
SUBMITTED BY:
FILE NAME:
SIZE: D 22"x34" | PLOT SCALE: AS SHOWN
SOLICITATION NO.:
CONTRACT NO.:
CATEGORY CODE:
PLOT DATE:

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
SAVANNAH DISTRICT

CLAUNCH & NAVARRO
Architecture & Engineering
4038 Walton Blvd., Suite 280
Alpharetta, Georgia 30004
P 770.828.1870 F 770.828.1877
http://www.claunch.com

108th ADA ROUNDOUT
FT BRAGG, NORTH CAROLINA

EXISTING COMMUNICATIONS MH LOCATIONS

PLATE REFERENCE NUMBER
C-104

Appendix K - Fuel Cost Information

Appendix K

Utility Data for Life Cycle Cost Analysis (BLCC)
December 2009

The following utility rates reflect Fort Bragg's FY2009 costs. The utility costs are strictly for the commodity costs. No capital cost for infrastructure improvements or distribution expenses are included. In applying the energy costs to the BLCC, the NIST escalation rates should be applied.

Electricity: Fort Bragg purchases power from Progress Energy under an experimental real-time tariff (RTP-LGS-TOU-14). There is a baseline purchase (approximately 90% of the total demand). The additional power is purchased on a real-time basis. Anyone dealing with active energy management such as thermal storage or demand management should contact the DPW Energy Group.

The 2009 electricity blended rate➔ $.0616/kWh[1]

The prices vary according to the balance of supply and demand in the system. The RTP prices range from $.035/kWh in the spring and fall to $.90/kWh during summer peaks. During the summer there is usually a significant difference between on-peak (10AM-10PM) and off-peak hours. The historic averages for the summer (May-September) are $.05/kWh off-peak and $.09/kWh on-peak. The rest of the year is $.04/kWh off-peak and $.055/kWh on-peak.

Natural Gas: Fort Bragg purchases firm transport gas and it is delivered by Piedmont Natural Gas. Prices fluctuate monthly with the market.

The 2009 natural gas average burner tip rate➔ $7.19/MMBtu

Water➔ $1.1441/kgal

Sewage➔ $0.7433/kgal

District Heating System - Medium Temperature Hot Water➔ $9.00/MMBtu (Indexed on natural gas prices)

District Cooling System - Chilled Water➔ $.042/tonh (Indexed on electricity prices)

[1] Based on Progress Electric main electric bill, which represents more than 94% of the Cantonment consumption

Appendix L– LEED Project Credit Guidance

LEED Project Credit Guidance (OCT 09)

This spreadsheet indicates Army required credits, Army preferred credits, project-specific ranking of individual point preferences, assumptions guidance for individual credits, and references to related language in the RFP for individual credits.

LEED 2.2 Credit Paragraph	LEED Project Credit Guidance	**Army Guidance:** Required - Preferred - Avoid	**Project Preference Ranking**: (1=most preferred, blank=no preference, X=preference not applicable to this credit, Rqd=required)	
PAR	**FEATURE**			**REMARKS**
SUSTAINABLE SITES				
SSPR1	Construction Activity Pollution Prevention (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met.
SS1	Site Selection		X	See paragraph LEED CREDITS COORDINATION.
SS2	Development Density & Community Connectivity - OPTION 1 DENSITY		X	See paragraph LEED CREDITS COORDINATION.

	Development Density & Community Connectivity - OPTION 2 CONNECTIVITY		X	See paragraph LEED CREDITS COORDINATION.
SS3	Brownfield Redevelopment		X	See paragraph LEED CREDITS COORDINATION.
SS4.1	Alternative Transportation: Public Transportation Access		X	See paragraph LEED CREDITS COORDINATION.
SS4.2	Alternative Transportation: Bicycle Storage & Changing Rooms	Pref		Assume that non-transient building occupants are NOT housed on Post unless indicated otherwise.
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. Assume that 50% of GOV fleet is NOT alternative fuel 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		See paragraph STORMWATER MANAGEMENT.
SS6.2	Stormwater Design: Quality Control	Pref		See paragraph STORMWATER MANAGEMENT.
SS7.1	Heat Island Effect: Non-Roof			
SS7.2	Heat Island Effect: Roof	Pref		Coordinate with nearby airfield requirements, which may preclude this credit.
SS8	Light Pollution Reduction	Pref		
WATER EFFICIENCY				
WEPR1	Water Use Reduction (Version 3 only)	Rqd	Rqd	All LEED prerequisites are required to be met.
WE1.1	Water Efficient Landscaping: Reduce by 50%	Pref		See paragraph IRRIGATION. 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	Water Use Reduction	Pref		See paragraph BUILDING WATER USE REDUCTION.
ENERGY AND ATMOSPHERE				

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	1	Earning of LEED EA1 points as indicated in paragraph ENERGY CONSERVATION, as a minimum, is required.
EA2.1	On-Site Renewable Energy	Pref		See paragraph ENERGY CONSERVATION.
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			Assume Government will not provide post-occupancy activities unless indicated otherwise.
EA6	Green Power		X	See paragraph LEED CREDITS COORDINATION.
MATERIALS AND RESOURCES				
MRPR1	Storage & Collection of Recyclables (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met. Coordinate with

				Installation during design development on collection service and receptacles.
MR1	Building Reuse			
MR2.1	Construction Waste Management: Divert 50% From Disposal	Pref		See paragraph CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT.
MR2.2	Construction Waste Management: Divert 75% From Disposal	Pref		
MR3	Materials Reuse			
MR4.1	Recycled Content: 10% (post-consumer + 1/2 pre-consumer)	Pref		See paragraph RECYCLED CONTENT.
MR4.2	Recycled Content: 20% (post-consumer + 1/2 pre-consumer)	Pref		
MR5.1	Regional Materials:10% Extracted, Processed & Manufactured Regionally			
MR5.2	Regional Materials:20% Extracted, Processed & Manufactured Regionally			
MR6	Rapidly Renewable Materials	Pref		See paragraph BIOBASED AND ENVIRONMENTALLY PREFERABLE MATERIALS and paragraph FEDERAL BIOBASED PRODUCTS PREFERRED

				PROCUREMENT PROGRAM.
MR7	Certified Wood	Pref		See paragraph BIOBASED AND ENVIRONMENTALLY PREFERABLE MATERIALS.
INDOOR ENVIRONMENTAL QUALITY				
EQPR1	Minimum IAQ Performance (PREREQUISITE)	Rqd	Rqd	All LEED prerequisites are required to be met.
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).
EQ1	Outdoor Air Delivery Monitoring			
EQ2	Increased Ventilation			
EQ3.1	Construction IAQ Management Plan: During Construction	Pref		See paragraph CONSTRUCTION IAQ MANAGEMENT.
EQ3.2	Construction IAQ Management Plan: Before Occupancy	Pref		See paragraph CONSTRUCTION IAQ MANAGEMENT.
EQ4.1	Low Emitting Materials: Adhesives & Sealants	Pref		See paragraph LOW-EMITTING MATERIALS.
EQ4.2	Low Emitting Materials: Paints & Coatings	Pref		See paragraph LOW-EMITTING MATERIALS.
EQ4.3	Low Emitting Materials: Carpet/Flooring Systems	Pref		See paragraph LOW-EMITTING MATERIALS.
EQ4.4	Low Emitting Materials: Composite Wood & Agrifiber Products	Pref		See paragraph LOW-EMITTING MATERIALS.
EQ5	Indoor Chemical & Pollutant Source Control	Pref		System requiring weekly cleaning to earn this credit is not a permitted option unless indicated

				otherwise.
EQ6.1	Controllability of Systems: Lighting			
EQ6.2	Controllability of Systems: Thermal Comfort			
EQ7.1	Thermal Comfort: Design	Pref		See paragraph APPLICABLE CRITERIA
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		See paragraph DAYLIGHTING.
EQ8.2	Daylight & Views: Views for 90% of Spaces	Pref		
INNOVATION & DESIGN PROCESS				
IDc1.1	Innovation in Design			See paragraph INNOVATION AND DESIGN CREDITS. Assume Government will not provide any activities associated with ID credits.
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.
REGIONAL PRIORITY CREDITS (Version 3 only)				See paragraph LEED CREDITS COORDINATION.

Appendix M– LEED Owner's Project Requirements

Owner's Project Requirements Document for LEED Fundamental Commissioning

Project: 108th ADA Brigade Headquarters _____

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.

16 FEB 10

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
   - Daylighting 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)

Office building with classroom space and server area

Describe pertinent project history. (example: standard design development)

Current Army standard design for large Brigade Headquarters building.

Broad Goals

What are the broad goals relative to program needs?

To provide economical, standardized facilities that meet the basic functional needs of units and can be easily adapted to changing needs.

What are the broad goals relative to future expansion?

The project does not require accommodation of future expansion of the facility.

What are the broad goals relative to flexibility?

The standard requires a high degree of flexibility to reconfigure spaces within the building envelope for mission or force structure changes. Classrooms have operable walls to allow flexibility in room size.

What are the broad goals relative to quality of materials?

Similar to a representative facility of the same type in the private sector. 40-year life with normal maintenance. Facility must meet budget.

What are the broad goals relative to construction costs?

Facility must meet budget. Project cost is limited to DD Form 1391 construction cost limits.

What are the broad goals relative to operational costs?

Minimize operating costs as much as possible within budget.

What are the broad goals relative to life cycle of the equipment?

Provide high efficiency equipment with long life expectancies and low maintenance requirements.

Other broad goals: *(Insert as applicable)*

Meet EPACT 2005 (reduce energy consumption). To provide 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. To reduce construction time.

2. Environmental and Sustainability Goals

What are the project goals relative to sustainability and environmental issues? (example: LEED Silver rating)

LEED silver rating

What are the project goals relative to energy efficiency? (example: Meet EPACT)

Meet EPACT

What are the project goals and requirements for building siting that will impact energy use?

Special local requirements are indicated in Paragraph 6 of the Statement of Work.

What are the project goals and requirements for building facade that will impact energy use?

Exterior appearance must be compatible with Fort Bragg Installation Design Guide.

What are the project goals and requirements for building fenestration that will impact energy use?

Exceed minimum fenestration requirements in ASHRAE Standard 90.1. Meet recommended fenestration performance for zone 3A as indicated in UFC 4-140-01. Laminated glass is required in accordance with UFC 4-010-01.

What are the project goals and requirements for building envelope that will impact energy use?

Exceed minimum envelope performance requirements in ASHRAE Standard 90.1. Meet recommended envelope performance for zone 3A as indicated in UFC 4-140-01.

What are the project goals and requirements for building roof that will impact energy use?

Exceed minimum roof performance requirements in ASHRAE Standard 90.1. Meet recommended roof performance for zone 3A as indicated in UFC 4-140-01. Roof design must be compatible with Fort Bragg Installation Design Guide.

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.

None.

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 work day with occasional evening and weekend use. Typical occupancy schedule is given in UFC 4-140-01.

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.

Zone temporary override for all normally occupied HVAC zones. 24 hour HVAC for duty officer.

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: IESNA RP-1-04 _____
Temperature: See Table 5-1 in Statement of Work _____

Humidity: ASHRAE Standard 55 _____
Air Quality: ASHRAE Standard 62.1 _____

Ventilation: ASHRAE Standard 62.1 _____

Filtration: ASHRAE Standard 62.1 _____

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.

Minimum STC 42, see Statement of Work. _____

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: Per Statement of Work _____

Temperature: None _____
Humidity: None _____
Air Quality: None _____

Ventilation: None _____

What, if any, specific types of lighting are desired? (example: fluorescent in 2x2 grid, accent lighting, particular lamps)

None _____

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: Per Statement of Work _____

Quality: _____

Preferred Manufacturer: _____
Reliability: _____
Automation: _____

Flexibility:_____
Maintenance Requirements: _____
Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Ventilation

Desired Type: Per Statement of Work _____

Quality: _____

Preferred Manufacturer: _____
Reliability: _____
Automation: _____

Flexibility:_____
Maintenance Requirements: _____
Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Air Conditioning

Desired Type: Per Statement of Work _____

Quality: _____

Preferred Manufacturer: _____
Reliability: _____
Automation: _____

Flexibility:_____
Maintenance Requirements: _____
Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Refrigeration

Desired Type: Per Statement of Work _____

Quality: _____

Preferred Manufacturer: _____
Reliability: _____
Automation: _____

Flexibility:_____
Maintenance Requirements: _____
Efficiency Target: _____

Desired Technologies:

Indicate desired features for the following commissioned system: HVAC Controls

Desired Type: Per Statement of Work _____

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: Per Statement of Work _____

Quality: _____

Preferred Manufacturer: _____
Reliability: _____
Automation: _____

Flexibility: _____
Maintenance Requirements: _____
Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Lighting Controls

Desired Type: Per Statement of Work _____

Quality: _____

Preferred Manufacturer: _____
Reliability: _____
Automation: _____

Flexibility: _____
Maintenance Requirements: _____
Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Daylighting Controls

Desired Type: Per Statement of Work _____

Quality: _____

Preferred Manufacturer: _____
Reliability: _____
Automation: _____

Flexibility:_____
Maintenance Requirements: _____
Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Emergency Power

Desired Type: Per Statement of Work _____

Quality: _____

Preferred Manufacturer: _____
Reliability: _____
Automation: _____

Flexibility:_____
Maintenance Requirements: _____
Efficiency Target: _____

Desired Technologies: _____

Indicate desired features for the following commissioned system: Other – none identified _____

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?

Varies. DPW contractor or staff._____
_____
_____

Will the facility be connected to an EMCS? If so, what are the interface requirements? (example: monitoring points, control points, scheduling)

Varies. See Statement of Work.

What is the desired level of training and orientation for building occupants to understand and use the building systems?

Minimal for occupants, per RFP.

What is the desired level of training and orientation for O&M staff to understand and maintain the building systems?

As indicated in Section CONSTRUCTION CLOSEOUT and Statement of Work.

Table 1

Space	Use / Activity	Num of Occs	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 Occup Adjustability Reqmt.

APPENDIX N
LEED Requirements for Multiple Contractor Combined Projects

Not Used

Appendix O – LEED Strategy Tables

Fort Bragg

LEED NC v2.2 Credit Preferences

C: Code (Prerequisite or Credit with number)	Bold Text: Requirement	P: Preference (1: highest; 5: lowest)

CATEGORY 1 - SUSTAINABLE SITES: SS (14 POSSIBLE POINTS)

C	Description	P	Comment
P1	**Construction Activity Pollution Prevention**		**Prerequisite is met through compliance with basic NCDENR erosion and sedimentation control requirements.**
C1	Site Selection	3	
C2	Development Density & Community Connectivity		Sometimes possible in more urbanized area, but unlikely in most areas.
C3	Brownfield Redevelopment		Unlikely credit. Selection of previously remediated sites does not qualify.
C4.1	Alternative Transportation Public Transportation Access	3	Unlikely credit. Access is currently very limited.
C4.2	Alternative Transportation Bicycle Storage & Changing Rooms	2	Credit is easily earned at minimal to no additional first cost.
C4.3	Alternative Transportation Low Emitting & Fuel Efficient Vehicles		Credit is easily earned at minimal to no additional first cost.
C4.4	Alternative Transportation Parking Capacity		Credit is easily earned at minimal to no additional first cost.
C5.1	Site Development Protect or Restore Habitat		
C5.2	Site Development Maximize Open Space		AT/FP standoffs often create open space required to earn this credit.
C6.1	**Stormwater Design Quantity Control**	**2**	**Credit is earned through compliance with §438 of EISA2007, §2(f) of EO13423 (Guiding Principle III), AR 200-1, and NCDENR stormwater management requirements.**
C6.2	**Stormwater Design Quality Control**	**2**	**Credit is earned through compliance with §438 of EISA2007, §2(f) of EO13423 (Guiding Principle III), AR200-1, and NCDENR stormwater management requirements.**
C7.1	Heat Island Effect Non-Roof		Often can be met with proper landscape vegetation design.
C7.2	Heat Island Effect Roof	2	Coordinate with nearby airfield requirements, which may preclude this credit.
C8	Light Pollution Reduction		Credit is easily earned at minimal to no additional first cost. May not be feasible for projects subject to UFC 3-550-03FA lighting requirements.

Fort Bragg

LEED NC v2.2 Credit Preferences

CATEGORY 2 – WATER EFFICIENCY: WE (5 POSSIBLE POINTS)

C	Description	P	Comment
C1.1	**Water Efficient Landscaping Reduce by 50%**	**1**	**Credit is earned through compliance with §2(f) of EO13423 (Guiding Principle III).**
C1.2	**Water Efficient Landscaping No Potable Water Use or No Irrigation**	**2**	**Credit is easily earned at no additional first cost. Permanent irrigation not allowed outside designated 'high-visibility' areas. See Fort Bragg Landscape Vegetation List.**
C2	Innovative Wastewater Technologies	2	Generally achievable through compliance with ECB 2006-7R (waterless urinals requirement, very high efficiency toilets, rainwater harvesting).
C3.1	**Water Use Reduction: 20% Reduction**	**1**	**Credit is earned through compliance with §2(f) of EO13423 (Guiding Principle III).**
C3.2	Water Use Reduction: 30% Reduction	2	

CATEGORY 3 – ENERGY AND ATMOSPHERE: EA (17 POSSIBLE POINTS)

C	Description	P	Comment
P1	**Fundamental Commissioning of the Building Energy Systems**		**All LEED prerequisites are required to be met.**
P2	**Minimum Energy Performance**		**All LEED prerequisites are required to be met.**
P3	**Fundamental Refrigerant Management**		**All LEED prerequisites are required to be met.**
C1	Optimize Energy Performance	1	Must achieve 30% more efficiency than ANSI/ASHRAE/IESNA Standard 90.1-2004. Maximization of this is most prefered credit.
C2	**On-Site Renewable Energy**	**2**	**Generate at least 5% of energy demand through on-site renewable sources (such as photovoltaic) as required by §203 and §204 of EPAct2005.**
C3	Enhanced Commissioning		Credit is not readily achievable. Estimated costs range from 2.5% to 5% of construction cost.
C4	Enhanced Refrigerant Management		Credit is generally achievable through compliance compliance with §2(f) of EO13423 (Guiding Principle III).
C5	**Measurement & Verification**	**1**	**Metering required per EPAct2005, §2(f) of EO13423 (Guiding Principle II), and pursuant to §434 of EISA 2007.**
C6	Green Power	5	Unlikely credit. Green power purchase is not currently implementable.

Fort Bragg

LEED NC v2.2 Credit Preferences

CATEGORY 4 – MATERIALS AND RESOURCES: MR (13 POSSIBLE POINTS)

C	Description	P	Comment
P1	**Storage & Collection of Recyclables**		**Prerequisite to be coordinated with installation recycling program.**
C1.1	Building Reuse: Maintain 75% of Existing Walls, Floors & Roof		Unlikely credit.
C1.2	Building Reuse: Maintain 95% of Existing Walls, Floors & Roof		Unlikely credit.
C1.3	Building Reuse: Maintain 50% of Interior Non-Structural Elements		Unlikely credit.
C2.1	**Construction Waste Management: Divert 50% From Disposal**	**1**	**Credit is earned through compliance with §2(f) of EO13423 (Guiding Principle III).**
C2.2	Construction Waste Management: Divert 75% From Disposal	2	Contractor diversion data is provided quarterly to Fort Bragg for inclusion in installation waste diversion reporting.
C3.1	Materials Reuse: 5%		Credit is generally achievable through compliance compliance with §2(f) of EO13423 (Guiding Principle V).
C3.2	Materials Reuse: 10%		Credit is generally achievable through compliance compliance with §2(f) of EO13423 (Guiding Principle V).
C4.1	Recycled Content: 10% (post-consumer + 1/2 pre-consumer)	1	Credit is generally achievable through compliance compliance with §2(f) of EO13423 (Guiding Principle V).
C4.1	Recycled Content: 20% (post-consumer + 1/2 pre-consumer)	2	Credit is generally achievable through compliance compliance with §2(f) of EO13423 (Guiding Principle V).
C5.1	Regional Materials: 10% Extracted, Processed & Manufactured Regionally	1	Credit is easily earned at minimal to no additional first cost.
C5.2	Regional Materials: 20% Extracted, Processed & Manufactured Regionally	2	
C6	Rapidly Renewable Materials		Credit is generally achievable through compliance compliance with §2(f) of EO13423 (Guiding Principle V).
C7	Certified Wood		Credit is easily earned at minimal additional first cost in projects that include very little wood. High wood containing projects are difficult.

Fort Bragg

LEED NC v2.2 Credit Preferences

CATEGORY 5 – INDOOR ENVIRONMENTAL QUALITY: EQ (15 POSSIBLE POINTS)

C	Description	P	Comment
P1	**Minimum IAQ Performance**		**Prerequisite to be met in relation to compliance with 10 CFR 434 (Federal Energy Code).**
P2	**Environmental Tobacco Smoke (ETS) Control**		**Prerequisite to be met in relation to Fort Bragg facility smoking policy.**
C1	Outdoor Air Delivery Monitoring	3	
C2	Increased Ventilation		Incorporation of energy recovery units are suggested.
C3.1	**Construction IAQ Plan During Construction**	**3**	**Credit is earned through compliance with §2(f) of EO13423 (Guiding Principle IV).**
C3.2	Construction IAQ Plan Before Occupancy	3	Credit is easily earned at minimal additional first cost.
C4.1	**Low Emitting Materials Adhesives & Sealants**	**4**	**Credit is earned through compliance with §2(f) of EO13423 (Guiding Principle IV).**
C4.2	**Low Emitting Materials Paints & Coatings**	**4**	**Credit is earned through compliance with §2(f) of EO13423 (Guiding Principle IV).**
C4.3	**Low Emitting Materials Carpet Systems**	**4**	**Credit is earned through compliance with §2(f) of EO13423 (Guiding Principle IV).**
C4.4	**Low Emitting Materials Composite Wood & Agrifiber**	**4**	**Credit is earned through compliance with §2(f) of EO13423 (Guiding Principle IV).**
C5	Indoor Chemical & Pollutant Source Control	4	Credit is easily earned at minimal to no additional first cost.
C6.1	Controllability of Systems: Lighting		
C6.2	Controllability of Systems: Thermal Comfort		Feasibility and cost of provision of individual workstation comfort controls are highly dependent on project type.
C7.1	**Thermal Comfort: Design**		**Credit is earned through compliance with §2(f) of EO13423 (Guiding Principle IV).**
C7.2	Thermal Comfort: Verification		Assume Fort Bragg will not provide post-occupancy activities.
C8.1	**Daylight & Views Daylight 75% of Spaces**	**2**	**Credit is earned through compliance with §2(f) of EO13423 (Guiding Principle IV) - exempt facilities provide documentation**
C8.2	Daylight & Views Views for 90% of Spaces	2	Credit is easily earned at minimal to no additional first cost provided building design limitations do not preclude such.

CATEGORY 6 – INNOVATION & DESIGN PROCESS: ID (5 POSSIBLE POINTS)

C	Description	P	Comment
C1.1	Innovation in Design		
C1.2	Innovation in Design		
C1.3	Innovation in Design		
C1.4	Innovation in Design		
C2	**LEED Accredited Professional**		

Fort Bragg

LEED NC v2.2 Credit Preferences

Whole Building Design Guide (WBDG): http://www.wbdg.org
The WBDG is a web-based portal providing government and industry practitioner's one-stop access to up-to-date information on a wide range of building-related guidance, criteria and technology from a 'whole buildings' perspective. Development of the WBDG is a collaborative effort among federal agencies, private sector companies, non-profit organizations and educational institutions. In addition to a wide range of design information, WBDG includes links to federal Executive Orders, Code of Federal Regulations and Construction Criteria Base (CCB). CCB is an electronic library of construction guide specifications, manuals, standards and many other essential criteria documents from participating federal agencies.

WBDG, LEED Resource Page: http://www.wbdg.org/tools/leed.php?a=1
WBDG, Building Commissioning: http://www.wbdg.org/project/buildingcomm.php
WBDG, Project Management: http://www.wbdg.org/project/index.php
WBDG, DoD Antiterrorism Standards: http://www.wbdg.org/tools/leed_atfp_rp.php?l=ss-2

Office of the Federal Environmental Executive (OFEE): http://www.ofee.gov
OFEE's mission is to advocate, coordinate, and assist environmental efforts of the federal community in waste prevention, recycling, affirmative procurement of CPG items, and the acquisition of recycled and environmentally preferable products and services. General reference with links.

Engineer Knowledge Online (EKO) Sustainable Design and Development (SDD)
https://eko.usace.army.mil/fa/sdd/

Corps of Engineers (ERDC/CERL TR 06 1 Draft)
Implementation of US Green Building Council's LEED as the Army's Green Building Rating System
http://www.cecer.army.mil/techreports/ERDC-CERL-TR-06-1/ERDC-CERL-TR-06-1.pdf
This work compares the SPiRiT and LEED rating systems and makes recommendations regarding further development and implementation, including the adoption of LEED®NC (New Construction) without modification or supplement. This work also reviewed 40 sample projects to reveal patterns of successful LEED® use within the Army.

DA Pamphlet [DA PAM] 200-1, Environmental Protection and Enhancement (HQDA, 17 January 2002)
http://www.army.mil/usapa/epubs/pdf/p200_1.pdf
Provides detailed guidance to support implementation of AR 200-1 to include: water resources management, oil and hazardous substances spills, hazardous materials management, hazardous and solid waste management, air pollution, environmental noise management, asbestos management, radon reduction, pollution prevention, environmental restoration, environmental quality technology, automated environmental management systems, the Army environmental program in foreign countries, and other miscellaneous topics.

Engineering Pamphlet 1110-1-16 [EP], Engineering and Design (HQUSACE, 28 February 1997)
Handbook for the Preparation of Storm Water Pollution Prevention Plans for Construction Activities
http://www.usace.army.mil/publications/eng-pamphlets/ep1110-1-16/toc.htm

DOD Instruction 4170.11, Installation Energy Management (DOD, 13 October 2004)
http://army-energy.hqda.pentagon.mil/policies/4170_11.asp
Provides procedures for DOD installation energy management and pertains to all phases of administration, planning, programming, budgeting, operations, maintenance, training and material acquisition activities that impact the supply, reliability and consumption of energy at DOD installations.

Fort Bragg

LEED NC v2.2 Credit Preferences

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.

UFC 1-900-01, Selection of Methods for the Reduction, Reuse, and Recycling of Demolition
UFC 3-210-06A, Site Planning and Design
UFC 3-210-10, Design: Low Impact Development Manual
UFC 3-230-14A, Evaluation Criteria Guide for Water Pollution Prevention Control and Abatement Programs
UFC 3-400-01, Design Energy Conservation
UFC 3-401-01FA, Utility Monitoring Control Systems
UFC 3-410-01FA, Design: Heating, Ventilating, and Air Conditioning
UFC 3-440-01, Design: Active Solar Preheat Systems
UFC 3-440-03N, Design: Passive Solar Buildings
UFC 3-440-04N, Design: Solar Heating of Buildings and Domestic Hot Water
UFC 3-440-06, Cooling Buildings by Natural Ventilation
UFC 4-826-10, Refrigeration Systems for Cold Storage

EISA2007 - Energy Independence and Security Act of 2007 (Public Law 110-140)

EPAct2005 - Energy Policy Act of 2005 (Public Law 109-58)

EO13423 - Executive Order 13423 (Strengthening Federal Environmental, Energy, and Transportation Management)

HPSB MOU - High Performance and Sustainable Buildings Memorandum of Understanding
Incorporated as part of EO13423

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Project Sustainability Requirements Checklist

1. Project Name:	
2. Building Number(s):	
3. Short Project Description:	
4. Fort Bragg PM (incl email, tele):	
5. USACE PM (incl email, tele):	
6. Facility Type:	
7. Occupant/Tenant:	
8. Work Type:	__ New Construction __ Major Renovation __ Equipment Replacement __ Other (describe):
9. Building Area (GSF):	
10. Footprint Area (SF):	
11. Est Total Cost ($):	
12. Est Construction Start (YY/MM):	
13. Est Construction End (YY/MM):	

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Project Sustainability Requirements Checklist

14. Will Integrated Design be implemented, including an integrated project planning/design team, as required by §2(f) of EO 13423 (Guiding Principle I)?	☐ Yes ☐ No ☐ N/A
15. Is this a designated T20 facility to meet the 15% minimum high performance, sustainable buildings goal established by EO 13423, §2(f)?	☐ Yes ☐ No ☐ N/A
16. Is this a potential T20 facility to meet the 15% minimum high performance, sustainable buildings goal established by EO 13423, §2(f)?	☐ Yes ☐ No ☐ N/A
17. Will this project be designed and constructed at a specific LEED Certification level under the LEED for New Construction and Major Renovations (LEED NC) standard as required for MTRFP projects?	☐ Yes ☐ No ☐ N/A
18. If "Yes" to the question above, what level of Certification will be sought?	☐ Certified ☐ Silver ☐ Gold ☐ Platinum ☐ N/A
19. Will this project be designed and constructed at a specific LEED Certification level under the LEED for Existing Buildings (LEED EB) standard?	☐ Yes ☐ No
20. If "Yes" to the question above, what level of Certification will be sought?	☐ Certified ☐ Silver ☐ Gold ☐ Platinum ☐ N/A
21. Will the facility energy consumption achieve 30% or more below the ASHRAE 90.1-2004 energy consumption baseline for New Construction or 20% below the FY 2003 facility baseline for Major Renovations as required by §109 of EPAct 2005 and §2(f) of EO 13423 (Guiding Principle II)?	☐ Yes ☐ No ☐ N/A
22. If "No" to the question above, has a life-cycle cost analysis been prepared to support the exemption as required by 10 CFR 436 and the 2006 December 4 Preamble to 10 CFR 434 Interim Final Rule?	☐ Yes ☐ No ☐ N/A
23. Will ENERGY STAR or FEMP designated equipment (HVAC, chillers, boilers, appliances, lighting, motors, etc) be specified for energy-consuming products as required by §104 of EPAct 2005?	☐ Yes ☐ No ☐ N/A
24. If "No" to the question above, has an analysis been prepared indicating that available ENERGY STAR or FEMP designated equipment is either not life-cycle cost effective or cannot meet the Army's functional requirement(s) as required by §104 of EPAct 2005?	☐ Yes ☐ No ☐ N/A
25. If "No" to the question above, will the project utilize the most energy-efficient equipment that is life-cycle cost effective (and has an analysis supporting that decision been prepared) as required by §434 of EISA 2007?	☐ Yes ☐ No ☐ N/A
26. Will ENERGY STAR or FEMP designated products that utilize less than 1 Watt of standby power be specified for energy-consuming products as required by §524 of EISA 2007?	☐ Yes ☐ No ☐ N/A
27. Will the facility be tested for envelope air leakage compliance as required by 10 CFR 434?	☐ Yes ☐ No ☐ N/A
28. Will the facility generate at least 5% of energy demand through on-site renewable sources (such as photovoltaic) as required by §203 and §204 of EPAct 2005?	☐ Yes ☐ No ☐ N/A
29. Will energy efficient light bulbs be utilized throughout the facility as required by §321 of EISA 2007?	☐ Yes ☐ No ☐ N/A

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Project Sustainability Requirements Checklist

30. If the facility will be designated as an office building, will it conform to ENERGY STAR standards required by §2(f) of EO 13423 (Guiding Principle II) for New Construction and Major Renovation?	☐ Yes ☐ No ☐ N/A
31. Is advanced utility-level metering for electricity in place or will it be installed during this project as required by §2(f) of EO 13423 (Guiding Principle II) and pursuant to §103 of EPAct 2005?	☐ To Be Installed ☐ In Place ☐ No ☐ N/A
32. Is advanced utility-level metering for natural gas in place or will it be installed during this project as required by §2(f) of EO 13423 (Guiding Principle II) and pursuant to §434 of EISA 2007?	☐ To Be Installed ☐ In Place ☐ No ☐ N/A
33. Is advanced utility-level metering for steam in place or will it be installed during this project as required by §2(f) of EO 13423 (Guiding Principle II) and pursuant to §434 of EISA 2007?	☐ To Be Installed ☐ In Place ☐ No ☐ N/A
34. Is metering for water in place or will it be installed during this project as needed pursuant to §2(f) of EO 13423 (Guiding Principle II)?	☐ To Be Installed ☐ In Place ☐ No ☐ N/A
35. Will the facility receive at least 30% of its domestic hot water demand (restrooms, kitchens, etc) from solar hot water heaters as required by §523 of EISA 2007?	☐ Yes ☐ No ☐ N/A
36. If "No" to the question above, has a life-cycle cost analysis justifying the decision been prepared as required by §523 of EISA 2007?	☐ Yes ☐ No ☐ N/A
37. Will the project include an energy-saving lighting plan (automatic dimming controls, external photoreceptors, and energy saving fixtures) as required by §2(f) of EO 13423 (Guiding Principle IV)?	☐ Yes ☐ No ☐ N/A
38. Will all plumbing fixtures meet or exceed International Plumbing Code (IPC) 2006 standards as required by 42 USC 6295(j), (k), and (l)?	☐ Yes ☐ No ☐ N/A
39. Will waterless urinals be installed during this project as required by ECB 2006-7R?	☐ Yes ☐ No ☐ N/A
40. Will the project reduce indoor water consumption by at least 20% relative to the facility's baseline calculated after meeting EPAct 1992 fixture performance as required by §2(f) of EO 13423 (Guiding Principle III)?	☐ Yes ☐ No ☐ N/A
41. Will the project reduce potable water consumption for outdoor uses (landscaping, etc) by at least 50% relative to the facility's conventional means as required by §2(f) of EO 13423 (Guiding Principle III)?	☐ Yes ☐ No ☐ N/A
42. Will a during-construction stormwater management plan (erosion and sedimentation control) be developed and implemented as per the North Carolina Sedimentation Pollution Control Act of 1973, Federal Water Pollution Control Amendments of 1972, Clean Water Act of 1977, Water Quality Act of 1987, and AR 200-1?	☐ Yes ☐ No ☐ N/A
43. Will an after-construction stormwater management plan be developed and implemented as per the Federal Water Pollution Control Amendments of 1972, Clean Water Act of 1977, Water Quality Act of 1987, AR 200-1, and associated regulations, including the North Carolina Stormwater Management Program?	☐ Yes ☐ No ☐ N/A
44. If the project footprint will exceed 5000GSF, will an analysis be prepared to demonstrate that the project will not alter, or will restore, the pre-development hydrology of the site as required by §438 of EISA 2007?	☐ Yes ☐ No ☐ N/A
45. Will the project include best management practices to minimize stormwater runoff and water quality impacts due to pollutants in stormwater runoff as per NPDES	☐ Yes ☐ No ☐ N/A

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Project Sustainability Requirements Checklist

Phase II Stormwater Requirements, §2(f) of EO 13423 (Guiding Principle III), and AR 200-1?	
46. If cement or concrete will be used, then will fly ash or other recovered mineral additives be incorporated in the cement and/or concrete as required by §108 of EPAct 2005?	☐ Yes ☐ No ☐ N/A
47. Will the project use materials for which Comprehensive Procurement Guidelines (CPGs) have been developed?	☐ Yes ☐ No ☐ N/A
48. If "Yes" to the question above, will all proposed materials meet or exceed the relevant CPGs for recycled content as required by §2(f) of EO 13423 (Guiding Principle V)?	☐ Yes ☐ No ☐ N/A
49. Will the project use materials that are not in EPA's CPG database?	☐ Yes ☐ No ☐ N/A
50. If "Yes" to the question above, will all such materials satisfy the following formula: ((Cost of all post-consumer recycled content + 0.5 × Cost of all pre-consumer recycled content) ≥ 10% of the Total Cost of materials used on the project) as required by §2(f) of EO 13423 (Guiding Principle V)?	☐ Yes ☐ No ☐ N/A
51. Will bio-based materials or those that contain bio-based components be available for this project?	☐ Yes ☐ No ☐ N/A
52. If "Yes" to the question above, will all such materials meet or exceed the minimum bio-based content specifications established by the USDA as required by §2(f) of EO 13423 (Guiding Principle V)?	☐ Yes ☐ No ☐ N/A
53. Will products made from renewable resources and/or certified sustainable wood available be feasible and cost-effective to use on this project?	☐ Yes ☐ No ☐ N/A
54. If "Yes" to the question above, will the project make use of renewable resources and/or certified sustainable wood products as required by §2(f) of EO 13423 (Guiding Principle V)?	☐ Yes ☐ No ☐ N/A
55. Will the project, excluding consideration of refrigerants, avoid use of ozone-depleting substances when alternative environmentally preferable products are available as required by §2(f) of EO 13423 (Guiding Principle V)?	☐ Yes ☐ No ☐ N/A
56. Will the project implement refrigerants with the lowest ozone depletion potential that are feasible for relevant cooling systems considering energy efficiency and operating costs as required by §2(f) of EO 13423 (Guiding Principle V)?	☐ Yes ☐ No ☐ N/A
57. Will the project use materials and products that are produced using significantly less energy and/or water and/or generating less waste during manufacturing as required by §2(d) of EO 13423?	☐ Yes ☐ No ☐ N/A
58. Will the facility include a waste prevention and recycling program during occupancy as required by §2(e) of EO 13423?	☐ Yes ☐ No ☐ N/A
59. Will the facility meet or exceed the requirements of ASHRAE 55-2004 for thermal comfort as required by §2(f) of EO 13423 (Guiding Principle IV)?	☐ Yes ☐ No ☐ N/A
60. Will the facility meet or exceed the requirements of ASHRAE 62.1-2004 for ventilation as required by §2(f) of EO 13423 (Guiding Principle IV)?	☐ Yes ☐ No ☐ N/A
61. Will the project use only low-pollutant emitting adhesives, sealants, paints, furnishings, carpets, and other materials as required by §2(f) of EO 13423 (Guiding Principle IV)?	☐ Yes ☐ No ☐ N/A

Fort Bragg
Directorate of Public Works
Building 3-1634 Butner Road
Fort Bragg NC 28310
910/396-0321 voice
910/432-6073 fax

Project Sustainability Requirements Checklist

62. Will the facility achieve a minimum daylight factor of 2% (excluding all direct sunlight penetration) in 75% of all spaces occupied for critical visual tasks (computer work, reading and writing, laboratory testing, etc) as required by §2(f) of EO 13423 (Guiding Principle IV)?	☐ Yes ☐ No ☐ N/A
63. Will the facility include individual controls of lighting, (e.g. task lighting) where applicable, and appropriate glare control as required by §2(f) of EO 13423 (Guiding Principle IV)?	☐ Yes ☐ No ☐ N/A
64. Will the project include strategies to minimize moisture accumulation and prevent mold formation at the facility as required by §2(f) of EO 13423 (Guiding Principle IV)?	☐ Yes ☐ No ☐ N/A
65. Will the project plan include a minimum 72-hour flush-out period of affected areas prior to occupancy as required by §2(f) of EO 13423 (Guiding Principle IV)?	☐ Yes ☐ No ☐ N/A
66. Will the project include other best practices (blocking off ventilation grills, storing volatile materials in sealed containers, etc.) to prevent occupant exposures to potentially harmful substances during construction by following SMACNA Indoor Air Quality Guidelines 1995 as required by §2(f) of EO 13423 (Guiding Principle IV)?	☐ Yes ☐ No ☐ N/A
67. Will at least 50 percent of the non-hazardous construction, demolition and land clearing materials (excluding soil) where markets or onsite recycling opportunities exist be utilized for construction, recycling or salvage as required by §2(f) of EO 13423 (Guiding Principle V)?	☐ Yes ☐ No ☐ N/A
68. Will salvage, reuse, and recycling services for waste generated from major renovations be provided as required by §2(f) of EO 13423 (Guiding Principle V)?	☐ Yes ☐ No ☐ N/A
69. Will all life cycle cost analyses utilize a 40 year time span for facility accounting analysis as required by §441 of EISA 2007?	☐ Yes ☐ No ☐ N/A

EPAct 2005 - Energy Policy Act of 2005 (Public Law 109-58)
EO 13423 - Executive Order 13423 (Strengthening Federal Environmental, Energy, and Transportation Management)
EISA 2007 - Energy Independence and Security Act of 2007 (Public Law 110-140)
OAA 2009 - Omnibus Appropriations Act of 2009 (Public Law 111-8)

APPENDIX P

USGBC Registration of Army Projects

Typical Registration Procedure

1. Complete the online registration form (see guidance below) at the USGBC website http://www.usgbc.org/showfile.aspx?documentid=875 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. The USGBC will follow up with a final invoice, the LEED-online passwords and template information.
4. If you have any questions, the USGBC contact (as of October 08) is:
Courtney Yan, LEED Program Assistant
U.S. Green Building Council
202/587-7180
cyan@usgbc.org

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
Total gross area all buildings in project
Total construction cost for buildings only (see Project Details Section instructions below)

ACCOUNT/LOGIN INFORMATION SECTION

1. The person registering the project **must have an account with USGBC** (login and password) to complete the form. If you have an account, select "I already have a USGBC Web site account" and enter email and password (twice). If you do not have an account, you may select "Create a new USGBC website 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 on the form (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.

PROJECT TYPE SECTION

Self-explanatory. As of October 08 USACE projects use LEED for New Construction V2.2. USACE staff members are USGBC members.

GENERAL PROJECT INFORMATION SECTION

Project Title: Match the project name used in P2. Contact the USACE Project Manager for this information.
Is Project Confidential: Indicate NO except if project has security sensitivity (elements that are FOUO or higher security) indicate YES.
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
How Did You Hear About LEED: USACE requirement

PRIMARY CONTACT INFORMATION

The Primary Contact may be a Contractor or a USACE staff member. USGBC considers this individual the primary point of contact for all aspects of the project. It is recommended this person be the Contractor Project Manager or the USACE Project Manager.

PROJECT OWNER INFORMATION

Project Owner First Name, Last Name, email: The Project Owner is the USACE Project Manager.
Organization Name: 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.

PROJECT DETAILS

Owner Type: Military Base
Project Scope: Provide brief description (example: barracks complex)
Site Conditions: Provide brief description (example: wooded with steep grades)
Occupant Type: Provide brief description (example: military and civilian employees)
Owner Occupied: No
Gross Square Footage: Provide total area all buildings in project
Project Budget: Do not include the cost for design, site work, demolition, abatement or other work – do not include Government contingency or supervision costs. For design-build and construction projects registered after award, use the awarded contract cost for construction of buildings only. For projects registered prior to award of design-build or construction contract, use the total Primary Facility cost from DD1391 or updated Primary Facility cost based on design development if available.
Current Project Phase: Identify phase at time of registration (example: design start, construction start)
Project Type: Self-explanatory

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 ≥6′-11″ (as measured to the underside of the structural system) and having perimeter walls which are ≥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

SECTION	PARAGRAPH NUMBER	DESCRIPTION OF ITEM SUBMITTED	TYPE OF SUBMITTAL											CLASSIFICATION						REVIEWING OFFICE					
			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	FIO - 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				X				
00 73 00	1.11	Dev. From Accept. Design. No Deviation from Contract					X											X			X			X	
00 73 00	1.11	Dev. From Accepted Design - Deviates from Contract					X												X		X			X	
00 73 00	1.17	Supplemental Price Breakdown	X											X							X				
00 73 00	1.18	SSHO Qualifications	X												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							X				
01 10 10	***	Tests as Req by Codes - DOR Develops Test Program						X						X							X			X	
01 10 00	5.8.3	BAS Review Information		X														X		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			X	
01 33 00	1.8	Submittal Register Updates (Design Packages, etc.)	X												X						X			X	
01 33 00	1.3.1	Substitution of Manuf or Model Named in Proposal		X	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										
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				

RMS INPUT FORM 4288A

Export to RMS in CSV(MS-DOS) (*.csv) Format

Note: Reviewing Office Optional

Appendix AA - Supplemental Paragraphs

Supplemental Paragraphs

The following paragraphs amend, supplement or in some cases supersede portions or the RFP as indicated of Section 01 10 00, paragraphs 2, 3, 4, 5 & 6.

Paragraph 2.4; clarification.

Where the term "this contract" is used in the second paragraph, it refers to the Design/Build Contactor for the Brigade HQ Building.

Paragraph 3.1.7; revise as follows.

Delete entire paragraph.

Paragraph 3.3.1(1); delete paragraph in its entirety and insert the following in its place.

"(1) Tactical SCIF Vehicle Operation Areas (TVSA) at Brigade Headquarters. A parking area for two HMMWV vehicles with trailers shall be located in the secure area and immediately adjacent to the interior SCIF. The area shall be provided with the following features: 1) a perimeter fence consisting of a 6-foot high chain link fabric topped by a single outrigger with three-strand barbed wire designed in accordance with STD 872-90-03, FE-6, chain link security fence details. Provide organizational vehicle and personnel gates that are manually operated and manually secured. 2) provide 30-foot wide by 40-foot long rigid concrete pavement designed to support HMMWV vehicles with trailers 3) a 10-foot wide zone clear of trees and shrubs is required on each side of the fence. The clear zone should require minimal maintenance, and the area 5 feet each side of the fence should be covered with gravel and treated to discourage vegetation growth. Provide 6-inch high concrete wheel stops for each parking stall 6 feet from the exterior wall of the Brigade Headquarters to prevent damage to the building by vehicle impact. No above ground transformers, generators, or mechanical equipment shall be located in this area."

Paragraph 3.3.2(5); add the following sentence at the end of the paragraph.

"Penetrations in the walls for ventilation and/or HVAC ductwork shall not exceed 96 square inches unless protected by a reinforced steel grid in accordance with AR 380-5 guidelines."

Paragraph 3.3.3 (3)(c); delete first two sentences of paragraph and insert the following in its place.

"Backflow Preventer. Provide a reduced pressure zone (RPZ) type backflow preventer on the fire water main serving each building. This shall be located exterior of the building in a "hot box" enclosure. The location of the hot box shall be coordinated with Old North State Utility Services (ONUS)."

Paragraph 3.3.5 (3)(h); delete paragraph in its entirety and insert the following in its place.

"Mass Notification System (MNS). A mass notification system shall be provided as required by UFC 4-021-01."

Paragraph 3.3.5 (5); insert the following after NFPA 13.

", NFPA 14"

Paragraph 3.3.7(2); revise as follows.

Change ASHRAE 91.1 to ASHRAE 90.1.

Paragraph 4.1; add the following item to the Industrial Criteria.

National Fire Protection Association (NFPA)	
NFPA 70E	Standard for Electrical Safety in the Workplace

Paragraph 5.8.2.3; revise second sentence as follows.

Change "… single zone systems and multi-zone systems …" to "systems".

Paragraph 6.4.6.5; delete entire paragraph (This building will require a "standalone" HVAC system. Chilled and Hot Water from a central plant is not available.)

Paragraph 6.4.6.6; revise as follows.

Delete "(Government)" from paragraph title.

Paragraph 6.4.6.8; revise as follows.

Delete entire paragraph.

Paragraph 6.6.4; add the following new paragraph.

"6.6.4 Where the applicable Code issued by the International Code Council (ICC) calls for inspections by the Building Official, the Contractor shall include the inspections in the Quality Control Plan and shall perform the inspections required by the applicable ICC and the Contractor shall perform these inspections, using qualified inspectors. The Designer of Record shall develop a program for any special inspections required by the applicable International Code Council (IBC 2009 tables 1704.3; 1704.4; 1704.5.1 and 1604.5.3). Include the special inspections plan requirements in the Contractor's Quality Control Plan."

Paragraph 6.8.1; add the following sentence at the end of the paragraph.

"Battery-powered faucets and flush valves are not permitted."

Paragraph 6.9.3.1; delete paragraph in its entirety and insert the following in its place.

"The privatized electrical system contractor, Sandhills Utilities Services (SUS), will design and construct site electrical primary distribution to and within the project site. The SUS point of

contact is John Myers, 910-818-1769, johnmyers@sandhillsutility.com. See Appendix J (Site and Utility Plan) for additional information."

Paragraph 6.9.3.11; add the following new paragraph.

6.9.3.11. – Stand-by Power System

(a) The privatized electrical system contractor, Sandhills Utilities Services (SUS), will design and provided the stand-by power system. The stand-by generator, fuel tank with 48 hour capacity and automatic transfer switches shall be installed by SUS. SUS will install electrical conduit and wiring from the stand-by generator to the automatic transfer switch. The contractor shall coordinate the stand-by power system design and installation with SUS.

(b) Design/Builder shall provide electrical conduits and wiring between the automatic transfer switch and the building electrical distribution system.

Paragraph 6.9.4.2- 6.9.4.3; delete paragraphs entirely and insert the following in its place.

6.9.4.2. - The site lighting design, installation and controls (including roadways, walkways, parking areas, hardstands and area lighting) shall be provided by the privatized electrical system contractor Sandhills Utilities Services(SUS). Coordinate site lighting design and installation with SUS. Exterior building mounted area lighting shall be designed and furnished by the contractor.

Paragraphs 6.9.5.1, 6.9.5.3-6.9.5.5; delete paragraphs entirely and insert the following in its place.

6.9.5.1. Connect to the OSP, extending a new duct line, manhole and cable system to the building main communications room. Each ductline shall be minimum 3-way 4-inch, Schedule 40 PVC conduits Coordinate design, construction and connection point location with the installation US Army Signal Network Enterprise Center (NEC)/DOIM. Typical drawings required for design can be found in I3A figures C2 thru C6.

6.9.5.3. Coordinate planning and design of outside plant communications systems on Fort Bragg with the Fort Bragg NEC. Provide the following for the communication design.

(a) 12-strands of fiber optic cable shall be available at MH10o1.

(b) 300 pair of copper cable shall be available at MH10K3.

6.9.5.4. Install 300 pair copper cable in an existing duct between MH10o1 and MH10K3. Provide a 3-way 4 inch duct line to the building main communications room. Install one 300 pair copper cable in one of the 4" conduits. Install one 12 strand single mode fiber cable in one 4" conduit. The third conduit in the bank shall be spare. Terminate cables on protected entrance terminal blocks in the main communication room.

Paragraph 6.9.5.14(c); delete paragraph in its entirety and insert the following in its place.

"(c) Provide service entrance termination hardware for fiber optics service cables. Terminate the facility service data fiber optic cables on a patch panel, on 19-inch floor mounted

standard racks. Terminate cables with 'SC' connectors at facility service entrance. Terminate the facility's data communication at an RJ45 patch panel in this connectors at facility service entrance. Terminate the facility's data communication at an RJ45 patch panel in this rack. Provide patch cables (fiber and copper) and connect as required by NEC to meet I3A required on the project site."

Paragraph 6.10.3; delete paragraph in its entirety and insert the following in its place.

6.10.3. Elevators

Install conduit, wiring and a telephone device as the emergency phone in the elevator cab. Coordinate with the Ft. Bragg NEC for connection to the Ft. Bragg DES 911 Emergency Call Center.

Paragraph 6.11.1; add the following at the end of the paragraph.

All building automation systems (BAS) shall meet specifications as required in UFGS 23 09 23 and shall be capable of integrating into Fort Bragg's UMCS.

Paragraph 6.11.1.1; add the following at the end of the paragraph.

Integration of the building's BAS will be performed as part of this project, but is outside of the General Contractor's SOW. All coordination shall be through Fort Bragg's UMCS system manager, Mr. Coby Jones, (910) 396-1868.

Paragraph 6.11.1.2(b); revise second sentence to read as follows.

Control and safety functions shall be the boiler manufacturer's responsibility.

Paragraph 6.11.1.2(d); add the following new paragraph.

Coordinate HVAC air distribution in server rooms with rack system layout.

Paragraph 6.13.3.1; add the following.

"Contractor shall provide one fire extinguisher for the elevator equipment room for elevator certification."

Appendix BB– Contractor Installation Design Guide for Ft. Bragg Specific Communications Infrastructure Requirements

DEPARTMENT OF THE ARMY
DIRECTORATE OF INFORMATION MANAGEMENT (DOIM)
FORT BRAGG, NORTH CAROLINA

CONTRACTOR INSTALLATION DESIGN GUIDE (IDG)
FOR
FORT BRAGG SPECIFIC
COMMUNICATIONS INFRASTRUCTURE REQUIREMENTS

MARCH 2009 rev. 4

Distribution A

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INTRODUCTION

Fort Bragg -DOIM: The Directorate of Information Management plans, programs, operate and maintain base operations Information Technology (IT) support and services for Fort Bragg. It provides power projection IT support for contingency missions, emergency and split base operations and support for USAR and ROTC units of North Carolina.

Areas of Interest:

Communications Systems & Systems Support:
The DOIM provides customers with switch-based and wireless communications to facilities and/or activities of an installation, which are designated by the installation commander to be critical to accomplishing the mission. Other serves include providing cable infrastructure, networks, and external network necessary to deliver electronic information to, from, and among mission-critical facilities/activities.

Visual Information:
The DOIM provides customers with visual information (VI) products and services to include: graphic art, still imagery, motion imagery, historical documentation, multimedia, web page design, audio, consultation/instruction, media loan/issue, equipment/ systems, broadcast, and presentation support. VI processes include those functions required to maintain visual information resources. Products and services are compatible with current and emerging network-centric information technology architectures to enhance war fighting capabilities.

Information Assurance:
The DOIM provides infrastructure and management services to protect Non-Secure Internet Protocol (NIPRNET), Secret Internet Protocol Network (SIPRNET) information, and information systems from unauthorized access and to protect the data within the systems. Services cover communication security and computer security requirements; includes network security features such as intrusion detection and controlled access, standard workstation security tools such as virus detection software, advice and assistance for accreditation documentation, security training, analysis of computer security incidents, and Information System Security monitoring.

Information Technology:
The DOIM provides common-user software and hardware components/support necessary to process and store data, as well as the management services needed to maintain them. Information Technology can exist with or without external communicators or networking (i.e., connected vs. stand-alone systems).

1.0 PURPOSE.

This Installation Design Guide (IDG) provides information in addition to the I3A that will enable the qualified communications contractors to meet the specific communications infrastructure requirements that are compatible with the Fort Bragg DOIM architecture. Some of these items either add information or clarify broader gauge instruction provided in the I3A. The DOIM has also provided a preferred materials list within this document that will enable standardization with previously installed components at Fort Bragg.

2.0 APPLICABILITY.

This IDG applies to all subcontractors performing installation infrastructure work for the DOIM, as specified in their contract with CONTRACTOR. Stricter requirements may be imposed by subcontractors upon their employees or sub tier contractors. Subcontractors must follow the requirements of this IDG; however, the means of implementation may vary as determined by the subcontractor.

3.0 REQUIREMENTS.

NOTE: General electrical trade staff (electricians) shall not be used for the installation of the premises distribution system cables and associated hardware unless they are certified BICSI installers.

Equipment delivered and placed in storage shall be stored with protection from the weather, humidity and temperature variation, dirt and dust, or other contamination.

Commercial off the shelf manuals shall be furnished for operation, installation, configuration, and maintenance for all products provided as a part of the premises distribution system. Specification sheets for all cable, connectors, and other equipment shall be provided.

A record of all installed patch panels and outlets shall be provided in hard copy format per ANSI TIA/EIA-606. The hardware records shall include only the required data fields per ANSI TIA/EIA-606.

All work shall be performed by a certified Telecommunications Contractor, hereafter referred to as the Contractor. In addition, all equipment shall be furnished and installed by a certified Telecommunications Contractor. The qualifications of the Manufacturer, Contractor, and the Installer to perform the work are specified herein. This shall include proof of the minimum qualifications specified herein.

3.1 Contractor Qualifications:

Contractor shall have a minimum of 3 years experience in the application, installation and testing of the specified systems and equipment to be installed. All Communication System Design will shall be performed and stamped by a Registered Communications Distribution Designer (RCDD) certified by Building Consulting Services International (BICSI).

All supervisors assigned to the installation of this system or any of its components shall have a minimum Level 2 Installer certification from BICSI and installers assigned to the installation of this system or any of its components shall have a minimum Level 1 Installer certification from BICSI. All supervisors and installers shall have factory certification from each equipment manufacturer that they are qualified to install and test the provided products**.**

Installers: The Contractor shall submit certification to the Contracting Officer (DOIM Plans and Requirements Branch (PRB) that all the installers are factory certified to install and test the provided products.

All installers assigned to the installation of this system or any of its components shall have a minimum of 3 years experience in the installation of the specified copper and fiber optic cable and their components.

3.1.1 Contractor Responsibility

The Contractor shall be responsible for recording and providing, to the Contracting Officer, all test data within 7 days of system final testing. A record of all installed cable shall be provided in hard copy format per ANSI TIA/EIA-606. The cable records shall include the required data fields for each cable and complete end-to-end circuit report for each complete circuit from the assigned outlet to the entry facility per ANSI TIA/EIA-606. For all fiber optic cables, power meter test results shall be provided in a hard copy format. All twisted pair copper cables shall have a disk copy output of the test results with station ID assigned.

3.2 Contractor Personnel:

3.2.1 Program Manager (PM)

The contractor shall provide a PM and alternate(s) responsible for contract performance and continuity. The contractor shall identify the Program Manager or alternate's range of authority to act for the contractor relating to daily contract operation. The Contractor Program Manager shall provide the following while performing any tasks associated with this IDG to the DOIM PRB.

3.2.1.1

Weekly project status report to DOIM PRB

3.2.1.2

A project timeline that illustrates critical milestones and/or other significant points of interest (i.e. road closures, facility access, etc.).

3.2.1.3

Request for information, modification, or engineering changes to the original SOO. All requests shall be made in writing and submitted to DOIM PRB for action.

3.2.1.4

Changes in schedule or delays that will cause a change in the project timeline

3.2.1.5

Submit all work order clearance requests (digging permits) to DPW no later than 2 weeks in advance of schedule excavations.

3.2.2. Team Leader

The Contractor shall designate the Contractor's on-site team leader and alternate(s) as the Site Point of Contact (POC) for individual projects in their Site Visit Request Letter. The Site POC or alternate(s) shall be on site during duty hours until project completion.

The Site POC shall be the interface for all work site communications with the government, including quality, safety, and discrepancy matters.
The Site POC shall provide DOIM PRB with their contact information (i.e. phone number, e-mail, etc.).

3.2.3. Team Communication
The Program Manager, Site POC, and respective alternate(s) shall be able to read, write, speak, and understand English.

3.3 Manufacturer Qualifications:

The equipment and hardware provided under this contract shall be from manufacturers that have a minimum of three years experience in producing the types of systems and equipment specified.

3.4 Manufacturer Recommendations:

Where installation procedures, or any part thereof, are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations, prior to installation shall be provided. Installation of the item will not be allowed to proceed until the recommendations are received and approved.

3.5 Materials and Equipment:

Materials and equipment shall be the standard products of a manufacturer regularly engaged in the manufacture of the products and shall be the manufacturer's latest standard design that has been in satisfactory use for at least 1 year prior to installation. Materials and equipment shall conform to the respective publications and other requirements specified below and to the applicable requirements of NFPA 70.

Where materials and equipment are specified to conform, be constructed, or tested to meet specific requirements, certification that the items conform to such requirements must be provided. Certification by a nationally recognized testing laboratory that a representative sample has been tested to meet the requirements, or a published catalog specification statement to the effect that the item meets the referenced standard, will be acceptable as evidence that the item conforms. Compliance with these requirements does not relieve the Contractor from compliance with other requirements of the specification.

3.6 Ft Bragg Outside Plant Design Support

Planning and design of outside plant fiber optics and copper cable plant at Ft Bragg must be coordinated through DOIM. DOIM will provide the following information and assistance to the design engineer for the proposed facility design;

- Location of nearest fiber service and strand count
- Location of the nearest copper service and cable count
- Location of nearest manhole, handhole, or base cable support infrastructure that can provide a duct tie-in point
- Fiber optic and/or copper cable designation for labeling any new cables required
- Numbering scheme for manhole, handholes, pedestals, and other base cable support infrastructure
- Field support to engineer/designer during engineering site survey
- Reserve copper cable counts, fiber strand counts, and rack space provided by DOIM
- Reserve and duct pathways identified by the design engineer
- Any drawings available to aid the design engineer with base cable pathway or duct bank design.

3.7 Initial Design requirements for Ft Bragg

Design of outside plant pathways, outside plant cable scheme, cable placement in ducts and all other design requirements for outside plant shall be completed by the design engineer, not DOIM. Please refer to the Army I3A document, specifically figures C-2 through C-6 to obtain typical drawings required as submittals for outside plant design.

- The design engineer shall not use the last remaining duct in any pathway system/ductbank on Ft Bragg. The design shall include one spare duct for maintenance purposes in any segment of pathway or duct bank design on Ft Bragg.

When no existing fiber or copper service is available near the proposed facility location, the following scenarios will apply;

- Design engineer shall be required to provide service to the nearest Area Distribution Node (ADN) or Remote Switch Unit (RSU).
- To preserve limited duct space at the ADNs and RSUs, it is required at Ft Bragg to place a substantially larger cable into the facility than may be necessary for the project under design.
- DOIM requires a minimum fiber optic design of 288 strands from any ADN
- DOIM requires a minimum of 2400 copper cable pair design at any RSU location

NOTE: Tab F of the 1391 shall include compensation for upsizing any cable system planned from an ADN or RSU point of demarcation.

4.0 DELIVERABLES/SUBMITTALS.

Deliverables are to be transmitted with a cover letter, on the prime contractor's letterhead, describing the contents. Built drawings shall be delivered within 14 days of completion of project.

All test results will be required as applicable to this project. Test results will be required 7 days after completion of all testing. Three copies will be submitted. One copy will be sent to the identified POC at DOIM. Two copies will be provided to the servicing Contracting Office.

Government approval is required for submittals. The DOIM Plans and Requirements Branch has to review everything that is submitted and/or delivered to include the following:

4.1 Drawings:

4.1.1 Premises Distribution System

Written certification that the premises distribution system complies with the EIA ANSI/TIA/EIA-568-b.1, b.2, and b.3, EIA ANSI/TIA/EIA-569-A, EIA ANSI/TIA/EIA-606 standards, and EIA ANSI/TIA/EIA-607 standards.

Detail drawings, size E drawing format, including a complete list of equipment and material. Detail drawings shall contain complete wiring and schematic diagrams and other details required to demonstrate that the system has been coordinated and will function properly as a system. Drawings shall include vertical riser diagrams, equipment rack details (to include complete wire management support systems in Telecommunications Room), elevation drawings of telecommunications room wall, outlet face plate details for all outlet configurations, size and types of cables, conduits, and cable trays.

Drawings shall show proposed layout and anchorage of equipment and appurtenances and equipment relationship to other parts of the work including clearance for maintenance and operation.

4.1.2 Record Drawings

Record drawings for the installed wiring system infrastructure per EIA ANSI/TIA/EIA-606. The drawings shall show the location of all cable terminations and location and routing of all backbone and horizontal cables. The identifier for each termination and cable shall appear on the drawings.

4.1.3 As-Built Drawings:

4.1.3.1 Drawing Format

The contractor shall provide all drawings in either AutoCAD or Microstation formatted drawings. The contractor shall contact DOIM PRB for information regarding software requirements to accomplish all updates identified in this IDG.

4.1.3.2 Drawing Submittals

The contractor shall provide the DOIM PRB one (1) electronic and (1) hardcopy of the proposed route prior to construction and the final installation Cable Diagram drawings, “D” size series.

The drawings shall reflect all cable and duct pathways, manholes, manhole sizes, distance between manholes, number of conduit in each duct bank, and the size, type, and cable designations. The contractor shall provide three (3) hard copies of the “red-line” Cable Diagram drawings, “D” size series to DOIM PRB prior to or during final inspection and acceptance.

4.1.3.3 Butterfly Drawings

The contractor shall provide the DOIM PRB one (1) electronic and (1) hardcopy of the proposed installation prior to construction and the final installation of the Manhole Racking Diagram (butterfly) "D" size series drawings. The drawings shall reflect all cable and duct penetrations, manhole sizes, conduit placement in relation to the manhole, and the size, type, and cable designation.

The contractor shall provide three (3) hard copies of the "red-line" Manhole Racking Diagram (butterfly) drawings, "D" size series to DOIM PRB prior to or during final inspection and acceptance.

4.2 Testing:

Category 6 Premise Cabling

A. Every cabling link in the installation shall be tested in accordance with ANSI/TIA/EIA-568-B.1.

B. The horizontal cabling shall be tested from the communications rooms patch panel to the wall outlet using the specification of ANSI/TIA/EIA-568-B.1.

C. All of the installed cables must be tested and must pass the specifications of ANSI/TIA/EIA-568-B.1.

D. Any cable that fails shall be re-terminated and tested again. If the cable does not meet specifications after terminating again, replace the cable, terminate, and test again.

E. A paper copy of the test results shall be provided in a three-ring binder and presented to the DOIM PRB.

The following summary information shall be included:

- The identification of the link in accordance with labeling scheme.
- The name of the building where the cable is located.
- The brand name, model, and serial number of the tester.
- The identification of the tester interface.
- The revision of the tester software and the revision of the test standards database in the tester.
- The overall pass/fail evaluation of the link being tested, including the Near End Cross Talk (NEXT) Headroom (overall worst case) number.
- Date and time the test results were saved in the memory of the tester.
- The name of the standard selected to execute the stored test results.
- The type of cable being tested (Cat 6).

F. The detailed test results must include the following parameters:

- Wire map
- Length
- Insertion loss
- Near-End Cross Talk (NEXT)
- Power Sum Near-End Cross Talk (PSNEXT)
- Equal-Level Far End Crosstalk (ELFEXT)
- Power Sum Equal-Level Far-End Crosstalk (PSELFEXT)
- Return loss
- Propagation delay
- Delay skew

G. The test equipment shall comply with or exceed the accuracy requirements for the proposed Level III field testers as defined in the TIA Cat 6 Standard.

H. The pass or fail condition for the link being tested is determined by the results of the required individual tests. Any fail or fails result yields failure for the link-under-test.

I. The test results for each link shall be recorded in the memory of the field tester upon completion of the test.

J. The test results saved by the tester shall be transferred to a CD-ROM. A guarantee must be made that the measurement results are transferred to the CD-ROM unaltered, that is, as saved by the tester at the end of each test. The guarantee also must specify that the results cannot be modified later.

K. The test results for the completed job shall be stored and delivered to DOIM PRB on a CD-ROM, including the software tools required to view, inspect, and print any selection of test reports.

<u>Copper Cabling - OSP and telephone cross-connect cable</u>

A. Existing Cables. Prior to splicing, test existing pairs to be spliced into the new cable. The contractor's tests shall check for cable faults (grounds, shorts, crosses, opens), splicer's errors (splits, reverses, transpositions), shield continuity, and insulation resistance (insulation resistance on existing cables is accomplished on spare pairs only). The contractor shall not be responsible for correcting existing cable faults, splicer's errors, open shield continuity or low insulation resistance; however, the DOIM PM must be notified of such conditions immediately upon identification.

B. New Cables. After splicing and terminating new cable and prior to splicing any new cable into existing cable, the new cable will be tested and documented to be free of cable faults (grounds, shorts, crosses, and opens) and splicer's errors (splits, reverses, and transpositions).

C. After splicing and terminating new cable and prior to splicing new cable into existing cable, insulation resistance as tested on a minimum of three conductors in each 25 pair group of the new cable against all other conductors of the cable and the shield, shall be documented to be of a value that is satisfactory for the length and type cable being tested.

D. After splicing and terminating new cable and prior to splicing new cable into existing cable, test to ensure the cable shield is continuous from the Main Distribution Frame (MDF) to each distant termination point.

E. After splicing new cable into existing cable test the cable for end-to-end cable faults (grounds, shorts, crosses, and opens) and splicer's errors (splits, reverses, and transpositions). Any cable faults or splicer's errors not documented on existing cable test shall be cleared by the contractor, if caused by the new cable installation.

F. Insulation resistance as tested on a minimum of three non-working conductors in each 25 pair group of the cable shall be documented to be of a value that is satisfactory for the length and type cable being tested.

G. Loop Resistance Tests: After all splicing and terminating is complete, make a D.C. loop resistance measurement on all affected (non-working) cable pairs. Measure from all terminals back to the cable origin or central office

H. Cable Shield Continuity. Test to ensure the cable shield is continuous from the MDF to each distant termination point.

I. Test results may be recorded on locally developed test sheet.

J. Where the contractor uses an existing ground point, it shall be tested prior to being connected to the system. Even though the National Electrical Code calls for a resistance to ground not to exceed 25 ohms, Military Handbook 419A, paragraph 2.2.2.2 states that 25 ohms is not low enough. In order to protect personnel and equipment, MIL-HDBK 419A recommends a design goal of 10 ohms for communications systems where practical. If the ground point proves unsuitable, the contractor shall notify the DOIM PM in writing of the defective ground. The tests to be performed on the grounds shall measure the ground potential (ability to dissipate voltage through the ground point to the earth).

Fiber Optic Cable

A. All of the installed fiber optic cables must be tested and must pass the requirements of ANSI/TIA/EIA-568-B.

B. Every fiber optic cable in the installation shall be tested in accordance with field test specifications as defined in ANSI/TIA/EIA-568-B.

C. Any cable that fails these tests must be diagnosed and corrected. The corrective action shall be followed with a new test to prove that the corrected link meets the performance requirements. The final and passing test must be saved and included in the final test results documentation.

D. Field test instruments for single-mode fiber cabling shall meet the requirements of ANSI/TIA/EIA-526-7.

E. The test results for each link shall be recorded in the memory of the field tester upon completion of the test.

F. The test results saved by the tester shall be transferred to a CD-ROM. A guarantee must be made that the measurement results are transferred to the CD-ROM unaltered, that is, as saved by the tester at the end of each test. The guarantee also must specify that these results cannot be modified later.

G. The test results for the completed job shall be stored and delivered to DOIM PRB on a CD-ROM, including the software tools required to view, inspect, and print any selection of test reports.

H. A paper copy of the test results shall be provided to DOIM PRB in a three-ring binder.

The following summary information shall be included:

- The identification of the link in accordance with the DOIM labeling scheme.
- The name of the building where the cable is located.
- The brand name, model, and serial number of the tester.
- The revision of the tester software and the revision of the test standards database in the tester.
- The overall pass/fail evaluation of the link being tested.
- The name of the standard selected to execute the stored test results.

- Cable type and the value of the index of refraction used to calculate lengths.
- The insertion loss (attenuation) measured at each wavelength, the test limit calculated for the corresponding wavelength and the margin (difference between the measured attenuation and the test limit value).

- The link length shall be reported for each optical fiber for which the test limit was calculated using the following formulas:

  - Link Attenuation = Cable Attenuation + Connector Attenuation = Splice Attenuation

  - Cable Attenuation (dB) = Attenuation Coefficient (dB/km) * Length (km)

  - Connector Attenuation (dB) = number_of_connector_pairs * connector_loss (dB) (Maximum acceptable connector loss = 0.75 dB)

I. The date, time, and test results will be saved in the memory of the tester

J. All fiber strands shall be tested Bi-directionally End-to-End (each segment of cable, building-to-building, etc.) @ 1550nm and 1330nm.

K. Optical fiber Cable testing shall be conducted according to ANSI/TIA-EIA568-A, Annex H. Each optical fiber shall be tested Bi-Directionally utilizing Optical Power Meter@ 1550 and 1330 nm.

L. Optical fiber Cable shall be conducted according to ANSI/TIA-EIA568-A, Annex H. Each optical fiber shall be tested and recorded Bi-Directionally utilizing OTDR.

M. At minimum, OTDR traces are required for Outside Plant Fiber Optic Tests. A Power Meter may be used for premise fiber horizontal or facility backbone cabling.

4.2.1 Test Plan

Test plan defining the tests required to ensure that the system meets technical, operational and performance specifications, 60 days prior to the proposed test date. The test plan must be approved before the start of any testing. The test plan shall identify the capabilities and functions to be tested, and include detailed instructions for the setup and execution of each test and procedures for evaluation and documentation of the results.

4.2.2 Test Reports

Test reports in booklet form with witness signatures verifying execution of tests. Reports shall show the field tests performed to verify compliance with the specified performance criteria. Test reports shall include record of the physical parameters verified during testing. Test reports shall be submitted within seven business days after completion of testing to the DOIM Plans and Requirements Branch for Quality Assurance Inspection purposes.

4.3 Spare Parts

Spare parts, tools, and test equipment provided under this contract shall be submitted to DOIM PRB along with an inventory of these spare parts, tools, and test equipment. The inventory data shall include a complete list of parts and supplies, with current unit prices and source of supply, and a list of spare parts recommended for stocking.

5.0 GENERAL

5.1 Telecommunications Room (TR) Requirements:

Per I3A, figure B-4, Telecommunication rooms must be an appropriate size to accommodate the proposed cable/local area network (LAN) distribution system and associated connectivity equipment for any given facility and/or facility floor. The minimum size telecommunications room for system installation is 8 feet by 10 feet. This would support a two-equipment rack configured system. If any additional equipment/racks are placed in a TR, the TR must be enlarged to meet the requirement of having a full 36 inches of space between the communications rack assembly and the nearest wall. The entrance door must swing outward into the hallway, or additional room square footage must be added to the floor space to accommodate interior door swing. Minimum distance of three feet separation from wall shall be maintained. Dedicated Ventilation Air Conditioning (VAC) systems support must be provided for each telecommunications room. Systems must be of an appropriate capacity to self-support the room per proposed equipment installation requirements. VAC systems must not take up any floor space within the comm. room. A dedicated 20 Ampere (Amp) circuit for the use of a VAC system. Preference for placing a Telecommunications room is towards the center of any given facility. If facility is multiple stories, preference is for stacked telecommunications room placement, facilitating easy interconnectivity between telecommunication rooms.

5.2 Equipment Mounting Backboard

In addition to Para 2.5.6 in the I3A, DOIM requires covering no less than two walls with fire rated plywood.

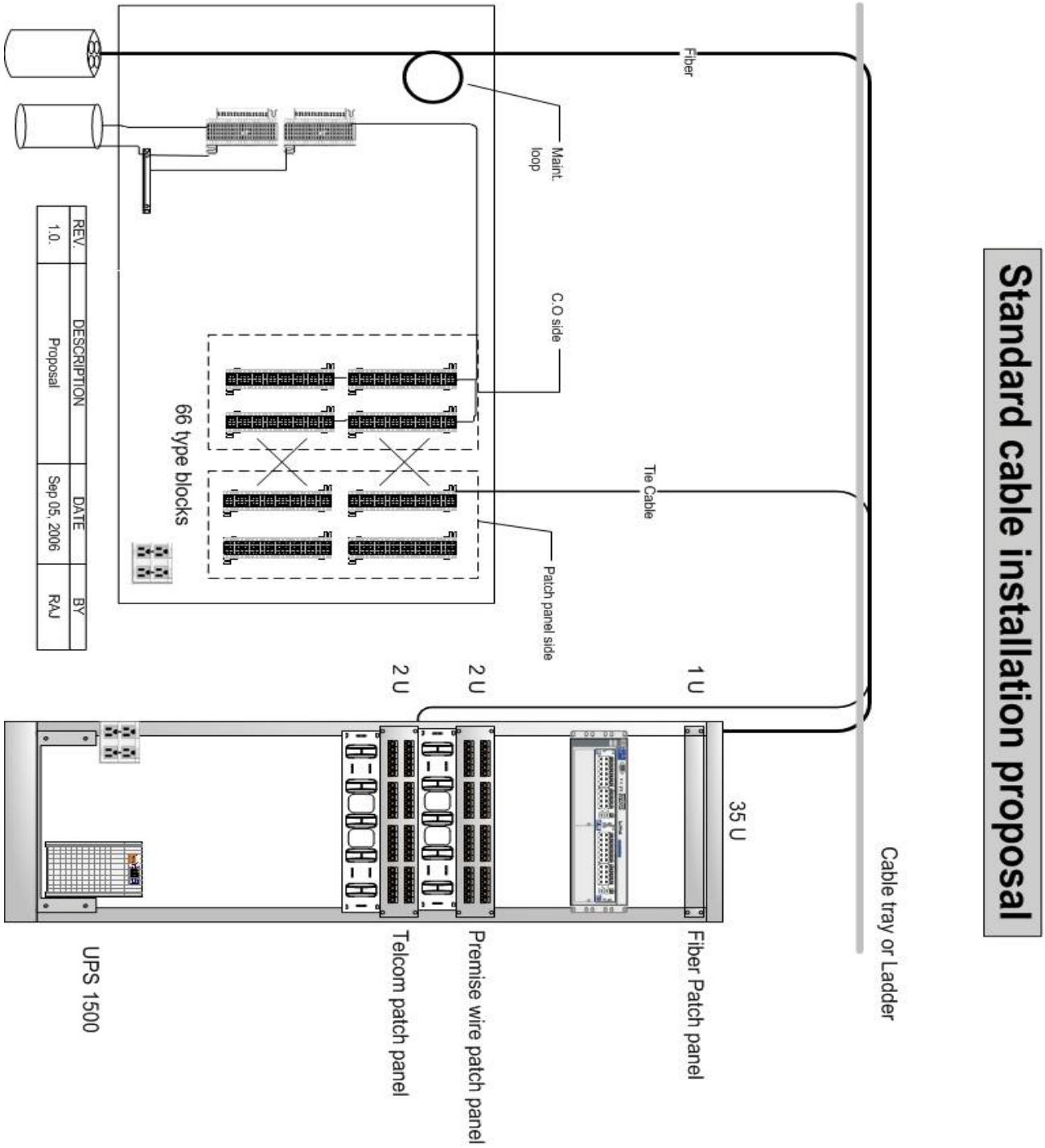
5.3 Ladder and Wire Cable Tray

Per I3A, figures B-4 and B-8, channel type cable ladder must be used in the TR to provide distribution between the telephone backboard, equipment racks, backbone conduits and the distribution cable tray. Welded wire cable tray (Flextray or equivalent) must be used to distribute premise cabling outside the TR.

5.4 Equipment Racks – See Figure 5-4.

Floor mounted equipment racks shall be standard 19-inch aluminum relay racks, uprights shall be three inches deep, 1 ¼ inches wide, drilled and tapped 12-24 in a half inch patterns. Racks shall be provided with a standard top cross-member, and predrilled base plate to allow floor fastening. Open frame equipment racks shall be seven feet in height and clear coated. AC outlets shall be provided in the equipment rack to prevent tripping; one quad outlet dedicated 20-Ampere line assembly, per every two equipment racks provided.

Figure 5-4


Standard cable installation proposal
Cable tray or Ladder
Fiber
Maint. loop
C.O side
Tie Cable
Patch panel side
66 type blocks
35 U
1 U
2 U
2 U
Fiber Patch panel
Premise wire patch panel
Telcom patch panel
UPS 1500
REV.
DESCRIPTION
DATE
BY
1.0.
Proposal
Sep 05, 2006
RAJ

5.5 Cable Management

Cable management shall be specifically manufactured for routing cables, wires and patch cords horizontally and vertically on standard 19-inch equipment racks. Cable management shall consist of ring or bracket-like devices mounted on rack panels for front horizontal use or of a type that utilizes duct fingers with snap on covers. Cable management shall mount to racks by screws and/or nuts and lock washers. Cable management shall be provided above, below and to both sides of each patch panel on the standard 19-inch equipment rack(s). Vertical cable management will be provided between and to the ends of equipment racks, and provide front and rear vertical cable management. Vertical Cable management shall be of a type that utilizes duct fingers with snap on covers. Cable management will be provided in the rear of the rack, utilizing duct fingers with snap on cover style, or standoff bars. Velcro ties shall be utilized for binding of horizontal distribution wires within the telecommunications room trays and wire management systems.

5.6 Horizontal Cable Maintenance Slack

Maintenance loop or slack required for modification or re-termination of horizontal cabling shall be no less than three meters (10 feet), at the distribution closet and no less than 30 centimeters (24 inches) at the outlet. Slack at the user termination shall not be placed in the outlet box, but shall be installed at the nearest practical point to the outlet box. (I.e. above the ceiling prior to entering the wall).

5.7 Cable Jacket and RJ-45 Color Code

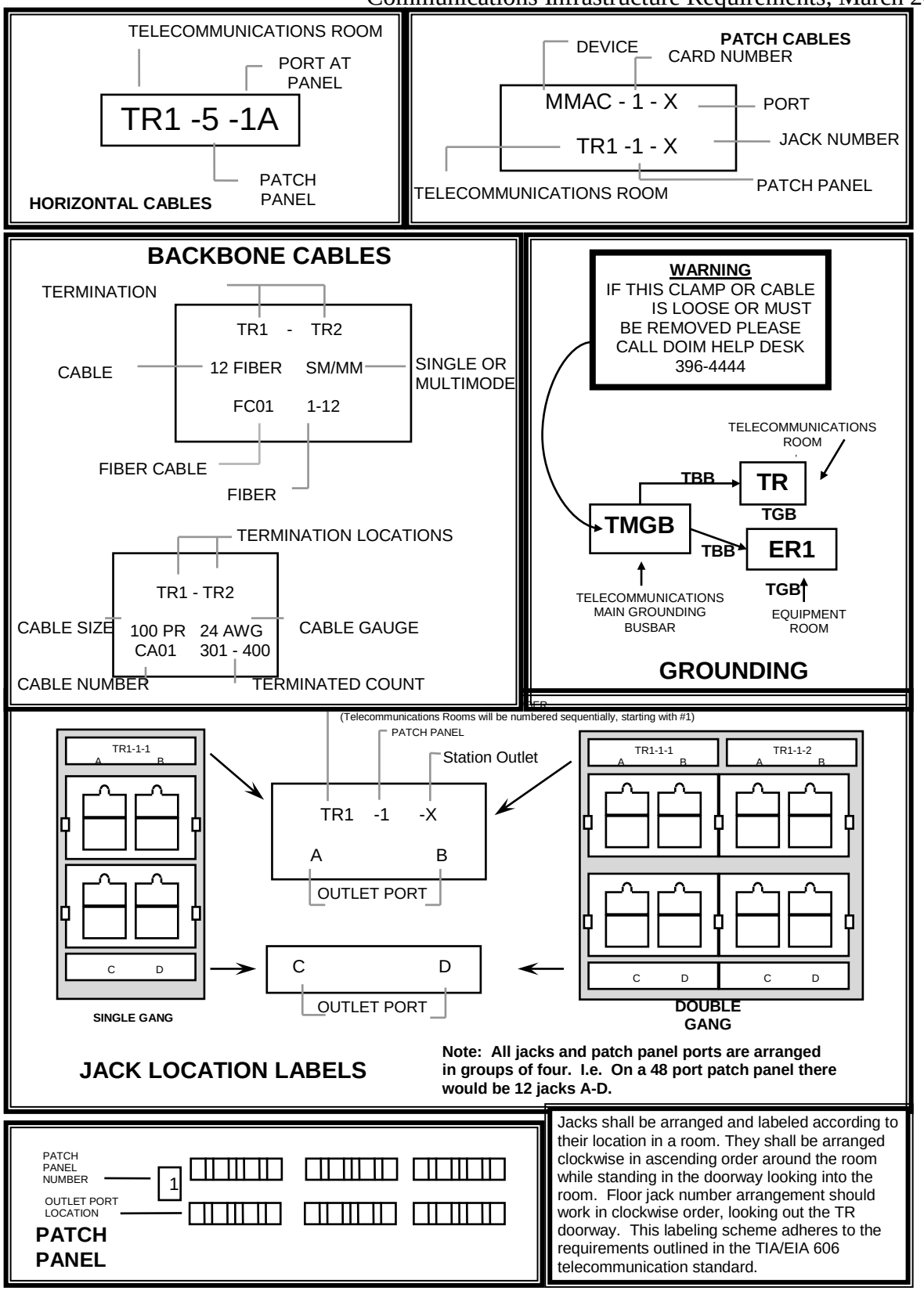
Standard color code:

Green - The standard wire and jack color for UNCLASSIFIED.
Red - The standard wire and jack color for CLASSIFIED (SECRET)
Yellow - The standard wire and jack color for CLASSIFIED (TOP SECRET)

5.8 Labeling – Premise Cable

All labeling shall be done in accordance with Fort Bragg DOIM standard labeling scheme provided as a technical exhibit to this specification. See Figure 5-8...

Figure 5-8
Page 17



5.9 Geospatial Information

5.9.1 Format.

Geospatial information shall be delivered on storage media (specify magnetic or optical media preferences), in a “shape file” format within a folder named the same as the prefix of the shape file, e.g., if the shape-file is named "points_pafb_28.shp" the folder shall be named "points_pafb_28". The folder shall contain all the files that make up the general shape file, i.e., “.shp”, “.shx”, “.dbf”, etc. along with a standard metadata file, i.e., “.shp .xml”. Any collected “z-values” shall be reported in a dedicated field, in the appropriate table, and in the format/datum consistent with the standard elevation methods in use by the DPW.

5.9.2 Attributes.

Attributes and data table formats for communication infrastructure/facilities are described and defined in the Communications Mission Data Set promulgated by the DOIM PRB. The following attributes are to be reported in the appropriate shape file for the geospatial features collected by the contractor:

- Manhole Number
- Secure Manhole Lid (Yes or No)
- Location of Manhole\Nearest Intersection
- Nearest Manhole
- Nearest Bldg
- Existing Copper Cables
- Existing Fiber Cables
- Comments (Manhole Condition)
- Date Collected
- Date of Last update
- Obstructions

Subcommodity_a (Table: xxxyyy) {for feature y}
Attribute_1 (Field: aaabbb)
Attribute_4 (Field: cccddd)

Subcommodity_e (Table: yyyzzz) {for feature z}
Attribute_7 (Field: zzzaaa)

5.9.3 Data Delivery

The contractor shall provide the geospatial information in electronic format to each of the following:

Fort Bragg DOIM PRB, ATTN: Larry White, Fort Bragg, NC 28310

and

Fort Bragg Directorate of Public Works (DPW), Fort Bragg, NC 28310

6.0 PROTECTED DISTRIBUTION SYSTEM (PDS)

All PDS design and material data sheets must be submitted to the DOIM for approval, prior to procurement or installation to save from costly revisions or change orders.

ALL PDS Designs shall be signed off by DOIM SIPR planner to ensure proper installation pathway engineering practices are met in the initial design prior to installation.

PDS shall NOT be installed in "dead space" areas out of normal inspection areas. I.e. (Closets, bathroom, ceilings and under the floor).

The Contractor shall install Holocom or an expandable type PDS System solution. The PDS System attributes shall include an interlocking "clam-shell" design that enhances security and flexibility in that it can be securely closed and locked, and then re-opened for security inspections and network changes or enhancements. The PDS must also include an electrostatic powder coating, which provides an aesthetically pleasing appearance. All SIPRnet installation technicians must be certified by the manufacture of the designated product choice to install SIPRnet PDS on Ft. Bragg.

6.1 Documentation

A. NSTISSI 7003, Army Regulation
B. 25-2 Chapter 6, Army Regulation
C. Technical Guide for Integration of SIPRNET version 5.0 as a Hardened Carrier PDS
D. NSTISS, NSTISS Advisory Memorandum (NSTISSAM) TEMPEST 2/95, Red/Black Installation Guidelines, 12 Dec 95.
E. NSTISS, NSTISSAM TEMPEST 2/95A,
F. Amendment to TEMPEST 2/95, 03 Feb.

Per these references, each agency, service, or organization is afforded interpretation and approval authority, by the Designated Approving Authority (DAA), per the respective manual when assessing any PDS design and installation methodology.

6.2 Guidelines (This is a quick reference guide and should not be treated as a substitute to the above listed references.)

PDS installations shall be inspected by DOIM QA/QC personal in 3 phases:

1. **Initial pre installation walk thru of bldg PDS pathways.**
2. **50% installation inspection prior to cable being installed.**
3. **Final after cable and epoxy are installed and applied prior to bldg or system turnover.**

6.2.1 Raceway Solution

A. Ensure that all raceway runs should be approximately 1 inch of the wall, in special instances, this separation may be exceeded but in no case should the raceway be mounted flush with the wall.
B. There should be no more than ¼ inch play on all vertical TOP CAP and span cuts.

C. All INF's should be physical inspected to ensure that they are tight and cannot turn.

D. Lock covers shall be physically inspected to ensure that the lock cap is properly seated inside the locking mechanism. This will be accomplished by grasping by hand and moving from side to side while attempting to remove from raceway.

E. Thru walls will be run utilizing threaded rigid pipe and locking rings on both the inside and outside of raceway to ensure a secure penetration into the raceway will be maintained.

6.2.2 Electrical Metallic Tubing (EMT) Solution

A. Use all ferrous thin walls EMT of the following sizes ¾ inch, 1 inch, 1.5 inches, and 2 inches.
B. Use all ferrous compression fittings only. Plastic is not permitted. Epoxy all fittings upon assembly (except L covers). Steel epoxy all L covers upon completion of all wire pulling and testing. Ensure that all fittings and hangers are secured completely and cannot be loosened or removed by hand prior to the application of epoxy. The epoxy will reveal pilferage. All epoxy must be clean and neat to distinguish pilferage or tamper evidence when periodically inspected by the local security office (once every six months or as required by local policy).
C. Install all distribution in plain view i.e. not above the ceiling and not behind the walls.
D. PDS between floors. A PDS installed between floors in multi-story buildings should be installed in the following manner. The section that goes through the false ceiling must be installed in a manner to allow inspection. The ceiling tile can be removed or replaced with a clear tile or egg crate style, if allowable by the local fire code. If neither of those options is viable, an inspection path (tube) should be built around the riser. Conduit within this facility must be at least ¾-inch EMT or galvanized threaded pipe, which should be large enough to accommodate cables that will be ran in the facility at no more than a 40% fill ratio.

E. Design the SIPRNET distribution in a tree type fashion. Start at the closet location where the equipment is located with a single EMT sized to contain all CAT 6 wire runs (sizing is 40% fill max in circular mils). Extend the distribution from this backbone to locations. Careful planning will allow for future expansion additionally leave pull strings in place for future growth and expansion.

F. Run all EMT throughout the building to optimize the separation from water pipes, electrical wires, electrical pipes, plumbing, air conditioning, etc. A minimum of six-inch separation is required.

G. Have the contractor install cast iron elbows LR's, LB's, LL's and pull boxes also known as C's at critical locations for ease of installing CAT 6 cable. Insure that a pull box is installed at 30 foot intervals for straight runs and after every two 90 degree turns or when you transverse between floors and into new areas.

H. Secure the EMT to the structure using standard strap and spacer, hangers and anchors (dry wall/toggle bolts, concrete/ expansion bolts, etc.) 360 degree inspection area must be maintained around the PDS.

I. **Lockboxes**. A lockbox (with internal hinges) is used to protect the PDS termination. Lockboxes used for termination within the LCA should be at least 6 x 6 x 4 inches deep and have a door with internal hinges. The hasp must be permanently fixed to the box. If hinges are external, the hinge pin must be welded. Tap screws may be used internally to mount the terminal block. No other openings or air gaps are authorized for this box. The lock for the lockbox must be a GSA-approved changeable combination lock. The lockbox may terminate up to six connections within the box as long as it is within 12 feet of the classified workstations and/or printer located in the same room.

J. **Paint.** The carrier must not be painted or covered with wallpaper or any other covering. Coverings can conceal carrier penetration. Paint and coverings are easier to match than the bare material when attempting to hide unauthorized penetration.

K. All EMT PDS shall be left with PULL STRINGS in place throughout the conduit PDS system, even after cable is pulled in each run.

7.0 SECURE ROOM/COMMUNICATION CLOSET

NOTE: The card reader release mechanism must not be a magnetic lock that will release during a power failure. As a minimum, the door must have a high security dead bolt lock with a 25-millimeter (1-inch) throw and a cylinder that meets the requirements of Underwriters Laboratories, Inc., (UL) 437 Standard for Key Locks.

A. Units that will have their nodes operating only during normal business hours require the following site preparation of their closets:

B. To be certified as a CAA, the area must meet the following physical requirements. The walls, floor, and roof must be of permanent construction materials; i.e., concrete block, concrete, plaster, gypsum wallboard, metal panels, hardboard, wood, plywood, or other materials offering resistance to, and evidence of, unauthorized entry into the area.

For new construction, walls should extend from true floor to true ceiling (structural floor to structural ceiling) with permanent construction materials. In existing facilities, walls may also be extended with 18-gauge expanded steel screen or equivalent wire mesh.

C. The access door to the area must be substantially constructed of wood or metal. In addition, either a combination type lock such as a KABA-MAS CDX-09 or a card reader lock should be added to the entry door to provide greater physical protection than the single key entry and limit access to authorized personnel.

As an alternative, a built-in GSA-approved combination lock meeting Federal Specification FF-L-2740 can be used. The hinge pins of out-swing doors must be pinned, brazed, or spot-welded to prevent removal. When double doors are used, install an astragal on the active leaf of the door. Doors other than the access door must be solid wood or metal (with no glass panels), have a metal bar that extends across the width of the door, or be secured by another means that will prevent entry from the outside.

D. Ideally, the area should not contain windows. When windows are used, they should be permanently secured to prevent opening. For new construction, all windows that might reasonably afford visual observation of classified activities within the facility must be made opaque. In existing facilities, windows must be made opaque or be equipped with Room-darkening blinds, drapes, or other coverings. Windows that are less than 5.5 meters (18 feet) above the ground measured from the bottom of the window, or are easily accessible by means of objects directly beneath the windows, must be constructed from or covered with materials that provide protection from forced entry and must be protected by an IDS. The protection provided to the windows need be no stronger than the strength of the contiguous walls.

E. COMSEC equipment (e.g. Type 1 encryption devices) cannot be installed within an LCA unless it is housed within a GSA-approved, Class 5 security container such as the IPS cabinet specifically designed for housing COMSEC or electronic equipment.

- Classified Storage Containers. If existing safes are used for classified material storage, the locks shall be an X-09 lock. If the safe does not have an X-09 lock, the existing lock shall be replaced to meet this requirement. It may be more cost effective to replace one safe per unit with a GSA-approved safe than to retrofit an old safe with questionable serviceability

- One option is to place the SIPRNET equipment in an Information Processing System (IPS) container. Diebold Security, Hamilton Products Group, and Trusted System all have a GSA-approved IPS container solution for this project; however, a long lead-time is required for delivery. The container shall have a lockable metal box bolted over the container's cable entrance to provide a point for affixing the PDS to the IPS. The box must be included in the IPS order.

- In addition, the product (IPS and box) shall have GSA-approval for the finished state, e.g., no unauthorized modifications shall be made to the IPS.
- A minimum space of 24-inch W x 32 inch D will be reserved for the locking SIPRNET Node cabinets in the communication closets. The dimensions for the IPS container are 31¾-inch W x 43 inch D x 28½ inch H. The space may be an unused corner in the room. A standard 120Volts AC, 20-ampere receptacle is required to power the UPS in the container.

8.0 SIPRNET COMMUNICATION ROOM

8.1 New Construction Guidance

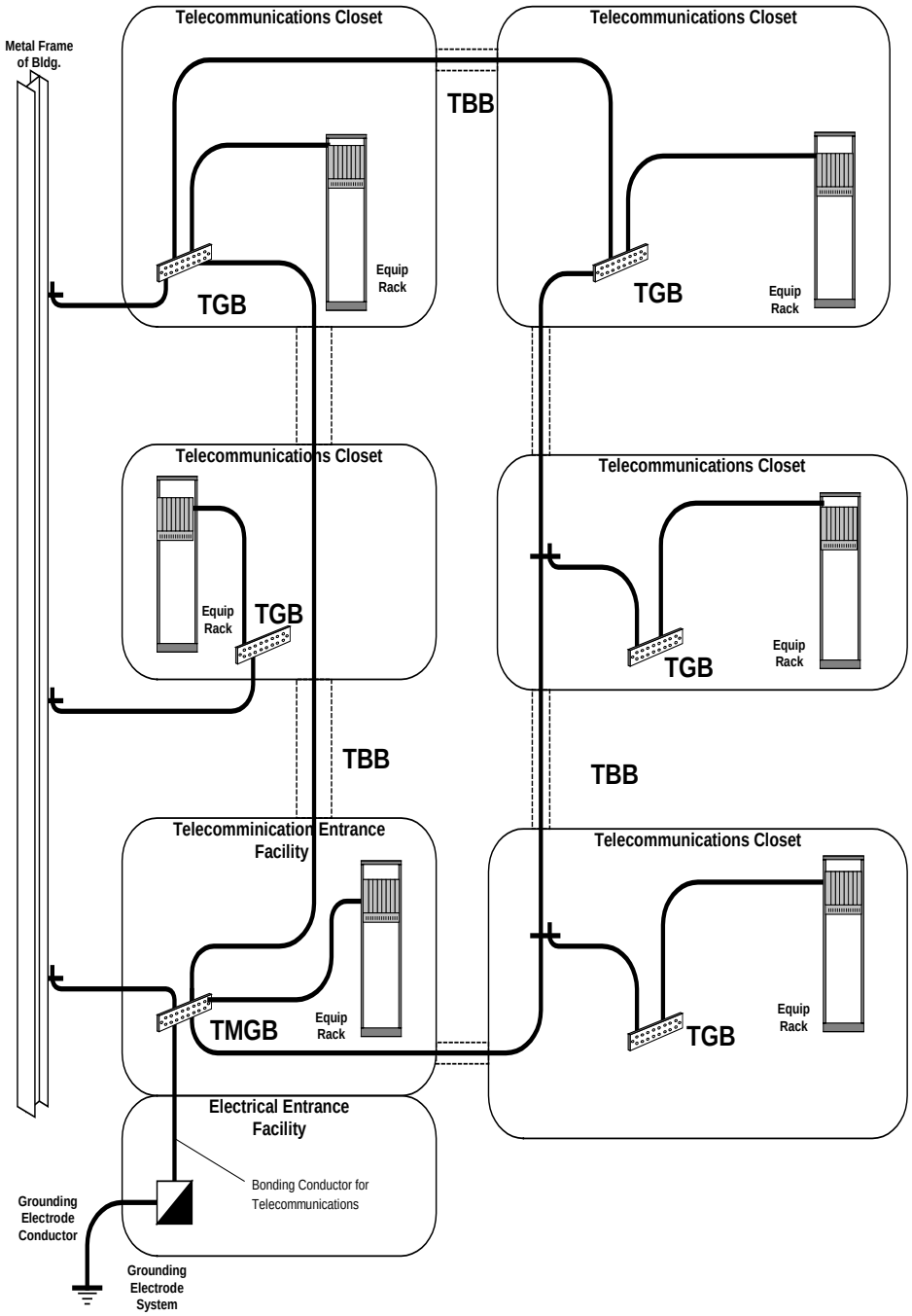
A. One SIPRNET room will be required for each building, located adjacent to the main telecommunications room, (TR) and opening to the interior of the building.
B. The SIPRNET room will be a minimum of 6 feet by 6 feet, constructed in accordance with AR 380-5, Section III, Chapter 7. The room requires an IDS.
C. A steel entrance door, with a CD-X09 lock, minimum width of 32 inches to accommodate a cabinet is recommended. If the room is constructed as a CAA (in accordance with AR 380-5), an IPS will not be necessary.
D. The connection to the main TR will be via a single 2-inch trade size steel conduit.
E. All heating, ventilation, and cooling (HVAC) vents or ducts should be provided to maintain local ambient temperatures. The vents must be designed and installed in accordance with the construction requirements of AR 380-5.
F. A communication signal ground busbar must be connected to the main TR signal busbar via properly sized ground wire (see MIL-HDBK-419-A).
G. Additional SIPRNET closets are not required on subsequent floors or in other areas. If more distribution points are required, a large lockbox may be wall-mounted in a secondary communications closet.
H. One dedicated 20-Ampere breaker shall be installed for the SIPRnet rack in addition to convenience outlets in the SIPRNET room. A dedicated 20- Ampere breaker for SIPRnet shall be provided in each standard (NIPRnet) TR, to support the SIPRnet distribution to network operation centers or individual drops.

9.0 FACILITY BONDING AND GROUNDING – See Figure 9-0

Bonding and grounding systems shall be configured in the telecommunications entrance facility and in each telecommunications closet (utilizing grounding busbars with standoff insulators) in accordance with EIA ANSI/TIA/EIA-607. Telecommunications Main Grounding Busbar (TMGB) shall be tied to acceptable ground source with #2 AWG wire and appropriate two-hole compression lug fittings. TMGB with standoff insulators shall be tied to the Telecommunications Ground Busbar (TGB) with #4 AWG wire and appropriate two-hole compression lug fittings. The Equipment Racks shall be bonded together using Compression Lugs and green-jacketed 6 AWG Stranded Copper. Equipment racks shall be connected to the electrical safety ground only if a separate earth ground is not available.

Deviations to these standards shall be submitted to DOIM Plans and Requirements Branch (PRB) for approval. Bonding and grounding system shall be tested per ANSI/TIA/EIA and NEC standards. Bonding and grounding system shall be labeled per ANSI/TIA/EIA and Fort Bragg DOIM standards.

Figure 9-0



TGB = Telecommunications Ground Busbar

TBB = Telecommunications Backbone Busbar

TMGB = Telecommunications Main Ground Busbar

10.0 CABLE TAGGING AND TERMINAL STENCILING – See Figure 10-0

10.1 Tag Type

Tags shall be made of metallic (i.e. stainless steel, etc.) corrosion resistive material suitable for submersion under water and stamped with the applicable cable information identified below.

10.2 Tag Information

Tag new cables and retag existing cables that are to be re-used. In the cable vault, tag each tip cable. In manholes and handholes, place a tag on each end of the cable as it enters and exits. At splice locations, place a tag on each side of the splice. In the TR, tag cable near cable entry point and at the terminal.

Tag cables as they pass through a pull box or an LB. Tag cables where they are exposed in basements. Tag cable to include cable type, cable number, cable size and type, cable count, the origin manhole or termination on the CO side and the destination manhole or termination location on the field side. Dead complements in cables will not be designated as "DD", "DP", "XDD" or any variation thereof. Identify dead complements with the appropriate "A" (or B, etc) count. Use "A" count after splice where a cable count is no longer terminated to the CO side but the cable pairs continue. Use "B" count at first appearance where same cable count is not terminated to field side and the cable pairs continue.

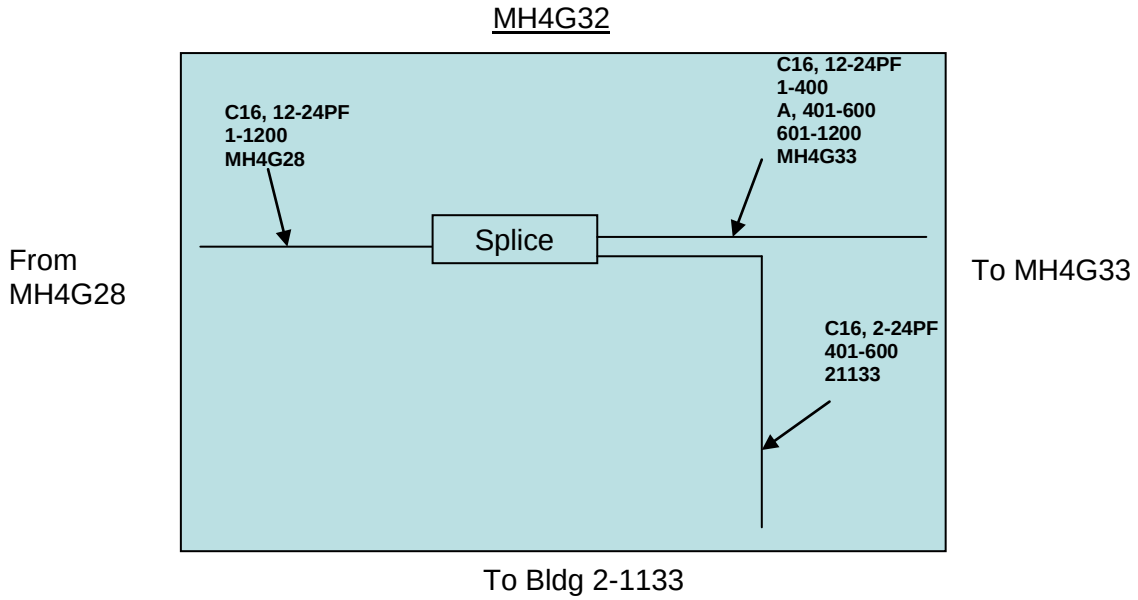
Example (CO side of splice):
C16, 12-24PF (Cable Number, Cable Size and Type)
1-1200 (Cable Count)
MH4G28 ("from MH")

Example (Field side of splice):
C16, 12-24PF (Cable Number, Cable Size and Type)
1-400 (Cable Count)
A, 401-600 ("A" Count past splice)
601-1200 (Cable Count)
MH4G28 ("To MH")

Example (Field Side to Bldg):
C16, 2-24PF (Cable Number, Cable Size and Type)
401-600
2-1133 (“To Building”)

Figure 10-0

MH/HH Labeling Example



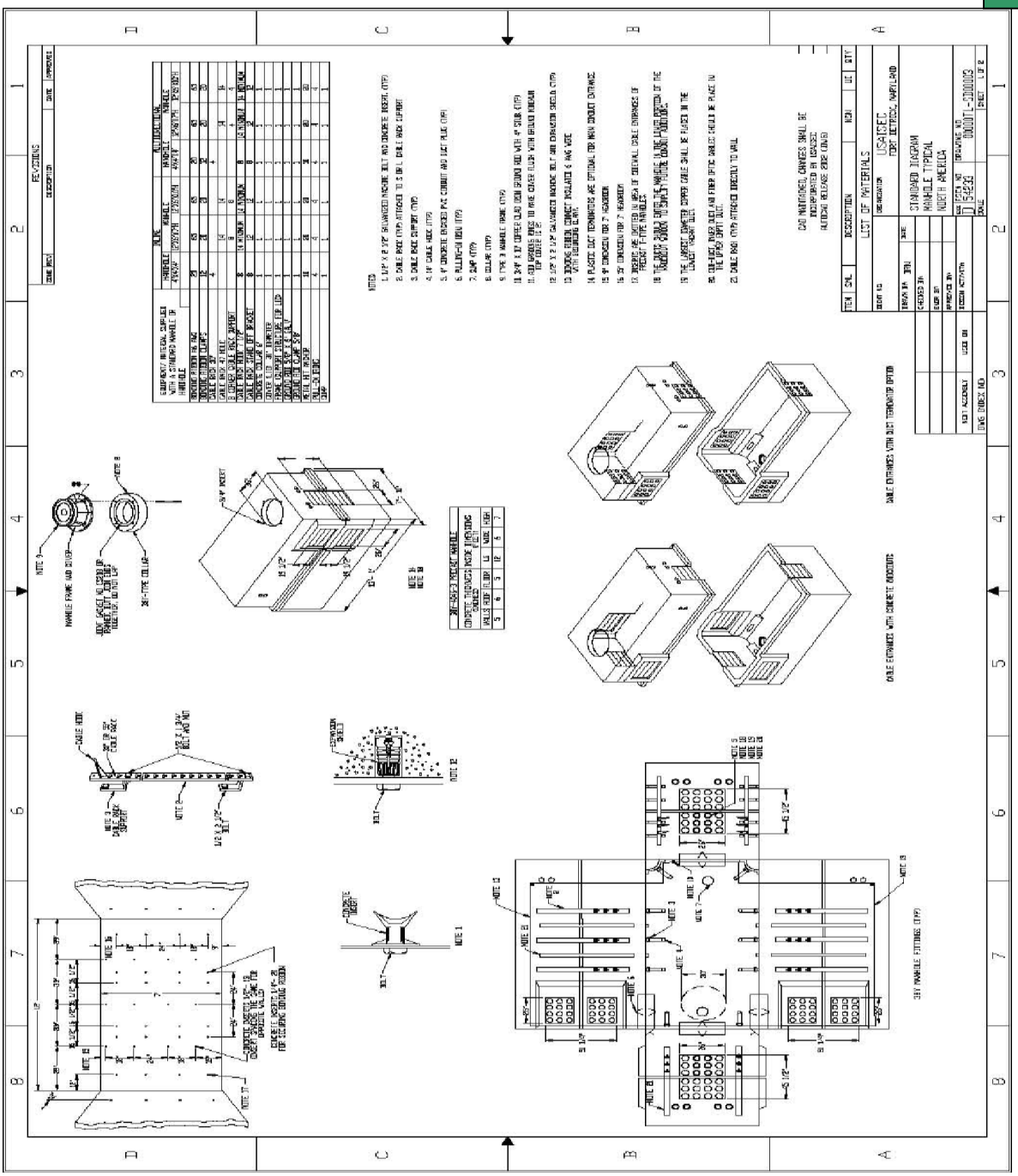
11.0 MANHOLES/HANDHOLES – See Figure 11-0

Refer to I3A Para 3.8.1.1 for Manhole Reference and 3.8.2 for Hand hole Reference. Per I3A Fig C-5, Manholes shall be 38YJ4 on Ft Bragg and shall contain a moveable ladder.

11.1 Maintenance Hole Lids

Ft Bragg DOIM requires size 30” maintenance hole lids unless otherwise specified or approved by DOIM. Maintenance hole lids larger than the standard 30” size are extremely cumbersome when providing maintenance on Ft Bragg cable infrastructure. Ref. I3A, paragraph 3.8.1.3 (a)

Figure 11-0



12.0 SUB-DUCT/INNERDUCT

In reference to I3A Para 3.8.8, Fabric Mesh Innerduct shall be used for Fort Bragg duct and cable installations. 3 each, 3 inch, 3 cell Maxcell or equivalent must be installed with each fiber cable installation and in one of four newly installed ducts.

13.0 SYSTEM FURNITURE

When considering System Furniture for admin spaces, the different classified systems must be taken into consideration. Power, SIPR, and NIPR could potentially be housed within the systems furniture channels. Stringent separation restrictions must be adhered to for this practice.

A systems furniture module, **figure 13-0B**, must have a separate channel for each cable category. They must enter the piece typically through a ceiling mounted power pole or underneath via a raised floor system and then channeled through the furniture.

Power is typically directed to the floor channel and is then terminated. NIPR enters through a separate power pole and is channeled to the mid "Beltline" channel and SIPR, if installed, enters in through its own power pole system and is channeled through the top channel.

This configuration will provide all separation necessary to comply with Tempest requirements. Because of the nature of this furniture, infrastructure space is a valuable commodity that is somewhat overlooked. Extended Depth faceplates, **figure 13-0A**, when installed, ensure the proper bend radius is provided to make sure specifications are met for connectivity.

Preferred Materials List

Item	Manufacturer	Part Number	Comments
Extended Depth Faceplates	Leviton	49900-E*4	4 port only for shallow channels

Table 1

OSP Preferred Materials List

Item	Manufacturer	Part Number	Comments
OSP Fiber Cable – Direct Buried	Corning	SMF-28e	Double-Jacket/Single-Armor Cable, 2-288 Fibers
OSP Fiber Cable - underground	Corning	**xxxEW4-T4101D20**	ALTOS All-Dielectric Gel-Free Cable, 2-288 Fibers
Buffer Fan out kit 12F		FAN-BT25-12	
Closet Connector Housing	Corning	CCH-02U	Need to order loaded with SC panels
Panel, 6 duplex SC	Corning	CCH-CP12-59	to fill CCH-02U
SC Unicam Conn	Corning	95-200-41	standard connector for Bragg
Pretium Connector Housing 4U	Corning	PCH-O4U	for ADN termination - need to order loaded with LC panels
LC Unicam Connectors	Corning	95-200-99	for termination in ADN
Fiber storage unit for Connector housing	Corning	PC4-SLK-D24	Slack storage for pretium housing
OSP Copper Cable, 25X22 pr		09-062-02	size appropriately for installation requirement
BEP, 25 pr	Marconi	F019432	size appropriately for cable pair size
Protector Modules (for BEP)	Marconi	4C1S	Carbon protectors for BEP
Stainless Steel Splice Cases	Preformed	8000630	Use appropriate size for copper or fiber. DO NOT ENCAPSULATE. Part # is example of 9.5 inch case - need to order proper size + organizer and splice trays if required
End Plate Kit, 9.5 2 section	Preformed	8003542	For re-entry of splice cases - order appropriate size
Organizer, Fiber, Vert	Preformed	8001049	order and size appropriately for splice case
Splice tray	Preformed	8001021	order and size appropriately for splice case
25 Pair splicing module	3M	3M710-SC1-25	Order amount appropriate for splice plus filler strips
MaxCell Fiber Mesh Innerduct	MaxCell	MXC3456BK5300	3 inch, 3 cell (Blk, Red and Green) stitching for subdividing OSP 4 inch conduits
		MXC3456RD5300	
		MXD3456GR5300	Detectable w/tracer wire

Table 2

SIPR / PDS MATERIALS

Sargent & Greenleaf Inc.	80177-102	Combination Padlock	$109.00
Hamilton	7110-00-920-9193	Class 6 Legal Size Single Lock, 5-Drawer Capacity	$2,313.00
Kaba Mas	CD-X09	CD-X09 combination lock	$900.00
Performance Metal	9930-203-CB-4635-01	Lockbox, custom hinged door hasp 6.75 inch H x 5 inch D	$70.00
Hamilton	IPS-30-39-24	Information Processing Security Container (Safe) with 19 inch rack	$4,448.00
City Electric	664JH009.	Lockbox custom hinge and hasp	
APC UPS	PS450	APC Powerstack 450VA 1U 120V	$239.00
3M EPOXY	021200-82262-9	2 Part epoxy DP 270	$16.55
3M Epoxy Applicator	62-9744-9930-3	EPX Plus II	$50.55
3M Epoxy Applicator	62-9164-9931-2	Mixing Nozzels	

Table 3

APPENDIX A. GLOSSARY OF ACRONYMS AND TERMS

AC Alternating Current
AD Active Directory
ARFORGEN Air Force Generation
AR Army Regulation
ATM Asynchronous Transfer Mode
ATO Approval to Operate

BCT Brigade Combat Team
Bn Battalion
BOM Bill of Materials

CAA Controlled Access Area
CAN Campus Area Network
CE Compromising Emanations
CIK Cryptographic Ignition Key
CNSS Committee on National Security Systems
COMSEC Communications Security
CONUS Continental United States
COOP Continuity of Operations Plan
COTS Commercial Off-the-Shelf
CSLA Communications Security Logistics Activity
CSU Channel Service Unit
CTTA Certified TEMPEST Technical Authority

DAA Designated Approving Authority
DATM DISA ATM
DIACAP DOD Information Assurance Certification and Accreditation Program
DISA Defense Information Systems Agency
DISN Defense Information Systems Network
DITSCAP DOD Information Technology Security Certification and Accreditation
DMS Defense Message System
DoA Department of the Army
DOD Department of Defense
DPW Director of Public Works
DSAWG DISN Security Accreditation Working Group
DSS Defense Security Services
DSU Digital Service Unit
DTD Data Transfer Device
DTOC Divisional Tactical Operations Center
DVS-G Defense Video Services - Global

APPENDIX A. GLOSSARY OF ACRONYMS AND TERMS

EKMS Electronic Key Management System
EMT Electrical Metallic Tubing
EUB End User Building

FDED Fort Detrick Engineering Directorate

GCCS Global Command and Control System
GEM General Dynamics Encryptor Manager
GIG Global Information Grid
GSA General Services Administration

HAIPE High Assurance Internet Protocol Encryptor
HHC Headquarters, Headquarters Company
HQ Headquarters

IA Information Assurance
IDS Intrusion Detection System
IMO Information Management Officer
IMR Initial Modification Request
INE In-Line Network Encryptor
INFOSEC Information Security
IOT&E Initial Operational Test and Evaluation
IP Internet Protocol
IPS Information Processing System
IPv6 Internet Protocol Version 6
IS Interoperability Specification
ISDN Integrated Services Digital Network

LCA Limited Control Access (also Limited Control Area)
LOM List of Materials

MAC Mission Assurance Category
Mbps Megabits per second
MOA Memorandum of Agreement
MSE Mobile Subscriber Equipment

APPENDIX A. GLOSSARY OF ACRONYMS AND TERMS

NES Network Encryption Solution
NETCOM Network Enterprise Technology Command
NIPRNET Non-Classified but Sensitive Internet Protocol Router Network
NOFORN Not Releasable to Foreign Nationals/Governments/Non-US Citizens
NSA National Security Agency
NSI National Security Information
NSTISS National Security Telecommunications and Information Systems Security
NSTISSAM National Security Telecommunications and Information Systems Security Advisory Memorandum

OCONUS Outside Continental United States

PC Personal Computer
PCMCIA Personal Computer Memory Card International Association
PDS Protected Distribution System
PM Program Manager
POC Point of Contact
POM Personnel Operations and Maintenance
PoP Point of Presence
PPK Pre-placed Key
PPP Power Projection Platform
PSP Power Support Platform

QoS Quality of Service

RF Radio Frequency
RFS Request for Service

S Secret
SA Systems Administrator
SCAO SIPRNET Connection Approval Office
SCCPG SIPRNET Customer Connection Process Guide
SIPRNET Secret Internet Protocol Router Network
STIG Security Technical Implementation Guide
SVN Secure Virtual Network

APPENDIX A. GLOSSARY OF ACRONYMS AND TERMS

TA Technical Authority
TACE Technical Analysis and Cost Estimate
TACLANE Tactical LAN Encryptor
TAR Technical Acceptance Recommendation
TCP Transmission Control Protocol
TLA Top Level Architecture
TOC Tactical Operations Center
TS Top Secret
TS/SCI Top Secret / Sensitive Compartmentalized Information
TSO Telecommunications Service Order

UAA Uncontrolled Access Area
UL Underwriters Laboratory
UPS Uninterruptible Power Supply

VLAN Virtual Local Area Network
VoIP Voice over Internet Protocol

WAN Wide Area Network

APPENDIX B. REFERENCES

1. ANSI/TIA/EIA-568-B.1 Commercial Building Telecommunications Cabling Standard, Part 1: General Requirements
2. ANSI/TIA/EIA-568-B.2 Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted Pair Cabling Components
3. ANSI/TIA/EIA-568-B.2 –1 Addendum 1 – Transmission Performance Specifications for 4-pair 100-ohm Category 6 Cabling
4. ANSI/TIA/EIA-568-B.2–4 Addendum 4 - Solderless Connection Reliability Requirements for Copper Connecting Hardware
5. ANSI/TIA/EIA-568-B.3 Commercial Building Telecommunications Cabling Standard, Part 3: Optical Fiber Cabling Components
6. ANSI/TIA/EIA-568-B.3-1 Addendum 1 –Additional Transmission Performance Specifications for 50/125 Optical Fiber Cables
7. ANSI/TIA/EIA-569-B Commercial Building Standard for Telecommunications Pathways and Spaces
8. ANSI/TIA/EIA-526-7 Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant
9. ANSI/TIA/EIA-526-14A Measurement of Optical Power Loss of Installed Multimode Fiber Cable Plant
10. ANSI/TIA/EIA-606-A Administrative Standard for the Telecommunications Infrastructure of Commercial Buildings
11. ANSI-J-STD-607-A-2002, Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications, Telecommunications Industry Association (TIA), October 2002.
12. EN 50173:1996 Information Technology – Generic Cabling Systems
13. EN 50174-1:2001 Information Technology – Cabling Installation, Part 1: Specification and Quality Assurance
14. EN 50174-2:2001 Information Technology – Cabling Installation, Part 2: Installation Planning and Practices Inside Buildings
15. EN 50174-3:2002 DRAFT Information Technology – Cabling Installation, Part 3: Installation Planning and Practices Outside Buildings
16. ISO/IEC 11801:2002 Information Technology – Generic Cabling for Customer Premises
17. ISO/IEC 14763-1:1999 Information Technology – Implementation and Operation of Customer Premises Cabling, Part 1: Administration
18. ISO/IEC 14763-2:2000 Information Technology – Implementation and Operation of Customer Premises Cabling, Part 2: Planning and Installation
19. ISO/IEC 14763-3:2000 Information Technology – Implementation and Operation of Customer Premises Cabling, Part 3: Testing of Optical Fiber Cabling

APPENDIX B. REFERENCES

20. NFPA 70, National Electrical Code, 2002 Edition, National Fire Protection Association, Inc., August 2001.
21. NFPA 780, Standard for the Installation of Lightning Protection Systems, latest issue
22. C2-2002, National Electrical Safety Code, 2002 Edition, Institute of Electrical and Electronics Engineers, Inc., August 2002.
23. MIL-STD-188-124B, Grounding, Bonding and Shielding for Common Long Haul/Tactical Communication Systems Including Ground Based Communications- Electronics Facilities and Equipments.
24. MIL-HDBK-419A, Grounding, Bonding, and Shielding For Electronic Equipments and Facilities.
25. UFC 1-300-01 Criteria Format Standard
26. UFC 3-580-10 Design: Navy And Marine Corps Intranet (NMCI) Standard Construction Practices Information System (IS)
27. UFGS-16710 09/2004, Structured Telecommunications Cabling and Pathway System.
28. ETL 1110-3-502 - Telephone and Network Distribution System Design and Implementation Guide (Installation Information Infrastructure Architecture (I3A) Design and Implementation Guide).
29. MIL HDBK 1012/3 - Telecommunications Premises Distribution Planning, Design, and Estimating
30. Building Industry Consulting Service International (BiCSi) telecommunications distribution methods manual
31. BBP 03-EC-0-0001: Acquiring Secret Internet Protocol Router Network (SIPRNET) Connectivity: Version 1.0
32. AR 25-2, Information Assurance
33. AR380-5, Information Security Program
34. AR380-40, Policy for Safeguarding and Controlling Communications Security – (COMSEC) Material
35. Army Regulation 381-14; Military Intelligence, Technical Counterintelligence, (C)

Appendix CC – Fort Bragg Landfill Requirements

Fort Bragg Landfill Directives

DEPARTMENT OF THE ARMY
INSTALLATION MANAGEMENT AGENCY
HEADQUARTERS, FORT BRAGG GARRISON COMMAND (AIRBORNE)
FORT BRAGG, NORTH CAROLINA 28310

REPLY TO
ATTENTION OF

IMSE-BRG-PWE

11 Sep 06

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Updated Asbestos and Permitting Procedures for Use of the Fort Bragg Lamont Road Landfill Facility

1. References:

a. North Carolina Solid Waste Management Rules, 15 North Carolina Administrative Code (NCAC) 13B.

b. North Carolina Department of Environment and Natural Resources, Construction and Demolition Operational Permit #26-08.

c. National Emission Standards for Hazardous Air Pollutants 40 CFR Part 61. Subpart M.

d. Occupational Safety and Health Administration 29 CFR 1910.1200 and 29 CFR 1926.1101.

e. North Carolina Department of Health and Human Services Asbestos Hazard Management Program per 10A NCAC 41C.0605.

2. Effective 25 September 2006, the Directorate of Public Works (DPW) will implement updated procedures for the handling, transportation, and disposal of Friable and Non-Friable Asbestos on Fort Bragg. Updated procedures are located in Enclosure 1. Procedures are also available via web at www.bragg.army.mil/envbr/solidwaste.aspx (user should access the Solid Waste Training for Landfill Users/Asbestos Information).

3. Effective 11 September 2006, new scale systems at the Lamont Road Facility will be operational. The DPW has begun the initial phase of landfill user re-permitting for contractors. Landfill users are required to know and follow all rules and regulations pertaining to the landfill. Updated procedures and timeframes for obtaining new permits are located at Enclosure 2.

a. All prime contractors utilizing the Fort Bragg Landfill will be required to review landfill procedures prior to

IMSE-BRG-PWE
SUBJECT: Updated Asbestos and Permitting Procedures for Use of the Fort Bragg Lamont Road Landfill Facility

obtaining a new permit and all subs-contractors are encouraged to review the landfill procedures for knowledge.

b. All government personnel issuing a contract that includes access to the landfill by a contractor should review the procedures for knowledge.

c. Military and civil service personnel accessing the landfill in government-owned vehicles are not required to have a permit. However, they are encouraged to review the "Solid Waste Training for Landfill Users" available via web at www.bragg.army.mil/envbr/solidwaste.aspx to ensure compliance.

4. Point of contact for this action is Sid Williamson at 396-3372 or Christine Hull at 907-3214.

GREGORY C. BEAN
Directorate of Public Works

DISTRIBUTION:
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Director
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43d CS, Pope AFB

1-1. Management Procedures for *Friable and Non-friable Asbestos* for Disposal at the Fort Bragg Landfill

Purpose: Ensure compliance with all applicable regulations concerning loading, unloading, transporting and disposal of friable and non-friable asbestos containing material (ACM) on Fort Bragg.

1-2. Regulatory Requirements

- National Emission Standards for Hazardous Air Pollutants (NESHP) 40 CFR Part 61.Subpart M.
- OSHA 29 CFR 1910.1200 and CFR 1926.1101.
- North Carolina Solid Waste Management Rules, 15 NCAC 13B.
- North Carolina Department of Environment and Natural Resources (NCDENR), Construction and Demolition Operational Permit #26-08.
- North Carolina Department Health and Human Services Asbestos Hazard Management Program per 10A NCAC 41C.0605.

1-3. Management of Friable Asbestos

1-3-1. Loading of *Friable Asbestos* at the Work Site

- **The Contractor is responsible for:**
  - Excluding public access by barriers or warning tape and posting proper signs.
  - Ensuring contractor personnel have proper training.
  - Ensuring all friable asbestos is adequately wet during removal, packaging and loading process.
  - Ensuring any driver who transports asbestos containing material (ACM) is trained (Awareness Level Training), have completed ***Fort Bragg Asbestos Removal, Transportation and Disposal Documentation Form*** and has a valid Fort Bragg landfill Permit.
  - Ensuring all waste is adequately wet and in properly labeled 6 mil plastic bags and covered prior to trucks departing construction site.
  - Ensuring the vehicle used to transport has proper OSHA signs prior to departing construction site

Danger Asbestos Cancer And Lung Disease Hazard Authorized Personnel Only

1.3.2. Management of Friable Asbestos during Transportation

- **Truck Operator (The Contractor) is responsible for:**
  - o Calling Landfill Manager 24 hours in advance to schedule disposal. Estimating quantity (i.e. number of trucks and size)
  - o Obtaining a valid Fort Bragg Landfill Permit
  - o Ensuring that all material is adequately wet while packaging and discharges no visible emission during loading.
  - o Ensuring all friable asbestos material is sealed in leak-tight containers.
  - o Ensuring truck is covered.
  - o Labeling the vehicle with required OSHA Asbestos signs.
  - o Posting signs in the area during loading and unloading.
  - o Completing the ***Fort Bragg Asbestos Removal, Transportation and Disposal Documentation Form*** **Section 1 and 2.**
  - o Completing **NC Asbestos Waste Shipment Record** prior to leaving construction site.

1-3.3 Management of Friable Asbestos during Disposal - At the Scale House:

- **Scale House Operator is responsible for:**
  - o Checking for valid Fort Bragg Landfill Permit.
  - o Receiving NC Asbestos Waste Shipment Record from the driver and ensuring that driver has completed Block 10 and 11.
  - o Receiving ***Fort Bragg Asbestos Removal, Transportation and Disposal Documentation Form*** (parts 1 and 2 complete) from the driver and recording inbound weight.
  - o Giving the driver the "FRIABLE ASBESTOS CONTAINING MATERIALS" sign to display in truck windshield.
  - o Directing the driver to appropriate disposal area.

1-3-4. C&D Landfill Operations for Disposal of Friable Asbestos

- **At Asbestos Disposal Area of Landfill**
  - o Driver is instructed by landfill personnel to proceed to posted asbestos disposal area.
  - o Driver is instructed by landfill personnel to unload asbestos that is properly bagged and wetted.
  - o Landfill operator covers friable asbestos immediately with at least 6 inches of clean cover material (soil)
  - o Driver is directed back to scale house by landfill operator.
  - o Landfill manager ensures that asbestos disposal areas are properly annotated on maps.

1-3-5. C&D Landfill Operations for Disposal of Friable Asbestos

- **At the Scale House:**
  - o Driver returns to Scale House.

o Scale House Operator records outbound weight, calculates and records ACM (asbestos containing material) weight on Block 13 of ***NC Asbestos Waste Shipment Record***, and signs Section 3 of the ***Fort Bragg Asbestos Removal, Transportation and Disposal Documentation Form***.

o Scale House Operator retains one (1) copy of the ***NC Asbestos Waste Shipment Record*** and returns remaining copies to the driver.

o Scale House Operator receives the "FRIABLE ASBESTOS CONTAINING MATERIALS" sign from the outbound driver.

o Scale House Operator provides the ***NC Asbestos Waste Shipment Record*** and the ***Fort Bragg Asbestos Removal, Transportation and Disposal Documentation Form*** to the C&D Operator at the close of business for signature. (Staple these two forms together and retained by Landfill for record.)

2-1. Management of Non-Friable Asbestos

2-1-1. Management of *Non-Friable Asbestos* at the Work Site

The Contractor is responsible for:

- Excluding public access by barriers or posting warning tape.
- Ensuring contractor personnel have proper training.
- Ensuring all building debris must be wetted inside and out during the demolition and loading process.
- Coordinating with DPW-FMD prior to using any fire hydrant. Note: use of fire hydrants requires a back flow-prevention device and during times of water restrictions on Fort Bragg, contractor must use non-potable water sources (lakes) to obtain water.
- Ensuring any drivers transporting non-friable asbestos is properly trained (Awareness Level Training).
- Ensuring driver has a completed ***Fort Bragg Asbestos Removal, Transportation and Disposal Documentation Form*** and has a valid Fort Bragg landfill Permit.

2-1-2. Management of Non-Friable Asbestos during Transportation

- Truck Operator is responsible for:
  - o Calling Landfill Manager 24 hours in advance to schedule disposal. Estimating quantity (i.e. number of trucks and size).
  - o Obtaining valid Fort Bragg landfill permit
  - o Ensuring that all material is adequately wet while loading and ensure no visible emission occur during loading and transport.
  - o Ensuring truck is covered.
- Completing the ***Fort Bragg Asbestos Removal Transportation and Disposal Documentation Form*** Section 1 and 2.

2-1-3. Management of Non-friable Asbestos during Disposal

- At the Scale house:
  - o Peceives ***Fort Bragg Asbestos Removal, Transportation and Disposal Documentation Form*** from the driver with section 1 and 2 completed.
  - o Checks for valid Landfill Permit.
  - o Gives the driver the ***"NON-FRIABLE ASBESTOS CONTAINING MATERIALS"*** sign to display in truck windshield and records inbound weight and directs the driver to the appropriate disposal area.

2-1-4. C&D Landfill Operations Non-friable Asbestos Disposal

- At Asbestos Disposal Area
  - o Driver is directed by scale house personnel to proceed to regular C&D Area.
  - o Landfill operator designates specific area for disposal.
  - o Landfill operator covers non-friable asbestos containing material at the end of the working day with 6 inches of C&D waste or clean cover material.
  - o Landfill manager ensures that asbestos disposal areas are properly annotated on maps.
  - o Landfill operator directs driver to scale house.

2-1-5. C&D Landfill Operations Non-friable Asbestos Disposal

- At the Scale House:
  - o Scale House Operator records outbound weight and Collects and signs **Section 3 of the *Fort Bragg Asbestos Removal Transportation and Disposal Documentation Form*.**
  - o Scale House Operator receives the ***"NON-FRIABLE ASBESTOS CONTAINING MATERIALS"*** sign from the outbound driver.
  - o Scale House Operator provides the ***Fort Bragg Asbestos Removal Transportation and Disposal Documentation Form*** to the C&D Operator at the close of business for signatures.

Points of Contact:

- Bruce Billings Asbestos Program Manager ECB, Building 3-1137 Reilly Road, Fort Bragg, NC, Phone: (910) 432-8467, FAX: 396-4188
- Gary Cullen Air Program Manager ECB Building 3-1137 Reilly Road, Fort Bragg, NC, Phone: (910) 907-2645, FAX: 396-4188
- Christine Hull, Chief, Environmental Compliance Branch, Building 3-1137 Reilly Road, Fort Bragg, NC, Phone: (910) 907-3214, FAX: 396-4188
- NC Department of Health and Human Services Health Hazards Control Unit Occupational and Environmental Epidemiology Branch Phone: (919) 707-5950, FAX: (919) 870-4808

Fort Bragg Landfill Usage Permits / Landfill User Training

Updated Permitting Procedures – Scale System

Landfill Permits:

The Directorate of Public Works is currently implementing a new permit system for landfill users. This implementation began in August 2006 with training sessions for contractors and personnel with oversight responsibilities. The DPW began issuing new permits on 7 September 2006 and will continue to process permit applications for existing users through 1 November 2006. All contracts awarded or issued to proceed after 7 September 2006 must utilize the new system for obtaining permits.

Landfill permits will be issued only after landfill users have reviewed Fort Bragg's solid waste regulations. As a permitted landfill in the state of North Carolina, it is important that all users understand the permit requirements and abide by these regulations. This information is available on new web-based/CD tutorial. Upon completion of the tutorial, users will be prompted to print a Certificate of Completion.

Landfill permits will be issued only to prime contractors, who will, in turn, be responsible for ensuring that subcontractors understand and comply with Fort Bragg's landfill regulations. For government agencies who contract for specific projects (i.e., renovations in an AAFES, DECA, or DoD school) the same requirements will apply to any contractors. For government agencies utilizing roll-off containers for their waste management, the agency contracting for this service will be responsible for obtaining the permit and ensuring the driver has the permit when entering the landfill. The driver will be responsible for returning the permit to the agency.

All new permits will be issued with an electronic Landfill Usage Code (LUC) that is unique for each vehicle and each contract. Implementation of the new permit system and LUC's will be phased. Temporary LUC's will be assigned to the following agencies and will be used until the dates listed below, at which time the temporary LUC's will terminate. The listed agencies are expected to have all landfill users re-permitted by their listed date. Existing permits will no longer be valid after the following dates (by organization):

Termination Date	*Agency*	*Landfill Usage Code*
9/12/06	AAFES	0912
9/18/06	DECA	0918
9/25/06	DoD Schools	0925
10/02/06	Pope	1002
10/09/06	Picerne/RCI	1009
10/16/06	Customer Service	1016
10/23/06	DOC	1023
10/30/06	COE	1030

Enclosure 2 – Fort Bragg Landfill Permits and Landfill User Training. Effective 11 September 2006.

Steps to obtaining Landfill Usage Permits

Step 1. Prime contractors review solid waste regulations for Fort Bragg Landfill Users available:

- on CD in the Solid Waste Office (building 3-1137)
  - CD will auto-run
- via web at www.bragg.army.mil/envbr/solidwaste.aspx
  - Scroll down and select Solid Waste Training for Landfill Users
  - Select "read only" when prompted for a password
  - It is a large file and will take a moment to download

Step 2. Print and sign Certificate of Completion.

Step 3. *Complete* Landfill Usage Permit Application (LUPA)

Step 4. Deliver, send, or fax completed LUPA to government representative for signature.

Step 5. Deliver, send, or fax Certificate of Completion and completed LUPA to Solid Waste Office for processing.

Step 6. *Pick*-up or request fax of processed Landfill Usage Permit (LUP) with assigned Landfill Usage Code (LUC).

Step 7. Distribute Permit and assigned LUC's to assigned vehicles.

Step 8. Ensure sub-contractors receive training CD's or visit web-based training.

Enclosure 2 – Fort Bragg Landfill Permits and Landfill User Training. Effective 11 September 2006.

IMSE-BRG-PWE-C 14 FEB, 2006

FORT BRAGG ASBESTOS REMOVAL, TRANSPORTATION, AND DISPOSAL DOCUMENTATION FORM

1. **REMOVAL:** ON _____ **(DATE)** **(SF/LF/CF/CY/Bags/LBS)** **(Circle)** OF **(FRIABLE/NON-FRIABLE)** **(Circle)** ASBESTOS CONTAINING MATERIAL (ACM) REMOVED FROM **(BUILDING)** _____, _____ **(STREET ADDRESS)**, FORT BRAGG, NC, PER _____ **(WORK ORDER/CONTRACT #)** WAS PREPARED FOR MOVEMENT TO THE LANDFILL:

   UNDER THE SUPERVISION OF _____ **(PRINT NAME)**

   REPRESENTING _____ **(FIRM/ORGANIZATION)**

   _____ **(SIGNATURE OF SUPERVISOR)**

2. **TRANSPORTATION:** ON _____ **(DATE)** THE ASBESTOS CONTAINING MATERIAL MENTIONED ABOVE WAS TRANSPORTED ON THE VEHICLE

   _____ **(LICENSE PLATE NUMBER)**

   _____ **(SIGNATURE OF DRIVER)**

   TO THE CONSTRUCTION & DEMOLITION LANDFILL ON LAMONT ROAD, FORT BRAGG, NC.

3. **DISPOSAL:** THE ACM DESCRIBED IN PARAGRAPH 1 WAS DELIVERED BY THE VEHICLE IDENTIFIED ABOVE TO THE CONSTRUCTION & DEMOLITION LANDFILL

   _____ **(SIGNATURE/DATE, SCALE HOUSE PERSONNEL)**

I (Landfill Operator/Manager) CERTIFY THAT THE LANDFILL HAS BEEN APPROVED FOR THE DISPOSAL OF ASBESTOS. THE MATERIAL DELIVERED WAS COVERED PER THE REQUIRED LAWS/REGULATIONS WITH THE REQUIRED MATERIAL IN THE PRESCRIBED MANNER.

_____ **(SIGNATURE/DATE)**

Asbestos Manager - 907-3645
Scale House - 432-0265
Landfill Manager - 396-6873
Solid Waste Manager - 396-3372

Application for Landfill Permit

1. Contractors may dispose of on-post generated refuse at the Lamont Road Landfill provided the active contract allows the use of the Government Landfill and each vehicle carrying refuse displays a current landfill permit. The Government inspection representative will verify that the contract allows the use of the Government Landfill and will certify same by signing this request form.

2. Contractors will complete the information on this form and hand-carry it to the Environmental Compliance Branch (ECB), Public Works Business Center, located in Bldg. 3-1137, North of DPW Butner and Reilly Road personnel parking lot or FAX it to 910-396-4188. Contractors will insure that the Government inspection representative signs this form before submitting to ECB. Additional vehicles can be added on page 2 of this form.

Sid Williamson, Solid Waste/Recycling Manager
Environmental Compliance Branch
Phone # (910) 396-3372, Cell # (910) 977-2502

Prime Contractor _____ POC _____ Phone # _____

Sub Contractor _____ POC _____ Phone #_____

Project # _____ Project Name_____

Circle One: Fort Bragg Pope AFB Beginning Date _____ Duration _____

---

1) Vehicle Year/Make _____/_____

License Plate # _____ State _____ Exp Date _____

2) Vehicle Year/Make _____/_____

License Plate # _____ State _____ Exp Date _____

3) Vehicle Year/Make _____/_____

License Plate # _____ State _____ Exp Date _____

4) Vehicle Year/Make _____/_____

License Plate # _____ State _____ Exp Date _____

Approval of Government Representative

Print Name and Signature _____

Phone Number _____

SUBJECT: Application for Landfill Permit (continued)

5) Vehicle Year/Make _____/_____

License Plate # _____ State _____ Exp Date _____

6) Vehicle Year/Make _____/_____

License Plate # _____ State _____ Exp Date _____

7) Vehicle Year/Make _____/_____

License Plate # _____ State _____ Exp Date _____

8) Vehicle Year/Make _____/_____

License Plate # _____ State _____ Exp Date _____

9) Vehicle Year/Make _____/_____

License Plate # _____ State _____ Exp Date _____

10) Vehicle Year/Make _____/_____

License Plate # _____ State _____ Exp Date _____

11) Vehicle Year/Make _____/_____

License Plate # _____ State _____ Exp Date _____

12) Vehicle Year/Make _____/_____

License Plate # _____ State _____ Exp Date _____

13) Vehicle Year/Make _____/_____

License Plate # _____ State _____ Exp Date _____

Approval of Government Representative

Print Name and Signature _____

Phone Number _____

AFZA-DE-RJ (420-10c) Date: _____

MEMORANDUM FOR DEH ENVIRONMENTAL OFFICE

SUBJECT: Landfill Permit Application

1. Fill in the following information for each Contractor vehicle:

   a. Landfill to Be Used: Sanitary _____ Demolition _____ Both _____

   b. Company Name: _____

   c. Contract Number: _____

   d. Project Title: _____

   e. Project Location: _____

   f. Date of Notice to Proceed: _____

   g. Project Length (In Days): _____

   h. Vehicle Make: _____

   i. Vehicle License Plate Number: _____

   j. Contract Inspector: _____

2. Note: Applications must be forwarded to the Environmental Office by a Government Official (e.g., Contracting Officer's Representative or Project Inspector). Applications delivered on any working day will be processed and available for pickup the following workday by 0830.

Appendix DD - Borrow Permit Form

BORROW PIT PERMIT

Public Works Business Center

BORROW PIT PERMIT

Project Title/Description: _____

Contract Number: _____

Contractor Point Of Contact: _____

Phone Number: _____

Contracting Agency: _____

Government Inspector Name: _____

Phone Number: _____

Authorization for Use of Fort Bragg Borrow Pits

1. Your organization is authorized to remove up to the amount of material indicated from the Fort Bragg borrow pit listed below in support of the above project:

CUBIC YARDS	START DATE	END DATE

BORROW PIT	LOCATION	TRAINING AREA	GRID COORDINATES
Lamont	Lamont Road	K	PJ 755 905

2. This permit is subject to the following conditions:
   a. Limit borrow operations to the area listed above. Do not expand the boundary of the pit.
   b. Re-grade any areas worked so that water will not stand in the pit.
   c. Do not excavate trenches.
   d. Slopes cut at the edge of the areas worked will not exceed 3:1.
   e. Do not exceed amount of material authorized above. Requestor must apply for an amended permit to increase the amount.
   f. Maintain a copy of this permit at the work site. Be prepared to present it on demand to environmental compliance inspectors, Public Works employees, or law enforcement personnel.
   g. This permit does not guarantee exclusive right to work a specific borrow area within the pit. Coordination and cooperation with other contractors is required while at the borrow pit. It may be necessary to move excavation operations to different areas of the pit to accommodate other users.
   h. Permits are valid only for 60 days from the issue date below.
   i. Contact the Engineering Equipment Section at 396-7156 prior to starting excavation operations.

3. Points of contact are Rick Akers 910-396-7156 (DPW Engineering Equipment Section) or Dan Messier 910-396-6873 (DPW Landfill and Borrow Pit)

Permit Issued By: _____ Date Issued: _____

Dan Messier, Fort Bragg Borrow Pit Manager

Appendix EE – North Carolina Division of Water Quality and Stormwater Best Management Practices Manual

The Manual is available online at:
http://h20.enr.state.nc.us/su/documents/BMPManual WholeDocument CoverRevisedDec2007.pdf

Corps of Engineers SAS Fort Bragg Area Office

Design Considerations and Lessons Learned

1. Attention designers not located in North Carolina: you must follow and comply with NC NCDENR Erosion and Sediment Control Manual. Out of state (NC) requirements will not be accepted nor approved. http://www.dlr.enr.state.nc.us/pages/sedimentation_new.html
2. If the project location changes during the design phase be aware that this may trigger further NEPA action. If the NEPA documents need to be modified or changed this may increase time needed for permit approvals.
3. Sequence of construction. Keep areas of disturbance to a minimum at any one time during site construction. Be aware of any existing or proposed sloping of the site that will affect your erosion control and stormwater measures.
4. Consider constructability when designing the erosion control and stormwater measures. When designing for compliance requirements the space needed to reasonably construct these measures is often not addressed. Be aware of other phases of the project and how they will affect the location and use of the measures.
5. Consider buffer zones between the limits of disturbance and the project limits. This zone can be very useful in helping to treat the water from the site before it leaves the project if left undisturbed or grassed. It allows space for corrective actions should an erosion control measure fail.
6. Consider the areas surrounding your proposed site and the existing conditions. Be aware that endangered species, wetlands, streams, trees and historical sites may incur additional time to obtain permits and/or mitigation. Consider the effect on your design of surrounding existing erosive or drainage features.
7. If your project will affect a wetland or stream you will likely need to obtain a 401 NC DWQ permit and a 404 COE Wilmington District permit. This will involve an approved jurisdictional determination, approved application and receipt of the permit. Always practice Avoidance and Minimization. http://www.saw.usace.army.mil/WETLANDS/Permits.html
8. If the projects design impacts more than .5 acres of wetlands then an Individual Permit (IP) will be needed. This will trigger new NEPA documents. This may take 120 days before permit approval can be completed.
9. Be aware the NPDES permit requires that monitoring of rain gauges and rainfall amounts continue after construction until the project is officially closed out by NCDENR Land Quality.

This document is for informational uses only. It has been provided to share lessons learned for improving the design process. This list may be periodically updated to better serve others.

Appendix FF– Fort Bragg Mass Notification Documentation

INDIVIDUAL BUILDING MASS NOTIFICATION (IBMNS)/PERSONNEL ALERTING SYSTEMS (PAS) SPECIFICATIONS AND INSTALLATION GUIDELINES

1.0 INTRODUCTION

The Individual Building Mass Notification System (IBMNS) / Personnel Alerting System (PAS) is a mass notification system with public address and visual alert capabilities. The Installation's I2MC/911 Center will have the ability to activate the buildings IBMNS/PAS mass notification system and provide real-time information to all building occupants or personnel in the immediate vicinity of the building during emergency situations. MNS is a construction requirement for all new inhabited buildings as outlined in the UFC 4-021-01, par 1-6.1

1.1 GENERAL REQUIREMENTS (UFC 4-021-01, chap 4)

- UFC COMPLIANCE – IBMNS/PAS must be fully compliant with Unified Facility Criteria UFC 4-021-01. Live voice, pre-recorded messages and visual alerts are required for existing inhabited buildings, primary gathering locations and billeting locations
- IBMNS/PAS must be capable of interfacing to a Telephone Alerting Systems (TASs), as well as existing fire alarm and public address systems where appropriate and required.
- IBMNS/PAS must be part of an integrated indoor/outdoor solution, controlled by the same control point or points
- IBMNS/PAS must be modular in design, allowing system flexibility and scalability.

2.0 EQUIPMENT SPECIFICATIONS (every building's application and installation will be different and must be sized per the intent of the UFC)

2.1 REMOTE TERMINAL UNIT (RTU) (activation point)

2.1.1 FEATURES

2.1.1.1 AMPLIFIERS

Amplifiers must be hot swappable from front panel for ease of maintenance

RTU must be capable of regulating sound output levels individually via remote control point(s), allowing remote optimization of alerts and notifications.

2.1.1.2 COMMUNICATIONS

RTU must be capable of either radio and/or landline control.

Communications format must include 128-bit encryption for security.

2.1.1.3 DIGITAL VOICE STORAGE (UFC 4-021-01, par 2-2.2.1)

RTU must be capable of storing up to 16 digitally stored messages for a total of 8 minutes of pre-recorded messages.

2.1.1.4. SIGNAL ALERTING FORMATS

RTU must be capable of a mixture of voice & tone signaling, with a minimum of 7 preprogrammed warning tones.

2.1.1.5. DYNAMIC OVER-THE-AIR (OR LANDLINE) REPROGRAMMING

At least 25% of the available signal duration capacity must be reprogrammable from the control point(s), with the ability to resend message multiple times and overwrite with new message as necessary.

2.1.1.6 PROGRAMMING SOFTWARE

RTU must be capable of reprogramming with easy-to-use Microsoft Windows-based programming software.

2.1.2 POWER REQUIREMENTS

Input voltage:	120 or 240 VAC +/- 10% 50-60 Hz 1 Phase
Input current:	5A AC, 45A DC Maximum
Battery Input Voltage:	21.5 – 30 VDC (24 VDC Nominal)
Operating Voltage:	24 VDC
Standby Time:	> 3 Days with 5 minute full signal reserve
Continuous Signaling Time:	Minimum of 30 minutes

2.1.3 CONTROLLER REQUIREMENTS

Inputs:	Minimum of 8 remote inputs, 8 sensor inputs and 4 direction sensor inputs
Outputs:	12 Audio outputs per amplifier
Signal Duration:	At least three minutes, with auto reset

Local Microphone Input Impedance:	10 KOhms
Audio Distortion	< 1% Total Harmonic Distortion
Maximum Load Impedance:	600 Ohms
Audio Output Voltage:	.25 to 2.0 Volts P-P @ 600 Ohms
Audio Input Voltage:	.10 to 2.0 Volts P-P @ 600 Ohms
Contact Closure	Minimum of 500 ms. < 1.0 KOhms
Relay Output:	30 VDC, 15 A

2.1.4 TELECOMMUNICATIONS SIGNAL FORMATS

Digital:	Minimal Shift Keying (MSK)
DTMF:	3 – 12 digits
Remote Activation Inputs:	Minimum of 8

2.1.5 AMPLIFIER MODULE

Frequency response:	+/- 3 dB 300 – 3000 Hz (Reference 1 KHz)
Output Voltage to Speaker Drivers:	70 VRms (nominal) 25 VRms (optional)
Input Impedance (per amplifier):	100 KOhms
Power Output (per amplifier)	Minimum of 400 Watts each

2.1.6 GENERAL

Operating Temperature:	-30 to +65 Degrees Celsius
Dimensions (HWD):	32" x 18" x 14" maximum
Enclosure:	NEMA 1 (Lockable)

2.1.7 MONITORING (UFC 4-021-01, par 4-2.1.4)

Two-way diagnostics status monitoring of system, diagnostics must provide Information on. (at a minimum):

- AC Power
- Charger Operation
- Battery Voltage
- Activation Current
- Amplifier voltage and current (per amplifier)
- Quiet Test (Inclusive of Speakers and Amplifiers)
- Local Activation
- Intrusion

- Line Supervision

2.2 PERIPHERALS (speakers, strobe lights, etc)

2.2.1 POWER REQUIREMENTS

Peripherals must be powered by the RTU, not locally at peripheral device. Power distribution must be low voltage, plenum rated class II wiring.

2.3 SPEAKERS (UFC 4-021-01, par 2-3.1.2)

Speaker volume must be locally adjustable with taps or hidden volume controls not readily accessible to building inhabitants (system volume must also be remotely optimizable via software at control point(s). Speaker locations and placement will be in such a manner as to provide intelligible instruction.

Acceptable speakers include:

Federal Signal – AudioMaster

Model	Wattage	Output in dB(C) @ 10'	TYPE
AM-50	2	87	Unamplified, Wall Mounted
AM-300	15	110	Unamplified reentrant trumpet, wall mounted
AM-302	30	114	Unamplified reentrant Trumpet, wall mounted

Federal Signal – Selectone

Model	Wattage	Output in dB(C) @ 10'	Type
50GC	2	88	Amplified w/gain Control, wall mounted
300GC	15	110	Amplified reentrant trumpet w/gain control, wall mounted
302GC	30	114	Amplified reentrant Trumpet w/gain control, Wall mounted

Penton

Model	Wattage	Output in dB(C) @ 10'	Type
RCS6XT72	.25 – 8	94	8" Ceiling mounted, tappable
CELL10T	1.25 – 10	85	Directional Wall Mounted, tappable
CELLBD10T	2.5 – 20	85	Bidirectional wall mounted, tappable
LIS8+XT72	.25 – 8	86	Lay-in Ceiling tile (PP) speaker tappable
PCB6T72	.25 – 5	84	Low profile surface mount, tappable
PH10	10	92	Amplified horn, wall mounted
PH20	20	95	Amplified horn, wall mounted
PH30	30	97	Amplified horn, wall mounted

2.4 STROBE LIGHTS (OPTIONAL) (UFC 4-021-01, par 4-2.1.1)

Strobe lights should meet the intent of the UFC. The domes will be (**AMBER**) in color, mounted to the ceiling on the interior side or the interior wall. The strobe lights are intended to get the building occupants attention to listen to further verbal instructions. IBMNS/PAS strobes are not intended to evacuate the building. Strobe lights need to be distinct and different from Fire Protection Systems strobes when possible.

Acceptable strobes include:

Federal Signal

Model	Peak Candlepower		Type
LP3 (A,G,R,C,B)	175,000	2.2 joules	Drop ceiling, Low-Profile 65-95 FR per min. (PP) ECP@ 51.5
FB24STHI-024C (ADA)	1,000,000		Supervised hearing Impaired strobe

NOTE: The marking (PP) denotes items used in Pilot Program testing.

3.0 INSTALLATION GUIDELINES (every building's application and installation will be different and must be sized per the intent of the UFC)

3.1 RTU LOCATION & POWER REQUIREMENTS

RTU should be centrally located on the ground floor of building.
RTU should be located in a controlled (locked) space inside a NEMA 1 enclosure
RTU must have a dedicated 120 VAC 20A circuit with separate breaker.

Multiple indoor RTUs or outdoor RTUs should be considered for large buildings with audio power requirements exceeding 800 watts

3.2 PERIPHERAL QUANTITIES AND PLACEMENT

Peripheral alerting devices should of sufficient quantities and placement to supply adequate sound (speakers) and visual (strobes) indoor coverage to: Corridors, Hallways, Primary Gathering locations, Conference Rooms, Large Admin Areas, Large Work Areas (Hangers, Warehouses)

3.2.1 INDOOR SOUND COVERAGE (UFC 4-021-01, par 2-3.1.2)

Speakers will provide intelligible (NFPA 72) instruction and measured in accordance with International Electrochemical Commission (IEC 60849)

Consideration for placement and speaker type must be given to:

Building size and usage

Ambient noise levels
> Utilize higher output speakers (15, 30, or 100 Watts) to overcome high ambient noise

Building Construction:

Block Walls vs. Drywall Partition
> Block walls attenuate sound more than drywall partitions

Slab on Deck vs. Metal/Wood Joist Floors
> Floor penetrations are required to distribute speaker and strobe wiring floor-to-floor.

Wood Framed vs. Block & Brick
> One exterior wall penetration required for each RTU for coaxial cable to antenna mounted on exterior wall.

Drop Ceiling vs. Sheetrock Ceilings

For "drop" tile ceilings, use "Lay In" Speakers

Drop ceilings allow use of plenum rated class II wiring without conduits

3.2.2 VISUAL COVERAGE (UFC 4-021-01, par 4-2.1.1)

Utilize 1 strobe light approx every 60 feet, and 1 strobe light at each RTU location. The RTU should be start point for strobe placement.
Taking into consideration ADA personnel for location placement, candlepower, joules and ECP.
Placement in Hallways and Corridor coverage should suffice unless large office areas break rooms, and conference rooms exist.

3.3 INTERFACE TO EXISTING SYSTEMS (UFC 4-021-01, par 2-4.1.2)

3.3.1 PUBLIC ADDRESS SYSTEMS (UFC 4-021-01, par 2-4.1.2)

Limit interface to existing systems that have been recently installed as recently as 5 years or less. PA system must meet or exceed required specifications.
Do not interface to existing PA systems that are not always on.
As a general rule, try to avoid interfacing existing PA systems unless absolutely required.

3.3.2 FIRE ALARM PANELS (UFC 4-021-01, par 4-2.1.6)

IBMNS/PAS will interface with existing fire alarm panels; the interface will temporarily deactivate the building fire alarm system's audible notification appliances. The UFC authorizes this deviation from the NFPA 72

Appendix GG– Fort Bragg Supplement to LONWorks Direct Digital Controls

Fort Bragg Supplement

to

LONWorks Direct Digital Control for HVAC and Other Local Building Systems

Where this supplement fails to address, UFGS 23 09 23 requirements apply.

1. The building control network shall be a single complete non-proprietary Direct Digital Control (DDC) system for control of the heating, ventilating and air conditioning (HVAC) systems. The building control network shall be an Open implementation of LONWORKS® technology using ANSI/EIA 709.1B as the only communications protocol and shall 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.

2. 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:

   2.1. Install hardware such that individual control equipment can be replaced by similar control equipment from other equipment manufacturers with no loss of system functionality.

   2.2. 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.

   2.3. At Fort Bragg the following systems are prohibited for new installation:

      2.3.1. BACNet

      2.3.2. Proprietary DDC systems

      2.3.3. Pneumatic systems or combination Direct Digital Control (DDC)/Pneumatic systems

   2.4. Gateways may be used provided that each gateway communicates with and performs protocol translation for control hardware controlling:

      2.4.1. A single major component (chiller, boiler, etc)

      2.4.2. Legacy or existing equipment in a building that is to remain

3. DDC Hardware (controllers) Requirements:

   3.1. All DDC Hardware shall:

      3.1.1. Be connected to a TP/FT-10 ANSI/EIA 709.3 control network.

      3.1.2. Communicate over the control network via ANSI/EIA 709.1B exclusively.

      3.1.3. Communicate with other DDC hardware using only SNVTs

      3.1.4. Conform to the LonMark® Interoperability Guidelines.

      3.1.5. Be locally powered; link power (over the control network) is not acceptable.

      3.1.6. 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

3.1.7. 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. SNVT inputs for overrides of all setpoints, and SNVT inputs for overrides of all hardware Outputs.

3.2. Application Specific Controllers have a fixed factory-installed application program (i.e. ProgramID) with configurable settings and do not have the ability to be programmed for custom applications. In addition to the requirements for all DDC Hardware ASCs shall:

3.2.1. Be LonMark Certified unless otherwise approved.

3.2.2. Be configurable via an LNS plug-in unless otherwise approved

3.3. Application Generic Controllers (AGCs) have a fixed application program which includes the ability to be programmed for custom applications. In addition to the requirements for all DDC Hardware ASCs shall:

3.3.1. have a fixed ProgramID and fixed XIF file

3.3.2. be fully programmable and configurable for the application through one or more LNS plug-in unless otherwise approved

3.4. General Purpose Programmable Controllers (GPPCs) are not installed with a fixed factory-installed application program and must be programmed for the application.

3.5. At Fort Bragg, Local Display Panels (LDPs) shall be installed at a minimum in each mechanical room where an AHU exist and programmed as per the Point Schedules.

4. Do not rely on the control network to perform DDC sequence applications unless otherwise approved.

5. Where multiple pieces of DDC Hardware are used to execute one sequence, all DDC Hardware executing that sequence shall be on a common segment and isolated from all other DDC Hardware via a CEA-709.1B Router.

6. Each scheduled system shall accept a network variable of type SNVT_occupancy (which will be provided by the UMCS outside the scope of this work) 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][the occupied mode].

7. Fort Bragg currently has an Open LonWorks technology Utility Monitoring Control System (UMCS) manufactured by Johnson Controls, Inc. Integration of building DDC system are performed by Fort Bragg's System Integration contractor. This should be coordinated with the UMCS System Manager.

8. Submittals:

8.1. Prior to DDC system installation the following should be submitted for Government approval:

8.1.1. Points Schedules: Submit Points Schedules using the Points Schedule template located at https://eko.usace.army.mil/fa/bas/ for each piece of DDC Hardware. Points Schedules shall be submitted in hard copy (11"x17") and electronic format. Electronic submission shall be in [AutoCAD][Microstation][Excel] format and submitted on CD or DVD.

8.1.2. Control System Schematic diagram and Sequence of Operation for each HVAC system.

9. Deliverables:

9.1. Upon completion of project the following should be delivered to the Government for acceptance:

9.1.1. Final (as-built) commissioned Turbo LonWorks® Network Services (LNS®) database with Lon Credits transferred to the Government.

9.1.2. eXternal Information Files (XIF), Resource files and Plug-ins for the completed system.

9.1.3. Point Schedules: Final (as-built) Points Schedules using the Points Schedule template located at https://eko.usace.army.mil/fa/bas/ for each piece of DDC Hardware. Points

Schedules shall be submitted in hard copy (11"x17") and electronic format. Electronic submission shall be in [AutoCAD][Microstation][Excel] format and submitted on CD or DVD.

9.1.4. Control System Schematic diagram and Sequence of Operation for each HVAC system.

9.1.5. Programming Software: All software, including licensing information and user manuals, necessary to program GPPCs installed under this contract.

9.1.6. GPPC and AGC Application Source Code: Copies of the installed application programs (all software that is not common to every controller of the same manufacturer and model) as source code compatible with the supplied programming software.

9.1.7. Operation and Maintenance Instructions including procedures for system start-up, operation and shut-down, a routine maintenance checklist, and a qualified service organization list.

9.1.8. Quality Control (QC) checklist (below) completed by the Contractor's Chief Quality Control (QC) Representative.

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

11. 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. Subsequent integration of the building control system into a basewide Utility Monitoring and Control System by the Government or its agents shall not void warranty.

12. Provide a minimum of [8 hours] 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.

Table: 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	XIF files, Resource files and Plug-in's are up-to-date and accurately represents the final installed system	
5	Commissioned Turbo LNS database with the understanding that the Lon Credits will be transferred to the Government as a complete system.	
6	All software has been licensed to the Government	
7	Local Display Panels (LDPs) have been created for all building systems, including all override and display points indicated on Points Schedule drawings.	
8	Final As-built Drawings accurately represent the final installed system.	
9	O&M Instructions have been completed and submitted.	
10	LonWorks® Network Services (LNS) based M&C software was provided	

Section:

By signing below I verify that all requirements of the contract, including but not limited to the above, been met. Signature:_____ Date:_____

Ft. Bragg, NC
UMCS DDC Integration
Statement of Work

1.0 SYNOPSIS: The Contractor shall provide the materials and labor required to integrate direct digital control (DDC) systems into the Fort Bragg base-wide Utility Monitoring Control System (UMCS) manufactured by Johnson Controls, Inc, known as the LCS-8520.

2.0 PRICE PROPOSAL: The Contractor shall provide a firm fixed price proposal for the integration of the Direct Digital Control (DDC) systems specified below into the Fort Bragg Utility Monitoring Control System (UMCS).

3.0 SPECIFIC WORK TO BE ACCOMPLISHED: The Contractor shall provide materials and labor required to integrate LNS-based LonWorks® Direct Digital control (DDC) systems specified below into the Fort Bragg Utility Monitoring Control System (UMCS). All work shall be in accordance with the Fort Bragg UMCS System Integration Methodology (SIM), Fort Bragg Installation Design Guide (IDG) **http://www.bragg.army.mil/dpw/idg/index.htm,** Unified Facilities Guide Specification (UFGS) 25 10 10 "LonWorks Utility Monitoring Control System" http://wbdg.org/ and this Statement of Work (SOW). All work performed by the contractor shall ensure that the system is and remains an Open LNS-Based Flat LON system in accordance with UFGS 25 10 10 and UFGS 23 09 23 "LonWorks Direct Digital Control for HVAC and Other Local Building Systems". In cases where UFGS 25 10 10 allows options, the Contractor shall coordinate these options with Fort Bragg.

3.1 The contractor shall integrate the following building(s) DDC systems:

3.1.1 Buildings **< Number>**

3.2 For each DDC system the contractor shall perform all tasks required to fully integrate the system into the UMCS including but not limited to:

3.2.1 Determine if building has a DOIM switch

3.2.1.1 If DOIM switch or spare port is not available proceed with the following;

3.2.1.1.1 Coordinate with the UMCS System Manager to have a survey performed on building to determine cost to install switch.

3.2.1.1.2 Once the survey is complete that cost will be sent to the UMCS Integration contractor to be added to their integration price.

3.2.1.1.3 UMCS Integration contractor will perform work (or sub-contract the work) to add and set-up the switch.

3.2.1.1.4 Once work is complete and accepted by the Government a DD1354 form will be submitted to the appropriate Government representative for transfer of equipment.

3.2.1.2 If DOIM switch is available, including an available port, coordinate with UMCS System Manager to have DOIM install V-Lan port and activate.

3.2.2 Install an ANSI/CEA 709.1 to ANSI/CEA 852 router Building Point of Connection (BPOC) and connect the building DDC system to the UMCS IP backbone.

3.2.2.1 BPOC locations will be provided after contract award.

3.2.2.2 BPOC IP addresses will be provided after contract award.

3.2.2.3 Currently only the Loytec LIP IP-852 Router and the i-Lon 600 are acceptable for use on the UMCS network.

3.2.3 Incorporate each DDC system LNS database into the UMCS database:

3.2.3.1 Merge the building database into the UMCS database or establish a new LNS database at the UMCS as required to maintain UMCS performance and in accordance with the UMCS SIM.

3.2.3.2 If an LNS database does not exist or is unusable for the building DDC system, contractor is responsible for creating a new usable database.

3.2.3.3 Configure Fort Bragg's LNS network configuration tool (NCT):

- Upgrade NCT licensing as required.
- Configure NCT drawings and displays, if applicable, to clearly display building DDC systems.
- Install and update Plug-ins, XIF and Resource files

3.2.4 Incorporate each DDC system into the UMCS Monitoring and Control Software:

3.2.4.1 Create graphic display pages that represent each HVAC system:

- To the greatest extent possible, graphics for similar systems shall be the same.
- Graphics shall provide monitoring and override points as shown on the Points Schedules.
- Graphics shall include duct and zone layouts and controller wiring diagrams, if applicable or available.
- Floorplan graphics showing location and readings for each VAV, etc.

3.2.4.2 Configure Scheduling, Alarming and Trending functionality for the building system as shown on the Points Schedules.

3.2.4.3 Configure supervisory control functions such as demand limiting, load shedding or optimum start/stop, if applicable.

3.2.4.4 Create baseline building energy usage and update Point Schedules to reflect energy alarm limits.

3.2.5 Create network variable bindings for communication between building systems, if applicable.

3.2.6 Reconfigure building DDC devices that poll for network variables, particularly Local Display Panels (LDPs), to use the new domain-subnet-node addressing for the building DDC system.

3.3 Contractor shall demonstrate completed integration to the Government. This demonstration shall show all work performed and shall be sufficient to familiarize the Government with the integrated building's systems.

3.4 Prior to contract award, contractor must meet the following requirements:

3.4.1 Have a Fort Bragg Username and Password for network access

3.4.2 Posses a CAC card

3.4.3 Possess a Secret Security Clearance and Elevated User Privileges for network access

3.4.4 Have a Information Management Officer (IMO) on staff at Fort Bragg

3.4.5 Have a LonMark Certified Professional on staff at Fort Bragg

3.4.6 Posses a Fort Bragg System Administrator certification

4.0 GOVERNMENT FURNISHED INFORMATION:

4.1 Control system drawings notably including the Points Schedule drawing(s)

4.2 Mechanical drawings

4.3 Commissioned LNS database including XIF files and plug-ins

4.4 Network Configuration Tool (NCT) licensing information including NCT model, manufacturer, revision and license status.
4.5 Floor plan drawings
4.6 Ductwork layout drawings

* Note: If none or part of the above items cannot be furnished by the Government, the Contractor will provide pricing to the Government to reproduce, re-create or duplicate such information and/or provide alternate solutions.

5.0 DELIVERABLES:

5.1 Summary listing of all software edits, changes, and updates made to Building Level DDC programming performed as part of system integration. Format shall be: Hardcopy and MS-Word or PDF on CD-ROM.
5.2 Product data including product data sheets and computer software supplied under this contract as specified in UFGS 25 10 10. Format shall be: Hardcopy and MS-Word or PDF on CD-ROM of all data sheets, plus computer software on CD-ROM.
5.3 Licensing information for all software provided or modified under this contract as specified in UFGS 25 10 10. Format shall be: Hardcopy and electronic file on CD-ROM.

6.0 SCHEDULE: The performance period shall be two months. Notice of demonstration of completed integration shall be given to [point of contact] no less than one week before demonstration. Schedule impacts, for any cause, will be brought to the attention of the COR and the Contracting Officer immediately. The contractor shall provide a proposed resolution and basis for delay.

7.0 Warranty: The SI contractor will warranty the integrated building for one year covering the following items:
7.1 UMCS is capable to communicate to the integrated building (exceptions; Destruction by others, communication issues not controlled by contractors)
7.2 Graphics represent correct information
7.3 UMCS programming and/or functions performed as programmed
7.4 Integration of such building listed has not caused problems with previously integrated buildings or surrounding buildings.

Appendix HH– Excavation Permit

EXCAVATION PERMIT

For use of this form, see AR Reg 420-49; proponent agency is PW.

DATE:

INSTRUCTIONS FOR USE OF EXCAVATION PERMIT

1. Excavation permit must be approved prior to any unearthing that penetrates the ground by more than 6 inches.
2. Permit will be approved at jobsite.
3. The DOIM staff shall approve all excavations on Fort Bragg and Camp Mackall.
4. The requestor shall contact DPW at 396-0325 for an appointment and request to locate underground lines at least 5 full business days in advance of desired work commencement. Each locate request shall not exceed 600 linear feet. The requestor shall meet with these organizations at the jobsite with the project/contract drawings.
   a. DPW, Utilities Branch
   b. DOIM, Outside Plant Branch
   c. Embarq
   d. Time Warner Cable Company
   e. North Carolina Locate Service
   f. Sandhills Utilities
   g. Old North Utilities
5. Excavation Permit is valid for the duration of the project and after all locates are completed it is the sole responsibility of the Project Manager to ensure all underground locates are maintained until the project is released back to the government.
6. Any Additional underground utilities that are added to the area must be updated with DPW and DOIM at the completion of the project.
7. Each excavation site must have seperate approval. A copy of the permit must remain at the jobsite while work is in progress.
8. Contractors shall NOT operate any utilities systems.
9. Any Excavations on Pope Air Force Base require a Work Clearance Permit issued by the Base Civil Engineer @ 394-2776.

1. Clearance Is Requested To Proceed With Work At	**Service / Work Order**	**Contract No.**

2. Method of Excavation			
	☐	A. Hand	Other (specify)
	☐	B. Power Shovel	
	☒	C. Ditcher	

3. Scope of Work (depth, width, length, location and sketch as applicable). If contract, a copy of applicable drawings or sketches must be attached.

4. Date Clearance Required	**5. Termination Date Of Clearance**

6. Requesting Organization Or Company	**7. Phone No.**	**8. Signature (Requesting Official)**

9. Excavation Clearance Approval

Utility	Responsibility	Remarks	Signature of Approving Official	Date
Electrical Underground Distribution	Primary - Sandhills Utility Service Secondary - DPW			
Steam or HTW Distribution	Honeywell			
Chiller Distribution	Honeywell			
Sewer Lines	Old North Utilities			
Water Distribution	Old North Utilities			
Natural Gas Distribution	DPW or Honeywell or Piedmont			
Telephone	DOIM			
Telephone	Embraq			
Cable Company	Time Warner			
Other	Time Warner			

DIGGING WILL NOT BE PERMITTED UNLESS SIGNED

Appendix II – Utility Monitoring Control System (UMCS) DDC Integration Statement of Work

Ft. Bragg, NC
UMCS DDC Integration
Statement of Work

1.0 SYNOPSIS: The Contractor shall provide the materials and labor required to integrate direct digital control (DDC) systems into the Fort Bragg base-wide Utility Monitoring Control System (UMCS) manufactured by Johnson Controls, Inc, known as the LCS-8520.

2.0 PRICE PROPOSAL: The Contractor shall provide a firm fixed price proposal for the integration of the Direct Digital Control (DDC) systems specified below into the Fort Bragg Utility Monitoring Control System (UMCS).

3.0 SPECIFIC WORK TO BE ACCOMPLISHED: The Contractor shall provide materials and labor required to integrate LNS-based LonWorks® Direct Digital control (DDC) systems specified below into the Fort Bragg Utility Monitoring Control System (UMCS). All work shall be in accordance with the Fort Bragg UMCS System Integration Methodology (SIM), Fort Bragg Installation Design Guide (IDG) **http://www.bragg.army.mil/dpw/idg/index.htm,** Unified Facilities Guide Specification (UFGS) 25 10 10 "LonWorks Utility Monitoring Control System" http://wbdg.org/ and this Statement of Work (SOW). All work performed by the contractor shall ensure that the system is and remains an Open LNS-Based Flat LON system in accordance with UFGS 25 10 10 and UFGS 23 09 23 "LonWorks Direct Digital Control for HVAC and Other Local Building Systems". In cases where UFGS 25 10 10 allows options, the Contractor shall coordinate these options with Fort Bragg.

3.1 The contractor shall integrate the following building(s) DDC systems:

3.1.1 Buildings **< Number>**

3.2 For each DDC system the contractor shall perform all tasks required to fully integrate the system into the UMCS including but not limited to:

3.2.1 Determine if building has a DOIM switch or DSL

3.2.1.1 If DOIM switch or spare port is not available proceed with the following;

3.2.1.1.1 Coordinate with the UMCS System Manager to have a survey performed on building to determine cost to install switch (DSL).

3.2.1.1.2 Once the survey is complete that cost will be sent to the UMCS Integration contractor to be added to their integration price.

3.2.1.1.3 UMCS Integration contractor will perform work (or sub-contract the work) to add and set-up the switch (DSL).

3.2.1.1.4 Once work is complete and accepted by the Government a DD1354 form will be submitted to the appropriate Government representative for transfer of equipment.

3.2.1.2 If DOIM switch is available, including an available port, coordinate with UMCS System Manager to have DOIM install V-Lan port and activate.

3.2.2 Install an ANSI/CEA 709.1 to ANSI/CEA 852 router Building Point of Connection (BPOC) and connect the building DDC system to the UMCS IP backbone.

3.2.2.1 BPOC locations will be provided after contract award.

3.2.2.2 BPOC IP addresses will be provided after contract award.

3.2.2.3 Currently only the Loytec LIP IP-852 Router and the i-Lon 600 are acceptable for use on the UMCS network.

3.2.3 Incorporate each DDC system LNS database into the UMCS database:

3.2.3.1 Merge the building database into the UMCS database or establish a new LNS database at the UMCS as required to maintain UMCS performance and in accordance with the UMCS SIM.

3.2.3.2 If an LNS database does not exist or is unusable for the building DDC system, contractor is responsible for creating a new usable database.

3.2.3.3 Configure Fort Bragg's LNS network configuration tool (NCT):

- Upgrade NCT licensing as required.
- Configure NCT drawings and displays, if applicable, to clearly display building DDC systems.
- Install and update Plug-ins, XIF and Resource files

3.2.4 Incorporate each DDC system into the UMCS Monitoring and Control Software:

3.2.4.1 Create graphic display pages that represent each HVAC system:

- To the greatest extent possible, graphics for similar systems shall be the same.
- Graphics shall provide monitoring and override points as shown on the Points Schedules.
- Graphics shall include duct and zone layouts and controller wiring diagrams, if applicable or available.
- Floorplan graphics showing location and readings for each VAV, etc.

3.2.4.2 Configure Scheduling, Alarming and Trending functionality for the building system as shown on the Points Schedules.

3.2.4.3 Configure supervisory control functions such as demand limiting, load shedding or optimum start/stop, if applicable.

3.2.4.4 Create baseline building energy usage and update Point Schedules to reflect energy alarm limits.

3.2.5 Create network variable bindings for communication between building systems, if applicable.

3.2.6 Reconfigure building DDC devices that poll for network variables, particularly Local Display Panels (LDPs), to use the new domain-subnet-node addressing for the building DDC system.

3.3 Contractor shall demonstrate completed integration to the Government. This demonstration shall show all work performed and shall be sufficient to familiarize the Government with the integrated building's systems.

3.4 Prior to contract award, contractor must meet the following requirements:

3.4.1 Have a Fort Bragg Username and Password for network access

3.4.2 Posses a CAC card

3.4.3 Possess a Secret Security Clearance and Elevated User Privileges for network access

3.4.4 Have a Information Management Officer (IMO) on staff at Fort Bragg

3.4.5 Have a LonMark Certified Professional on staff at Fort Bragg

4.0 GOVERNMENT FURNISHED INFORMATION:

4.1 Control system drawings notably including the Points Schedule drawing(s)

4.2 Mechanical drawings

4.3 Commissioned LNS database including XIF files and plug-ins

4.4 Network Configuration Tool (NCT) licensing information including NCT model, manufacturer, revision and license status.
4.5 Floor plan drawings
4.6 Ductwork layout drawings

* Note: If none or part of the above items cannot be furnished by the Government, the Contractor will provide pricing to the Government to reproduce, re-create or duplicate such information and/or provide alternate solutions.

5.0 DELIVERABLES:

5.1 Summary listing of all software edits, changes, and updates made to Building Level DDC programming performed as part of system integration. Format shall be: Hardcopy and MS-Word or PDF on CD-ROM.
5.2 Product data including product data sheets and computer software supplied under this contract as specified in UFGS 25 10 10. Format shall be: Hardcopy and MS-Word or PDF on CD-ROM of all data sheets, plus computer software on CD-ROM.
5.3 Licensing information for all software provided or modified under this contract as specified in UFGS 25 10 10. Format shall be: Hardcopy and electronic file on CD-ROM.

6.0 SCHEDULE: The performance period shall be two months. Notice of demonstration of completed integration shall be given to [point of contact] no less than one week before demonstration. Schedule impacts, for any cause, will be brought to the attention of the COR and the Contracting Officer immediately. The contractor shall provide a proposed resolution and basis for delay.

7.0 Warranty: The SI contractor will warranty the integrated building for one year covering the following items:
7.1 UMCS is capable to communicate to the integrated building (exceptions; Destruction by others, communication issues not controlled by contractors)
7.2 Graphics represent correct information
7.3 UMCS programming and/or functions performed as programmed
7.4 Integration of such building listed has not caused problems with previously integrated buildings or surrounding buildings.

Appendix JJ– Fort Bragg Construction Warranty Policy

DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, UNITED STATES ARMY GARRISON, FT BRAGG
2175 REILLY ROAD, STOP A
FORT BRAGG NORTH CAROLINA 28310-5000

REPLY TO
ATTENTION OF

IMSE-BRG-PWM

1 April 2008

MEMORANDUM THRU

US Army Corps of Engineers Area Office, Area Engineer
US Air Force and Special Operations Area Office Area Engineer

FOR See Distribution

SUBJECT: Construction Warranty Service Order "New" Process

1. This memorandum provides a summary of the major changes the Directorate of Public Works (DPW) has made in the Construction Warranty Service Order process and procedures Engineering and Corps of Engineers construction projects.

2. Construction Warranty Service Orders have been a longstanding problem at Fort Bragg that has been magnified by the increased levels of construction. The process was initially developed in a 2003 Memorandum of Understanding between the DPW and the Corps of Engineers. The DPW and US Army Corps of Engineers (USACE) partnered in a Lean Six Sigma project to improve the average response time of 61 days in FY07 by removing the two DPW Operations and Maintenance Division Quality Services Branches and Engineering Division Construction Inspection Branch as well as the USACE from the process.

3. The LEAN SIX SIGMA solution:

a. Eliminates the need for the Contractor to interface with the USACE resident engineer or DPW project engineer.

b. Provides our customers with a quick response.

c. Manages the service order through completion, improves the overall process efficiency, productivity, cycle time, and resource utilization.

4. The LEAN SIX SIGMA process:

a. Creates a warranty technician (WT)in the Operations and Maintenance Division to validate the warranty service order, notify the prime contractor, QA the contractors completed work, and close the service order.

IMSE-BRG-PWM
SUBJECT: Construction Warranty Service Order "New" Process

b. The WT will notify the Contractor directly and the Contractor will respond to construction warranty service requirements and submit the cause of the problem, the date reported, corrective action taken, and when repair was completed on validation form (attached) directly back to the WT.

c. In the event the Contractor fails to repair the construction warranty work required, the WT will notify the USACE resident engineer and/or DPW project engineer to follow up.

5. Thank you for your anticipated cooperation with this new process. Provide a copy of the enclosed letter and validation form to all prime Contractors for Engineering and Corps of Engineers construction projects. Include detailed prime contractor information on all DD Form 1354s - Transfer and Acceptance of Military Real Property, to facilitate the transfer of knowledge and the population of our database. We look forward to working with you, as our team works to improve process efficiency and process effectiveness.

6. If you have any questions or comments about the contents of this memorandum, please contact Monica Stephenson, Chief, Operations and Maintenance Division at 910-432-6352 or email monica.a.stephenson@us.army.mil.

Encl

GREGORY G. BEAN
Director of Public Works

Distribution:
USACE, CD-BRB, Resident Engineer
USACE, CD-BRC, Resident Engineer
USACE, CD-BRC, Resident Engineer
USACE, CD-BRD, Resident Engineer
USACE, CD-PSS, Resident Engineer,
USACE, CD-PSB, Resident Engineer,
DPW, Engineering Division, Project Engineers

DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, UNITED STATES ARMY GARRISON, FT BRAGG
2175 REILLY ROAD, STOP A
FORT BRAGG NORTH CAROLINA 28310-5000

REPLY TO
ATTENTION OF

April 1, 2008

Directorate of Public Works

Prime Contractor
Engineering Project
Fort Bragg, NC 28310

Dear Contractor:

The purpose of this letter is to inform you of the changes in the process and procedures for construction warranty service orders.

The Directorate of Public Works (DPW), US Army Corps of Engineers (USACE), and representative prime contractors partnered in a Lean Six Sigma project to improve the process efficiency and effectiveness for the Fort Bragg customer.

The Lean Six Sigma solution:

a. Created a warranty technician in the Directorate of Public Works Operations and Maintenance Division to validate the warranty service order, notify the prime contractor, QA the contractors completed work, and close the service order.

b. The Contractor will respond to construction warranty service requirements and submit the cause of the problem, the date reported, corrective action taken, and when repair was completed on validation form (attached) directly back to the warranty technician.

c. Eliminates the need for the Contractor to interface with the DPW Engineering Division Construction Inspection Brach or Project engineer unless the Contractor fails to repair the construction warranty work required.

Thank you for your anticipated cooperation with this new process. If you have any questions or comments about the contents of this memorandum, please contact Monica Stephenson, Chief, Operations and Maintenance Division at 910-432-6352 or email monica.a.stephenson@us.army.mil.

GREGORY G. BEAN
Director of Public Works

Appendix KK– Fort Bragg Access Control

DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, UNITED STATES ARMY GARRISON, FT BRAGG
2175 REILLY ROAD, STOP A
FORT BRAGG NORTH CAROLINA 28310-5000

REPLY TO ATTENTION OF

IMSE-BRG-ESI

27 DEC 2006

MEMORANDUM FOR Fort Bragg Tenant Sponsors

SUBJECT: Fort Bragg Access Control for Vendors, Suppliers, Contractors, and Service Providers

1. Beginning February 2007, Fort Bragg institutes a new standardized entry protocol called the *RAPID*Gate™ Program for all new and existing vendors, suppliers, contractors, and service providers (companies) who require routine access to buildings within the Fort Bragg facility to perform unclassified work. The *RAPID*Gate™ Program is one of several steps Fort Bragg is undertaking to comply with Homeland Security Presidential Directive 12 (HSPD12). Companies will be able to enroll in the *RAPIDGate*™ Program to facilitate quick and efficient entry into Fort Bragg. Companies who choose not to enroll in the *RAPID*Gate™ Program will be allowed to enter Fort Bragg only through the following Inspection ACPs: All American, Randolph, Longstreet and Knox. Vehicles greater than GVW of 13 tons or 4 axles must enter using the Knox ACP. Inspection ACPs will conduct a security screening and a mandatory vehicle search. Companies not enrolled in the *RAPID*Gate™ Program will require a one-day vehicle pass while on the installation.

2. The *RAPID*Gate™ Program, from Eid Passport, provides a standardized background check, identification badge and entry procedures for vendors, suppliers, and contractors that require routine access to Fort Bragg. Companies and individuals who choose to participate can register for the program at the All American Visitor Center, Randolph Gate, or the Truck Plaza using the self-service *RAPID*Gate™ Registration Station. Based on the information collected at the registration station, the *RAPID*Gate™ Program runs a 10-year felony background screen, other criminal screens, and validates the individual's social security number. The *RAPID*Gate™ Program also verifies that the individual is either a U.S. Citizen or is legally eligible to work in the United States. Upon passing the background screening process, participants will be issued a personalized *RAPID*Gate™ Badge that when verified by a security officer will allow the participant to enter Fort Bragg through all gates without having to stop for a vehicle inspection or be required to have directorate issued paper pass. The *RAPID*Gate™ Program not only saves your companies time, but also increases the safety and security for Fort Bragg and all personnel who work on the base. *RAPID*Gate™ participants are still subject to random inspections.

3. To assist your vendors or companies, have them follow the guidelines on the enclosed *RAPID*Gate™ Program Enrollment Procedures. Questions from your vendors or companies about the *RAPID*Gate™ program should be addressed to info@rapidgate.com with the subject line RE: *RAPID*Gate™ Program. Questions you may have regarding the *RAPID*Gate™ Program at Fort Bragg or Fort Bragg's access control policies and procedures, please contact Mr. Keith Lundquist, Antiterrorism Program Manager, Security and Intelligence Division, at (910) 396-1924.

Encl

DAVID G. FOX
COL, SF
Garrison Commander

April 2008

*RAPID*Gate™ Program Enrollment Procedures

Enroll your company by calling Eid Passport at 877-*RAPID*GATE (877-727-4342) and provide a Fort Bragg sponsor point of contact that includes a name, phone number, and e-mail address. Once your request is received, final authorization to participate in the *RAPID*Gate™ Program will be granted by Fort Bragg Office of the Provost Marshal.

Once your company has been approved for enrollment and paid the enrollment fee, instruct your employees who need access to Fort Bragg to register for the *RAPID*Gate™ Program using the self-service Registration Station in the All American Visitor Center, Randolph Gate, or the Truck Plaza. Each employee should be ready to provide your company's *RAPID*Gate™ company code, his or her address, phone number, date of birth, and social security number for proof of identification and background screening. The Registration Station will capture the employees photograph and fingerprints for identity verification and badging during the application process.

Once your company has approved each employee for participation, and paid the registration fee, the employee will undergo a background screen. Upon passing the screen, your company will be notified to send the employee to pickup their personalized *RAPID*Gate™ Badge at the Fort Bragg, Security and Intelligence Division. The employee will be required to show identification at the time of badge pickup. The employees can show one form of identification from List A, or two forms of identification from List B. Please see last page for listing.

Once a *RAPID*Gate™ Badge is issued employees will be required to present their badge to gain entry to Fort Bragg facilities, and must wear and display the Badge at all times while on the premises. Questions about the Fort Bragg *RAPID*Gate™ Program should be addressed to info@rapidgate.com with the subject line RE: *RAPID*Gate™ Program.

Encl

April 2008

Forms of Acceptable Identification to Present When Picking Up Your *RAPID*Gate Badge

List A – One Required

- U.S. Passport (unexpired or expired)
- Certificate of U.S. Citizenship (Form N-560 or N-561)
- Certificate of Naturalization (Form N-550 or N-570)
- Unexpired foreign passport, with I-551 stamp or attached Form I-94 indicating unexpired employment authorization
- Permanent Resident Card or Alien Registration Receipt Card with photograph (Form I 151 or I-551)
- Unexpired Temporary Resident Card (form I-688)
- Unexpired Employment Authorization Card (Form I-688A)
- Unexpired Reentry Permit (Form I-327)
- Unexpired Refugee Travel Document (Form I-571)
- Unexpired Employment Authorization Document issued by DHS that contains a photograph (Form I-688B)

List B – Two Required

- Driver's license or ID card issued by a state
- ID Card issued by federal, state or local government agencies or entities
- School ID card with a photograph
- Voter's registration card
- U.S. Military card or draft record
- Military Dependent's ID card
- U.S. Coast Guard Merchant Mariner Card
- Native American tribal document
- Driver's license issued by a Canadian government authority
- U.S. Social Security card issued by the Social Security Administration
- Certification of Birth Abroad issued by the Department of State (Form FS-545 or Form DS-1350)
- Original or certified copy of a birth certificate issued by a state, county, municipal authority or outlying possession of the United States bearing an official seal
- Native American tribal document
- U.S. Citizen ID Card (Form I-197)
- ID Card for use of Resident Citizen in the United States (Form I-179)
- Unexpired employment authorization document issued by DHS (other than those listed under List A)