141st Field Artillery Battalion Readiness Center

Jackson Barracks
New Orleans, Louisiana

National Guard Bureau
Project No. 220027

Louisiana Army National Guard

Volume 1 of 5
Design Analysis

35% Design Submittal
Preliminary Review Documents
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Section I – Disclaimer

A. DISCLAIMER

These documents, including design criteria narratives, are conceptual in nature and are not suitable for construction. It is the intent of these documents to clearly delineate the baseline minimum scale, scope and quality of the project. It is the responsibility of the design-builder that his proposal provides for a complete and functional facility responding to relative Army National Guard criteria, recognized industry standards and applicable building codes regardless of the content of these conceptual specifications.

Further, it will be the responsibility of the successful design-builder and his architect-of-record to prepare complete construction documents responding to the fullest intent of the conceptual drawings and specifications.

Section II – Project Overview

A. PROJECT SUMMARY

The devastation left by Hurricane Katrina disabled operations at Jackson Barracks, New Orleans, Louisiana. Most of the buildings, facilities, and infrastructure have been rendered unusable and consequently, a major rehabilitation of the entire base is being undertaken. The Louisiana Army National Guard in the New Orleans area have called the Jackson Barracks home for many years and are committed to restoring and enhancing this campus in order to serve our State and Country as called upon in times of need. The Guard played a significant role in assisting many government agencies and private citizens during and after the tragic events that destroyed their living environment.

The LAARNG has taken this opportunity, with support and funding through the State and Federal government, to analyze the existing base and to develop a master plan which best meets the demands of this type facility and applicable operations. The campus at this location stretches for several blocks from the Mississippi River toward Lake Pontchartrain and borders on the parish line delineating Orleans Parish from adjacent St. Bernard Parish. This long and narrow complex has been divided into five areas or zones with two major highways dissecting the campus.

The scope of work included in this proposed Contract, as Base Bid or Add Alternates, includes both new construction and re-furbishing of an existing facility. This work will be spread over Areas C, D, and E. The main portion of this Contract will involve the construction of a new four-story Readiness Center for the LAARNG 141st Field Artillery Battalion. The facility is located in Area C adjacent to and facing Claiborne Avenue. The proposed location of this building places it adjacent to the proposed 61st Readiness Center, being designed and constructed under a separate contract. The two facilities are to be designed to blend with the overall aesthetic established as part of the master plan but each with its own distinct character and aesthetic flavor. The two Readiness Centers have a shared courtyard, parade ground area, and paved utilitarian areas which serve for access into the Assembly Hall and to the dock area.

In addition, a separate building included with this package is a Central Plant that will serve Area C. This facility has been carefully situated between the two proposed readiness centers. The building has also been designed to blend with the proposed base architecture and resembles the Guard House in scale and appearance. The Guard House, under another contract, will be positioned on the same side of the site as the Central Plant, but between Claiborne Avenue and the 141st RC. It is the intention that the Central Plant be designed to facilitate the HVAC demands of the 141st and 61st Readiness Centers and the DFAC (Dining Facility)(Refer to the applicable Add Alternates). The facility should be sized to accommodate future equipment, which will meet the needs of future buildings and the restoration of the existing Museum on the south side of Area C. All chill water piping associated with these facilities must be designed accordingly with valves that can be connected as each facility comes on board. It is assumed that the installation of these water lines will be conducted by trenching, as part of the Add Alternates. Careful consideration must be given in the event historical artifacts are discovered. It is presumed that most of the artifacts will fall in Areas A and B, which are closer to the Mississippi River and former historical settings.

Both the 141st RC and the Central Plant should be designed to facilitate the possibility of future flooding as was experienced after Hurricane Katrina. The documents and drawings provided in this solicitation will illustrate that the RC should be designed to allow simple cleaning of wall surfaces and removal of ceiling tiles and classroom carpet on the first floor after any flood waters recede. All voids in walls must be filled or, in the case of exterior veneers, must have weep holes from the air spaces. Insulation in the exterior wall must be rigid board resistant to the effects of temporary

flooding. Careful consideration must be given to the placement of all building utilities and services. The main electrical and mechanical systems have been placed on upper floors and branch down to the first floor. All outlets and switches should be positioned as high on the walls as possible to minimize contact in the event of flood waters.

The proposed top of slab elevation has been set at 48 inches above existing grade in consideration of storm waters and to accommodate dock access to and from the unit storage area. It is strongly advised that coordination to establish slab elevation between the 141st and 61st RCs be conducted and the final established elevation shall be the responsibility of the respective professionals-of-record.

Portions of the building and emergency systems should be designed to accommodate operations during and after hurricanes and other emergency operations. Included as part of the Central Plant, adjacent to the platform supported cooling towers, is the emergency generator and three day supply of fuel for the UPS system. All associated HVAC and electrical equipment will be placed on an elevated facility recognizing the possibility of potential flooding and damage.

As mentioned in the mechanical narrative, the heating and cooling of the emergency operations on the fourth floor will be a separate system attached to an UPS. The associated elevated condensing units have also been incorporated into a facade feature blending with the overall aesthetics of the facility.

Another aspect of this Contract includes the rehabilitation of an existing building in Area E, which had extensive damage due to winds and storm water sustained during Katrina. It is estimated that the OMS #12 Building took on fourteen feet of floodwaters. This facility, once returned to a fully functional vehicle maintenance operation, will service both the 141st and 61st Battalions. It is projected that the building will be refurbished by removing everything except the foundation, the building structure and sub-structure, and all masonry walls. It will be cleaned and the structure will be re-painted prior to installing complete new metal roof and wall panel systems with blanket insulation at all previous locations. All the building systems will be replaced to restore the building to a new condition. New utility tie-ins will be required as part of this Contract and to accommodate the new infrastructure, being installed under a separate contract. Other minor exterior repairs will be needed. Each prospective contractor will be encouraged to visit the facility, prior to bidding, to document existing conditions and to project quantities and systems needed above and beyond what is illustrated in the preliminary drawings. This facility was constructed around 1996 and only the civil and structural drawings have been located from the original construction documents. These drawings have been included as part of the Appendices in Volume 3 for additional reference. All work associated with this building is listed as an Add Alternate.

The final aspect of this Contract involves the site work in Areas C and D. In Area C within the confines of the project, demolition of the existing 61st Facility and other smaller buildings and structures distributed through-out the boundaries must be removed in there entirety for the placement of the proposed 141st RC and the Central Plant Building. The Site Plan included will better communicate the scope of work.

The 141st RC is labeled as a Primary Gathering Facility per AT/FP guidelines. The Central Plant is labeled as an Uninhabited Structure based on the actual occupancy of the building. The 141st RC has been situated on the designated site to maximize the required setbacks and, where this criterion has been sacrificed, special provision must be implemented to achieve the integrity of the facility. The suggested Privately Owned Vehicles (POV) parking with the access drive have been illustrated on the Site Plan and positioned between the controlled Gate House and fencing at Claiborne Avenue and the proposed 141st RC. The entire drive and parking area is surfaced with pavers on a concrete base per the required vehicle loads, as part of an Add Alternate. The drive has been situated at the building entrance axis to maintain the 82 feet setback distance that allows

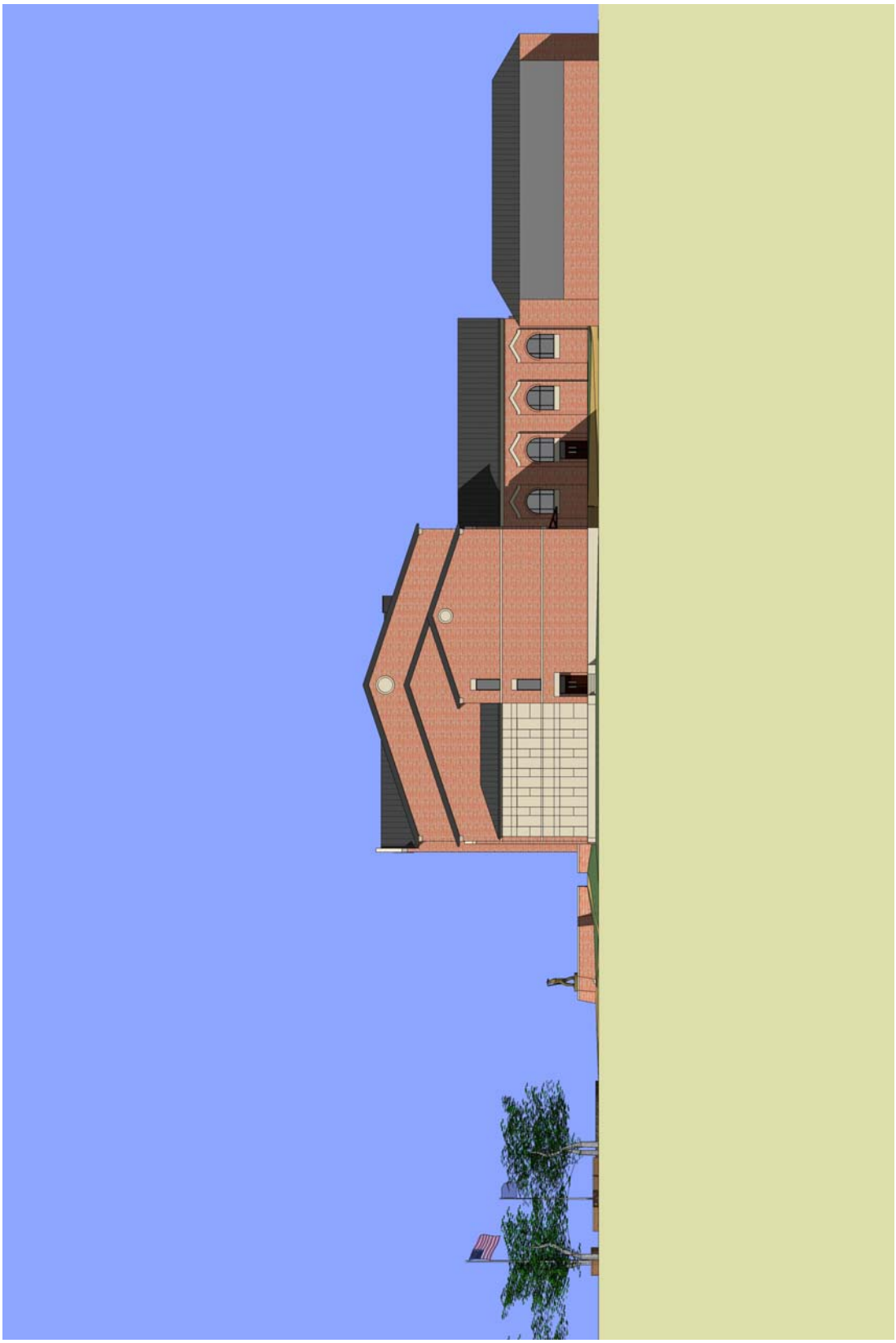
conventional construction of the main entrance vestibule. The entrance terrace has been placed with the drive meandering through it and it displays special design elements that communicate Army National Guard presence. The surfacing of this area is patterned with matching pavers and flagstone, as part of an Add Alternate.

Landscaping, as part of an Add Alternate, will enhance the terrace and yard space between the building and security fencing. New decorative trees should be added to emphasize an axis corridor that extends through Area C. It should be coordinated with the landscape master plan being conducted under another contract. The need to maintain a clear zone per AT/FP must be considered in the final landscape design. Trees should be added around the POV parking area to facilitate SPiRiT guidelines. Drought resistance and low maintenance vegetations should be considered for the final design in areas not part of the irrigation system. All areas not landscaped or paved within the limits of construction should utilize hydro-seed and/or sod to prevent erosion at the completion of the project. The final grading of the site must be coordinated with the adjacent 61st RC and the Guard House engineers.

In Area D the remaining POV parking is to be distributed in the areas designated for this Contract. Also located within this area is the Military Vehicles (MV) parking with the associated storage containers as outlined in the 1390/91. Parking paving in this area will be designed for the appropriate vehicle loads as existing paving and crushed stone as the base bid or concrete as part of an Add Alternate. In order to achieve the incorporation of these parking areas in Area D, the existing buildings and structure will be totally demolished.

This description or project overview touches on many of the main components of the proposed Contract. It is the responsibility of each of the teams to review all of the applicable documents and to further understand all the required aspects of the scope of work, associated with this proposed Contract. A disclaimer has been placed on the documents that have been generated at the 35% Preliminary phase. It states that it is the responsibility of the successful D/B team to provide a complete design and build effort assuring the LAARNG receive the facilities that both meet their needs and fulfill all the designated criteria per this Solicitation. It is important to note that careful review of all documents relative to the Alternate Bid Items listed must be conducted and considered.

B. 3D Renderings




LOUISIANA NATIONAL GUARD

Section III – Basis of Design

A. BUILDING SPACE LAYOUT AND FUNCTIONAL ANALYSIS

A-1 Building Space Layout and Functional Analysis

1. General

A. The Louisiana National Guard 141st Field Artillery Battalion Readiness Center is a four story structure with approximately 38,000 sf. on the first floor, 29,000 sf. on the second and third floors, and 16,000 sf. on the fourth floor. The floors are connected by two fire stairs (one located at east and west ends of the structure), one monumental stair (centrally located), one passenger/service elevator (centrally located) and one equipment lift (connecting first and second floors only for Vault operations). Restroom facilities are centrally located on each floor and mechanical, electrical and communications rooms are located on floors two thru four. All areas in the building are designed and arranged to fully comply with the 1390/1391 requirements, the spatial relationship requirements, and all applicable codes and regulations.

2. First Floor

A. General

1) The first floor of the structure is devoted to areas with functions requiring public and heavy storage access. To protect the mechanical, electrical and communications systems in the event of a flood, there are no mechanical, electrical, or communications rooms on this floor. The main building entry is located on the north side of the building. The recruiting and family service offices are located adjacent to the front entrance and are accessed from the vestibule; the public does not need to enter the lobby of the building to visit these offices. Immediately beyond the vestibule is the atrium lobby that contains a four storey monumental stair. This stair is the primary vertical circulation element in the building. Proceeding through the atrium lobby, one enters corridor 108. This corridor is used to access the passenger/service elevator (ADA access) the public restrooms, classroom areas, storage areas, and the Assembly Hall. Display cases and drinking fountains are provided in this corridor.

B. Assembly Hall

1) The Assembly Hall is a large double height space with a trussed, vaulted exposed ceiling and is located in the south wing of the building. This room has personnel doors and large, high windows on the east, west and south elevations. Large insulated overhead doors are positioned on the south side for vehicular access. Opening directly off of the Assembly Hall are the Audio Visual Storage Room, the Break Room/Vending area, the equipment lift, and the Table and Chair Storage area. The equipment lift is locate to give access to the Vault on the second floor and is used to transport arms to the vault. The audio Visual Storage Area has a door which connects it to the Unit Storage Areas. Both the Table and Chair Storage Area and the Break Room / Vending area have doors that provide access to the classroom areas.

C. West Wing

1) The west wing of the structure on the first floor is fully occupied by the Unit Storage Areas. This is a large open area with a loading dock on the south side. Individual Unit Storage areas are subdivided through the use of security mesh partitions. An office for each Supply NCO is located in each of the individual storage areas.

D. East Wing

1) The east wing of the first floor is occupied with classroom functions. A central corridor gives access to classrooms of varying sizes, all of which are located along the exterior walls to take advantage of natural lighting. The Library/Learning Center is centrally located for easy access.

3. Second Floor

A. The second floor of the structure, in addition to that described above, contains the following functions: Locker Rooms, Toilets and Showers, Training Device Simulation Center, CMDS, Tech, and 1ST. BN (TS) (256eSB) 349TH RGT'S Administration areas. These areas are located to minimize the potential for flood damage as well as all others areas on the second thru fourth floors. The central portion of the second floor contains the Atrium Lobby, Restrooms and drinking fountains. The Locker Rooms, toilets and showers are arranged in the west wing of the structure and are served by a central corridor. There are three separate locker rooms and three separate toilet and shower rooms. Two of each are designated for use by males and one of each is designated for use by females. There are a total of 512, 36"W x 24" D x 72"H lockers provided. The east wing contains the remainder of the second floor spaces listed above which are accessed via a central corridor. The north side of the east wing contains the Training Device Simulation Center and the 1ST. BN (TS) (256eSB) 349TH RGT'S Administration areas. Both of these are located to take best advantage of natural light. The CMDS and TECH areas are immediately adjacent to each other on the north side of the west wing. Due to the secure nature of these areas they are positioned away from the exterior walls and have no windows. On the south side of the west wing are located the Vault and mechanical rooms. The Vault is adjacent to the equipment lift and the mechanical space occupies the remainder of the space on the second floors. The mechanical space is positioned along the exterior wall to facilitate the venting requirements of the equipment.

4. Third Floor

A. The third floor of the structure contains the following functions: Medical Section, General Storage, Battery A 1/141ST Field Artillery Battalion Administration areas, Battery B 1/141ST Field Artillery Battalion Administration, and 199TH Fires Forward Support Company Administration areas. The central portion of the second floor contains the Atrium Lobby, Restrooms and drinking fountains. Also located in this area is Medical Section. Flanking the restrooms on the east and west sides are large general storage areas. Both the east and west wings of the structure are served by central corridors. The west wing contains the Battery B 1/141ST Field Artillery Battalion Administration areas, and 199TH Fires Forward Support Company Administration areas. The east wing contains Battery A 1/141ST Field Artillery Battalion Administration areas, and a portion of the Battery B 1/141ST Field Artillery Battalion Administration area. Space plans for these areas were developed based upon LAARNG input. Private offices are located along the exterior walls to take advantage of natural light. Break rooms and readiness rooms are arranged along the central corridor. Offices systems furniture is utilized to create additional work stations within the area. It is possible for the systems furniture work stations to take advantage of natural lighting dependent upon the final layout.

5. Fourth Floor

A. The fourth floor of the structure contains the HHB 1/141ST Field Artillery Battalion Administration areas. Space plans for these areas were also developed using LAARNG input and are arranged in a fashion similar to those on the third floor.

6. Central Plant

A. The Central Plant is an elevated detached structure with approximately 3,500 sq. ft. of building with an attached elevated structure for the cooling towers and the UPS equipment. All areas in the building are designed and arranged to fully comply with the 1390/1391 requirements, the spatial relationship requirements, and all applicable codes and regulations. Two fire stairs are located at opposite end walls of the building. The main space houses the chillers with all associated equipment including the Electrical Closet. An Office and Shop have been included to serve as support and accessory spaces.

7. General Comment

A. This description and information highlights the major aspects of the preliminary spatial layouts for the 141st Readiness Center and the Central Plant. Refer to the remainder of included documentation to assist in understanding the program for these facilities and to further develop the final design.

B. DESIGN CRITERIA NARRATIVES

B-1 GENERAL

1. Purpose

A. The design criteria narratives are intended to generally identify the requirements and description of each major building system that may be implemented in the new Louisiana Army National Guard 141st Field Artillery Battalion Readiness Center. It is not the intent to describe every individual item, space and/or function. It is the design build contractors responsibility to provide the design for all items, included within this document or not, to be in compliance with the applicable reference guides.

2. Criteria

A. This project shall be designed in accordance with the following criteria and other pertinent data that are herein incorporated by reference.

1) DG-415-1 Army National Guard Design Guide for Readiness Centers, 18 May 2005.

2) DG-415-1 Army National Guard Design Guide for Readiness Centers, November 1999 (where not addressed by 2005 edition).

3) DG 415-5 General Appendices, November 1999.

4) Army National Guard DG 415-5: General Facilities Information Design Guide

5) NG Pam 415-5 Army National Guard Military Construction Program Execution, 31 July 2003.

6) NGB Pamphlet 415-12 Army National Guard Facilities Allowances, 23 July 2003.

7) TM 5-785, Engineering Weather Data

8) TM 6290.99-10, Indoor Firing Ranges, Industrial Hygiene Technical Center

9) UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings, 8 October 2003.

10) UFC 4-023-03, Design Of Buildings To Resist Progressive Collapse, 25 January 2005

11) UFC 3-400-01, Design: Energy Conservation, 5 July 2002.

12) UFC 3-410-01FA, Design: Heating, Ventilating, and Air Conditioning dated 15 May 2003 (in lieu of the retired AR-420-54).

13) UFC 3-600-1 Fire Protection Engineering for Facilities

14) UFC 4-160-01 Design and Maintenance, Small Arms Range Facilities.

15) Army Regulation 420-49, Utility Services, 28 April 1997.

16) Army Regulation 11-27, Army Energy Program, 3 February 1997.

17) United States Army Corps of Engineers (USACE): Sustainable Project Rating Tool (SPiRiT), Version 1.4.1, June 2002.

18) DD Forms 1390/91, 25 January 2005.

19) ACGIH Industrial Ventilation Handbook

20) ASHRAE Standard 62.1-2004, Ventilation for Acceptable Indoor Air Quality

21) ASHRAE Standard 90.1-2004: Energy Standard for Buildings Except Low Rise Residential

22) International Building Code, 2003

23) International Mechanical Code, 2003

24) NFPA 30A-2003, Motor Fuel Dispensing Facilities and Repair Garages

25) NFPA 33-2003, Spray Application Using Flammable or Combustible Materials

26) NFPA 91-2004, Exhaust Systems for Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids

27) Pertinent State, Regional, Local Codes as applicable to this project.

B-2 CIVIL

1. Purpose

A. The information contained in this Civil narrative, in the Civil performance specifications, and on the Civil drawings represents a 35% design effort. This information is intended only to set minimum standards of performance for the Civil features. The onus is on the final design professional to provide final calculations, drawings, and specifications based on final Architectural, Structural, Electrical, and Mechanical plans and information.

2. Codes and Standards

A. Building Codes

1) International Building Code 2003 (IBC 2003).

B. Standards

1) Code Prescribed Standards:

a. American Society of Testing & Materials: A.S.T.M. standards as applicable.

b. Concrete: ACI Building Code Requirements for Structural Concrete (ACI 318-02).

c. Louisiana Department of Transportation and Development: Standard Specifications for Highways and Bridges (2000 edition).

d. American Water Works Association: A.W.W.A. standards as applicable

e. American Association of State Highway and Transportation Officials: A.A.S.H.T.O "Standard Specifications for Transportation, Materials and Methods of Sampling and Testing".

f. All work on the water system and sewerage collection system shall be in accordance with requirements and standard drawings of the Sewerage and Water board of New Orleans.

g. Americans with Disabilities Act (ADA): All site parking and access to parking shall comply with ADA requirements.

3. Grading/Drainage

A. The existing site, located at Jackson Barracks in New Orleans, is subdivided into smaller sections of land by streets. Each section is designated by letters A-E. The sections are drained by an existing series of open ditches, concrete swales and culvert pipes which drain to municipal storm sewer systems located thought-out the installation.

B. General grading of the project site shall include necessary cut and fill for construction. The existing elevation of the site will be modified as shown on the drawings. The site shall be drained to the new underground pipes connected to the storm water system owned and operated by the Sewerage and Water board of New Orleans. Storm water detention shall be required per local requirements and standards of practice. All storm water design shall include adequate surface slopes and piping to properly drain the proposed facilities.

C. A Storm Water Pollution Prevention Plan (SWPPP) shall be developed for the site in accordance with the State of Louisiana Department of Environmental Quality (DEQ), to comply with the U. S. Clean Water Act and the Louisiana Environmental Quality Act. The SWPPP shall also comply with local and municipal requirements for on-site soil erosion and sediment control. The chosen design build contractor shall be responsible for filing a Notice

of Intent (NOI) and Notice of Termination (NOT) with the Louisiana DEQ and all other agencies requiring similar action for implementing the plan. The chosen design build contractor shall be responsible for the payment of any fees associated with requirements of this paragraph.

4. Site Utilities

A. General Infrastructure

1) During the utility infrastructure replacement projects new utility services to the Jackson Barracks installation have been placed in a central corridor along the perimeter of the site and utilize the security setbacks. All building related services shall be connected to these new series of utility lines with sub metering at each building.

B. Domestic Water

1) Water service can be obtained from the new water main located within the central utility corridor no more than 400 feet from the facility. Actual size and available pressure shall be coordinated with LAARNG and the Sewerage and Water board of New Orleans.

C. Fire Protection

1) A fire loop shall be extended around the perimeter of Jackson Barracks and will be sized appropriately with fire hydrants and standpipe locations as required. Connections to these mains for the new facility are to be provided as shown and as required. Flow/pressure information shall be obtained from the Sewerage and Water board of New Orleans. Coordination will be required with the design build contractor designing the infrastructure improvement project. The design build contractor for this facility shall develop the required calculations to determine flow/pressure, etc.

D. Sanitary Sewer

1) Sanitary sewer service shall connect to the new sewer main constructed within the central utility corridor by others. The design build contractor shall contact the Sewerage and Water board of New Orleans to coordinate house service locations. Oil/grease separators shall be provided from the floor/trench drains in areas of the facility with the possibility of introducing oil and/or grease into the sewer main.

E. Natural Gas

1) A new natural gas main is to be located within the central utility corridor and used as the connection point for the project. A service will be required to be extended to the site. New tap, valves, piping, service meter and regulating station shall comply with the local gas utility provider's regulations.

F. Pavement Design

1) All pavements shall be designed in accordance with TM5-822-5 - Pavements Design for Roads, Streets, and Walks and Open Storage Areas and TM5-803-14 – Site Planning and Design. If flexible pavement is desired, it shall be designed in accordance with "AASHTO Design of Pavement Structures." The design build contractor will be responsible for the final pavement design based on the geotechnical report of the existing soil mechanics.

2) A geotechnical investigation and report shall be prepared by a Licensed Louisiana Civil Engineer for use in designing all pavements. Recommendations for various rigid and flexible pavements shall be included in the report.

3) Consideration shall be given to the use of recycled crushed concrete as a base course for flexible pavements.

G. Signage

1) All site signage, pavement markings and traffic control shall be in accordance with Manual of Uniform Traffic Control Devices (MUTCD) and shall be shown on the construction plans.

B-3 ARCHITECTURAL

1. General Building Description

A. The new Readiness Center facility generally consists of a multi-level administrative spaces, assembly areas, locker rooms, storage and related ancillary spaces. The following describes a general palette of materials identified as preferred by the LAARNG. It is not the intent that all of the following will be used; however, the design build contractor should consider the function of the facility/space and vernacular style of architecture at the respective site when selecting materials/systems. Due to the historic nature of the Jackson Barracks site, consideration of similar and complementary materials is significant to maintain the inherent character of the complex.

B. The envelope of the building should be designed with consideration to the thermal properties of the composite exterior envelope. The following U values are given as a minimum. The contractor is responsible for the final design and the coordination with the heating and cooling demands of the facility. Consideration should also be given to the SPiRiT guidelines

C. The construction phasing of the building should be coordinated with the other Design Build Contractors that will be working in other areas of the Jackson Barracks facility.

2. Demolition

A. The extent of any site specific demolition and the responsibility for the same will need to be verified by the design build contractor with actual site conditions, demolition drawings and the requirements of LAARNG.

3. Concrete

A. The foundation and slab systems are described in the Structural section. Concrete slabs that receive no architectural finish flooring shall be treated with penetrating hardener/sealer as described in the technical specifications.

4. Masonry

A. Exterior Masonry

1) Cavity wall system with exterior face brick veneer over load bearing concrete masonry unit back up system.

B. Interior Masonry

1) Ground face block at high traffic areas with integral color and sealed face shall be used in those areas requiring the durability of CMU for the specific function of the space. Refer to the architectural drawings (Room Finish Schedule) and specifications.

C. Stone on Building

1) Match existing facilities with limestone columns, capitals, bases, exterior wall system copings, fascia, moldings, keystones, panels, carved features etc. All stone accessories, fasteners, etc. shall be stainless steel.

D. Flagstone Pavers

1) The flagstone pavers are to be installed over a mortar bed supported by concrete foundation located at the front entrance, refer to architectural site plan.

E. Brick Pavers

1) The brick pavers are to be installed over a mortar bed supported by concrete foundation located at the front entrance, refer to architectural site plan.

5. Metals

A. Miscellaneous Metals

1) Exterior steel that is exposed to the elements shall be kept to a minimum. If required it shall be shop galvanized and field painted with a high performance paint system. Interior steel shall be shop primed and, where exposed to view, field painted.

B. Steel Stairs

1) Steel framed with concrete filled metal pan treads. Hand and guardrails shall be steel pipe with fully welded connections. All components shall be shop primed and field painted.

6. Wood & Plastics

A. No exterior woodwork shall occur.

B. Interior architectural woodwork shall include wall and base cabinet millwork. Plastic laminate on MDF panel construction shall be typical for all wall and base cabinets, as called for in finish schedule. Countertops shall be constructed of solid surfacing material with 4" high backsplashes at all wall transitions. Sinks shall be separately inset or under-hung units.

C. Provide premium grade hardwood wall and base cabinet millwork, wainscot, paneling, running trim, etc. where indicated on finish schedule.

7. Thermal & Moisture Protection

A. The Design Build Contractor shall be cognizant of the implications of mold due to the climate and the possible weather related scenarios (wind driven rain, flood, etc.) related to this locale. All facilities shall incorporate materials/building systems that assist in the elimination of moisture infiltration/build-up that would promote mold formation. In locations that are prone to flooding, the use of any material easily damaged by moisture (ie: gypsum board assemblies, batt insulation, etc.) at ground floor levels are not acceptable.

B. Structural Standing Seam Metal (Zinc) Roofing Systems

1) Mechanically seamed, metal roofing system on rigid insulation and metal deck.

C. Building Wall Insulation

1) At perimeter building walls, masonry cavity walls to have rigid insulation, steel stud cavities shall be filled with fiberglass batt insulation. Calculations shall be performed by the Design Build Contractor to determine location of vapor barrier/retarder as required by climate of locale.

D. Flashing Sheet Metal

1) Sheet metal (zinc) flashing, gutters, downspouts, trim, etc. at building exterior. Zinc shall be utilized due to proximity to Gulf of Mexico to prevent corrosion.

8. Windows and Doors

A. Storefront and Entrance System

1) The glazed entrances and windows shall be constructed of steel reinforced pre-finished aluminum frame, glazed storefront/curtain wall.

2) Entrance doors shall be medium-style aluminum framed, glazed doors. Glazing at wall systems and windows shall be insulated, tinted and laminated glazing units meeting requirements of wind born debris criteria, blast resistance criteria of the UFC DoD Minimum Antiterrorism Standards for Buildings and all applicable codes.

B. Standard Steel Doors

1) Interior doors and frames at first floor shall be fully welded, galvanized, shop primed and field painted. Interior door and fames shall be steel, fully welded and factory primed and field painted. Exterior door frames shall be fully welded, galvanized. Where steel doors are required, fully welded, insulated and galvanized panels shall be used. All door frames in the Assembly Hall shall be grout filled.

C. Wood Doors

1) Interior doors (at second, third and fourth floor) shall be 1 ¾" solid-core, red oak premium grade with a factory applied finish.

D. Coiling Doors

1) Exterior overhead coiling stainless steel doors shall be flat slat profile, insulated, motorized, keyed access control, with manual function in the event of power failure.

E. Vault Door

1) A class 5-A armory vault door complying with Federal Specification AA-D-600D shall be provided at the weapons vault.

F. Glazing

1) Where glass is used in windows and entrances, blast mitigation, required by the force protection criteria, may be achieved by laminated glass.

2) Glazing at wall systems and windows shall be insulated, tinted and laminated glazing units meeting requirements of wind born debris criteria, blast resistance criteria of the UFC DoD Minimum Antiterrorism Standards for Buildings and all applicable codes.

9. Finishes

A. Finishes shall be per the DG 415-1 and DG 415-5 unless otherwise noted. The Design Build Contractor shall present LAARNG with both interior and exterior finish selections for approval of material and colors.

B. VCT

1) Vinyl Composition Tile shall be 12" x 12" x 1/8" tiles with a premium color and pattern. Wall base shall be 4" x 1/8", coved, rubber and adhesively applied. Pre-molded corners shall be used.

C. Terrazzo

1) Terrazzo floor and base shall be used at all public spaces on the first floor with exception of classrooms, storage area, bathrooms, etc. refer to the architectural drawings - Room Finish Schedule.

2) The terrazzo floor to have an eight foot diameter LAARNG emblem (in color) at atrium lobby.

D. Carpet

1) Carpet shall be provided in areas as designated in finish schedule. Refer to specifications for quality and type of broadloom and carpet tile to be provided.

E. Ceramic Tile

1) CT glazed wall tile and coved base shall be 4 ½" x 4 ½" and flooring shall be 2" x 2" mosaic tile.

F. Concrete Hardening Floor Topping, Curing and Sealing Floor System

1) Provide a concrete hardening floor topping, sealed with intregal color at all areas designated in the finish schedule.

G. Dry Erase Wall Covering

1) At offices and administration space, provide a resilient wall covering material that is designed to serve as a dry-erase marker board shall be adhered to painted gypsum board partitions. Extruded aluminum pen trays shall be provided at each location of a dry-erase wall covering finish. Provide at one wall of each office and training space, refer to finish schedule.

H. Acoustic Panel Ceilings

1) Refer to finish schedule for location of 2x2 lay-in acoustic ceiling panels. Refer to specifications for quality and type of acoustical panel ceiling system.

10. Specialties

A. Tack-Boards, Bulletin Boards, Directories and Display Cases

1) Provide adequate blocking for installation of tack-boards, bulletin boards, directories and display cases provided by the Owner.

B. Lockers

1) To be metal, athletic-style lockers with doors fabricated from diamond pattern expanded steel sheet to create an open, full-venting locker unit on concrete bases. Benches are to be 1 ¼" thick hardwood laminated bench seats with shop-applied finish mounted to stainless steel pedestals.

C. Wire Mesh Partitions

1) Provide galvanized standard duty wire mesh partitions in first floor storage areas.

2) Provide baked enamel finish wire mesh partitioning in Vault 212.

D. Toilet Compartments

1) Provide overhead braced plastic laminate partitions and urinal screens in toilet rooms.

2) The shower partitions shall consist of phenolic or solid surface material.

E. Louvers and Vents

1) All exterior louvers (including mechanical louvers) shall be extruded aluminum architectural horizontal storm resistant drainable louvers in accordance with the minimum criteria as called for in the specifications, Section 10200.

F. Cannons and "Minute Man" Statue

1) Provide anchors for securing cannons (provided by Owner) to structural foundation.

2) Provide a 13 foot high bronze statue (provided and installed by Design Build Contractor) secured to structural foundation.

G. Signage

1) The signage (interior, exterior and site signage) to be provided by Owner in compliance with all applicable codes. The Design Build Contractor to install all signage and will be responsible for coordinating and scheduling fabrication, delivery and installation with the Owner. The Design Build Contractor to coordinate with the local state fire marshal the signage requirements for assembly areas and have installed prior to substantial completion.

H. Fire Protection Specialties

1) The Design Build Contractor will be responsible for installation of fire extinguisher cabinets located on drawings. The fire extinguishers will be provided by the Owner and installed in cabinets by the Design Build Contractor.

I. Accordion Folding Partition

1) Provide a pre-manufactured, automatic, rigid, flat, acoustic partition wall system that is retractable from the ceiling to allow storage of wall system and prevent damage from future flooding.

J. Toilet and Bath Accessories

1) The Design Build Contractor shall provide toilet paper dispensers; paper towel dispensers; soap dispensers; trash receptacles; sanitary dispensers and napkin disposals; stainless steel shower rods; stainless steel shower curtain hooks; shower curtains; towel hooks; robe hooks; grab bars; towel bars; mirrors; baby changing station; combination mop and broom holder, shelving and hook in all toilet room, locker room and shower room locations.

11. Equipment

A. Power Retractable Projection Screens

1) To be concealed, ceiling mounted. Coordinate installation of audio / video components and systems.

2) Projector by Owner.

B. Loading Dock Equipment

1) Provide surface mounted dock bumpers at the loading dock area adjacent to the HHB Storage 131 and Circulation 135, refer to exterior elevations.

C. Disappearing Stairway

1) Provide a one-hour rated disappearing stairway unit.

12. Furnishings

A. Foot Grilles

1) Provide stainless steel foot grills at front entrance and vestibule with intrigal drainage system.

B. Window Treatment

1) All window treatments to be provided by Owner and the Design Build Contractor will be responsible for providing adequate blocking to support the window treatment system.

C. Fixed Audience Seating

1) Provide fixed audience seating in Classroom 118 on first floor attached to concrete risers.

D. Office System Furniture

1) The office system furniture will be provided by the Owner and the Design Build Contractor will be responsible for coordinating with the Owner the layout of furniture with electrical devices, lighting, etc.

13. Special Construction

A. Vault

1) A weapons vault is to be provided at the second floor level (refer to floor plans). The Design/Build Contractor shall have the option of providing a cast-in-place concrete vault or a modular vault system providing the same level of protection as required by the ARG DG 415-1 Readiness Center Design Guide.

14. Elevators

A. Service Elevator

1) An electric traction service elevator shall be provided. The rated capacity shall be 4,000 lbs. Refer to specifications for additional requirements.

B. Material Lift

1) A hydraulic material lift system (freight elevator) shall be provided to allow for the transporting of weapons from the first floor to the weapons vault located on the second floor. Refer to specifications for additional requirements.

B-4 STRUCTURAL

1. General Description

A. The construction of the structural systems shall consist of:

1) Foundations: Based on the geotechnical report, foundations will be appropriately designed. The geotechnical report issued indicates 25 ton piles.

2) Ground Floor Framing: The ground floor slab will be a reinforced concrete one-way slab designed to span over reinforced concrete grade beams. The grade beams will span between pile caps and/or single piles.

3) Elevated Floors Framing: The elevated floor system will consist of a lightweight concrete slab poured over composite metal deck supported by composite steel beams and girders. The central plant will be a reinforced concrete frame and slab with structural steel roof framing.

4) Roof Framing: The roof framing system will be composed of a non-composite metal roof deck spanning over structural steel beams.

5) Lateral Load Resisting System: The lateral load (i.e. wind & seismic) resisting system for the building will be achieved by designing selected bays as ordinary steel moment frames.

6) Security Analysis: Due to the fact that the building is more than two stories in height, most anti-terrorism design criteria are applicable. The columns are able to stand two stories in height without lateral bracing and the exterior wall elements span vertically in order to minimize the lateral load from a blast on the columns. The central plant is very low risk and there are no special security requirements of the structure.

7) Miscellaneous framing and canopies: Steel framing will be provided at exterior roof top equipment screen walls and entrance canopies. Miscellaneous steel will be provided in coordination of appropriate masonry openings and incidental equipment support.

8) Exterior Wall System: The exterior wall system for the building is not a load bearing system and is to be specified by the Architect.

2. Codes and Standards

A. Building Codes

1) International Building Code 2003 (IBC 2003).

B. Standards

1) Code Prescribed Standards:

a. Structural Steel: AISC Manual of Steel Construction, Allowable Stress Design 9th edition, 1989.

b. Concrete: ACI Building Code Requirements for Structural Concrete (ACI 318-02).

c. Masonry: ACI 530-02/ASCE 5-02 Building Code Requirements for Masonry Structures.

d. Minimum Design Loads for Buildings and Other Structures, ASCE 7-02.

e. Steel Joists: SJI Standard Specifications and Load Tables for Open Web Joists, 41st Edition.

f. Steel Deck: SDI Steel Deck Institute Design Manual, Specifications and Commentary, Publication 29.

3. Design Criteria

A. Soil Conditions – piling required.

B. Design Loads

1) Live Loads:

a. Roof

(1) Live Load: 20 psf

(2) Snow Load, IBC 1608

(a) Ground Snow (Pg): 0 psf.

(b) Flat Roof Snow Load (Pf): 0 psf.

(c) Ce = 0.9 Exposure Factor

(d) Ct = 1.0 Thermal Factor

(e) I = 1.1 Importance Factor

(f) Terrain Category = B

(3) Rain Load IBC 1611

(g) Weight of water up to inlet of secondary drainage system: 0 psf

(h) Roofing will be adequately sloped to prevent ponding of rain water: YES

(4) Roof Design Load: Greater of Snow Load or Live Load or Rain Load.

b. Floors

(1)	Office/Classroom:	50 psf
(2)	Entrances/Stairs/Lobbies/Corridors:	100 psf
(3)	Locker Rooms/Kitchen/Restrooms:	75 psf
(4)	Unit Storage/Assembly Hall:	150 psf
(5)	Mechanical/Library/Vault	150 psf
(6)	Corridors above 1st floor:	80 psf

2) Lateral Loads

a. Wind IBC 1609.6 (Simplified Provisions for Low-Rise Buildings)

(1) Basic Wind Speed, V = 130 mph (3 second gust, 50-year return)

(2) Importance Factor, I = 1.15

(3) Exposure: B

b. Earthquake (Seismic) IBC 1616

(1) Seismic Use Groups III, $I_E = 1.25$

(2) Spectral Response Coefficients:

(i) S_S= 0.12g (from map for Site Class B)

(j) S_1= 0.05g (from map for Site Class B)

(k) Fa= 2.5 (for Site Class E)

(l) Fv= 3.5 (for Site Class E)

(m) S_{MS}=Fa x S_S= 0.125

(n) S_{M1}= Fv x S_1= 0.175

(o) S_{DS}= 2/3 x S_{MS}= 0.083

(p) S_{D1}= 2/3 x S_{M1}= 0.117

(3) Site Class: E.

(4) Basic Seismic-Force Resisting System:

(q) Ordinary steel moment frames.

(5) Response Modification Factor, R

(r) 3 ½ @ Ordinary steel moment frames.

(6) Deflection Amplification Factor, Cd

(s) 3 @ Ordinary steel moment frames

(7) Analysis Procedure: Equivalent Lateral Force

(8) Seismic Design Category: C

C. Serviceability Considerations

1) Beam Deflections:

a. Roof Beams and Joists: Live load deflection less than L/360, total load deflection less than L/240 with a maximum limit of 1.25".

b. Floor Beams: Live load deflection less than L/360, total load deflection less than L/240 with a maximum limit of 1".

2) Vibration Considerations

a. Mechanical equipment: Equipment capable of creating vibrations will be placed on vibration isolators.

3) Building Drift Due To Wind

a. Limit lateral drifts to H/500 due to 10-year return wind. H = height of building.

4) Fire rating: Locations and specific rating requirements will be coordinated and indicated on the final Architectural documents.

4. Materials of Construction

A. Concrete Strength and Reinforcing

1) Foundations: 4,000 psi

2) Cast in place concrete: 4,000 psi

3) Reinforcing bars: A615, Fy = 60 ksi

B. Structural Steel

1) Wide-flange shapes: A992

2) Hollow Structural Sections: Tubes, A500 Grade B; Pipes, A53 Grade B.

3) Other shapes and plates: A36

4) Bolts: A325, minimum size ¾".

5) Welding electrodes: E70

C. Masonry: f'm= 1900 psi

B-5 PLUMBING

1. General Description

A. This section includes the basis of design and construction for the interior plumbing systems for the Jackson Barracks 141st Readiness Center and Central Chiller Plant. This section includes installation inside the facility and out to five feet from the building's foundation foot print.

2. Codes and Standards

A. All plumbing design and construction of this project shall comply with the latest edition of the following codes and standards:

1) International Building Code (IBC)

2) International Plumbing Code (IPC)

3) International Fuel Gas Code (IFC)

4) Louisiana State Plumbing Code (LSPC)

5) ASHRAE 90.1

6) NFPA 54 – National Fuel Gas Code

3. Design Criteria

A. Plumbing System

1) Provide a complete interior plumbing system as described in the basis of design. System shall include all accessories and devices as necessary and required for a complete and workable system.

B. Quality Assurance

1) All materials and work shall be installed in accordance with industry standards and specifications of this project. Any materials or work found not in compliance shall be removed and corrected.

C. Material Standards

1) All materials, equipment, fixtures, and any other equipment associated with the plumbing system shall comply with industry standards and applicable codes. All materials shall be new and of highest grade to meet the design requirements of the design build solicitation.

D. Natural Gas

1) Above ground natural gas piping shall be black malleable iron with threaded or butt-welded fittings. Below ground piping shall be ASTM 2513 polyethylene piping with anodeless risers. Piping shall be installed in accordance with NFPA 54. Provide, pressure regulator, and earthquake valve at the building service entrance. A gas cock, union and dirt leg shall be provided at each equipment connection.

E. Domestic Water

1) All domestic water piping shall be type 'L' hard drawn copper tubing above ground and type 'K' below ground with lead free solder.

2) Domestic cold-water piping above ground shall receive minimum ½ " glass fiber pipe insulation with vapor barrier, thickness for hot water piping shall be as required by ASHRAE Standard 90.1.

3) The water piping shall be designed for a maximum flow rate of 6 FPS with the pressure loss not to exceed 2.5 psi per 100 ft. Fixture unit values shall be based on the IPC and LSPC tables.

4) A shut-off valve, turbine type water service meter with read-out in US gallons and a double check valve type backflow preventer or reduced pressure backflow preventer (as required by local codes) shall be provided at each building domestic water service entrance. A reduced pressure principle type backflow preventer shall be provided at all make-up water lines.

5) The building water incoming service shall be based on the IPC and LSPC tables to provide the domestic water to meet the building demand. The minimum demand for the building shall be 647 water supply fixture units, which corresponds to a minimum of 165 gpm, and a minimum of a 4" domestic water main shall be provided. The Design Build Contractor shall provide calculations for the proposed installation that meets the building requirements

6) A domestic water booster system shall be provided. Booster system shall be based mounted factory assembled and tested, with capacities as required to meet the minimum design requirements. System capacity shall provide for the flow requirements throughout the building with a minimum pressure at the highest point of 25 psi.

7) Metering type faucets and flush valves shall be used for water conservation and compliance with ASHRAE 90.1.

8) The hot water demand per fixture shall be based on the ASHRAE Handbook HVAC Applications 2003 Ch 49 table 8 as follows:
   a. Lavatory – 15 GPH
   b. Kitchen Sink – 20 GPH
   c. Service Sink – 20 GPH
   d. Shower – 225 GPH
   e. Demand Factor – .4 GPH
   f. Storage Factor – 1.0

9) Based on the above, the minimum projected hot water demand for the building shall be 1250 GPH with (2) 250-gallon storage tanks. The Design Build Contractor shall provide calculations for the proposed installation that meets the minimum building requirements. The domestic hot water for the building shall be provided by natural gas, high efficiency forced draft storage type water heaters with glass-lined steel tanks, polyurethane foam insulation, replaceable anodes and adjustable thermostats. The domestic hot water system shall be provided with a circulating pumps, aquastat and timer. A mixing valve shall be provided at the water heater to deliver 110 °F to the fixtures as required. Hot water shall be generated and stored at 140°F.

F. Plumbing Fixtures

1) The fixture quantities shall be as indicated on the floor plans with the following fixture types (see specifications for complete fixture descriptions):
   a. Wall mounted water closets with sensor flush valves (Restroom).
   b. ADA wall mounted water closets with sensor flush valves (Restroom).
   c. Countertop lavatories (Restroom).

d. Handicapped countertop lavatories (Restroom).
e. Wall hung lavatories (Restroom).
f. Countertop sinks two-compartment stainless steel (break room).
g. Terrazzo mop sinks.
h. Wall mounted ADA electric water coolers.
i. Non-freeze wall hydrants
j. Hose bibs.
k. 3" floor drains flush strainer type with automatic trap primers with deep seal traps.
l. Emergency eyewash station free standing floor supported unit (tempered water supply).

2) Handicapped accessible fixtures shall be located throughout the building as required for ADA compliance.

3) Isolation valves shall be provided at each toilet room and at each major branch of water piping.

4) Mechanical water hammer arrestors shall be provided at each fixture group.

G. Sanitary Sewer

1) Above ground sanitary sewer and vent piping shall be cast iron no-hub piping and fittings. Underground sanitary sewer shall be hub-and-spigot soil pipe with compression joints and fittings. A minimum 1/4" per linear foot slope shall be maintained on all sewer piping. Clean outs shall be provided as required by LSPC and IPC.

2) All sanitary sewer piping under building foundation shall be supported with stainless steel hangers, see specifications and drawings for requirements.

3) Swing joints for the sewer system shall be provided where any waste piping exits from under any pile supported foundation, see specifications and drawings for requirements.

4) The estimated building sewer demand based on the IPC and LSPC tables is 211 fixture units therefore, a 6" sewer main will be provided.

5) Floor drains shall be provided in all mechanical rooms, restrooms, and work areas that will be washed down. All floor drains shall be provided with a deep seal p-trap and trap primer.

6) Provide insulation with a vapor barrier to all waste piping that receives condensate.

H. Miscellaneous

1) All overhead utilities and other fixtures weighting 31 pounds or more shall be mounted to minimize the likelihood that they will fall and injure building occupants. All equipment mounting shall be designed to resist forces of 0.5 times the equipment weight in any direction and 1.5 times the equipment weight in the downward direction. Provide seismically supported piping and ductwork for anti-terrorist protection for the following:
   a. Gas piping 1" or larger
   b. Piping in equipment rooms 1-1/4" or larger
   c. All other piping 2-1/2" or larger

2) All above ground piping shall be identified with type of service and direction of flow. Letter size, lengths and colors shall be per ANSI A13.1.

B-6 Heating Ventilation Air Conditioning

1. General Description

A. The Cooling system shall consist of a Central Plant to provide 42 deg F chilled water to the Site Area C, and to the 141st. Field Artillery Readiness Center Building. The Plant shall contain three Chillers with constant flow primary pumping and variable flow secondary pumping for the Site loop. The Readiness Center Building shall have a variable flow Tertiary pumping system to distribute the chilled water throughout the building to the individual air handling units.

B. The heating within the Readiness Center Building shall consist of electric heaters in each VAV terminal unit or in the discharge of the constant volume air handling units.

C. A 100% outside air heat recovery unit with heat recovery wheels shall be used to pre-treat the outside air to all air-handling units. A combination of VAV and constant volume air-handling units shall be used.

2. Codes and Standards

A. The latest edition of the following codes and standards shall be applied to the HVAC design and construction of this project:

1) International Mechanical Code (IMC)

2) ASHRAE Handbooks and Standards

3) Applicable NFPA Standards (62, 90A, 92B,101)

4) ASHRAE 90.1

5) SMACNA Standards

6) ACCE TI 809-04 Seismic Design for Buildings

3. Design Criteria

A. System Design

1) The HVAC system sizing shall be calculated at the following listed conditions, to determine the building demand.

	Indoor Temperatures		Outdoor Temperatures
	Occupied	Unoccupied	
Summer	75 deg F DB 50%RH	80 deg F DB 60% RH	95 deg F DB 80 deg F WB
Winter	72 deg F	60 deg F	25 deg F

2) Outside air shall be introduced into each system based on the requirements of ASHRAE Standard 62-2004

B. Air Distribution Systems

1) Air handling units shall be provided to meet the design requirements of the design build solicitation. Units shall be variable volume type or constant volume type as scheduled on the drawings. Motors for the air handling unit fans shall be premium efficient type

with variable frequency drives or solid state starters. Direct drive plug fans shall be used when possible.

2) Conditioned air shall be provided to each control zone via variable frequency drive air handling units and pressure independence VAV terminal units with electric heating coils. Each unit shall have minimum airflow set points to ensure positive building pressurization and control of the Indoor Air Quality as required by ASHRAE 62.

3) A total energy (enthalpy) type energy recovery outside air unit shall be provided to recover the energy of the building entire exhaust system and pre treat and dehumidify the outside air introduced into each air handling system.

C. Atrium Smoke Control System

1) The atrium consists on a four story vertical space with communicating spaces separated by one hour rated construction. The smoke control system shall; maintain a tenable environment in the means of egress spaces during the time required for evacuation; control the migration of smoke between the fire area and adjacent areas; aid in post-fire smoke removal; and contribute to the protection of life and the reduction of property loss. The fundamental philosophy of atrium smoke control systems is to manage the smoke generated by a fire to prevent the smoke from migrating from a communicating space to an atria or vice versa. If a fire in the atrium is generating smoke, the smoke control system will remove smoke from the atrium via the atrium smoke exhaust fans to limit the depth of smoke accumulation in the atrium and to keep the atrium under negative pressure with respect to the communicating spaces.

2) The Contractor shall provide the calculations that establish the design requirements of the smoke management system. These calculations shall be as directed in NFPA 92B and the IBC and shall establish the airflow quantities, airflow velocities and system activation times.

3) The air flow quantities shown on the drawings are to be considered a minimum to only be use as a guide for the final design by the design build Contractor. The entire smoke control system shall be designed and installed to meet all the requirements of NFPA 92B and the IBC.

4) Makeup air shall be introduced at the 1st level. The smoke exhaust fans shall be UL listed to handle air temperatures of 1000° F or higher. The smoke control system shall be powered from normal and emergency power sources. The entire smoke control system including the fans and dampers shall be connected to the building fire alarm system.

5) The smoke control system shall be activated by both manual and automatic means. Spot type smoke detectors around the floor openings on each level of the atrium, automatic sprinkler system waterflow, projected beam smoke detectors at the 2nd floor ceiling, and manual controls at the Fire Command Center shall be the means of activation for the atrium smoke control fans.

6) The smoke control system shall include operational testing for all means of activation. A test and balance report for all fans and makeup air openings shall be provided to ensure that actual airflows meet the design requirements.

D. Chilled Water System

1) The chilled water system shall consist of three water cooled centrifugal chillers with each unit's capacity to meet 50% of the design requirements of the design build solicitation. Minimum chiller capacities shall be as scheduled. Contractor shall provide calculations to verify that the capacity of each chiller is equal to 50% of the total site chilled water demand (including the future Museum Area).

2) Chillers shall have condenser water provided by updraft crossflow open cell cooling towers with capacities based on 95 degrees F DB and 80 degree F WB ambient conditions sized to match the peak chillers requirements. Condenser water bypass shall be provided.

3) The chilled water pumping system shall consist of a constant flow primary loop, a variable flow secondary loop to serve the buildings (including the future Museum Area) and tertiary variable flow loop inside the buildings. The cooling towers shall have variable speed controls on the fans that are controlled by the tower basin temperature. Each pumping system shall have one pump for each chiller and tower for the primary loops and a 100% standby pump for each system. The secondary and tertiary pumps shall have a 100% standby pump for each system and loop. Pumps shall be centrifugal with motor, motor starter, and motor enclosure conforming to NEMA standards. Pumps shall be insulated.

E. Heating System

1) The heating system shall consist of resistive electric heating coils with capacities to meet the design requirements of each zone as indicated on the drawings.

F. Vibration Isolation

1) Housekeeping pads and vibration isolators shall be provided under all floor-mounted equipment.

2) All motor-connected equipment shall be considered a source of vibration and shall be isolated to prevent vibration and sound transmission. Work shall include furnishing, installing and testing all material required for complete execution of the vibration isolation system. Specific reference to isolation under equipment headings is to provide additional information by which proper selection of the required isolation may be made. Equipment specification data showing physical size, bearing points, weights per point, rotating speeds and sound power levels generated shall be furnished by the respective equipment supplier to the vibration isolation supplier after equipment submittals have been approved.

G. Maintenance

1) Based on the requirements of the design-build solicitation the following major system components that require scheduled and heavy maintenance will be used:
   a. Water-cooled chillers
   b. Cooling towers.
   c. Pumps
   d. Modular construction double wall air handling units with adjustable frequency drives with single point power.
   e. VAV terminal units with electric heating coils.
   f. Heat recovery unit with double wall construction and rotor seals to limit cross contamination.
   g. Exhaust system for Mechanical, Toilet Rooms, locker rooms and Janitor's Closets.

H. Ductwork / Diffusers / Grilles / Louvers

1) All medium pressure ductwork between the terminal box and the air-handling unit shall be sized based on the equal friction method using 0.2 inch per 100' duct length.

2) All low-pressure ductwork from the terminal box to the diffuser shall be sized based on the equal friction method using 0.1 inch per 100' duct length.

3) The duct velocity shall not exceed 1800 FPM.

4) The ductwork shall be constructed according to ASHRAE and SMACNA standards.

5) Ductwork shall be galvanized steel insulated with 2" fiberglass ductwrap.

6) The backs of all diffusers shall be insulated.

7) Dynamic fire dampers shall be provided in penetrations of fire-rated partitions.

8) Anodized aluminum alloy outdoor air and exhaust air louvers with bird screens shall be used.

9) The air distribution system shall be designed for a noise criterion of 25 to 35 dB in the occupied spaces.

10) The air distribution of each zone and space shall be designed to provide the indoor air quality and accomplish a ventilation effective value of 0.9, as defined and required by ASHRAE 62.

I. Mounting

1) All overhead utilities and other fixtures weighing 31 pounds or more shall be mounted to minimize the likelihood that they will fall and injure building occupants.

2) All equipment mounting shall be designed to resist forces of 0.5 times the equipment weight in any direction and 1.5 times the equipment weight in the downward direction.

3) Anti-Terrorist Protection

a. Provide seismically supported piping and ductwork for anti-terrorist protection for the following:

(1) Piping in equipment rooms 1-1/4" or larger

(2) All other piping 2-1/2" or larger

(3) Rectangular ductwork 6 sq ft or larger

(4) Round ductwork 28" or larger

J. Piping

1) Above ground chilled and condenser water piping shall be electric resistance welded or seamless Schedule 40 black steel pipe conforming to ASTM A 53. Piping 4" or smaller may be Type K copper.

2) Underground chilled water piping shall be factory-prefabricated, pre-insulated steel or steel with field installed high-density cellular glass as described in the design build solicitation.

3) Above ground chilled water piping shall be insulated with cellular glass, ASTM C552, Type II, Grade 2.

4) All above ground piping shall be identified with type of service and direction of flow. Letter size, lengths and colors shall be per ANSI A13.1.

K. Direct Digital Control (DDC) System

1) A direct digital control (DDC) system shall be provided.

2) The DDC system shall comply with Direct Digital Control systems specification of the design build solicitation.

3) The DDC system shall be capable of off site connection to the LAANG State Facility Energy Monitoring system as specified in the design build solicitation.

L. Testing and Balancing

1) A certified test and balance contractor shall perform a complete test and balance of all air and hydronic systems.

2) Test and balance procedures shall comply with the design build solicitation.

M. Commissioning

1) Contractor shall prepare a detailed commissioning procedure for both the basic plan and the advanced plan to attain Spirit Points.

N. SPiRiT – Sustainable Goals

1) Spirit points shall be developed towards a GOLD certification as here in after listed. Design Build Contractor shall provide documentations and calculations to verify points credited. A public sector life cycle cost analysis shall be performed on the SPiRiT design and compared to the base condition described below to verify the energy savings of the SPiRiT design.

O. Life Cycle Cost Analysis

1) Design Build Contractor shall provide a public sector Life Cycle Cost Analysis to show that the design meets the minimum target as defined in ASHRAE 90.1.

B-7 Electrical

1. PURPOSE

A. The information contained in this electrical narrative, in the electrical performance specifications, and on the electrical drawings represents a 35% design effort and is intended only to set minimum standards of performance for the electrical systems. The onus is on the final design professional to provide final calculations, drawings, and specifications based on final Architectural, Structural, and Mechanical plans and information.

2. Referenced Codes and Standards

A. The following references shall apply to, and be a part of, the electrical design:

1) NFPA 70 National Electric Code
2) NFPA 72 National Fire Alarm Code
3) NFPA 90A Standard for the Installation of Air Conditioning and Ventilating Systems (2002 Edition).
4) NFPA 101 Life Safety Code
5) NFPA 110 Emergency and Standby Power Systems
6) NFPA 780 Installation of Lightning Protection Systems
7) ASHRAE Standard 90.1-2004: Energy Standard for Buildings Except Low Rise Residential
8) International Building Code
9) ADAAG
10) Uniform Federal Accessibility Standards (UFAS)
11) IESNA Handbook
12) Telecommunications Industry Alliance / Electronic Industry Alliance (TIA/EIA) Communication Standards
13) Institute of Electrical and Electronic Engineers (IEEE) Standards
14) ANSI C-2: National Electrical Safety Code
15) American Society for Testing Materials (ASTM)
16) National Electrical Manufacturers Association (NEMA)
17) Underwriter Laboratories, Inc. (UL)
18) Building Industry Consulting Services International (BICSI)
19) Army National Guard Design Guide DG 415-1 Readiness Centers
20) Army National Guard Design Guide DG 415-5 General Facilities Information
21) Army Regulations (AR), Technical Guides and Manuals, and United Facilities Criteria (UFC) referenced by the above Army National Guard Design Guides, including, but not limited to, the following:
    a. UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings
    b. UFC 4-020-04A Security Engineering: Electronic Security Systems

c. UFC 4-021-01 Design and O&M: Mass Notification Systems
d. UFC 3-400-01, Design: Energy Conservation
e. Army Regulation 420-49, Utility Services
f. Army Regulation 11-27, Army Energy Program
g. United States Army Corps of Engineers (USACE): Sustainable Project Rating Tool (SpiRiT)
h. Army Regulation 190-11: Physical Security of Arms, Ammunition, and Explosives
i. Army Regulation 190-51: Security of Unclassified Army Property (Sensitive and Nonsensitive)
j. Army Regulation 420-49: Utility Services Occupational Safety and Health Administration (OSHA) Regulations
k. Technical Guide for Installation Information Infrastructure Architecture, Technical Guide I3A

3. General Electrical Design Description

A. The design shall be based on the Army National Guard Design Guides, which seek to achieve sustainable, energy-efficient, secure, safe, functional, flexible facilities projected to be used for 70+ years.

B. Systems shall be energy efficient. The design shall strive to achieve the USACE SPiRiT Gold Level Rating. The design shall seek to achieve these standards with energy efficient light fixtures and extensive, integrated lighting and dimming controls.

C. An emphasis shall be placed on power quality to limit the amount of harmonic currents and transients present in the distribution system.

D. An emphasis shall be placed on security, anti-terrorism, and force protection. Security systems shall be designed in accordance with referenced UFC criteria.

E. An emphasis shall be placed on hurricane and flood resistant construction. Critical electrical systems shall be elevated. Wiring methods on the first flood shall be flood resistant.

4. Design Criteria

A. Preliminary Code Analysis

1) For each of the buildings within this scope of work, the final design professional is directed to review the Code analysis set forth by the Architect in conjunction with the information stated herein to set forth electrical system code requirements.

2) 141st Field Artillery Battalion:

a. The primary Occupancy Type is Business, with secondary occupancies including Assembly and Storage. The building will be sprinkled under another division of work. The building is less than 75-feet to the highest occupied floor and is therefore not considered a high-rise.

3) 141st / 61st Central Chiller Plant Building:

a. The primary occupancy is Storage with a small amount of square footage dedicated to Business Occupancy. The communicated, intended use of the building is for the housing of mechanical equipment to serve chilled water to a select group of buildings on the site. It has been stated that it is the intention of the LAARNG for this building to be un-manned, except during times of service or maintenance. Total occupancy at any given time will be minimal. The building will be sprinkled under another division of work.

4) OMS 12 Vehicle Maintenance Facility:

a. The primary occupancy is Industrial with secondary occupancies of Storage and Business. The building is not sprinkled. All normally unoccupied storage areas shall have automatic fire detectors listed for the environment in which they will be installed.

B. Preliminary Load Calculations

1) Preliminary load calculations, based on square footage and preliminary mechanical loads are as follows:

a. 141st Field Artillary Batallion:

(1)	Lighting / Receptacle:	5VA per square foot times 125,000 square feet = 625 kVA
(2)	Electric Heat:	About 425 kW
(3)	Mechanical AHU's:	About 150 kVA
(4)	Atrium Exhaust Fans:	About 75 kVA
(5)	ERV's:	About 60 kVA
(6)	CU's:	About 75 kVA
(7)	Tertiary CHWP's (2):	About 45 kVA
(8)	DWP's:	About 10 kVA
(9)	Elevators:	About 100 kVA ? (No information available).
(10)	Miscellaneous:	About 35 kVA
(11)	25% Spare:	400 kVA
(12)	Total:	2000 kVA

(13) Service size shall be a minimum of 2000 kVA.

b. Central Chiller Plant:

(1)	Lighting / Receptacle:	3VA per square foot times 4000 square feet = 12 kVA
(2)	(4) Chillers:	About 1300 kVA
(3)	(4) Cooling Towers:	About 125 kVA
(4)	(5) Primary CHWP's:	About 60 kVA
(5)	(3) Secondary CHWP's:	About 200 kVA
(6)	(5) CWP's:	About 150 kVA
(7)	Electric Heat:	About 25 kW
(8)	Miscellaneous:	About 28 kVA
(9)	25% Spare:	0 kVA (Additional Chillers, pumps, etc, already figured above).
(10)	Total:	1900 kVA

(11) Service size shall be a minimum of 2500 kVA.

c. OMS 12 (Renovation of Existing Building):

(1) Existing service is 400-amp, 240-volt, closed delta, which corresponds to a maximum of 166 kVA. The panel would be typical for a 150 kVA service. Minimum service size shall remain 150 kVA. Service should be changed to 208-volt, 3-phase, 600-amp to eliminate the "stinger leg" of the 240-volt delta service. Lighting panels can then be changed to 3-phase and the load can be better balanced.

C. Special Equipment Power Requirements

1) Training Device / Simulation Equipment: Final design professional shall obtain power requirements for the equipment from the vendor.

D. Statement Of Electrical Equipment Above Flood Plain

1) For new construction, all electrical distribution equipment, control equipment, power supplies, special systems equipment, LAARNG-furnished telecommunications equipment, and any other critical equipment shall be installed on or above the second floor.

2) For building renovations with only a single floor, equipment shall be elevated as high as code will allow and shall be protected as best as possible from damage through the use of NEMA 4X stainless steel enclosures, cast weatherproof boxes, rigid galvanized conduit (in lieu of EMT), waterproof mastic at splices and terminations, and other means as economically feasible.

3) Receptacles on the First Floor of all buildings shall be GFI-type, mounted 48-inches above the floor.

4) Fire Alarm and Security monitoring and control equipment in the Security Office of the 141st Readiness Center shall be limited to annunciators and workstations that will not compromise the normal operations of those systems, should the Security Office be flooded.

5) All main electrical distribution equipment, dry-type transformers, service connections, switchgear, etc., shall be located at elevations above the anticipated flood levels, or otherwise protected from potential flood hazards. Interior electrical equipment in such flood-prone areas shall be installed, whenever practical, on upper-floors or other suitable levels that are higher than anticipated flood levels, and interior building electrical wiring shall be suitable for wet locations.

E. Spare Capacity

1) The design shall allow for future expansion of each building. A minimum of 25% spare capacity shall be provided on all electrical distribution equipment, lighting control systems, communication systems, and alarm and detection systems.

F. Site Electrical Utilities

1) The final design professional shall be responsible for the final coordination of all building electrical services with the infrastructure designer and with the LAARNG.

2) Utility tie-ins shall be directionally bored wherever possible. Trenching shall be avoided, unless deemed absolutely necessary. Minimum boring depths shall be 8-feet below grade for medium voltage cables, 6-feet below grade for 600-volt and lower power cables, and 4-feet below grade for telephone, data, and other low voltage cables. Telecommunications and special systems conduits shall be separated from power conduits by a minimum of 24 inches. Where conduits are directional bored, use HDPE conduits with smooth interiors and integral tracer wire. Warning tape shall be provided above all underground conduits at a depth of 12-inches below grade.

3) Electrical Power:

a. A 25kV underground, primary electrical distribution loop will be provided for the entire campus as part of a separate project. A 3-way medium-voltage sectionalizing cabinet will be installed for each building / area requiring electrical power.

b. The design/build contractor shall furnish and install an oil-filled, medium-voltage, pad-mounted 25kV Delta : 480v Wye, 3-phase transformer, unless noted otherwise, for serving electrical power to each building or area. The transformer shall be filled with BioTEMP or equivalent non-toxic, non-flammable oil.

c. A "duct bank" shall be constructed from each building or area oil-filled transformer to the designated sectionalizing cabinet to provide primary electrical service to the building. The duct bank shall be constructed utilizing a minimum of (2) 5" conduits. The duct bank shall be concrete encased where required by the LAARNG. If encasement is not required, the conduits should be directional bored.

d. The design/build contractor shall be responsible for installing cables and making final connections between the sectionalizing cabinet and the transformer as well as between the transformer and the building / area requiring electrical service.

4) Telecommunications:

a. Empty conduits with pull cords shall be provided for telecommunications and data connectivity to each building. The infrastructure designer for the site, under a separate contract, will furnish multi-pair copper and / or fiber optic cabling to each building. Interior cabling inside of each building shall connect to that provided. Single-mode and/or multi-mode fiber shall be utilized, as determined by the specific communications requirements of the LAARNG.

b. A Communications "duct bank" shall be constructed from each building to the designated site infrastructure telecommunications manhole to provide pathway for the required cabling connections. The duct bank into the building shall be constructed utilizing a minimum of (4) 4" conduits. The duct bank shall be concrete encased where required by the LAARNG and sloped toward manholes to prevent moisture from entering the Facility. If encasement is not required, the conduits should be directional bored.

5) Alarm, Detection, and Notification Systems (ADNS):

a. Fire Alarm / Mass Notification: The design/build contractor shall supply connectivity to each building via multi-pair copper and /or fiber optic cabling for the Fire Alarm System (Mass Notification system requires empty conduits and pull cords only). Cabling shall connect to that provided by the infrastructure designer for the site. Copper, single-mode and/or multi-mode fiber shall be utilized, as determined by the specific requirements of the system and of the LAARNG. An ADNS "duct bank" shall be constructed from each building to the designated site infrastructure manhole to provide pathway for the required cabling connections. The duct bank shall be concrete encased where required by the LAARNG and sloped toward manholes to prevent moisture from entering the Facility. Provide a minimum of (2) 2" conduits in the ADNS duct bank for the required cabling connections.

b. Security (Intrusion Alarm, Access Control, CCTV): The design/build contractor shall coordinate required connectivity to each building for security systems. Provide a minimum of (6) 2" conduits in the ADNS duct bank for the required cabling connections.

6) Energy Management Systems:

a. Contractor shall supply a minimum of (2) empty 2" conduits with pull cords from each building to the designated site infrastructure manhole to provide pathway for the required cabling connections. The mechanical design/build contractor shall provide cables and connections for the EMS.

G. Basic Materials And Wiring Methods / Building Prep Conduits and Cable Trays

1) Raceway shall be EMT, except where exposed to physical damage or in wet (or potentially flooded) locations, in which case raceway shall be Rigid Galvanized Steel (RGS). All conduit below the second floor of a building shall be RGS. Underground circuits shall utilize HDPE or PVC.

2) Conductors and cables for Power and Lighting circuits shall be routed in conduit.

3) Fire Alarm system cables shall be routed in conduit.

4) Rough-ins shall be provided for Security System devices. Coordinate system requirements with the LAARNG and provide conduit paths and boxes as required for security system installation. Security system cables shall not be routed in tray or exposed above ceilings.

5) Communication cables shall be routed in tray and conduit.

6) Final connections to vibrating equipment (such as dry-type transformers and electric motors) shall be made with Liquidtight, Flexible, Metallic Conduit (LFMC).

7) Power and lighting systems wiring shall be designed and installed in conduit suitable for the intended application. RGS shall be used in areas exposed to moisture, within mechanical rooms less than six feet above finished floors, and in other locations where damage is likely to occur. Conduits installed in concrete slabs or underground duct banks shall be PVC or HDPE type. Rigid galvanized steel elbows turned up through the finished slab shall be used where elbows are subject to possible damage. All connections to motors, transformers, and other equipment subject to vibration shall be made with flexible metal conduit.

8) Unless specific wiring materials are otherwise required by DG 415-1, DG 415-5 or to meet other required equipment applications, wiring on the first and second floors shall be suitable for wet applications to reduce potential flooding damage.

9) Oversized neutral conductors (at least 175%) on 3-phase circuits shall be provided for IT/Telecom loads to reduce heating and voltage drops on the neutral conductors.

10) Branch circuits shall be sized so as not to exceed a 3% voltage drop from the branch circuit panelboard to the last device on the circuit. This shall allow an additional 2% voltage drop to occur in the distribution system and still comply with the NEC suggested 5% maximum voltage drop.

H. Grounding

1) A grounding system shall be designed and installed for each facility that will serve as the building AC protective grounding system. The AC protective grounding system shall be bonded to the service entrance equipment, building steel, and domestic water service piping per NEC requirements.

2) A main ground bar (MGB) shall be installed in each Main Electrical Room and shall be the point of connection between the grounded equipment within the building and the exterior grounding systems. Secondary ground bars (SGB) bonded to the MGB shall be located in the Main Telephone Rooms. Equipment chassis, racks, and cable trays within the telephone rooms shall be bonded to the SGBs.

3) Each branch circuit shall contain an equipment grounding conductor sized in accordance with NEC requirements.

4) A separate telecommunication ground system shall be provided consisting of a Telecommunication Main Ground Bus (TMGB) in the Main IT Rooms connected to the

Main Electrical Service Entrance Ground bus and building steel. All racks and equipment in the main and Remote IT Rooms shall be grounded to the TMGB or TGB.

I. Building Lightning Protection

1) A Lightning Protection System (LPS) shall be designed and provided for each building and associated external elements, such as electric service platforms, etc., to meet UL Master Label requirements. The LPS shall consist of air terminals placed on the roof structure and bare copper lightning protection conductors. LPS down conductors shall be concealed within the building structure in PVC conduit and terminate at ground rods. The LPS shall be bonded to the building grounding electrode system per NFPA 780 and NEC requirements.

J. Emergency Power

1) A standby generator power system for the Central Chiller Plant, and the 141st and 61st Readiness Centers shall be located outdoors and used during power outages. The generator shall be located on the Central Chiller Plant Cooling Tower Platform, and similarly protected against flooding hazards. Automatic transfer switches shall be used to automatically transfer connected loads to generator power. Generator power shall be provided to supply power to emergency systems, essential operating systems, Communication Systems, Security Systems, and Life Safety systems.

2) The final design professional shall be responsible for final generator sizing calculations. Preliminary calculations are based on known and estimated emergency loads for the Central Chiller Plant, the 141st Readiness Center, and the 61st Readiness Center at the time of the 35% submission.

K. Uninterrupted Power Supply (UPS)

1) Uninterruptible Power Supplies will be furnished by the LAARNG for communications systems components. No other UPS systems will be provided.

L. Power Quality and Distribution

1) Main Switchboards and all designated or critical lighting and distribution panelboards shall be provided with integral Transient Voltage Surge Suppression.

2) Panelboards serving telecommunications equipment or other non-linear loads shall be provided with 200% rated neutral busses.

3) Dry-type transformers shall be of the energy efficient, harmonic filtering type.

4) Variable Frequency Drives (VFD's - furnished by Division 15) shall be isolated from the power distribution system by implementing filtering at the input to the VFD.

5) The final design professional shall provide a short circuit and device coordination study for each building and shall provide all device settings to assure coordination of the distribution system and proper short circuit protection. All electrical distribution equipment shall be fully rated for the calculated short circuit currents (series rated equipment shall not be allowed).

6) The primary building service voltage shall be 480Y/277 volt 3-phase, 4-wire, unless noted otherwise. The main distribution switchboards shall be located on the second floor, above anticipated flood level. Transient Voltage Surge Suppression (TVSS) devices and a multifunction digital meter, capable of reporting through the building automation system (BAS), shall also be installed in conjunction with the main building switchgear.

7) Branch circuit panels, rated at 480Y/277 Volt, shall provide power for lighting and large mechanical equipment. Dry-type transformers feeding 208Y/120 Volt panelboards shall

be used to transform the voltage where necessary to serve receptacle loads and small motor loads. Transformers shall be double-shielded, energy efficient, harmonic filtering type. Transformers and panels shall be located in electrical closets distributed to reduce branch circuit length. Where practical, transformers and panelboards shall be located above predicted flood levels.

8) Power and electrical fixtures located in hazardous environments, such as battery rooms, battery charging locations, flammable storage areas, and weapons/ammunition storage areas shall be explosion-proof and rated in accordance with the applicable hazard classification requirements.

M. Building Illumination (Exterior and Interior)

1) Building mounted lighting fixtures shall be used to provide illumination in the immediate vicinity of the building. Pole-mounted lighting fixtures shall be used to illuminate POV and military parking in the vicinity of the facility. Poles shall be mounted on suitable concrete bases.

2) Lighting levels for military vehicle storage lots shall extend 30-40 feet beyond the fence line but not past the edge of the LAARNG property line. Pathway lighting shall be provided along the walkways from the parking lot to the building entrance. In addition, lighting shall be provided for site features, including flagpoles and signage.

3) Lamps used shall match Louisiana Army National Guard standards. If no applicable Louisiana Army National Guard standards exist, metal halide lamps shall be proposed.

4) Exterior lighting fixtures shall be selected to reflect the historic fabric and character of the facility, and shall use full cut-off optics and be aimed and oriented such that no direct beam illumination leaves the site or encroaches on other areas with different lighting needs. Fixtures shall match those chosen by the site master planner.

5) Lighting levels shall be in accordance with NGB DG 415-1, DG 415-5, any requirements identified in the Threat/Risk Assessment Report for the facility, ASHRAE 90.1, SPiRiT, and IESNA recommendations for exterior lighting as stated in the *Lighting Handbook, 9th Edition*. General lighting illumination level requirements for Readiness Centers are contained in the DG 415-1.

6) Building-mounted exterior lighting shall be Metal Halide, HID sources controlled by photocell and the BMS supplied under Division 15. Metal Halide is chosen over High Pressure Sodium (HPS) because of its color rendering properties versus HPS and to complement color, video surveillance systems.

7) Exterior light fixtures shall be full cut-off, Dark Skies compliant to meet SPiRiT requirements.

8) Where ceilings are to be installed, recessed lighting fixtures shall be used. In areas where computer terminals are to be used extensively, recessed direct-indirect fixtures shall be used to reduce glare on the displays. Unfinished spaces, and spaces with an exposed ceiling shall use surface or pendant mounted fixtures.

9) Emergency egress lighting shall be provided per NFPA 101 requirements. All emergency lighting shall be powered from emergency power and configured such that it will automatically operate upon loss of normal power. Battery ballasts integral to selected fixtures shall provide emergency egress lighting. Emergency lighting fixtures shall be located to provide an average of 1 fc (10 lux), but no less than 0.1 fc (1 lux), along the egress path.

10) T8 and T5HO linear fluorescent lamps and compact fluorescent lamps shall be low mercury tri-phosphor lamps with a minimum color rendering index (CRI) of 80.

11) All ballasts used with fluorescent lamps shall be electronic instant start or programmed start (for T5HO) with a total harmonic distortion (THD) less than 10%.

12) Lighting levels shall be in accordance with NGB DG 415-1 DG 415-5, NFPA 101, and IESNA recommendations for interior lighting as stated in the IES Lighting Handbook.

13) Interior fixtures shall be lamped with energy efficient, fluorescent and compact fluorescent sources. Incandescent sources shall be limited to small, specific applications where the alternative source would be cost-prohibitive.

14) Lighting in classrooms shall be light-controlling parabolics to complement A/V presentations.

N. Lighting Controls

1) Automatic occupancy sensor controls shall be provided in normally occupied rooms like offices and shops. In normally unoccupied spaces, such as storage and supply rooms, electronic timer switches shall be provided. Interior lighting controls shall be interfaced to the Building Management System.

2) Multi-Level or dimmable lighting shall be provided in selected areas per DG 415-1, DG 415-5, ASHRAE 90.1, and SPiRiT.

3) Daylight harvesting shall be implemented in large open areas with windows.

4) Addressable (separately controlled) fixtures shall be provided for the Assembly Hall of the 141st Readiness Center to promote flexibility in area usage.

5) Lighting controls and dimming shall be through centralized, programmable systems that interface the BMS provided under Division 15.

O. Energy Management Systems

1) Building Management Systems (BMS) will be specified by the Mechanical Contractor and interfaced by the Power Distribution System and by the Lighting/Dimming Controls System.

2) The Main Switchboard of the power distribution system shall be equipped with multifunction digital meters capable of interfacing the provided BMS.

3) The Lighting/Dimming Controls System shall interface whatever BMS is provided via open protocol (LonWorks, BACNet, Modbus) or via specific gateways if required to interface proprietary BMS's.

P. Fire Alarm System / Future Mass Notification System

1) Each facility shall be provided with a complete Simplex (or 100% compatible with Simplex) UL-Approved addressable fire alarm and detection system. In addition to local building annunciation, each system shall provide remote fire alarm reporting to an emergency dispatch center, the local public fire station, and a minimum of (6) additional contacts to be determined. The A-E shall coordinate remote connection requirements with the LAARNG.

2) Each fire alarm system shall be capable of integrating with the future Jackson Barracks campus wide combination fire alarm and mass notification system. Future integration with this system shall assure that mass notification messages provided at the Readiness Center are part of, and coordinated with, the campus wide emergency messages and alerts issued by Jackson Barracks for the purpose of notifying all tenants. Coordinate future Mass Notification System Requirements with the LAARNG and with UFC 4-021-01 Design and O&M: Mass Notification Systems.

3) Each system shall be designed in accordance with the applicable provisions of the National Electric Code (NFPA 70), National Fire Alarm Code (NFPA 72), Life Safety Code (NFPA 101), Army National Guard DG 415-1, Army National Guard DG 415-5, UL Standards, UFC 3-600-1, Americans with Disabilities Act (ADA), and Uniform Federal Accessibility Standards (UFAS). The system shall be designed and installed to meet all Louisiana State Fire Marshal requirements.

4) Each system shall include a Fire Alarm Control Panel, Voice Command Centers, Remote Annunciator panels , manual fire alarm stations, smoke and thermal detectors, provisions for monitoring fire protection systems, and combination audio-visual occupant notification devices as appropriate.

5) Manual fire alarm stations shall be addressable, double action, non-break glass, and key re-settable. They shall typically be located at exits and other locations as required by applicable codes and standards.

6) Audio-visual occupant notification devices (strobes and combinaton speaker-strobes) shall be wall or ceiling-mounted at strategic locations so as to be heard and seen in all portions of the buildings. Fire alarm signals shall be annunciated audibly through the speakers (using tones) and shall flash the visual indicating devices.

7) Smoke detectors shall be located in all normally unoccupied areas, and other areas as required. Smoke detectors shall be addressable, photoelectric types with integral LED indicators, unless otherwise noted.

8) Each fire alarm system shall be provided with a battery back-up system and shall be connected to the building emergency power source. All Fire Alarm cabling shall be installed in conduit.

9) The Fire Alarm System shall have the following required features.
   a. Double action, push-pull type, addressable, manual stations at Stairwells and exit doors in the path of normal egress.
   b. Analog, addressable, photoelectric smoke sensors in all Elevator Lobbies, Elevator Pits, and top of the Elevator Shafts.
   c. Analog, addressable heat sensors (fixed and rate-of-rise type) shall be provided within 2-feet of every sprinkler head serving the Elevator Machine Rooms, the Elevator Pits, and the top of the Elevator Shafts.
   d. Elevators shall be recalled whenever the presence of smoke is detected in any of the Elevator Pits, Elevator Shafts, Elevator Machine Rooms, or Elevator Lobbies.
   e. Elevators shall be shunt-tripped whenever the presence of heat is detected in any of the Elevator Pits, Elevator Shafts, or Elevator Machine Rooms.
   f. Analog, addressable, photoelectric, duct-mounted smoke sensors shall be provided in the supply and return duct of all AHU's.
   g. Addressable relays shall shut down AHU's whenever the associated, duct-mounted smoke sensor detects the presence of smoke in the duct.
   h. Sprinkler System Flow and Tamper switches shall be monitored.
   i. Audible notification shall be via speakers (recorded and live voice messages).
   j. Visual notification shall be provided in accordance with the ADAAG and NFPA 72. Strobes on the same circuit (and in the same room) shall be synchronized.
   k. System shall implement distributed, network, token-ring architecture with control panels located on floors 2, 3, and 4.
   l. Class A, Style Z Notification Appliance Circuits (NAC's).
   m. Class A, Style 6 Signaling Line Circuits (SLC's).

n. Class A, Style 7 Communication Circuits, including the tie-in to the campus system.

o. Class A, Style Z audio circuits between floors and at the tie-in to the campus system.

p. Battery backup for 24-hours supervisory and 15-minutes of alarm.

q. System shall connect to existing Simplex Fire Alarm System Network on the Jackson Barracks campus.

Q. Electronic Security Systems (Access Control System, Intrusion Alarm System, CCTV System)

1) The design for electronic security systems shall consist of communications backbone infrastructure, 120 VAC power, conduit raceways, backboxes and associated backbox cover plates to support the installation of security systems required by the National Guard, UFC 4-010-01 "Minimum Anti-terrorism Standards for Buildings," and UFC 4-020-04A "Security Engineering: Electronic Security Systems." The design shall include support for Electronic Entry Control System (EECS), Closed Circuit Television System, (CCTV) and perimeter intrusion detection system (PIDS), if the PIDS is required to meet antiterrorism/force protection requirements resulting from the AT/FP threat/risk assessment. These systems shall connect to a monitored central alarm facility located at the Jackson Barracks installation.

2) The final design professional shall coordinate with the National Guard Bureau and designated Louisiana National Guard representatives to determine specific security system requirements. Electronic intrusion detection systems shall be provided and monitored by a commercial security system provider. It has been established that the 141st Readiness Center EECS shall be a Lenel Systems International, Inc. (contact Bill Morehouse 713-937-7936 direct or 585-248-9720 corporate) Electronic Entry Control System to ensure standardization with other LAARNG systems. The EECS shall be partitioned into separate (exclusive) security zones to provide for the needs of the Readiness Center separately from other facilities. All security systems provided for the Readiness Center shall be completely compatible and coordinated with those used at the adjacent Jackson Barracks facilities. The final design professional shall coordinate security system requirements for the Readiness Center with the other facilities during design to ensure compatibility between projects and facilities

R. Public Address / Paging System

1) Paging Systems shall be telephone type and integrate with the LAARNG-provided telecommunications equipment.

2) A central PA system shall be provided in each facility with the head end amplifier and zone paging equipment being located in the Main Telecomm Room (MDF). Speakers shall be located throughout the facility interior and at locations on the exterior to allow pages to be heard in each room as well as on the surrounding grounds. The system shall be integrated into the telephone system to allow paging from telephone handsets. Telephone station dialing access restrictions and access codes shall be utilized to prevent unauthorized persons from making pages.

S. Communication Systems

1) Category 6 cables shall be provided for voice and data. Cables shall be routed above accessible ceilings in tray, back to the Communication Room for that Floor. Cables for the First Floor shall be routed to the Second Floor Communication Room.

2) A complete, standards-based structured cabling system shall be provided within each building. Cabling, pathways and technical spaces shall be provided for support of Telecommunications, Data Networks and secure/specialty communication systems. A combination of multi-pair copper and fiber optic cabling systems shall be provided based on LAARNG Standards and requirements for the facility. Cable containment shall be provided utilizing a cable tray and conduit system for horizontal and backbone cabling systems. Cable standards (cable performance Category) to be installed shall be per current LAARNG IT/Telecomm standards and EIA/TIA standards, but should be a minimum of Category 6, compliant with current Industry Standards.

3) Telecommunications:
   a. Telephone (Voice) communications shall utilize multi-pair copper cabling for Telephone (Voice) communications shall utilize multi-pair copper cabling for horizontal and vertical (backbone) connectivity. Telephone systems shall utilize structured cabling systems and administration points. LAARNG provided telephone equipment shall be located in equipment rooms and be interconnected to site cabling system.

4) Network Communications:
   a. Data Communications shall utilize a combination of multi-pair copper and fiber optic cabling for horizontal and vertical (backbone) connectivity. Data network shall utilize structured cabling systems and administration points. LAARNG provided network equipment shall be located in equipment room and be interconnected to site cabling systems.

5) Secure Communications / Networks:
   a. If required, separate, dedicated pathways and spaces are to be provided for LAARNG secure networks and communications systems. Specific requirements shall be coordinated with the LAARNG.

6) Telecommunication Rooms:
   a. The Main Equipment Room shall house the LAARNG-provided Main Distribution Frame (MDF) and Local Area Network (LAN) head end equipment. The Main IT/Telecomm Support Room (Main Equipment Room) for the 141st Readiness Center shall be located on the Fourth Floor.
   b. Common IT Spaces (Telecommunications Rooms) shall house telephone intermediate distribution frames (IDFs), voice/data routers, switches, and patch panels. Telecommunications Rooms shall be located as required throughout each facility to assure that horizontal distribution cables are within the 295' (90 meter) maximum cable lengths defined by TIA/EIA and LAARNG standards. IT/Telecomm rooms shall be provided with a minimum of (4) 4-inch conduit sleeves for vertical cable access.
   c. The rooms shall be located away from sources of electromagnetic interference (EMI) at a distance that will reduce interference to 3.0 V/m.
   d. Plywood backboards, 3/4" thick with fire resistant paint to match the wall finish, shall be rigidly installed (per TIA/EIA standard) to support the MDF wall field and wall mounted user equipment. Rooms will have open-frame relay racks to house fiber and copper patch panels, and allow for installation of LAARNG provided equipment.

7) Wiring Methods:
   a. Fiber optic backbone cabling installed in a star type topology shall provide connectivity between the MDF and IDF(s). Fiber cables between the MDF and IDF(s) shall be sized per LAARNG IT technical standards, and shall consist of

multi-mode and/or single-mode fibers, to be determined by the requirements of network applications. Fiber shall be terminated using appropriate connectors compatible with systems to be installed. Category 6 copper cables shall be used for throughout for horizontal distribution from the MDF and IDF(s) to each voice and data outlet location.

b. Cable tray shall be provided for main cable pathways. In finished spaces the tray shall be located above lift-out ceilings in corridors. In shops or high bay areas, cable trays shall be located in the building overhead structure. Where cable pathways must pass through finish areas with inaccessible ceilings, conduits shall be used in lieu of cable tray. Innerduct shall be provided for fiber optic cables, as required by LAARNG Standards, spare cells to be provided with pull strings to accommodate future expansion. From the cable tray, each voice and data horizontal cable drop shall be installed in conduit to the outlet location.

8) Voice / Data Outlet Provisions:

a. Unless directed otherwise by the LAARNG, combination voice and data (V/D) outlets shall consist of a minimum of four RJ-45 jacks in a common faceplate, two designated "VOICE", and two designated "DATA". Voice only (VO) or data only (DO) outlets shall consist of one RJ-45 jack marked appropriately. Specific number and types of jacks to be coordinated with the LAARNG.

b. In enclosed and open office areas, combination Voice and Data (V/D) outlets shall be provided as necessary to serve the equipment in the room, with no less than one V/D outlet being provided per workstation. Networked copiers, fax machines, and printers shall be provided with voice and data connections as required. Locations of communications outlets shall be coordinated with the LAARNG, with basic requirements from DG-415-1 and DG 415-5.

c. A wall-mounted combination voice/data outlet shall be provided for each 70 ft^2 of open administration area.

B-8 OVM #12 Building

1. General Description

A. This section includes the basis of design and construction for the interior vehicular maintenance systems for the Jackson Barracks Operational Vehicle Maintenance Building. The Plumbing and HVAC shall be as herein before Specified and /or as shown on the drawings.

2. Codes and Standards

A. All plumbing design and construction of this project shall comply with the latest edition of the following codes and standards:

1) International Building Code (IBC)

2) International Plumbing Code (IPC)

3) International Mechanical Code (IMC)

4) Louisiana State Plumbing Code (LSPC)

5) NFPA 91

6) NFPA 30A

3. Design Criteria

A. General

1) Provide replacements for the complete interior vehicle maintenance systems as here in after described. Installations shall include all accessories and devices as necessary and required for complete and workable systems.

B. Quality Assurance

1) All materials and work shall be installed in accordance with industry standards and specifications of this project. Any materials or work found not in compliance shall be removed and corrected.

C. Material Standards

1) All materials, equipment, fixtures, and any other equipment associated with the maintenance systems shall comply with industry standards and applicable codes. All materials shall be new and of highest grade to meet the design requirements of the design build solicitation.

D. Vehicle Exhaust System

1) Provide a complete and operational overhead vehicle exhaust system to replace the existing system. System outlets and capacities shall be as directed by the LAANG at Jackson Barracks. The Design Build Contractor shall obtain the system requirements and provide a system to accommodate those requirements.

E. Vehicular Oil/Lube/Grease System

1) Provide a complete and operational vehicle oil/lube/grease system to replace the existing system. System outlets and capacities shall be as directed by the LAANG at Jackson Barracks. The Design Build Contractor shall obtain the system requirements and provide a system to accommodate those requirements.

F. Compressed Air System

1) Provide a complete and operational vehicle compressed air system to replace the existing system. System outlets and compressor capacities shall be as directed by the LAANG at Jackson Barracks. The Design Build Contractor shall obtain the system requirements and provide a system to accommodate those requirements.

C. Life Safety Code Analysis

C-1 Code Analysis

1. Applicable Codes and Standards

A. Per the project's Design Criteria, the following codes and standards are the basis of design for fire and life safety.

1) UFC 3-600-01 Fire Protection Engineering for Facilities

2) International Building Code (IBC)

3) Project Design Criteria

B. UFC 3-600-01, paragraphs 2-1 and 2-1.3 require conformance to the IBC for fire resistance requirements, allowable floor area, building height limitations, building separation distances and permitted types of construction, except where modified by the UFC. Paragraph 2-1.1 requires conformance to NFPA 101 for egress and safety to life.

2. Classification of Occupancy

A. The primary occupancy classification of the building is Business. The first floor Assembly Hall is Assembly occupancy. The first floor storage area is Storage occupancy, with the hazard of the contents classified as Ordinary Hazard.

3. Construction Requirements

A. The building is four stories in height. The area per floor ranges from 38,326 sq.ft. for the first floor to16,417 sq.ft. for the fourth. Per the IBC Table 503, using the average area per floor of 28,721 sq.ft., applying the area modification of 200% allowed by IBC para. 506.3, and discounting the option of combustible construction, the minimum allowable construction type is Type IIB. This construction type carries no fire resistance rating requirements for the building elements, per IBC Table 601.

4. Means of Egress Requirements

A. Business Occupancy Areas

1) Means of Egress Components: There are no special requirements for means of egress components. They are required to comply with NFPA 101 Chapter 7.

2) Capacity of Means of Egress: The occupant load factor is 100 sq.ft. (gross). Resulting calculated occupant loads are applied to stair widths, using a factor of 0.3 in./person, and to doors and other level components using a factor of 0.2 in./person. The Life Safety Plans for this project show the calculations.

3) Number of Exits: The required number of exits is two.

4) Arrangement of Means of Egress: Dead end corridor length is limited to 50 ft. Common path of travel (CPOT) is limited to 100 ft.

5) Travel Distance to Exits: Travel distance is limited to 300 ft.

6) Illumination of Means of Egress: Required.

7) Emergency Lighting: Required.

8) Marking of Means of Egress: Required. Internally illuminated signs must be of the LED or cold cathode type. Radioluminous signs are not permitted.

B. First Floor Assembly Occupancy Area

1) Means of Egress Components: There are no special requirements for means of egress components, except that panic or fire exit hardware is required on exit doors. Otherwise they are required to comply with NFPA 101 Chapter 7.

2) Capacity of Means of Egress: The occupant load factor is 7 sq.ft. (net). Resulting calculated occupant loads are applied to stair widths, using a factor of 0.3 in./person, and to doors and other level components using a factor of 0.2 in./person. One exit is to be designated as the main exit, and have capacity for one half the occupants. The Life Safety Plans for this project show the calculations.

3) Number of Exits: The required number of exits is four.

4) Arrangement of Means of Egress: Dead end corridors are not permitted. CPOT is limited to 20 ft.

5) Travel Distance to Exits: Travel distance is limited to 200 ft.

6) Illumination of Means of Egress: Required.

7) Emergency Lighting: Required.

8) Marking of Means of Egress: Required. Internally illuminated signs must be of the LED or cold cathode type. Radioluminous signs are not permitted.

C. First Floor Storage Occupancy Area

1) Means of Egress Components: There are no special requirements for means of egress components. They are required to comply with NFPA 101 Chapter 7.

2) Capacity of Means of Egress: This is based on the maximum probable number of occupants at any time. The Life Safety Plans for this project show the calculations.

3) Number of Exits: The required number of exits is one if the exit can be reached within the allowable CPOT. Otherwise the required number is two.

4) Arrangement of Means of Egress: Dead end corridors are limited to 100 ft. in length. CPOT is limited to 100 ft.

5) Travel Distance to Exits: Travel distance is limited to 400 ft.

6) Illumination of Means of Egress: Required.

7) Emergency Lighting: Required.

8) Marking of Means of Egress: Required. Internally illuminated signs must be of the LED or cold cathode type. Radioluminous signs are not permitted.

5. Limiting Interior Fire Spread

A. Penetrations through fire rated construction: Ducts passing through fire rated construction are to be in accordance with NFPA 90A. All other penetrations are to be protected with UL or FM listed systems of the same hourly rating as the element being penetrated.

B. Occupancy separations: Occupancy separations are to comply with the IBC. IBC 302.3.2, Exception. permits the separations in Table 302.3.2 to be reduced by 1 hr. because the building is sprinklered. Separation between Business (B) and Assembly (A-3) occupancies are to be 1 hr. rated. Separations between Storage (S-1) and Assembly (A-3) are to be 2 hr. fire rated. Separations between Storage (S-1) and Business (B) are to be 2 hr. rated.

C. Incidental use areas: Mechanical equipment rooms are not required to be separated because no piece of equipment is over 400,000 Btu/hr. input. Storage rooms 100 sq.ft. or less need not be separated.

6. Protection of Vertical Openings

A. All vertical openings, including stairways, are to be enclosed in 2 hr. fire rated construction.

7. Protection from Hazards

A. None required, as there are no "high hazard" contents areas.

8. Interior Finish

A. Walls and Ceilings: In exits and exit access corridors, Class A or B finish is required. In other areas, Class A, B or C may be used, except in the first floor Assembly Hall where Class A or B is required. Foam grid drop out panel ceilings are not permitted.

B. Floors: In exits, floor finish is required to be Class I or II.

9. Detection, Alarm and Communications Systems

A. General: Per the Project Design Criteria, the building is to be provided with an addressable fire alarm and detection system throughout, Simplex-compatible, designed to be compatible with the Jackson Barracks campus wide combination fire alarm and mass notification system. Design is to be in accordance with NFPA 72 and UFC 3-600-01. The system is to be connected to the building's emergency power source and be provided with battery backup power. CFMO has stated that they are looking for a 4-wire Class A system, with the ability to dial out to New Orleans 911 service and a minimum of 6 additional contacts in a dialup tree. Attached is the detail fire protection spec recently approved for Camp Beauregard, which should roughly fit the remainder of the facilities including Jackson Baracks. For additional or more specific questions, our contact will be Gint Mikucauskas (gintas.mikucauskas@jacobs.com).

B. Initiation: Initiation is to be by photoelectric type smoke and heat detectors, manual pull stations (double action, non-break glass, key resettable) and fire protection systems actuation switches.

C. Occupant Notification: The Mass Notification requirements for Jackson Barracks have been eliminated by CFMO. Systems should be designed to accept future connections.

10. Extinguishment Requirements

A. Combined Sprinkler/Standpipe system: Per the Project design Criteria and UFC 6-300-01, an automatic, wet pipe sprinkler system is to be provided throughout in accordance with NFPA 13 and UFC 3-600-01. Design is to be for light hazard, except in the storage area where the design is to be for ordinary hazard Group 2. The design shall include protection from damage due to earthquake. A combination sprinkler/standpipe riser is required in at least two stairwells, that are interconnected on each floor. Each floor control valve assembly is to include a check valve for the sprinkler connection.

B. A double check valve backflow preventer is required at the service connection.

C. Per UFC 3-600-01, para. 4-5.1, a Class I standpipe system (without hoses) in accordance with NFPA 14 is to be provided. The NFPA 14 residual pressure requirements are permitted to be omitted because of the availability of fire department apparatus to boost pressure.

D. Portable Extinguishers: Required throughout in accordance with NFPA 10.

E. Water Supply Requirements: A water supply with minimum capacity of X gpm at a residual pressure of Y psi is required at grade at the perimeter of the building.

11. Atrium Requirements

A. The atrium is permitted per NFPA 101. It is to be separated from adjacent spaces with barriers of 1 hr. fire rated construction or equivalent. A smoke management system in accordance with NFPA 92B is required.

12. Corridors

A. Per UFC 3-600-01, 2-1.2, fire resistance ratings of non-bearing partitions are to comply with NFPA 101. The only corridors are in the Business area, although they also serve the first floor Assembly area. No fire rating is required for corridors serving the Business or Assembly areas because the building is sprinklered.

13. Outside Protection

A. Hydrants and fire mains are to be provided in accordance with NFPA 24. Hydrants are to have two 2-1/2 in. hose outlets and one 4-1/2 in. suction connection with national standard fire hose threads, or as necessary for local fire department requirements. Installation and spacing details are to comply with UFC 3-600-01, 3-7.3.1 and 3-7.3.2.

D. SPiRiT – SUSTAINABLE GOALS

D-1 General

1. Certification Goals

A. The sustainable design effort shall work towards integrated solutions that provide the best value for the facility and contribute to the project total minimum design goal of 50 points for Spirit GOLD certification without increasing the overall cost of the project beyond the available budget.

B. Mechanical Designer shall work with the Architect to implement and document sustainable strategies and materials in the project.

C. The design shall include all applicable analysis and reports including the Sprit Project Checklist indicating all Spirit USGBC Prerequisites and Credits that are applicable to the project.

D-2 References

1. Publications

A. The following publications shall be applied to meet SPiRiT certification for this project:

1) Sustainable Project Rating Tool Version 1.4.1

D-3 Prerequisites and Credits

1. 1.0 Sustainable Sites

A. 1.R1 – Erosion, Sedimentation, and Water Quality Control – Required

1) Design a site sediment and erosion control plan and a pollution prevention plan that conforms to best management practices in the EPA's Storm Water management for Construction activities, EPA Document No. EP!-833-R-92-001, Chapter 3, or local Erosion and Sedimentation Control standards and codes whichever is more stringent. The plan shall meet the following objectives:

a. Prevent loss of soil during construction by storm water runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse.

b. Prevent sedimentation of storm sewer or receiving streams and/or air pollution with dust and particulate matter.

c. Prevent hazardous material discharge into storm water systems

d. Prevent petroleum oils and lubricants (POL) discharge into storm water systems.

B. 1.C1 – Site Selection –

C. 1.C2 – Installation/Base Redevelopment –

D. 1.C3 – Brownfield Redevelopment –

E. 1.C4 – Alternative Transporation –

F. 1.C5 – Reduced Site Distrubances – 1 Point

1) On previously developed sites, restore a minimum of 50% of the remaining open area by planting native or adapted vegetation.

G. 1.C6 – Stormwater Management

H. 1.C7 – Landscape and Exterior Design to Reduce Heat Islands – 2 Points

1) Provide shade (within 5 years) on at least 30% of non-roof impervious surface on the site, including parking lots, walkways, plazas, etc. or use light-colored/high-albedo materials (reflectance of at least 0.3) for 30% of the site's non-roof impervious surfaces.

2) Use ENERGY STAR roof compliant, high reflectance and low emissivity roofing (initial reflectance of at least 0.65 and three-year-aged reflectance of at least 0.5 when tested in accordance with ASTM E408) for a minimum of 75% of the roof surface.

I. 1.C8 – Light Pollution Reduction – 1 Point

1) Exterior fixtures shall be full cut-off, Dark Skies compliant.

2) House-side shields shall be implemented as necessary to limit light trespass past the property line.

J. 1.C9 – Optimize Site Features

K. 1.C10 – Facility Impact

L. 1.C11 - Site Ecology

2. 2.0 Water Efficiency

A. 2.C1 – Water Efficient Landscaping – 1 Point

1) Provide high efficiency irrigation technology.

B. 2.C2 – Innovative Wastewater Technologies

C. 2.C3 – Water Use Reduction – 1 Point:

1) 20% water use reduction using EPACT fixture performance requirements.

a. Sensor flush valves and sensor faucets shall be used to maximize water efficiency within the building. Reduced flow aerators for faucets shall be provided.

3. 3.0 Energy & Atmosphere

A. 3.R1 – Fundamental Building Systems Commissioning – Required

1) Design shall call for manufacturer-trained and certified personnel to supervise the installation of, to setup, to inspect, and to test the following systems:

a. Diesel Generator Set.
b. Lighting and Dimming Controls Systems
c. Access Control System
d. Intrusion Alarm System
e. CCTV System
f. Fire Alarm System
g. Area of Rescue Assistance System
h. Paging System
i. Mass Notification System

2) For each system mentioned above, a commissioning authority shall be assigned, commissioning procedures shall be documented, systems training shall be recorded for

future reference, and a final commissioning report shall be provided to the Owner at the end of the project.

B. 3.R2 – Minimum Energy Performance - Required

1) The mechanical design shall comply with ASHRAE/IESNA Standard 90.1-2001.

2) Lighting systems shall be designed to pass DOE, State, and Local energy efficiency requirements. COMCheck, software with lighting efficiency information shall be utilized and provided to the AHJ's as proof that the lighting systems pass minimum efficiency requirements.

C. 3.R3 – CFC Reduction in HVAC&R Equipment – Required

1) CFC based refrigerants shall not be used in the new HVAC systems. Appropriate documentation shall be issued to support this declaration.

D. 3.C1 – Optimize Energy Performance – 12.5% Energy Reduction – 9 Points

1) Energy performance shall be increased by 12.5% with a combination of high efficiency lighting fixtures, high efficiency water heating equipment and high efficiency HVAC equipment.

2) The HVAC system shall be designed to operate efficiently in part load conditions via the use of a variable frequency drive (VFD) on the variable air volume (VAV) air unit and a high efficiency chillers. Primary-secondary-tertiary chilled water pumping systems shall be employed for energy reduction. Water cooled centrifugal chillers shall be utilized in lieu of air-cooled chillers.

3) A heat recovery wheel and CO_2 detector shall treat and control the amount of outside air thereby reducing energy consumption. Computer analysis of energy usage shall be compared with baseline building design analysis to quantify energy reduction performance.

4) Lighting systems shall exceed efficiency requirements set forth above by a minimum of 10%, resulting in a minimum of 4 additional credits.

E. 3.C2 – Renewable Energy

F. 3.C3 – Additional Commissioning – 1 Point

1) Verify and ensure building is designed, constructed and calibrated to operate as intended. Contractor shall employ a third party commissioning agent to oversee the design, construction and calibration of the building.

G. 3.C4 – (Deleted)

H. 3.C5 – Measurement and Verification – 1 Point

1) Main electrical service shall be equipped with power monitoring equipment.

2) Lighting control panels with monitoring and trend logging shall be provided.

I. 3.C6 – Green Power

J. 3.C7 – Distributed Generation

4. 4.0 Materials and Resources

A. 4.R1 – Storage and Collection of Recyclables - Required

B. 4.C1 – Building Reuse

C. 4.C2 – Construction Waste Management – 1 Point

1) Recycle and/or salvage at least 50% (by weight) of construction, demolition and land clearing waste.

D. 4.C3 – Resource Reuse

E. 4.C4 – Recycled Content – 1 Point

1) Provide a minimum of 25% of building materials that contain in aggregate a minimum weighted average of 20% post-consumer recycled content material or a minimum weighted average of 40% post-industrial recycled content material.

a. Common building materials and products with recycled content include: wall, partition, and ceiling materials and systems; insulation; tiles and carpets; cement, concrete, and reinforcing metals; structural and framing steel.

F. 4.C5 – Local/Regional Materials – 1 Point

1) Provide a minimum of 20% of building materials that are manufactured regionally within a radius of 500 miles.

G. 4.C6 – Rapidly Renewable Materials

H. 4.C7 – Certified Wood – 1 Point

1) Provide a minimum of 50% of wood-based materials certified in accordance with the Forest Stewardship Council guidelines for wood building components.

5. 5.0 Indoor Environmental Quality (IEQ)

A. 5.R1 - Minimum IAQ Performance – Required

1) The HVAC design shall meet the minimum requirements of ASHRAE 62-1999, Ventilation for Acceptable Indoor Air Quality, and approved Addenda ASHRAE 62-2001, Appendix H using the Ventilation Rate Procedure.

B. 5.R2 - Environmental Tobacco Smoke (ETS) Control – Required

1) The Readiness Center shall be a non-smoking facility.

C. 5.C1 – IAQ Monitoring – 1 Point

1) A permanent CO_2 monitor shall be installed and integrated into the HVAC automated system. Set point for the monitor shall be in accordance with ASHRAE 62-2001, Appendix D.

D. 5.C2 – Increase Ventilation Effectiveness - 1 Point

1) The HVAC system shall be designed to optimize air change effectiveness.

2) The occupied spaces shall be supplied with a mix of fresh air to support indoor air quality, comfort and well being of the building occupants.

3) Air shall be distributed according to ASHRAE 2001 Fundamentals for Space Air Diffusion.

E. 5.C3 – Construction IAQ Management Plan – 2 Points

1) Air handlers to be operated during construction shall be required to use filtration media with a minimum efficiency reporting value (MERV) 8 at each return grille.

2) Prior to occupancy, the filtration media shall be changed to a (MERV) 13 or higher as determined by ASHRAE 52.2-1999.

3) Filters used during construction shall be documented by the contractor at the beginning and the end of construction.

a. Documentation shall include the MERV value, manufacturer name and the model number of each filter used during construction.

b. Eighteen photos shall be taken, six taken at three different occasions during construction. Each photo shall identify a SMACNA approach in order to show consistent adherence to the IAQ management plan.

4) Conduct a two week flush-out with new filtration media at 100% outside air after construction ends prior to occupancy.

F. 5.C4 – Low-Emitting Materials – 4 points

1) The quantity of indoor air contaminants that are odorous or potentially irritating shall be reduced to provide installer and occupant health and comfort.

2) Adhesives shall meet or exceed the VOC limits of South Coast Air Quality Management District Rule #1168 by, and all sealants used as a filler must meet or exceed Bay Area Air Resources Board Reg. 8, Rule 51.

3) Paints and coatings shall meet or exceed the VOC and chemical component limits of Green Seal Requirements.

4) Carpet systems shall meet or exceed the Carpet and Rug Institute Green Label Indoor Air Quality Test Program.

5) Composite wood or agrifiber products must contain no added urea-formaldehyde resins.

G. 5.C5 – Indoor Chemical and Pollutant Source Control – 1 Point

1) Janitor closets, toilet rooms and diaper changing stations shall be exhausted at a rate of 2 cfm/ft^2 to minimize pollutant cross-contamination of occupied spaces.

2) Air from the janitor closet and toilet rooms shall not be allowed to re-circulate to the main air distribution system.

H. 5.C6 – Controllability of Systems – 1 Point

1) Individual thermostats and humidistats shall be provided for each of the HVAC zones.

2) Set point of the thermostat shall determine airflow and temperature of the variable air volume (VAV) box for each zone.

3) The proposed design shall account for greater than 50% of the occupants to have individual controls.

I. 5.C7 – Thermal Comfort – 2 Points

1) The HVAC system shall comply with ASHRAE standard 55-1992, Addenda 1995, for thermal comfort standards including humidity control within established ranges per climate zone.

2) The building HVAC system shall be monitored by a Direct Digital Control (DDC) system which shall be programmed for occupied and unoccupied temperature set points, and humidity control. The setpoints for the air systems shall be 75° F/ 50% RH cooling and 70° F heating.

a. The appropriate documentation shall be provided to confirm that the DDC system is installed and operated as required.

J. 5.C8 – Daylight and Views – 2 Points

1) Provide a minimum Daylight Factor of 2% (excluding all direct sunlight penetration) in 75% of all space occupied for critical visual tasks, not incuding copy rooms, storage

areas, mechanical, and other low occupancy support areas. Exceptions include those spaces where tasks would be hindered by the use of daylight or where accomplishing the specific tasks within a space would be enhanced by the direct penetration of sunlight.

2) Provide a direct line of sight to vision glazing from 90% of all regularly occupied spaces, not including copy rooms, storage areas, mechanical and other low occupancy support areas.

K. 5.C9 – Acoustic Environment / Noise Control – 1 Point

1) Design mechanical systems to limit noise intrusion into occupied spaces.

L. 5.C10 – Facility In-Use IAQ Management Plan – 1 Point

1) Develop air quality action plans scheduling HVAC system cleaning; educating occupants and facility managers on indoor pollutants and their roles in preventing them; and including permanent monitoring of supply and return air, and ambient air at the fresh air intake, for carbon monoxide, carbon dioxide, total volatile organic compounds and particulates.

6. 6.0 Facility Delivery Process

A. 6.C1 – Holistic Delivery of Facility – 7 Points

1) LARNG has encouraged a facility delivery process that actively engages all stakeholders in the design process to deliver a facility that meets all functional requirements while effectively optimizing tradeoffs among sustainability, first costs, life cycle costs and mission requirements. Provide support to LARNG to continue this endeavor throughout the design/build process. These efforts include the following:

a. Choose team leaders that are experienced in holistic delivery of facilities.

b. Train the entire team in the holistic delivery process. The team must include all stakeholders in the facility delivery, including the users, the contracting staff, the construction representatives, project manager, and design/engineering team members.

c. Identify project goals and metrics.

d. Plan and execute charrettes with team members at critical phases of the facility delivery.

e. Identify and resolve tradeoffs among sustainability, first costs, life cycle costs and mission requirements through charrettes and other collaborative processes.

f. Document required results for each phase of project deliverables that achieve the project goals and are measurable throughout the facility life span.

7. 7.0 Current Mission

A. 7.C1 – Operation and Maintenance – 3 Points

1) Provide support to LARNG for the development of a facility delivery process that enhances efficient operation and maintenance of the facility. The facility operations and maintenance program is to include the following:

a. Commissioning instructions for all facility systems.

b. Comprehensive facility operations and maintenance instructions for system operation, performance verification procedures and results, an equipment inventory, warrantee information, and recommended maintenance schedule. The instructions should include a comprehensive, preventive maintenance program to keep all facility systems functioning as designed.

c. A periodic training program for occupants, facilities managers, and maintenance staff in all facility operations and maintenance activities.

d. Instructions on sustainable cleaning and pest control practices.

e. Develop a comprehensive site/facility recycling/waste management plan.

2) Provide surfaces, furnishings, and equipment that are appropriately durable, according to life cycle cost analysis.

B. 7.C2 – Soldier and Workforce Productivity and Retention – 3 Points

1) Provide a high-quality, functional, healthy and safe work environment to promote soldier and workforce productivity and retention.

a. Provide a high quality indoor environment to enhance user/occupant quality of life.

b. Provide a highly functional work environment to promote user/occupant work productivity.

c. Provide a healthy and safe work environment to sustain quality of life and productivity.

2) Use a registered/certified interior designer to provide stimulating interior environments with pleasant colors, surface treatments, room proportions and ceiling heights, external views, natural lighting and quality detailing for interior furnishings, equipment, materials and finishes.

3) Use IES standards to provide light to occupied space with variations in level, comfortable contrasts, natural color rendition, natural/man-made, and adequate controls to optimize light aesthetic qualities.

4) Provide occupant control of individual work areas configuration, and lighting, thermal and ventilation systems.

5) Collaborate with end users to identify functional and technical requirements and to perform adjacency studies. Configure occupied space to address the specific workers/occupants functions and activities that will be carried out there. Meet TI 800-01 Design Guide requirements. Design and configure occupied space, and select furniture and equipment using human ergonomics.

6) Provide ventilation air in sufficient volume free from natural and man made contaminants.

8. 8.0 Future Missions

A. 8.C1 – Functional Life of Facility and Supporting Systems

B. 8.C2 – Adaptation, Renewal and Future Uses

D-4 Opportunities for Additional Credits

1. 3.0 Energy & Atmosphere

A. 3.C1 – Optimize Energy Performance

1) For every 2.5% more efficient the lighting system is than what is required, an additional credit may be earned.

2. 5.0 Indoor Environmental Quality (IEQ)

A. 5.C6 – Controllability of Systems

1) (1 Credit) If operable windows are provided along the exterior, multiple lighting zones could be implemented (1 per 200 sqft). Cost impact is significant since separate wiring would have to be provided for every 200 sqft of fixtures in an area, and means of control would have to be added for each 200 sqft.

D-5 Summary

1. SPiRiT Points

A. The site development and landscaping design should contribute a minimum of 3 SPiRiT Points to the project.

B. The architectural design should contribute a minimum of 8 SPiRiT Points to the project.

C. The mechanical design should contribute 19 SPiRiT Points to the project.

D. The electrical design should contribute a minimum of 6 SPiRiT Points to the project with the opportunity for additional points to be earned.

E. The construction activities should contribute a minimum of 1 SPiRiT Points to the project.

F. The facility delivery and operations/maintenance process should contribute a minimum of 13 SPiRiT Points to the project.

2. Gold Rating

A. The project shall achieve a minimum of 50 SPiRiT Points to obtain the required Gold Rating.

3. Facility Points Summary

A. Summary of points is indicated on the following pages.

SPiRiT - FACILITY POINTS SUMMARY		POINTS AVAIL.	TO BE INCLUDED	MAY BE INCLUDED
1.0	**SUSTAINABLE SITES (S)**			
1.R1	Erosion and Sedimentation Control	REQ'D.	REQ'D.	
1.C1	Site Selection	2		**2**
1.C2	Installation/Base Redevelopment	2		**2**
1.C3	Brownfield Redevelopment	1		**1**
1.C4	Alternative Transportation	4		**4**
1.C5	Reduced Site Disturbance	2	**1**	**1**
1.C6	Stormwater Management	2		**2**
1.C7	Landscape and Exterior Design to Reduce Heat Islands	2	**2**	
1.C8	Light Pollution Reduction	1	**1**	
1.C9	Optimize Site Features	1		**1**
1.C10	Facility Impact	2		**2**
1.C11	Site Ecology	1		**1**
2.0	**WATER EFFICIENCY (W)**			
2.C1	Water Efficient Landscaping	2	**1**	**1**
2.C2	Innovative Wastewater Technologies	1		**1**
2.C3	Water Use Reduction	2	**1**	**1**
3.0	**ENERGY and ATMOSPHERE (E)**			
3.R1	Fundamental Building Systems Commissioning	REQ'D.	REQ'D.	
3.R2	Minimum Energy Performance	REQ'D.	REQ'D.	
3.R3	CFC Reduction in HVAC&R Equipment	REQ'D.	REQ'D.	
3.C1	Optimize Energy Performance.	20	**9**	**11**
3.C2	Renewable Energy	4		**4**
3.C3	Additional Commissioning	1	**1**	
3.C4	<<Deleted>>			
3.C5	Measurement and Verification	1	**1**	
3.C6	Green Power	1		**1**
3.C7	Distributed Generation	1		**1**
4.0	**MATERIALS and RESOURCES (M)**			
4.R1	Storage & Collection of Recyclables	REQ'D.	REQ'D.	
4.C1	Building Reuse	3		**3**
4.C2	Construction Waste Management	2	**1**	**1**
4.C3	Resource Reuse	2		**2**
4.C4	Recycled Content	2	**1**	**1**
4.C5	Local/Regional Materials	2	**1**	**1**
4.C6	Rapidly Renewable Materials	1		**1**
4.C7	Certified Wood	1	**1**	

SPiRiT - FACILITY POINTS SUMMARY		POINTS AVAIL.	TO BE INCLUDED	MAY BE INCLUDED
5.0	**INDOOR ENVIRONMENTAL QUALITY (IEQ) [Q]**			
5.R1	Minimum IAQ Performance	REQ'D.	REQ'D.	
5.R2	Environmental Tobacco Smoke (ETS) Control	REQ'D.	REQ'D.	
5.C1	IAQ Monitoring	1	1	
5.C2	Increase Ventilation Effectiveness	1	1	
5.C3	Construction IAQ Management Plan	2	2	
5.C4	Low-Emitting Materials	4	4	
5.C5	Indoor Chemical and Pollutant Source Control	1	1	
5.C6	Controllability of Systems	2	1	1
5.C7	Thermal Comfort	2	2	
5.C8	Daylight and Views	2	2	
5.C9	Acoustic Environment/Noise Control	1	1	
5.C10	Facility In-Use IAQ Management Plan	1	1	
6.0	**FACILITY DELIVERY PROCESS (P)**			
6.C1	Holistic Delivery of Facility	7	7	
7.0	**CURRENT MISSION**			
7.C1	Operation and Maintenance	3	3	
7.C2	Soldier and Workplace Productivity and Retention	3	3	
8.0	**FUTURE MISSIONS**			
8.C1	Functional Life of Facility and Supporting Systems	2		2
8.C2	Adaptation, Renewal and Future Use	2		2
	CREDIT TOTALS	**100**	**50**	**50**
SPiRiT CERTIFIED: Bronze: 25-34 Points; Silver: 35-49 Points; Gold: 50-74 Points; Platinum: 75-100 Points				

E. ANTI-TERRORISM/FORCE PROTECTION

E-1 Purpose and Requirements

1. General Description

A. The Jackson Barracks 141st Field Artillery Battalion Readiness Center is located within the secure perimeter of the Jackson Barracks site and reduced stand-off distances will be required from internal vehicle circulation paths, due to site limitations. It is anticipated that the site perimeter wall will provide a level of blast mitigation. The Design Build Contractor shall coordinate any Anti-terrorism/Force-protection (AT/FP) facility-specific issues affecting design with LA ARNG representatives, as required. The Jackson Barracks campus is patrolled and monitored by full time security, security monitoring stations, mail inspection facility, truck inspection facility and EMS/Fire response.

2. Referenced Standards

A. Physical security protective design elements must meet the primary requirements of UFC 4-010-02, DOD Minimum Antiterrorism Standoff Distances For Buildings, Army TM 5-853-2 Security Engineering Concept Design, Army TM 5-853-3, Security Engineering Final Design and UFC 4-021-01 Design and O&M: Mass Notification Systems, integrated with the support guidance from the UFC 4-010-01 DOD Minimum Antiterrorism Standards for Buildings, as performance-based criteria.

E-2 Design Parameters

1. General

A. Protective measure design parameters shall be developed with a layered security approach to meet the mission objectives to protect Army National Guard assets and personnel.

2. Physical Protection Site Design

A. The effective stand-off distance (for a controlled perimeter) as identified in the UFC to achieve the minimum force protection criteria to meet both the clear zone stand-off and exclusive stand-off zone. Design physical protection systems to include back-bone infrastructure and security power supplies for; Electronic Entry Control System (EECS) Closed Circuit Television System, (CCTV) and perimeter intrusion detection system (PIDS). The Electronic Security systems shall report to a monitored central alarm facility designated by the ARNG. Depending on the security fence designation identified by the ARNG, the security perimeter fence and gates shall be designed to meet Army fencing standards as identified in TM 5-853-3 and the project specific threats. The Security fence may include; fence enhancements to increase delay time, obscuration enhancements, and may be designed to resist the penetration of moving vehicles.

3. Locking Mechanisms

A. All physical locking mechanisms shall be designed to meet low-level threat performance conditions at all facility entry/portal areas.

4. Security Lighting

A. Specific security lighting shall be designed to meet the foot-candle levels for CCTV assessment and balance lighting along the site perimeter fence line, area lighting for interior yards, and the interior portions of the protected areas to include the Readiness Center facility and associated Support Spaces. Demand Lighting Technology shall be utilized for the military vehicle parking areas for energy conservation.

5. Landscaping

A. The use of landscaping and crime prevention through environmental design (CPTED) elements shall be considered as a protection component to the security design.