

**SECTION 01 10 00.[Not Supplied - ProjectInfo : TONUM]
TASK ORDER STATEMENT OF WORK**

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1.0 PROJECT OBJECTIVES

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

Comparison of Military Facilities to Civilian Facilities

Military Facility	Civilian Facility
[Not Supplied - Unique : UNIQUE_NAME]	[Not Supplied - Unique : UNIQUE_COMPARABLE]

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

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

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

1.1. SECTION ORGANIZATION

This Section is organized under 6 major "paragraphs".

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

2.2. SITE:

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

Approximate area available 25.00 acres

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

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

The following are also GFGI items: [Not Supplied - FacilityAddREq : GFGI_ITEMS]

2.4. FURNITURE REQUIREMENTS

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

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

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

2.5. NOT USED

4.0 APPLICABLE CRITERIA

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

4.1. INDUSTRY CRITERIA

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

Table 1: Industry Criteria

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

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

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

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

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

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

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

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

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

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

4.2. MILITARY CRITERIA

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

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

5.0 GENERAL TECHNICAL REQUIREMENTS

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

5.1. SITE PLANNING AND DESIGN

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

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

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

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

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

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

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

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

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

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

5.2. SITE ENGINEERING

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

5.2.2. SOILS:

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

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

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

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

5.2.3.2. Parking Requirements.

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

5.2.3.3. Sidewalks. Design the network of walks throughout the complex (where applicable) to facilitate pedestrian traffic among facilities, and minimize the need to use vehicles. Incorporate sidewalks to enhance the appearance of the site development, while creating a sense of entry at the primary patron entrances to the buildings. Minimum sidewalk requirements are in Paragraph 3, where applicable and/or paragraph 6 and/or site plans, where applicable..

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

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

electricity. Gas and electric meters will also provide demand readings based on consumption over a maximum of any 15 minute period. Configure all meters to transmit at least daily even if no receiver for the data is currently available at the time of project acceptance. For privatized utilities, coordinate with the privatization utility(ies) for the proper meter base and meter installation.

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

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

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

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

5.3. ARCHITECTURE AND INTERIOR DESIGN:

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

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

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

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

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

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

5.3.5. BUILDING INTERIOR

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

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

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

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

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

5.3.5.6. Window Treatment: Provide interior window treatments with adjustable control in all exterior window locations for control of day light coming in windows or privacy at night. Maintain uniformity of treatment color and material to the maximum extent possible within a building.

5.3.6. COMPREHENSIVE INTERIOR DESIGN

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

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

5.4. STRUCTURAL DESIGN

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

5.4.2. GENERAL: The structural system must be compatible with the intended functions and components that allows for future flexibility and reconfigurations of the interior space. Do not locate columns, for instance, in rooms requiring visibility, circulation or open space, including, but not limited to entries, hallways, common areas, classrooms, etc. Select an economical structural system based upon facility size, projected load requirements and local availability of materials and labor. Base the structural design on accurate, site specific geotechnical information and anticipated loads for the building types and geographical location. Consider climate conditions, high humidity, industrial atmosphere, saltwater exposure, or other adverse conditions when selecting the type of cement and admixtures used in concrete, the concrete cover on reinforcing steel, the coatings on structural members, expansion joints, the level of corrosion protection, and the structural systems. Analyze, design and detail each building as a complete structural system. Design structural elements to preclude damage to finishes, partitions and other frangible, non-structural elements to prevent impaired operability of moveable components; and to prevent cladding leakage and roof ponding. Limit deflections of structural members to the allowable of the applicable material standard, e.g., ACI, AISC, Brick Industry Association, etc. When modular units or other pre-fabricated construction is used or combined with stick-built construction, fully coordinate and integrate the overall structural design between the two different or interfacing construction types. If the state that the project is located in requires separate, specific licensing for structural engineers (for instance, such as in Florida, California and others), then the structural engineer designer of record must be registered in that state.

5.4.3. LOADS: See paragraph 3 for facility specific (if applicable) and paragraph 6 for site and project specific structural loading criteria. Unless otherwise specified in paragraph 6, use Exposure Category C for wind. If not

specified, use Category C unless the Designer of Record can satisfactorily justify another Exposure Category in its design analysis based on the facility Master Plan. Submit such exceptions for approval as early as possible and prior to the Interim Design Submittal in Section "Design After Award". Design the ancillary building items, e.g. doors, window jambs and connections, overhead architectural features, systems and equipment bracing, ducting, piping, etc. for gravity, seismic, lateral loads and for the requirements of UFC 4-010-01, DOD Minimum Antiterrorism Standards for Buildings. Ensure and document that the design of glazed items includes, but is not limited to, the following items under the design loads prescribed in UFC 4-010-01:

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

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

5.5. THERMAL PERFORMANCE

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

5.5.2. BUILDING ENVELOPE SEALING PERFORMANCE REQUIREMENT. Design and construct the building envelope for office buildings, office portions of mixed office and open space (e.g., company operations facilities), dining, barracks and instructional/training facilities with a continuous air barrier to control air leakage into, or out of, the conditioned space. Clearly identify all air barrier components of each envelope assembly on construction documents and detail the joints, interconnections and penetrations of the air barrier components. Clearly identify the boundary limits of the building air barriers, and of the zone or zones to be tested for building air tightness on the drawings. Pending the publication of the 2010 version of ASHRAE 90.1, the use of painted interior walls is not an acceptable air barrier method.

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

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

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

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

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

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

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

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

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

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

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

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

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

(b) Test the completed building using Infrared Thermography testing. Use infrared cameras with a resolution of 0.1deg C or better. Perform testing on the building envelope in accordance with ISO 6781:1983 and ASTM C1060-90(1997). Determine air leakage pathways using ASTM E 1186-03 Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems, and perform corrective work as necessary to achieve the whole building air leakage rate specified in (a) above.

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

5.6. PLUMBING

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

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

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

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

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

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

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

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

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

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

5.7. ELECTRICAL AND TELECOMMUNICATIONS SYSTEMS

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

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

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

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

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

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

5.7.5.1. Interior Lighting:

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

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

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

- (d) Metal Halide Lighting (where applicable): Metal Halide lamp fixtures in the range of 150-500 Watts shall be pulse start type and have a minimum efficiency rating of 88%.
- (e) Lighting Controls: ANSI/ASHRAE/IESNA 90.1 has specific lighting controls requirements. Provide a high level of lighting system control by individual occupants or by specific groups in multi-occupant spaces (classrooms, conference rooms) to promote the productivity, comfort and well being of the building occupants. In office spaces, the preferred lighting should be a 30 FC ambient lighting level with occupancy sensor controlled task lighting in the work spaces to provide a composite lighting level of 50 FC on the working surfaces. Consider incorporating daylighting techniques for the benefit of reducing lighting energy requirements while improving the quality of the indoor spaces. If daylight strategies are used, additional coordination is required with the architect and mechanical engineer. Additionally, incorporate electric lighting controls to take advantage of the potential energy savings.
- (f) Exterior Lighting: See paragraph 6.9 for site specific information, if any, on exterior lighting systems. Minimize light pollution and light trespass by not over lighting and use cut-off type exterior luminaries.

5.7.6. TELECOMMUNICATION SYSTEM: Building telecommunications cabling systems (BCS) and OSP telecommunications cabling system shall conform to APPLICABLE CRITERIA, including but not limited to I3A Technical Criteria. An acceptable BCS encompasses, but is not limited to, copper and fiber optic (FO) entrance cable, termination equipment, copper and fiber backbone cable, copper and fiber horizontal distribution cable, workstation outlets, racks, cable management, patch panels, cable tray, cable ladder, conduits, grounding, and labeling.. Items included under OSP infrastructure encompass, but are not limited to, manhole and duct infrastructure, copper cable, fiber optic cable, cross connects, terminations, cable vaults, and copper and FO entrance cable.

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

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

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

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

5.8. HEATING, VENTILATING, AND AIR CONDITIONING

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

5.8.2. DESIGN CONDITIONS.

5.8.2.1. Outdoor and indoor design conditions shall be in accordance with UFC 3-410-01FA. Outdoor air and exhaust ventilation requirements for indoor air quality shall be in accordance with ASHRAE 62.1. All Buildings with

minimum LEED Silver requirement (or better) will earn LEED Credit EQ 7.1, Thermal Comfort-Design., except where precluded by other project requirements. Where the contract specifies indoor design temperature , airflow, humidity conditions, etc., use those parameters.

5.8.2.2. High Humidity Areas: Design HVAC systems in geographical areas meeting the definition for high humidity in UFC 3-410-01FA to comply with the special criteria therein for humid areas.

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

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

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

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

5.8.3. BUILDING AUTOMATION SYSTEM. The Building Automation System (BAS) shall be a single complete non-proprietary Direct Digital Control (DDC) system for control of the heating, ventilating and air conditioning (HVAC) and other building systems. The BAS shall be based on an Open implementation of BACnet using ASHRAE 135-2004 exclusively as the communications protocol for communication between DDC Hardware devices to allow multi-vendor interoperability. The building BAS shall include integration to a basewide supervisory monitoring and control (M&C) system.

5.8.3.1. The system shall be Open in that it is designed and installed such that the Government or its agents are able to perform repair, replacement, upgrades, and expansions of the system without further dependence on the original hardware vendor or their agents. This includes, but is not limited to the following:

- Hardware shall be installed such that individual control equipment can be replaced by similar control equipment from other equipment manufacturers with no loss of system functionality.
- Necessary documentation (including rights to documentation and data), configuration information, configuration tools, application programs (with comments explaining program logic), application source code for programmable controllers, drivers, and other software shall be licensed to and remain with the Government such that the Government or its agents are able to perform repair, replacement, upgrades, and expansions of the system without subsequent or future dependence on the Contractor.

5.8.3.2. All DDC Hardware shall:

- Be connected to a ASHRAE 135 MS/TP control network.
- Implement all required functionality of the application network interface via BACnet objects, properties, and services
- Shall conform to basewide addressing schemes, particularly with regard to Device ID.
- Minimize the use of proprietary BACnet objects and properties
- Not use any of the following BACnet services for application control functionality or communication:
 - AtomicFile or AtomicFileWrite
 - ConfirmedTextMessage or UnconfirmedTextMessage
 - ConfirmedPrivateTransfer or UnconfirmedPrivateTransfer
- Communicate over the control network via ASHRAE 135 exclusively.
- Conform to the BACnet Testing Lab's Device Implementation Guidelines.
- Be capable of responding to Who-Is/I-Am and Who-Has/I-Have service requests.

- All settings and parameters used by the application shall be fully configurable:
 - to the greatest extent possible, via properties of BACnet objects that can be written to via BACnet services.
 - via properties of BACnet objects that can be written to via BACnet services for the following
- Setpoint
- Alarm limit
- Schedule modification
- Trend modification
 - All other settings and parameters that can not be written to via BACnet services shall be fully configurable via either:
- Properties of BACnet objects that can be written to with a configuration tool, or
- Hardware settings on the controller itself to support the application.
- Provide BACnet objects, properties, and services required to support the application and supervisory monitoring and control functionality including:
 - System start/stop and overrides.
 - Scheduling
 - Alarming
 - Trending
- To the greatest extent practical, not rely on the control network to perform the application
- Be BTL Listed

5.8.3.3. Include any device capable of communicating over IEEE 802.3 (Ethernet) in a DIACAP and Certificate of Networkiness (CoN) for this installation, regardless of whether the Ethernet connection is active at time of installation. Do not use devices with Ethernet connection capability not included in a DIACAP or without a DIACAP or without a CoN shall not be used.

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

5.8.3.5. Not Used

5.8.3.6. Perform all necessary actions needed to fully integrate the ASHRAE 135-based building control system to the UMCS. These actions include but are not limited to:

- Install BACnet MS/TP-to-IP routers and/or BACnet/IP Broadcast Management Devices (BBMD) in accordance with ASHRAE 135 Annex J as needed to connect the building control network to the UMCS IP network. Devices shall be capable of configuration via DHCP and Write-Broadcast-Distribution-Table messages but shall not rely on these services for configuration. All communication between the UMCS and building networks shall be via BACnet/IP and in accordance with ASHRAE 135. Any IP network work including access to existing networks shall be coordinated with the installation Network Enterprise Center (NEC).
- Configure M&C Software functionality including: graphical pages for System Graphic Displays including overrides, alarm handling, scheduling, trends for critical values needing long-term or permanent monitoring via trends, and demand limiting.
- Configure M&C software to provide hierarchically arranged screens to allow operator to configure (via BACnet services to the appropriate objects) all devices on the installation BACnet internetwork. The following adjustments shall be supported:
 - Setpoints
 - Alarm limits
 - Schedules
 - Trends

This requirement is separate from and in addition to the requirement to provide all necessary programming and configuration software.

5.8.3.7. Perform all necessary actions needed to integrate legacy systems to the UMCS. Configure M&C Software functionality including: graphical pages for System Graphic Displays including overrides, alarm handling, scheduling, trends for critical values needing long-term or permanent monitoring via trends, and demand limiting. Integration may be via drivers in the M&C Software or hardware gateways may be provided. Where hardware

gateways are provided, include all hardware, software, software licenses, and configuration tools required for gateway operation, modification, and maintenance. Configure software driver or a hardware gateway to support M&C software functionality as listed above.

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

- The latest version of all software including source code for application software (for programmable controllers), software licenses, and user manuals required to program, configure and operate the system.
- Points Schedule drawing that shows every DDC Hardware device. The Points Schedule shall contain the following information as a minimum for each device:
 - Device ID and network address (MS/TP network and MAC address, or IP address).
 - Input and Output Objects including Name, Type, Description, and relevant supported or required Properties.
 - Hardware I/O, including Type (AI, AO, BI, BO) and Description.
 - Alarm information including alarm limits and BACnet device IDs, object IDs, and property information.
 - Supervisory control information including BACnet device IDs, object IDs, and properties for trending and overrides.
 - Objects and Properties needed for device configuration.
 - Device IDs and objects (where applicable) of remote devices and objects that communicate with the given Device (e.g. clients and servers for BACnet services used by the given device).
 - Example Points Schedules are available at: <https://eko.usace.army.mil/fa/besc/>
- Riser diagram of the network showing all network cabling and hardware. Label hardware with BACnet Device IDs, BACnet network addresses, network names, and locations.
- A consolidated list of all Device IDs.
- Control System Schematic diagram and Sequence of Operation for each controlled system.
- Operation and Maintenance Instructions including procedures for system start-up, operation and shut-down, a routine maintenance checklist, and a qualified service organization list.
- Quality Control (QC) checklist (below) completed by the Contractor's Chief Quality Control (QC) Representative

Table 5-1: QC Checklist

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

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

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

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

NEBB, or TABB), the requirements and recommendations contained in these procedures and requirements are mandatory.

5.8.5. COMMISSIONING: Commission all HVAC systems and equipment, including controls, and all systems requiring commissioning for LEED Enhanced commissioning, in accordance with ASHRAE Guideline 1.1, ASHRAE Guideline 0 and LEED. Do not use the sampling techniques discussed in ASHRAE Guideline 1.1 and in ASHRAE Guideline 0. Commission 100% of the HVAC controls and equipment. Hire the Commissioning Authority (CA), certified as a CA by AABC, NEBB, or TABB, as described in Guideline 1.1. The CA will be an independent subcontractor and not an employee of the Contractor nor an employee or subcontractor of any other subcontractor on this project, including the design professionals (i.e., the DOR or their firm(s)). The CA will communicate and report directly to the Government in execution of commissioning activities. The Contracting Officer's Representative will act as the Owner's representative in performance of duties spelled out under OWNER in Annex F of ASHRAE Guideline 0. All buildings with Minimum LEED Silver (or better) requirement will earn LEED Credit EA3 Enhanced Commissioning.

5.9. ENERGY CONSERVATION

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

5.9.2. Design all building systems and elements to meet the minimum requirements of ANSI/ASHRAE/IESNA 90.1. Design the buildings, including the building envelope, HVAC systems, service water heating, power, and lighting systems to achieve an energy consumption that is at least 40% below the consumption of a baseline building meeting the minimum requirements of ANSI/ASHRAE/IESNA Standard 90.1. Energy calculation methodologies and substantiation requirements are defined in Section 01 33 16, Design After Award.

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

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

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

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

5.10. FIRE PROTECTION

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

5.10.2. Inspect and test all fire suppression equipment and systems, fire pumps, fire alarm and detection systems and mass notification systems in accordance with the applicable NFPA standards. The fire protection engineer of

record shall witness final tests. The fire protection engineer of record shall certify that the equipment and systems are fully operational and meet the contract requirements. Two weeks prior to each final test, the contractor shall notify, in writing, the installation fire department and the installation public work representative of the test and invite them to witness the test.

5.10.3. Fire Extinguisher Cabinets: Provide fire extinguisher cabinets and locations for hanging portable fire extinguishers in accordance with NFPA 10 Standard for Portable Fire Extinguishers. The Government will furnish and install portable fire extinguishers, which are personal property, not real property installed equipment.

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

5.10.5. Roof Access: Paragraph 2-9 of UFC 3-600-01 Fire Protection for Facilities will be modified in the next update to that UFC. Pending revision, comply with roof access and stairway requirements in accordance with the International Building Code. Where roof access is required by the IBC or other criteria, comply with UFC 4-010-01, Anti-Terrorist Force Protection, Standard 14. "Roof Access".

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

5.11. SUSTAINABLE DESIGN

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

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

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

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

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

5.11.5. DAYLIGHTING. Except where precluded by other project requirements, do the following in at least 75 percent of all spaces occupied for critical visual tasks: achieve a 2 percent glazing factor (calculated in accordance

with LEED credit EQ8.1) OR earn LEED Daylighting credit, provide appropriate glare control and provide either automatic dimming controls or occupant-accessible manual lighting controls.

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

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

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

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

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

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

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

- (a) Standoff distance from roads, parking and installation perimeter; and/or structural blast mitigation
- (b) Blast resistant windows and skylights, including glazing, frames, anchors, and supports
- (c) Progressive collapse resistance for all facilities 3 stories or higher. Unless determined otherwise by the Installation and noted in paragraphs 3 or 6, the building shall be considered to have areas of uncontrolled public access when designing for progressive collapse.
- (d) Mass notification system (shall also conform to UFC 4-021-01, Mass Notification Systems)
- (e) For facilities with mailrooms (see paragraph 3 for applicability) – mailrooms have separate HVAC systems and are sealed from rest of building

6.0 PROJECT SPECIFIC REQUIREMENTS

6.1. GENERAL

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

6.2. APPROVED DEVIATIONS

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

The requirements of Section 6 of specification section 01 10 00 superscedes the requirements in Section 3 and 5 specification section 01 10 00.

6.3. SITE PLANNING AND DESIGN

6.3.1. General:

6.3.1 Site Description: The proposed site location is within the Fort Drum site, located at the southeast corner of the intersection of 45th Infantry Drive and Enduring Freedom Drive. The site is predominantly undeveloped woods. The existing grades are relatively level sloping approximately 1-3 % from west to east away from Enduring Freedom Drive with the exception of some steep slopes scattered through site area. Additionally the site is 3 to 4 feet above Enduring freedom drive and 10 to 30 feet above 45th Infantry Drive with steep slopes along the roadways. The project site shall be designed and constructed in accordance with the following criteria: UFC 3-210-01A "Area Planning, Site Planning, and Design" UFC 3-210-02 "POV Site Circulation and Parking" UFC 3-210-05FA "Landscape Design and Planning Criteria" UFC 3-210-06A "Site Planning and Design".

6.3.1.2 Snow / Ice: Walkways and mechanical area shall be designed to maintain a safe distance from the roof lines to minimize the impact of sliding snow and ice using the (CRREL) sliding snow calculator. Parking areas shall be designed with consideration for plowing and managing snow.

6.3.1.3 Contractor's Storage Yard: The Contractor's storage yard shall be located within the project site as approved by the Contracting Officer.

6.3.1.4 Drainage: New slopes grade away from the exterior of all buildings at 1:10 for 20 feet to maintain positive site drainage. New grades in turfed areas shall be a minimum of 2% in the direction of drainage and a maximum of 33%. Slopes on ditches and swales shall have an absolute minimum of 0.3% and a desirable minimum of 0.5%. Storm water design shall be calculated using the rational method and account for the 10/50/100 year storms in compliance with the NYSDEC Stormwater Management Design Guidelines latest version.

6.3.1.5 All building finished floors shall be 6" above the surrounding grade elevation.

6.3.1.6 Special consideration regarding construction phasing will be required if the demolition of World War II facilities is awarded under this contract. Several of these facilities are occupied by equipment and personnel that will be moving to the new primary facilities.

6.3.2. Site Structures and Amenities

6.3.2.1 Dumpster Pad: Provide a reinforced concrete dumpster pad with HS-20 DOT loading and Standard Bollards set 4' O.C. with a minimum clearance of 2 inches between dumpster pad and bollard foundations for each building. Screening shall be as required by the Fort Drum Design Guide.

6.3.2.2 Mechanical and Electrical Concrete Pads: Provide appropriately sized 8" thick reinforced concrete pads for the exterior mechanical equipment. Pads are to have a minimum 4" thick gravel base wrapped in geotextile fabric. Pads shall be sized to extend at least 6 inches beyond the limits of the equipment.

6.3.2.3 Concrete-Filled Pipe Bollards: 8" diameter concrete-filled pipe bollards constructed with minimum 7-foot long 8" diameter steel schedule 40 pipes filled with concrete & placed in reinforced mesh concrete foundation cylinders 24" diameter by 42" long. Bollard concrete foundations shall be located below frost line. Bollards shall be painted to match the architectural theme with yellow accent marks for safety.

6.3.2.4 Removable Bollards: 4" diameter schedule 80 steel pipe with welded cap and lifting bar. The permanent in ground pipe shall be 5" diameter schedule 80 steel pipe constructed in reinforced mesh concrete foundation cylinders 24" diameter by 36"

long. The top of the steel pipe shall require standard internal threads for standard screw in plug.

6.3.2.5 Provide for ease of snow removal and storage in parking areas, motor pool areas, and adjacent areas. No curbs or islands are allowed unless specifically shown on drawings or required to meet AFTP requirements.

6.3.2.6 Slabs in paved areas: Granular material placed below slabs of exterior structures in paved areas shall be wrapped in geotextile.

6.3.2.7 Powered Front Vehicle Gates: Mortorized sliding gates shall be installed on each side of the building for entry and exit to the mortorpool area. Keypads shall be used on drivers side for entry and exit at each gate for access.

6.3.3. Site Functional Requirements:

6.3.3.1. Stormwater Management (SWM) Systems.

6.3.3.1 The Contractor(s) shall comply with Article 17 of New York State Environmental Conservation Law; Title 6, Part 750 of New York Codes, Rules, and Regulations; and the current New York State Pollutant Discharge Elimination System permit. Inclusive of this permit is the requirement for the contractor to prepare a "Stormwater Pollution Prevention Plan" (SWPPP) and a site specific Erosion and Sedimentation Control Plan. Storm water designs will comply with NYS DEC design manual.

6.3.3.2 Storm water runoff from the site currently flows north-west to north-east to a depression past the tree line where it eventually is collected by a stream near Fort Drum Road. The new development will increase the quantity of impervious pavement and occupy a substantial portion of this area so the flow will have to be collected and discharged. An open swale collection system is preferred however some limited underground piping is anticipated.

6.3.3.3 Permanent storm water treatment must be addressed for both quantity and quality. It is anticipated that the contractor will be able to address quantity by performing an analysis of the down stream receiving waters to confirm that the development will not impair the waterway in accordance with New York State Department of Environmental Conservation (NYSDEC) criteria however if this does not prove true during the analysis the contractor shall provide a storm water management basin or other approved measure to control the additional runoff in accordance with the NYSDEC guidelines. Water quality treatment will be required and the contractor may be able to meet this requirement by constructing a grass channel with check dams, or a water quality pond. The contractor must perform the necessary analysis to confirm the design and provide all necessary storm water measures to address both water quality and quantity in accordance with the NYSDEC guidelines.

6.3.3.2. Erosion and Sediment Control

6.3.3.2.1 The contractor shall install temporary and permanent erosion and sediment controls in accordance with the NYSDEC guidelines.

6.3.3.2.2 The contractor is required to maintain and inspect soil erosion and sediment control measures in accordance with NYSDEC guidelines.

6.3.3.3. Vehicular Circulation.

6.3.3.3.1.1 The site will be accessed from Enduring Freedom Drive and include a new POV parking facility with approximately 125 spaces, service drive providing circulation around the covered vehicle parking as well as access to the trailer parking and maintenance bays.

6.3.3.3.1.2 The new building must be situated a minimum of 82-feet from the edge of pavement of any roadways, parking areas or existing buildings with the exception of the enclosed service yard which will be secured by a fence with motorized sliding security gates.

6.3.3.3.1.3 Truck access to the service yard will be through one new access drives and a loop drive around the site. The site must accommodate circulation of large delivery vehicles such as WB-67 trucks. Bollards shall be installed at building corners and exterior access doors.

6.3.3.3.1.4 Pedestrian access between all building entrances and POV parking is required by means of concrete sidewalks constructed in accordance with the ADA act. The main entrance sidewalk is 12 feet wide and the other site sidewalks are a minimum of 5 feet wide.

6.3.3.3.1.5 Parking and access for the physically handicapped shall be provided in accordance with the ADA act.

6.3.3.3.2 The new building shall comply with Fort Drum Emergency Vehicle Access Requirements. Requests for Proposal should address the following five (5) emergency vehicle access requirements in Section 5: (1) The emergency access road shall be within 50 feet of an exterior door to the building. (2) The emergency access road shall be at least 20 feet wide. (3) The emergency access road shall be designed to accommodate a 70,000 pound vehicle. (4) The emergency vehicle access road radii shall be sized to accommodate Fort Drum fire fighting apparatus. (5) The emergency access road curb cuts shall extend at least 2 feet beyond the road's width.

6.4. SITE ENGINEERING

6.4.1. Existing Topographical Conditions

6.4.1 A field topographic and utility survey of the project site is included (accuracy +/- one foot). Contractor is responsible for verifying all existing conditions, including but not limited to existing condition features, topographic line and grade and all existing utility information including horizontal location and vertical depth and slope. Additionally the site is 3 to 4 feet above Enduring freedom drive and 10 to 30 feet above 45th Infantry Drive with steep slopes along the roadways.

6.4.2 The site is predominantly wooded. The grades are relatively level sloping approximately 1-3 % from west to east away from Enduring Freedom Drive with the exception of some steep slopes scattered around the site area.

6.4.3 Survey control information is as follows: Horizontal Datum: Survey Coordinates are in New York State Plane Central Zone 3102, NAD 83/99, based on CORS Station "NYWT". Combined Grid-Scale Factor = 0.999966443, Vertical Datum: NAVD 88, based on CORS Station "NYWT".

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

6.4.2.1 A limited geotechnical investigation was performed and is available for review however it is the contractor's responsibility to verify and or collect all necessary geotechnical data to develop the design.

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

6.4.3 Fire Flow Tests: The minimum anticipated water for fire protection adjacent to the site is 50 PSI. The contractor shall coordinate with the DPW and perform the necessary fire flow tests to verify this information.

6.4.4. Pavement Engineering and Traffic Estimates:

6.4.4.1 Pavement Design: Asphalt pavement design shall be in accordance with the New York State Department of Transportation Comprehensive Design Manual. At connection of new pavement to existing pavement: Provide a straight line saw cut of the wearing top course of existing pavement a minimum of 6-inches beyond the edge of new pavement and remove the existing top course in this area. Bridge the wearing top course from the new pavement over the existing pavement base course to the vertical cut to minimize differential settlement and minimize breakdown of the asphalt surface along the joint.

6.4.4.2 Pavement Grade: Finished pavement shall be graded to assure positive drainage across the paved areas as shown on the drawings. Paved surfaces to have a minimum grade of 1.0% and a maximum grade of 2.5%.

6.4.5. Traffic Signage and Pavement Markings

6.4.5 Shall be per New York State MUTCD.

6.4.6. Base Utility Information

6.4.6.1 Utilities: See site utility plans. Contractor to provide live/hot power, communications, gas, and water connections. If not physically possible, utility connections shall be provided as required below. Any utility outages, road closures, etc. shall be coordinated with Fort Drum agencies and may be required to be accomplished at off

hours/weekends and holidays. A 14 day timeline notification shall be submitted to the Fort Drum Public Works prior to any work. All piping indicated in the RFP (shown on plans or in the specifications) are indicated as minimum inside diameter regardless of type of pipe. Piping provided shall not be less than this minimum diameter. The design of the water and sewer systems shall be stamped by a NYS Registered Professional Engineer and shall conform to all the requirements of the 10 State Standards & DOH Standards. Outages are not acceptable during the heating season and require 30 day advance notice.

6.4.6.2 Marker Tape and Tracer: Provide marker tape and tracer wire for all underground pipe with the exception of storm sewer piping. Tracer wire test stations and termination to be contained in a test station that shall be a "TWABADJ18" – adjustable 18" tracer wire access box, by C.P. Test Services or equal. Test stations to be located at 500 feet intervals, by each valve box and the termination of the utility. Tracer wire is to be placed 6 to 12 inches above pipe, and dig tape is to be located 18 inches below grade. (Dig tape for communication duct banks is 12" and 12 inches below grade.)

6.4.6.3 Existing Utilities: Existing utilities are shown on the Site Utility Plans, as could be located by surface survey and plotted from record drawings. The Contractor shall be responsible for verifying the existence, location, size, depth and condition of the utilities.

6.4.6.4 There is existing overhead electric running parallel to Enduring Freedom Drive on the eastern side. Existing overhead electric lines also run along 45th Infantry Drive.

6.4.6.5 Service to the new building can be provided by a new underground electric service and pad mounted transformer installed west of the new building and connect to the overhead lines running from Enduring Freedom Drive.

6.4.6.6 There is an existing 20" Ductile Iron water main running parallel to Enduring Freedom Drive on the opposite side of the road from the side which has adequate capacity and pressure for the proposed development. The lines are owned and operated by Fort Drum DPW.

6.4.6.7 Flow test requests must be routed to the DPW should the design build contractor require this information.

6.4.6.8 Domestic water and fire services will be extended from the proposed building to the existing 20" water main in Enduring Freedom Drive. A post indicator valve will be placed on the fire service line, and hydrants will be placed throughout the site including the service yard. The contractor must verify that all new services will have adequate pressure and flow as part of the design.

6.4.6.9 Fire Hydrants: A minimum of two concrete filled bollards shall be provided around all hydrants. Those exposed to traffic on all sides will have 4 bollards. All hydrants will require a 5 foot long by ½ inch diameter fiber glass pole (alternating red and white reflective bands, 4-each) mounted on a spring to the top of the fire hydrant for locating the fire hydrant in the snow. Fire Hydrants to have a 5" 'Storz' Connection.

6.4.6.10 Valve and Valve Boxes: Sufficient sectional control valves shall be provided so that no more than two fire hydrants will be out of service in the event of a single break in a water main.

6.4.6.11 Post Indicator Valves (PIVs): Post indicator valves shall be provided on water services. Tamper switches must be included on all post indicator valves on the fire lines to building. PIVs are to be a minimum of 50 feet from the building.

6.4.6.12 Testing and Chlorination Requirements: Water main and service lines to be tested requires 2 working days notice and approval from the COR, the Fort Drum Public Works Plumbing Shop, and Environmental Division must be obtained.

6.4.6.13 Water Line Burial Depth: The minimum cover depth for water mains and service lines shall be 5'-6".

6.4.6.14 There is an existing 8" PVC sanitary sewer main running parallel to Enduring Freedom Drive terminating approximately 750 feet south of the proposed site. As part of this project, the sanitary sewer main will be extended to the site.

6.4.6.15 Sanitary sewer service will be run from the new building to a proposed manhole included in the sewer main extension.

6.4.6.16 There is an existing 12" HDPE gas line running along Enduring Freedom Drive approximately 480' to the northwest of the site. This line connects to the remainder of the gas network.

6.4.6.17 Service is distributed at 15 psi and must be reduced at the building to 0.5 psi. The existing gas line appears to have adequate capacity for the proposed development however the contractor shall verify this as part of the design.

6.4.6.18 Gas service meters are required at all new building connections and shall be located 30 feet from the building. Gas meter shall require a minimum of 3 standard 8" diameter concrete filled bollards. Minimum bollard foundations shall be 24" diameter wire mesh reinforced concrete by 42" deep below finished grade. A canopy shall be stated for the above designed meter.

6.4.6.19 Gas service will be extended from the building and connect to the 12" gas main along Enduring Freedom Drive.

6.4.6.20 Gas: Interruption of gas service to adjacent facilities, during construction, shall be minimized and restricted to the hours as permitted by the Contracting Officer. The gas service line shall be designed in accordance with the applicable codes and local gas company, National Grid, standards.

6.4.6.21 Gas Line Burial Depth: The minimum cover depth for gas mains and service lines shall be 30 inches.

6.4.6.22 Gas Line Materials: Materials for gas lines shall be Type II high density polyethylene with the PE 3408 designation SDR11 (100 PSI). Transition from underground to above ground piping shall be by anode less riser.

6.4.6.23 Gas Line Testing: Gas line to be pressure tested at a minimum 70 psi. Contractor shall provide a written work plan and drawing to Fort Drum Public Works for approval, a minimum 14 days prior to commencing any work. All gas piping shall be purged using nitrogen only; full nitrogen purge required, slug method is not allowed.

6.4.6.24 Fiberoptic connection is to be connected at Switchnode 5 at Building 10410 Approximately 3700 Feet from the site. From manhole THM 88A to building 10410 the contractor may utilize existing conduit.

6.4.6.25 New Copper must be run from the site to existing manhole TMH 141 approximately 2400 feet from the site. Conduit is available from manhole THM 88A to manhole THM 141.

See drawings in Appendix J

6.4.7. Cut and Fill

6.4.7.1 The contractor shall balance site cuts and fills to the greatest extent possible.

6.4.7.2 Excavated Materials: Excavated materials shall be separated to satisfactory and unsatisfactory soil materials. Surplus satisfactory material shall be disposed of at the on base clean soil disposal area, as directed by Fort Drum Public Works. Unsatisfactory material (all rock, concrete, asphalt, metal, refuse and organics) shall be legally disposed of off of Fort Drum property by the contractor.

6.4.8. Borrow Material

6.4.8 Acceptable borrow material is available at site 6-Alpha on Fort Drum upon request as directed and approved by Fort Drum Public Works.

6.4.9. Haul Routes and Staging Areas

6.4.9 The Contractor's haul route shall be from the project site location to NYS Route 26 - (Contractor entry gate). Contractor will be responsible for repairing any damage caused by the Contractor along the haul routes during construction.

6.4.10. Clearing and Grubbing:

6.4.10.1 Contractor shall stack saleable timber from the project site as directed by Contracting Officers Representative (COR) to a location adjacent to site. Saleable timber shall remain property of the Government.

6.4.10.1 If unclassified materials (glacial boulders, impenetrable bedrock) are encountered, the Contractor is to achieve desired elevation by suitable methods. If blasting is required, Contractor is to obtain a blasting permit from Fort Drum prior to proceeding.

6.4.11. Landscaping:

6.4.11 The contractor shall establish turf in all disturbed areas not receiving pavement or buildings.

6.4.12. Turf:

6.4.12 Loam & Seed: All disturbed areas shall be covered with stockpiled or imported loam a minimum of 4" and shall be seeded such that a dense grass growth becomes established. Loam must pass through 1/4" sieve.

6.4.13 For exterior portions of buildings adjacent to grass finished surfaces, require a gravel drip strip a minimum of 4-feet wide, 4-inches deep of Number 2 stone placed on geotextile with the top of aluminum edging set 1-inch above grade.

6.5. ARCHITECTURE

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

6.5.2. Design

6.5.2.1. Appendix F is provided "For Information Only", to establish the desired site and architectural themes for the area. Appendix F identifies the desired project look and feel based on Fort Drum's Installation Architectural Theme from existing and proposed adjacent building forms; i.e. building exterior skin, roof lines, delineation of entrances,

proportions of fenestration in relation to elevations, shade and shadow effects, materials, textures, exterior color schemes, and organizational layout.

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

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

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

Please See Appendix F.

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

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

6.5.2.6. Additional architectural requirements:

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

6.5.2.7 Design Requirements - To the maximum extent possible within the contract cost limitation, the buildings shall conform to the look and feel of the architectural style and shall use the same colors as adjacent facilities as expressed herein, and shall conform with the Fort Drum Real Property Master Plan and color and material matrix. Refer to Appendix EE for fire and life safety narrative and section 6.13 for fire protection.

6.5.2.7.1 Physical Characteristics and Exterior Façade: In conformance with the Fort Drum Installation Design Guide, the general massing and proportions of the buildings present a human scale and are sensitive to the physical characteristics of the existing buildings in the North Post. The proposed exterior finish materials and colors are based on safety, durability, energy efficiency, aesthetics and economics, and will comply with the current Ft. Drum color and material matrix. The above grade exterior base of all buildings will be 24" high AFF split face concrete block masonry plus 8" precast concrete water table for a total sill height of 32". The remaining exterior wall of the administrative wing will be brick veneer with vapor barrier and metal stud backup with exterior sheathing. All windows to have 8" high precast concrete sills. Administrative wing exterior walls to have an actual continuous thermal value of R20. The maintenance wing will have insulated metal panels with an actual continuous thermal value of R20 above the masonry base. The vehicle storage building and covered trailer structure will have modulated metal siding panels above the masonry base to roof copings, eaves, or soffits. All selected exterior materials will be earth tones which will be consistent with the North Post installation guidelines. All exterior walls will be designed to resist external blast and conform to UFC standards. All structural columns for the vehicle storage and covered trailer buildings are to be supported by 3'-0" minimum high concrete pilasters..

6.5.2.7.2 Concrete: Exposed concrete will not be permitted for major exterior architectural elements, except as noted for concrete floors, pre-cast sills and accent blocks. Building foundations and other structural elements of concrete shall be concealed. All exterior concrete surfaces shall receive a broom finish. Broom finish in direction perpendicular to traffic. All sidewalks shall be constructed of minimum strength concrete of 4500 psi and 4 inches thick unless to be used by service vehicles, which shall be 6 inches thick and reinforced.

6.5.2.7.3 Windows and Exterior Doors: All glass doors and windows will be anodized aluminum with a minimum 1" insulating laminated glass to comply with UFL 4-010-01 standard 10 to resist external blast and ASTM-F2248-03 for allowable stress in framing components and connections. All windows to be low E and argon filled with minimum R2.2 and be energy star rated to comply with NYS energy codes. All windows must be able to open to the outside (awning type operable lower portion with optional casements at upper portion) except SIPR vault and IFAC (Simulator) rooms MUST NOT have windows. The curtain wall system above the entrance must be designed to withstand the wind load requirements for the region and match the entrance enframement. All solid exterior doors exposed to weather shall be reinforced fiberglass (FRP). All exterior doors are to swing outward. All exterior main doors will have a minimum thermal value of R8. All exterior overhead doors will have a minimum thermal value of R13 and be galvanized steel finish painted and heavy duty industrial grade electrically operated with vision panels and emergency manual chain operation. Overhead doors will be designed for maximum local wind loads.

6.5.2.7.4 Roofing: The entire roof of the administration wing of the ASOS building will be constructed as sloped roofs with a series of modulated A-frame light gauge steel trusses with metal deck substrate and metal standing seam finish roof over. The roof finish will be gray to comply with the Fort Drum Installation Design Guide North Post requirements. Attic insulation with a thermal value of R48 will be provided throughout. Attic ventilation will be achieved with a continuous ridge vent and soffit vents.

6.5.2.7.4.1 Roofs for the vehicle maintenance building and the vehicle storage building will be flat roofs with minimum ¼" per foot pitches to internal drains with 100% back-up overflow drains or as an alternate, provide scuppers as back-up. Flat roofs will be constructed with minimum 60 mil fully adhered, gray, EPDM or TPO over 6" thick rigid polyisocyanurate insulation fastened to metal deck. All flat roof areas will have 1'-6" high parapet walls as requested. There shall be no mechanical equipment on roofs including exhaust fans which will be through wall where required per Fort Drum standards.

6.5.2.7.4.2 The roof for the covered trailer structure will be gray metal standing seam over metal deck pitched in one direction to the rear of structure.

6.5.2.7.4.3 N/A.

6.5.2.7.4.4 The Solar Wall System will be provided on the maintenance building and oriented in a southerly direction for maximum efficiency. The system is to be supported by the building structural system.

6.5.2.7.5 Exterior Soffits and Fascias: Soffit vents shall be fully perforated metal panels, screened and sealed to resist insect intrusion. Soffits and fascias shall be pre-finished metal to match the standing seam metal roof. Eaves shall be at a minimum 36" and no gutters will be allowed.

6.5.2.7.6 Exterior Canopies: Exterior walkways accessing building entrances are required to be covered with canopies. Mechanical room exterior doors require canopies sized to protect the door from snow and ice build-up. Canopies are required to cover an area two times the door width by 5'-0" deep minimum or a depth as calculated by the Contractor's designer. The designer shall use the sliding snow calculator developed by the USACE Cold Regions Research and Engineering Laboratory (CRREL) for sloped roofs. Utility connections to buildings shall be

protected from sliding snow and ice. Contractor shall submit all sliding snow calculations as part of the design submittals.

6.5.2.7.7 Snow Guards: Avoid where possible per above paragraphs. If snow guards are necessary, design and install per MP-05-6443 – Snow Guards on Metal Roofs as published by CRRELL.

6.5.2.7.8 Exterior Signage / Building Identification: Each building shall have anodized aluminum numbers and letters coordinated with Fort Drum personnel and North Post requirements. Signage shall be vandal resistant and mounted to exterior brick wall surfaces with spacers. Building names, logos, and numbers etc., shall be provided by the Contractor as required by COR. Sizes and locations shall be determined by COR.

6.5.2.7.9 Color Schedules: Exterior and interior colors shall comply with the current Fort Drum Color Matrix. Examples are provided in the Appendix F and Appendix J.

6.5.2.7.10 Interior Doors:

- All general room doors (solid core wood) and frames (painted metal)
- All rooms and areas requiring fire separation doors and frames – painted fire rated to meet code requirements.
- The exterior Doors shall be FRP of proper colors.
- All exit doors for stairways and fire exits will be provided with panic exit devices with concealed rods and closers as required.
- The required specialty secured door and hardware will be provided for the SIPR room.

The exterior Doors shall be FRP of proper colors.

6.5.2.7.10.1 Provide Class V vault door, minimum 4'0" wide x minimum 7'0" high. Vault door and frame must comply with Federal Specifications QPL-AA-D-600-7. Locks shall be Underwriters Laboratories listed Group 1 or 1R combination lock. Provide a metal ramp threshold. Provide a wire mess, dutch door style day gate with shelf for issues arms and ammunition. Day gate shall have lock operated room the outside by key and handle and from the inside handle. It shall also comply with egress requirements of applicable codes. The combination lock shall secure the exterior and interior handles. Vault Door Ingress shall be by operation of the combination lock and exterior level handle. Vault Door egress shall be by interior lever handle; egress system shall be constructed to allow multiple daily uses without manufacturer reset.

6.5.2.7.10.2 The arms vault shall be constructed of reinforced concrete walls, floors and ceiling, in conformance with AR 190-11 "Physical Security of Arms, Ammunition and Explosives", appendix 'H', Attachment 2 for Category II risk category.

6.5.2.7.11 Hardware; Locksets and Latchsets: The locks shall be supplied with Best Mortise Cylinders or as equal alternates: Arrow or Falcon to continue the Base Master Key System for all doors. The existing Fort Drum system is equal to Schlage Heavy Duty Commercial Lever Type with removable, 7 pin, Type L keyway, interchangeable core locks to be compatible with existing Fort Drum "Best" manufactured locks. Building entrance doors shall be keyed alike. The Contractor shall provide 3 sets of keys for each door to Public Works Fort Drum. Coordinate

keying requirements with Fort Drum and the Contracting Office. Overhead holders or closers with hold-open capability are to be provided at exterior doors to lobbies, corridors, mechanical rooms, electrical rooms and janitor's closets. The R value of the doors should be a minimum of R-8.

6.5.2.7.12 Clear Access Space: Clear access space shall be provided around each piece of equipment for operation, maintenance, and repair as recommended by the equipment manufacturer. No piping, ducts, or equipment shall infringe on access space. In Mechanical Rooms and other mechanical spaces, locate all pipes and ducts so that walkways and equipment access areas are not obstructed and a minimum of 78-inch clearance is provided above walkways and work spaces. Locate and route all piping and ducts to avoid piping and ducts from being stepped over or stepped on to access equipment or walk-through spaces.

6.5.2.7.13 Antennae and Roof Access Ladder: Provide exterior wall mounted radio antennae mast on the Southwest high wall of the maintenance bay with adequate backup in-wall support structure. A weatherproof thru-wall conduit of required size is to be provided for cable to antennae. And provide interior metal caged OSHA compliant roof access ladder with rest platform and roof access hatch.

6.5.2.7.14 Bike Racks: Provide (2) seven minimum bike capacity bike racks, size and style to be in conformance with North Post requirements. Loop Wave Racks – 10-gauge galvanized steel with powder coating. Mount with proper concrete fastening hardware to concrete foundation. One to be located outside of main entrance to the Admin Wing, and one to be located by the Northwest Maintenance Wing entrance.

6.5.3. Programmable Electronic Key Card Access Systems:

If applicable per ASOS, refer to paragraph 3.4.1.5 and the referenced appendices.

6.5.4. INTERIOR DESIGN

6.5.4 Interior Design

6.5.4.1 Floors: Will comply with requirements of applicable codes. Durable flooring materials will be provided.

Administration Building Floors (Ground Floor):

- Main Entrance Vestibule – Porcelain Tile and a recessed walk off grille system with a floor drain and sediment bucket shall be provided.
- Physical Training – Rubber flooring.
- Main Lobby/Reception Area – Porcelain Tile.
- Corridor, Armory/Vestibule, Storage/Copy Room, Stan/Eval Room, Training/Schedule Room, Mission Planning/Mission Briefing Room, Weather-Amlo/Office, Telcom, Flight Ops/Office A, B, C and D- VCT- Vinyl Composition Tile
- Toilets/Showers – Ceramic Tile
- Elevator machine Room, Mechanical Room – Epoxy painted
- Electric Service Room- sealed concrete
- Shower Alternate – shall be fiberglass units with seamless surrounds.

- Stairs – shall be constructed of concrete filled metal pans with closed risers. Treads shall include full-depth type extruded aluminum casting to accept a replaceable abrasive insert. Aluminum frames shall be surface applied, not cast into, the concrete steps. Use stainless steel fasteners. Nosings shall be noncombustible.

Administration Building Floors (Second Floor):

- Lobby/Corridor, Break Room, Storage Rooms, Copy/Fax, Electric Closet. IM Storage, Telecom Room – VCT – Vinyl Composition Tile.
- Meeting Room, Commander Office, Squadron Superintendent Office, 1st Sergeant Office, Ops Director Office, Ops Superintendent Office, Assistant Ops Director Area, CSS Area, Waiting Area, IFACT Room, SIPR/Office - Carpet
- IFACT Room - Raised Floor System for installation/maintenance of simulator.
- Toilets / Showers – Ceramic tile.
- Shower Alternate – shall be fiberglass units with seamless surrounds.
- Stairs – shall be constructed of concrete filled metal pans with closed risers. Treads shall include full-depth type extruded aluminum casting to accept a replaceable abrasive insert. Aluminum frames shall be surface applied, not cast into, the concrete steps. Use stainless steel fasteners. Nosings shall be noncombustible.

Vehicle Maintenance Building Floors:

- Maintenance Superintendent Office, Material Control Room, Vehicle and Power Pro Room, Radio Office – VCT – Vinyl Composition Tile
- Corridors, Maintenance Bays, Storage and Room, Radio Maintenance – Non-slip Epoxy Painted
- General Storage, Portable Radio, MRSP Storage, Mobility Storage, Radio Field Storage, Battery Room – sealed concrete

Enclosed Vehicle Storage Building Floors:

- BAMS locker room – Non-slip epoxy painted
- Parts Wash bay, Vehicle storage- sealed concrete

Covered Trailer Structure Floors:

- All rooms and spaces – sealed concrete

6.5.4.2 Walls: Will comply with requirements of applicable codes. Durable wall materials will be provided. Minimum 1 hour rated fire separation to be provided for exit stairs, elevator shaft, machine room, mechanical room, and large storage areas.

Administration Building Walls (Ground Floor):

- Armory – Reinforced Cast-In-Place Concrete – Finish painted
- Toilets/Showers – painted concrete block with 5'-0" high ceramic tile wainscot walls and 7'-0" at showers.
- Physical Training – painted sound retardant concrete block or abusive resistant gypsum board – insulated walls
- Mechanical Room, Water and Electric Service Rooms – Painted concrete block
- Elevator shaft, elevator machine room and HVAC duct shafts – fire rated painted gypsum board
- All other rooms and spaces – painted gypsum board
- Stairs, Main Corridor and Lobby – painted concrete block

Administration Building Walls (Second Floor):

- Toilets/Showers – painted moisture resistant gypsum board with 5'-0" high ceramic tile wainscot. And 7'-0" high at showers. Sound insulation provided in all walls.
- Elevator shaft and HVAC duct shafts – painted fire resistant gypsum board
- SIPR/Office - Sound insulation in all perimeter walls.
- All other rooms and spaces – painted gypsum board with full height sound insulation
- Lobbies, Stairs and Corridor – painted concrete block

Vehicle Maintenance Building Walls:

- All rooms and spaces – painted concrete block

Enclosed Vehicle Storage Building Walls:

- All rooms and spaces – 4'-0" high painted concrete block base wall and finish metal panel to roof. (Insulated)
- All building structural columns and miscellaneous steel to be finish painted

Covered Trailer Structure Walls:

- Trailer Storage – 4'-0" exposed high concrete lock base wall and finish metal panel to roof. (Non-insulated).
- All building structural columns and miscellaneous steel to be finish painted
- Storage rooms – exposed concrete block

6.5.4.3 Ceilings: Will comply with requirements of applicable codes. Durable ceiling materials will be provided.

Administration Building Ceilings (Ground Floor):

- Toilets/showers, Janitor Closet, Telecom Rooms, and Soffits – painted gypsum board
- Elevator Machine Room, Electric Service Room, Mechanical Room – painted fire resistant gypsum board with sound insulation over mechanical room.
- All other rooms and spaces – ACT – Acoustical Ceiling Tile
- Armory – Pre cast concrete planks – finish painted

Administration Building Ceilings (Second Floor):

- Toilets/shower, Janitor Closet, Telecom Rooms, and Soffits – painted gypsum board
- SIPR and IFACT rooms – Painted gypsum board with sound insulation.
- All other rooms and spaces – ACT – Acoustical Ceiling Tile

Vehicle Maintenance Building Ceilings:

- Corridors, Maintenance Superintendent Office, Material Control room, Vehicle and Power Pro, Radio office, Maintenance Storage – ACT – Acoustical Ceiling Tile.
- All other rooms and spaces – painted exposed structure

Enclosed Vehicle Storage Building Ceilings:

- All rooms and spaces – painted exposed structure.

Covered Trailer Structure Ceilings:

- All rooms and spaces – painted exposed structure.

6.5.4.4 Shower: The showers shall be fiberglass units with seamless surrounds, curtain rods

6.5.4.5 Furnishings: Furniture, appliances, and vending machines throughout the facility will be provided and installed by the Government except as noted. The Contractor shall coordinate electrical and utility connections for all appliances, vending machines and furniture. Appliances which are built-in shall be provided and installed by the Contractor unless stated otherwise. Comprehensive furnishings design services are required. FF&E items include, but are not limited to workstations, seating, files, tables, beds, wardrobes, draperies and accessories as well as marker boards, tack boards, and presentation screens.

6.5.4.6 Entryway Grille System: A slab recess to accept a walk-off mat will be provided with a floor drain under mat

at all flight ops building entrances. Floor drain in entry vestibule shall include a sediment bucket to facilitate easy cleaning and minimize clogging.

6.5.4.7 Wood and Casework: The use of wood shall be limited to fire rated shelves and cabinetry, millwork, plastic laminate mounting panels and unexposed fire retardant treated nailers, roof curb blocking shims, or backing for flashing. Kitchenette: Provide manufactured unitized kitchenettes or architectural cabinets complying with AWI Quality Standards, Section 400, Custom grade cabinets with high pressure decorative laminate finish, meeting NEMA LD3 standards, fire retardant laminate over fire rated plywood.

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

6.5.4.9 Signage: Interior signage for overall way finding and life safety requirements shall be provided. Comprehensive interior plans shall be from one manufacturer and shall include the following sign types: (1) Lobby Directory, (2) Directional Signs; (3) Room Identifications Signs; (4) Building Service Signs; (5) Regulatory Signs; (6) Official and Unofficial Signs (7) Visual Communication Boards. Use of emblems or logos may also be incorporated into the signage plan.

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

6.5.4.11 Toilet Accessories:

Toilet Tissue Dispenser - Heavy duty double roll S.S. finish.

Paper Towel / Waste Receptacle Combo - Semi recessed heavy gauge S.S. 600 C-Fold w/ 12 gallon waste receptacle.

Toilet Seat Cover Dispenser - S.S. 250 seat covers.

Feminine Napkin Dispenser / Disposal Unit - S.S. recessed.

Mirrors - Mirror w/ S.S. Frame 24" x 36" at each lavatory.

Soap Dispensers - In counter pump type or wall mounted type.

Grab Bars - S.S. wall mounted w/ concealed mounting per ADA requirements.

Robe Hooks - S.S. wall mounted w/ double hooks. Number as required for dressing area and showers.

Shower Curtain Rod and Curtain - S.S. rods and heavy vinyl curtain and S.S. hooks.

Janitor Closet - 36" long S.S. shelf with mop holders.

Toilet Compartments and Urinal Screens - Ceiling hung toilet compartments and wall mounted urinal screens, solid phenolic or S.S.

Folding Shower Seat - reversable durable with solid phenolic seat and S.S. mechanism and support frame.

Interior building signage requirements:

[Not Supplied - PS_Architecture : INTERIOR_SIGNAGE]

6.6. STRUCTURAL DESIGN

6.6 Structural Design

6.6.1 General

6.6.1.1 The ASOS Facility consists of a two-story administration building and a one story vehicle systems maintenance building. Additionally for this project, a one story vehicle storage building and a one story trailer building will be constructed on the Fort Drum site. The administration building, vehicle systems maintenance building, and the vehicle storage building are adjacent to each other and are separated by expansion joints. The trailer building is located elsewhere on the site. Lateral stability for the vehicle systems maintenance building will be provided by moment frames. For all other buildings lateral stability will be provided by braced frames. Per the preliminary draft of the Fort Drum building design standards, all buildings will be founded on spread footings. Exterior base of all buildings will be 4'-0" high CMU Wall.

6.6.1.2 The Administration building is a two-story structure, rectangular in plan, whose gross plan dimensions are 185-ft x 70-ft. The second floor will be a lightweight concrete slab-on-metal deck system supported by steel beams and girders. The entire roof of the administration will be constructed with gabled light gauge steel trusses and metal standing seam finish roof over metal deck substrate. The ground level will consist of a non-structural slab-on-grade. The administration building contains an armory whose walls and ceilings will be reinforced concrete for blast resistance. The outside wall of the building wall is metal stud framing with brick veneer.

6.6.1.3 The vehicle systems maintenance building is a one story structure which is also rectangular in plan. The gross dimensions of the vehicle systems maintenance building are 116-ft x 72-ft. The roof for the one story structure will be flat on metal deck with EPDM roofing, pitched for drainage. The vehicle maintenance bays in the vehicle systems maintenance portion of the building will have a structural slab-on-grade with 10 mil vapor barrier capable of supporting a 40,000-lb vehicle load. The outside wall will be metal siding panels above CMU base.

6.6.1.4 The storage building is a one story structure that is rectangular in plan. The gross dimensions of the vehicle storage portion of the building are 430-ft x 60-ft. The roof for the one story structure will be flat on metal deck with EPDM or TPO roofing, pitched for drainage. The vehicle storage building will also have structural slab-on-grade capable of supporting the heavy vehicles such as Humvee and MRAPs. The outside wall will be metal siding panels above CMU base.

6.6.1.5 The one story trailer building is rectangular in plan and has gross dimensions of 181-ft x 68-ft. This building will be a pre-engineered building with full height metal siding panels on CMU base on all three sides except the front face of the building. The roof will be metal standing seam over metal deck pitched in one direction to the rear of the building.

6.6.1.6 All exterior walls will be designed to resist external blast and conform to UFC standards. All columns for the vehicle storage and covered trailer buildings will be on minimum 12" high concrete pedestals.

6.6.1.7 The preliminary draft of the Fort Drum Building Design Standards indicates that the minimum foundation depth shall be 5'-6" below finished grade or pinned to sound rock surface. Interior non-bearing partition walls shall be set on thickened areas of the concrete slab-on-grade floor. Interior masonry or CIP walls shall have continuous spread footings.

6.6.2 Applicable Standards, Codes, and Criteria

6.6.2.1 Structural design criteria indicated herein is based on requirements specified by (latest edition) UFC 1-200-01, IBC and UFC 3-310-01 including Chapter 2, (Structural Load Data). While IBC (latest edition), UFC 3-300-10N and UFC 3-310-01 will be used as the model building code for structural design, ASCE 7 (as referenced by IBC) will be used to develop structural design loads including those for wind, snow, and seismic. The preliminary draft of the Fort Drum Building Design Standards indicates that TI 809-04 is to be used for the seismic design of building. However, this reference has been superseded by UFC 3-310-04. This latest document will be referenced for the seismic design. Also follow UFC 3-310-02A for structural design criteria, UFC 3-320-06A for concrete floor on grade subject to heavy loads and UFC 3-310-7A for cold formed metal stud system design

6.6.2.2 The following latest codes and standards (as referenced by IBC) comprise a partial listing of documents that will be used for design and analysis. In the event that two or more standards conflict, the more stringent criteria applies.

- Building Code Requirements for Structural Concrete and Commentary (ACI 318)
- Building Code Requirements for Masonry Structures (ACI 530)
- AISC Specification for Structural Steel Buildings (AISC)
- Steel Joist Institute Standards, Load Tables, and Weight Tables for Steel Joist and Joist Girders (SJI)
- Steel Deck Institute Design Manual for Composite Decks, Form Decks, and Roof Decks (SDI)

6.6.2.3 The Occupancy Category is used to determine structural requirements based on occupancy. This value ranges from I to IV (IBC Table 1604.5) with essential facilities given the highest level (IV). (Reader note: UFC 3-310-01 lists one additional Level (V) which is not applicable for this project). The Occupancy Categories for each portion of the facility are listed in the table below.

Table 1-1: Building Occupancy Category

Administration Building II
Vehicle Systems Maintenance II
Trailer Building I
Vehicle Storage Building I

6.6.2.4 Wind, snow, seismic, and geotechnical design criteria (see tables below) are based on information specified in ASCE 7.

Table 1-2: Wind Load Criteria

Design Wind Speed 100 mph
Wind Exposure C
Wind Importance Factor 1.0

Table 1-3: Snow Load Criteria

Ground Snow Load 70 psf
Exposure Factor 0.9
Thermal Factor 1.0
Snow Importance Factor (Admin & Vehicle Storage) 1.0 and 0.8

Snow drift and snow sliding calculations shall be performed as required by USACE Design criteria.

Table 1-4: Seismic Load Criteria

Ss 0.27
S1 0.077
Site Class TBD
Analysis procedure Linear Static
Seismic Importance Factor 1.0

6.6.2.5 Net Allowable Soil Bearing Pressure to be determined after Geotechnical exploration performed. The minimum thickness for vapor barriers shall be 10 mil.

6.6.2.6 Anti Terrorism Force Protection is required per UFC 4-010-01 for this facility.

6.6.2.7 All concrete shall be a minimum of 4,500 psi. Provide 4" minimum high concrete house keeping pads for all floor mounted mechanical & electrical equipment.

6.6.2.8 The structural framing system shall be designed to minimize interior columns. The vehicle bay area shall be free of any interior columns.

6.6.2.9 Limit deflections of structural members to the allowable limits specified in IBC and to assure adequate drainage from roof without ponding.

6.6.3 Provide input & output data including loads, loading diagrams, results with adequate documentation to illustrate design method & type of analysis performed.

6.7. THERMAL PERFORMANCE

6.7 Thermal Performance

6.7.1 Moisture protection shall be considered as part of the building design. Protection from damage to flooring and wall finishes shall be taken into consideration when designing floor slabs and walls. The building will be provided with a vapor barrier under the floor slab, behind masonry veneer and beneath standing seam roof.

6.8. PLUMBING

6.8.1 Plumbing

6.8.1.1 Domestic water piping: No piping shall be located under slab, inside exterior wall cavities, unheated attics, or other areas subject to freezing.

6.8.1.2 Sanitary sewer piping: Plumbing vents through roof shall have a minimum height of 24 inches and shall be located as close to the roof ridge as possible and provided with adequate supports as necessary to resist forces from sliding snow and ice during winter.

6.8.2 Miscellaneous Items:

6.8.2.1 Cleanout(s) shall be provided at building service exit.

6.8.2.2 Exterior wall hydrants shall be non-freeze, exposed, anti-siphon self-draining type and mounted a minimum of 3'-0" above finish grade.

6.8.2.3 Interior hose bibs shall be equipped with anti-siphon device (integral or as attachment). Hose bibs shall be installed in each Mechanical room.

6.8.2.4 Cold-water makeup for HVAC equipment shall be by use of a hose bib equipped with an anti-siphon device to manually refill the water system. (Note: No direct potable water connection shall be made to the glycol system).

6.8.2.5 Floor drains with sediment buckets shall be installed in Mechanical Rooms and vestibules. Vestibules shall have floor drain(s) with depressed floor mat. Floor drains shall be provided in the laundry room.

6.8.2.6 All floor-mounted equipment shall be provided with a concrete housekeeping pad. Housekeeping pad shall be sized to extend at least 6 inches beyond the equipment and shall be a minimum of 4 inches thick.

6.8.2.7 Electric water coolers shall be wall mounted, stainless steel, lead free, with front and side push bars and must comply with ADA requirements.

6.8.2.8 Water hammer arrestors shall be provided as part of the plumbing system and shall be a complete engineered system designed by the Engineer of Record or designee and noted in the contract documents. Water hammer arrestors shall be specified and scheduled for use with fixtures as required by engineering calculations.

6.8.2.9 A recessed cold water valve box outlet and floor drain shall be provided in the vicinity of the ice machine, if provided.

6.8.2.10 N/A

6.8.2.11 Floor drains shall be provided in all mens and womens toilets / showers rooms.

6.8.2.12 Toilets and showers shall comply w/ ADA requirements.

6.8.2.13 N/A

6.8.2.14 A sump pit and pump will be provided in the elevator shaft.

6.8.2.15 Floor trench drains shall be provided in the vehicle maintenance bays and vehicle storage and wash bays.

6.8.2.16 All flat roof surfaces will be adequately pitched for proper drainage to internal roof drains with scuppers for 100% back-up.

6.9. SITE ELECTRICAL AND TELECOMMUNICATIONS SYSTEMS

6.9 Exterior Electric Power:

6.9.1.1 Primary Power: Obtain primary 13.2/7.62 kV 3-phase power from the solidly grounded 3-phase, 4-wire electrical distribution system. Electric is to be brought onsite through under ground conduit.

6.9.1.1.1 The layout and location of ducts, manholes, handholes, etc. shown on the Civil site utility plans are approximate. Provide ducts, manholes as per I3A.

6.9.1.1.2 Provide an underground reinforced concrete encased duct bank within 20 feet of the limits of the road. Within 20 feet of roads all electrical handholes, manholes, and other structures and appurtenances shall be designed for HS-20 DOT surface loading.

6.9.1.1.3 Minimum cover for the primary power duct bank shall be 36" for 15 kV conduits with 15 kV cables.

6.9.1.1.4 Medium-voltage cable joints shall comply with IEEE Std 404 and IEEE Std 592. Medium voltage cable terminations shall comply with IEEE Std 48. Splice kits shall be of the pre-molded splice and connector type. Joints used in underground facilities shall be certified by the manufacturer for waterproof, submersible applications. Tape type splices are not acceptable. Medium-voltage cable joints shall be made by qualified cable splicer's only. The Government reserves the right to require the cable splicer to make a demonstration or sample splice for approval. Underground splicing kits shall be 15 kV class RTE type BOL-T connectors or equal and terminations at the medium-voltage sectionalizing switch 600 ampere terminations shall be 15 kV class, separable insulated connectors, type BOL-T connectors, or approved equal. All 200A terminations shall be by load break elbows.

6.9.1.1.5 Fault and Overcurrent Protection: Line-side and load-side overcurrent and fault protection devices shall be coordinated to isolate any electrical fault from the rest of the system and for all overload conditions. After contract award, the Contractor shall contact the Contracting Officer to obtain the information (i.e., site one lines, etc.) necessary to provide this coordination.

6.9.1.2 Primary Conductors: The phase conductors on the line side of the fuse terminals shall be single copper conductor 15kV, 133% insulated, type MV90, with a semi-conducting shield, and EPR insulation, 500 kcmil with a #4/0 neutral with USE/XHHW insulation. All neutral connections shall be made with irreversible permanent connector. The phase conductors (primary cables) downstream of the sectionalizing switch shall be single copper conductor 15kV, 133% insulated, type MV90, with a semiconductor shield, and EPR insulation sized per NEC for the loads, but shall be a minimum of #2. Provide #2 copper ground wire with USE/XHHW insulation with the phase conductors.

6.9.1.2.1 The primary side transformer compartment shall be dead front with load-break elbow terminations, load-break oil immersed switch and draw-out, dry-well mounted current-limiting fuses, with primary surge arrestors. The primary feeder shall be connected to one set of bushings, and the surge arrestors shall be connected to the second set of bushings. Transformers shall be pad mounted with delta primary and wye secondary.

6.9.1.2.2 The transformer secondary compartment shall be live front with NEMA pattern spade terminations. The neutral connections shall be solidly grounded.

6.9.1.2.3 Provide 8" schedule 80 concrete filled standard bollards to protect transformers and fused terminals from vehicular traffic where required. Minimum bollard foundations shall be 36" diameter wire mesh reinforced concrete by 48" deep below finished grade. Man door bollards shall be provided. Man door bollards shall be 3" diameter schedule 40 pipes filled with concrete and constructed with 12" diameter concrete foundation cylinders by 36" long by 48" deep concrete below finished grade.

6.9.1.2.4 Provide curb and containment of transformer oil per standards in National Grid Electric Service Bulletin 750, 754 &

759. Available at HYPERLINK "www.nationalgridus.com/niagaramohawk./construction/3-elec-specs.asp"www.nationalgridus.com/niagaramohawk./construction/3-elec-specs.asp

6.9.1.2.5 N/A

6.9.1.2.6 Site Lighting: Provide building and parking area lighting.

Light minimization measures are to be incorporated that may include but are not limited to full cutoffs, reflectors, shields, and/or downward angling of lights. In addition, structures surrounding the Bat Conservation Areas for the Indiana bat are to be retrofitted to minimize lighting impacts. The following guidelines have been established for light minimization within the Installation Design Guide:

1. Maximum light at the edge of parking lot/road pavement will be two (2) foot candles.
2. Light levels for parking lots/sidewalks shall be in accordance with Illuminating Engineering Society (IES) Lighting Handbook.
3. Professional Engineer certification of the lighting plan is required.
4. Use full cutoff luminaires for road, parking lot, and sidewalk illumination. These are luminaires that allow no direct light emissions above a horizontal plane through the luminaire's lowest light emitting part.

Use downward-angling lights and appropriate shields for lights on building exteriors

6.9.2 Grounding

6.9.2.1 Grounding Systems: All underground bonding connections shall be made with exothermic welds. The maximum resistance to ground shall be 10 ohms.

6.9.3 Communications Utilities: Additional Requirements: In addition to any requirements specified in I3A, the following shall be provided:

- (a) Galvanized racks, ground rods and sumps for all hand holes.
- (b) Use fusion splice end connectors feeding all fiber to racks.
- (c) Communication outlet density shall be a minimum of two per room irregardless of the number of users per room.
- (d) Provide 100% spare rack space plus 1 extra rack.
- (e) In all existing manholes that are utilized for conveyance of the communications the contractor shall add grounding and racking to meet I3A standards for all communications going thru the manholes even though it is not connecting to the 20th ASOS facility, see Appendix CC for additional information.

6.9.3.1 The contractor shall provide 4-4" schedule 40 PVC conduits from existing manhole indicated in Civil narrative to the new facility.

6.9.3.2 Provide 4-4" conduits from the last manhole to the telecommunication room.

6.9.3.3 All communication duct shall be concrete encased.

6.9.3.4 The conduits are for telephone, cable TV and fiber optic cable. Provide fabric mesh interduct (3-3" cell tape) and pull string in the fiber cable conduit.

6.9.3.5 Provide a 24 strand single mode fiber optic cable to the telephone communications room. All installations shall meet I3A requirements.

6.9.3.6 Provide a 200 pair telephone to the telecommunications room.

6.9.3.7 All telecommunications design and installation shall be in compliance with I3A. All splices, terminations, and cutovers on each end of all cables shall be performed by Design-Build Contractor. The installation of the system shall be turnkey.

6.9.3.8 Exterior CATV cables will be provided by others. Cable TV: The CATV installer (Time-Warner) will provide the cable from the manhole to each building in the conduit provided by the Design-Build Contractor to the point of demarcation in the main Communications Room.

6.9.3.9 All utility meters shall be connected to the DDC system with cat 6 copper or fiber optic cables.

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6.10. FACILITY ELECTRICAL AND TELECOMMUNICATIONS SYSTEMS

6.10.1 Interior Electrical System:

6.10.1.1 Voltage drop shall be limited to 1% on the service conductors and 4% from the building's main distribution panel to all loads for a maximum of 5%. Voltage drop calculations shall be based on calculated demand loads plus 25% future load growth. All loads shall be assumed to be at 90% power factor. Provide electrical service of characteristics and capacity to serve all calculated loads plus 25% future load growth.

6.10.1.2 Provide at least 1 spare conduit, which shall be the same size as the conduits with wires, from the transformer to the electric room. Spare conduits shall have pull cables installed and each end shall be capped.

6.10.1.3 Provide transient voltage surge suppression (TVSS) at the service entrance.

6.10.1.4 Transformers shall be furnished with standard accessories and at least 4 taps (2 – 2.5% above and below nominal voltage).

6.10.1.5 Transformers shall be Energy Star rated.

6.10.1.6 Transformers shall be K-rated where recommended by IEEE 1100, Recommended Practice for Powering and Grounding Electronic Equipment.

6.10.1.7 Panelboards:

6.10.1.7.1 All panelboards, including the main circuit breaker, switchboard and/or main distribution panelboard, shall be fully rated for the available fault current and comply with NEC arc-flash criteria. Provide 20% spare circuit breakers.

6.10.1.7.2 Except for the main service distribution panelboard and panelboards connected to stepdown transformers, panelboards shall be furnished with main lugs only. Provide bolt-on circuit breakers.

6.10.1.7.3 The main distribution panel/switchboard shall have a minimum of two spaces suitable for future 400 amp, 3 pole circuit breakers. In addition, provide one spare 225 amp, 3 pole and one spare 100 amp, 3 pole circuit breaker in the main distribution panel/switchboard.

6.10.1.7.4 Panelboards that serve computer and data processing loads shall be dedicated to these loads and other loads such as HVAC, lighting, and other building loads shall be served by separate panels. This requirement does not apply to HVAC equipment with motors less than ½ horsepower.

6.10.1.7.5 All panelboards serving harmonic loads that comprise over 50% of the load shall be provided with 200% rated neutral busses and 200% rated neutral feeders. Each panelboard serving harmonic loads shall be protected by a TVSS system.

6.10.1.7.5.1 Individual personal computers on user desktops shall not be considered data processing loads for this purpose. This requirement applies to server rooms and similar spaces.

6.10.1.7.6 Provide a minimum of 20% empty space for all panelboards in accordance with UFC-3-520-02 Interior Electrical Systems

6.10.1.8 Branch Circuits, Receptacles and Outlets: All general receptacle and lighting circuits shall be 20 ampere circuits and fed by 20 ampere circuit breakers.

6.10.1.9 Building Grounding: Provide grounding grid around the building perimeter for grounding the incoming service, building steel, telephone service, income water pipe, lighting protection system and internal grounding requirements to meet a maximum of 10 ohms resistance.

6.10.2 Lighting: All luminaires shall be heavy commercial (specification) grade.

6.10.2.1 Exterior Lighting: Luminaires shall be high pressure sodium, cutoff type and include shields to minimize light trespass and comply with "Dark Sky" intent. Metal halide luminaires with pulse-start ballasts are permitted where necessary to match existing nearby luminaires, in locations with security cameras, and where color rendition is important. All exterior lighting circuits shall be underground and trenches shall use tracer wire and marking tape.

6.10.2.1.1 In addition to the locations specified under paragraph 3.0, lighting shall be provided for the streets (where not already existing), access roads, sidewalks, in exterior canopies if provided, pavilions (if provided), recreation facilities and formation areas (if provided), and above all exterior doors. The actual number and locations of luminaires shall be determined by the Engineer of Record. Placement of fixtures near building penetrations such as louvers, intakes, etc.. shall be avoided where practical.

6.10.2.1.2 Poles for parking areas shall be metal 30' high and shall be installed on 3' high concrete pedestals. Poles for sidewalks shall be metal and approximately 15' high. Pole assemblies shall be rated for 110 mph wind loading. Poles and fixtures shall match the style and type of existing.

6.10.2.1.3 Exterior luminaires shall be controlled by the DDC system via an electrically held magnetic lighting contactor with a hand-off-auto switch located in the electric or mechanical room.

6.10.2.1.4 Provide a photometric plan that does not exceed 2 lumens beyond edge of pavement and sidewalks or edge of lawn areas. Specify light types to include lamps, heights, shields and mounting criteria. Photometric plans shall be stamped by a Professional Engineer.

6.10.2.2 Interior Lighting: All interior luminaires shall be energy efficient fluorescent and Compact Fluorescent (CFL). The lighting levels shall meet IESNA standard levels of illuminance.

6.10.2.2.1 Provide luminaires for all rooms and interior areas. All luminaires shall be controlled from wall mounted switches in each room. Provide 3 or 4 way switches for rooms with multiple entry points.

6.10.2.3 Egress and Emergency Lighting:

6.10.2.3.1 Exit lights shall be LED type with emergency battery packs, self-diagnostics, and PVC housings locate as required by NFPA 101.

6.10.3 Communications Utilities: Communications utilities include telephone, fiber optic, and cable TV and are to be extended from tie-in point established under civil utilities section. All installations shall meet I3A requirements.

6.10.3.1 Provide equipment racks, cabinets, fiber and copper patch panels, grounding equipment, service entrance equipment (including protectors and cross-connects), "110" punch down blocks, all conductors and outlets throughout the building. All horizontal copper cabling shall be rated for the present level of Category 6 cabling as approved by EIA/TIA standards. Make all required connections for both telephone and data systems both inside and outside the building to make for a complete turnkey installation. The entire horizontal distribution cabling system link for data and telephone systems shall be part of the manufacturer's warranted cabling solution, including patch cords. The design documents shall include data rack layouts and elevations showing each type of patch panel and equipment space required.

6.10.3.2 Provide 24-strand single mode fiber optic cables in innerduct and telephone cables (type and number of pairs per I3A) to each building. The data (fiber optic cable) and telephone service entrances shall be located in main communications room in each building.

6.10.3.3 Provide communications rooms in the building such that no data/telephone cable will be longer than 295 feet between patch panel and work area jack, provide 3 feet of slack at the TR and 3 Feet of slack above the outlet. If fiber is used, long runs are allowed, see paragraph 3.1.9(f) of Part II of UFC 4-214-02.

6.10.3.4 Provide all final connections of the building telephone system at the main telephone cross connect and between each communications rooms. Backbone cables for voice between communications rooms shall be multiple 25 pair bundle cables. Backbone cables shall be sized as follows: 2 pairs for each telephone plus 25% spare capacity.

6.10.3.5 intentionally blank.

6.10.3.6 The Contractor shall provide a complete and usable (turnkey) data networking system including but not limited to all routers and servers. Make all final connections for both the fiber optic and copper data system cables, including patch cords, and between each communications room. Furnish to the Government 5% spare patch cords for copper cables and 25% spare patch cords for fiber optic cables.

6.10.3.7 Provide 4 pair, EIA/TIA 568B, category 6, unshielded twisted pair (UTP), #24 AWG, solid copper, plenum rated cables for both telephone and data systems to all data jacks.

6.10.3.8 All horizontal cables from data and telephone jacks shall be terminated on rack mounted patch panels with 110 style IDC connectors. Two 10' long patch cords shall be provided with each horizontal link. All components shall be CAT 6 rated.

6.10.3.9 Provide, connect, and test a dedicated fiber optic communications link for the Building Management System (BMS). Coordinate specific requirements with the equipment manufacturer. Fiber optic cables shall be used to connect the BMS to the main Ft Drum Energy Management and Control System.

6.10.3.10 Provide fiber optic connections to the fire alarm and mass notification systems as required. The requirement to provide fiber optic cables to the barracks and equipment takes precedence over statements to the contrary in other sections in the RFP.

6.10.3.11 Cable TV: The CATV installer (Time-Warner) will provide the cable from the manhole to each building in the conduit provided by the Design-Build Contractor to the point of demarcation in the main Communications Room.

6.10.3.12 The Design-Build Contractor shall provide a point of demarcation as required by Time Warner Cable and shall make all connections downstream from the point of demarcation. There shall be individual home runs from each outlet to the junction boxes in the communications room.

6.10.3.13 Conduit shall be provided for in areas subject to physical damage. All CATV home runs shall be concealed in finished spaces.

6.10.3.14 In addition to the requirements in the previous paragraph, the Contractor shall provide 1" conduits from the cable trays to the CATV outlets in all rooms.

6.10.3.15 Provide flush mount boxes.

6.10.3.16 Additional outlet location must be provided based on coordination with the facility user. Provide outlets per I3A requirements. Provide 120V AC duplex outlets for each communication outlet.

6.10.4 Functional and Technical Requirements:

6.10.4.1 Provide adequate electrical power, devices and all necessary appurtenances to meet facility users requirements and will comply with NFPA 70, NFPA 72, and NFPA 101.

6.10.4.2 Communications Distribution Telephone and data communications for the facilities will be distributed throughout the building from the communications closets. Punch down blocks, Cat 6, 4 pair cable, and telephone jacks will be provided as part of this project. For communication, patch panels, Cat 6 4 pair cable, and data jacks will be provided. Data cables will be color coded.

6.10.4.3 Telecommunication Grounding: A Communication main grounding bus-bar shall be provided in the main communication room.

6.10.4.4 Additional Requirements: In addition to any requirements specified in I3A, the following shall be provided:

a) Use fusion splice end connectors feeding all fiber to racks.

b) Communication outlet density shall be a minimum of two per room irregardless of the number of users per room.

[Not Supplied - PS_Facility_Telecom : FACILITY_TELECOM]

6.11. HEATING, VENTILATING, AND AIR CONDITIONING

6.11.1 HVAC Design Parameters: The design shall be based on the following parameters:

Project Location: Fort Drum, New York; Latitude: 44° 02' N; Longitude: 75° 46' W; Elevation: 650' above sea level.

Outdoor Design Conditions:

1. Use 90°F DB OA temperature for air-cooled condensers.
2. Prevailing Wind: From Northwest, at 5 knots, in the winter.
3. Use -30°F DB OA temperature for winter conditions.
4. Summer: 83°F DB and 70°F WB

6.11.2 HVAC Systems:

6.11.2.1 HVAC System for Communications Room: All Communications Rooms shall utilize an HVAC system which conforms to the requirements of I3A as a minimum. Units shall include air-conditioning, heating, and be independently thermostatically controlled. Units shall be available to provide cooling 365 days per year regardless of outdoor air temperature. Units shall be provided with micro-processor controls and any other options necessary to meet the design conditions such as low ambient temperature controls, humidifiers, or hot-gas bypass reheat for humidity control. Rooms shall be provided with positive atmospheric pressure.

6.11.2.2 HVAC System for Mechanical rooms: To prevent freeze-ups in the mechanical rooms the Contractor shall consider one of the following options:

1. Each gas fired piece of equipment located in the mechanical room shall have a dedicated combustion air louver sized for the combustion air requirements of that unit. An independently controlled combustion air damper shall be provided at each louver and will open whenever the unit is operating. A pre-heat coil shall be installed at each louver to temper the outside air to minimum of 40 degrees F.
2. If a pre-heat coil is not provided to temper the outside air, then all items located in the mechanical room that have a potential of freezing (i.e. water piping including sprinkler piping, water heaters, etc.) shall be located in a

separate room and all combustion air requirements shall be direct vented to the outside from the equipment. No outside combustion air intakes louvers shall be provided.

6.11.2.3 Equipment - The boiler room shall be provided with natural gas and carbon monoxide gas leakage monitoring, with remote alarm. System shall be connected to the DDC system and fire alarm panel. Boilers shall be mounted on anchored, reinforced 4 inch high concrete housekeeping pads, with a 6 inch clear space from boiler to the edge of pad.

6.11.2.4 Gas Piping: Natural gas will be provided from the Fort Drum 15 psig natural gas distribution system. Existing gas pressure in main line at street shall be assumed to be 10 psig for pipes sizing purposes. Provide gas meter to have volume monitored by UMCS. Gas meter assembly shall not be located near outdoor air intakes. Gas meter shall be protected by three 8" diameter bollards and 16-gauge painted galvanized steel shield located 36" above meter supported at the wall and protected by bollards to protect meter from falling snow/ice from roof. Gas valves shall be solenoid valves - "normally open," no manual reset.

6.11.2.5 Cooling System: Where chilled water is used for cooling, the chilled water system shall have an air cooled chiller(s) and all required accessories. Pumps shall be base-mounted and selected for non-overloading operation at all conditions. Pump seals shall be silicon carbide for use in systems with suspended particles. If the motors for the distribution pumps exceed 7.0 kW then a primary/secondary pumping arrangement shall be used, the distribution loop shall be designed for variable flow and the pumps shall be controlled by variable frequency drives.

Chilled water piping system shall be constructed of Type L copper or ASTM A53 SCH 40 black steel with screwed, welded or grooved end fittings.

Refrigerants shall be one of the fluorocarbon gases. Refrigerant shall meet the requirements of ARI 700 as a minimum. Refrigerant Ozone Depletion Potential (ODP) shall not exceed 0.00. Refrigerant R-22 shall not be used. Chiller shall be provided with a complete factory mounted and prewired microprocessor based control system. Controls package shall provide operating controls, monitoring capabilities, programmable setpoints, safety controls, and UMCS interfaces.

Exterior cooling system piping trench shall use Marker Tape and Tracer Wire in trenches.

6.11.2.6 Air Handling Units: Modular Type Air Handling Units shall be double wall configuration, cooling coil -sized to cool the outside air to 55 degrees F in order to dehumidify the outside air; filters; and mixing box complete with automatic air dampers. Ultraviolet light C band (UV-C) emitters shall be incorporated downstream of all cooling coils and above all drain pans to control airborne and surface microbial growth and transfer. Safety features shall be provided to prevent hazard to operating staff. Units shall not produce ozone. Freeze protection shall be accomplished by monitoring the air handling units discharge air temperature. When the discharge air temperature falls to 50 degrees F (adjustable), the DDC system shall send a signal to stop fan, close the outside air damper, and send an alarm to the control system. Filters shall have a MERV of 8 or higher when evaluated under ASHRAE standard 52.2. All filters shall be UL class 2. Provide each filter assembly with its dedicated automatic alarm (latching) to signal the need for filter change due to loading.

6.11.2.7 Ventilation and Exhaust Openings: Outside air shall be taken through outdoor air louver with louvers to be "double rain guard type". Ducts at louvers shall be watertight for 8'-0" from louver and shall pitch to drain to louver or attached 2" diameter minimum size drain with trap piped to floor drain.

6.11.2.8 Freeze Protection: All chilled water and hot water piping shall be protected from freezing by use of a 40/60 propylene glycol mixture. Glycol mixture shall be premixed by manufacturer using deionized water. Contractor shall provide glycol fill station for each separate heating and cooling system with feed water pump, tank, all necessary water treatment equipment, required hydronic controls and accessories for all hydronic systems. Glycol fill station shall be automatically operated, manually filled, with a minimum volume of 50 gallons. Provide test kits and a test coupon assembly with balancing valve, shut-off valve and plugged tees for sampling connections, 1-inch diameter. Provide drum-mounted, manually operated bung pump for the transfer of glycol into the storage and make-up/fill tank. The glycol make-up system shall automatically operate on a reduction of system pressure. Fluid level in the glycol tank shall be monitored by the DDC system and shall send an alarm when the fluid level is low. Domestic water connection shall not be provided.

6.11.2.9 Boilers. Boilers shall provide heating for the buildings and shall be cast iron, gas-fired boilers with minimum annual fuel utilization efficiency (AFUE) of 88%. (Basis of design: Hydrotherm KN Series.) Pulse type combustion boilers are not acceptable. (Note: Fort Drum requires cast iron condensing boilers due to their smaller footprint and higher efficiency.) Provide minimum of two boilers. Each boiler's capacity shall be 65% of the calculated capacity required to heat building. Manufacturer's packaged operation controls shall be provided to handle all aspects of capacity modulation and safeguarding. Controls shall be provided to allow for staggered operation and shall interface with the building DDC system and allow changes to be made to boiler control set points from the DDC system. Boiler water supply temperature shall be reset based on outside air temperature controlled by DDC control system. Solid-state controls shall be used to monitor and control all operating and safety functions. Each boiler shall utilize a separate boiler secondary pumping system to maintain constant hot water (glycol) circulation rate through the boiler whenever the boiler is enabled. Burners shall be power burners. Boiler flue system shall be a double wall, prefabricated, positive pressure type, stainless steel and factory pre-insulated, furnished and installed in strict accordance with manufacturer's installation requirements. Boiler vents exiting through the roof shall be not more than 5'-0" from the roof ridge. Anchor at 2 points within the building.

6.11.3 Controls:

HVAC system temperature control system shall be a microprocessor based Direct Digital Control (DDC) system. The DDC system shall completely, seamlessly and directly interfaces with the existing base-wide Utility Management and Control System (UMCS) installed at Fort Drum without interpreters or third party devices. Communication with existing base-wide Utility Management and Control System (UMCS) workstations, servers and laptops shall utilize BACnet protocol and be configured for operation on VLAN#4003 only, connected by common fiber optic system serving building. The system shall include software with all the necessary means for global data exchange, scheduling, local and remote control and adjustment; load shedding for demand control; event management; monitoring; trending; logging; maintenance notification; and alarms. The Fort Drum systems are Trane, Siemens. The building control systems must have seamless communications with one of the two existing base-wide systems and be capable of sending to, receiving from, and interpreting global commands with the base-wide system and resident software.

In addition to fully control and monitor the building HVAC systems, the DDC system shall monitor the following:

1. Water meters.

2. Gas meters.
3. Building electrical power and demand meter.
4. Glycol fill tank fluid level.
5. Natural gas detector.
6. Carbon monoxide detectors.
7. Existing global system substations electrical power and demand meters.
8. Existing global system outside air temperature.
9. Existing global system duty cycling modes for demand shedding.
10. Existing global system summer/winter modes.
11. Existing global system heating/cool modes.
12. Control exterior lighting through a "Hand-Off-Auto" switch.
13. Building fire alarm system.
14. Freezestat points.
15. Low ambient temperature control.

6.11.3.1 Instruction: Upon completion of work and acceptance by Government, factory representatives under direct employ of temperature control manufacturer shall provide 8 hours of classroom and "hands-on" instruction to 20 of Government's operating personnel responsible for mechanical systems. Instruction shall be video recorded and three copies provided on DVDs.

6.11.4 HVAC Systems (Building Specific Design Requirements):

6.11.4.1 HVAC System - General: All facilities shall be equipped with HVAC systems that are appropriate for their function and occupancy and meets all code requirements. Systems shall be designed and installed in accordance with the latest industry standards for each type of application.

Heating and/or cooling requirements:

- Provide heating and cooling in all admin/office areas including rooms 131 thru 134 and 136.
- Provide heating in the vehicle maintenance bays, vehicle storage bays, bams lockers and storage rooms next to the vehicle maintenance bays .

6.11.4.2 Vehicle Maintenance and Storage Areas:

6.11.4.2.1 Vehicle maintenance bay areas shall be heated by using a floor radiant heat system in accordance with UFC 3-410-01. The radiant heat system shall be sized to provide a minimum of 50 percent of the heat load of the spaces. The in floor radiant system shall be hydronic type.

6.11.4.2.2 Air handling Units (AHU) shall be located in attic spaces or exposed suspended from the structure depending on the size and arrangement of the vehicle maintenance area. Air-handling units shall provide the remainder of the heat load and ventilation required. Air handling units shall be designed to provide minimum outdoor during normal operation with the capability of providing 100 percent outdoor air when an economizer cycle can be used. CO2 detector in return air stream will modulate outdoor air open as necessary to maintain CO2 levels in the building.

6.11.4.3 Vehicle Exhaust Evacuation Systems: Vehicle exhaust evacuation systems shall be provided in the maintenance area for capturing exhaust fumes from stationary vehicles and vehicles moving in and out of the building. Consider viable alternative systems meeting the functional requirements of the area. Size and locate the exhaust lines as required to service the vehicles and equipment within the repair areas. Lines shall not interfere with maintenance operations or obstruct equipment. The contractor shall provide the transition connectors between the vehicle exhaust and the vehicle exhaust system. Coordinate with the using service. All system components must be compatible with the vehicle exhaust temperatures. Unless otherwise indicated by the user, design exhaust outlets for 1400 cfm and 700 degrees F. Exhaust evacuation systems in repair bays intended for repair of tracked vehicles shall be designed to withstand at least 1250 degrees F and shall have two exhaust outlets evacuating 1400 cfm each which can be connected to the tracked vehicle's exhaust grills. Ventilation shall be as a minimum per ASHRAE 62.1. Additional makeup air may be needed to compensate for the exhaust requirements. Hose reels shall be mounted above as not to interfere with vehicle traffic and shall be electrically operated.

6.11.5 Geothermal System (OPTIONAL BID ITEM)

Provide and install a complete geothermal heating/cooling system for the Administrative and Support areas and the in-floor radiant heating for the Firing Range area, to include but not limited to the heat pumps, piping/pumps/distribution systems, heating and cooling systems, controls, etc. to make a complete and usable system.

System design may incorporate water-to-refrigerant-to-air water source heat pumps and/or water-to-refrigerant-to-water central chiller/heat pump and/or Gas absorption heat pumps.

Heating for the applicable areas of the building will be accomplished using the geothermal heat pump system. Where annual heating and cooling loads are unmatched by more than 25% the geothermal heat pump system shall employ an auxiliary heating water system. Heating water system shall be used for ventilation air preheat, ventilation air re-heat (if required), mechanical, electrical and storage rooms heating, and perimeter and vestibule heating where required. The auxiliary heating water system shall include a minimum of two (2) heating water boilers and circulation pumps. Heating system shall use a primary/secondary pumping arrangement. There shall be not less than two primary hot water distribution pumps for each building, one of which shall be operating and the other on automatic standby. Pumps with motors that are equal or greater than 5.0 Horsepower shall utilize variable frequency drives. Pump seals shall be silicon carbide for use in systems with suspended particles. The controls shall alternate the lead/lag pumps daily to equalize their running hours (adjustable).

Integrate the control system to the installation's existing UMCS. The existing UMCS is Fort Drum uses Trane and Siemens

6.12. ENERGY CONSERVATION

6.12.1. General

6.12 Energy Conservation

6.12.1 Note that ASHRAE 90.1 requires the use of ASHRAE 62.1 for ventilation and exhaust rates. Coordinate system selection with the installation based on energy usage, reliability and operating considerations, and the limited maintenance capabilities and resources of the user.

6.12.2 Coordinate with the customer on their plans to implement the Energy Policy Act of 2005 (Public Law 109-58); for estimating purposes, assume no additional requirements for adding alternative fueling stations.

6.12.3 Roof Penetrations shall be kept to a minimum.

6.12.4 Insulate all duct and hot water piping systems per ASHRE standard 9D-1.

6.12.5 Photovoltaic system. (OPTIONAL BID ITEM)

The Contractor shall provide a photovoltaic system to generate electricity for the facility. The system shall be a complete and usable system and consist of at minimum: a fixed panel mono-crystalline photovoltaic array, energy inversion and conditioning device, an energy distribution panel, connection to the utility grid (no storage batteries) with coordination with the local Fort Drum utility, metering for the energy consumed by the building, metering for the energy displaced to the grid, and metering produced by the array with metered data monitored by a single data logger in kWh. Tie the data logger into the building DDC control system and head end. The Contractor shall use a NYSERDA approved installer for photovoltaic system, in order for the installer to obtain a rebate from NYSERDA.

6.12.5.1 Provide system manufactured by SunWize Technologies, True North Solar LLC, or government approved equal. The peak capacity of the system shall be designed to:

6.12.5.1.1. Minimum of 90 kW (Roof Mounted)

The photovoltaic panels shall be roof mounted and span the entire south roof exposure and be visually consistent over that area.

6.12.5.1.3. Minimum of 90 kW (Ground Mounted)

The photovoltaic panels shall be ground mounted in a location adjacent to the indoor range site as coordinated by the Government.

6.12.5.2 Roof Mounted Systems: A roof-mounted photovoltaic system shall be provided by the Contractor. The framing and support system shall allow the discharge of snow and rain to prevent accumulation on the photovoltaic arrays and ice damming. The framing and support system for the photovoltaic panels shall connect to the roof structure. The photovoltaic arrays shall be as close as possible to roof structure and match the slope.

6.12.5.3 Ground mounted systems: A separate structure with its' own foundation and lightning protection shall be provided by the Contractor for support of the photovoltaics. The structure shall be grated and permit accessibility for maintenance while allowing the discharge of snow and rain to prevent accumulation on the photovoltaic arrays. The photovoltaic arrays shall not be placed in the shade of any building, monument, structure, or landscaping. The photovoltaic structure, array, or any component of the photovoltaic system shall not in any way interfere with air, vehicle, or pedestrian traffic. The structure shall be installed such that the solar panels are at minimum 12 inches above the line of annual extreme snow accumulation. The photovoltaic arrays shall be positioned facing south and at the most efficient position and angle as recommended by the manufacturer of the panels, or as determined by the NYSERDA approved installer.

6.12.5.4 Photovoltaic system limitations:

Thin film photovoltaics are not acceptable. The photovoltaic arrays shall not be placed in the shade of any building, monument, structure, or landscaping. The photovoltaic system shall not track the position of the sun or move relative to time of day.

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

[Not Supplied - PS_EnergyConservation : RENEWABLE_ENERGY_FEATURES]

6.13. FIRE PROTECTION

6.13.1 Fire Protection

6.13.2 Fire Protection Engineer: The fire protection engineer shall be an integral part of the design team and shall be involved in all aspects of the design of the fire protection system and life safety analysis. As a minimum, the fire protection engineer shall design the automatic sprinkler systems; the fire alarm system; and the MONACO fire alarm radio transmitter/ receiver system.

6.13.3 Incoming Fire Service Main: A minimum of an 8 inch fire service shall be brought into the buildings and the domestic water service shall be branched off of and be supplied by it. A PIV (post indicator valve) shall be provided outside at a minimum distance of 50 feet from the exterior of the building. The incoming fire protection service shall be in the mechanical room and shall be located to prevent freezing. A backflow preventer shall be provided with OS&Y valves at each end to isolate the assembly. A vertical assembly may be considered to conserve space if no fire pump is provided.

6.13.4 Fire Extinguisher Cabinets: Extinguisher shall be installed in semi-recessed cabinets. Cabinets shall be no locking type with glass window.

6.13.5 Piping: There shall be no exposed sprinkler piping in the building except in mechanical and electrical spaces and stairwells.

6.13.5.1 Sprinklers: Sprinklers with internal O-rings shall be used. Sprinklers shall be quick response (QR) unless noted otherwise. All areas without a finished ceiling shall be provided with upright sprinkler heads.

6.13.5.2 The fire protection sprinkler design criteria for the offices and other miscellaneous areas shall be a wet-pipe system for Light Hazard. Sprinklers shall be allowed to be spaced up to 15 ft. apart and shall protect an area per sprinkler of up to 225 sq. ft. The system shall be sized by hydraulic calculations and shall be able to provide at least 0.10 GPM/sq. ft. over the most remote 3,000 sq. ft. An allowance of 250 GPM for hose streams shall be added and the water supply shall be capable of duration at calculated demand of 60 minutes (UFC 3-600-01 Table 4-1).

6.13.5.3 The fire protection sprinkler design criteria for the Vehicle Maintenance Wing, mechanical rooms, electrical rooms and similar areas shall be a wet-pipe system for Ordinary Hazard Group 1. Sprinklers shall be allowed to be spaced up to 15 ft. apart and shall protect an area per sprinkler of up to 130 sq. ft. The system shall be sized by hydraulic calculations and shall be able to provide at least 0.15 GPM/sq. ft. over the most remote 3,000 sq. ft. An allowance of 500 GPM for hose streams shall be added and the water supply shall be capable of duration at calculated demand of 60 minutes (UFC 3-600-01 Table 4-1).

6.13.5.4 The fire protection sprinkler design criteria for the Radio Maintenance bay and shops shall be a preaction system for Ordinary Hazard Group 1. Sprinklers shall be allowed to be spaced up to 15 ft. apart and shall protect an area per sprinkler of up to 130 sq. ft. The system shall be sized by hydraulic calculations and shall be able to provide at least 0.15 GPM/sq. ft. over the most remote 3,900 sq. ft. An allowance of 500 GPM for hose streams shall be added and the water supply shall be capable of duration at calculated demand of 60 minutes (UFC 3-600-01 Table 4-1).

6.13.6 Fire Department Connection: Threads shall be 5" Storz connection compatible with the equipment at the Fort DRUM Fire Department. It shall be installed with a 45 degree downturn. At this termination the riser is to be protected with a painted, concrete filled steel bollard. FDC escutcheons shall be lettered to identify the interior building fire protection system(s) as appropriate, as either "AUTO SPKR" or "AUTO SPKR & STANDPIPE". The location of the fire department connection shall be coordinated and approved by the Fort DRUM Fire Chief. The location of the fire department connection may not necessarily be in the vicinity of the incoming fire service but, shall be within 150 feet of a fire hydrant.

6.13.6.1 Fire Detection and Alarm System:

The ASOS building will be provided with a complete addressable fire alarm system (UFC 3-600-01, 5-3.1). The system will include a fire alarm control panel, manual fire alarm stations, smoke detectors at FACP and as required in other areas, provisions for monitoring fire protection systems, remote annunciator at main building entrance, audio/visual occupant notification devices, and equipment compatible with the base systems, to transmit alarm, trouble and supervisory signals to the fire department alarm receiving station. The fire alarm control panel will be installed in an electrical or mechanical room (as directed) with access from the outside of the building.

No general area smoke detection is needed unless required by UFC 3-600-01 or other applicable criteria (such as NFPA 72).

The systems will be designed in accordance with the applicable provisions of UFC 3-600-01, NFPA 72, ADA/ABA, UFAS, and other applicable codes, standards, and regulations.

- Panel boxes will be keyed alike.
- The system will be programmable from the fire alarm control panel.
- Manual fire alarm stations will be addressable, non-break glass, and key re-settable. They will typically be located at exits and other locations as required by applicable codes and standards. Double action metal construction manual pull stations will be provided.
- Audio/visual occupant notification devices will be wall- or ceiling-mounted at strategic locations so as to be heard and/or seen as required by the applicable codes and standards.
- The fire alarm system will be provided with battery backup that meets the requirements of NFPA 72 and UFC 4-021-01.
- All cabling will be installed in conduit.
- A combined mass notification system and fire alarm system as described in UFC 4-021-01 is acceptable. The fire alarm system will be arranged to transmit signals to the Fort Drum fire department alarm headquarters.

6.13.6.2 Mass Notification System:

The ASOS building will be provided with a Mass Notification System in accordance with UFC 4-021-01, and will be integrated into the Fire Alarm System. Separate circuits of amber-colored strobes will be provided to alert personnel. The system will broadcast the required pre-recorded messages as well as live messages sent via radio-signal from a remote location, or via push-to-talk microphones located at strategic locations in the building.

6.13.7 Fire Alarm / Mass Notification System: The system shall be a voice evacuation fire alarm system with manual voice paging features to combine both fire alarm and mass notification system features. The system installed in accordance with all applicable codes and standards. It shall utilize an addressable microprocessor based type system with manual and automatic alarm initiation. Signal transmission shall be a multiplex format and be dedicated to fire alarm service only. Fire alarm control panel shall be mounted in building main electrical room with an auxiliary annunciator panel capable of all control functions mounted in the building main entrance vestibule. The type and location of the fire alarm annunciator shall be coordinated with the Fort Drum Fire Chief. The fire alarm control panel shall have dial up access. Manual pull stations shall require a key to reset.

6.13.7.1 Each Mass Notification system shall have a dedicated control panel and interfaced to a Monaco transceiver that can accept all messages, including live voice messages, from the central control station. Coordinate transceiver connection requirements with the Contracting Officer.

6.13.7.2 Audible alarm indication shall be via fire alarm speakers. Visual alarm indication shall be by synchronized strobes. Spacing and location of speakers and strobes shall be commensurate with the ADA (Americans with Disabilities Act); NFPA 72; and any other applicable codes.

6.13.7.3 Public Address System A public address (PA) system will be provided throughout the entire station. The PA will be zoned as required by the users and will be tied into the station's radio system. A push-to-talk intercom system will be provided for each of the customer service entrances. Location of the head-end equipment will be coordinated with the end user.

6.13.7.4 No general area smoke detection is needed. The areas radio equipment areas of the vehicle maintenance wing provided with preaction sprinkler system protection will have smoke detectors as necessary for the initiation of the preaction sprinkler system.

6.13.8 The NAC (Notification Appliance Circuits) and the SLC (Signal Line Circuits) shall be class and style as required for the application. "A", Style 6. The AID (Alarm Indicating Device) (Identified as Notification Appliance Circuits (NAC) in NFPA 72) circuits shall be Class "A", All circuits shall have at least 40% spare capacity for additional devices (initiating and indicating) in

each building.

6.13.9 All signals from the fire alarm panel shall be transmitted to the Fort Drum fire department fire alarm receiving station. The transmitter shall be identical to the current base wireless manufacturer and shall be added to the existing base receiving system. The fire alarm radio transmitter shall be a MONACO BTX Series Transceiver and/or an approved equal system compatible with Fort Drum's radio transmitter system.

6.13.10 Monitor Module shall be designed to monitor system components that are not equipped for multiplex communication with the fire alarm control panel and cannot transmit a unique identification signal. Monitor Modules shall be provided in the appropriate quantity and location (no greater than 3 feet away) to individually monitor other fire alarm initiating devices or supervisory devices and provide a unique address to the fire alarm control panel. The monitor module shall contain an integral LED that flashes each time the control module is polled.

6.13.11 Control Modules shall be capable of operating as a relay (dry contact FORM C) for interfacing the control panel with other systems or other devices. The module shall be UL Listed as compatible with the control panel. The indicating device or the external load being controlled shall be configured as a STYLE Y notification appliance circuit(s). The system shall be capable of supervising audible, visual and dry contact circuits. The supervision shall detect a short on the supervised circuit and shall prevent power from being applied to the circuit. The control module shall contain an integral LED that flashes each time the control module is polled and be located within 3 feet of the controlled circuit or appliance.

6.13.12 The fire alarm system shall be provided with and connected to a Monaco BTX fire alarm transceiver and or an approved equal system compatible with Fort Drum's radio transmitter system, which shall transmit distinct signals to the existing base wide Monaco D21 fire alarm monitoring system. The fire alarm transceiver shall be provided with all necessary equipment to interface with the existing base monitoring system. Provide an omni-directional antenna for each radio transmitter. The antenna shall be mounted on a 25 feet high wood or fiberglass pole at the exterior of the building. The antenna shall be corrosion resistant and designed to withstand wind velocities of 100 MPH. The antenna shall not be mounted to any portion of the building roof system. The antenna shall be properly grounded. Also provided shall be a lightning arrester for the antenna mast assembly appropriately grounded. The radio frequency for the existing FORT DRUM fire alarm transmitter system by MONACO is 413.325 (UHF). In addition to its signal transmission capabilities, the radio transceiver shall be capable of receiving voice signals so that live voice messages can be made throughout the building, over the fire alarm/mass notification system, from a remote location.

6.13.13 All mechanical rooms utilizing gas fired equipment shall be provided with both combustible gas detectors (calibrated to alarm at 25% of the LEL of methane) and carbon monoxide gas detectors (calibrated to alarm at 35 ppm). These detectors shall be monitored for alarm and trouble conditions by the building fire alarm system and shall transmit as separate zones to the fire alarm transceiver. When a detector activates it shall sound a horn/strobe with amber lens located in the vicinity of the detector (each detector shall have its own horn/strobe). Signage provided with the horn/strobe shall state what the hazard is and to evacuate the area immediately to fresh air. Activation of any gas detector shall initiate a building general fire alarm, however shall not sound the fire alarm audio/visual appliances in the building and only activate its respective special hazard horn/strobe device. Activation of any gas detector in a mechanical room shall shutdown all gas-fired appliances along with the gas supply to the appliances in the space via solenoid valves at the individual appliances.

6.13.14 Contractor shall be responsible for providing sufficient training materials for all present at the training session, (minimum 15 personnel). Coordinate actual requirements with the Owner at time of training.

6.13.15 The Contractor shall be responsible for providing video taped training sessions, which will be submitted to the Owner for future employee training. All of the training sessions conducted shall be video taped.

6.13.16 Fire Standpipe System: Standpipe connections shall be installed at intermediate landings between floors in all stairwells. A standpipe hose connection shall be provided near the end of halls for ease of connection for the fire department. The use of combination sprinkler/standpipe risers shall be permitted.

6.14. SUSTAINABLE DESIGN

6.14.1. LEED Rating Tool Version. This project shall be executed using LEED-NC Version 2.2.

6.14.2. The minimum requirement for this project is to achieve LEED Silver level. Each non-exempt facility (building plus sitework) must achieve this level. In addition to any facilities indicated as exempt in paragraph 3, the following facilities are exempt from the minimum LEED achievement requirement: [Not Supplied - PS_SustainableDesignGeneral : SD_EXEMPT_FACILITIES].

6.14.3. Credit Validation: LEED registration, compiling of documentation at LEED OnLine and use of the LEED Letter Templates is required. Registration and payment of registration fees will be by the Contractor. Administration/team management of the online project will be by the Contractor. Validation of credits will be accomplished by the Government. LEED certification of the project by the Contractor is not required. The

Government may choose to seek LEED certification of the project, in which case the Government will pay certification fees and coordinate with the GBCI and the Contractor will furnish audit data as requested at no additional cost.

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

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

SS Credit 1 Site Selection:

Project site IS NOT considered prime farmland.

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

Project site contains no habitat for threatened or endangered species.

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

Project site WAS NOT previously used as public parkland.

SS Credit 2 Development Density & Community Connectivity.

Project site DOES NOT meets the criteria for this credit.

SS Credit 3 Brownfield Redevelopment.

Project site DOES NOT meets the criteria for this credit.

SS Credit 4.1 Public Transportation Access.

Project site DOES NOT meets the criteria for this credit.

EA Credit 6 Green Power.

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

MR Credit 2 Construction Waste Management.

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

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

6.14.7. Not Used

6.14.8. Additional Information

[Not Supplied - PS_SustDesign_Additional : MR2]

6.15. ENVIRONMENTAL

6.15 Environmental

6.15.1 The D/B Contractor shall comply with all Federal, State, and Local environmental requirements

6.15.2 The federally endangered Indiana bat is present on Fort Drum and must be considered in all actions. Actions on Fort Drum, must be in accordance with requirements negotiated with the U.S. Fish & Wildlife Service under Section 7 of the Endangered Species Act. Projects involving ANY habitat modification (e.g., vegetation removal) must be addressed by Fort Drum's Fish and Wildlife Management Program. In general, no trees greater than 4 inches (diameter breast height) may be cut from 15 April - 01 October to avoid any direct adverse effects to the Indiana bat. Clearing of natural vegetation (e.g., shrubs and trees) less than 4 inches (diameter breast height) should typically occur between August 1 - April 15 to minimize the impact to migratory birds and to maintain foraging areas for bats. The contractor (and all subcontractors) shall be responsible for coordination with Fort Drum's Fish & Wildlife Management Program to ensure compliance with the Endangered Species Act and all other applicable laws and regulations pertaining to wildlife. Overall the contractor (and all subcontractors) shall minimize interference with, disturbance to, and damage to plants, fish, wildlife, and their habitats on and adjacent to the project area. **The contractor shall immediately inform the COR of any coordination or contact with Fort Drum's Fish and Wildlife Management Program.**

6.15.3. Flagging or signs must be used to demarcate areas to be cleared vs. not cleared prior to any construction activities or tree clearing for a given project. Clearing must only occur within the flagged area, and flagging must be removed upon completion of the project.

6.15.4 If any bats are discovered during the demolition or repair of buildings (to include work such as complete and partial building demo, removal/replacement of roofs, siding, etc.), all work must cease and Fort Drum's Fish and Wildlife Management Program (772-9636 or 772-4999) must be immediately contacted. If the building has pre-existing known bat colonies, then Fort Drum's Fish and Wildlife Management Program must be contacted before demolition is to occur. (At this time, the only structures known to contain bat colonies are within the historic LeRay Area.)

6.15.5. All found bats must be immediately reported to Fort Drum's Fish and Wildlife Management Program (772-9636 or 772-4999). Do not attempt to handle any live bats, regardless of condition. If a live bat is found in a building please contact 772-2072 or 772-4999.

6.15.6. Light minimization measures are to be incorporated for all exterior lighting that may include but are not limited to full cutoffs, reflectors, shields, and/or downward angling of lights. The following are guidelines that have been established for light minimization within the draft Installation Design Guide and must be followed to the maximum extent possible.

- a. Maximum light at the edge of parking lot/road pavement will be 2 foot candles or its equivalent.
- b. Light levels for parking lots/sidewalks shall be in accordance with Illuminating Engineering Society (IES) Lighting Handbook.
- c. A Professional Engineer must review the lighting plan and ensure it is sound and meets minimization requirements.
- d. Use full cutoff luminaires for road, parking lot, and sidewalk illumination. These are luminaires that allow no direct light emissions above a horizontal plane through the luminaire's lowest light emitting part.
- e. Use downward-angling lights and appropriate shields in all applicable locations.

6.15.7. No night lighting for construction projects is authorized without prior coordination and authorization from the **COR** and Fort Drum's Fish and Wildlife Management Program.

6.15.8. Project planning and design should attempt to minimize building footprints by combining infrastructure (i.e. roads, utility lines, etc.) for multiple buildings or by constructing multi-story versus multiple or expanded single story buildings whenever possible.

6.15.9 OUTDOOR LIGHTING MINIMIZATION

The purpose of the Fort Drum Outdoor Lighting Guidelines is to regulate outdoor lighting in order to reduce or prevent light pollution. This means to the extent reasonably possible the reduction or prevention of glare and light trespass, the conservation of energy, and promotion of safety and security. These Guidelines will ensure

appropriate outdoor lighting in compliance with the Endangered Species Act and in accordance with the Fort Drum's Army Strategic Plan for Sustainability.

Definitions

- a. **Fixture Height:** height of the fixture shall be the vertical distance from the ground directly below the centerline of the fixture to the lowest direct light emitting part of the fixture.
- b. **Foot-candles:** a unit of illumination of a surface that is equal to one lumen per square foot. For the purposes of these regulations, foot-candles shall be measured at a height of 3 ft. above finished grade.
- c. **Fully Shielded Light:** light fixtures shielded or constructed so that no light rays are directly emitted by the installed fixture at angles above the horizontal plane as certified by a photometric test report. The fixture must also be properly installed to effectively down direct light in order to conform with the definition.
- d. **Light Trespass:** the shining of light produced by a light fixture beyond the boundaries of the property on which it is located.
- e. **Lumen:** the unit of luminous flux, the total amount of light falling uniformly on or passing through an area of 1 square foot, each of which is 1 foot from a 1-candela source, yielding an illuminance of 1 foot candle at that distance (the output of lamps and bulbs is customarily measured in lumens, a common 100 watt incandescent light bulb, for example, having an output less than 1,800 lumens).
- f. **Point Light Source:** the exact place from which illumination is produced (i.e., a light bulb filament or discharge capsule).
- g. **Sag-lens or Drop-lens:** A clear or prismatic refracting lens that extends below the lowest opaque portion of a light fixture.

Applicability

All outdoor lighting fixtures installed, retro-fitted, or replaced on Fort Drum property shall comply with these regulations. These regulations do not apply to interior lighting.

Exemptions

The following are exempt from the provisions of these guidelines:

- a. Traffic control signals and devices.
- b. Temporary emergency lighting (i.e. fire, police, repair workers).
- c. Moving vehicle lights.
- d. Navigation lights (i.e. airports, heliports, radio/television towers).
- e. Seasonal decorations with individual lights in place no longer than 60 days.
- f. Lighting for flags. Efforts should be made in these areas to minimize sky glow and light trespass whenever feasible.
- g. Sports field outdoor lighting (i.e. ball fields, football, soccer, ice rink, etc.). Sports outdoor lighting is to be turned off when a sporting event is not occurring.
- h. Other special situations for temporary or periodic events (i.e. fairs, festivals, carnivals, night-time construction).
- i. Security lights of any wattage that are controlled by a motion-sensor switch and which do not remain on longer than 10 minutes after activation.

- j. Access points, Army Supply points, or other high security areas subject to AR 190-11 or TM-8-583-2. Efforts should be made in these areas to minimize sky glow and light trespass whenever feasible.

Additional exemptions may be provided after coordination with Fort Drum's Fish and Wildlife Management Program.

General Standards

The following general standards shall apply to all outdoor lighting installed, retrofitted, or replaced on Fort Drum, which is not exempted above:

- a. Outdoor lighting must be hooded, fully shielded (i.e. full cutoff fixtures), and/or aimed downward. Outdoor lighting used to illuminate parking spaces, driveways, maneuvering areas, or buildings shall conform to the definition for "fully shielded light fixtures" and be designed, arranged and screened so that the point light source shall not be visible from adjoining lots (i.e. woodlands) or streets.
- b. The intensity of light within a site shall not exceed two (2) footcandles at any property line, edge of pavement, or road.
- c. The hood or shield must mask the direct horizontal surface of the light source. The light must be aimed to insure that the illumination is only pointing downward onto the ground surface, with no escaping light permitted to contribute to sky glow by shining upward into the sky.
- d. Any bright light shining onto adjacent properties (i.e. woodlands) or streets which would result in a nuisance glare or a disabling glare shall not be permitted. Light trespass beyond property boundaries or above the horizontal plane shall be considered non-compliant.
- e. Existing fixtures may be adapted to comply with these guidelines by adding a properly designed hood or shield, or by pointing any upward-mounted, shielded fixture downward onto the ground surface.
- f. All outdoor lighting fixtures shall be designed, installed, located and maintained such that nuisance glare onto adjacent properties (i.e. woodlands) or streets shall be minimized and all direct illumination kept within the boundaries of a building's property.
- g. Accent lighting shall be directed downward onto the building or object and not toward the sky or onto adjacent properties (i.e. woodlands). Direct light emissions shall not be visible above the roof line or beyond the building edge.
- h. Spot lighting on landscaping and foliage shall be limited to 150 watts (2220 lumens output) and lighting is to be angled downwards. The lamp shall be fully shielded and not create disabling or nuisance glare.
- i. No sag-lens or drop-lens are to be used.

6.15.10. Project planning and design should attempt to minimize building footprints by combining infrastructure (i.e. roads, utility lines, etc.) for multiple buildings or by constructing multi-story versus multiple or expanded single story buildings whenever possible.

6.15.11 Leadership in Energy and Environmental Design (LEED)

6.15.11.1 Please refer to the LEED checklist in the Appendix for preliminary point evaluation.

6.15.11.2 Within Fifteen (15) days of the award of the contract, the Designer shall: (1) Submit projected LEED credits including a completed LEED 2.2 NC Checklist listing minimum anticipated credits to attain rating, possible credits, and credits not being pursued. (2) Submit projected energy consumption indicating levels meeting EPA Act 2005 requirements for the project

6.15.11.3 At interim design the Design shall: (1) Submit an updated LEED 2.2 NC Checklist reflecting the final LEED rating and credits obtained. (2) Submit calculated energy consumption levels meeting EPact 2005 requirements. Provide calculation worksheets for review.

6.15.11.4 At project closeout the Designer shall: (1) Submit a final LEED 2.2 NC Checklist reflecting the final LEED rating and credits obtained.(2) Submit final calculated energy consumption levels meeting EPact 2005 requirements. Provide calculation worksheets for review.

6.15.11.5 The following information is provided for LEED credits:

6.15.11.5.1 SS Credit 1 Site Selection

- o Project site **is not** considered prime farmland
- o Project site is five feet or more above 100-year flood elevation
- o Project site contains no habitat for threatened or endangered species.
- o Delineation of water, wetlands, and areas of special concern is shown on site drawings provided in this CONTRACT.
- o Project site [PARKLAND] previously used as public parkland

6.15.11.5.2 MR Credit 2 Construction Waste Management

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

6.15.11.5.3 EA Credit 1 use \$0.105 per kWh for electricity and \$0.91 per therm for natural gas in calculating the cost savings.

6.15.11.5.4 The following four (4) LEED Credits shall not be accepted:

SS Credit 2 Development Density & Community Connectivity

SS Credit 3 Brownfield Development

SS Credit 4.1 Public Transportation Access

EA Credit 6 Green Power

6.15.12 Cultural Resources

6.15.12.1 Inadvertent Discovery. The proposed construction area has been evaluated for potential cultural resources, consultation has been completed and concurrence achieved that any proposed construction at this location will have no impact on any significant cultural resource. However, if an historic archeological district has been set aside in the vicinity of the proposed project, all posted signs will be respected by the contractor. In addition, there remains the possibility that archeological remains could be accidentally discovered during the course of construction. Examples of remains to be expected in the area could include, but are not limited to: bones, Native American stone tools and debris, evidence of fire in the soil including fire-cracked rock, charcoal and burnt soil, Native American pottery, evidence of historic foundations, and concentrations of historic artifacts or debris. If accidental discovery of items that appear to be cultural remains occurs during construction, all work shall cease within a ten meter radius of the find. The contracting officer shall be contacted immediately who will contact Public Works, Environmental Division, 315-772-4165, or 315-772-5708.

6.15.12.2 Borrow Quality: All fill brought from outside Fort Drum to be used within Fort Drum boundary shall come from a source with a valid New York State mining permit. These sources must have been subjected to archeological review and a determination of no effect issued from the New York State Office of Historic Preservation.

6.16. PERMITS

6.16 Permits

6.16.1 The D/B Contractor shall comply with all Federal, State, and Local environmental requirements and coordinate all necessary permitting with the installation's DPW and COR.

6.17. DEMOLITION

6.17 Demolition

6.17.1 Site Demolition: Demolition is to include removal and proper disposal of all material in conflict with the proposed construction. Utility termination is to include complete and proper coordination with respective utility prior to performing the work. Termination is to occur back to the utility mains with appropriate plugs and caps.

6.17.1.2 Site Demolition: Demolition, removal and disposal (off Fort Drum) of any and all existing man made features that will be impacted by the proposed development shall be provided.

6.17.1.3 Utility Demolition: All utility removal shall be terminated back to the utility mains with appropriate plugs and caps.

6.17.1.4 Utility Relocation: If existing utility mains on the site interfere with construction of any portion of the project, the utility shall be either; relocated on the project site, rerouted around the site and reconnected to maintain service or provide service from another location which will provide the required capacity for the connected systems. All utility changes or modifications shall be approved by the Contracting Officers Representative (COR).

6.17.1.5 Buildings to be demolished are as follows: 4802, 4808, 4813, 4814, 4816, 4817, 4818, 4828, and 4881 all buildings are free of LEAD and Asbestos. Demolition shall take place within 6 months of completion of the 20th ASOS buildings and the customer relocating into the new building. Locations are shown in Appendix BB.

6.18. ADDITIONAL FACILITIES

6.18 Other Facilities

6.18.1 The storage building floor will be a sealed 6" concrete slab-on-grade with no finish.

6.18.2 Will have a minimum of two personnel doors and one 8'x10' overhead door are provided for building access and egress.

End of Section 01 10 00.[Not Supplied - ProjectInfo : TONUM]

**SECTION 01 33 00.[Not Supplied - ProjectInfo : TONUM]
SUBMITTAL PROCEDURES
(DESIGN-BUILD TASK ORDERS)**

1.0 GENERAL

1.13. GOVERNMENT APPROVED OR CONCURRED WITH SUBMITTALS

1.14. INFORMATION ONLY SUBMITTALS

1.0 GENERAL

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

1.13. GOVERNMENT APPROVED OR CONCURRED WITH SUBMITTALS

Upon completion of review of submittals requiring Government approval or concurrence, the Government will stamp and date the submittals as approved or concurred. The Government will retain twenty five (25) copies of the submittal and return zero(0) copy(ies) of the submittal.

1.14. INFORMATION ONLY SUBMITTALS

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

End of Section 01 33 00.[Not Supplied - ProjectInfo : TONUM]

**SECTION 01 33 16
DESIGN AFTER AWARD****1.0 GENERAL INFORMATION**

1.1. INTRODUCTION

1.2. DESIGNER OF RECORD

2.0 PRODUCTS (Not Applicable)**3.0 EXECUTION**

3.1. PRE-WORK ACTIVITIES & CONFERENCES

3.1.1. Design Quality Control Plan

3.1.2. Post Award Conference

3.1.3. Partnering & Project Progress Processes

3.1.4. Initial Design Conference

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3.2.7. Late Submittals and Reviews

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3.3.1. Procedures

3.3.2. Tracking Design Review Comments

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3.4. INTERIM DESIGN REVIEWS AND CONFERENCES

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 - 3.5.7. Building Rendering
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- 3.6. FINAL DESIGN REVIEWS AND CONFERENCES
- 3.7. FINAL DESIGN REQUIREMENTS
 - 3.7.1. Drawings
 - 3.7.2. Design Analysis
 - 3.7.3. Specifications
 - 3.7.4. Submittal Register
 - 3.7.5. Preparation of DD Form 1354 (Transfer of Real Property)
 - 3.7.6. Acceptance and Release for Construction
- 3.8. DESIGN COMPLETE CONSTRUCTION DOCUMENT REQUIREMENTS
- 3.9. SUBMITTAL DISTRIBUTION, MEDIA AND QUANTITIES
 - 3.9.1. Submittal Distribution and Quantities
 - 3.9.2. Web based Design Submittals
 - 3.9.3. Mailing of Design Submittals
- 3.10. AS-BUILT DOCUMENTS

ATTACHMENT A STRUCTURAL INTERIOR DESIGN (SID) REQUIREMENTS

ATTACHMENT B FURNITURE, FIXTURES AND EQUIPMENT REQUIREMENTS

ATTACHMENT C TRACKING COMMENTS IN DRCHECKS

ATTACHMENT D SAMPLE FIRE PROTECTION AND LIFE SAFETY CODE REVIEW

ATTACHMENT E LEED SUBMITTALS

ATTACHMENT F BUILDING INFORMATION MODELING REQUIREMENTS

ATTACHMENT G DESIGN SUBMITTAL DIRECTORY AND SUBDIRECTORY FILE ARRANGEMENT

1.0 GENERAL INFORMATION

1.1. INTRODUCTION

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

1.1.2. The Contractor may elect to fast track the design and construction that is, proceed with construction of parts of the sitework and facilities prior to completion of the overall design. To facilitate fast tracking, the Contractor may elect to divide the design into no more than six (6) design packages per major facility type and no more than three (3) design packages for site and associated work. Designate how it will package the design, consistent with its overall plan for permitting (where applicable) and construction of the project. See Sections 01 33 00 SUBMITTAL PROCEDURES and 01 32 01.00 10 PROJECT SCHEDULE for requirements for identifying and scheduling the design packaging plan in the submittal register and project schedule. See also Sections 01 10 00 STATEMENT OF WORK and 01 57 20.00 10 ENVIRONMENTAL PROTECTION for any specified permit requirements. If early procurement of long-lead item construction materials or installed equipment, prior to completion of the associated design package, is necessary to facilitate the project schedule, also identify those long-lead items and how it will assure design integrity of the associated design package to meet the contract requirements (The Contract consists of the Solicitation requirements and the accepted proposal). Once the Government is satisfied that the long-lead items meet the contract requirements, the Contracting Officer will allow the Contractor to procure the items at its own risk.

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

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

1.2. DESIGNER OF RECORD

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

2.0 PRODUCTS (Not Applicable)

3.0 EXECUTION

3.1. PRE-WORK ACTIVITIES & CONFERENCES

3.1.1. Design Quality Control Plan

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

3.1.2. Post Award Conference

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

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

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

3.1.3. Partnering & Project Progress Processes

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

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

3.1.4. Initial Design Conference

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

3.1.5. Pre-Construction Conference

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

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

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

3.2.1. Site/Utilities

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

3.2.2. Interim Design Submittals

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

3.2.3. Over-the-Shoulder Progress Reviews

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

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

3.2.4. Final Design Submissions

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

3.2.5. Design Complete Submittals

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

3.2.6. Holiday Periods for Government Review or Actions

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

3.2.7. Late Submittals and Reviews

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

3.3. DESIGN CONFIGURATION MANAGEMENT

3.3.1. Procedures

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

3.3.2. Tracking Design Review Comments

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

3.3.3. Design and Code Checklists

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

3.4. INTERIM DESIGN REVIEWS AND CONFERENCES

3.4.1. General

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

3.4.2. Procedures

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

3.4.3. Conference Documentation

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

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

3.5. INTERIM DESIGN REQUIREMENTS

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

3.5.1. Drawings

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

3.5.2. Design Analyses

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

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

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

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

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

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

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

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

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

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

3.5.2.8. For parts including plumbing systems:

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

3.5.2.9. For elevator systems:

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

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

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

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

3.5.3. Geotechnical Investigations and Reports:

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

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

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

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

3.5.4. LEED Documentation:

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

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

3.5.5. Energy Conservation:

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

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

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

3.5.6. Specifications

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

3.5.7. Building Rendering

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

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

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

3.5.8. Interim Building Design Contents

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

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

3.5.8.1. Lawn and Landscaping Irrigation System

3.5.8.2. Landscape, Planting and Turfing

3.5.8.3. Architectural

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

3.5.8.4. Structural Systems. Include:

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

3.5.8.5. Plumbing Systems

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

3.5.8.6. HVAC Systems

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

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

3.5.8.7. Fire Protection and Life Safety.

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

3.5.8.8. Elevators. Provide:

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

3.5.8.9. Electrical Systems.

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

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

3.5.8.10. Electronic Systems including the following responsibilities:

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

3.5.8.11. Separate detailed Telecommunications drawings for Information Systems including the following responsibilities:

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

3.6. FINAL DESIGN REVIEWS AND CONFERENCES

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

3.7. FINAL DESIGN REQUIREMENTS

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

3.7.1. Drawings

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

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

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

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

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

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

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

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

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

(c) Each file (both CAD and PDF) shall represent one complete drawing from the drawing set, including the date, submittal phase, and border. Each drawing file shall be completely independent of any data in any other file, including fonts and shapes not included with the basic CAD software program utilized. Fonts that are not included as part of the default CAD software package installation or recognized as an allowable font by the A/E/C CAD Standard are not acceptable in delivered CAD files. All displayed graphic elements on all levels of the drawing files shall be part of the project drawing image. The drawing files shall not contain any graphic element that is not part of the drawing image.

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

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

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

3.7.2. Design Analyses

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

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

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

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

3.7.3. Specifications

Specifications shall be 100% complete and in final form.

3.7.4. Submittal Register

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

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

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

3.7.6. Acceptance and Release for Construction

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

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

3.8. DESIGN COMPLETE CONSTRUCTION DOCUMENT REQUIREMENTS

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

3.9. SUBMITTAL DISTRIBUTION, MEDIA AND QUANTITIES

3.9.1. Submittal Distribution and Quantities

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

Activity and Address	Drawing Size (Full Size) ANSI D Full Sets/ *Partial Sets	Design Analyses & Specs Full Sets/ *Partial Sets	Drawing Size (Half Size) [Not Supplied - Submittal Req Distribution : HALF SIZE] Full Sets/ *Partial Sets	Non-BIM Data CD-ROM or DVD as Necessary (PDF & .dgn)	Furniture Submittal (Per Attachment B)	Structural Interior Design Submittal	BIM Data DVD (Per Attachment F)
Commander, U.S.Army Engineer District New York District	4/0	4/0	0/0	0	1	0	0
Commander, U.S.Army Engineer District, Center of Standardization [Not Supplied - Submittal Req Distribution : COS]	0/0	0/0	0/0	0	N/A	0	0
Installation	10/0	10/0	0/0	0	2	0	0
U.S.Army Corps of Engineers Construction Area Office	5/0	2/0	0/0	0	1	0	0
Information Systems Engineering Command (ISEC)	0/0	0/2	0/0	1	N/A	N/A	1
Other Offices	6/0	6/0	0/0	0	N/A	0	2

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

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

3.9.2. Web based Design Submittals

Except for full or half-sized drawings for Installation personnel, as designated in the Table above, Web based design submittals will be acceptable as an alternative to the paper copies listed in the Table above, provided a single hard-copy PDF based record set is provided to the Contracting Officer for record purposes. Where the

contract requires the Contractor to submit documents to permitting authorities, still provide those authorities paper copies (or in an alternate format where required by the authority). Web based design submittal information shall be provided with adequate security and availability to allow unlimited access those specifically authorized to Government reviewers while preventing unauthorized access or modification. File sizes must be of manageable size for reviewers to quickly download or open on their computers. As a minimum, drawings shall be full scale on American National Standards Institute (ANSI) D sheets (34" x 22"). In addition to the optional website, provide the BIM data submission on DVD to each activity and address noted above in paragraph 3.9.1 for each BIM submission required in Attachment F.

3.9.3. Mailing of Design Submittals

3.9.3.1. Mail all design submittals to the Government during design and construction, using an overnight mailing service. The Government will furnish the Contractor addresses where each copy shall be mailed to after award of the contract (or individual task order if this is an indefinite delivery/indefinite quantity, task order contract). Mail the submittals to five (5) different addresses. Assemble drawing sheets, specs, design analyses, etc. into individual sets; do not combine duplicate pages from individual sets so that the government has to assemble a set.

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

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

3.10. AS-BUILT DOCUMENTS

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

ATTACHMENT A STRUCTURAL INTERIOR DESIGN (SID) REQUIREMENTS

1.0 GENERAL INFORMATION

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

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

2.1. FORMAT AND SCHEDULE

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

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

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

Design submittal requirements include, but are not limited to:

2.1.1. Narrative of the Structural Interior Design Objectives

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

2.1.2. Interior Color Boards

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

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

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

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

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

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

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

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

2.1.3. Exterior Color Boards

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

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

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

2.2. STRUCTURAL INTERIOR DESIGN DOCUMENTS

2.2.1. General

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

2.2.2. Finish Color Schedule

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

2.2.3. Interior Finish Plans

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

2.2.4. Furniture Footprint Plans

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

2.2.5. Interior Signage

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

2.2.6. Interior Elevations, Sections and Details

Indicate material, color and finish placement.

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

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

1.1. FORMAT AND SCHEDULE

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

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

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

Submit four copies of the final and complete FF&E information and samples in 8 1/2" x 11" format using three ring binders with pockets on the inside of the cover upon completion of the final architectural submittal or ten months prior to the contract completion date (whichever comes first). Use more than one binder when there are numerous pages with thick samples. Large D-ring binders are preferred to O-ring binders. Use page protectors that are strong enough to keep pages from tearing out for upholstery and finish boards. Anchor large or heavy samples with mechanical fasteners, Velcro, or double-faced foam tape rather than rubber cement or glue. Fold out items must have a maximum spread of 25 1/2". Provide cover and spine inserts sheets identifying the document as "Furniture, Fixtures & Equipment" package and include the project title and location, project number, Contractor/A/E name and phone number(s), submittal stage and date.

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

Design submittal requirements include, but are not limited to:

1.1.1. Narrative of Interior Design Objectives

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

1.1.2. Furniture Order Form

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

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

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

Chair Description:

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

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

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

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

1.1.3. Alternate Manufacturer List

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

1.1.4. FF&E Procurement List

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

1.1.5. Points of Contact (POCs)

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

1.1.6. Color Boards

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

1.1.7. Itemized Furniture Cost Estimate

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

1.2. INTERIOR DESIGN DOCUMENTS

1.2.1. Overall Furniture and Area Plans

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

1.2.2. Workstation Plans

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

1.2.3. Panel Plans

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

1.2.4. Desk Plans

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

1.2.5. Reflected Ceiling Plans

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

1.2.6. Electrical and Telecommunication Plans

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

1.2.7. Artwork Placement Plans

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

1.2.8. Window Drapery Plans

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

1.3. FURNITURE SELECTION

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

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

1.4. CONSTRUCTION

1.4.1. Provide knee space at workstations and tables that is not obstructed by panels/legs that interfere with knee space of seated person and specify modesty panels at walls to be of a height or be hinged to allow access to building wall electrical outlets and communication jacks. Provide desks, storage and tables with leveling devices to compensate for uneven floors.

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

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

1.4.4. Unless otherwise noted, provide lockable desks and workstations, filing cabinets and storage. Key all locks within a one person office the same; key all one person offices within a building differently. If an office or open office area has more than one workstation, key all the workstations differently, but key all locks within an individual workstation the same. Use tempered glass glazing when glazing is required. Use light-emitting diode (LED)/solid state lighting where task lighting is required in furniture.

1.5. FINISHES AND UPHOLSTERY

1.5.1. Specify neutral colors for casegoods, furniture systems, storage and tables. Specify desk worksurfaces and table tops that are not too light or too dark in color and have a pattern to help hide soiling. Accent colors are

allowed in break and lounge areas. Keep placement of furniture systems panel fabric accent colors to a minimum. All finishes shall be cleanable with ordinary household cleaning solutions.

1.5.2. Use manufacturer's standard fabrics; including textile manufacturers fabrics that have been graded into the furniture manufactures fabric grades and are available through their GSA Schedule. Customers Own Material (COM) can be used in headquarter buildings in command suites with executive furniture. Coordinate specific locations with Corps of Engineers Interior Designer.

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

1.6. ACCESSORIES

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

1.6.2. Not Used.

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

1.7. MISSION UNIQUE EQUIPMENT

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

1.8. SUSTAINABILITY

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

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

1.9. FURNITURE SYSTEMS

1.9.1. General.

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

1.9.2. Connector Systems.

Specify a connector system that allows removal of a single panel or spine wall within a typical workstation configuration without requiring disassembly of the workstation or removal of adjacent panels. Specify connector

system with tight connections and continuous visual seals. When Acoustical panels are used, provide connector system with continuous acoustical seals. Specify concealed clips, screws, and other construction elements, where possible.

1.9.3. Panels and Spine Walls

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

1.9.4. Electrical And Information/Technology (IT)

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

1.9.5. Pedestals

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

1.10. EXECUTIVE FURNITURE

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

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

1.11. SEATING

1.11.1. General

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

1.11.2. Desk and Guest Seating

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

1.11.3. Conference Room Seating

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

1.11.4. Lounge, Waiting and Reception Area Seating

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

1.11.5. Break Room Seating

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

1.11.6. Lounge, Waiting and Reception Furniture.

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

1.12. FILING AND STORAGE.

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

1.13. TRAINING TABLES.

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

1.14. FURNITURE WARRANTIES.

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

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

ATTACHMENT C TRACKING COMMENTS IN DRCHECKS

1.0 General

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

2.0 DrChecks Review Comments

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

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

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

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

3.0 DrChecks Initial Account Set-Up

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

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

4.0 DrChecks Reviewer Role

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

4.1. Log into DrChecks.

4.2. Click on the appropriate project.

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

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

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

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

5.0 DrChecks Comment Evaluation

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

5.1. Log into DrChecks.

5.2. Click on the appropriate project.

5.3. Under “Evaluate” click on the number under “Pending”.

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

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

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

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

6.0 DrChecks Back-check

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

6.1. Log into DrChecks.

6.2. Click on the appropriate project.

6.3. Under “My Backcheck” click on the number under “Pending”.

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

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

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

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

ATTACHMENT D
SAMPLE FIRE PROTECTION AND LIFE SAFETY CODE REVIEW

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

1.0 SAMPLE FIRE PROTECTION AND LIFE SAFETY CODE REVIEW

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

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

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

Fire Protection Engineer of Record:

Signature and Stamp

Date

OR

Architect of Record:

Signature and Stamp

Date

Mechanical Engineer of Record:

Signature and Stamp

Date

Electrical Engineer of Record:

Signature/Date

**ATTACHMENT E
LEED SUBMITTALS**

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	LEED-NC v2.2 Submittals (OCT09REV)	Provide for Credit Audit Only	REQUIRED DOCUMENTATION	Date Submitted (to be filled in by Contractor)	Government Reviewer's Use (OCT09REV)
PAR	FEATURE	DUE AT			DATE	REV
GENERAL						
GENERAL - All calculations shall be in accordance with LEED 2.2 Reference Guide.						
GENERAL - Obtain excel version of this spreadsheet at http://en.sas.usace.army.mil/enWeb/ "Engineering Criteria" . OCT09REV						
GENERAL - For all credits, narrative/comments may be added to describe special circumstances or considerations regarding the project's credit approach.						
GENERAL - Include all required LEED drawings indicated below in contract drawings with applicable discipline drawings, labeled For Reference Only.						
NOTE: Each submittal indicated with **** differs from LEED certified project submittals by either having a different due date or being an added submittal not required by GBCI. OCT09REV						
OCT09REV GENERAL - Audit documentation may include but is not limited to what is indicated in this table.						
			Closeout	List of all Final Design submittals revised after final design to reflect actual closeout conditions. Revised Final Design submittals. - OR - Statement confirming that no changes have been made since final design that effect final design submittal documents.		Proj Engr (PE)
CATEGORY 1 - SUSTAINABLE SITES						
SSPR1	Construction Activity Pollution Prevention (PREREQUISITE)	**Final Design		List of drawings and specifications that address the erosion control, particulate/dust control and sedimentation control measures to be implemented.		CIV
OCT09REV		**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
		**Final Design		Narrative that indicates which compliance path was used (NPDES or Local standards) and describes the measures to be implemented on the project. If a local standard was followed, provide specific information to demonstrate that the local standard is equal to or more stringent than the NPDES program.		CIV
SS1	Site Selection	Final Design		Statement confirming that project does not meet any of the prohibited criteria.		CIV
OCT09REV		**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
		Final Design	X	LEED Site plan drawing that shows all proposed development, line depicting boundary of all bodies of water and/or wetlands within 100 feet of project boundary and a line depicting 5' elevation above 100 year flood line that falls within project boundary. Not required if neither condition applies.		CIV
SS2	Development Density & Community Connectivity	Final Design		Option 1: LEED Site vicinity plan showing project site and surrounding development. Show density boundary or note drawing scale.		CIV
OCT09REV		**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
		Final Design		Option 1: Table indicating, for project site and all surrounding sites within density radius (keyed to site vicinity plan), site area and building area. Project development density calculation. Density radius calculation. Development density calculation within density radius.		CIV
		Final Design		Option 2: LEED Site vicinity plan showing project site, the 1/2 mile community radius, pedestrian walkways and the locations of the residential development(s) and Basic Services surrounding the project site.		CIV
		Final Design		Option 2: List (including business name and type) of all Basic Services facilities within the 1/2 mile radius, keyed to site vicinity plan.		CIV
SS3	Brownfield Redevelopment	Final Design		Narrative describing contamination and the remediation activities included in project. Include statement indicating how site was determined to be a brownfield.		CIV
OCT09REV		**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
SS4.1	Alternative Transportation: Public Transportation Access	Final Design		Statement indicating which option for compliance applies. State whether public transportation is existing or proposed and, if proposed, cite source of this information.		CIV
OCT09REV		**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
		Final Design		Option 1: LEED Site vicinity plan showing project site, mass transit stops and pedestrian path to them with path distance noted.		CIV
		Final Design		Option 2: LEED Site vicinity plan showing project site, bus stops and pedestrian path to them with path distance noted.		CIV
SS4.2	Alternative Transportation: Bicycle Storage & Changing Rooms	Final Design		FTE calculation. Bicycle storage spaces calculation. Shower/changing facilities calculation.		CIV
		Final Design		List of drawings that show the location(s) of bicycle storage areas. Statement indicating distance from building entrance.		CIV
		Final Design		List of drawings that show the location(s) of shower/changing facilities and, if located outside the building, statement indicating distance from building entrance.		ARC
SS4.3	Alternative Transportation: Low Emitting & Fuel Efficient Vehicles	Final Design		Statement indicating which option for compliance applies. FTE calculation. Statement indicating total parking capacity of site.		CIV
OCT09REV		**Final Design		Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
		Final Design		Option 1: Low-emission & fuel-efficient vehicle calculation.		CIV

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	LEED-NC v2.2 Submittals (OCT09REV)	Provide for Credit Audit Only	REQUIRED DOCUMENTATION	DATE	REV
				Option 1: List of drawings and specification references that show location and number of preferred parking spaces for low-emission & fuel-efficient vehicles and signage.		CIV
				Option 1: Statement indicating quantity, make, model and manufacturer of low-emission & fuel-efficient vehicles to be provided. Statement confirming vehicles are zero-emission or indicating ACEEE vehicle scores.		CIV
				Option 2: Low-emission & fuel-efficient vehicle parking calculation.		CIV
				Option 2: List of drawings and specification references that show location and number of preferred parking spaces and signage.		CIV
				Option 3: Low-emission & fuel-efficient vehicle refueling station calculation.		CIV
				Option 3: List of drawings and specifications indicating location and number of refueling stations, fuel type and fueling capacity for each station for an 8-hour period.		CIV
			X	Option 3: Construction product submittals indicating what was provided and confirming compliance with respect to fuel type and fueling capacity for each station for an 8-hour period.		CIV
SS4.4		Alternative Transportation: Parking Capacity	Final Design	Statement indicating which option for compliance applies.		CIV
OCT09REV			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design	Option 1: Preferred parking calculation including number of spaces required, total provided, preferred spaces provided and percentage.		CIV
			Final Design	Option 2: FTE calculation. Preferred parking calculation including number of spaces provided, preferred spaces provided and percentage.		CIV
			Final Design	Options 1 and 2: List of drawings and specification references that show location and number of preferred parking spaces and signage.		CIV
			Final Design	Option 3: Narrative indicating number of spaces required and provided and describing infrastructure and support programs with description of project features to support them.		CIV
SS5.1		Site Development: Protect or Restore Habitat	**Final Design	Option 1: List of drawing and specification references that convey site disturbance limits.		CIV
OCT09REV			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			**Final Design	Option 2: LEED site plan drawing that delineates boundaries of each preserved and restored habitat area with area (sf) noted for each.		CIV
			**Final Design	Option 2: Percentage calculation of restored/preserved habitat to total site area. List of drawings and specification references that convey restoration planting requirements.		CIV
SS5.2		Site Development: Maximize Open Space	Final Design	Option 2: LEED site plan drawing delineating boundary of vegetated open space adjacent to building with areas of building footprint and designated open space noted.		CIV
OCT09REV			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
SS6.1		Stormwater Design: Quantity Control	Final Design	Statement indicating which option for compliance applies.		CIV
OCT09REV			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design	Option 1: Indicate pre-development and post-development runoff rate(cfs) and runoff quantity (cf) -OR - Narrative describing site conditions, measures and controls to be implemented to prevent excessive stream velocities and erosion.		CIV
			Final Design	Option 2: Indicate pre-development and post-development runoff rate(cfs) and runoff quantity (cf). Indicate percent reduction in each.		CIV
SS6.2		Stormwater Design: Quality Control	Final Design	For non-structural controls, list all BMPs used and, for each, describe the function of the BMP and indicate the percent annual rainfall treated. List all structural controls and, for each, describe the pollutant removal and indicate the percent annual rainfall treated.		CIV
OCT09REV			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
SS7.1		Heat Island Effect: Non-Roof	**Final Design	LEED site plan drawing indicating locations and quantities of each paving type, including areas of shaded pavement. Percentage calculation indicating percentage of reflective/shaded/open grid area.		CIV
OCT09REV			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
SS7.2		Heat Island Effect: Roof	Final Design	Option 1: Percentage calculation indicating percentage of SRI compliant roof area. List of drawings and specification references that convey SRI requirements and roof slopes.		ARC

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	LEED-NC v2.2 Submittals (OCT09REV)	Provide for Credit Audit Only	REQUIRED DOCUMENTATION	DATE	REV
				Option 1: List of specified roof materials indicating, for each, product type, manufacturer, product name and identification if known, SRI value and roof slope. OCT09REV		ARC
				Option 1: List of installed roof materials indicating, for each, manufacturer, product name and identification, SRI value and roof slope.		PE
			X	Option 1: Manufacturer published product data or certification confirming SRI		PE
				Option 2: Percentage calculation indicating percentage of vegetated roof area.		ARC
				Option 3: Combined reflective and green roof calculation.		ARC
				Option 3: List of specified roof materials indicating, for each, product type, manufacturer, product name and identification if known, SRI value and roof slope. OCT09REV		
				Option 3: List of installed roof materials indicating, for each, manufacturer, product name and identification, SRI value and roof slope.		PE
			X	Option 3: Manufacturer published product data or certification confirming SRI		PE
SS8		Light Pollution Reduction	Final Design	Interior Lighting: List of drawings and specification references that convey interior lighting requirements (location and type of all installed interior lighting, location of non-opaque exterior envelope surfaces, allowing confirmation that maximum candela value from interior fixtures does not intersect non-opaque building envelope surfaces). - OR - List of drawings and specification references that show automatic lighting controls that turn off non-essential lighting during non-business hours		ELEC
OCT09REV			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		ELEC
			Final Design	Exterior Lighting: List of drawings and specification references that convey exterior lighting requirements (location and type of all site lighting and building façade/landscape lighting).		ELEC
			Final Design	Exterior Site Lighting Power Density (LPD): Tabulation for exterior site lighting indicating, for each location identification or description, units of measure, area or distance of the location, actual LPD using units consistent with ASHRAE 90.1, and the ASHRAE allowable LPD for that type of location. Percentage calculation of actual versus allowable LPD for all site lighting.		ELEC
			Final Design	Exterior Building Facade/Landscape Lighting Power Density (LPD): Tabulation for exterior building facade/landscape lighting indicating, for each location identification or description, units of measure, area or distance of the location, actual LPD using units consistent with ASHRAE 90.1, and the ASHRAE allowable LPD for that type of location. Percentage calculation of actual versus allowable LPD for all building facade/landscape lighting.		ELEC
			Final Design	Exterior Lighting IESNA Zone: Indicate which IESNA zone is applicable to the project.		ELEC
			Final Design	Exterior Lighting Site Lumen table indicating, for each fixture type, quantity installed, initial lamp lumens per luminaire, initial lamp lumens above 90 degrees from Nadir, total lamp lumens and total lamp lumens above 90 degrees. Percentage of site lamp lumens above 90 degrees from nadir to total lamp lumens.		ELEC
			Final Design	Exterior Lighting Narrative describing analysis used for addressing requirements for light trespass at site boundary and beyond.		ELEC
CATEGORY 2 – WATER EFFICIENCY						
WE1.1		Water Efficient Landscaping: Reduce by 50%	Final Design	Statement indicating which option for compliance applies.		CIV
OCT09REV			**Final Design	Delineation and labeling of "LEED Project site boundary" on site plan.		CIV
			Final Design	Calculation indicating, for baseline and design case, total water applied, total potable water applied, total non-potable water applied. Design case percent potable water reduction. If nonpotable water is used, indicate source of nonpotable water.		CIV
			Final Design	List of landscape plan drawings.		CIV
			Final Design	Narrative describing landscaping and irrigation design strategies, including water use calculation methodology used to determine savings and, if non-potable water is used, specific information about source and available quantity.		CIV
WE1.2		Water Efficient Landscaping: No Potable Water Use or No Irrigation	Same as WE1.1	Same as WE1.1		CIV
WE2		Innovative Wastewater Technologies	Final Design	Statement confirming which option for compliance applies.		MEC

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PAR		FEATURE	DUE AT		DATE	REV
			Final Design	Statement confirming which occupancy breakdown applies (default or special). For special occupancy breakdown, indicate source and explanation for ratio.		MEC
			Final Design	Occupancy calculation including male/female numbers for FTEs, visitors, students, customers, residential and other type occupants/users		MEC
			Final Design	Statement indicating percent of male restrooms with urinals. Statement indicating annual days of operation.		MEC
			Final Design	Baseline flush fixture calculation spreadsheet indicating, for each fixture type, gender, flush rate, daily uses per person for each occupant type identified in occupancy calculation and annual baseline flush fixture water usage.		MEC
			Final Design	Design case flush fixture calculation spreadsheet indicating, for each fixture type, gender, fixture manufacturer, fixture model number, flush rate, percent of occupants using this fixture type, daily uses per person for each occupant type identified in occupancy calculation and annual design case flush fixture water usage.		MEC
			Final Design	Option 1: If onsite non-potable water is used, identify source(s), indicate annual quantity from each source and indicate total annual quantity from all onsite non-potable water sources.		MEC
			Final Design	Option 1: Summary calculation indicating baseline annual water consumption, design case annual water consumption, non-potable annual water consumption and total percentage annual water savings.		MEC
			Final Design	Option 2: Statement confirming on-site treatment of all generated wastewater to tertiary standards and all treated wastewater is either infiltrated or used on-site.		MEC
			Final Design	Option 2: List of drawing and specification references that convey design of on-site wastewater treatment features.		CIV
			Final Design	Option 2: On-site water treatment quantity calculation indicating all on-site wastewater source(s), annual quantity treated, annual quantity infiltrated and annual quantity re-used on site from each source and totals for annual quantity treated, annual quantity infiltrated and annual quantity re-used on site from all sources.		CIV
			Final Design	Option 2: Wastewater summary calculation indicating design case annual flush fixture water usage, annual on-site water treatment and percentage sewage conveyance reduction.		MEC
			Final Design	Narrative describing project strategy for reduction of potable water use for sewage conveyance, including specific information on reclaimed water usage and treated wastewater usage.		MEC
WE3.1		Water Use Reduction: 20% Reduction	Final Design	Statement confirming which occupancy breakdown applies (default or special). For special occupancy breakdown, indicate source and explanation for ratio.		MEC
			Final Design	Occupancy calculation including male/female numbers for FTEs, visitors, students, customers, residential and other type occupants/users		MEC
			Final Design	Statement indicating percent of male restrooms with urinals. Statement indicating annual days of operation.		MEC
			Final Design	Baseline flush fixture calculation spreadsheet indicating, for each fixture type, gender, flush rate, daily uses per person for each occupant type identified in occupancy calculation and annual baseline flush fixture water usage.		MEC
			Final Design	Design case flush fixture calculation spreadsheet indicating, for each fixture type, gender, fixture manufacturer, fixture model number, flush rate, percent of occupants using this fixture type, daily uses per person for each occupant type identified in occupancy calculation and annual design case flush fixture water usage.		MEC
			Closeout	X Manufacturer published product data or certification confirming fixture water usage.		PE
WE3.2		Water Use Reduction: 30% Reduction	Same as WE3.1	Same as WE3.1		MEC
CATEGORY 3 – ENERGY AND ATMOSPHERE						
EAPR1		Fundamental Commissioning of the Building Energy Systems (PREREQUISITE)	**Final Design	**Owner's Project Requirements document		ALL
			**Final Design	**Basis of Design document for commissioned systems		MEC, ELEC
			**Final Design	**Commissioning Plan		MEC, ELEC

LEED Credit Paragraph	Contractor Check Here if Credit is Claimed	LEED-NC v2.2 Submittals (OCT09REV)	Provide for Credit Audit Only	REQUIRED DOCUMENTATION	DATE	REV
				Statement confirming all commissioning requirements have been incorporated into construction documents.		PE
				Commissioning Report		PE
EAPR2		Minimum Energy Performance (PREREQUISITE)	Final Design	Statement listing the mandatory provisions of ASHRAE 90.1 that project meets relative to compliance with this prerequisite and indicating which compliance path was used.		MEC ELEC ARC
EAPR3		Fundamental Refrigerant Management (PREREQUISITE)	Final Design	Statement indicating which option for compliance applies.		MEC
EA1		Optimize Energy Performance	Final Design	Option 2: Narrative describing phase out plan, including specific information on phase out dates and refrigerant quantities.		MEC
			Final Design	Statement indicating which compliance path option applies.		MEC
			Final Design	Option 1: Statement confirming simulation software capabilities and confirming assumptions and methodology.		MEC
			Final Design	Option 1: General information including simulation program, principal heating source, percent new construction and renovation, weather file, climate zone and Energy Star Target Finder score.		MEC
			Final Design	Option 1: Space summary listing, for each building use, the conditioned area, unconditioned area and total area and include total area for each category		MEC
			Final Design	Option 1: List of all simulation output advisory message data and show difference between baseline and proposed design		MEC
			Final Design	Option 1: Comparison summary for energy model inputs including description of baseline and design case energy model inputs, showing both by element type		MEC
			Final Design	Option 1: Energy type summary listing, for each energy type, utility rate description, units of energy and units of demand		MEC
			Final Design	Option 1: Statement indicating whether project uses on-site renewable energy. If yes, list all sources and indicate, for each source, backup energy type, annual energy generated, rated capacity and renewable energy cost		MEC
			Final Design	Option 1: If analysis includes exceptional calculation methods, statement describing how exceptional calculation measure cost savings is determined		MEC
			Final Design	Option 1: If analysis includes exceptional calculation methods, for each exceptional calculation method indicate energy types and, for each energy type, annual energy savings, annual cost savings, and brief descriptive narrative		MEC
			Final Design	Option 1: Baseline performance rating compliance report table indicating, for each energy end use, whether it is a process load, energy type, annual and peak energy demand for all four orientations. For each orientation indicate total annual energy use for each orientation and total annual process energy use.		MEC
			Final Design	Option 1: Baseline energy cost table indicating, for each energy type, annual cost for all four orientations and building total energy cost.		MEC
			Final Design	Option 1: Proposed Design performance rating compliance report table indicating, for each energy end use, whether it is a process load, energy type, annual and peak energy demand, baseline annual and peak energy demand and percent savings. Indicate total annual energy use and total annual process energy use for both proposed design and baseline and percent savings.		MEC
			Final Design	Option 1: Proposed Design energy cost table indicating, for each energy type, annual cost for all four orientations and building total energy cost.		MEC
			Final Design	Option 1: Energy cost and consumption by energy type report indicating, for each energy type, proposed design and baseline annual use and annual cost, percent savings annual use and annual cost. Indicate for renewable energy annual energy generated and annual cost. Indicate exceptional calculations annual energy savings and annual cost savings. Indicate building total annual energy use, annual energy cost for proposed design and baseline and indicate percent savings annual energy use and annual energy cost.		MEC

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PAR		FEATURE	DUE AT		DATE	REV
			Final Design	Option 1: Compliance summaries from energy simulation software. If software does not produce compliance summaries provide output summaries and example input summaries for baseline and proposed design supporting data in the tables. Output summaries must include simulated energy consumption by end use and total energy use and cost by energy type. Example input summaries should represent most common systems and must include occupancy, use pattern, assumed envelope component sizes and descriptive features and assumed mechanical equipment types and descriptive features		MEC
			Final Design	Option 1: Energy rate tariff from project energy providers (only if not using LEED Reference Guide default rates)		MEC
EA2.1		On-Site Renewable Energy	Final Design	Statement indicating which compliance path option applies.		ELEC
			Final Design	List all on-site renewable energy sources and indicate, for each source, backup energy type, annual energy generated, rated capacity and renewable energy cost. Indicate total annual energy use (all sources), total annual energy cost (all sources) and percent renewable energy cost.		ELEC MEC
			Final Design	Option 1: Indicate, for renewable energy, proposed design total annual energy generated and annual cost.		ELEC MEC
			Final Design	Option 2: Indicate CBECS building type and building gross area. Provide the following CBECS data: median annual electrical intensity, median annual non-electrical fuel intensity, average electric energy cost, average non-electric fuel cost, annual electric energy use and cost, annual non-electric fuel use and cost.		ELEC MEC
			Final Design	Option 2: Narrative describing renewable systems and explaining calculation method used to estimate annual energy generated, including factors influencing performance.		ELEC MEC
EA2.2		On-Site Renewable Energy	Same as EA2.1	Same as EA2.1		ELEC MEC
EA2.3		On-Site Renewable Energy	Same as EA2.1	Same as EA2.1		ELEC MEC
EA3		Enhanced Commissioning	**Final Design	**Owner's Project Requirements document (OPR)		ALL
			**Final Design	**Basis of Design document for commissioned systems (BOD)		ELEC MEC
			**Final Design	**Commissioning Plan		ELEC MEC
			Closeout	Statement confirming all commissioning requirements have been incorporated into construction documents.		PE
			Closeout	**Commissioning Report		PE
			**Final Design	Statement by CxA confirming Commissioning Design Review		
			Closeout	Statement by CxA confirming review of Contractor submittals for compliance with OPR and BOD		PE
			Closeout	**Systems Manual		PE
			Closeout	Statement by CxA confirming completion of O&M staff and occupant training		PE
			Closeout	**Scope of work for post-occupancy review of building operation, including plan for resolution of outstanding issues		PE
			**Predesign	Statement confirming CxA qualifications and contractual relationships relative to work on this project, demonstrating that CxA is an independent third party.		MEC
EA4		Enhanced Refrigerant Management	Final Design	Refrigerant impact calculation table with all building data and calculation values as shown in LEED 2.2 Reference Guide Example Calculations		MEC
			Final Design	Narrative describing any special circumstances or explanatory remarks OCT09REV		
			Closeout	X Cut sheets highlighting refrigerant data for all HVAC components.		PE
EA5		Measurement & Verification	Closeout	Statement indicating which compliance path option applies.		PE
			Closeout	Measurement and Verification Plan		PE
			Closeout	**Scope of work for post-occupancy implementation of M&V plan		PE
EA6		Green Power	Closeout	Statement indicating which compliance path option applies.		PE
			Closeout	Option 1: Indicate proposed design total annual electric energy usage		PE
			Closeout	Option 2: Indicate actual total annual electric energy usage		PE
			Closeout	Option 3: Calculation indicating building type, total gross area, median electrical intensity and annual electric energy use		PE

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PAR		FEATURE	DUE AT			
			Closeout	Green power provider summary table indicating, for each purchase type, provider name, annual quantity green power purchased and contract term. Indicate total annual green power use and indicate percent green power		PE
			Closeout	Narrative describing how Green Power or Green Tags are purchased		PE
CATEGORY 4 – MATERIALS AND RESOURCES						
MRPR1		Storage & Collection of Recyclables (PREREQUISITE)	Final Design	Statement confirming that recycling area will accommodate recycling of plastic, metal, paper, cardboard and glass. Narrative indicating any other materials addressed and coordination with pickup.		ARC
MR1.1		Building Reuse: Maintain 75% of Existing Walls, Floors & Roof	**Final Design	If project includes a building addition, confirm that area of building addition does not exceed 2x the area of the existing building.		ARC
			**Final Design	Spreadsheet listing, for each building structural/envelope element, the existing area and reused area. Total percent reused.		ARC
MR1.2		Building Reuse: Maintain 95% of Existing Walls, Floors & Roof	Same as MR1.1	Same as MR1.1		ARC
MR1.3		Building Reuse: Maintain 50% of Interior Non-Structural Elements	**Final Design	If project includes a building addition, confirm that area of building addition does not exceed 2x the area of the existing building.		ARC
			**Final Design	Spreadsheet listing, for each building interior non-structural element, the existing area and reused area. Total percent reused.		ARC
MR2.1		Construction Waste Management: Divert 50% From Disposal	**Preconstruction	Waste Management Plan		PE
			**Construction Quarterly and Closeout	Spreadsheet calculations indicating material description, disposal/diversion location (or recycling hauler), weight, total waste generated, total waste diverted, diversion percentage		PE
			**Construction Quarterly and Closeout	OCT09REV		
			**Construction Quarterly and Closeout	Receipts/tickets for all items on spreadsheet		PE
MR2.2		Construction Waste Management: Divert 75% From Disposal	Same as MR2.1	Same as MR2.1		PE
MR3.1		Materials Reuse: 5%	Closeout	Statement indicating total materials value and whether default or actual.		PE
			Closeout	Spreadsheet calculations indicating, for each reused/salvaged material, material description, source or vendor, cost. Total reused/salvaged materials percentage.		PE
MR3.2		Materials Reuse: 10%	Same as MR3.1	Same as MR3.1		PE
MR4.1		Recycled Content: 10% (post-consumer + 1/2 pre-consumer)	Closeout	Statement indicating total materials value and whether default or actual.		PE
			Closeout	Spreadsheet calculations indicating, for each recycled content material, material name/description, manufacturer, cost, post-consumer recycled content percent, pre-consumer recycled content percent, source of recycled content data. Total post-consumer content materials cost, total pre-consumer content materials cost, total combined recycled content materials cost, recycled content materials percentage.		PE
			Final Design or NLT Preconstruction	**Purchasing Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal. OCT09REV		PE
			Closeout	X Manufacturer published product data or certification, confirming recycled content percentages in spreadsheet		PE
MR4.2		Recycled Content: 20% (post-consumer + 1/2 pre-consumer)	Same as MR4.1	Same as MR4.1		PE
MR5.1		Regional Materials:10% Extracted, Processed & Manufactured Regionally	Closeout	Statement indicating total materials value and whether default or actual.		PE
			Closeout	Spreadsheet calculations indicating, for each regional material, material name/description, manufacturer, cost, percent compliant, harvest distance, manufacture distance, source of manufacture and harvest location data. Total regional materials cost, regional materials percentage.		PE
			Preconstruction OCT09REV	**Purchasing Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal. OCT09REV		PE
			Closeout	X Manufacturer published product data or certification confirming regional material percentages in spreadsheet		PE

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PAR		FEATURE	DUE AT		DATE	REV
MR5.2		Regional Materials:20% Extracted, Processed & Manufactured Regionally	Same as MR5.1	Same as MR5.1		PE
MR6		Rapidly Renewable Materials	Closeout	Statement indicating total materials value and whether default or actual.		PE
			Closeout	Spreadsheet calculations indicating, for each rapidly renewable material, material name/description, manufacturer, cost, rapidly renewable content percent, rapidly renewable product value. Total rapidly renewable product value, rapidly renewable materials percentage.		PE
			Final Design OCT09REV	**Purchasing Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal. OCT09REV		ARC
			Closeout	Manufacturer published product data or certification confirming rapidly renewable material percentages in spreadsheet		PE
MR7		Certified Wood	Closeout	Statement indicating total materials value and whether default or actual.		PE
			Closeout	Spreadsheet calculations indicating, for each certified wood material, material name/description, vendor, cost, wood component percent, certified wood percent of wood component, FSC chain of custody certificate number. Total certified wood product value, certified wood materials percentage.		PE
			Final Design or NLT Preconstruction	**Purchasing Plan consisting of spreadsheet indicated above, filled in with estimated quantities to show strategy for achieving goal. OCT09REV		PE
			Closeout	Vendor invoices, FSC chain of custody certificates and manufacturer published product data or certification confirming all certified wood materials percentages in spreadsheet.		PE
CATEGORY 5 – INDOOR ENVIRONMENTAL QUALITY						
EQPR1		Minimum IAQ Performance (PREREQUISITE)	Final Design	Statement indicating which option for compliance applies, stating applicable criteria/requirement, and confirming that project has been designed to meet the applicable requirements.		MEC
			Final Design	Narrative describing the project's ventilation design, including specifics about fresh air intake volumes and special considerations.		MEC
EQPR2		Environmental Tobacco Smoke (ETS) Control (PREREQUISITE)	Final Design	Statement indicating which option for compliance applies, stating applicable criteria/requirement, and confirming that project has been designed to meet the applicable requirements.		ARC
			Final Design	List of drawing and specification references that convey conformance to applicable requirements (signage, exhaust system, room separation details, etc).		ARC
EQ1		Outdoor Air Delivery Monitoring	Final Design	Statement indicating which option for compliance applies and confirming that project has been designed to meet the applicable requirements.		MEC
			Final Design	List of drawing and specification references that convey conformance to applicable requirements.		MEC
			Final Design	Narrative describing the project's ventilation design and CO2 monitoring system, including specifics about monitors, operational parameters and setpoints.		MEC
			Closeout	X Cut sheets for CO2 monitoring system.		PE
EQ2		Increased Ventilation	Final Design	Statement indicating which option for compliance applies and confirming that project has been designed to meet the applicable requirements.		MEC
			Final Design	Narrative describing the project's ventilation design, including specifics about zone fresh air intake volumes and demonstrating compliance.		MEC
			Final Design	Option 2: Narrative describing design method used for determining natural ventilation design, including calculation methodology/model results and demonstrating compliance.		MEC
			Final Design	List of drawing and specification references that convey conformance to applicable requirements.		MEC
EQ3.1		Construction IAQ Management Plan: During Construction	**Preconstruction	Construction IAQ Management Plan		PE
			Closeout	Statement confirming whether air handling units were operated during construction		PE
			Closeout	Dated jobsite photos showing examples of IAQ management plan practices being implemented. Label photos to indicate which practice they demonstrate. Minimum one photo of each practice at each building.		PE
			Closeout	Spreadsheet indicating, for each filter installed during construction, the manufacturer, model number, MERV rating, location installed, and if it was replaced immediately prior to occupancy.		PE
EQ3.2		Construction IAQ Management Plan: Before Occupancy	**Preconstruction	Construction IAQ Management Plan		PE

Monday, October 18, 2010

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PAR		FEATURE	DUE AT		DATE	REV
			Closeout	Statement indicating which option for compliance applies and confirming that required activities have occurred that meet the applicable requirements.		PE
			Closeout	Option 1a: Narrative describing the project's flushout process, including specifics about temperature, airflow and duration, special considerations (if any) and demonstrating compliance.		PE
			Closeout	Option 1b: Narrative describing the project's pre-occupancy and post-occupancy flushout processes, including specifics about temperature, airflow and duration, special considerations (if any) and demonstrating compliance.		PE
			Closeout	Option 2: Narrative describing the project's IAQ testing process, including specifics about contaminants tested for, locations, remaining work at time of test, retest parameters and special considerations (if any).		PE
			Closeout	Option 2: IAQ testing report demonstrating compliance.		PE
EQ4.1		Low Emitting Materials: Adhesives & Sealants	Closeout	Spreadsheet indicating, for each applicable indoor adhesive, sealant and sealant primer used, the manufacturer, product name/model number, VOC content, LEED VOC limit, and source of VOC data.		PE
			Closeout	Spreadsheet indicating, for each applicable indoor aerosol adhesive, the manufacturer, product name/model number, VOC content, LEED VOC limit, and source of VOC data - OR - Statement confirming no indoor aerosol adhesives were used for the project.		PE
			Closeout	Manufacturer published product data or certification confirming material VOCs in spreadsheet		PE
EQ4.2		Low Emitting Materials: Paints & Coatings	Closeout	Spreadsheet indicating, for each applicable indoor paint and coating used, the manufacturer, product name/model number, VOC content, LEED VOC limit, and source of VOC data.		PE
			Closeout	Spreadsheet indicating, for each applicable indoor anti-corrosive/anti-rust paint and coating used, the manufacturer, product name/model number, VOC content, LEED VOC limit, and source of VOC data - OR - Statement confirming no indoor anti-corrosive/anti-rust paints were used for the project .		PE
			Closeout	Manufacturer published product data or certification confirming material VOCs in spreadsheet		PE
EQ4.3		Low Emitting Materials: Carpet Systems	Closeout	Spreadsheet indicating, for each indoor carpet used, the manufacturer, product name/model number, if it meets LEED requirement (yes/no) and source of LEED compliance data.		PE
			Closeout	Spreadsheet indicating, for each indoor carpet cushion used, the manufacturer, product name/model number, if it meets LEED requirement (yes/no) and source of LEED compliance data - OR - Statement confirming no indoor carpet cushion was used for the project.		PE
			Closeout	Manufacturer published product data or certification confirming material CRI label in spreadsheet		PE
EQ4.4		Low Emitting Materials: Composite Wood & Agrifiber Products	Closeout	Spreadsheet indicating, for each indoor composite wood and agrifiber product used, the manufacturer, product name/model number, if it contains added urea formaldehyde (yes/no) and source of LEED compliance data.		PE
			Closeout	Manufacturer published product data or certification confirming material urea formaldehyde in spreadsheet		PE
EQ5		Indoor Chemical & Pollutant Source Control	Closeout OCT09REV	Spreadsheet indicating, for each permanent entryway system used, the manufacturer, product name/model number and description of system. Roll-up and carpet systems requiring weekly cleaning to earn this credit are not a permitted option for Army projects.		PE
			Final Design	List of drawing and specification references that convey locations and installation methods for entryway systems.		ARC
			Final Design	Spreadsheet indicating, for each chemical use area, the room number, room name, description of room separation features (walls, floor/ceilings, openings) and pressure differential from surrounding spaces with doors closed - OR - Statement confirming that project includes no chemical use areas and that no hazardous cleaning materials are needed for building maintenance.		ARC MEC
			Final Design	If project includes chemical use areas: List of drawing and specification references that convey locations of chemical use areas, room separation features and exhaust system.		ARC MEC
			Closeout OCT09REV	If project includes chemical use areas: Spreadsheet indicating, for AHUs/mechanical ventilation equipment serving occupied areas, the manufacturer, model number, MERV rating, location installed, and if it was replaced immediately prior to occupancy (yes/no) - OR - Statement confirming that project does not use mechanical equipment for ventilation of occupied areas.		PE

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PAR		FEATURE	DUE AT		DATE	REV
EQ6.1		Controllability of Systems: Lighting	Final Design	Calculation indicating total number of individual workstations, number of workstations with individual lighting controls and the percentage of workstations with individual lighting controls.		ELEC
			Final Design	For each shared multi-occupant space, provide a brief description of lighting controls.		ELEC
			Final Design	Narrative describing lighting control strategy, including type and location of individual controls and type and location of controls in shared multi-occupant spaces.		ELEC
EQ6.2		Controllability of Systems: Thermal Comfort	Final Design	Calculation indicating total number of individual workstations, number of workstations with individual thermal comfort controls and the percentage of workstations with individual thermal comfort controls.		MEC
			Final Design	For each shared multi-occupant space, provide a brief description of thermal comfort controls.		MEC
			Final Design	Narrative describing thermal comfort control strategy, including type and location of individual and shared multi-occupant controls.		MEC
EQ7.1		Thermal Comfort: Design	Final Design	Design criteria spreadsheet indicating, for spring, summer, fall and winter, maximum indoor space design temperature, minimum indoor space design temperature and maximum indoor space design humidity.		MEC
			Final Design	Narrative describing method used to establish thermal comfort control conditions and how systems design addresses the design criteria, including compliance with the referenced standard.		MEC
EQ7.2		Thermal Comfort: Verification	Final Design	Narrative describing the scope of work for the thermal comfort survey, including corrective action plan development		MEC
EQ8.1		Daylight & Views: Daylight 75% of Spaces	Final Design	Option 1: Table indicating all regularly occupied spaces with space area and space area with 2% daylighting factor. Sum of regularly occupied areas and regularly occupied areas with 2% daylighting factor. Percentage calculation of areas with 2% daylighting factor to total regularly occupied areas.		ARC
			Final Design	Option 1: Glazing factor calculation table		ARC
			Final Design	Option 2: Simulation model method, software and output data		ARC
			Final Design	Option 2: Table indicating all regularly occupied spaces with space area, space area with minimum 25 footcandles daylighting illumination, and method of providing glare control. Sum of regularly occupied areas and regularly occupied areas with 25 fc daylighting. Percentage calculation of areas with 25 fc daylighting to total regularly occupied areas.		ARC
			Final Design	For all occupied spaces excluded from the calculation, provide narrative indicating reasons for excluding the space.		ARC
			Final Design	List of drawing and specification references that convey exterior glazed opening head and sill heights and glazing performance properties.		ARC
			Closeout	X Manufacturer published product data or certification confirming glazing Tvis in spreadsheet		PE
EQ8.2		Daylight & Views: Views for 90% of Spaces	Final Design	Table indicating all regularly occupied spaces with space area and space area with access to views. Sum of regularly occupied areas and regularly occupied areas with access to views. Percentage calculation of areas with views to total regularly occupied areas.		ARC
			Final Design	For all occupied spaces excluded from the calculation, provide narrative indicating reasons for excluding the space.		ARC
			Final Design	LEED Floor plan drawings showing line of sight diagramming of views areas in each regularly occupied space. List of drawing/specification references that convey exterior glazed opening head and sill heights.		ARC
CATEGORY 6 – FACILITY DELIVERY PROCESS						
IDc1.1		Innovation in Design	Final Design OCT09REV	Narrative describing intent, requirement for credit, project approach to the credit. List of drawings and specification references that convey implementation of credit. All other documentation that validates claimed credit.		
IDc1.2		Innovation in Design	Final Design OCT09REV			
IDc1.3		Innovation in Design	Final Design OCT09REV			
IDc1.4		Innovation in Design	Final Design OCT09REV			
IDc2		LEED Accredited Professional	Final Design	Narrative indicating name of LEED AP, company name of LEED AP, description of LEED AP's role and responsibilities in the project.		ARC

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

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

2.0 Section 2 – Design Requirements

2.1. BIM Model and Facility Data. Contractor shall use BIM application(s) and software(s) to develop project designs. "Facility Data" is defined as associated intelligent attribute data. The "Model" is defined as 3D graphics that includes Facility Data and output as described in the paragraph 'Output' below. Contractors will use the Model to produce accurate Construction Documents. All submitted BIM Models and associated Facility Data shall be fully compatible with [Not Supplied - SubmittalReqCADDSystem : BENTLEY_VERSION] with associated USACE Bentley BIM Workspace

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

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

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

2.2.2. Submittal Requirements. BIM submittals shall conform to the requirements of Sections 3 and 4 below.

2.2.3. BIM Project Execution Plan.

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

2.2.4. BIM Requirements.

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

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

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

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

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

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

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

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

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

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

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

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

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

3.0 Section 3 – Design Stage Submittal Requirements

3.1. General Submittal Requirements.

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

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

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

- The Model, Facility Data, and CAD Data files.

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

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

3.1.4. The Government shall confirm acceptability of all submittals identified in Section 3 in coordination with the USACE New York District BIM Manager

3.2. Initial Design Conference Submittal.

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

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

3.3. Interim Design Submittals.

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

3.4. Final Design Submissions and Design Complete Submittals.

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

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

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

4.0 **Section 4 – BIM Model Minimum Requirements and Output**

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

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

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

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

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

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

- 4.2.5. Floors. The floor slab shall be developed in the structural Model and then referenced by the architectural Model for each floor of the Project building.
- 4.2.6. Ceilings. All heights and other dimensions of ceilings, including soffits, ceiling materials, or other special conditions shall be depicted in the Model with the necessary intelligence to produce accurate plans, building sections and generic wall sections where ceiling design elements are depicted.
- 4.2.7. Vertical Circulation. All continuous vertical components (i.e., non-structural shafts, architectural stairs, handrails and guardrails) shall be accurately depicted and shall include the necessary intelligence to produce accurate plans, elevations and sections in which such design elements are referenced.
- 4.2.8. Architectural Specialties and Woodwork. All architectural specialties (i.e., toilet room accessories, toilet partitions, grab bars, lockers, and display cases) and woodwork (i.e., cabinetry and counters) shall be accurately depicted with the necessary intelligence to produce accurate plans, elevations and sections in which such design elements are referenced.
- 4.2.9. Signage. The Model shall include all signage and the necessary intelligence to produce accurate plans and schedules.
- 4.2.10. Schedules. Provide door, window, hardware sets using BHMA designations, flooring, wall finish, and signage schedules from the Model, indicating the type, materials and finishes used in the design.
- 4.3. Furniture. The furniture systems Model may vary in level of detail for individual elements within a Model, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing, and have necessary intelligence to produce accurate plans. Representation of furniture elements is to be 2D. Contractor may provide a minimal number of 3D representations as examples. Examples of furniture include, but are not limited to, desks, furniture systems, seating, tables, and office storage.
- 4.3.1. Furniture Coordination. Furniture that makes use of electrical, data or other features shall include the necessary intelligence to produce coordinated documents and data.
- 4.4. Equipment. The Model may vary in level of detail for individual elements within a Model. Equipment shall be depicted to meet layout requirements with the necessary intelligence to produce accurate plans and minimum schedules depicting their configuration. Examples of equipment include but are not limited to copiers, printers, refrigerators, ice machines and microwaves.
- 4.4.1. Schedules. Provide furniture and equipment schedules from the model indicating the materials, finishes, mechanical, and electrical requirements.
- 4.5. Structural. The structural systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Additional minimum Model requirements include:
- 4.5.1. Foundations. All necessary foundation and/or footing elements, with necessary intelligence to produce accurate plans and elevations.
- 4.5.2. Floor Slabs. Structural floor slabs shall be depicted, including all necessary recesses, curbs, pads, closure pours, and major penetrations accurately depicted.
- 4.5.3. Structural Steel. All steel columns, primary and secondary framing members, and steel bracing for the roof and floor systems (including decks), including all necessary intelligence to produce accurate structural steel framing plans and related building/wall sections.
- 4.5.4. Cast-in-Place Concrete. All walls, columns, and beams, including necessary intelligence to produce accurate plans and building/wall sections depicting cast-in-place concrete elements.
- 4.5.5. Expansion/Contraction Joints. Joints shall be accurately depicted.

4.5.6. Stairs. The structural Model shall include all necessary openings and framing members for stair systems, including necessary intelligence to produce accurate plans and building/wall sections depicting stair design elements.

4.5.7. Shafts and Pits. The structural Model shall include all necessary shafts, pits, and openings, including necessary intelligence to produce accurate plans and building/wall sections depicting these design elements.

4.6. Mechanical. The mechanical systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Small diameter (less than 1-1/2" NPS) field-routed piping is not required in the model. Additional minimum Model requirements include:

4.6.1. HVAC. All necessary heating, ventilating, air-conditioning and specialty equipment, including air distribution ducts for supply, return, and ventilation and exhaust ducts, including control system, registers, diffusers, grills and hydronic baseboards with necessary intelligence to produce accurate plans, elevations, building/wall sections and schedules.

4.6.1.1. Mechanical Piping. All necessary piping and fixture layouts, and related equipment, including necessary intelligence to produce accurate plans, elevations, building/wall sections, and schedules.

4.6.2. Plumbing. All necessary plumbing piping and fixture layouts, floor and area drains, and related equipment, including necessary intelligence to produce accurate plans, elevations, building/wall sections, riser diagrams, and schedules.

4.6.3. Equipment Clearances. All HVAC and Plumbing equipment clearances shall be modeled for use in interference management and maintenance access requirements.

4.6.4. Elevator Equipment. The Model shall include the necessary equipment and control system, including necessary intelligence to produce accurate plans, sections and elevations depicting these design elements.

4.7. Electrical/Telecommunications. The electrical systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Small diameter (less than 1-1/2"Ø) field-routed conduit is not required in the model. Additional minimum Model requirements include:

4.7.1. Interior Electrical Power and Lighting. All necessary interior electrical components (i.e., lighting, receptacles, special and general purpose power receptacles, lighting fixtures, panelboards, cable trays and control systems), including necessary intelligence to produce accurate plans, details and schedules. Lighting and power built into furniture/equipment shall be modeled.

4.7.2. Special Electrical Systems. All necessary special electrical components (i.e., security, Mass Notification, Public Address, nurse call and other special occupancies, and control systems), including necessary intelligence to produce accurate plans, details and schedules.

4.7.3. Grounding Systems. All necessary grounding components (i.e., lightning protection systems, static grounding systems, communications grounding systems, bonding), including necessary intelligence to produce accurate plans, details and schedules.

4.7.4. Communications. All existing and new communications service controls and connections, both above ground and underground with necessary intelligence to produce accurate plans, details and schedules. Cable tray routing shall be modeled without detail of cable contents.

4.7.5. Exterior Building Lighting. All necessary exterior lighting with necessary intelligence to produce accurate plans, elevations and schedules. The exterior building lighting Model shall include all necessary lighting, relevant existing and proposed support utility lines and equipment required with necessary intelligence to produce accurate plans, details and schedules.

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

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

Additional minimum Model requirements include:

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

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

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

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

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

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

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

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

5.0 Section 5 - Ownership and Rights in Data

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

6.0 Section 6 – Contractor Electives

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

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

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

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

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

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

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

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

6.4.2.1. Sub system level extracted quantities from the BIM for use within the estimate shall be provided according to how detailed line items or tasks should be installed/built so that accurate costs can be developed and/or reflected. Therefore, when developing a BIM, the designer shall be cognizant of what tasks need to be separated appropriately at the beginning stages of model development, such as tasks done on the first floor versus the same task on higher floors that will be more labor intensive and therefore need to have a separate quantity and be priced differently. Tasks and their extracted quantities from the BIM shall be broken down by their location (proximity in the structure) as well as the complexity of its installation.

6.4.2.2. At all design stages it shall be understood that BIM output as described in this document will not generate all quantities that are necessary in order to develop a complete and accurate cost estimate of the project based on the design. An example of this would be plumbing that is less than 1.5" diameter and therefore not expected to be modeled due to granularity; this information is commonly referred to as The Gap. Quantities from The Gap and their associated costs shall be included in the final project actual cost estimates as well.

6.5. Other Analyses and Reports. Structural, energy and efficiency, EPACT 2005 & EISA 2007, lighting design, daylighting, electrical power, psychrometric processing, shading, programming, LEED, fire protection, code compliance, Life Cycle Cost, acoustic, plumbing.

7.0 Section 7 – BIM Project Execution Plan Template

7.1. Contractors will utilize the latest version of the USACE BIM PROJECT EXECUTION PLAN (USACE PxP) Template to develop an acceptable Plan. The template can be downloaded from the CAD/BIM Technology Center website.

**ATTACHMENT G
DESIGN SUBMITTAL DIRECTORY AND SUBDIRECTORY FILE ARRANGEMENT**

Organize electronic design submittal files in a subdirectory/file structure in accordance with the following table. The Contractor may suggest a slightly different structure, subject to the discretion of the government.

Design Submittal Directory and Subdirectory File Arrangement.

Directory	Sub-Directory	Sub-Directory or Files	Files
Submittal/Package Name	Narratives	PDF file or files with updated design narrative for each applicable design discipline	
	Drawings	PDF (subdirectory)	Single PDF file with all applicable drawing sheets - bookmarked by sheet number and name
		BIM (subdirectory) See Attachment F.	BIM project folder (with files) per the USACE Workspace. Include an Excel drawing index file with each drawing sheet listed by sheet #, name and corresponding dgn file name (Final Design & Design Complete only)
	Design Analysis & Calculations	Individual PDF files containing design analysis and calculations for each discipline applicable to the submittal	
		PDF file with Fire Protection and Life Safety Code Review checklist	
	LEED	PDF file with updated Leed Check List	
		PDF file or files with LEED Templates for each point with applicable documentation included in each file.	
		LEED SUBMITTALS	
	Energy Analysis	PDF with baseline energy consumption analysis	
		PDF with actual building energy consumption analysis	
	Specifications	Single PDF file with table of contents and all applicable specifications sections.	
		Submittal Register (Final Design & Design Complete submittal only)	
	Design Quality Control	PDF file or files with DQC checklist(s) and/or statements	
	Building Rendering(s)	PDF file of rendering for each building type included in contract (Final Design & Design Complete).	

**SECTION 01 45 04.00 10
CONTRACTOR QUALITY CONTROL**

1.0 GENERAL

1.1. REFERENCES

1.2. PAYMENT

2.0 PRODUCTS (NOT APPLICABLE)

3.0 EXECUTION

3.1. GENERAL REQUIREMENTS

3.2. QUALITY CONTROL PLAN

3.3. COORDINATION MEETING

3.4. QUALITY CONTROL ORGANIZATION

3.5. SUBMITTALS AND DELIVERABLES

3.6. CONTROL

3.7. TESTS

3.8. COMPLETION INSPECTION

3.9. DOCUMENTATION

3.10. NOTIFICATION OF NONCOMPLIANCE

1.0 GENERAL

1.1. REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only. Refer to the latest edition, as of the date of the contract solicitation.

- ASTM INTERNATIONAL (ASTM)
- ASTM D 3740 Minimum Requirements for Agencies
Engaged in the Testing and/or Inspection
of Soil and Rock as Used in Engineering
Design and Construction
- ASTM E 329 Agencies Engaged in the Testing
and/or Inspection of Materials Used in
Construction
- U.S. ARMY CORPS OF ENGINEERS (USACE)
ER 1110-1-12 Quality Management

1.2. PAYMENT

There will be no separate payment for providing and maintaining an effective Quality Control program. Include all costs associated therewith in the applicable unit prices or lump-sum prices contained in the Contract Line Item Schedule.

2.0 PRODUCTS (Not Applicable)

3.0 EXECUTION

3.1. GENERAL REQUIREMENTS

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause titled "Inspection of Construction." The quality control system shall consist of plans, procedures, and organization necessary to produce an end product, which complies with the contract requirements. The system shall cover all design and construction operations, both onsite and offsite, and shall be keyed to the proposed design and construction sequence. The site project superintendent is responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the contract. The site project superintendent in this context shall be the highest level manager responsible for the overall construction activities at the site, including quality and production. The site project superintendent shall maintain a physical presence at the site at all times, except as otherwise acceptable to the Contracting Officer, and shall be responsible for all construction and construction related activities at the site.

3.2. QUALITY CONTROL PLAN

Furnish for Government review, not later than 30 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction." The plan shall identify personnel, procedures, control, instructions, tests, records, and forms to be used. The Government will consider an interim plan for the first 30 days of operation. Design and construction may begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. The Government will not permit work outside of the features of work included in an accepted interim plan to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started. Where the applicable Code issued by the International Code Council calls for an inspection by the Building Official, the Contractor shall include the inspections in the Quality Control Plan and shall perform the inspections. The Designer of Record shall develop a program for any special inspections required by the applicable International Codes and the Contractor shall perform these inspections, using qualified inspectors. Include the special inspection plan in the QC Plan.

3.2.1. Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all design and construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents subcontractors, designers of record, consultants, architect/engineers (AE), fabricators, suppliers, and purchasing agents:

3.2.1.1. A description of the quality control organization. Include a chart showing lines of authority and an acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. A CQC System Manager shall report to the project superintendent or someone higher in the contractor's organization.

3.2.1.2. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function. Also include those responsible for performing and documenting the inspections required by the International Codes and the special inspection program developed by the designer of record.

3.2.1.3. A copy of the letter to the CQC System Manager, signed by an authorized official of the firm, which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Furnish copies of these letters.

3.2.1.4. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents subcontractors, designers of record, consultants, architect engineers (AE), offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

3.2.1.5. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. Use only Government approved Laboratory facilities.

3.2.1.6. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

3.2.1.7. Procedures for tracking design and construction deficiencies from identification through acceptable corrective action. These procedures shall establish verification that identified deficiencies have been corrected.

3.2.1.8. Reporting procedures, including proposed reporting formats.

3.2.1.9. A list of the definable features of work. A definable feature of work is a task, which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable feature under a particular section. This list will be agreed upon during the coordination meeting.

3.2.1.10. A list of all inspections required by the International Codes and the special inspection program required by the code and this contract.

3.2.2. Additional Requirements for Design Quality Control (DQC) Plan

The following additional requirements apply to the Design Quality Control (DQC) plan:

3.2.2.1. The Contractor's QCP Plan shall provide and maintain a Design Quality Control (DQC) Plan as an effective quality control program which will assure that all services required by this design-build contract are performed and provided in a manner that meets professional architectural and engineering quality standards. As a minimum, competent, independent reviewers identified in the DQC Plan shall review all documents. Use personnel who were not involved in the design effort to produce the design to perform the independent technical review (ITR). The ITR is intended as a quality control check of the design. Include, at least, but not necessarily limited to, a review of the contract requirements (the accepted contract or task order proposal and amended RFP), the basis of design, design calculations, the design configuration management documentation and check the design documents for

errors, omissions, and for coordination and design integration. The ITR team is not required to examine, compare or comment concerning alternate design solutions but should concentrate on ensuring that the design meets the contract requirements. Correct errors and deficiencies in the design documents prior to submitting them to the Government.

3.2.2.2. Include in the DQC Plan the discipline-specific checklists to be used during the design and quality control of each submittal. Submit these completed checklists at each design phase as part of the project documentation.

3.2.2.3. A Design Quality Control Manager, who has the responsibility of being cognizant of and assuring that all documents on the project have been coordinated, shall implement the DQC Plan. This individual shall be a person who has verifiable engineering or architectural design experience and is a registered professional engineer or architect. Notify the Government, in writing, of the name of the individual, and the name of an alternate person assigned to the position.

3.2.3. Acceptance of Plan

Government acceptance of the Contractor's plan is required prior to the start of design and construction. Acceptance is conditional and will be predicated on satisfactory performance during the design and construction. The Government reserves the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.4. Notification of Changes

After acceptance of the CQC Plan, notify the Government in writing of any proposed change. Proposed changes are subject to Government acceptance.

3.3. COORDINATION MEETING

After the Postaward Conference, before start of design or construction, and prior to acceptance by the Government of the CQC Plan, the Contractor and the Government shall meet and discuss the Contractor's quality control system. Submit the CQC Plan for review a minimum of 7 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, design activities, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. The Government will prepare minutes of the meeting for signature by both parties. . The minutes shall become a part of the contract file. There may be occasions when either party will call for subsequent conferences to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4. QUALITY CONTROL ORGANIZATION

3.4.1. Personnel Requirements

The requirements for the CQC organization are a CQC System Manager, a Design Quality Manager, and sufficient number of additional qualified personnel to ensure contract compliance. The CQC organization shall also include personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly. The Contractor's CQC staff shall maintain a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure contract compliance. The CQC staff shall be subject to acceptance by the Contracting Officer. Provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Promptly furnish complete records of all letters, material submittals, shop drawing submittals, schedules and all other project documentation to the CQC organization. The CQC organization shall be responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

3.4.2. CQC System Manager

Identify as CQC System Manager an individual within the onsite work organization who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System

Manager shall be a graduate engineer, graduate architect, or a BA/BS graduate of an ACCE accredited construction management college program. The CQC system Manager may alternately be an engineering technician with at least 2 years of college and an ICC certification as a Commercial Building Inspector (Residential Building Inspector certification will be required for Military Family Housing projects). In addition, the CQC system manager shall have a minimum of 5 years construction experience on construction similar to this contract. The CQC System Manager shall be on the site at all times during construction and shall be employed by the prime Contractor. Assign the CQC System Manager no other duties (except may also serve as Safety and Health Officer, if qualified and if allowed by Section 00 73 00). Identify an alternate for the CQC System Manager in the plan to serve in the event of the System Manager's absence. The requirements for the alternate shall be the same as for the designated CQC System Manager but the alternate may have other duties in addition to serving in a temporary capacity as the acting QC manager.

3.4.3. CQC Personnel

3.4.3.1. In addition to CQC personnel specified elsewhere in the contract provide specialized CQC personnel to assist the CQC System Manager in accordance with paragraph titled Area Qualifications.

3.4.3.2. These individuals may be employees of the prime or subcontractor; be responsible to the CQC System Manager; **are not intended to be full time, but must be physically present at the construction site during work on their areas of responsibility**; have the necessary education and/or experience in accordance with the experience matrix listed herein. These individuals may perform other duties but must be allowed sufficient time to perform their assigned quality control duties as described in the Quality Control Plan. **One person may cover more than one area, provided that they are qualified to perform QC activities for the designated areas below and provided that they have adequate time to perform their duties:**

3.4.4. Experience Matrix

3.4.4.1. Area Qualifications

3.4.4.1.1. Civil - Graduate Civil Engineer or (BA/BS) graduate in construction management with 4 years experience in the type of work being performed on this project or engineering technician with 5 yrs related experience.

3.4.4.1.2. Mechanical - Graduate Mechanical Engineer or (BA/BS) graduate in construction management with 4 yrs related experience or engineering technician with an ICC certification as a Commercial Mechanical Inspector with 5 yrs related experience.

3.4.4.1.3. Electrical - Graduate Electrical Engineer or (BA/BS) graduate in construction management with 4 yrs related experience or engineering technician with an ICC certification as a Commercial Electrical Inspector with 5 yrs related experience.

3.4.4.1.4. Structural - Graduate Structural Engineer or (BA/BS) graduate in construction management with 4 yrs related experience or person with an ICC certification as a Reinforced Concrete Special Inspector and Structural Steel and Bolting Special Inspector (as applicable to the type of construction involved) with 5 yrs related experience.

3.4.4.1.5. Plumbing - Graduate Mechanical Engineer or (BA/BS) graduate in construction management with 4 yrs related experience, or person with an ICC certification as a Commercial Plumbing Inspector with 5 yrs related experience.

3.4.4.1.6. Concrete, Pavements and Soils Materials Technician (present while performing tests) with 2 yrs experience for the appropriate area

3.4.4.1.7. Testing, Adjusting and Balancing Specialist must be a member (TAB) Personnel of AABC or an experienced technician of the firm certified by the NEBB (present while testing, adjusting, balancing).

3.4.4.1.8. Design Quality Control Manager Registered Architect or Professional Engineer (not required on the construction site)

3.4.4.1.9. Registered Fire Protection Engineer with 4 years related experience or engineering technician with 5 yrs related experience (but see requirements for Fire Protection Engineer of Record to witness final testing in Section 01 10 00, paragraph 5.10, Fire Protection).

3.4.4.1.10. QC personnel assigned to the installation of the telecommunication system or any of its components shall be Building Industry Consulting Services International (BICSI) Registered Cabling Installers, Technician Level. Submit documentation of current BICSI certification. In lieu of BICSI certification, QC personnel shall have a minimum of 5 years experience in the installation of the specified copper and fiber optic cable and components. They shall have factory or factory approved certification from each equipment manufacturer indicating that they are qualified to install and test the provided products. QC personnel shall witness and certify the testing of telecommunications cabling and equipment.

3.4.5. Additional Requirement

In addition to the above experience and/or education requirements the CQC System Manager shall have completed the course entitled "Construction Quality Management for Contractors". This course is periodically offered at [Not Supplied - ConstructionReqQC : COURSE_LOCATION]. Inquire of the District or Division sponsoring the course for fees and other expenses involved, if any, for attendance at this course.

3.4.6. Organizational Changes

When it is necessary to make changes to the CQC staff, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5. SUBMITTALS AND DELIVERABLES

Make submittals as specified in Section 01 33 00 **SUBMITTAL PROCEDURES**. The CQC organization shall certify that all submittals and deliverables are in compliance with the contract requirements.

3.6. CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. The CQC organization shall conduct at least three phases of control for each definable feature of the construction work as follows:

3.6.1. Preparatory Phase

Perform this phase prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase shall include:

3.6.1.1. A review of each paragraph of applicable specifications, reference codes, and standards. Make a copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field at the preparatory inspection. Maintain these copies in the field, available for use by Government personnel until final acceptance of the work.

3.6.1.2. A review of the contract drawings.

3.6.1.3. A check to assure that all materials and/or equipment have been tested, submitted, and approved.

3.6.1.4. Review of provisions that have been made to provide required control inspection and testing.

3.6.1.5. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.

3.6.1.6. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

3.6.1.7. A review of the appropriate activity hazard analysis to assure safety requirements are met.

3.6.1.8. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.

3.6.1.9. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.

3.6.1.10. Discussion of the initial control phase.

3.6.1.11. Notify the Government at least 24 hours in advance of beginning the preparatory control phase. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. Document the results of the preparatory phase actions by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2. Initial Phase

Accomplish this phase at the beginning of a definable feature of work. Include the following actions:

3.6.2.1. Check work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.

3.6.2.2. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.

3.6.2.3. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.

3.6.2.4. Resolve all differences.

3.6.2.5. Check safety to include compliance with and upgrading of the Accident Prevention plan and activity hazard analysis. Review the activity analysis with each worker.

3.6.2.6. Notify the Government at least 24 hours in advance of beginning the initial phase. The CQC System Manager shall prepare and attach to the daily CQC report separate minutes of this phase. Indicate exact location of initial phase for future reference and comparison with follow-up phases.

3.6.2.7. Repeat the initial phase any time acceptable specified quality standards are not being met.

3.6.3. Follow-up Phase

Perform daily checks to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Conduct final follow-up checks and correct deficiencies prior to the start of additional features of work which may be affected by the deficient work. Do not build upon nor conceal non-conforming work.

3.6.4. Additional Preparatory and Initial Phases

Conduct additional preparatory and initial phases on the same definable features of work if: the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.7. TESTS

3.7.1. Testing Procedure

Perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements and project design documents. Upon request, furnish to the Government

duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of a Corps of Engineers approved testing laboratory, or establish an approved testing laboratory at the project site. The Contractor may elect to use a laboratory certified and accredited by the Concrete and cement Reference Laboratory (CCRL) or by AASHTO Materials Reference Laboratory (AMRL) for testing procedures that those organizations certify. The Contractor shall perform the following activities and record and provide the following data:

3.7.1.1. Verify that testing procedures comply with contract requirements and project design documents.

3.7.1.2. Verify that facilities and testing equipment are available and comply with testing standards.

3.7.1.3. Check test instrument calibration data against certified standards.

3.7.1.4. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

3.7.1.5. Include results of all tests taken, both passing and failing tests, recorded on the CQC report for the date taken. Include specification paragraph reference, location where tests were taken, and the sequential control number identifying the test. If approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. Provide an information copy of tests performed by an offsite or commercial test facility directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.7.2. Testing Laboratories

3.7.2.1. Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in ASTM D 3740 and ASTM E 329.

3.7.2.2. Capability Recheck

If the selected laboratory fails the capability check, the Government will assess the Contractor a charge of \$1,375 to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

3.7.3. Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests, and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.7.4. Furnishing or Transportation of Samples for Government Quality Assurance Testing

The Contractor is responsible for costs incidental to the transportation of samples or materials. Deliver samples of materials for test verification and acceptance testing by the Government to the Corps of Engineers Laboratory, f.o.b., at the following address:

- For delivery by mail:
 - [Not Supplied - ConstructionReqQC : LAB_NAME]
 - [Not Supplied - ConstructionReqQC : LAB_ATTEN]
 - [Not Supplied - ConstructionReqQC : LAB_MAIL]
 - [Not Supplied - ConstructionReqQC : LAB_STATE]
- For other deliveries:
 - [Not Supplied - ConstructionReqQC : LAB_NAME_OTHER]

[Not Supplied - ConstructionReqQC : LAB_ATTEN_OTHER]

[Not Supplied - ConstructionReqQC : LAB_MAIL_OTHER]

[Not Supplied - ConstructionReqQC : LAB_STATE_OTHER]

The area or resident office will coordinate, exact delivery location, and dates for each specific test.

3.8. COMPLETION INSPECTION

3.8.1. Punch-Out Inspection

Near the end of the work, or any increment of the work established by a time stated in the SPECIAL CONTRACT REQUIREMENTS Clause, "Commencement, Prosecution, and Completion of Work", or by the specifications, the CQC Manager shall conduct an inspection of the work. Prepare a punch list of items which do not conform to the approved drawings and specifications and include in the CQC documentation, as required by paragraph DOCUMENTATION. The list of deficiencies shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government Pre-Final inspection.

3.8.2. Pre-Final Inspection

As soon as practicable after the notification above, the Government will perform the pre-final inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. The Contractor's CQC System Manager shall ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Correct any items noted on the Pre-Final inspection in a timely manner. Accomplish these inspections and any deficiency corrections required by this paragraph within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

3.8.3. Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative shall attend the final acceptance inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups and major commands may also attend. The Government will formally schedule the final acceptance inspection based upon results of the Pre-Final inspection. Provide notice to the Government at least 14 days prior to the final acceptance inspection and include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause titled "Inspection of Construction".

3.9. DOCUMENTATION

3.9.1. Maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers using government-provided software, QCS (see Section 01 45 01.10). The report includes, as a minimum, the following information:

3.9.1.1. Contractor/subcontractor and their area of responsibility.

3.9.1.2. Operating plant/equipment with hours worked, idle, or down for repair.

3.9.1.3. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.

- 3.9.1.4. Test and/or control activities performed with results and references to specifications/drawings requirements. Identify the applicable control phase (Preparatory, Initial, Follow-up). List deficiencies noted, along with corrective action.
- 3.9.1.5. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.
- 3.9.1.6. Submittals and deliverables reviewed, with contract reference, by whom, and action taken.
- 3.9.1.7. Offsite surveillance activities, including actions taken.
- 3.9.1.8. Job safety evaluations stating what was checked, results, and instructions or corrective actions.
- 3.9.1.9. Instructions given/received and conflicts in plans and/or specifications.
- 3.9.1.10. Provide documentation of design quality control activities. For independent design reviews, provide, as a minimum, identity of the ITR team, the ITR review comments, responses and the record of resolution of the comments.
- 3.9.2. Contractor's verification statement.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. Furnish the original and one copy of these records in report form to the Government daily within 24 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, submit one report for every 7 days of no work and on the last day of a no work period. Account for all calendar days throughout the life of the contract. The first report following a day of no work shall be for that day only. The CQC System Manager shall sign and date reports. The report shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel. The Contractor may submit these forms electronically, in lieu of hard copy.

3.10. NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

End of Section 01 45 04.00 10

**SECTION 01 50 02.[Not Supplied - ProjectInfo : TONUM]
TEMPORARY CONSTRUCTION FACILITIES**

1.0 OVERVIEW

1.1. GENERAL REQUIREMENTS

1.3. BULLETIN BOARD, PROJECT SIGN, AND PROJECT SAFETY SIGN

1.0 OVERVIEW

1.1. GENERAL REQUIREMENTS

1.1.1. This section contains requirements specifically applicable to this task order. The requirements of Base ID/IQ contract Section 01 50 02 apply to this task order, except as otherwise specified herein.

1.3. BULLETIN BOARD, PROJECT SIGN, AND PROJECT SAFETY SIGN

1.3.1. Bulletin Board (As Specified in Base contract)

1.3.2. Project and Safety Signs (Added to Stress standardization of signs, in the event that the Base ID/IQ Section 01 50 02 does not contain this information)

Erect a project sign and a site safety sign with informational details as provided by the Government at the Post award conference, within 15 days prior to any work activity on project site. Update the safety sign data daily, with light colored metallic or non-metallic numerals. Remove the signs from the site upon completion of the project. Engineer Pamphlet EP 310-1-6a contains the standardized layout and construction details for the signs. It can be found through a GOOGLE Search or try <http://www.usace.army.mil/publications/eng-pamphlets/ep310-1-6a/s-16.pdf>.

End of Section 01 50 02.[Not Supplied - ProjectInfo : TONUM]

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3.0 SITE SURFACE CONDITIONS

The proposed building site is currently undeveloped wooded land. The surface elevation of the borings performed at the site ranged in elevation from 597.6 to 603.2 feet.

4.0 SUBSURFACE INVESTIGATION & SAMPLING METHODOLOGY

The boring locations for the proposed buildings were selected by representatives of ATL and Jacobs. The borings were staked and elevations determined in the field by representatives of Thew Associates, PLLC. The surface elevations of the borings were referenced to the North American Vertical Datum of 1988 (NAVD88). A **Boring Location Plan** is included in **Appendix B**.

The borings were advanced utilizing 4¼-inch inside diameter hollow stem augers. Soil sampling and standard penetration testing was performed utilizing a 2-inch outside diameter split spoon sampler in accordance with ASTM D 1586. Soil sampling was performed continuously to auger refusal at depths ranging from 3 to 8.6 feet. Rock cores were obtained from borings B-1 and B-4 utilizing an NX-size, double tube core barrel.

The soil samples were classified in the laboratory by an engineering technician in general accordance with the Burmister Soil Classification System. The split spoon sampler does not recover material larger than 1¾-inch in nominal dimension; therefore, the soil classifications may not be representative of the entire soil matrix. The laboratory classifications and the standard penetration test results are presented on the **Subsurface Investigation Logs** included in **Appendix C**.

The boreholes were backfilled with on-site soils upon completion. It is important that the backfilled borings be monitored for settlement or subsidence. This will be the responsibility of Jacobs and/or their client. ATL assumes no liability for loss or damage resulting from borehole settlement.

5.0 SITE SUBSURFACE CONDITIONS

The following description of subsurface conditions is based on the soil and groundwater conditions encountered during this subsurface investigation. Actual subsurface conditions may vary across the site in both the horizontal and vertical dimensions. Detailed subsurface descriptions are provided on the **Subsurface Investigation Logs**.

5.1 Soil Borings

The borings generally encountered loose (N values 4 to 10) to very compact (N values greater than 50) silty, gravelly sand that extended from the surface to auger refusal at depths ranging from 3 to 8.6 feet (elevation 589 to 598.5). The consistency of the soils generally increased with depth. Cores were taken of the limestone bedrock in borings B-1 and B-4 and are summarized as follows:

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Rock Core Descriptions

Boring No.	Run No.	Depth (ft)	Rock Type	Recovery (%)	RQD (%)
B-1	1	3.5-8.5	Limestone	58	15
B-4	1	3-8	Limestone	92	27

5.2 Groundwater

Groundwater measurements were performed during the subsurface investigation through cased and open boreholes. The soil samples were also classified for coloration and moisture conditions.

Based on groundwater measurements, freestanding water was encountered in boring B-4 at a depth of approximately 5.4 feet; however, the water reading was likely affected by the water induced to core the bedrock. The remaining soil borings did not encounter freestanding water.

Perched water may be encountered on the surface of the very compact soils or bedrock during the wetter periods of the year. Perched water should be anticipated in shallow foundation and utility excavations, especially during wetter periods of the year.

Fluctuations in water levels may occur due to seasonal and climatic variations, changes in surface runoff patterns, construction activity, and subsequent development of the site along with other interrelated factors.

6.0 LABORATORY ANALYSES

Select soil samples were submitted to ATL's geotechnical laboratory for physical analyses. Water Content Determination of Soil (ASTM D 2216) was performed on 20 soil samples. The test results are presented on the subsurface investigation logs.

A Particle Size Analysis without Hydrometer (ASTM D 422) was performed on two soil samples. The **Particle Size Distribution Curves** are included in **Appendix D**.

7.0 GEOTECHNICAL ENGINEERING DISCUSSION

The Geotechnical Engineering Discussion is based on information provided by Jacobs and the subsurface conditions outlined in this report.

7.1 Proposed Building

7.1.1 Site Work

Site work will require the removal of the existing trees and surficial organic materials. The building footprints should be prepared to 1.2 feet below the finish floor elevation (assuming a 6-inch concrete slab-on-grade and 8 inches of Engineered Structural Fill). Based on the existing surface elevations, it is anticipated minor cuts and fills may be required. Granular

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Fill placed and compacted in accordance with Geotechnical Recommendations 8.5.4 and 8.5.5 should be utilized as fill within the building footprints.

After performing the cuts and prior to placing fill, the subgrade soils should be compacted to densities in excess of 95% of the maximum dry density as determined by ASTM D 1557, or as directed by a Geotechnical Engineer, and proof rolled in accordance with Geotechnical Recommendation 8.3.2.

7.1.2 Building Foundations

The surface elevation of the bedrock is variable within the footprint of the proposed buildings. It appears the foundation subgrades could consist of a combination of bedrock and in-situ soils depending on the finish floor elevation of the buildings. To minimize the potential for differential settlement due to varying subgrade materials, it is recommended that all foundations bear on the surface of the bedrock or bedrock subgrades be over excavated a minimum of 1-foot, where encountered, and replaced with compacted Granular Fill. In-situ soil subgrades should be proof-compacted, under the observation of a Geotechnical Engineer, to densify soils loosened during the excavation process and to identify unstable subgrade areas.

To aid in estimating construction costs, the excavation of test pits or rock probes are recommended to verify the surface elevation of the bedrock within the proposed building footprint.

The on-site soils may be utilized as exterior foundation backfill, provided all organics, deleterious, and oversize material (particles larger than 4 inches in diameter) are removed and the material is properly moisture conditioned. Granular Fill should be utilized as interior foundation backfill. All fill must be placed in accordance with Geotechnical Recommendations 8.5.4 and 8.5.5.

7.1.3 Soil Bearing Capacity

Shallow foundations founded entirely on bedrock may be designed using an allowable rock bearing capacity of 6,000 psf. Foundations founded on compacted in-situ soils and/or a minimum 1-foot layer of Granular Fill, that overlies bedrock, may be designed using an allowable soil bearing capacity of 4,000 psf. A detailed settlement analysis was outside the scope of this investigation; however, total and differential settlement less than 1-inch and ½-inch, respectively, are estimated.

7.1.4 Slabs-on-Grade

The concrete slabs-on-grade should be supported on a minimum of 8 inches of Engineered Structural Fill. The slabs-on-grade may be designed using a modulus of subgrade reaction of 150 pci.

A vapor retarder should be installed beneath slabs with moisture sensitive floor coverings. The vapor retarder should be installed in accordance with current ACI 302.1 recommendations.

7.2 Frost Protection

Shallow foundations must be founded on competent bedrock free of loose and weathered rock or a minimum of 5 feet below final exterior grade to provide adequate frost protection.

7.3 General

Perched groundwater, bedrock, cobbles, and boulders may be encountered during shallow foundation and utility excavations.

The following soil properties may be utilized in the design of foundations.

Table of Soil Properties

Soil Property	Silty, Gravelly Sand	Granular Fill	Engineered Structural Fill
Angle of Internal Friction (°)	30	32	34
Active Earth Coefficient (K_a)*	0.33	0.31	0.28
At Rest Earth Coefficient (K_o)*	0.50	0.47	0.44
Passive Earth Coefficient (K_p)*	3.00	3.25	3.54
Ultimate Coefficient of Sliding Friction	0.40	0.44	0.47
Wet Unit Weight (pcf)	130-140	135-145	140-150

*The earth pressure coefficients assume backfill placed in a fully drained condition.

7.4 Pavement Design

7.4.1 Pavement Site Work

Site work will consist of removing the surficial materials, including the existing trees and organic material. After performing the cuts, the subgrade soils should be compacted with a minimum 10-ton vibratory roller to densities in excess of 95% of the maximum dry density as determined by ASTM D 1557, or as directed by a Geotechnical Engineer. Compaction of the subgrade should be performed under the observation of a Geotechnical Engineer. The pavement subgrade should be proof rolled in accordance with Geotechnical Recommendation 8.6.1.

The silty, sandy gravel and silty sand subgrade soils encountered in the pavement soil borings are considered moderately moisture sensitive and frost susceptible. To minimize frost action in the pavement structures, a minimum of 18 inches of Granular Fill is recommended beneath the granular subbase. If this is not possible, based on economic considerations, the depth of granular fill can be reduced. If the depth of Granular Fill is reduced, premature pavement deterioration and/or maintenance should be anticipated. Consideration should be given to the installation of drainage in the Granular Fill layer to reduce the potential for a bath tub effect.

Proper drainage and control of surface water will be important to the longevity of the pavement structures.

8.0 GEOTECHNICAL RECOMMENDATIONS

The following recommendations are presented as the minimum requirements for the design, planning, and construction of the foundation systems, slabs-on-grade, and pavement design. The concepts and geotechnical engineering considerations presented in the preceding sections must be considered in the project design and construction.

8.1. Site Preparation

- 8.1.1.** In planning excavations adjacent to existing structures and utilities, care must be taken to locate and maintain their stability. The project should be designed to minimize disturbance to existing structures and utilities.
- 8.1.2.** Site work should be scheduled during the drier portions of the year to avoid possible delays and additional costs associated with construction during the wet seasons.
- 8.1.3.** The existing trees and organic materials must be removed within the footprint of the proposed building and paved areas. The site must be prepared as discussed in Section 7.1.1 and 7.4.1 of the Geotechnical Engineering Discussion.
- 8.1.4.** Site surface grading must be designed to convey surface water away from the buildings and pavement structures.
- 8.1.5.** The contractor must follow excavation safety practices as mandated by 29 CFR Part 1926 (OSHA) and by applicable state regulations.

8.2. Foundations

- 8.2.1.** The building footings should be founded entirely on the surface of the bedrock or on compacted in-situ soils and Granular Fill that overlies bedrock. Refer to the Geotechnical Engineering Discussion for specific details.
- 8.2.2.** Footings founded on bedrock may be designed using a safe allowable rock bearing capacity of 6,000 psf, provided the recommendations presented in this report are followed. Footings founded on compacted in-situ soil and/or a minimum of 1-foot of Granular Fill may be designed using a safe allowable soil bearing capacity of 4,000 psf.

8.3. Slab-on-Grade Preparation

- 8.3.1.** A minimum of 8 inches of Engineered Structural Fill, should be placed to support the concrete slabs-on-grade. The slab may be designed using a modulus of subgrade reaction of 150 pci. A vapor retarder should be installed beneath slabs with moisture sensitive floor coverings.
- 8.3.2.** Areas to receive slabs-on-grade should be proof rolled, where possible, prior to placing the Granular Fill and Engineered Structural Fill. Proof rolling should be conducted using a tandem axle truck with a minimum gross weight of 40,000 lbs. Rollers or low ground pressure construction equipment shall not be used for proof rolling. The proof rolling must be conducted under the observation of a

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Geotechnical Engineer. Any areas noted to weave or deflect should be excavated to stable material, at the direction of a Geotechnical Engineer, and replaced with compacted Granular Fill or Engineered Structural Fill.

8.4. Dewatering

8.4.1. It will be the contractor's responsibility to maintain adequate water control at all times. Project specifications should clearly indicate that standing water, and/or saturated, unstable soil conditions will not be tolerated in areas to receive foundations or utilities. The project specifications should state that the contractor will not be reimbursed for extras related to the control of water.

8.4.2. Dewatering shall be performed in accordance with New York State Department Environmental Conservation (NYSDEC) stormwater discharge requirements for construction.

8.5. Backfill and Compaction Requirements

8.5.1. The on-site soils, excluding deleterious organics and oversize material (particles larger than 4 inches in diameter), may be used for general site fill and exterior foundation backfill, provided the fill is placed and compacted in accordance with Geotechnical Recommendations 8.5.4 and 8.5.5. Granular Fill should be utilized as interior foundation backfill.

8.5.2. Granular Fill should consist of a clean, screened, crushed, or bank-run gravel conforming to the following gradation:

Sieve Size	Percent Passing
4"	100
1/4"	35-65
#200	0-10

8.5.3. Engineered Structural Fill should consist of a screened, crushed gravel or crushed ledge rock conforming to the following gradation:

Sieve Size	Percent Passing
3"	100
1"	80 - 95
1/2"	45 - 75
#4	30 - 60
#40	10 - 40
#200	0 - 7

8.5.4. All fill and backfill should be placed and compacted in lifts not exceeding eight inches in loose thickness, at a moisture content of $\pm 2\%$ of the Optimum Moisture Content, and to densities in excess of 95%, as determined by ASTM D1557, or as directed by the Geotechnical Engineer.

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July 23, 2010

8.5.5. Compaction should be performed with vibratory rollers unless there is concern for damage to adjacent structures or underground utilities.

8.6. Pavement Design

8.6.1. Where possible, areas to receive pavement structures should be proof rolled. Proof rolling should be conducted using a tandem axle truck with a minimum gross weight of 40,000 lbs. Rollers or low ground pressure construction equipment shall not be used for proof rolling. The proof rolling must be conducted under the observation of a geotechnical engineer. Any areas noted to weave or deflect should be excavated to stable material, at the direction of the Geotechnical Engineer, and replaced with Granular Fill.

8.6.2. Light Duty Asphalt Pavement (Passenger Cars and Light Truck) structure should consist of the following:

Thickness	Course	NYSDOT Item No.
1 ½"	Bituminous Top Course	Table 403.1, Type 6F
3"	Bituminous Binder Course	Table 403.1, Type 3
12"	* Granular Subbase	304, Type 2
18"	** Granular Fill	Recommendation No. 8.5.2

* The product of crushed ledge rock.

** The thickness may vary based on the economic consideration discussed in the Geotechnical Engineering Discussion, however, should be a minimum of 12 inches.

8.6.3. Heavy Duty Asphalt Pavement (Trucks and Buses) structure should consist of the following:

Thickness	Course	NYSDOT Item No.
1 ½"	Bituminous Top Course	Table 304.1, Type 6F
2"	Bituminous Binder Course	Table 403.1, Type 3
3"	Bituminous Base Course	Table 403.1, Type 1
12"	* Granular Subbase	304, Type 2
18"	** Granular Fill	Recommendation No. 8.5.2

* The product of crushed ledge rock.

** The thickness may vary based on the economic consideration discussed in the Geotechnical Engineering Discussion, however, should be a minimum of 12 inches.

8.6.4. The Granular Subbase and Granular Fill should be placed and compacted in accordance with Geotechnical Recommendations 8.5.4 and 8.5.5.

8.6.5. The bituminous pavements should be compacted with a vibratory roller to densities in excess of 92% of the maximum theoretical specific gravity of bituminous paving materials as determined by ASTM D 2041.

8.6.6. It is anticipated there will be future revisions to the New York State DOT specifications for bituminous mixtures. Prior to bidding this project, ATL must review the final pavement specifications.

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July 23, 2010

8.7. Testing and Inspection

8.7.1. Subgrade compaction, foundation installations, and slab-on-grade subbase placement and compaction must be continuously observed by an experienced Geotechnical Engineer, and/or their representative, familiar with the subsurface conditions and analysis described in this report. The engineer will be required to assess any unusual conditions and to ensure that adequate bearing capacities and proper foundation installation requirements are achieved.

8.7.2. All backfilling, placement of fill, compaction of in-situ soils, and concrete construction should be inspected by an Independent Testing Laboratory, which conforms to ASTM E-329, "The Standard Practice for use in the Evaluation of Testing and Inspection Agencies as Used in Construction". It should be the Independent Testing Laboratory's responsibility to monitor construction practices to determine if they are in accordance with the project documents.

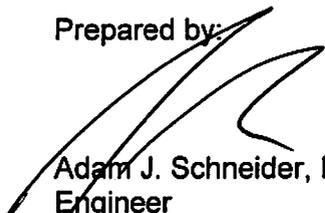
8.7.3. The final foundation plans and project specifications should be reviewed by our office to ensure that there has not been a misinterpretation of this report.

9.0 SUMMARY

The subsurface investigation logs and this report in its entirety should be provided to the contractors for information and interpretation. The subsurface investigation logs may not be representative of the entire site subsurface condition, but only what was found at the individual test location at the time the investigation was made. The subsurface soil and groundwater conditions may be different from those described on the subsurface investigation logs and summarized in this report.

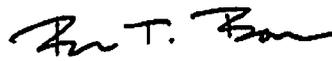
This report was prepared to present the findings of our subsurface investigation and engineering evaluation, and to outline concepts to be utilized in foundation design and construction. These concepts may require alterations to meet the specific design and economic considerations for this project.

Prepared by:



Adam J. Schneider, PE
Engineer
AJS/BTB/ajs

Reviewed by:

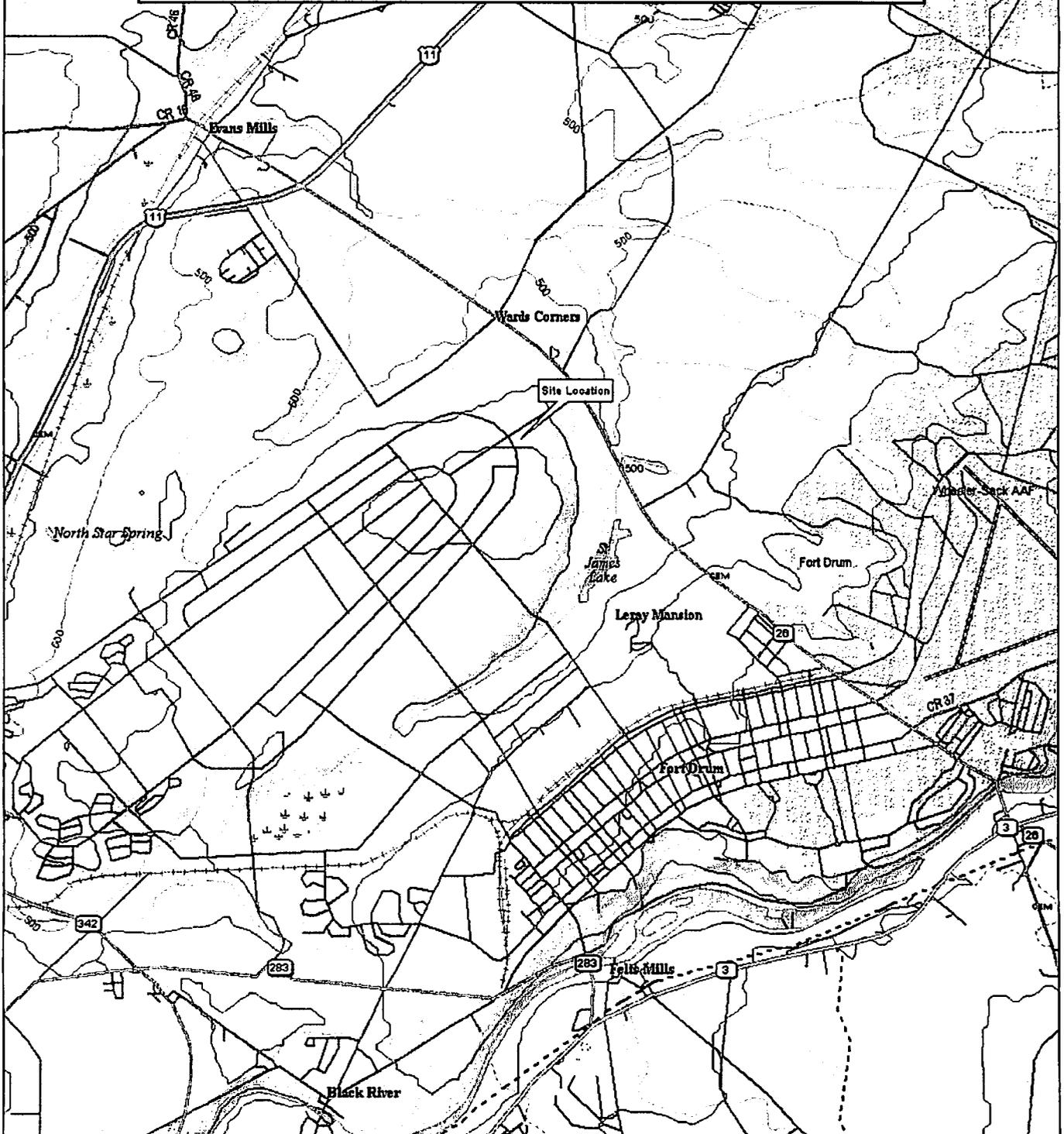


Brian T. Barnes, PE
Senior Engineer

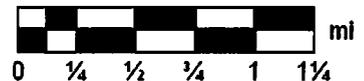
APPENDIX A
SITE LOCATION PLAN



ATLANTIC TESTING LABORATORIES, Limited
Proposed 20th ASOS
10400 Area
Fort Drum, New York
SITE LOCATION PLAN

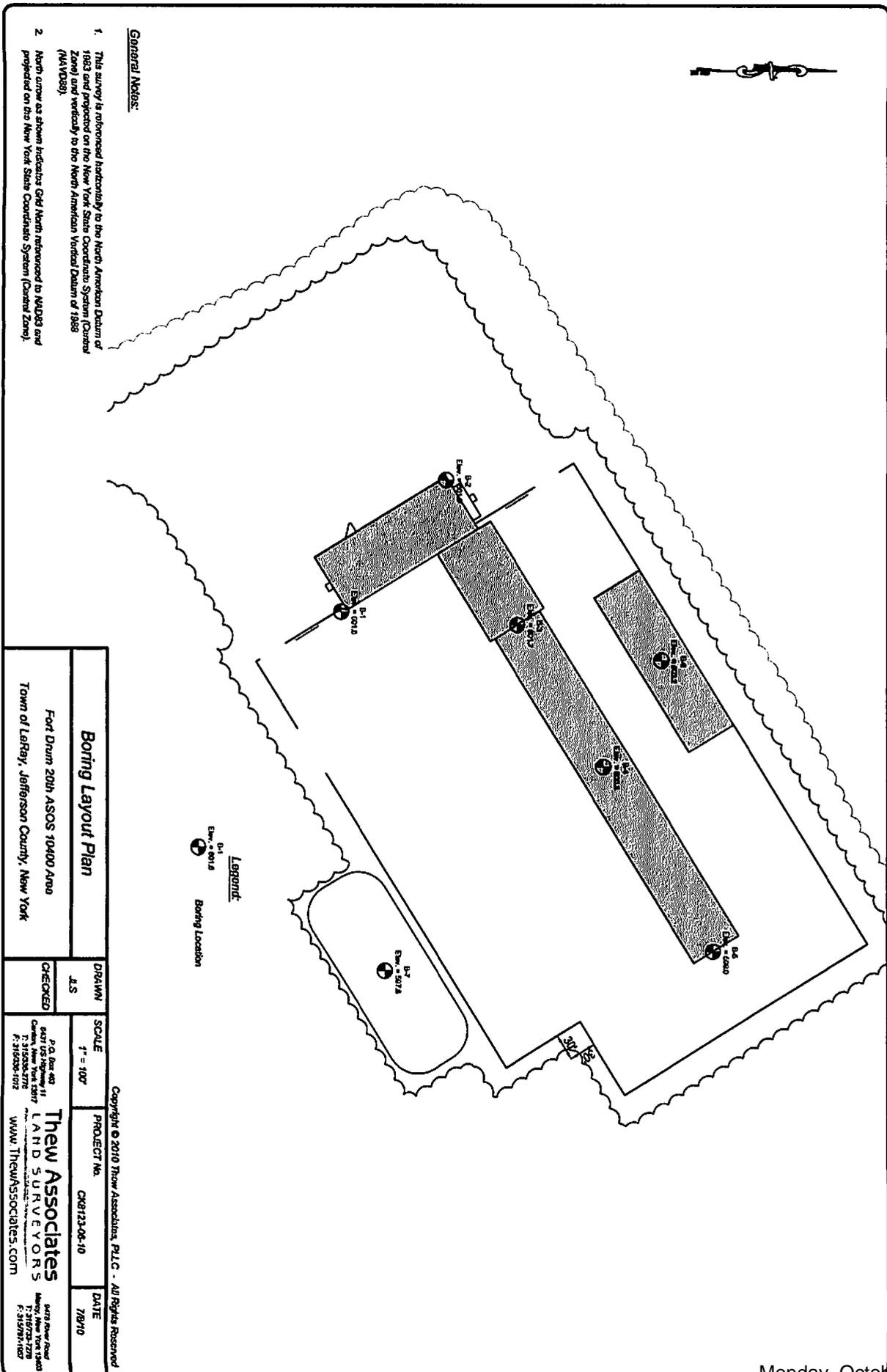


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Date of Issue: October 18, 2010

APPENDIX B
BORING LOCATION PLAN



APPENDIX C
SUBSURFACE INVESTIGATION LOGS

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Client: Jacobs Engineering Group, Inc.
Project: Subsurface Investigation
2th Air Support Operations Squadron
Fort Drum, New York

Report No.: CD3163E-01-07-10
Boring Location: See Boring Location Plan

Boring No.: B-1 Sheet 1 of 1

Start Date: 6/30/2010 Finish Date: 6/30/2010

Coordinates Northing _____ Easting _____
Sampler Hammer Weight: 140 lbs.
Fall: 30 in.
Hammer Type: Automatic

Groundwater Observations			
Date	Time	Depth	Casing
6/30/2010	PM	DRY	3.5'

Ground Elev.: 601.6 Boring Advance By: 4 1/4" Auger

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE		SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	Recovery (Inches)
			From	To					
1	A R E M C C	1	0.0	2.0	SS	2 15 7 8	3.5	Brown cmf SAND; trace SILT; trace mf GRAVEL; trace ORGANIC MATERIAL (roots, root hairs) (moist, non-plastic) w=29.2%	7
2		2	2.0	3.0	SS	5 100		Brown cmf SAND; some cmf GRAVEL; trace SILT (moist, non-plastic) w=5.5%	3
4	N X E R O C		3.5	8.5	NX	Run 1	8.5	Grey LIMESTONE 35" or 58" Recovery 7 Pieces (21") - 40% Chips and Fragments 2 Pieces longer than 4"(9") - RQD=15%	35
8								Boring terminated at 8.5 feet.	
10							Note: 1. Boring backfilled upon completion.		

ATL-LOG1 CD3163E-JACOBS ASOS.GPJ LOG-WELL.GDT 7/21/10

SS Spill Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: Brad Perry, Cory Farmer
Inspector: _____

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Client: Jacobs Engineering Group, Inc.
 Project: Subsurface Investigation
2th Air Support Operations Squadron
Fort Drum, New York

Report No.: CD3153E-01-07-10
 Boring Location: See Boring Location Plan

Boring No.: B-2 Sheet 1 of 1
 Coordinates _____ Sampler Hammer
 Northing _____ Weight: 140 lbs.
 Easting _____ Fall: 30 in.
 Hammer Type: Automatic
 Ground Elev.: 601.9 Boring Advance By:
4 1/4" Auger

Groundwater Observations			
Date	Time	Depth	Casing
<u>6/30/2010</u>	<u>PM</u>	<u>DRY</u>	<u>5.8'</u>
<u>6/30/2010</u>	<u>PM</u>	<u>DRY</u>	<u>TOW@5.0'</u>
_____	_____	_____	_____
_____	_____	_____	_____

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE		SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	Recovery (Inches)	
			From	To						
1	A R M C C	1	0.0	2.0	SS	1 4 2 2	Brown cmf SAND; some mf GRAVEL; trace SILT; trace ORGANIC MATERIAL (roots, root hairs) (moist, non-plastic) W=23.1%	6		
2		2	2.0	4.0		4 4 6 5			Similar Soil w=14.6%	6
4		3	4.0	5.4		17 25 100/5"			Brown cmf GRAVEL; some cmf SAND; some SILT (moist, non-plastic) w=6.7%	12
6						5.8	Boring terminated at 5.8 feet due to auger refusal on possible bedrock.			
7							Note: 1. A temporary observation well was installed at 5 feet.			
8										
9										
10										
11										
12										
13										
14										
15										

ATL-LOG1 CD3153 JACOBS ASOS.GPJ LOG-WELL.GDT 7/21/10

SS Spill Spoon Sample
 NX Rock Core
 SH Undisturbed Sample (Shelby Tube)
 Estimated Groundwater

Drillers: Brad Perry, Cory Farmer
 Inspector: _____

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Client: Jacobs Engineering Group, Inc.
 Project: Subsurface Investigation
2th Air Support Operations Squadron
Fort Drum, New York

Report No.: CD3163E-01-07-10
 Boring Location: See Boring Location Plan

Boring No.: B-3 Sheet 1 of 1

Start Date: 6/30/2010 Finish Date: 6/30/2010

Coordinates Northing _____ Easting _____
 Sampler Hammer Weight: 140 lbs.
 Fall: 30 in.
 Hammer Type: Automatic

Groundwater Observations			
Date	Time	Depth	Casing
<u>6/30/2010</u>	<u>PM</u>	<u>DRY</u>	<u>3.6'</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Ground Elev.: 601.7 Boring Advance By: 4 1/4" Auger

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE		SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER				DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	Recovery (inches)
			From	To		3	4	15	20			
1	A R E C	1	0.0	2.0	SS	3	4	15	20	3.6	Brown cmf SAND; some mf GRAVEL; trace SILT; trace ORGANIC MATERIAL (roots, root hairs) (moist, non-plastic) w=21.1%	6
2		2	2.0	3.6		17	31	72	100/1"			
3												
4											Boring terminated at 3.6 feet due to auger refusal on possible bedrock.	
5											Note: 1. Boring backfilled upon completion.	
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												

ATL-LOG1 CD3163 JACOBS ASOS.GPJ LOG-WELL.GDT 7/21/10

SS Spill Spoon Sample
 NX Rock Core
 SH Undisturbed Sample (Shelby Tube)
 Estimated Groundwater

Drillers: Brad Perry, Cory Farmer
 Inspector: _____

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Client: Jacobs Engineering Group, Inc.
Project: Subsurface Investigation
2th Air Support Operations Squadron
Fort Drum, New York

Report No.: CD3153E-01-07-10
Boring Location: See Boring Location Plan

Boring No.: B-4 Sheet 1 of 1
Coordinates Northing _____ Easting _____
Sampler Hammer Weight: 140 lbs. Fall: 30 in.
Hammer Type: Automatic
Ground Elev.: 600.8 Boring Advance By: 4 1/4" Auger

Start Date: 7/2/2010 Finish Date: 7/2/2010
Groundwater Observations
Date Time Depth Casing
7/2/2010 AM DRY 3.0'
7/2/2010 AM *5.4' 3.0'
*May be affected by core water.

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE		SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER				DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	Recovery (Inches)
			From	To		3	2	36	100/2"			
1	ARMO	1	0.0	2.0	SS	3	2	36	100/2"	3.0	Brown cmf SAND; little mf GRAVEL; trace SILT; trace ORGANIC MATERIAL (roots, root hairs) (moist, non-plastic) w=27.0%	10
2		2	2.0	2.8	SS	24	100/3"				Grey cmf SAND; and cmf GRAVEL; trace SILT (moist, non-plastic) w=5.1%	6
3	NEX EMPOC		3.0	8.0	NX	Run 1				8.0	Grey LIMESTONE 55" or 92% Recovery 13 Pieces (34") - 38% Chips and Fragments 3 Pieces longer than 4" (16") - RQD=27%	55
4												
5												
6												
7												
8											Boring terminated at 8.0 feet.	
9											Note: 1. temporary observation well was installed at 8 feet.	
10												
11												
12												
13												
14												
15												

ATL-LOG1 CD3153 JACOBS ASOS.GPJ LOG-WELL.GDT 7/2/10

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: Brad Perry, Cory Farmer
Inspector: _____

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Client: Jacobs Engineering Group, Inc.
 Project: Subsurface Investigation
2th Air Support Operations Squadron
Fort Drum, New York

Report No.: CD3153E-01-07-10
 Boring Location: See Boring Location Plan

Boring No.: B-6 Sheet 1 of 1
 Coordinates Northing _____ Easting _____
 Sampler Hammer Weight: 140 lbs. Fall: 30 in.
 Hammer Type: Automatic
 Ground Elev.: 599.0 Boring Advance By: 4 1/4" Auger

Start Date: 7/1/2010 Finish Date: 7/1/2010
 Groundwater Observations
 Date: 7/1/2010 Time: PM Depth: DRY Casing: 7.5'

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE		SAMPLE TYPE	BLOWS ON SAMPLER PER 8" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	Recovery (Inches)	
			From	To						
1	A R M C C	1	0.0	2.0	SS	1 1 1 2		Brown cmf SAND; trace mf GRAVEL; trace SILT; trace ORGANIC MATERIAL (roots, root hairs) (moist, non-plastic) w=18.4%	6	
2		2	2.0	4.0		14 15 21 28		Brown cmf SAND; and SILT; little mf GRAVEL (moist, non-plastic) w=8.8%	8	
3										
4		3	4.0	6.0		21 24 24 38		Similar Soil w=10.4%	12	
5										
6		4	6.0	7.0		42 100		Grey cmf SAND; some cmf GRAVEL; trace SILT (moist, non-plastic) w=2.9%	6	
7						7.5				
8							Boring terminated at 7.5 feet due to auger refusal on possible bedrock.			
9							Note: 1. Boring backfilled upon completion.			
10										
11										
12										
13										
14										
15										

ATL-LOG1 CD3153-JACOBS ASOS.GPJ LOG-WELL.GDT 7/21/10

SS Sp3 Spoon Sample
 NX Rock Core
 SH Undisturbed Sample (Shelby Tube)
 Estimated Groundwater

Drillers: Brad Perry, Cory Farmer
 Inspector: _____

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Client: Jacobs Engineering Group, Inc.
 Project: Subsurface Investigation
2th Air Support Operations Squadron
Fort Drum, New York

Report No.: CD3163E-01-07-10
 Boring Location: See Boring Location Plan

Boring No.: B-6 Sheet 1 of 1

Start Date: 7/1/2010 Finish Date: 7/1/2010

Coordinates
 Northing _____
 Easting _____
 Sampler Hammer
 Weight: 140 lbs.
 Fall: 30 in.
 Hammer Type: Automatic

Groundwater Observations			
Date	Time	Depth	Casing
<u>7/1/2010</u>	<u>PM</u>	<u>DRY</u>	<u>4.7'</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Ground Elev.: 603.2 Boring Advance By:
4 1/4" Auger

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE		SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	Recovery (Inches)
			From	To					
1	RMC	1	0.0	2.0	SS	2 4 4 19	4.7	Brown cmf SAND; some mf GRAVEL; trace SILT (moist, non-plastic) w=9.6%	10
2		2	2.0	4.0	SS	28 21 34 89		Brown cmf SAND; cmf GRAVEL; trace SILT (moist, non-plastic) w=5.7%	12
4		3	4.0	4.3	SS	100/3"		No Recovery	0
5							Boring terminated at 4.7 feet due to auger refusal on possible bedrock.		
6							Note: 1. Boring backfilled upon completion.		
7									
8									
9									
10									
11									
12									
13									
14									
15									

ATL-LOG1 CD3163E ASOS.GPJ LOG-WELL.GDT 7/21/10

SS Split Spoon Sample
 NX Rock Core
 SH Undisturbed Sample (Shelby Tube)
 Estimated Groundwater

Drillers: Brad Perry, Cory Farmer
 Inspector: _____

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Client: Jacobs Engineering Group, Inc.
 Project: Subsurface Investigation
2th Air Support Operations Squadron
Fort Drum, New York

Report No.: CD3153E-01-07-10
 Boring Location: See Boring Location Plan

Boring No.: B-7 Sheet 1 of 1
 Coordinates Northing _____ Easting _____
 Sampler Hammer Weight: 140 lbs. Fall: 30 in.
 Hammer Type: Automatic
 Ground Elev.: 597.6 Boring Advance By: 4 1/4" Auger

Start Date: 7/2/2010 Finish Date: 7/2/2010
 Groundwater Observations
 Date: 7/2/2010 Time: PM Depth: DRY Casing: 8.6'

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE		SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER				DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	Recovery (inches)
			From	To		4	5	6	7			
1	A REFUG	1	0.0	2.0	SS	4	5	6	7		Brown cmf SAND; trace mf GRAVEL; trace SILT; trace ORGANIC MATERIAL (roots, root hairs) (moist, non-plastic) w=24.5%	8
2		2	2.0	4.0	SS	13	14	17	18		Brown cmf SAND; trace SILT; trace mf GRAVEL (moist, non-plastic) w=12.1%	12
3												
4		3	4.0	6.0	SS	27	34	35	22		Similar Soil w=8.4%	18
5												
6		4	6.0	8.0	SS	38	41	100/3"			Similar Soil w=6.5%	9
7												
8		5	8.0	8.2	SS	100/2"				8.6	Grey cmf SAND; and cmf GRAVEL; trace SILT (moist, non-plastic) w=4.5%	2
9											Boring terminated at 8.6 feet due to auger refusal on possible bedrock.	
10												
11											Note: 1. Boring backfilled upon completion.	
12												
13												
14												
15												

ATL-LOG1 CD3153 JACOBS ASOS.GPJ LOG-WELL.GDT 7/2/10

SS Split Spoon Sample
 NX Rock Core
 SH Undisturbed Sample (Shelby Tube)
 Estimated Groundwater

Drillers: Brad Perry, Cory Farmer
 Inspector: _____

APPENDIX D
PARTICLE SIZE DISTRIBUTION CURVES

Particle Size Distribution Report

Project: 20th ASOS, Fort Drum, New York

Report No.: CD3153SL-01-07-09

Client: Jacobs Engineering Group, Inc.

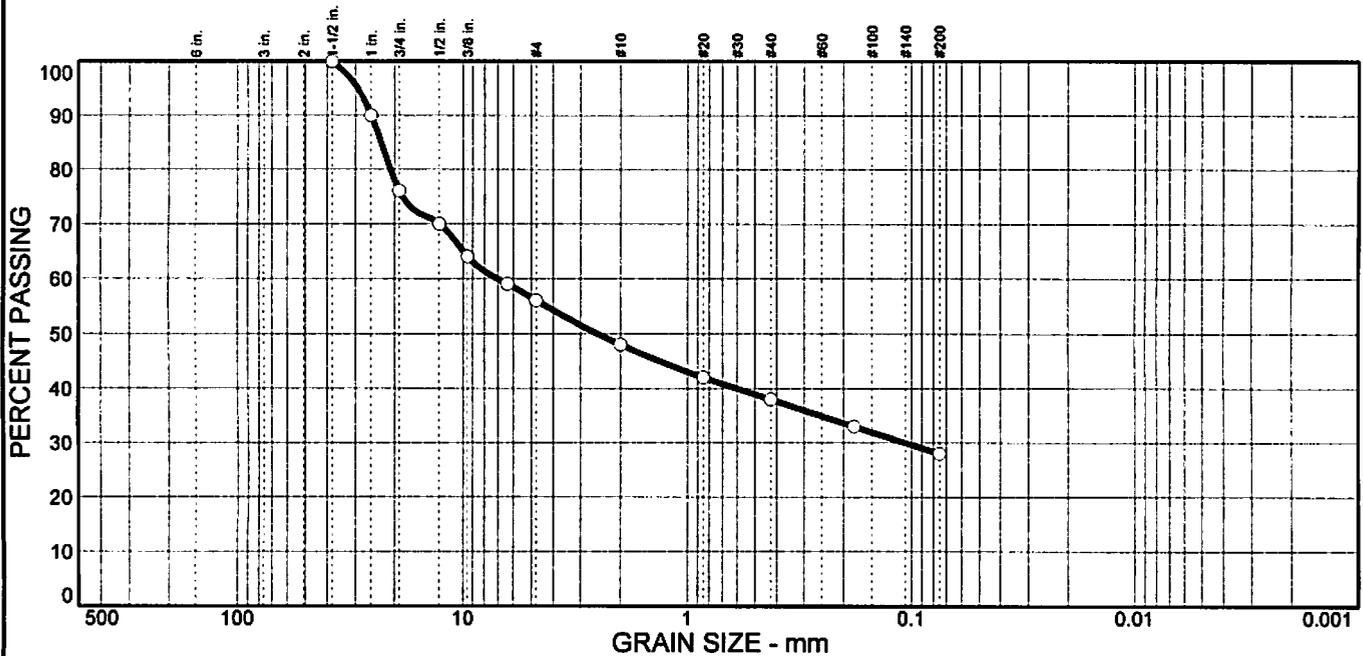
Date: 7/15/10

Sample No: B-2; S-3

Source of Sample: Boring Sample

Location: In-Situ

Elev./Depth: 4.0 - 6.0'



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0	24	20	8	10	10	28	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1.5 in.	100		
1 in.	90		
3/4 in.	76		
1/2 in.	70		
3/8 in.	64		
1/4 in.	59		
#4	56		
#10	48		
#20	42		
#40	38		
#80	33		
#200	28		

Soil Description

Brown cmf GRAVEL; some cmf SAND; some SILT

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D₈₅= 23.0 D₆₀= 7.07 D₅₀= 2.54
D₃₀= 0.107 D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= GM AASHTO=

Remarks

Moisture content 6.7%

* (no specification provided)

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____

Date: 7/24/10
Monday, October 18, 2010

Particle Size Distribution Report

Project: 20th ASOS, Fort Drum, New York

Report No.: CD3153SL-02-07-10

Client: Jacobs Engineering Group, Inc.

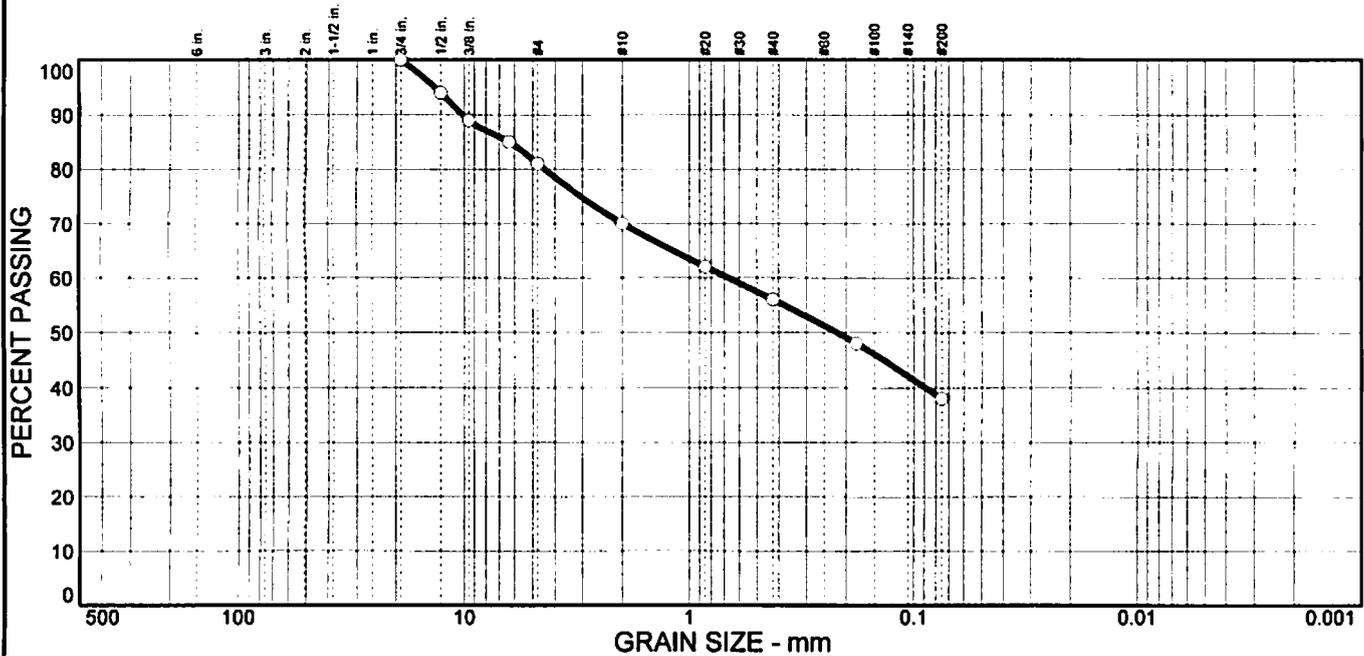
Date: 7/15/10

Sample No: B-5; S-2

Source of Sample: Boring Sample

Location: In-Situ

Elev./Depth: 2.0 - 4.0'



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0	0	19	11	14	18	38	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
3/4 in.	100		
1/2 in.	94		
3/8 in.	89		
1/4 in.	85		
#4	81		
#10	70		
#20	62		
#40	56		
#80	48		
#200	38		

Soil Description

Brown cmf SAND; and SILT; little mf GRAVEL

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D₈₅= 6.35 D₆₀= 0.674 D₅₀= 0.220
 D₃₀= D₁₅= D₁₀=
 C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

Moisture content 8.8%

* (no specification provided)

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by:

Date: 7/20/10
Monday, October 18, 2010

APPENDIX B
List of Drawings

Not Used

APPENDIX C
Utility Connections

Not Used

APPENDIX D
Results of Fire Flow Tests

Not Used

APPENDIX E
Environmental Information

Not Used

FIGURE 7-3

North Post— Administrative



Item	Image	Material	Common Name	Original Product/Color
Roof		Standing Seam Metal	Gray	Glidden Grey Tweed 30YY 22/059
Wall Primary Facade		Standard Brick	Old Bridge	Glen-Gray Brick Old Bridge C-107
Wall Plinth		Split-face CMU	10th Mountain Tan	Taylor Concrete 10th Mountain Tan
Wall Accents		Material Varies (Optional)	Beige	Glen Gray Brick Fall Gray
Louvers	—	Material Varies	Match Roof, Wall, Door, or Window Color	—
Windows		Material Varies	Gray Hearth	Glidden Grey Hearth 30YY 16/032
Doors		Material Varies	Gray Hearth	Glidden Grey Hearth 30YY 16/032

FIGURE 7-4

North Post— Community



Item	Image	Material	Common Name	Original Product/Color
Roof		Standing Seam Metal	Gray	Glidden Grey Tweed 30YY 22/059
Wall Primary Facade		Standard Brick	Old Bridge	Glen-Gray Brick Old Bridge C-107
Wall Plinth		Standard Brick / Split-face CMU	Old Bridge / 10th Mountain Tan	/Taylor Concrete 10th Mountain Tan
Wall Accents		Split-face CMU, Pre-cast Concrete	Beige	Glen Gray Brick Fall Gray
Louvers	—	Material Varies	Match Roof, Wall, Door, or Window Color	—
Windows		Material Varies	Gray Hearth / Dark Gray	Glidden Grey Hearth 30YY 16/032
Doors		Material Varies	Gray Hearth / Dark Gray	Glidden Grey Hearth 30YY 16/032

FIGURE 7-5 North Post— Industrial



Item	Image	Material	Common Name	Original Product/Color
Roof		Standing Seam Metal or Flat	Gray	Glidden Grey Tweed 30YY 22/059
Wall Primary Facade		Metal	Allspice	Benjamin Moore #1222
Wall Plinth		Split-face CMU	10th Mountain Tan	Taylor Concrete 10th Mountain Tan
Wall Accents	—	N/A	N/A	—
Louvers	—	Material Varies	Match Roof, Wall, Door, or Window Color	—
Windows		Material Varies	Sequoia	Pratt & Lambery Sequoia #R0202A
Doors		Material Varies	Sequoia	Pratt & Lambery Sequoia #R0202A

FIGURE 7-6 North Post— Troop Housing



Item	Image	Material	Common Name	Original Product/Color
Roof		Standing Seam Metal	Gray	Glidden Grey Tweed 30YY 22/059
Wall Primary Facade		Standard Brick	Old Bridge	Glen-Gray Brick Old Bridge C-107
Wall		Split-face CMU	10th Mountain Tan	Taylor Concrete 10th Mountain Tan
Wall Accents		Split-face CMU, Pre-cast Concrete	Beige	Glen Gray Brick Fall Gray
Louvers	—	Material Varies	Match Roof, Wall, Door, or Window Color	—
Windows		Material Varies	Gray Hearth	Glidden Grey Hearth 30YY 16/032
Doors		Material Varies	Gray Hearth	Glidden Grey Hearth 30YY 16/032

FIGURE 7-7

North Post— Unit Operations



Item	Image	Material	Common Name	Original Product/ Color
Roof		Standing Seam Metal	Gray	Glidden Grey Tweed 30YY 22/059
Wall Primary Facade		Standard Brick	Old Bridge	Glen-Gray Brick Old Bridge C-107
Wall Plinth		Split-face CMU	10th Mountain Tan	Taylor Concrete 10th Mountain Tan
Wall Accents		Split-face CMU, Pre- cast Concrete	Beige	Glen Gray Brick Fall Gray
Louvers	—	Material Varies	Match Roof, Wall, Door, or Window Color	—
Windows		Material Varies	Gray Hearth	Glidden Grey Hearth 30YY 16/032
Doors		Material Varies	Gray Hearth	Glidden Grey Hearth 30YY 16/032

APPENDIX G
GIS Data

Not Used

APPENDIX H
Exterior Signage

Not Used

APPENDIX I
Acceptable Plants List

Not Used



FIRST FLOOR BUILDING PLAN

0 8' 16' 32' 64'

- LEGEND**
- ADMIN / OPERATIONS
 - MAINTENANCE
 - SERVICE
 - CIRCULATION
 - UTILITY / STORAGE



USACE
NEW YORK DISTRICT
 US ARMY CORPS OF ENGINEERS



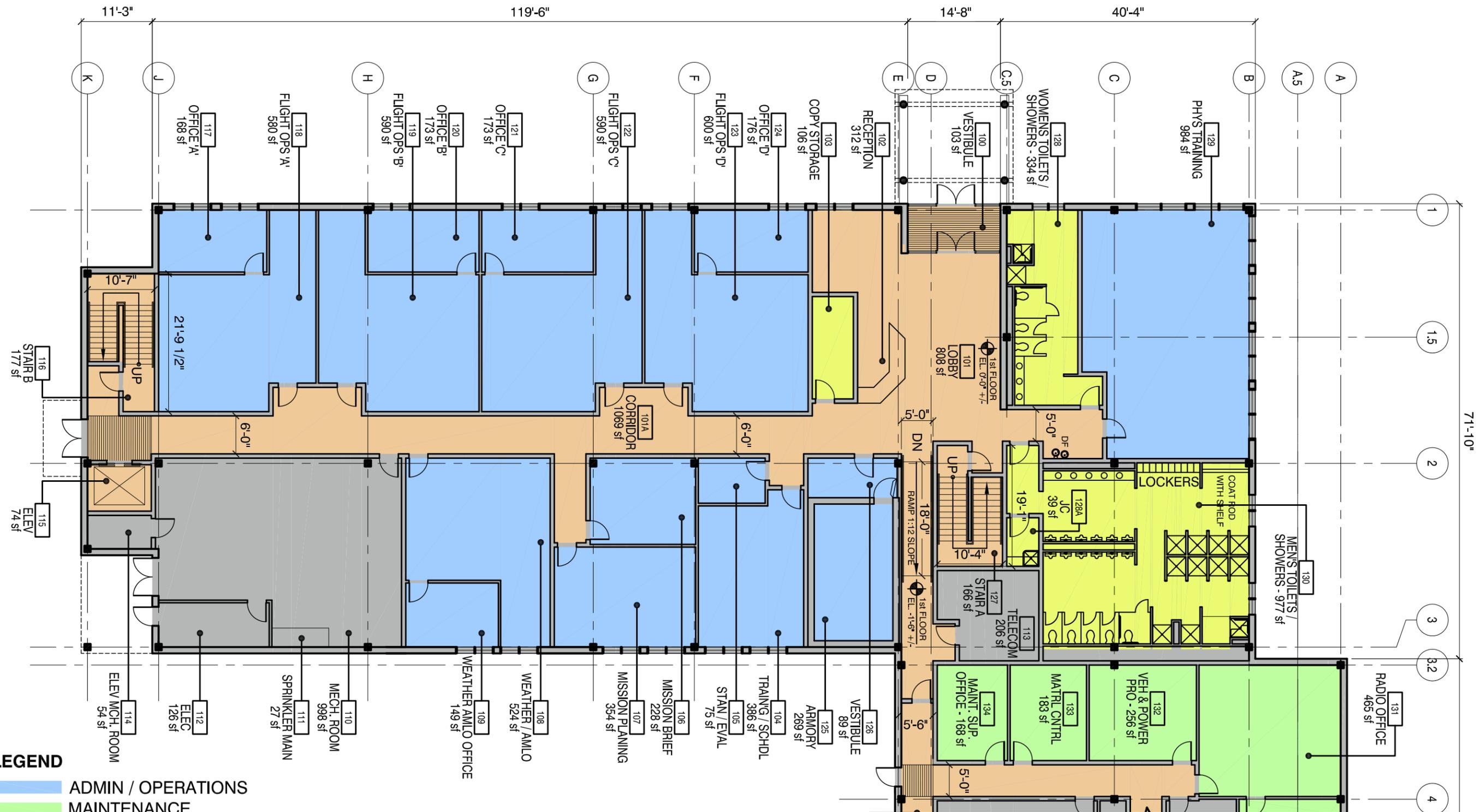
FORT DRUM
20TH ASOS COMPLEX

FIRST FLOOR BUILDING PLAN

A-100

SITE LOCATION: NORTHPOST
 INTERSECTION OF ENDURING FREEDOM DRIVE AND 45TH INFANTRY DIVISION DRIVE

09/30/10



USACE
NEW YORK DISTRICT
US ARMY CORPS OF ENGINEERS



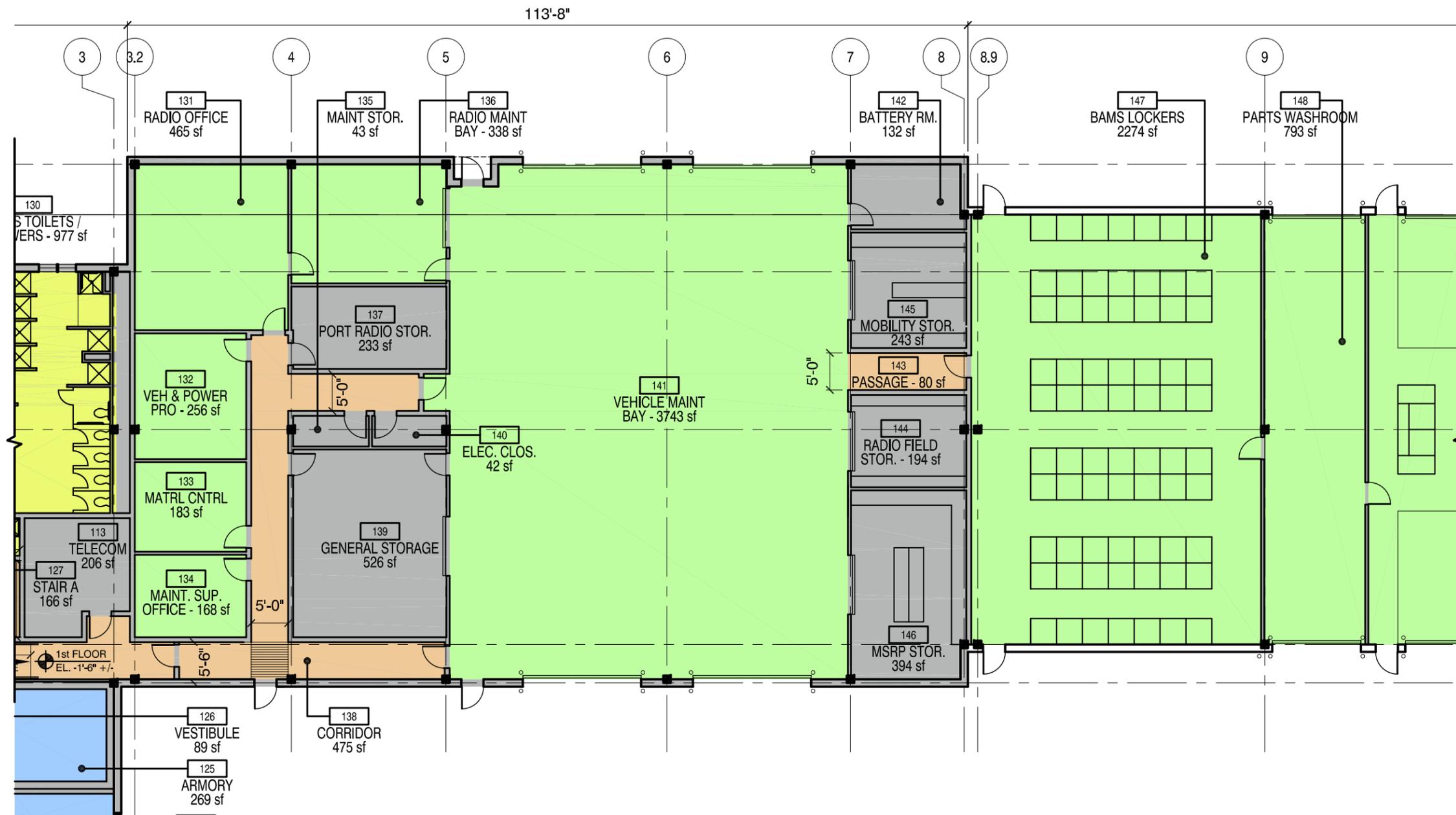
FORT DRUM 20TH ASOS COMPLEX

PARTIAL FIRST FLOOR - ADMIN WING

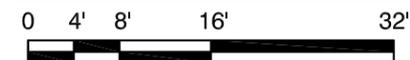
A-101

SITE LOCATION: NORTHPOST
INTERSECTION OF ENDURING FREEDOM DRIVE AND 45TH INFANTRY DIVISION DRIVE

09/30/10



PARTIAL FIRST FLOOR PLAN - MAINTENANCE WING



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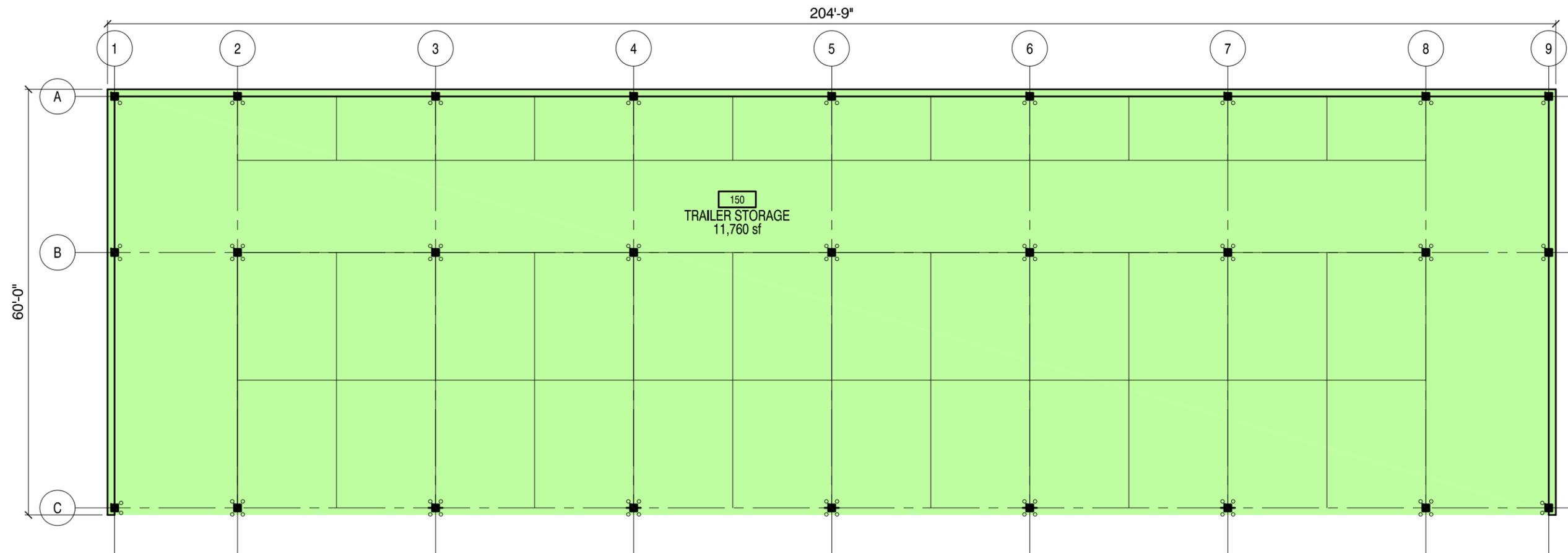
**FORT DRUM
20TH ASOS COMPLEX**

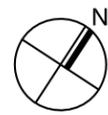
PARTIAL FIRST FLOOR -
MAINTENANCE WING

A-102

SITE LOCATION: NORTHPOST
INTERSECTION OF ENDURING FREEDOM DRIVE AND 45TH INFANTRY DIVISION DRIVE

09/30/10



 **COVERED TRAILER PLAN**

0 4' 8' 16' 32'



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NEW YORK DISTRICT
US ARMY CORPS OF ENGINEERS



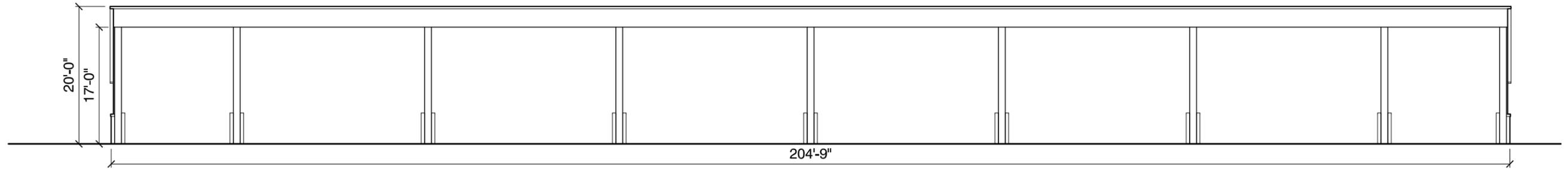
**FORT DRUM
20TH ASOS COMPLEX**

COVERED TRAILER PLAN

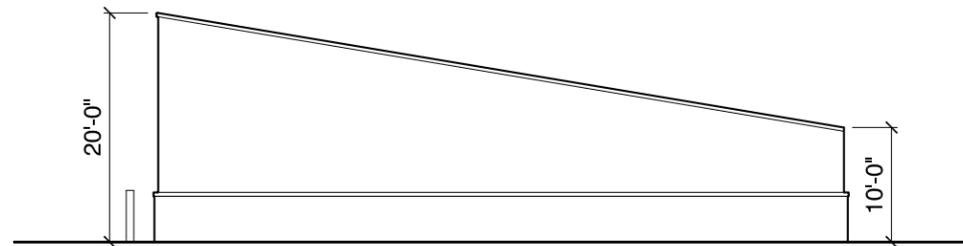
A-103

SITE LOCATION: NORTHPOST
INTERSECTION OF ENDURING FREEDOM DRIVE AND 45TH INFANTRY DIVISION DRIVE

09/30/10



COVERED TRAILER SOUTHEAST ELEVATION



COVERED TRAILER NORTHEAST ELEVATION



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 NEW YORK DISTRICT
 US ARMY CORPS OF ENGINEERS



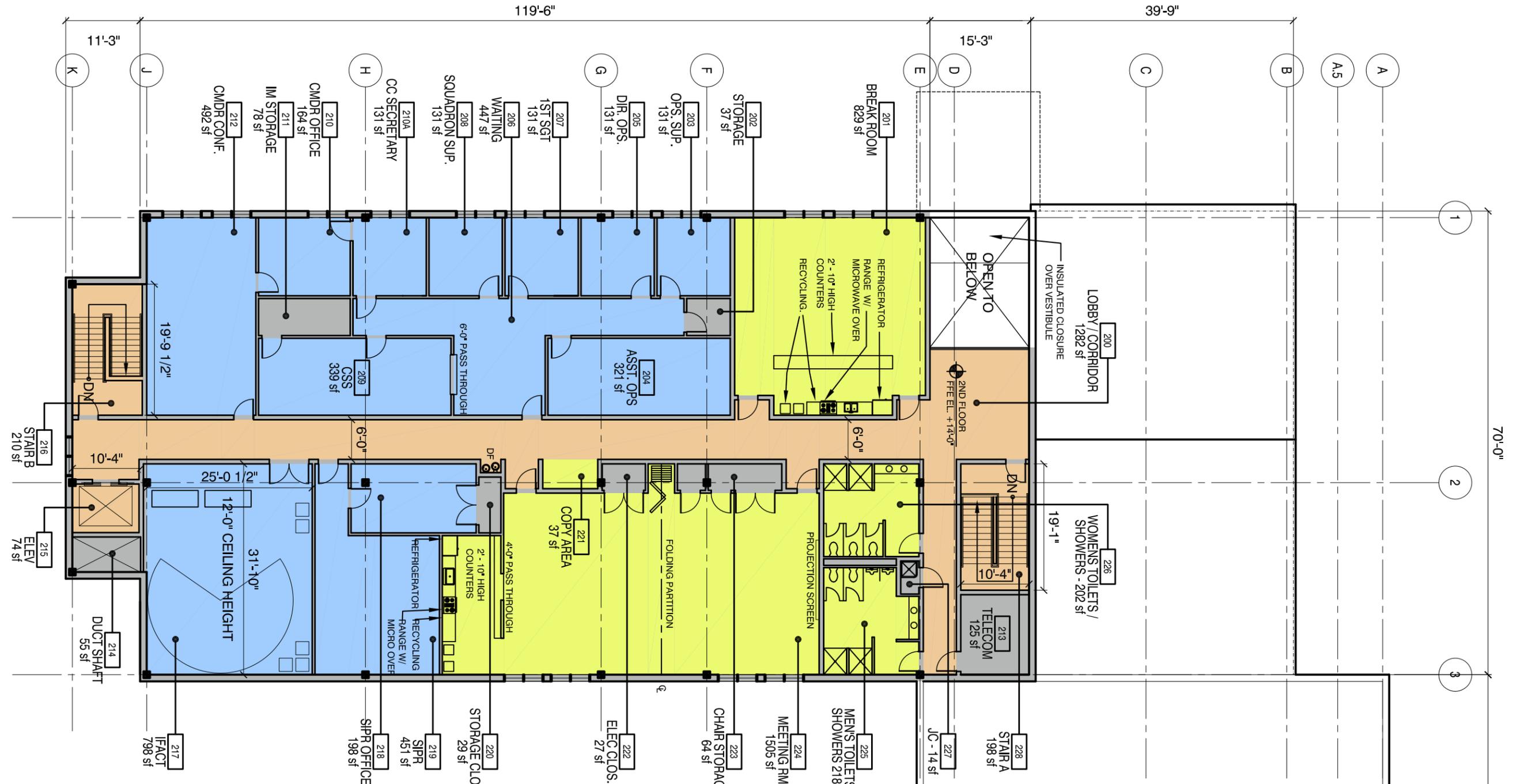
**FORT DRUM
 20TH ASOS COMPLEX**

COVERED TRAILER ELEVATIONS

A-104

SITE LOCATION: NORTHPOST
 INTERSECTION OF ENDURING FREEDOM DRIVE AND 45TH INFANTRY DIVISION DRIVE

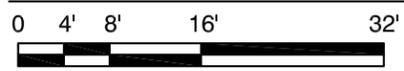
09/30/10



- LEGEND**
- ADMIN / OPERATIONS
 - MAINTENANCE
 - SERVICE
 - CIRCULATION
 - UTILITY / STORAGE



SECOND FLOOR PLAN - ADMIN WING



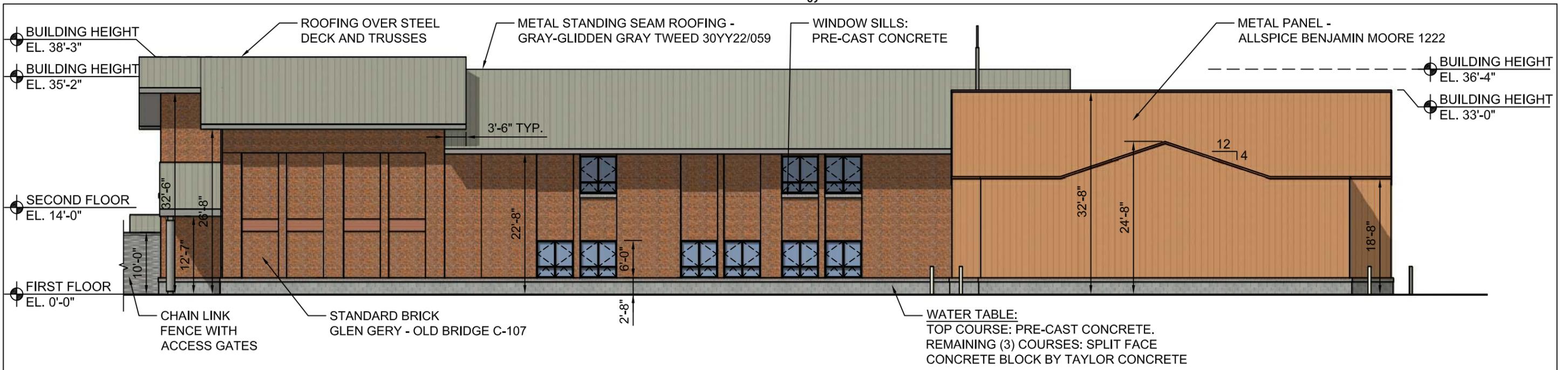
**FORT DRUM
20TH ASOS COMPLEX**

SECOND FLOOR PLAN - ADMIN WING

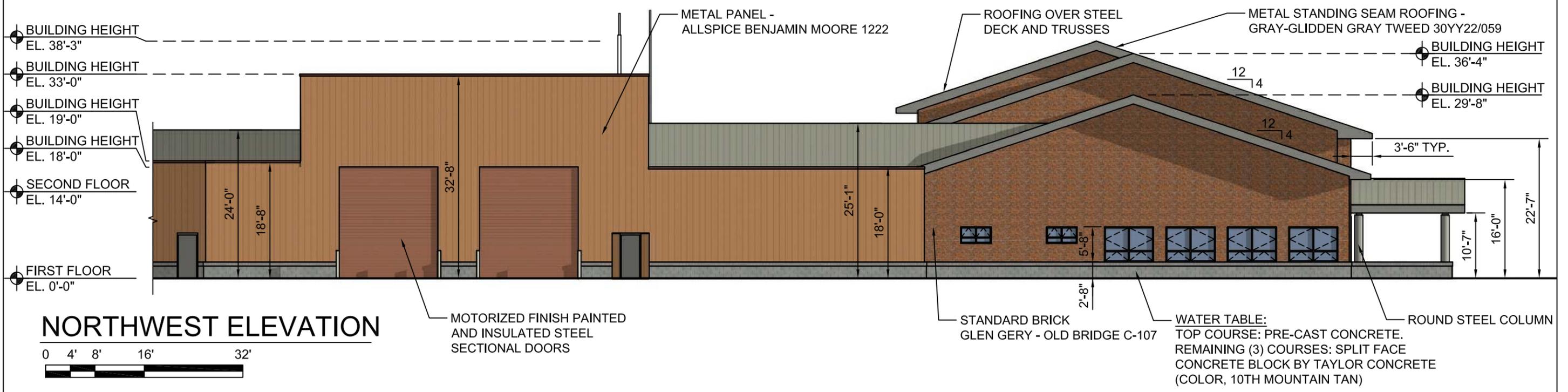
A-105

SITE LOCATION: NORTHPOST
INTERSECTION OF ENDURING FREEDOM DRIVE AND 45TH INFANTRY DIVISION DRIVE

09/30/10



NORTHEAST ELEVATION



NORTHWEST ELEVATION

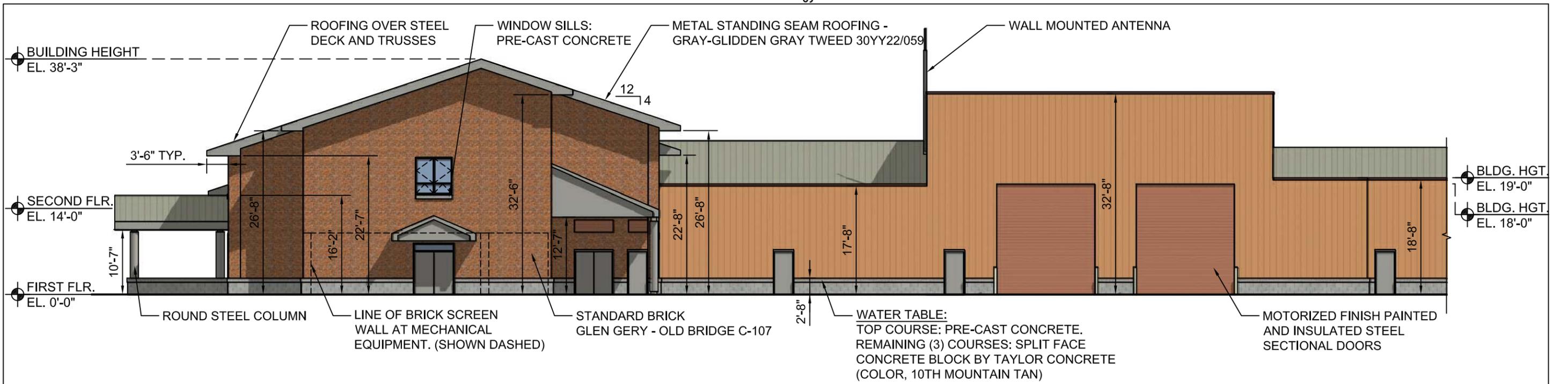


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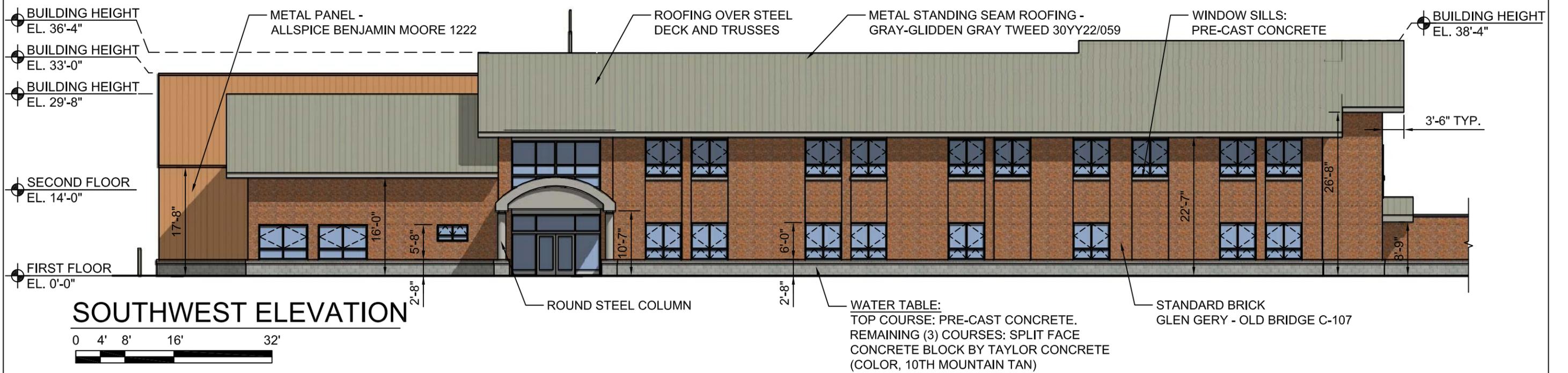


FORT DRUM 20TH ASOS COMPLEX

NORTH ELEVATIONS		A-106
SITE LOCATION: NORTHPOST INTERSECTION OF ENDURING FREEDOM DRIVE AND 45TH INFANTRY DIVISION DRIVE		09/30/10



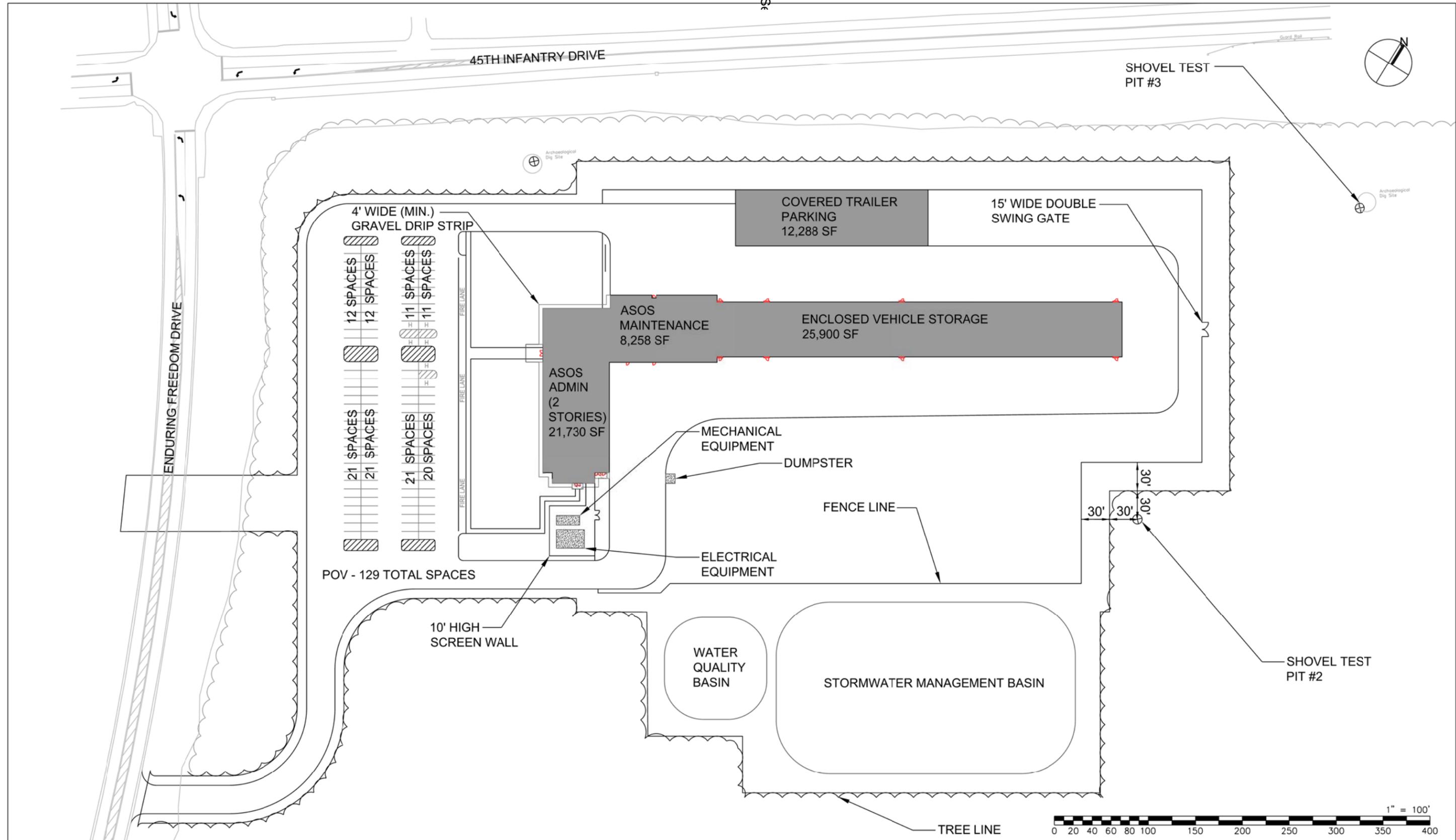
SOUTHEAST ELEVATION



SOUTHWEST ELEVATION



 USACE NEW YORK DISTRICT US ARMY CORPS OF ENGINEERS	 	FORT DRUM 20TH ASOS COMPLEX		SOUTH ELEVATIONS	A-107
		SITE LOCATION: NORTHPOST INTERSECTION OF ENDURING FREEDOM DRIVE AND 45TH INFANTRY DIVISION DRIVE		09/30/10	



USACE
NEW YORK DISTRICT
US ARMY CORPS OF ENGINEERS



FORT DRUM 20TH ASOS COMPLEX

SITE PLAN

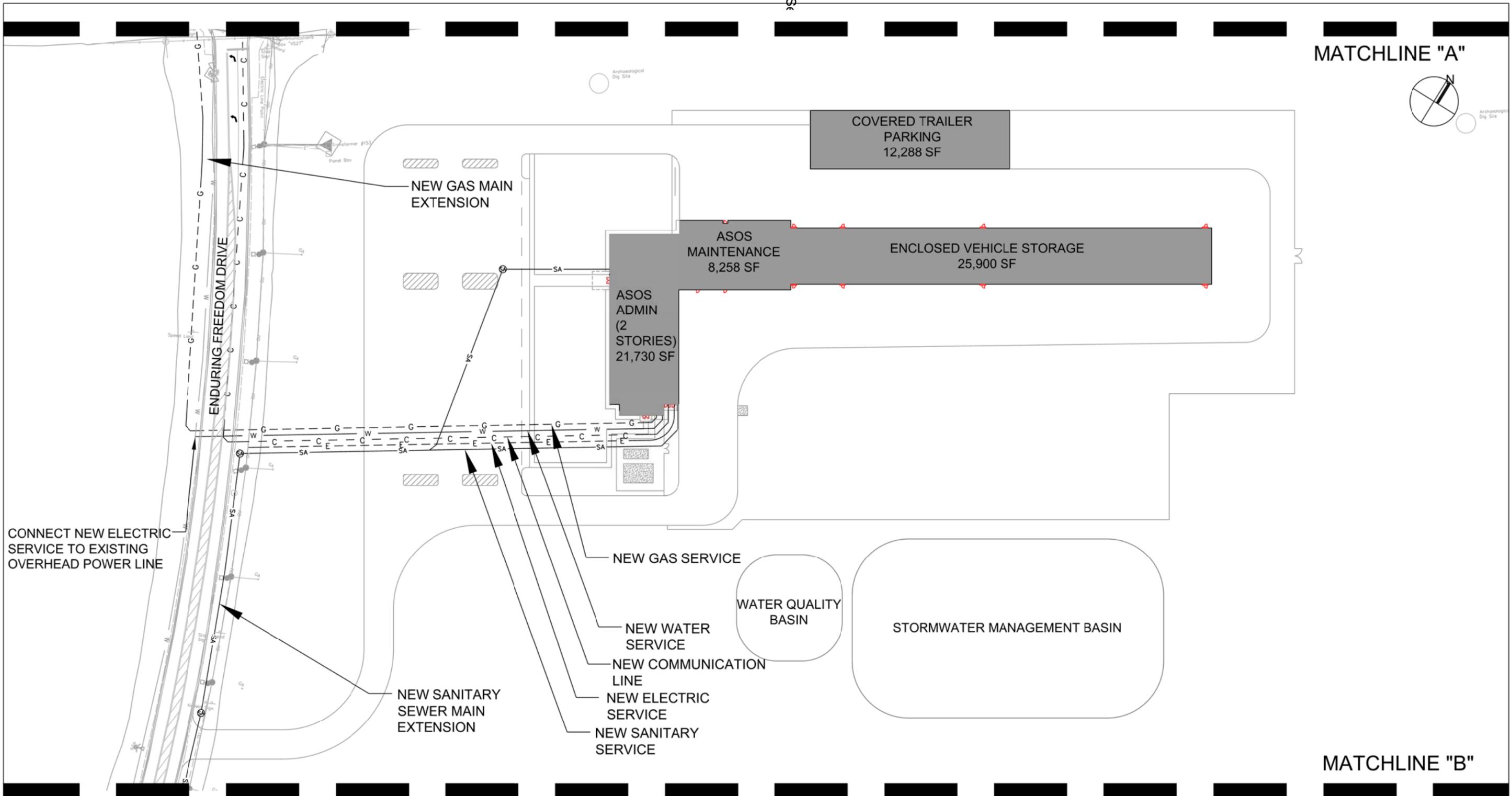
C-100

SITE LOCATION: NORTHPOST
INTERSECTION OF ENDURING FREEDOM DRIVE AND 45TH INFANTRY DIVISION DRIVE

09/30/10

*THESE ARE CONCEPT DESIGN DRAWINGS ONLY AND ARE NOT INTENDED TO BE USED FOR CONSTRUCTION. ELECTRONIC AUTOCAD DRAWINGS TRANSMITTED 10-06-2010.

MATCHLINE "A"



MATCHLINE "B"



USACE
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 US ARMY CORPS OF ENGINEERS



FORT DRUM
20TH ASOS COMPLEX

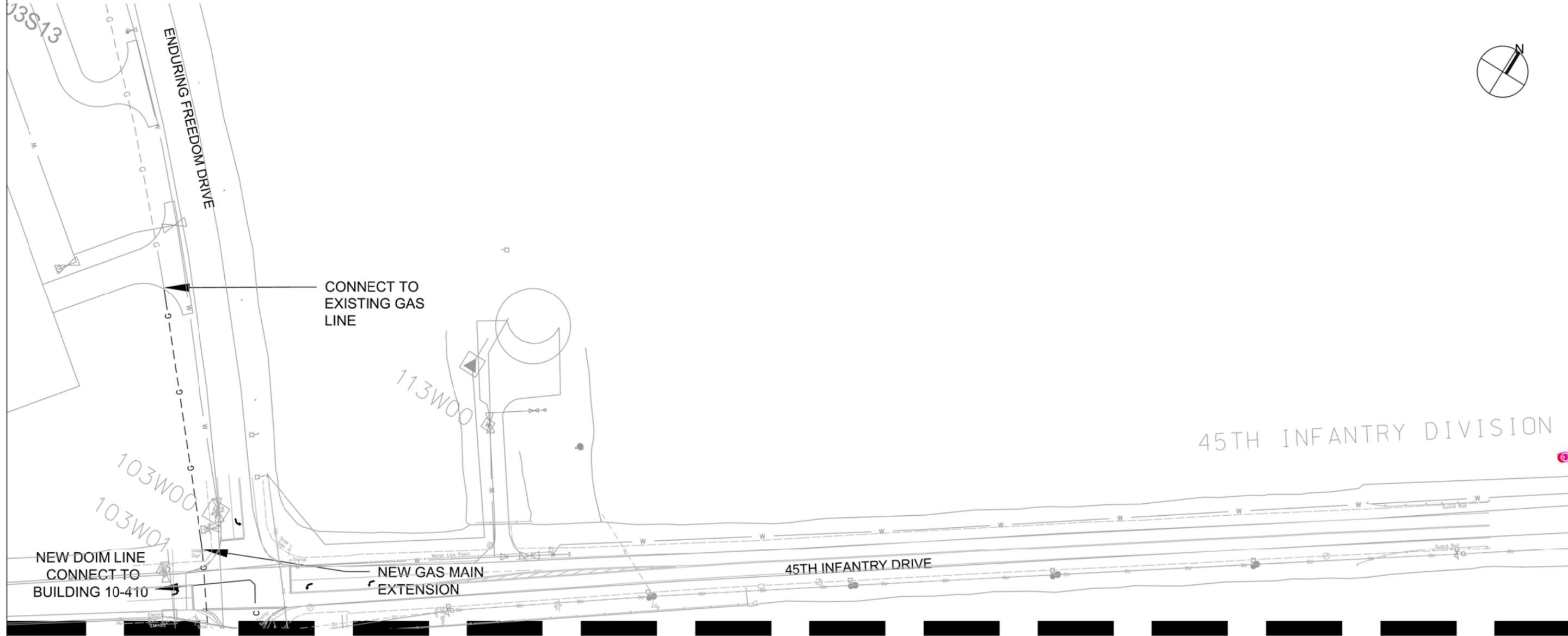
CONCEPTUAL UTILITY PLAN

C-101

SITE LOCATION: NORTHPOST
 INTERSECTION OF ENDURING FREEDOM DRIVE AND 45TH INFANTRY DIVISION DRIVE

09/30/10

*THESE ARE CONCEPT DESIGN DRAWINGS ONLY AND ARE NOT INTENDED TO BE USED FOR CONSTRUCTION. ELECTRONIC AUTOCAD DRAWINGS TRANSMITTED 10-06-2010.



MATCHLINE "A"

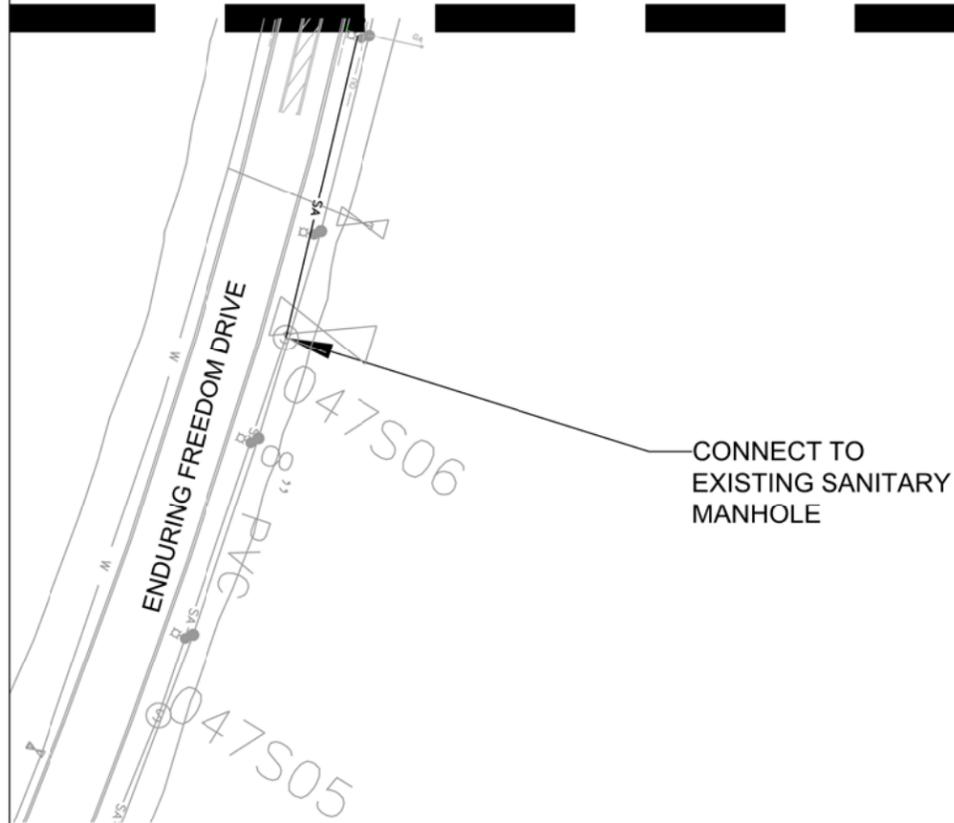


 USACE NEW YORK DISTRICT US ARMY CORPS OF ENGINEERS	 	FORT DRUM 20TH ASOS COMPLEX		CONCEPTUAL UTILITY PLAN	C-102
		<small>SITE LOCATION: NORTHPOST INTERSECTION OF ENDURING FREEDOM DRIVE AND 45TH INFANTRY DIVISION DRIVE</small>		09/30/10	

*THESE ARE CONCEPT DESIGN DRAWINGS ONLY AND ARE NOT INTENDED TO BE USED FOR CONSTRUCTION. ELECTRONIC AUTOCAD DRAWINGS TRANSMITTED 10-06-2010.



MATCHLINE "B"



USACE
 NEW YORK DISTRICT
 US ARMY CORPS OF ENGINEERS



FORT DRUM 20TH ASOS COMPLEX

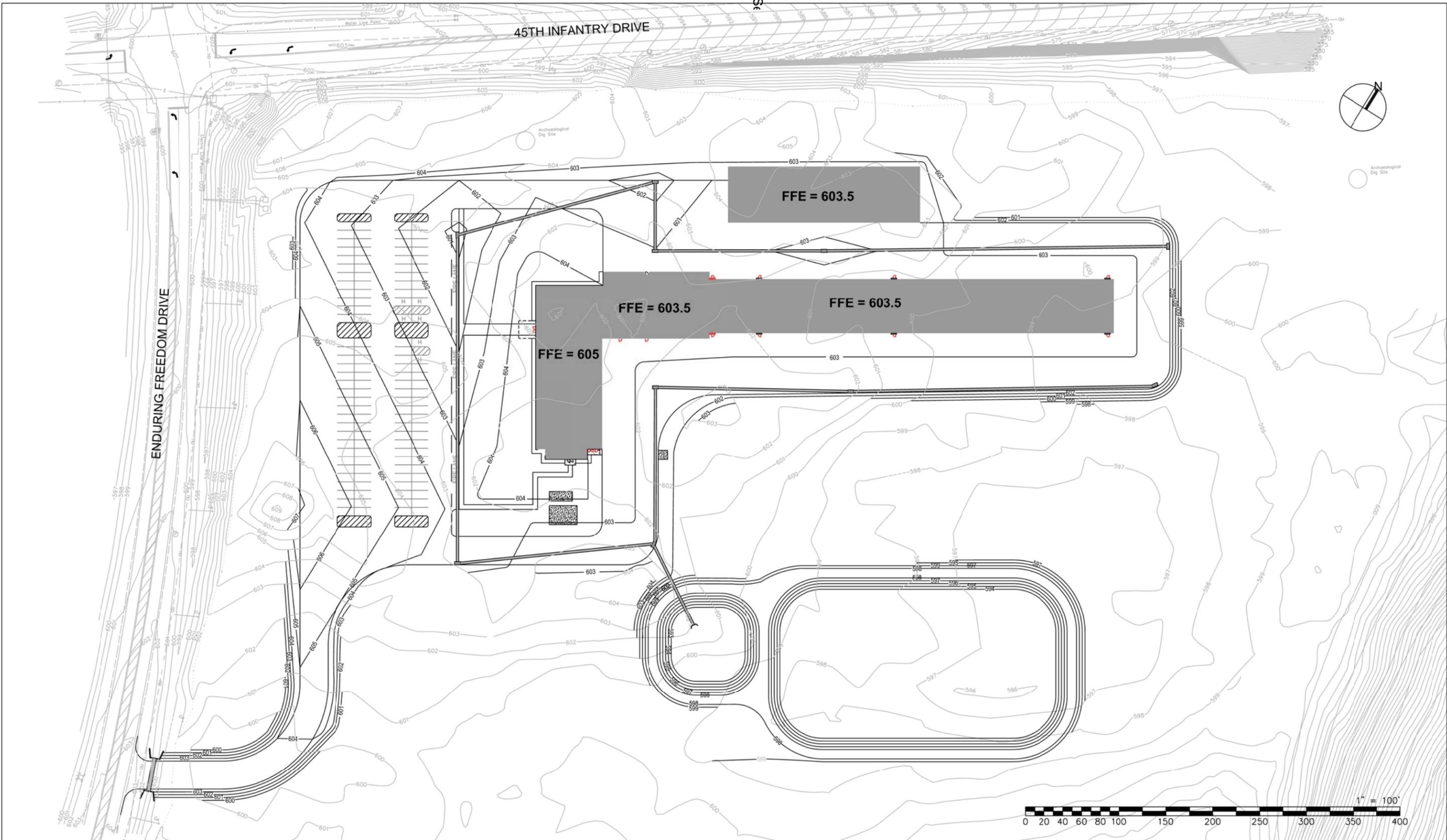
CONCEPTUAL UTILITY PLAN

C-103

SITE LOCATION: NORTHPOST
 INTERSECTION OF ENDURING FREEDOM DRIVE AND 45TH INFANTRY DIVISION DRIVE

09/30/10

*THESE ARE CONCEPT DESIGN DRAWINGS ONLY AND ARE NOT INTENDED TO BE USED FOR CONSTRUCTION. ELECTRONIC AUTOCAD DRAWINGS TRANSMITTED 10-06-2010.



USACE
NEW YORK DISTRICT
US ARMY CORPS OF ENGINEERS



FORT DRUM 20TH ASOS COMPLEX

GRADING PLAN

C-104

SITE LOCATION: NORTHPOST
INTERSECTION OF ENDURING FREEDOM DRIVE AND 45TH INFANTRY DIVISION DRIVE

09/30/10

*THESE ARE CONCEPT DESIGN DRAWINGS ONLY AND ARE NOT INTENDED TO BE USED FOR CONSTRUCTION. ELECTRONIC AUTOCAD DRAWINGS TRANSMITTED 10-06-2010.

APPENDIX K Fuel Cost Information

The following utility rates for this installation are provided for design

Electrical:

Demand Charge - \$xx.xx per kilowatt

Energy Charge - \$ x.xx per kilowatt-hour Blended Rate - \$ x.xx per kilowatt-hour (blended annual energy and demand cost)

Natural Gas:

Commodity Charge Rate - \$ x.xx per thousand cubic feet

Water:

Commodity Charge Rate - \$x.xx per [volume]

Sewer:

Commodity Charge Rate - \$x.xx per [volume]

Purchased/Central Steam:

Commodity Charge Rate - \$x.xx per [unit of measure]

Purchased High Temperature Water:

Commodity Charge Rate - \$x.xx per [unit of measure]

Purchased Chilled Water:

Commodity Charge Rate - \$x.xx per [unit of measure]



LEED-NC

LEED-NC Version 2.2 Registered Project Checklist

Fort Drum Air Support Operations Squadron

Fort Drum, New York

Preliminary Project Checklist

Yes ? No

6	3	5	Sustainable Sites	14 Points
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Y			Prereq 1 Erosion & Sedimentation Control	LEED req
Y			Prereq 2 Environmental Protection, (AF Amendment)	Required
Y			Prereq 3 Cultural Resources Protection, (AF Amendment)	Required
Y			Prereq 4 Clean Water Protection, (AF Amendment)	Required
1			Credit 1 Site Selection	1
		1	Credit 2 Urban Redevelopment	1
		1	Credit 3 Brownfield Redevelopment	1
		1	Credit 4.1 Alternative Transportation, Public Transportation Access	1
1			Credit 4.2 Alternative Transportation, Bicycle Storage & Changing Rooms	1
		1	Credit 4.3 Alternative Transportation, Alternative Fuel Refueling Stations	1
1			Credit 4.4 Alternative Transportation, Parking Capacity	1
	1		Credit 5.1 Reduced Site Disturbance, Protect or Restore Open Space	1
1			Credit 5.2 Reduced Site Disturbance, Development Footprint	1
		1	Credit 6.1 Stormwater Management, Rate or Quantity	1
1			Credit 6.2 Stormwater Management, Treatment	1
	1		Credit 7.1 Landscape & Exterior Design to Reduce Heat Islands, Non-Roof	1 concrete yard would reduce heat coating option on standing seam; vegetated roof as an option
	1		Credit 7.2 Landscape & Exterior Design to Reduce Heat Islands, Roof	1
1			Credit 8 Light Pollution Reduction	1

Yes ? No

4	1	0	Water Efficiency	5 Points
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1			Credit 1.1 Water Efficient Landscaping, Reduce by 50%	1
1			Credit 1.2 Water Efficient Landscaping, No Potable Use or No Irrigation	1
1			Credit 2 Innovative Wastewater Technologies	1
1			Credit 3.1 Water Use Reduction, 20% Reduction	1
	1		Credit 3.2 Water Use Reduction, 30% Reduction	1

Yes ? No

3	3	6	Energy & Atmosphere	17 Points
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Y			Prereq 1 Fundamental Building Systems Commissioning	LEED req
Y			Prereq 2 Minimum Energy Performance	Required

Y			Prereq 3	CFC Reduction in HVAC&R Equipment	LEED req
Y			Prereq 4	Air Quality Protection, (AF Amendment)	Required
1			Credit 1.1	Optimize Energy Performance, 20% New / 10% Existing	2
1			Credit 1.2	Optimize Energy Performance, 30% New / 20% Existing	2
	1		Credit 1.3	Optimize Energy Performance, 40% New / 30% Existing	2
		1	Credit 1.4	Optimize Energy Performance, 50% New / 40% Existing	2
		1	Credit 1.5	Optimize Energy Performance, 60% New / 50% Existing	2
		1	Credit 2.1	Renewable Energy, 5%	1
		1	Credit 2.2	Renewable Energy, 10%	1
		1	Credit 2.3	Renewable Energy, 20%	1
	1		Credit 3	Additional Commissioning	1
1			Credit 4	Ozone Depletion	1
	1		Credit 5	Measurement & Verification	1
		1	Credit 6	Green Power	1

Yes ? No

5	3	5	Materials & Resources	13 Points
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Y			Prereq 1	Storage & Collection of Recyclables	LEED req
Y			Prereq 2	Hazardous Materials and Waste Management, (AF Amendment)	Required
		1	Credit 1.1	Building Reuse, Maintain 75% of Existing Shell	1
		1	Credit 1.2	Building Reuse, Maintain 100% of Shell	1
		1	Credit 1.3	Building Reuse, Maintain 100% Shell & 50% Non-Shell	1
	1		Credit 2.1	Construction Waste Management, Divert 50%	1
	1		Credit 2.2	Construction Waste Management, Divert 75%	1
1			Credit 3.1	Resource Reuse, Specify 5%	1
1			Credit 3.2	Resource Reuse, Specify 10%	1
1			Credit 4.1	Recycled Content, Specify 25%	1
	1		Credit 4.2	Recycled Content, Specify 50%	1
1			Credit 5.1	Local/Regional Materials, 20% Manufactured Locally	1
		1	Credit 5.2	Local/Regional Materials, of 20% Above, 50% Harvested Locally	1
		1	Credit 6	Rapidly Renewable Materials	1
1			Credit 7	Certified Wood	1

Yes ? No

11	4	0	Indoor Environmental Quality	15 Points
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Y			Prereq 1	Minimum IAQ Performance	LEED req
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	Required
Y			Prereq 3	Acoustics and Noise Control, (AF Amendment)	Required
1			Credit 1	Carbon Dioxide (CO₂) Monitoring	1
1			Credit 2	Increase Ventilation Effectiveness	1
1			Credit 3.1	Construction IAQ Management Plan, During Construction	1
1			Credit 3.2	Construction IAQ Management Plan, Before Occupancy	1

1			Credit 4.1	Low-Emitting Materials , Adhesives & Sealants	1
1			Credit 4.2	Low-Emitting Materials , Paints	1
1			Credit 4.3	Low-Emitting Materials , Carpet	1
1			Credit 4.4	Low-Emitting Materials , Composite Wood	1
1			Credit 5	Indoor Chemical & Pollutant Source Control	1
	1		Credit 6.1	Controllability of Systems , Perimeter	1
	1		Credit 6.2	Controllability of Systems , Non-Perimeter	1
1			Credit 7.1	Thermal Comfort , Comply with ASHRAE 55-1992	1
	1		Credit 7.2	Thermal Comfort , Permanent Monitoring System	1
1			Credit 8.1	Daylight & Views , Daylight 75% of Spaces	1
	1		Credit 8.2	Daylight & Views , Views for 90% of Spaces	1

Yes ? No

1	3	3	Innovation & Design Process	5 Points
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	1		Credit 1.1	Innovation in Design : Certified Wood "Green" Furniture	1
	1		Credit 1.2	Innovation in Design : Interior Acoustics Performance	
	1		Credit 1.3	Innovation in Design : Occupant Education	
			Credit 1.4	Innovation in Design : Specific Title	
1			Credit 2	LEED™ Accredited Professional	1
		1	Credit 3	Integrated Landscape Management , (AF Amendment)	1
		1	Credit 4	Deconstruction , (AF Amendment)	1
		1	Credit 5	Advanced Resource Efficiency , (AF Amendment)	1

Yes ? No

30	17	19	Project Totals	69 Points
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Certified 26-32 points Silver 33-38 points Gold 39-51 points Platinum 52-69 points

APPENDIX M
LEED Owner's Project Requirements

Not Used

APPENDIX N
LEED Requirements for Multiple Contractor Combined Projects

Not Used

APPENDIX O
LEED Strategy Tables

Not Used

APPENDIX P**LEED Registration of Army Projects****15 April 2010****Number of Registrations**

Each building must be registered separately, except multiple instances of a standard building on a shared site may be registered as a single project. If a single registration for multiple buildings is chosen, all buildings under the single registration must earn exactly the same points. Do not register buildings that are exempt from a specific LEED achievement requirement.

Typical Registration Procedure

1. Login, complete the online registration form (see guidance below) at the GBCI LEED Online website <http://www.gbci.org/DisplayPage.aspx?CMSPageID=174> and submit it online.
2. Pay the registration fee via credit card (USACE staff: credit card PR&C is funded by project design or S&A funds).
3. GBCI will follow up with a final invoice, the LEED-online passwords and template information.
4. The individual who registers the project online is, by default, the Project Administrator.

Completing the Registration Form**BEFORE YOU BEGIN:**

Create a personal account with USGBC if you do not have one.

You will need the following information:

Project name as it appears in P2 (obtain from USACE Project Manager)

Building number/physical address of project

Zip code for Installation/project location

Anticipated construction start and end dates

Total gross area all non-exempt buildings in registration

Total construction cost all non-exempt buildings only (see Project Details Section instructions below)

ACCOUNT/LOGIN INFORMATION

1. The person registering the project **must have an account with USGBC** (login and password) to complete the form. Go to <http://www.gbci.org/>, click on "register a project" at the drop-down menu for project certification (at the top of the page) and select "register now for LEED 2009" to start the project registration process. If you have an account, login with your email address and password and select "register new project" to proceed. If you do not have an account, you may select "register a new account" and follow the instructions. It is recommended that you create an account separately on the USGBC website before you start the form. **IMPORTANT: USACE team members are members of USGBC and are eligible for Member prices. USACE team members registering projects should be sure to include the USACE Corporate Access ID in their personal account profile (if you do not have it contact richard.l.schneider@usace.army.mil or judith.f.milton@usace.army.mil for the number).**
2. The Account/Login Information section is filled out by the person registering the project. It may be a Contractor or a USACE staff member.

ELIGIBILITY SECTION

Follow directions (accepting the terms and conditions)

Review your profile information and make corrections if needed

RATING SYSTEM SELECTION SECTION

Select single project registration and I know which rating system.

Select the rating system - currently only LEED-NC and LEED for Homes are approved for Army use without special approval.

LEED Minimum Program Requirements: select YES

RATING SYSTEM RESULTS SECTION

Confirm selected rating system.

PROJECT INFORMATION SECTION

Project Title: Begin the project title with a one-word identifier for the Installation. Do not include the word "Fort". After this match the project name used in P2 (contact the USACE Project Manager for this information) and identify the building being registered. Example: "Stewart 4th IBC - DFAC".

Project Address 1 and 2: This is the physical location of the project. Provide building number, street address, block number or whatever is known to best describe the location of the project on the Installation.

Project City: Installation Name

State, Country, Zip Code: Self-explanatory

Anticipated Construction Start and End Dates: Self-explanatory – give your best guess if unknown. Note that required data entry format is: 1 or 2 digit month/1 or 2 digit date/4 digit year (example 3/23/2010)

Gross Square Footage: Provide total area all buildings in LEED project. Exclude the area of any buildings that are exempt from the LEED achievement requirement (for example, exclude an unconditioned storage shed to be constructed with a barracks complex).

Is Project Confidential: Indicate NO except, if project has security sensitivity (elements that are FOUO or higher security), indicate YES.

Notification of Local Chapter: Indicate NO unless Government/USACE Project Manager requests you to indicate YES.

Anticipated Project Type: Select the most appropriate option from the drop-down menu.

Anticipated Certification Level: Select the applicable option from the drop-down menu (Silver is the usual level).

PROJECT OWNER INFORMATION SECTION

Project Owner First Name, Last Name, email, phone, address: The Project Owner is the USACE Project Manager. Obtain this info from the USACE Project Manager.

Organization: U.S. Army Corps of Engineers. This field MUST be completed this way because it will be used as a search field by higher HQ to find all USACE registered projects. You may supplement it with district name at the end but DO NOT revise or use an acronym.

May we publish Owner information: Indicate NO

Owner Type: Pick Federal Government from drop-down menu.

Project Owner Assertion: Check the box

PAYMENT INFORMATION

Self-explanatory

APPENDIX Q
REV 2.1 – 30 SEP 2010
AREA COMPUTATIONS

Computation of Areas: Compute the “gross area” and “net area” of facilities (excluding family housing) in accordance with the following subparagraphs:

(1) Enclosed Spaces: The “gross area” is the sum of all floor spaces with an average clear height $\geq 6'-11"$ (as measured to the underside of the structural system) and having perimeter walls which are $\geq 4'-11"$. The area is calculated by measuring to the exterior dimensions of surfaces and walls.

(2) Half-Scope Spaces: Areas of the following spaces shall count as one-half scope when calculating “gross area”:

- Balconies
- Porches
- Covered exterior loading platforms or facilities
- **Covered but not enclosed spaces, canopies, training, and assembly areas**
- Covered but not enclosed passageways and walks
- Open stairways (both covered and uncovered)
- Covered ramps
- Interior corridors (Unaccompanied Enlisted Personnel Housing Only)

(3) Excluded Spaces: The following spaces shall be excluded from the “gross area” calculation:

- Crawl spaces
- Uncovered exterior loading platforms or facilities
- Exterior insulation applied to existing buildings
- Open courtyards
- Open paved terraces
- Uncovered ramps
- Uncovered stoops
- Utility tunnels and raceways
- Roof overhangs and soffits measuring less than 3'-0" from the exterior face of the building to the fascia

(4) Net Floor Area: Where required, “net area” is calculated by measuring the inside clear dimensions from the finish surfaces of walls. If required, overall “assignable net area” is determined by subtracting the following spaces from the “gross area”:

- Basements not suited as office, special mechanical, or storage space
- Elevator shafts and machinery space
- Exterior walls
- Interior partitions
- Mechanical equipment and water supply equipment space
- Permanent corridors and hallways
- Stairs and stair towers
- Janitor closets
- Electrical equipment space
- Electronic/communications equipment space

APPENDIX R

Preliminary Submittal Register

NOTE TO SPECIFIER:

1. Appendix R" will be a Adobe Acrobat pdf version of the Specifier completed "Sample Preliminary Submittal Register." The Sample Register is Excel Spreadsheet format of the RMS Input Form 4288A, which serves two purposes.
2. First, The Register allows the both Government and the Proposers to see and estimate the cost of the Division 00 and Division 01 submittals required by the contract in addition to the Contractor generated submittal register items developed during Design After Award.
3. Secondly, after award, the Government will provide the Contractor the actual Excel Spreadsheet for the Contractor to input the data into RMS to create the Submittal Register used during contract performance. See Section 01 33 00 (Submittal Procedures), paragraph 1.8 (Submittal Register) for the contract requirements.
4. For the contract or task order Solicitation, the Specifier must complete APPENDIX R, found at the following link:
<http://rfpwizard.cecer.army.mil/HTML/Docs/Refs/Sample%20Preliminary%20Submittal%20Register.xls> , save it as a PDF file and then upload it into the Wizard as Appendix R.
5. The RMS Input Form initially includes submittals required by the standardized Model RFP Division 00 and Division 01 Sections, except Section 01 10 00, paragraph 3. Examine the Special Contract Requirements, paragraphs 3 and 6 and any other locally developed portions of the RFP for required submittals and add them to the Input Form. Do not duplicate submittals already listed in the standardized RMS Input Form, because the Contractor needs to submit this information only once.
6. After award, the Government provides the Excel spreadsheet to the selected contractor to develop and input the RMS Input form for the submittal register required by paragraph 1.8 of Section 01 33 00, Submittals.

General Requirements (Paragraph 3.1)

3.1.1 Introduction: The Fort Drum ASOS administrative, maintenance, vehicle and trailer storage building functions were extensively discussed and planned with the ASOS users during the design charrette as outlined in the final design charrette report dated 07/08/2009. The Fort Drum ASOS space authorizations listed in the approved DD Form 1391 were identified based on the facilities allowances outlined in the Air Force Handbook (AFH) 32-1084 dated 01 September 1996. According to the DD Form 1391, the total authorized space for the new ASOS facility is **32,926 gross square feet (GSF)**. The required (actual) building size for the administrative and maintenance wings, totals **31,345 GSF**. The enclosed vehicle storage building is **25,900 SF** and the open covered trailer storage building is **12,288 SF**.

3.1.2 Administrative Wing: Based on the approved DD Form 1391 and guidelines from the AFH 32-1084, the authorized space for the administrative wing is **18,526 SF** and programming and planning work sessions and further refinement during the design charrette resulted in the reduced two-story administrative building square footage to **14,575 SF**, not including hallways and common use areas, and will be composed of the following spaces:

First Floor:

- Weather / AMLO and offices
- Flight Ops and offices
- Mission Planning and Briefing
- Training / Scheduling
- Physical Training
- Telecom
- M/W restrooms and showers
- Armory
- Admin support spaces (copy, storage, etc)
- Mechanical and Electrical Rooms

Second Floor

- Commander's Office and Conference Room
- Operations Director office
- CSS
- Operations Assistants
- IFACT
- SIPR
- Squadron offices and administrative areas
- Operations storage
- Meeting Room
- Break Room
- Telecom
- M/W restrooms and showers

3.1.3 Maintenance Wing: The authorized space for the maintenance wing of the ASOS facility, based on the DD Form 1391, is **7,122 SF**. The required (actual) square footage

for the one-story maintenance wing is **6,918 SF** not including hallways and common use areas and will be composed of the following spaces:

- Maintenance offices
- Radio office
- Maintenance storage
- Vehicle and Radio Maintenance Bays
- Storage areas

3.1.4 Vehicle Storage: The authorized space for the enclosed vehicle storage area is **25,900 SF**. The required (actual) square footage for the vehicle storage is **25,900 SF**, including the following components:

- 178 BAMS lockers
- 108 storage cabinets
- Parking for 54 vehicles
- Parts Washroom

3.1.5 Trailer Storage: The authorized space for the covered (with open front) trailer storage area is **12,288 SF**. The required (actual) square footage is **12,288 SF**, including the following components:

- 24 vehicle storage bays
- 12 storage rooms

3.1.6 Personnel Data: The new facility will house **128 full-time personnel** in the following areas:

- Administrative Wing – total of 116 full-time personnel including:

AREA	TOTAL
Weather/AMLO, Flight Ops A-D: 17 each	85
Offices for Weather/AMLO, Flight Ops A-D: 2 each	10
Training / Scheduling	5
IFACT	1
SIPR	3
Squadron Superintendent	1
CMDR	1
Ops Superintendent	1
Director of Operations	1
Assistant Ops Direct	3
1 st Sergeant	1
CSS	4
Total	116

- Maintenance Wing – total of 12 full-time personnel including:

AREA	TOTAL
Material Controls Office	2
Maintenance Supervisor Office	2
Radio Office	6
Vehicle and Power Pro Office	2
Total	12
Grand Total	128

3.1.7 Detailed ASOS Program and Room Matrix: Refer to Appendix CC for the detailed space program for the Fort Drum ASOS facility. The *Authorized* column lists the space allowance based on the DD Form 1391. The *Required* column lists the areas used to design the new facility.

Functional Requirements (Paragraph 3.2)

3.2.1 General: The 20th ASOS project is located at the southeast corner of the intersection of 45th Infantry Drive and Enduring Freedom Drive in Fort Drum, NY. The project includes a new two-story administrative facility, a one story maintenance building, a vehicle storage building and an open covered structure for trailers. All project buildings are required to meet the DD Form 1391 program GSF requirements, all required USACE New York District engineer and technical instructions, UFC standards, IBC, NFPA, Fort Drum design guidelines, ADA regulations and all other applicable regulations and codes. The final required spaces for the administration and maintenance ASOS building resulted in 31,345 GSF, which is 1,581 GSF less than the required DD Form 1391 program. The one-story vehicle maintenance building is attached to the training facility and is designed to accommodate current and anticipated vehicles such as the MRAP, which requires additional ceiling and door height as well as a special concrete floor slab design to sustain required loads. The vehicle maintenance building and enclosed vehicle storage building are attached for direct access to avoid exposure to severe winter weather conditions at Fort Drum.

3.2.2 Administrative Building

3.2.2.1 The administration building ground floor contains the main entrance, a two-story vestibule, and lobby with a reception area. With no public functions, there were no critical adjacencies related to the main entrance. However flight operations will have external access located along the northeast side of the first floor with covered vestibules facing the secured parking area.

3.2.2.2 The required large physical training room resulted in additional showers. The physical training room, male and female toilets and showers are adjacent to the main entrance. Lockers, hooks for clothing and bags are provided in the bathroom areas.

3.2.2.3 Flanking the north/south main corridor is the secured armory room, training/scheduling, mission planning/briefing, flight OPS with associated offices, weather/AMLO with associated offices, and stan/ eval room. The storage rooms, mechanical room, building electrical and water service rooms are all located on the southern corner of the facility to take advantage of adjacent utility tie-in opportunities.

3.2.2.4 Fire egress stairs and building exits on both ends of the facility and an ADA compliant elevator for access to the second floor are provided to comply with code requirements. The machine room is located adjacent to the elevator on the ground floor at the southeast end. The elevator with a minimum 3000# capacity and 42" wide opening is provided to transport furniture to the 2nd floor.

3.2.2.5 The second story of the facility is devoted to the command suite, break room and meeting spaces. Additional toilet and shower facilities are also assigned to the second floor. The administration building second floor will be accessible via the ground floor main lobby south stair, north stair, and elevator.

3.2.2.6 A large meeting room with storage, control area and pantry is adjacent to the break room to allow food and other supplies to be passed easily between the two spaces for events. An area designed to accommodate VTC equipment such as a back-projected screen is included. In order to consolidate secure areas, SIPR and IFACT were combined on the southeast corner of the second floor. Interior walls between the two areas will require sound dampening, but are not required to comply with additional security requirements.

3.2.2.7 The commander's suite with adjoining conference room, squadron superintendent office, first sergeant office, director of operations office, operations superintendent office, assistant operations area, commander support staff, and waiting area flank the corridor along the southwest side of the second floor. Telecom requirements are stacked as closely as possible above each other to minimize runs.

3.2.3 Vehicle Maintenance: The second component of the ASOS building is the two-bay attached vehicle maintenance facility. ASOS users stated that the vehicle maintenance bays are used for communications equipment maintenance and testing, but not vehicle maintenance. Wash racks, overhead cranes, and other related equipment are not required.

3.2.3.1 Functional drive-through bays and hallways connecting the bays to the administration building and the BAMS lockers areas are required by the users. Storage and office spaces are consolidated, with the majority of the storage areas located adjacent to the BAMS lockers. The MRSP supply storage room has an exterior roll-up door access. Separate toilets and showers are not required for the maintenance area since they are within close proximity in the administration building.

3.2.3.2 The one-story area contains the maintenance superintendent office, material control room, vehicle and power pro room, radio office, radio maintenance bay, secured portable radio storage and general storage.

3.2.3.3 Due to the MRAP requirements a 25-foot clear height, 2-bay vehicle maintenance space with four 18-foot high by 16-foot wide motorized roll-up or insulated sectional doors are required. Floor drains are required.

3.2.4 Vehicle Storage: The enclosed vehicle storage building 1391 requirement is 25,900 GSF. Due to the extreme winter weather conditions at Fort Drum, users requested interior access to the vehicles. Therefore, the facility will be attached to vehicle maintenance bays and accessible via a corridor between the battery and radio filed storage rooms.

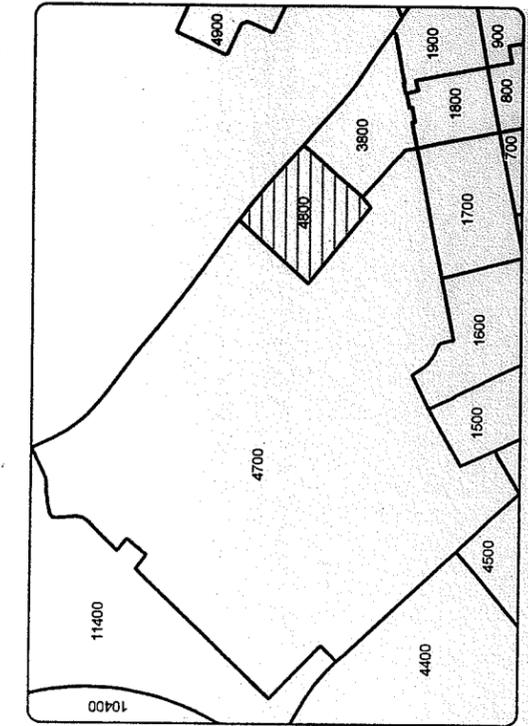
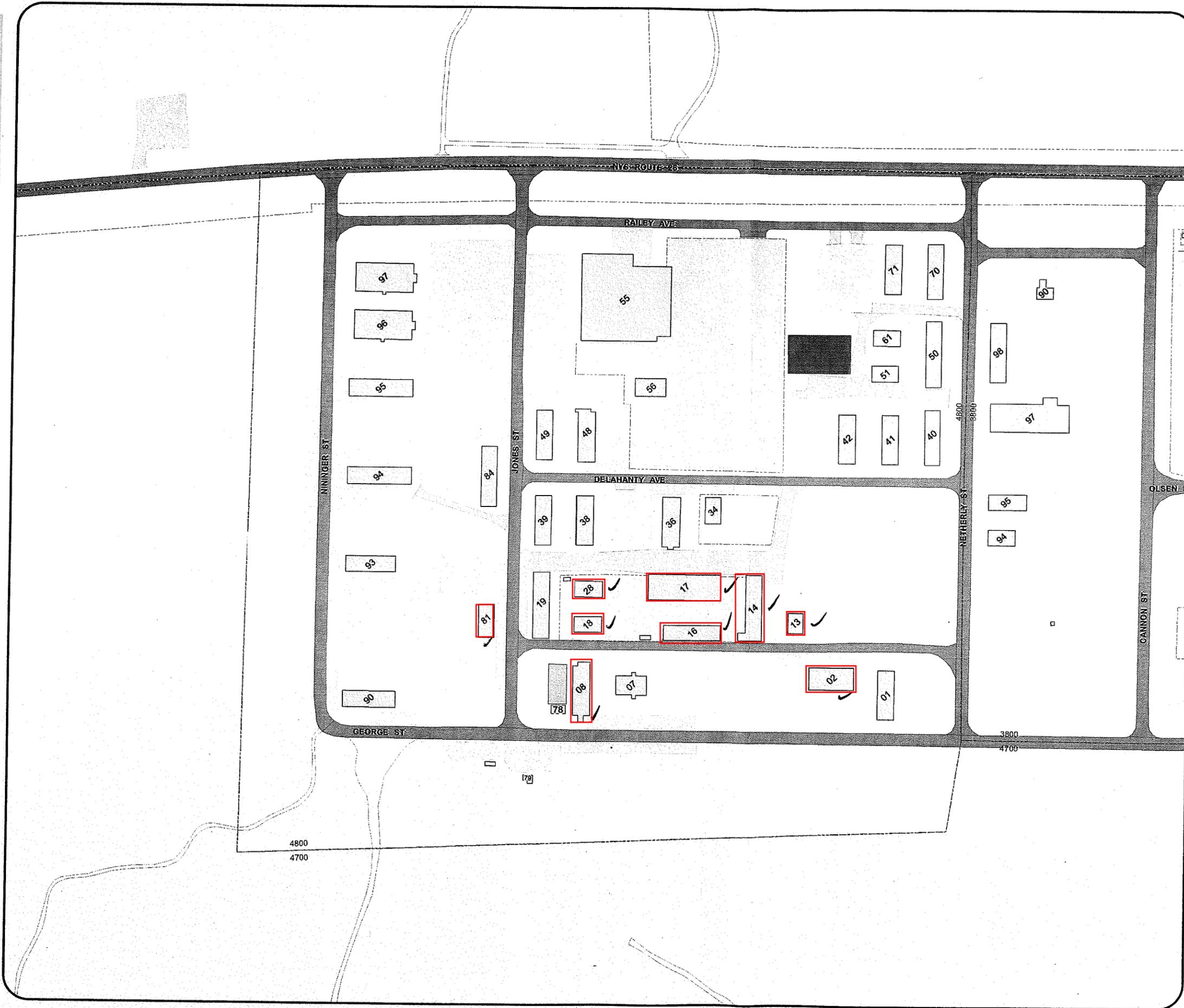
3.2.4.1 This storage building is planned to contain 54 vehicles and 178 BAMS lockers. Designed as a doubled-loaded 'corridor' with roll-up doors on both the north and south

sides, each 13.5-foot wide by 18-foot deep bay is designed to accommodate a humvee with its doors open for loading. All minimum bay door openings are to be 11'-6" wide x 12'-0" high, based on the existing vehicle storage building at Fort Drum. The central spine includes a passage aisle and a center row of two BAM lockers and two steel box lockers for each vehicle. One 18-foot wide x 60-foot long building deep bay will be allocated for basic parts washing and provided with a hose bibb.

3.2.4.2 Approximately 2,274 SF adjacent to the maintenance bays will be used to provide the balance of BAM storage lockers, for a total of 178 within the vehicle storage building. Lockers will be stacked two-high with aisles in between that will allow easy loading by personnel. Six fire egress doors will also be provided within the vehicle storage area. The vehicle storage building required floor drains will also be provided.

3.2.5 Covered Trailer Building: The final building requirement is a 12,288 GSF covered, open trailer storage structure constructed with three full-height walls and an open front. This structure will contain storage rooms and space for 24 trailers.

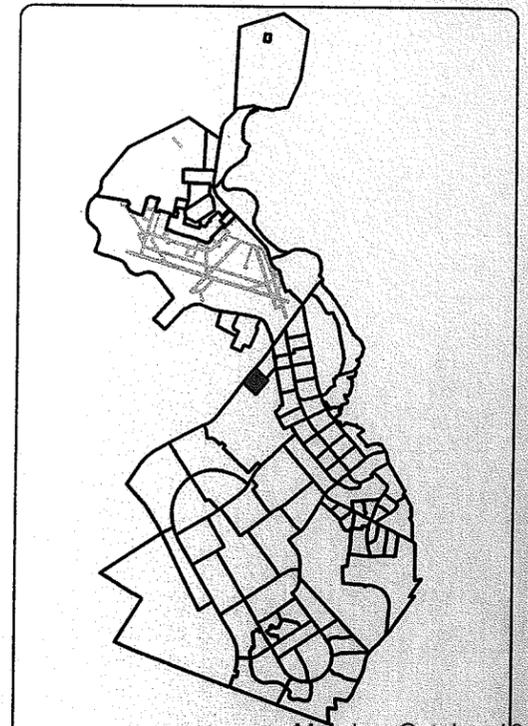
FORT DRUM BLOCK MAP



4800 BLOCK

MAP LEGEND

- BUILDINGS
- BOUNDARY
- Blocks
- RAILROAD
- ROADS
- FENCE
- Water
- ATHLETIC FIELD
- ATHLETIC COURT

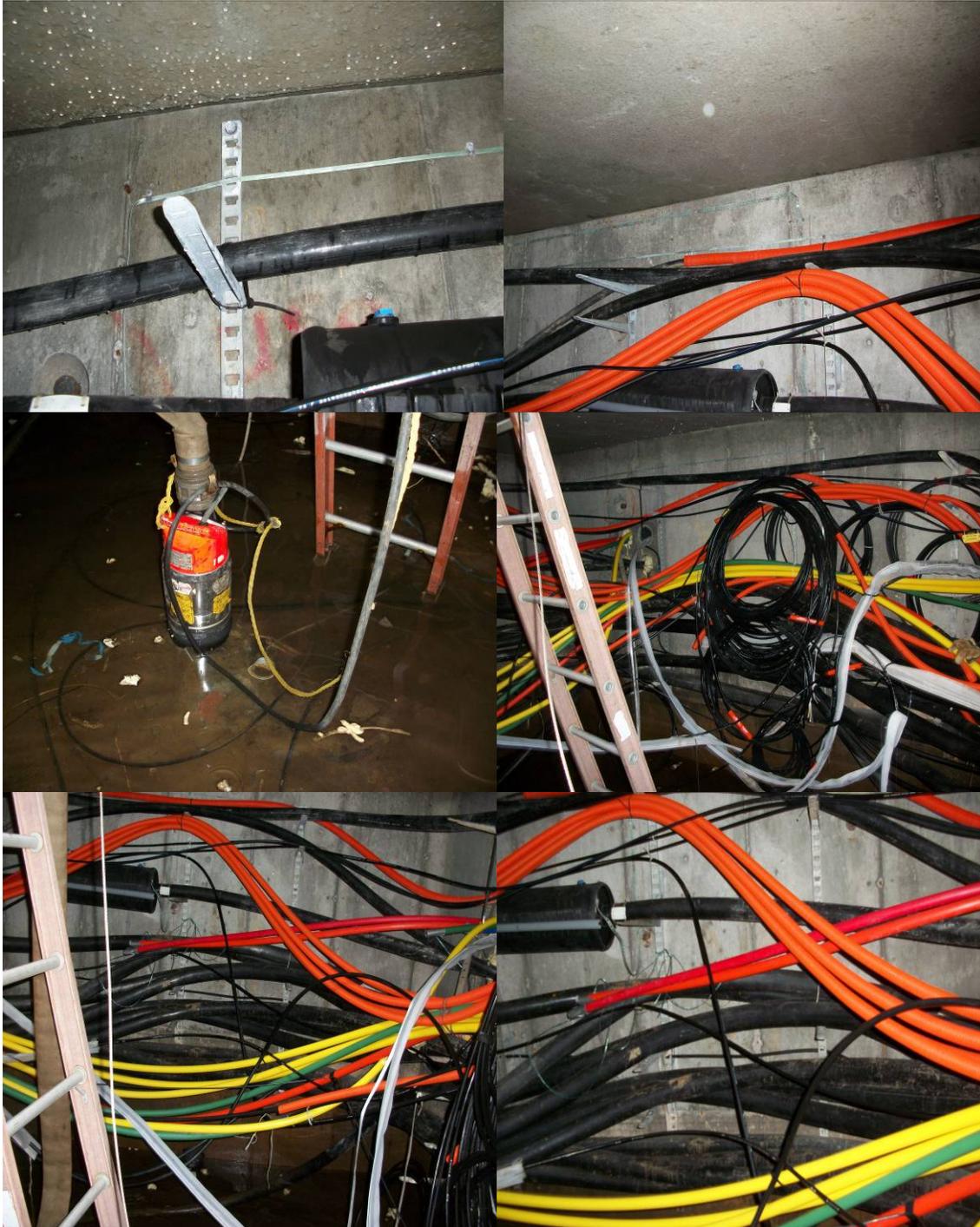


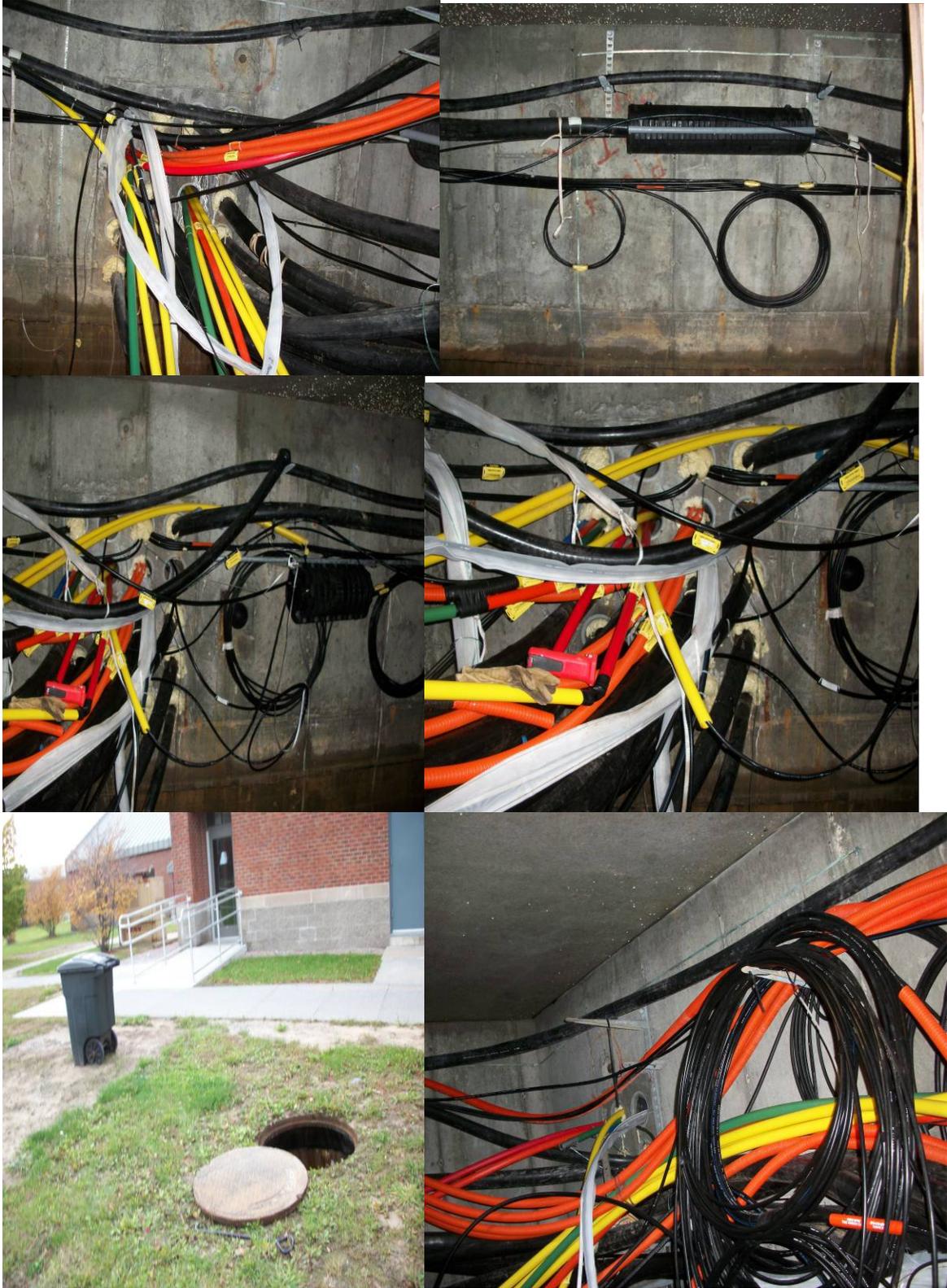
THIS MAP BOOK IS PRODUCED BY PUBLIC WORKS, MASTER PLANNING, FORT DRUM, NY
Bed Digger: 72-2438

ASOS MANHOLES FROM 10410 TO BUILDING SITE

Manhole 116-A: Next to SN#5 10410

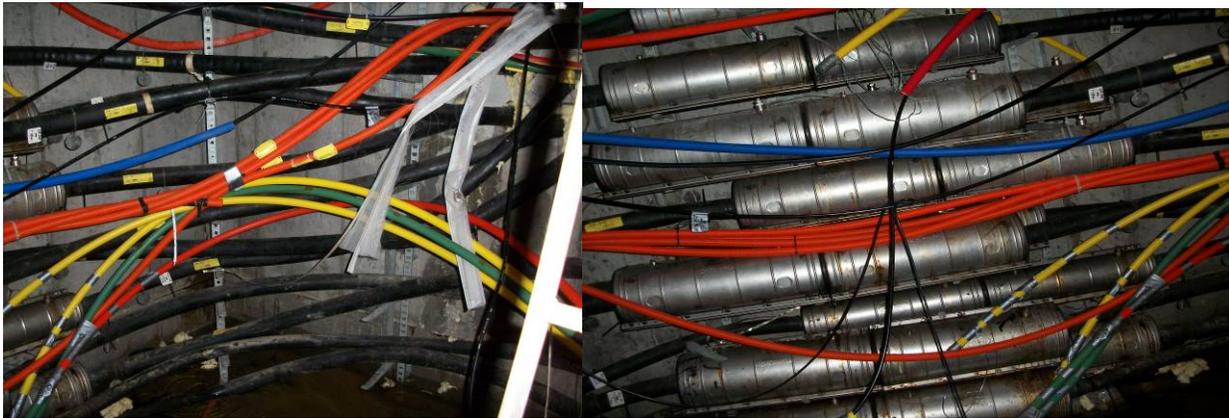
All manholes need proper racking and grounding. No racks are grounded in any of the manholes. There is a fiber path from SN to new proposed building site. There is a 12 pr bsw lying on the manhole floor that needs to be racked to avoid damage. It's not labeled but continues past DFAC on South Riva Ridge.





Manhole# 116



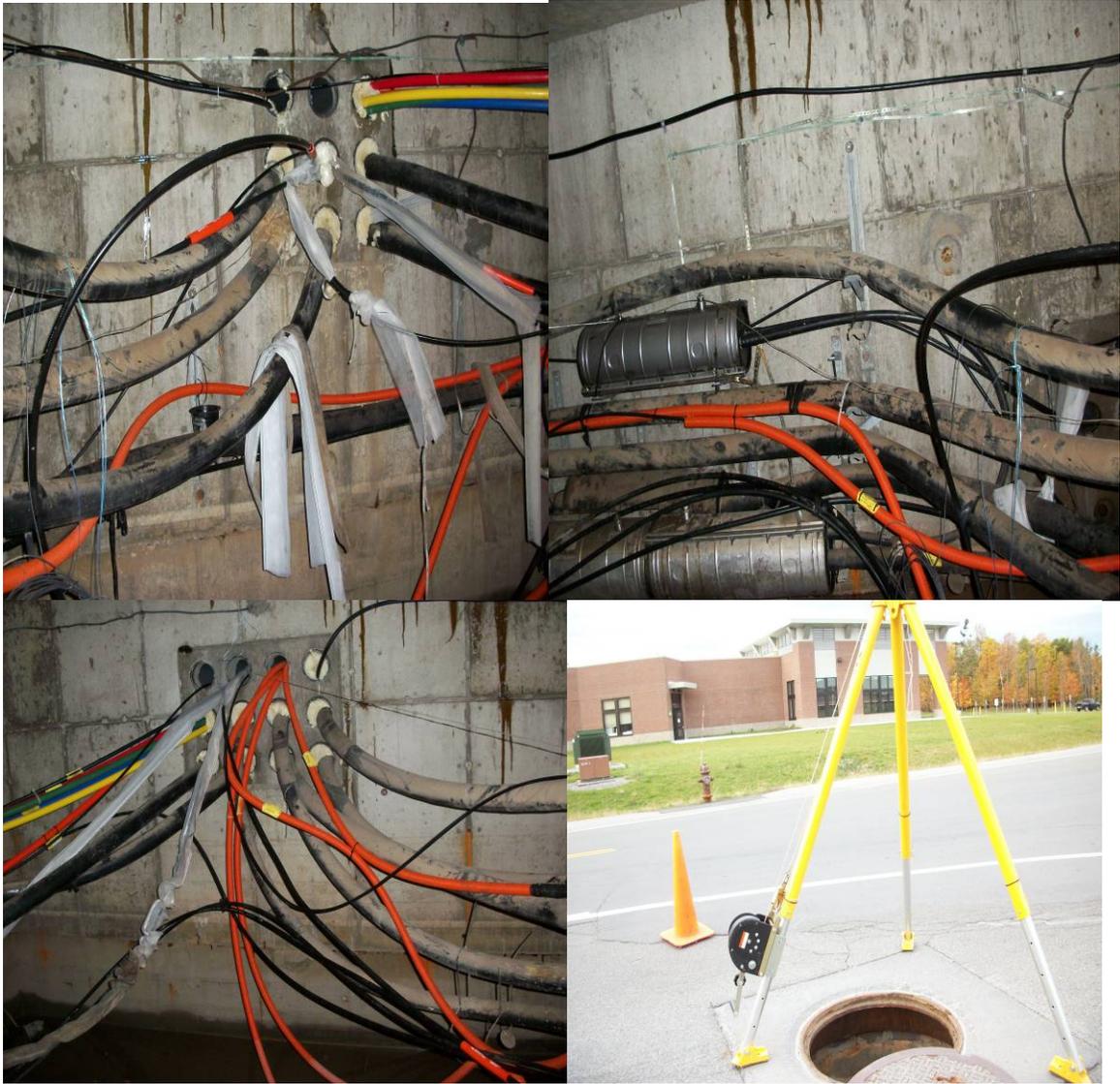




MH#115







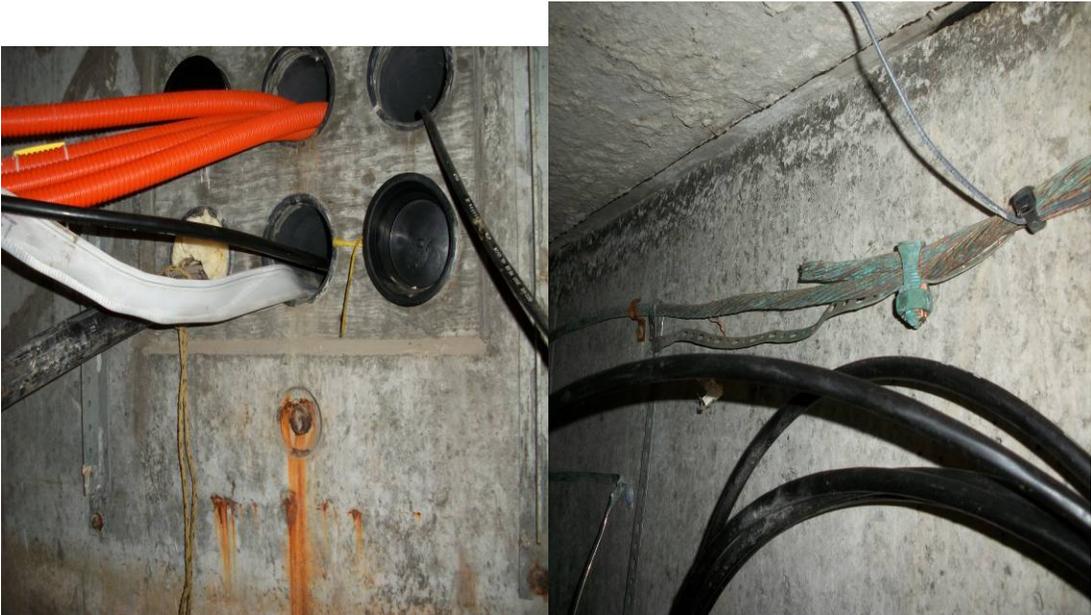
MH# 140

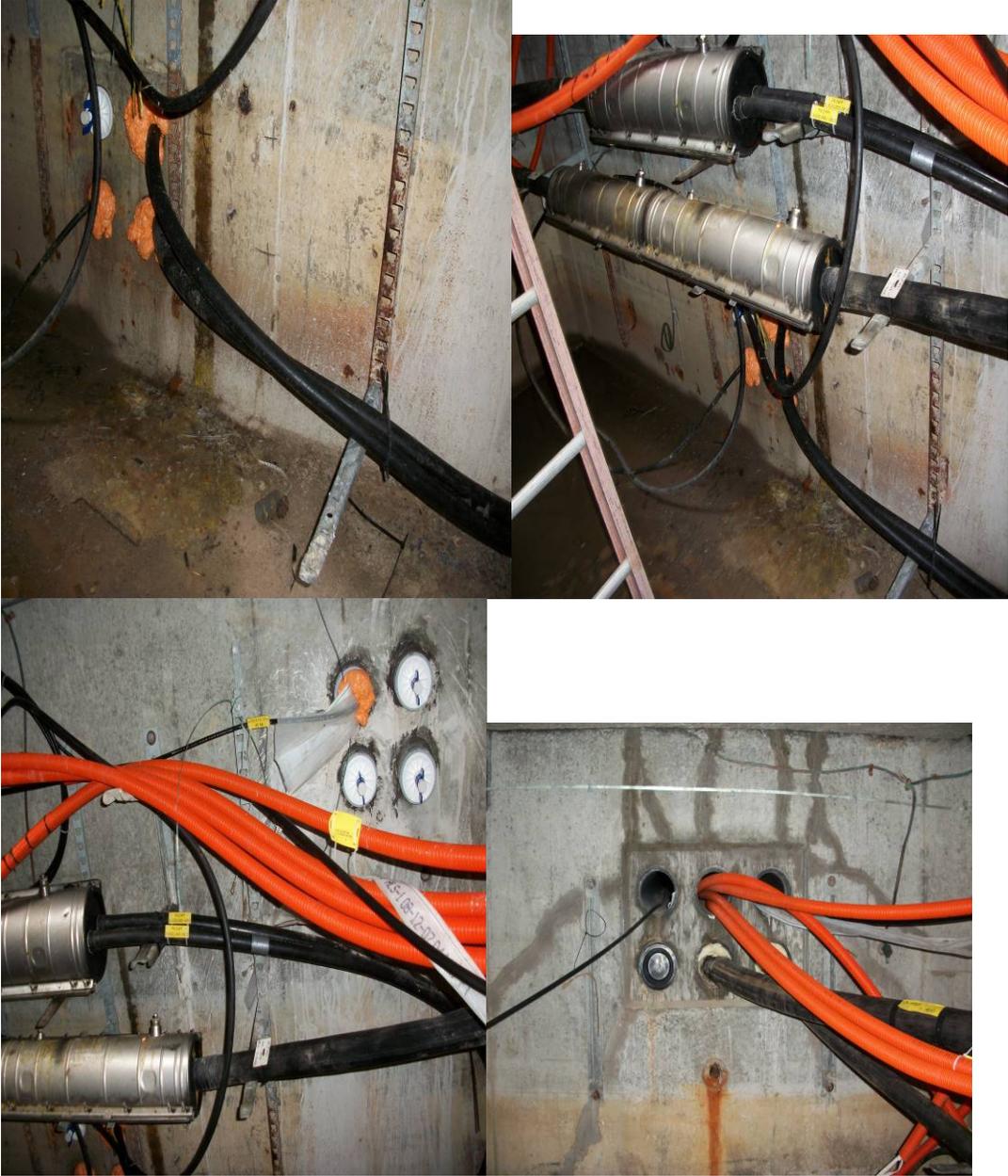






MH#141.

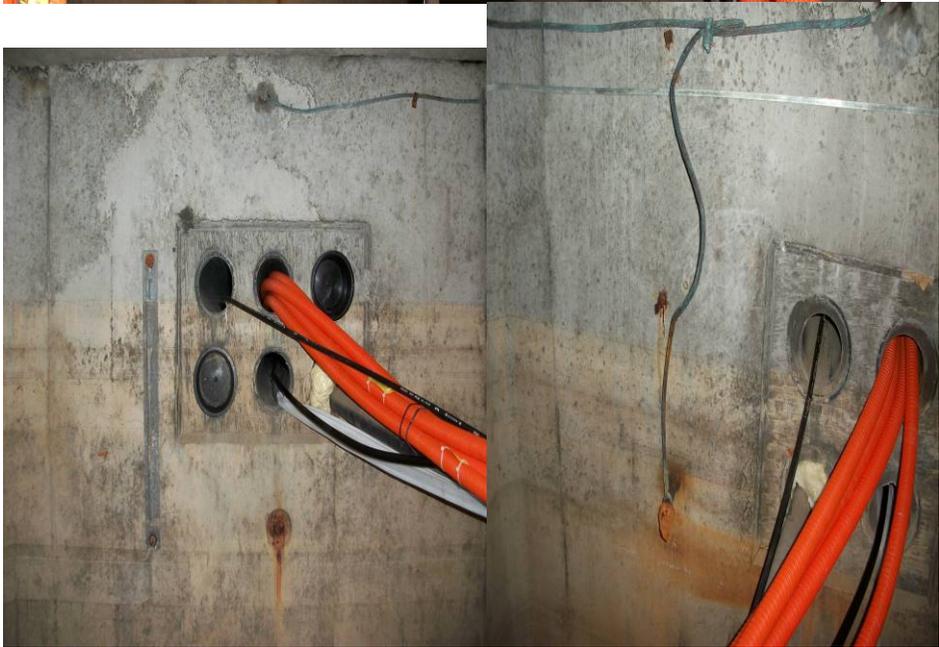






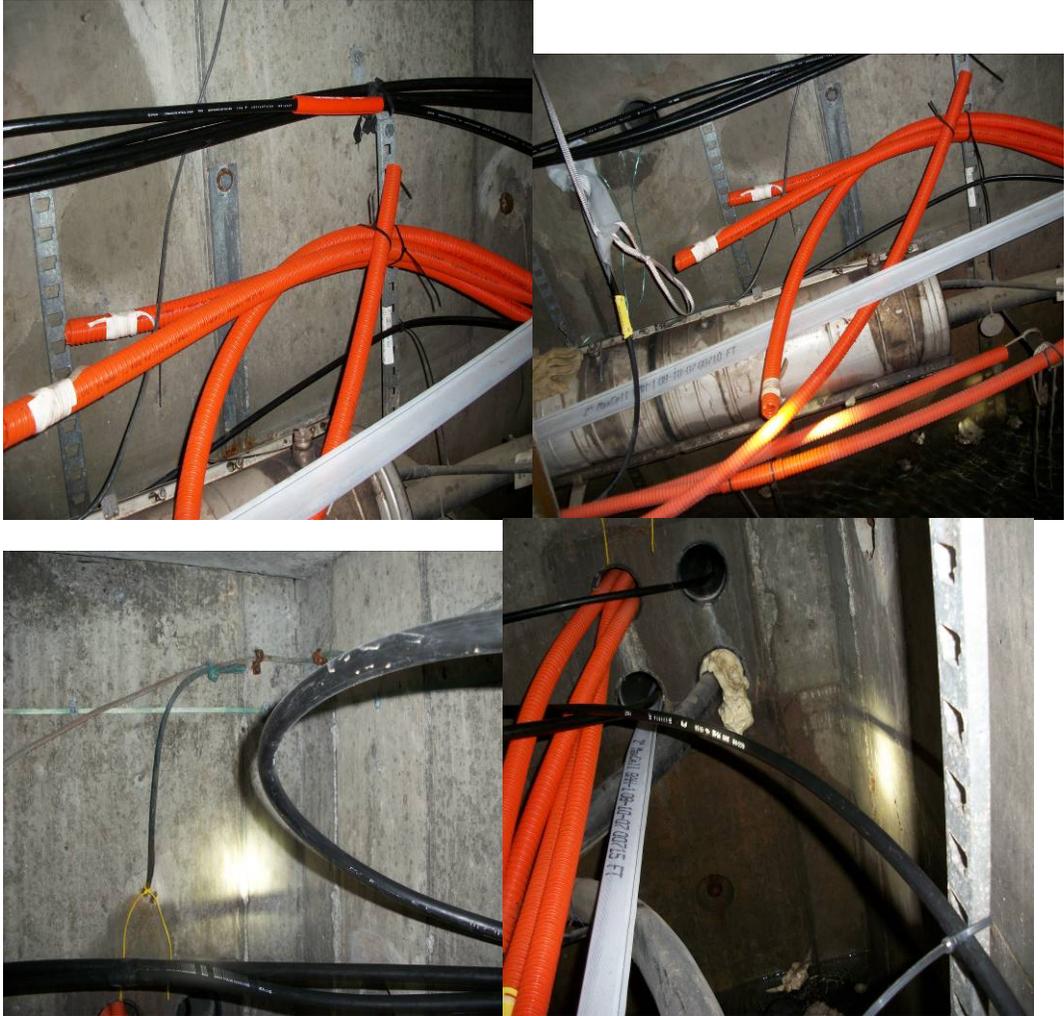
MH 142





MH#88





MH#89





MH# 88-A







Fire Protection and Life Safety Narrative

Referenced Codes and Standards

The latest adopted editions of the following Codes and Standards will be used:

- Fort Drum Building Design Standards (BDS), Fort Drum, NY (Preliminary Draft).
- Unified Facilities Criteria (UFC) 1-200-01, Design: General Building Requirements (20 June 2005).
- Unified Facilities Criteria (UFC) 3-600-01, Design: Fire Protection Engineering for Facilities (26 September 2006). In case of conflicts between this UFC and any other DoD document, referenced code, standard, or publication, this UFC must take precedence (UFC 3-600-01, 1-4.5).
- Unified Facilities Criteria (UFC) 4-021-01, Design and O&M: Mass Notification Systems, (9 April 2008).
- IBC 2006. Apply as modified by UFC 3-600-01 (per UFC 1-200-01).
- NFPA 1, Uniform Fire Code, 2006 edition.
- NFPA 13, Installation of Sprinkler Systems, 2007 edition.
- NFPA 24, Installation of Private Fire Service Mains and Their Appurtenances, 2007 edition.
- NFPA 70, National Electrical Code, 2005 edition.
- NFPA 72, National Fire Alarm Code, 2007 edition.
- NFPA 101, Life Safety Code, 2006 edition (for building construction related to egress and safety to life. For conflicts between IBC and NFPA 101, conform to NFPA 101 and applicable criteria in UFC 3-600-01. (UFC 3-600-01, 2-1.1)).
- ADA/ABA Guidelines, July 23, 2004. These update the Americans with Disabilities Act Accessibilities Guidelines (ADAAG), as amended through January 1998, and the guidelines for the Architectural Barriers Act of 1968.
- UFAS, Uniform Federal Accessibility Standards.

ASOS Building Use Group Classification and Construction Type

The structure is a two story office, vehicle systems maintenance and storage building. The gross first floor area of the building is approximately 46,450 square feet. It contains administrative and

support areas (Use Group B, IBC Section 904.1), vehicle systems maintenance and shop areas (Use Group F-1, IBC Section 306.2) and a vehicle storage area (Use Group S-2, IBC Section 311.3).

The gross second floor area of the building is approximately 9,350 square feet and contains administrative areas (Use Group B, IBC Section 904.1).

The building is classified as a nonseparated mixed use occupancy (IBC 508.3.2). Nonseparated occupancies shall be individually classified as to use. IBC requirements shall apply to each portion of the building based on the occupancy classification of that space except that the most restrictive applicable provisions of IBC Chapter 9, Fire Protection Systems, shall apply to the entire building. The allowable area and height of the building shall be based on the most restrictive allowances for the occupancy groups under consideration for the type of construction of the building in accordance with IBC 503.1 (IBC 508.3.2.2). No separation is required between occupancies (IBC 508.3.2.3).

The building will be constructed using Type IIB Construction and will be surrounded by public ways or yards not less than 60 feet in width. Automatic fire protection sprinkler systems in accordance with IBC 903 will be provided throughout the building. Accordingly, the allowable area for the building shall not be limited (IBC 507.4).

Fire Department (Emergency) Vehicle Access

A paved emergency vehicle access shall be provided from the road to within 33 feet of the front of the building, and shall have sufficient turning and maneuvering space as defined within NFPA 1 (UFC 3-600-01, 2-10). An all weather ground access surface for pumper apparatus shall be provided within 150 ft. of the sprinkler system fire department connection.

Sprinkler Systems

The new ASOS building will be protected throughout by an automatic sprinkler system (UFC 3-600-01, 6-33). The sprinkler system shall be designed in accordance with UFC 3-600-01 and NFPA 13. A fire department connection shall be provided as required by, and in a location acceptable to the Fire Marshal.

Most of the building will be protected with wet pipe style sprinkler systems. Areas subject to freezing will be provided with dry pipe style systems. Certain radio equipment areas of the vehicle maintenance wing will be provided with preaction style sprinkler system protection to minimize the potential for inadvertent sprinkler water damage.

A summary of water supply requirements based on hazard classification of the rooms, per UFC 3-600-01, 4-2.3 and Appendix B, is provided in the following table.

Sprinkler System Design				
Area	Description	Classification	Density/Area (gpm/sq ft / sq ft)	Hose
Vehicle Maintenance Wing	Vehicle system maintenance, shops, storage areas	OH1 (UFC 3-600-01 B-1.2 & NFPA 13 13.9)	0.15/3000 (NFPA 13 Table 11.2.3.1.5, except 3000 sq ft per UFC 3-600-01 4-2.3.1)	500 gpm for 60 minutes (UFC 3-600-01 4-2.3.1 & Table 4-1)
All administrative and support areas.	Offices, Corridors, Restrooms, etc.	LH (NFPA 13 A-5.3.2 & UFC 3-600-01 B-1.3)	0.10/3000 (NFPA 13 Table 11.2.3.1.5, except 3000 sq ft per UFC 3-600-01 4-2.3.1)	250 gpm for 60 minutes (UFC 3-600-01 4-2.3.1 & Table 4-1)
Vehicle Storage	Vehicle parking	OH1 (UFC 3-600-01 B-1.2 & NFPA 13 13.9)	0.15/3000 (NFPA 13 Table 12.1.10.1.1 Curve 4, except 3000 sq ft per UFC 3-600-01 4-2.3.1)	500 gpm for 60 minutes (UFC 3-600-01 4-2.3.1 & Table 4-1)

Fire Service Water Supply System

Complete information on the site water supply is not available at this time, but the site will be supplied with water for both fire protection and domestic purposes by existing mains, extended to the site as necessary. Additional mains will be provided to supply new fire hydrants as necessary. The water supply system will be tested and evaluated as to its capabilities to support the fire protection suppression systems demands.

New underground mains (combined domestic and fire service, minimum 8-inch diameter) connected to the existing mains will be designed and installed in accordance with NFPA 24. The layout of the new mains, together with the existing mains, will attempt to maintain a looped /gridded system in accordance with UFC 3-600-01. Isolation valves will be installed as appropriate.

A backflow preventer is required on the supply line to the sprinkler system. Means to perform a full flow test will be incorporated into the design by a test valve and header.

A fire hydrant will be located at the front of the building (within 150 feet of the Fire Department Connection) to meet UFC criteria. Fire hydrants will also be located around the building as required by UFC 3-600-01.

If the existing water supply system is unable to meet the flow and pressure demands of the sprinkler systems installed in the ASOS building, a fire pump and tank (if necessary) will be provided.

Fire Detection and Alarm System

The ASOS building will be provided with a complete addressable fire alarm system (UFC 3-600-01, 5-3.1). The system will include a fire alarm control panel, manual fire alarm stations, smoke detectors at FACP and as required in other areas, provisions for monitoring fire protection systems, audio/visual occupant notification devices, and equipment compatible with the base systems, to transmit alarm, trouble and supervisory signals to the

fire department alarm receiving station. The fire alarm control panel will be installed in an electrical or mechanical room (as directed) with access from the outside of the building.

No general area smoke detection is needed unless required by UFC 3-600-01 or other applicable criteria (such as NFPA 72). The areas radio equipment areas of the vehicle maintenance wing provided with preaction sprinkler system protection will have smoke detectors as necessary for the initiation of the preaction sprinkler system.

The systems will be designed in accordance with the applicable provisions of UFC 3-600-01, NFPA 72, ADA/ABA, UFAS, and other applicable codes, standards, and regulations.

- Panel boxes will be keyed alike.
- The system will be programmable from the fire alarm control panel.
- Manual fire alarm stations will be addressable, non-break glass, and key re-settable. They will typically be located at exits and other locations as required by applicable codes and standards. Double action metal construction manual pull stations will be provided.
- Audio/visual occupant notification devices will be wall- or ceiling-mounted at strategic locations so as to be heard and/or seen as required by the applicable codes and standards.
- The fire alarm system will be provided with battery backup that meets the requirements of NFPA 72 and UFC 4-021-01.
- All cabling will be installed in conduit.
- A combined mass notification system and fire alarm system as described in UFC 4-021-01 is acceptable. The fire alarm system will be arranged to transmit signals to the Fort Drum fire department alarm headquarters.

Mass Notification System

The ASOS building will be provided with a Mass Notification System in accordance with UFC 4-021-01, and will be integrated into the Fire Alarm System. Separate circuits of amber-colored strobes will be provided to alert personnel. The system will include the capability to broadcast the required pre-recorded messages as well as live messages via microphones at strategic locations in the building.

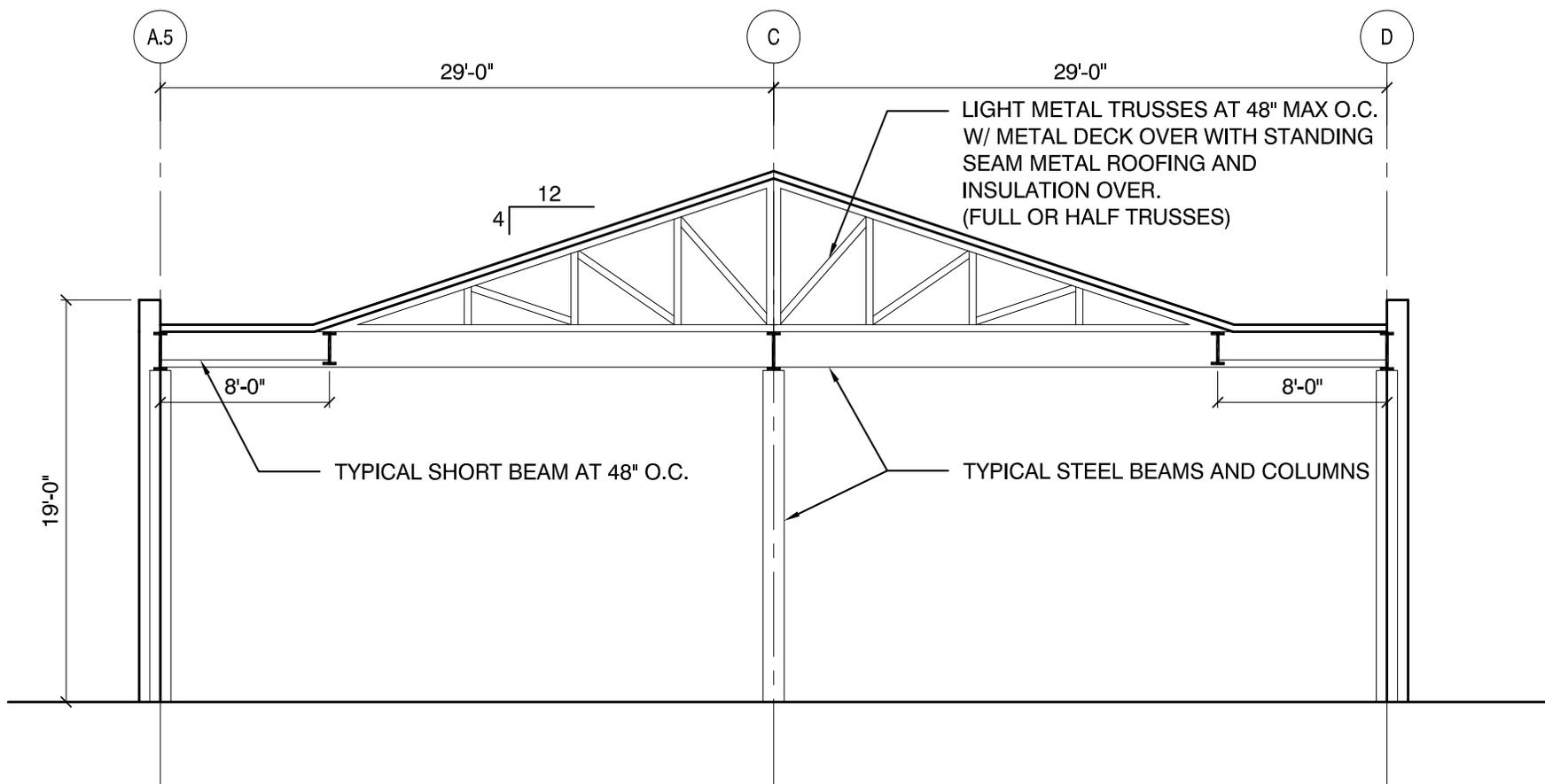
Life Safety

Means of egress and other life safety features will be designed in accordance with the applicable provisions of NFPA 101 (LSC). Table 7.3.1.2 provides Occupant Load Factors based upon Use of an area.

The vehicle storage area is classified as Storage Use (other than mercantile) and has an occupant load factor of 500 square feet per occupant. The vehicle maintenance areas and related shops and store rooms are classified as Industrial Use with an occupant load factor of 100 square feet per occupant. The BAMS Locker area, conference rooms, break rooms, briefing and planning rooms are classified as less concentrated Assembly Use with an occupant load factor of 15 net square feet per occupant. The physical training room (with equipment) is an Assembly Use with an occupant load factor of 50 square feet per occupant. The administrative office and support areas are Business Use with an occupant load factor of 100 square feet per occupant. Miscellaneous storage rooms, electrical closets, telephone rooms, mechanical rooms, etc. have an occupant load factor of 300 square feet per occupant.

Summary of Area and Occupants					
Use	Area	Unit	Load Factor	Occupant Load	Use Group
First Floor					
Vehicle storage area	22680	GSF	100	227	Storage
All administrative and support areas.	10330	GSF	100	104	Business
BAMS Locker area	1020	NSF	50	68	Assembly
Conference rooms, briefing rooms, operations rooms, planning rooms, etc.	3514	NSF	15	236 ¹	Assembly
Physical training	1005	GSF	50	21	Assembly
Storage, mechanical, electrical, etc.	1378	GSF	300	7 ¹	Storage
			Total	663	
Second Floor					
All administrative and support areas.	6160	GSF	100	62	Business
Meeting room	1546	NSF	7	221	Assembly
Conference rooms, briefing rooms, planning rooms, etc.	1374	NSF	15	92 ¹	Assembly
Storage, mechanical, electrical, etc.	265	GSF	300	5 ¹	Storage
			Total	380	

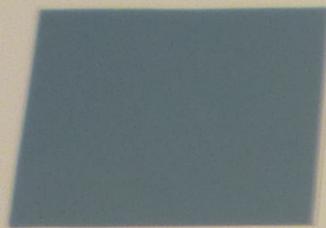
Notes: 1. Occupant load calculated individually for each space.



SECTION AT ENCLOSED VEHICLE STORAGE



WALL PAINT (FIELD)



WALL PAINT (ACCENT/ MEN'S RESTROOM)



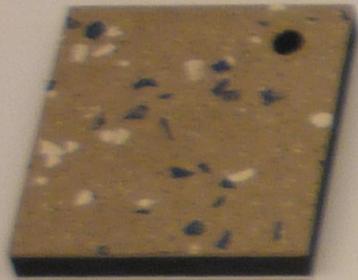
WALL PAINT (ACCENT/ WOMEN'S RESTROOM)



CERAMIC WALL TILE (ACCENT WOMEN'S RESTROOMS)



CERAMIC FLOOR TILE (WOMEN'S RESTROOM)



RUBBER FLOORING - PHYSICAL TRAINING AREA



CABINETS - PLASTIC LAMINATE



COUNTERTOP - PLASTIC LAMINATE (PANTRY)



CERAMIC WALL TILE (FIELD RESTROOMS)



LAVATORY COUNTERTOPS (WOMEN'S RESTROOM)



TYPICAL FLOOR FIELD TILE - VINYL COMPOSITION TILE (VCT)



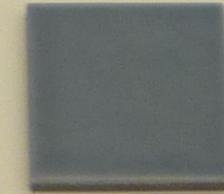
FLOOR ACCENT TILE - VINYL COMPOSITION TILE (VCT)



FLOOR ACCENT TILE - VINYL COMPOSITION TILE (VCT)



RUBBER WALL BASE FOR VCT



CERAMIC WALL TILE (ACCENT MEN'S RESTROOMS)



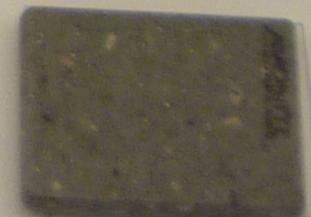
CERAMIC FLOOR TILE (MEN'S RESTROOM) AND ENTRANCE VESTIBULE



ACOUSTICAL CEILING TILE



CERAMIC WALL TILE (FIELD RESTROOMS)



LAVATORY COUNTERTOPS (MEN'S RESTROOM)



RUBBER WALL BASE FOR CARPET



FLOOR - CARPET TILE (ADMIN. SPACES)



FORT DRUM 20TH ASOS COMPLEX



INTERIOR COLOR SCHEME