

AMENDMENT OF SOLICITATION

1. AMENDMENT/MODIFICATION NO. 0001	2. EFFECTIVE DATE JUNE 19, 2003	
3. ISSUED BY DEPARTMENT OF THE ARMY, BALTIMORE DISTRICT CORPS OF ENGINEERS P.O. BOX 1715 BALTIMORE, MARYLAND 21203-1715		
4. NAME AND ADDRESS OF CONTRACTOR (Name, street, county, State and ZIP Code)	4A. AMENDMENT OF SOLICITATION NO. DACA31-03-M-0003 <hr/> 4B. DATED (SEE ITEM 5) JUNE 02, 2003	
5. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers is not extended. DATE OF RECEIPT OF PROPOSAL 4:00 PM, Local Time JULY 02, 2003 Others must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing items 4 and 8, and returning <u>1</u> copy of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of the amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.		
6. ACCOUNTING AND APPROPRIATION DATA (If required) FIRE STATION EXPANSION AND RENOVATION FORT DETRICK, MARYLAND		
7. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subjectmatter where feasible.) <u>SPECIFICATIONS:</u> <u>SECTION 01011 – DESIGN CRITERIA:</u> Delete the following chapters as originally and substitute with the attached same like number-sections. CHAPTER 2 – CIVIL; CHAPTE 5 – ARCHITECTURAL; CHAPTER 7 – HVAC and CHAPTER 10 – ELECTRICAL. <u>ATTACHMENTS: A/S</u> Except as provided herein, all terms and conditions of the document referenced in Item 4A, as heretofore changed, remains unchanged and in full force.		
8. NAME AND TITLE OF SIGNER (Type or print)	9. CONTRACTOR/OFFEROR <hr/> (Signature of person authorized to sign)	10. DATE SIGNED

CHAPTER 2
CIVIL DESIGN AND SITE DEVELOPMENT

2.0 CIVIL AND SITE DEVELOPMENT

2.1 Description

The site development consists of, but is not limited to, tree preservation, clearing and grubbing, grading for siting of new structure, construction of roads, drives, parking lots, curbs and gutters, pedestrian walks, storm drainage systems including storm water management structures, fencing, utilities, lighting, signage, landscaping, antiterrorism/force protection, and fire protection.

2.2 Reference Requirements and Standards:

The following codes and standards of the most current edition shall be used as standards for new construction and life safety design. Where there is a conflict between the Request For Proposal (RFP) and the building codes and standards, the most stringent shall apply. This list is not intended to be a complete list. All work shall be designed and constructed to meet all State and Federal codes, standards and laws. Refer to the technical specifications for other standards and references not listed below:

AASHTO, A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS, latest edition

ARMY TM-5-822-2/AIR FORCE AFM 88-7, General Provisions for Geometric Design for Roads, Streets, Walks, and Open Storage Areas, Department of the Army, and of the Air Force, July 1987

Accessibility Guidelines for Buildings and Facilities. Available from U.S. Architectural & Transportation Barriers Compliance Board, 1111 18th Street, NW, Suite 501, Washington, DC 20036-3894, (202) 653-7834 v/TDD or (202) 653-7863 FAX

AMERICANS WITH DISABILITIES ACT Accessibility Guidelines for Buildings and Facilities, Transportation Facilities, and Transportation Vehicles.

AWWA M17, INSTALLATION, FIELD TESTING, AND MAINTENANCE OF FIRE HYDRANTS, 1989, American Water Works Association

AWWA C500, METAL-SEALED GATE VALVES FOR WATER SUPPLY SERVICE, 1993, American Water Works Association

AWWA C502, Dry-Barrel Fire Hydrants, 1994, American Water Works Association

AWWA C651, DISINFECTING WATER MAINS, 1992, American Water Works Association

ANSI D6.1, Manual on Uniform Traffic Control Devices (MUTCD), Millenium Edition, dated December 2000

BOCA National Building Code, 1999, Building Officials and Code Administrators International

DEPARTMENT OF DEFENSE ANTITERRORISM/FORCE PROTECTION CONSTRUCTION STANDARDS, December 16, 1999, interim standards.

HEC-RAS, River Analysis System, U.S. Army Corps of Engineers Hydrologic Engineering Center, Sep 1998

INSTALLATION DESIGN GUIDELINES (IDG) FOR FORT DETRICK, latest edition, available from the Fort Detrick Directorate of Installation Services (DIS), Master Planning Section, (301) 619-2443.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, Maryland Department of the Environment Water Management Administration, 1994

MARYLAND STORMWATER DESIGN MANUAL VOLUMES I & II (COMAR 26.17.02.01-1), Maryland Department of the Environment Water Management Administration, October 2, 2000

MARYLAND STORMWATER MANAGEMENT GUIDELINES FOR STATE AND FEDERAL PROJECTS, July 1, 2001

MARYLAND STORMWATER MANAGEMENT REGULATIONS (COMAR 26.17.02)

MARYLAND STATE HIGHWAY ADMINISTRATION BOOK OF STANDARDS, HIGHWAY AND INCIDENTAL STRUCTURES, 1999

MARYLAND STATE HIGHWAY ADMINISTRATION HIGHWAY DRAINAGE MANUAL, latest edition

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)- NFPA 24, INSTALLATION OF PRIVATE FIRE SERVICE MAINS AND THEIR APPURTENANCES, 1995

OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)

SpecsIntact Federal Government Contract Specifications - Software can be downloaded from: <http://si.ksc.nasa.gov/specsintact/software/software.com>

United Facilities Criteria (UFC), DOD Minimum Antiterrorism Standards for Buildings, UFC4-010-01, dated 31 July 2002

UNIFORM FEDERAL DISABILITY STANDARDS (UFDAS)-

UNIFORM FEDERAL GUIDE SPECIFICATIONS (UFGS)- Located online at: <http://www.ccb/ufgs/ufgstoc.htm>

2.3 SURVEY

Topographic and utility mapping of the site may be obtained from Eric Williams, Directorate of Installation Services (DIS) at (301) 619-2712.

2.4 STAGING AREA, CONTRACTOR ACCESS, TEMPORARY FACILITIES, SECURE AREA AND MEMORIAL SITE

2.4.1 Staging Area

The location of the Contractor staging area shall be contained within the site boundaries as shown on Attachment 2-1.

2.4.2 Contractor Access

For all truck traffic, access to the Fort shall be through the Old Farm Gate. Truck arrival and routing should be discussed with and arrival For automobiles, access to the Fort shall be through any of the gates. Access to the site shall be via Porter Street. For times of operations, refer to Section 01000 ADMINISTRATIVE REQUIREMENTS, Para 1.9.2. For access badges/passes for all Contractor personnel refer to Section 01000 ADMINISTRATIVE REQUIREMENTS, Para 1.9.1.

2.4.3 Temporary Facilities for Fire Station Personnel

Temporary facilities shall be provided by the Contractor. The facilities shall include appropriate office and living space for 12 fire personnel per shift for two shifts a day. The facilities shall also include appropriate shower, restroom, kitchen and sleeping facilities with separate shower, restroom and sleeping for male and female fire personnel. The facilities may be in the form of pre-fabricated modular units or mobile trailers. The facilities are to be located in the area shown on Attachment 2-1.

2.4.4 Temporary Structure for Fire fighting equipment

A temporary enclosed structure is to be provided to house the fire fighting equipment (six pieces of equipment) and it shall be located in the area shown on Attachment 2-1. The Contractor shall coordinate with the Fire station personnel and the Provost Marshall to determine the actual size needed and to ensure that other necessary operations are not hindered. Temporary fencing shall be placed around this area with a gate that allows entrance/exit by the equipment. Any temporary facilities for fire station personnel shall also be enclosed by the fencing.

2.4.5 Temporary Fence

The contractor shall construct a temporary chain link fence having a minimum height of eight (8) feet around the temporary areas for fire station personnel and the fire fighting equipment. The fence shall be equipped with access gates that can be closed and padlocked.

2.4.6 Memorial Site

The existing memorial site shall remain and is to be protected during any demolition, construction or renovation required to complete the work.

2.5 DEMOLITION

Prior to any work being performed, the Contractor shall hire a locator company to locate all underground utilities. The Contractor shall mark out and record all locations of underground utilities after they are identified. The Contractor shall be responsible for protecting the utilities during the life of the project. There is a forced main, in particular, that passes between the Fire Station and Porter Street; any damage to this line would be very serious for the entire installation. The Contractor shall remove all pavement, abandoned utilities, trees, brush, debris and other features required to design and construct the new addition to the Fire Station. The existing mature and thriving trees, and recently planted trees on or adjacent to the site, shall remain and be incorporated into the design where

practical. If possible, trees can be relocated to other locations on the site rather than disposed of.

There are no existing buildings or structures on site to be demolished, however utility lines (including laterals and services), concrete or masonry manholes and utility boxes, or storm drain culverts could be encountered.

The existing utility lines are identified on Attachments 2-2, 2-3 and 2-4. All existing utilities shall be protected during any demolition, construction or renovation required to complete the work. The Contractor shall be liable for all damages should they occur.

Hazardous material or waste is not likely to be encountered at the site. The results of radon testing performed show that that no radon has been found at the Fort.

All debris and/or waste materials shall be disposed of outside the limits of Government controlled lands. Disposals shall be in accordance with the federal, state, and local regulations. The Contractor shall notify the Contracting Officer if any material to be disposed of is found to contain hazardous, toxic, biological, or radiological substances. Rubbish and debris shall be removed from Government property daily to avoid accumulation at the project site. Demolition shall be specified by the Contractor in the Uniform Federal Guide Specifications (UFGS) Section 02220 DEMOLITION.

2.6 ANTITERRORISM/*FORCE* PROTECTION REQUIREMENTS

The site shall be designed in accordance with DOD Minimum Antiterrorism Standards for Buildings, dated 31 July 2002. A copy of this document will be made available to the Contractor. Prospective bidders shall maintain a minimum thirty-three (33) foot setback between the building and any areas accessible by vehicles, including roads and proposed parking/drop off areas. Permanent objects, including mechanical equipment, landscaping, etc., greater than six (6) inches in height that could conceal a person or explosive device, should not be located within thirty-three (33) feet of the building. Dumpsters shall be kept a minimum of eighty-two (82) feet from the building. Final authority and approval of force protection requirements shall be coordinated with the Fort Detrick Plans and Operations at (301) 619-3312. ***Also see Chapter 1 of this RFP for additional information concerning Antiterrorism/Force Protection requirements.***

2.7 NEW CONSTRUCTION

2.7.1 General Requirements and Site Layout

Site planning and landscape design for the facility shall be focused to meet the emphasis of the Fort Detrick Installation Design Guide (IDG) and any additional requirements (refer to Section 01011, Chapter **4.0** - LANDSCAPING for additional requirements). The finished project will consist of the optimum layout of all of the features required, including but not limited to the building, parking lots, access roads or driveways, drainage, storm water management systems, and utilities. Wetlands, a one-hundred (100) year floodplain, historic/cultural resources and unexploded ordinance are not known to occur on this site.

The Contractor shall locate the features for this project within the limits shown using Attachment 2-1, in accordance with the requirements/restrictions listed on them.

Access to the site shall be from Porter Street. Access to the rear of the building using a paved driveway is required for emergencies, maintenance and deliveries. Access via wide sidewalks/clear areas around facility shall meet minimum customer requirements.

Additional items of consideration in siting the project features will be force protection, aesthetics, optimum drainage, fire protection, environmental concerns, safety, and convenience for vehicles and pedestrians. Outside mechanical and electrical units, dumpsters, etc., shall be screened with suitable landscaping or walls as per the Fort Detrick Installation Design Guidelines (IDG). Any storm water detention basin(s) shall be located on the site to accept runoff from the entire project.

2.7.2 Open Turf Area

Open turf areas shall be designed in accordance with Chapter 4.0 - LANDSCAPING.

2.7.3 Parking and Access Drives

2.7.3.1 A total of 12 new parking spaces shall be provided in the area shown on Attachment 2-1. The parking areas and access drives shall be designed to meet traffic flow requirements and to provide convenient and safe access and circulation (including deliveries and fire protection) within the facility areas.

2.7.3.2 The parking lot configuration shall be in accordance with the IDG and parking spaces shall be 9.5' wide by 18' long. Parking lots and access roads shall be bituminous pavement except in front of dumpsters where concrete shall be used.

2.7.3.3 New driveways for general access to the facility shall be two-lane and have a minimum width of twenty-four (24) feet. The minimum turning radius for all new intersections shall be twenty-four (24) feet except where fire truck access is required. The turning radii/access widths for fire trucks shall be coordinated with the Post Fire Department at (301) 619-2163. The designer shall consider the types of vehicles traversing and parking at these facilities. Vehicles shall include but not be limited to the following: passenger cars, fire trucks, emergency vehicles, garbage trucks, delivery vehicles, and utility vehicles.

2.7.3.4 Traffic control signs and pavement markings shall be provided as necessary in accordance with the Manual of Uniform Traffic Control Devices. Striping of the parking lots is required and all stripes shall be white.

2.7.4 Restricted Access

The existing driveway or lane directly adjacent to the fire station and police station entrances shall be restricted to fire and police personnel only. This may be accomplished by using appropriate automatic entrance/exit controls. The Contractor shall coordinate with the users of the building with regards to an agreeable configuration that addresses entrance/exit

controls. If necessary, the existing driveway shall be widened to accommodate the appropriate traffic flow.

2.7.5 Sidewalks

2.7.5.1 Exterior sidewalks shall be constructed along parking lots and roads. Depressed curb(s) shall be provided for handicapped accessibility at all intersections of walks and drives. The minimum thickness of sidewalks shall be four (4) inches, and the minimum width shall be six (6) feet. Sidewalks located parallel to curbs shall be set back a minimum of two (2) feet from the curb.

2.7.5.2 The sidewalks shall be constructed of concrete with a minimum compressive strength of 3000 pounds per square inch (psi). Contraction joints shall be spaced at five (5) feet; expansion joints shall be constructed at maximum spacing of thirty (30) feet and at the intersection of walks and curbs.

2.7.6 Curb and Gutter

Streets shall be provided with combination concrete curb and gutter. Curbs shall be depressed at entrances to driveways with gradients providing positive drainage. Depressed curbs shall also be provided as necessary for pavement drainage. Rolled combination curb and gutters are not permitted.

2.7.7 Pavement

The pavement design analysis shall meet the requirements specified in Section 01011, Chapter **3.0** - FOUNDATION AND GEOTECHNICAL DESIGN.

2.7.8 Street and Building Signs

Street and traffic control signs shall conform to the Manual of Uniform Traffic Control Devices. Non-traffic control signs as well as building signs shall conform to requirements of the Fort and shall match adjacent area signs. See sign information in the Fort Detrick IDG.

2.8 GRADING

2.8.1 General

Positive drainage shall be provided for all areas and existing drainage ways shall be utilized to the extent possible. A ditch parallel to Porter Street passes through the site.

Swales between buildings and parking areas shall be avoided, if possible. If not possible, they shall be graded for positive flow but flat enough to easily permit mowing and maintenance. Parking areas shall be graded such that storm water is directed off to the sides and not down the center of the parking area. Earthwork shall be balanced to the extent possible without compromising the design. Retaining walls and/or reinforced earth slopes shall only be used if necessary to locate the entire site features within the limits given (see Section 01011, Para 2.7 - NEW CONSTRUCTION). The number of existing trees to be removed shall be kept to a minimum. No grading shall be done within drip lines of existing trees to be preserved.

2.8.2 Adjustment of Existing Structures

All manhole castings, valve boxes, or inlet frames of any nature within the project that do not conform to the new finish grade in either surfaced or unsurfaced areas shall be adjusted to the new finish grade. Grade adjustment shall be accomplished using precast concrete rings, brick or masonry units and cement mortar. The maximum height of any adjustment shall be twelve (12) inches. Cement mortar shall be used where the required adjustment is one (1) inch or less. Where inlets, manholes, or valve boxes fall within a roadway or parking area, the frames and covers shall be heavy-duty (HS20-44 rated). All structures shall be of a type suitable for the intended use and shall conform to the requirements of the applicable section of these specifications.

2.8.3 Borrow and Waste

Borrow materials shall be obtained from sources outside the limits of Government-controlled land. The source of borrow material shall be the Contractor's responsibility. Approved materials shall be those classified in ASTM D 2487 as GM, GC, SW, SP, SM, SC, and CL and shall be free of trash, debris, roots or other organic matter, or stones larger than 3 inches in any dimension. These requirements shall be addressed in the specifications developed by the Contractor. The Contractor shall obtain from the owners the right to procure material, shall pay all royalties and other charges involved, and shall bear all the expense of developing the sources, including rights-of-way for hauling. Any surplus suitable materials not required for fill shall be removed from the base. Non-suitable materials shall be disposed of by the Contractor at his own expense and responsibility outside the limits of Government-controlled land at a location that meets federal, state and local requirements.

2.8.4 Sidewalks and Curbs

Concrete walks shall have a transverse grade of two (2.0) percent. Maximum desirable longitudinal walk grade shall be four (4.0) percent and an absolute maximum grade of 8.3 percent. The use of steps in walks will be avoided whenever possible. The use of single riser steps is especially discouraged. When steps are unavoidable, they should have at least three risers and will be provided with handrails. Barrier curbs shall be used along asphalt roads, drives, and parking lot edges.

2.8.5 Transverse Parking Area Grades

- a. Desirable minimum of two (2.0) percent.
- b. Absolute minimum of 1.5 percent for flexible pavement and one (1.0) percent for rigid pavement.
- c. Maximum of two (2.0) percent at handicap parking.

2.8.6 Longitudinal Parking Area Grades

- a. Maximum of five (5.0) percent

2.8.7 Ramp Grades

- a. Must comply with ADAAG standards.

2.8.8 Gutter Grades

- a. Desirable minimum of 0.8 percent.
- b. Absolute minimum of 0.5 percent.

2.8.9 Building Floor Elevation

Building finished floor elevation shall be set to ensure that the required minimum and maximum grades are met.

2.8.10 Grades Away From Building- Five (5.0) percent

- b. Greater than ten (10) feet from building- Two (2.0) percent minimum in the direction of drainage.

2.8.11 Overland Grades

Provide positive drainage for all areas.

- a. Minimum- Two (2.0) percent
- b. Maximum- Ten (10.0) percent. Steeper grades/ retaining walls may be used on the perimeter of the site.

2.8.12 Ditch Slopes

- a. Minimum- One (1.0) percent for channelized flow.

2.8.13 Ditches

Ditches shall be sloped so that they are non-erodible with vegetative cover. The ditch shall be lined with an appropriate material to prevent erosion. A design storm with a return period of at least two (2) years shall be used to determine erodibility of ditches and swales. The depth of ditches along pavement shoulders shall be such that the water surface from the 10-year design storm is below pavement sub base and base courses which daylight through the adjacent shoulder.

2.9 STORM DRAINAGE

2.9.1 Determination of Storm Runoff

The computation of runoff will be accomplished by the Rational Method, as defined in the Maryland State Highway Drainage Manual or by the Department of the Army Technical Manual - TM 5-820-4. Where detailed consideration of storm water retention is required, computation should be by unit-hydrograph and flow-routing procedures.

2.9.2 Design Storm Return Period

Storm drains shall be sized for a design storm with a return period of ten (10) years and culverts shall be sized for a design storm with a return period of twenty-five (25) years. Provisions shall be made to protect all buildings and critical structures from a major storm event with a return period of one-hundred (100) years.

2.9.3 Storm water Management

It shall be the responsibility of the Contractor to design a Storm Water Management (SWM) plan and to obtain a SWM permit from the Maryland Department of the Environment Water Management Administration prior to construction. The plan shall be prepared in accordance with the Code of Maryland Regulations (COMAR) 26.17.02, THE 2000 Maryland Storm Water Design Manual, Volumes I and II, dated October 2, 2000, and the Maryland Storm Water Management Guidelines for State and Federal Projects, dated July 1, 2001.

2.9.4 Storm Drainage System Design

The Contractor shall be responsible for the complete design of the storm drainage system. The new storm drainage system shall be coordinated with surrounding properties to ensure runoff does not cause damage to the other properties. The use of curb openings with flumes to drain water from streets and parking areas with curbing will be permitted. Drainage of runoff from turfed areas onto pavements shall be minimized.

Structures shall be located at all changes in direction of storm drain lines, at the intersection of two or more storm drain lines, and where required to intercept rainfall runoff. Storm runoff in streets and parking areas with curbing will be collected using curb inlets or area inlets. Drainage of runoff from turfed areas onto pavements shall be minimized. Where possible, a minimum drop of 0.1 feet between inverts of equal diameter storm drain pipes shall be provided at the centerline of drainage structures. Where storm drain pipes are of different diameters, the pipe crown elevations should be matched at the drainage structure. Storm drain pipes shall have a minimum diameter of twelve (12) inches. Storm drain pipes shall be located outside of paved areas to the extent possible. Under no circumstance shall storm drain pipes be located beneath buildings. Erosion control shall be provided for the outlets of all storm drain structures.

All storm drain pipes and structures shall be specified in UFGS Section 02630 STORM DRAINAGE SYSTEM. Submittal of pipe samples is not required. The Contractor shall refer to the Maryland State Highway Administration (MSHA) Book of Standards for any storm drain details required by the design. The Contractor shall provide details for any other drainage structures not found in the Book of Standards.

2.9.4.1 Hydraulic Design

New storm drain pipes shall be designed for gravity flow during the ten (10) year design storm unless otherwise approved by the Government. The hydraulic grade line shall be calculated for the storm drain system and all energy losses accounted for. Design computations shall adhere to procedures contained in the Maryland State Highway Drainage Manual or TM 5-820-4. Storm drain systems shall be designed to provide a minimum flow velocity of 2.5 feet per second (fps) when the drains are one-third or more full.

2.9.4.2 Manholes

The diameter of manholes shall be large enough to accommodate pipes entering/exiting the manhole. Manhole cast iron frames shall have a minimum opening diameter of thirty (30) inches. Galvanized steel ladders shall be provided in all manholes in accordance with UFGS Section 02630 STORM DRAINAGE SYSTEM.

2.9.4.3 Area Inlets

Area inlets and grates shall be properly sized and designed to accommodate the design flows. A safety factor shall be included to account for clogging by debris.

2.9.4.4 Curb Inlets

The location of parking area curb inlets at building entrances shall be avoided if possible. Curb inlets along two-lane streets shall be spaced and sized so that the flow in the gutter and ponded areas at low points does not cover the crown of the street. Grates for inlets shall be bicycle safe.

2.9.4.5 Head walls and Flared End Sections

Unless otherwise approved, head walls or flared end sections shall be provided at the ends of culverts and at storm drain outfalls. Precast concrete enwalls will be permitted. Protection from erosion at head wall and flared end section outfalls shall be provided as needed.

2.9.4.6 Culverts

Culvert pipes shall have a minimum diameter of eighteen (18) inches wherever possible, or low head pipes with equivalent capacity shall be used. The culverts shall be designed with a maximum allowable head that does not exceed the elevation of the sub grade of any adjacent road.

2.9.5 Roof Drains

Drainage from the roof areas shall be designed as to not cause an ice hazard. Gutters and downspouts shall be designed for an event with a return period of ten (10) years. Downspouts, which are located in areas that could cause a safety or maintenance concern, shall be collected underground and conveyed to the storm drainage system. Design of underground roof drain collection systems shall be done in accordance with the procedure in the National Standard Plumbing Code. Connections from downspouts to the underground collection pipes shall be via cast iron boot. Downspouts discharging to the surface shall be provided with splash blocks.

2.9.6 Storm Drain and Culvert Pipe

The Contractor shall select the appropriate storm drain and culvert pipe materials from the options specified in UFGS Section 02630 STORM DRAINAGE SYSTEM. Pipe, bedding, and backfill shall be of adequate strength (or stiffness) to support the earth, live, and construction loads imposed on the pipe. Only pipe materials that have a minimum design service life of fifty (50) years shall be allowed for permanent installations. As a minimum, all pipe joints shall be soil tight. The Contractor shall specify watertight resilient pipe connectors at drainage structures when the water table is at or above the pipeline.

2.9.6.1 Concrete Pipe

Reinforced concrete pipe shall be a minimum Class III. Type I cement may be used only when sulfates in the soil are 0.1 percent or less and dissolved sulfates in the effluent are 150 parts per million (ppm) or less. Type II cement may be used only when sulfates in the soil are 0.2 percent or less and dissolved sulfates in the effluent are 1,500 ppm or less. Only Type V cement

may be used if sulfates in the soil exceed 0.2 percent or dissolved sulfates in the effluent exceed 1,500 ppm. Concrete pipe shall be assumed to have a minimum design service life of 50 years unless the Contractor determines that conditions at the site will reduce the service life. Concrete culverts and storm drains shall be protected by a minimum of three (3) feet of cover during construction to prevent damage before permitting heavy construction equipment to pass over them during construction. The minimum cover between the top of pipe and the final grade elevation shall be in accordance with the pipe manufacturer's recommendations

2.9.6.2 Corrugated Metal Pipe

Corrugated Metal Pipe shall not be used.

2.9.6.3 Plastic Pipe

Stiffness of the plastic pipe and soil envelope shall be such that the predicted long-term deflection shall not exceed 7.5 percent. Plastic culverts and storm drains shall be protected by a minimum of three (3) feet of cover during construction to prevent damage before permitting heavy construction equipment to pass over them during construction. Split couplers shall not be allowed for corrugated high-density polyethylene (CHDPE) pipe. Plastic pipe shall be assumed to have a minimum design service life of fifty (50) years unless the Contractor determines that conditions at the site will reduce the service life.

2.9.7 Oil Separator

2.9.7.1 The Contractor shall install a new trench drain across the entire width of the exit driveway and the entire width of the entrance driveway of the new fire station. This trench drains shall include an appropriate valve system, such that outflow to the storm drainage system can be interrupted and diverted to the oil separator. The existing oil separator shall be moved and re-installed, if feasible, to a location that is easily accessible. If the existing oil separator cannot be removed and re-installed, then a new one of similar capacity shall be installed.

2.9.7.2 The connections between the trench drain and the oil separator shall be made using an appropriate pipe to handle oil flow. Abandoned lines under and within ten (10) feet of the building shall be removed.

2.10 WATER SYSTEM

2.10.1 There is an existing eight (8) inch diameter water main that runs parallel to Porter Street and a four (4) inch diameter lateral that connects the existing building to the water main. See Attachments 2-2 and 2-4 that show the location of the existing lines and their connection. It is assumed that existing water pressure and flow should be adequate.

2.10.2 It is expected that a new four (4) inch lateral to the existing water main will need to be installed. The Contractor shall secure approval for the water system addition as required by the Maryland Department of Environment, Health and Natural Resources Division, Public Works Section. No existing or new water lines shall be allowed underneath the new addition. Piping materials and installation beyond five (5) feet from the building shall comply with Section 02510 Water Distribution System except as noted herein. Piping less than three (3) inches in diameter shall be limited to polyvinyl

chloride plastic (PVC), oriented polyvinyl chloride plastic (PVCO), polyethylene (PE), or copper tubing. Piping three (3) inches in diameter or larger shall be limited to cement lined ductile iron, plastic (PVC or PVCO), or fiberglass (Reinforced Thermosetting Resin Pipe [RTRP] or Reinforced Plastic Mortar Pipe [RPMP]) materials. Underground water lines shall be installed to provide a minimum of four (4) feet of earth cover above the pipe from the finished site grade. After construction is complete, the Contractor's registered professional engineer shall certify that the construction was completed in accordance with the approved plans and specifications.

2.10.3 Distribution mains and sectional valves shall be arranged such that a combination of two fire hydrants, or one sprinkler system and one fire hydrant, are always available to protect the facility in case of a single break anywhere in the system. The water system shall be capable of supplying at least 50% of the fire demand in the event of a single pipe break. Fire flow requirements for sprinkler system and outside hose streams shall be in accordance with Military Handbook 1008C. The fire demand shall equal the sum of the sprinkler demand, hose demand and one-half of the domestic demand. Sprinkler and domestic water may be supplied through a bulk underground line with services separated inside the utility room.

2.10.4 The Contractor shall perform hydrant flow tests to determine available flow and pressure from the existing water system in order to determine the necessary flow data to aid in design. Further details can be found in Section 01011, Chapter 9, Fire Protection. Arrangements for testing shall be scheduled through the Contracting Officer and **Water Plant Operations**. Data shall include static pressures, residual pressures, flow rates, date and time tests were conducted, and name of personnel conducting the tests. Data shall also include a small water system map, at a scale of approximately 1 inch = 400 feet, showing the location of test hydrants and water mains in the project vicinity.

2.10.5 The Contractor shall submit layout drawings of the proposed piping system for approval. Connection points to the existing system shall be shown as well as hydrant flow test data. The Contractor shall provide design calculations showing that the flow and pressure requirements for domestic and fire demands are met. Test pits shall be made at connection points to confirm size, material and depth of existing water mains. Any discrepancies shall be reported to the Contracting Officer. A Hazen-Williams friction coefficient (C) of 120 shall be used for existing mains and 130 for new mains.

2.10.6 Interruptions to service for making connections shall be arranged and scheduled through the Contracting Officer. Dry connections shall require isolation of piping between existing valves. Before starting any work, the Contractor shall locate all valves that will be used to isolate the system. Operation of valves shall only be done under the supervision of the Post Water Department and the Contracting Officer. Outages for dry connections shall be scheduled as directed by the Contracting Officer; all affected lines shall be disinfected. A work plan shall be submitted to the Contracting Officer for approval before starting any work. Outages shall be scheduled at least forty-eight (48) hours in advance through the Fort Detrick Water Department and Contracting Officer.

2.10.7 Underground piping for a dedicated sprinkler service line (if ductile iron) shall have cathodic protection and bonded joints. Cathodic protection is not required for a combined domestic / sprinkler service line.

2.10.8 Service lines shall be of sufficient size to furnish water to the building in the quantity and at the pressure required by National Standard Plumbing Code. Domestic flow shall be determined on a fixture unit basis. Maximum velocity shall not exceed six (6) feet per second (fps).

2.10.9 Adjacent utility lines shall be separated for safety reasons. Separation between water and sewer lines shall be in accordance with UFGS Section 02510, WATER DISTRIBUTION SYSTEM, Part 3, Execution. Water lines shall not be laid in the same trench with sewer lines, gas line, fuel lines, or electrical wiring.

2.10.10 The Contractor shall install an adequate number of valves in the system. Curb stops are not permitted. Each building service shall be provided with a main shut off valve and valve box, readily accessible to maintenance and emergency personnel. A post indicator valve (PIV) shall be installed on each sprinkler service. Shutoff valves in located in sidewalks are prohibited. Valves three (3) inches and larger shall conform to AWWA C500; smaller valves shall conform to MSS SP 80, Type 1, Class 150.

2.10.11 Valve boxes shall be cast iron. Boxes shall be extension type with slide type adjustment and with flared base. The word "WATER" shall be cast in the cover. The boxes shall be of such length as will be adopted without full extension to the depth of cover required over the pipe at the valve location. Valve boxes shall be suitable for use in vehicular traffic. Where feasible valve boxes shall be located outside of roads and streets.

2.10.12 All valves and fire hydrants located near roadways shall be protected from traffic. If a post indicator valve or fire hydrant is located closer than ten (10) feet from an access drive, parking area or street, bollards shall be provided. A six (6) inch concrete curb around the traffic area is acceptable in lieu of bollards. Bollards shall be painted as directed.

2.10.13 Connections to mains shall be made by a tapping sleeve and valve whenever feasible to minimize disruption of service. If a tapping sleeve cannot be used, the connection shall be made with a mechanical tee and valve. Sprinkler service lines shall be connected to the main in accordance with NFPA 24. Post indicator valves shall be minimum of forty (40) feet from buildings.

2.10.14 Thrust blocks shall be provided at changes in direction of flow on all water lines three (3) inches or larger in diameter and fire hydrants. Thrust block sizes shall be in accordance with the pipe manufacturer's installation manual.

2.10.15 Hydrostatic tests - All lines shall be subject to pressure and leakage tests in accordance with NFPA 24 - UFGS Section 02510, WATER DISTRIBUTION SYSTEM, Part 3, Execution.

2.10.16 Disinfection - The Contractor shall disinfect all new water lines and any existing lines that do not remain fully pressurized during construction. Bacteriological disinfection shall conform to AWWA C651. Each section of service, hydrant lateral, and distribution line shall be tested. Personnel from the Contractor's commercial laboratory shall collect samples from each

section of new and/or existing line. When the isolated section length exceeds three-hundred (300) feet, intermediate line samples shall be taken every three-hundred (300) feet or increment thereof. The commercial laboratory used by the Contractor shall be certified by the State's approving authority for examination of potable water.

2.10.17 Lead residual is not permitted in new water lines. Following bacterial disinfection and testing, the system shall be flushed at each hot and cold-water discharge point and tested for lead residual as indicated in UFGS Section 02510, WATER DISTRIBUTION SYSTEM, Part 3, Execution.

2.10.18 Excavation, trenching and backfilling shall conform to USFG Section 02316 Excavation, Trenching and Backfilling for Utilities Systems. Pipe bedding materials shall conform to ASTM C33, coarse aggregate, Size #67. Bedding shall be placed from six (6) inches below pipe to one (1) foot above the pipe for plastic materials, and to the spring line of the pipe constructed of other material.

2.10.19 Plastic marking tape, blue in color, and capable of being located by a metal detector, shall be provided above the pipe but 18-inches below grade. Minimum tape strength shall be 1750 psi lengthwise and 1500 psi crosswise.

2.10.20 Pipe penetrations through structures shall be sleeved. Sleeves shall be Schedule 40 with integral collar, and furnished with mechanical link seals between the sleeve and pipe.

2.11 Sanitary Sewer System

2.11.1 The Contractor shall provide new building sewer connections in such a manner that all sewer lines can be maintained easily without major disruption to building occupants. Any new sewer line for the new facility shall be tied into an existing six (6) inch diameter line that flows southwest from the existing Fire Station through the site. Sewer line tie-ins shall be designed as gravity lines and the use of lift stations are prohibited. See Attachment 2-2 for the location of the existing sewer lines. According to DIS, this line has adequate capacity to accommodate the flow from the new facility.

Connections to existing sewers shall be made using a manhole. The Contractor shall verify the capacity of existing sewers, and pipe invert elevations at the proposed connection points. Materials and pipe installation beyond the five (5) foot line from the building shall conform to Section 02531 Sanitary Sewers: Gravity, except as noted herein. The construction of sewer lines under pavement shall be avoided whenever possible. Abandoned sewer lines under and within ten (10) feet of the building shall be removed.

2.11.2 Building connections shall be sized based on drainage fixture units in accordance with the National Standard Plumbing Code. The minimum diameter of building service laterals shall be six (6) inches. The flow in the pipes shall be computed using Manning's Equation with a roughness coefficient (n) of 0.013. The minimum pipe slope shall be 0.62% for six (6) inch diameter sewers, and 0.40% for eight (8) inch diameter sewers. Flow shall be maintained in the existing sewer system at all times when making new connections, either by gravity methods or by pumping. The Contractor shall submit all plans for maintaining sanitary sewer flow to the Contracting Officer for approval prior to starting any work.

2.11.3 Piping for sewer lines shall be limited to the following materials:

2.11.3.1 Plastic Pipe

Acrylonitrile-butadiene-styrene (ABS), ASTM D 2751.

Polyvinyl Chloride (PVC), ASTM D 3034, maximum SDR of 35.

High Density Polyethylene (HDPE), ASTM F714. The pipe shall have a smooth interior with corrugated exterior. Polyethylene shall be certified by the resin producer as meeting the requirements of ASTM D3350, cell Class 334433C. The pipe stiffness shall be equal or greater than $1170/\text{Diameter (D)}$ for cohesion less pipe trench backfills.

2.11.3.2 Cast Iron (CI), ASTM A74.

2.11.3.3 Ductile Iron (DI), AWWA C151.

2.11.3.4 Vitrified Clay/Extra Strength (XVC), ASTM C700.

2.11.4 Exterior cleanouts shall be provided for building waste piping at the five (5) foot line, at directional changes, and in the middle of straight runs longer than 150 feet. Cleanouts shall be the two-way type, which allows cleaning in either direction.

2.11.5 Sanitary sewer lines shall have a minimum cover of thirty (30) inches. Plastic marking tape, green in color, and capable of being located by a metal detector, shall be provided above the pipe, eighteen (18) inches below grade. The minimum tape strength shall be 1750 psi lengthwise and 1500 psi crosswise.

2.11.6 Manholes shall be provided at the points of connection to existing lines, and at all changes in direction, size or slope of gravity sewers. They shall not be spaced more than three-hundred (300) feet apart. Manholes shall be precast, reinforced concrete sections (risers) that conform to ASTM C478. The base section shall have a six (6) inch flange, monolithic with the riser, and shall extend at least sixteen (16) inches above top of pipe. Welded wire fabric reinforcement in the precast sections reinforcement shall conform to ASTM A 185. At least six (6) inches of granular bedding shall be placed under the base. It shall be coarse aggregate Size #4 that conforms to ASTM C33, and shall be nominally compacted to provide a uniform, firm under layer. The inside diameter of the risers shall be a minimum of four (4) feet, with a top section that can accommodate a manhole casting with a minimum diameter of thirty (30) inches. Manhole bench and invert channels shall be formed using concrete. Manhole joints shall be double-strip butyl rubber mastic adhesive. Pipe connections shall utilize a watertight rubber boot or sleeve conforming to ASTM C923 or C443; sleeves shall be secured with a stainless steel clamp. Manhole steps shall 12-inch wide, rubber coated, rated for a three-hundred (300) pound loading, installed on sixteen (16) inch centers, and securely embedded in concrete. Frames and covers shall be ductile iron. The words "SANITARY SEWER" shall be cast on the cover and plainly visible. Avoid placing manholes where the tops will be submerged or subject to surface water inflow. Where the invert of the inlet pipe is more than eighteen (18) inches above the manhole floor, a drop connection shall be provided. Manholes shall be designed for uplift (buoyancy) assuming that the groundwater table can reach the top of manhole sidewalls. Pipe joints shall be located at a distance of two (2) feet minimum or no more than four (4) feet maximum from the outside wall of manholes.

2.11.7 Lines shall be tested for leakage by low pressure air testing. Low pressure air testing shall be done in accordance with the pipe manufacturer recommendations. The Contractor shall visually inspect the section of line before backfilling to assure that joints are tight and the sewer is laid to proper line and grade. Lines shall be air tested using pneumatic plugs inflated to twenty-five (25) pounds per square inch gage (psig). Air shall be introduced into the sealed line until internal pressure is 4 psig greater than the average backpressure of any groundwater over the pipe. After a stabilization period of at least two (2) minutes, the pressure shall be adjusted to 3.5 psig and the air supply disconnected. The line shall be acceptable if the time required for the pressure to decrease from 3.5 to 2.5 psig is not less than the time computed as follows:

TIME REQUIRED IN MINUTES AND SECONDS FOR AIR PRESSURE TO DROP FROM 3.5 PSIG TO 2.5 PSIG

Pipe Dia. (in) L =	100 ft	200ft	300ft
6	2:50	2:50	2:50
8	3:47	3:47	3:48

When times are less than specified, a satisfactory correction of the problem shall be made and the line retested. Testing, correction and retesting shall be made at no additional cost to the Government.

2.11.8 A deflection test for plastic pipe shall be made not less than thirty (30) days after the completion of all work including leakage test, backfill and placement of fill, grading, pavement, concrete, or superimposed loads. The test shall be conducted in accordance with manufacturer recommendations. Installed pipe that shows deflections greater than 7.5% of the normal diameter of the pipe, shall be retested by a run from the opposite direction. If the retest also fails, the suspect pipe shall be replaced at no cost to the Government.

2.11.9 Excavation, trenching and backfilling shall conform to UFGS Section 02316 EXCAVATION, TRENCHING AND BACKFILLING FOR UTILITIES SYSTEMS. Pipe bedding materials shall conform to ASTM C33, coarse aggregate, Size #67. Bedding shall be placed from six (6) inches below pipe to one (1) foot above pipe for plastic materials, and to the spring line of pipe for other materials.

2.11.10 Pipe penetrations through structures shall be sleeved. Sleeves shall be Schedule 40 with integral collar, and furnished with mechanical link seals between the sleeve and pipe.

2.11.11 Pipe connections to existing manholes shall utilize a watertight rubber gasket as specified for new manholes. Manhole benches shall be reworked to accommodate new flow conditions. Existing manhole covers shall be adjusted flush with the finished grade in paved areas, and two (2) inches above finished grade in unpaved areas.

2.11.12 Adjacent facilities - Separation between water and sewer lines shall be in accordance with UFGS Section 02531 SEWERS, Part 3, Execution.

2.12 GAS LINES

2.12.1 General - The Contractor shall determine if the existing gas service needs to be increased. The Contractor shall provide design calculations for the required line size, pressure, and flow rate, which shall be based on the building demand. If necessary, the Contractor is responsible for construction of the gas service line from the point of delivery within five (5) feet of the building. The point of delivery is the meter set assembly. The Frederick Gas Company will construct the service line from the gas meter to the existing gas distribution main. The contractor is responsible for coordination all aspects of the construction with the gas company, including the cost of installation and payment for the work. Payment shall be made prior to the start of construction. The contractor is also responsible for coordination of the service line installation with the Fort's Directorate of Installation Support (DIS).

2.12.2 Service Interruption - Interruption of gas service shall be minimized during construction of the new line. The Contractor shall notify the Contracting Officer, in writing, at least ten (10) days in advance before connecting to existing lines.

2.12.3 Service Line - The service line shall be constructed of materials specified for gas. It shall be constructed as short and straight as possible with as few joints as practicable. Sharp changes in direction and tie-ins to existing lines shall be accomplished using standard fittings. Pressure testing of the line shall be completed prior to placement of any backfill. The line shall have a minimum cover of four (4) feet.

2.12.4 Shutoff Valves - The service line shall be equipped with a sufficient number of valves, having the same size as the service line, so that the line and building can be shutoff and/or isolated from the distribution main. The valves shall be contained in valve boxes.

2.12.5 Pressure Relief/ Regulators - The service line shall be equipped with pressure/relief valves to regulate the pressure of the line and provide a suitable method to prevent over-pressuring of the system in accordance with ASME B31.8 and NFPA - National Fuel Gas Code, 1999.

2.12.6 Pipe Protection - All metallic pipes shall have protective coating in accordance with UFGS Section 02556 GAS DISTRIBUTION SYSTEMS, Para. 2.7 and/or cathodic protection for corrosion control in accordance with Section 01011, Chapter 10.0, Electrical, General Requirements, Para 10.1.6 - Corrosion Control.

2.12.7 Meters - The gas meter for the building shall be suitable for accurately measuring the handling gas at the pressures, temperature, and volume required. The meter shall be equipped with an over-pressure protection.

2.12.8 Drips - The service line shall be supplied with drips and blow off lines at locations as required. Drips shall be a commercial unit of the approved type and capacity.

2.12.9 Excavation and Backfill - Excavation of trench for the pipe and backfill shall be as specified in UFGS Section 02316 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS.

2.12.10 Underground Marking - The pipe shall have a magnetic backed tape, using the standard color for gas pipe installation, placed in the trench above the pipe for future location using a magnetic detector.

2.13 PERMITS

2.13.1 Erosion and Sediment Control

The Contractor shall be responsible for selecting and implementing Best Management Practices (BMPs) to minimize pollutants in storm water discharges associated with construction activity at the construction site. The Contractor shall maintain all erosion and sediment measures and other protective measures in effective operating condition. All temporary erosion control measures shall be removed once the corresponding disturbed drainage area has been permanently stabilized. The project will require coverage under the State of Maryland's Storm Water General Permit for Construction Activities. The Contractor shall be responsible for compliance with State of Maryland's National Pollution Discharge Elimination System (NPDES) permit requirements for storm water discharges from construction sites in accordance with Section 01561 ENVIRONMENTAL PROTECTION of the specifications. Included in the permit requirements is the mandate for the Contractor to design and obtain approval for an Erosion and Sediment control plan in accordance with the Maryland Standards and Specifications for Soil Erosion and Sediment Control Manual. Also, the plan shall be coordinated with and submitted for approval to Rosario Dimarco, DIS, at (301) 619-2429 and with the NAB Construction Representative.

2.13.2 Storm Water Management

The Contractor shall obtain a Storm Water Management Permit from the State of Maryland Department of the Environment prior to construction. Refer to Section 01011, Para 2.9.2, Storm Water Management for details. Also, the plan shall be coordinated with and submitted for approval to Rosario Dimarco, DIS, at (301) 619-2429.

2.13.3 NPDES Permit

The Contractor shall be responsible for compliance with the State of Maryland's National Pollution Discharge Elimination System (NPDES) permit requirements for storm water discharges from construction sites. The Contractor shall obtain an NPDES permit from the Maryland Department of the Environment.

2.13.4 Excavation Permit

The Contractor shall be responsible for obtaining an Excavation Permit from the Fort's DIS prior to construction. Methods/limits of excavation shall be worked out with the Fort during this process; utility work adjacent to and in the vicinity of Porter Street shall not disrupt traffic. Also, any excavation or ground penetration has to be approved by the DIS. POC is Barry Schmidt at (301) 619-2316.

CHAPTER 5 ARCHITECTURAL

5.1 ARCHITECTURAL

5.2 GENERAL INFORMATION

5.2.1 Construction for the Fire Station Addition shall be based on the information contained in this Request for Proposal (RFP) and the attached conceptual floor plan at the end of this section as Attachment 1.

5.2.2 Information gathered during site visits and the pre-design conference meeting with the Fire Station personnel were used to discuss the floor plan layout and functional requirements.

5.2.3 Architectural features of this facility shall be designed in accordance with the Fort Detrick Installation Design Guidelines, which is included in Appendix A, after Chapter 10. The exterior shall be designed to incorporate the style, color and materials of other recent facilities in the area. All materials will be chosen for durability and low maintenance. Materials and finishes noted in this RFP should be considered as minimum requirements. Improved finishes or betterments are encouraged.

5.2.4 This facility shall be constructed in accordance with Military Handbook 1008C. MIL HDBK 1008C currently requires new buildings to be either Type I or Type II construction as determined by the Uniform Building Code (UBC). In accordance with EC 1110-1-94, CLASSIFICATION OF TYPE OF CONSTRUCTION, this Engineering Circular (EC) modifies MIL-HDBK 1008C to allow any type of construction, as long as it complies with the UBC requirements for determining construction type. Where there is a case of conflicting requirements the most stringent requirement shall apply. Military Handbook 1008C references: a) applicable portions of the Uniform Building Code for the following: type of construction, fire resistance requirements, allowable floor area, building height limitations, and building separation distance requirements; and b) building construction related to egress and safety to life shall comply with NFPA 101. Type of occupancy shall be in accordance with UBC and NFPA. Fire Resistant plywood is not permitted as a roof sheathing material. Finishes shall be Class A or B except that smoke spread rating cannot exceed 100 for Class B.

5.2.5 Antiterrorism/Force Protection (AT/FP): The facility shall be designed in accordance with Interim Department of Defense Antiterrorism/Force Protection Construction Standards. A copy of this document will be made available to the Contractor.

5.2.5.1 Antiterrorism/Force Protection Construction Standards and shall include but not be limited to controlling access to roofs, for insulated glass use a minimum of 1/4"(6 mm) annealed laminated glass for the inner pane, exterior doors shall use a minimum 1/4"(6 mm) annealed laminated glass, and attaching interior ceiling mounted fixtures to the supporting structural system which includes suspended ceilings, light fixtures, and mechanical and electrical ducting and pipes, etc. See the Interim Department of Defense

Antiterrorism/Force Protection Construction Standards, December 16, 1999 for additional requirements.

5.2.5.2 A minimum ten-meter standoff zone has been established around the building, and access to parking areas and driveways within the zone is restricted to authorized vehicles. Hardening standards will have to be met for the building, especially along Porter Street, where additional space for increase standoff distance is not available. Replacement windows that meet AT/FP criteria are proposed for the entire building. A vehicle spike strip is proposed to prevent unauthorized access from Porter Street to the exit drive for the apparatus bays. A gated access drive behind the building provides restricted access to Fire Department and PMO employee parking spaces.

5.2.6 Project Phasing: Fire Station and PMO must be fully operational at all times during construction. The fire personnel will be required to be relocated to temporary facilities with sleeping accommodations, toilets, showers and shared kitchen shall be provided during interior demolition and renovation of existing space. Two pumper trucks and one HAZMAT truck are to be protected with a temporary heated enclosure. Temporary asphalt parking surface and a temporary oil separator shall be provided as required by MDE. Fire apparatus vehicles will also require appropriate measure for temporary and secure parking that will not interfere with required fire response time. New expansion and renovation will have to be structured within the contractors work plan. Reference Section 2.4.3. Temporary Facilities for Fire Station Personnel, for coordination of temporary personnel facilities needed to maintain facility operation. Conceptual Site Plan presents information discussed with fire personnel and alternate solutions presented by contractor are encouraged.

5.2.7 Existing Building Background and Organization: The following is a discussion of Building 1504 existing conditions and organizational deficiencies:

5.2.7.1 Building 1504 is home to Fort Detrick one-company Fire Station and the Provost Marshal's Office and Police Station. The original fire station encompasses approximately 6,500 gross square feet (GSF), which includes a high bay apparatus room for two trucks and a one-story administrative/sleeping area. Two additions have since expanded the building to accommodate the requirements of a two-company fire department. In 1985-86, a two-story addition at the rear of the building provided a physical training room, training room and additional bunk space. In 1998-99, a two-vehicle apparatus room was added to the southwest corner of the building, adjacent to the original apparatus room.

5.2.7.2 The mission of the fire department has been expanded due to two additional responsibilities that require additional apparatus space. The closure of Fort Ritchie has required two trucks alternate being kept at Fort Detrick to "dry out". Also, Fort Detrick is responsible for HAZMAT response and rescue support for Fort Detrick as well as Frederick County.

5.2.7.3 The four existing bays in Building 1504 do not accommodate all of the assigned vehicles. Overflow equipment is parked outside on the driveway and one truck is stored off-site in Building 938. In addition, a new 50-foot

HAZMAT truck is expected in the future and the existing apparatus bays do not dimensionally accommodate this equipment.

5.2.7.4 The original Building 1504 Fire Station was programmed and designed prior to the publication of the USACE Design Guide for Fire Stations (DG 1110-3-145, March 1986). Original building and the following two additions do not conform to the Design Guide criteria.

5.2.7.5 This project has been coordinated with the installation physical security plan, and all required physical security and Antiterrorism/Force Protection (AT/FP) measures are included.

5.2.7.6 See Section 5.4 for a detailed listing of all personnel, rooms, spaces, areas, and equipment and Attachment 1 for conceptual floor plan (following Chapter 5).

5.3 REFERENCES:

Design shall meet the latest edition of the following criteria unless otherwise noted herein:

MIL-HDBK-1008C, "Fire Protection for Facilities, Engineering, Design, and Construction".

EC 1110-1-94, Dated 31 July 2001, Modifying MIL-HDBK-1008C.

MIL-HDBK-1190, "Facility Planning and Design Guide".

Conceptual Site Plan, see attachment 1 following Chapter 2.

Conceptual Floor Plan, see Attachment 1 following Chapter 5.

Installation Design Guide, Attached as Appendix A.

Uniform Federal Accessibility Standards (UFAS), 49 CFR 31528.

Americans With Disabilities Act (ADA), Public Law 101-336.

Americans with Disabilities Act Accessibility Guidelines (ADAAG), 36 CFR Part 1191.

ASHRAE 90.1-2001

International Building Code 2000(IBC).

NFPA-101, Life Safety Code.

Department of Defense Antiterrorism/Force Protection Construction Standards (with Army Supplemental Guidance) interim standards, 16 Dec. 99.

Army TM 5-853-1, Security Engineering Project Development, May 1994.

Army TM 5-853-2, Security Engineering Concept Design, May 1994.

Army TM 5-853-3, Security Engineering Final Design, May 1994.

Army TM 5-853-4, Security Engineering Electronic Security Systems, May 1994.

Army AR 190-11, Physical Security of Arms, Ammunition, and Explosives

Army Technical Letter 1110-3-491, Sustainable Design for Military Facilities.

Sustainable Project Rating Tool for military facilities, available at <http://www.usace.army.mil/inet/usace-docs/eng-tech-ltrs/etl1110-3-491/a-c.pdf>

Army Technical Instructions TI 809-04, Seismic Design for Buildings.

DG-1110-3-145, USACE, Design Guide for Fire Stations, March 1986.

5.4 BUILDING AREAS

5.4.1 Gross Area: The gross floor area of the Fire Station Modification and Addition shall equal but not exceed 13,380 square feet. The gross area is the floor area measured from the outer surfaces of the exterior walls of the new addition and to include existing area to be renovated. The following required Summary of Program Activities are shown in Table I with approximate areas in gross square feet (GSF).

**Summary of Program Activities
and Proposed GSF**

FUNCTIONAL ELEMENTS	GSF
Administrative/Operations	
Day Room	
Watch/Alarm Room	
Training Room With Storage	
Shift Supervisor's Office	
Physical Training	
Medical Supply	
Workroom/Extinguishing Agent/Storage	
Chief's Office	
Administrative Supply Storage	
Fire Inspector's Office	
Hose Dryer	
Janitor's Closet	
Mechanical/Electrical	
Subtotal GAF-Administrative	4,555
Dormitory/Kitchen Area	
Dormitory Units	
Male Toilet with Showers	
Female Toilet with Showers	
Kitchen	
Dining	
Subtotal GAF-Dormitory/kitchen	3,065
Apparatus Room	
% Drive-Through Bays (7-8 vehicles)	5,760
Subtotal GAF-Apparatus Room	5,760
TOTAL GROSS AREA	13,380

5.4.2 Excluded Space. Attic areas where average clear height does not exceed 7 feet; crawl spaces; exterior uncovered loading platforms or facilities, either depressed, ground level or raised; open courtyards; open paved terraces; roof overhangs and soffit for weather protection; uncovered ramps; uncovered stoops; and utility tunnels and raceways will be excluded from the gross area.

5.4.3 Net Floor Areas: Net floor area is that space within the interior faces of exterior walls and/or interior walls. Actual amount on space required for each area will be determined by the Design-Build Contractor to accommodate equipment and furniture requirements and space clearances for equipment service. Mechanical and Electrical Rooms may be resized to accommodate efficient layout of mechanical and electrical equipment.

5.5 INTERIOR BUILDING SPACE

5.5.1 The following interior building spaces are required and shall be included in the modification and addition. Attachment 1 shall be referenced as a conceptual plan layout. Modification of existing space shall address the step down into the original apparatus bays. Existing and new floors

shall align or be accessible by any means necessary. Special requirements for all program areas are as follows:

5.5.1.1 Existing Vestibule: The existing vestibule shall be designed with durable finishes for walls, ceiling, and floor. New outer and inner doors shall be provided. Doors shall be min. double 3' wide x 7' high. Access through these doors shall be handicap accessible.

5.5.1.2 Existing Main Corridor: Corridor shall serve as main access to fire station side of building. Some spaces along this corridor used by the fire station shall be turned over to the PMO.

5.5.1.3 Existing locker room/ bunkroom area: All existing lockers and concrete curbs beneath lockers shall be removed flush to existing floor.

5.5.1.4 Existing toilet room along main corridor shall become public handicapped accessible toilet. Modifications to this toilet room shall be made as required to achieve ADA compliance. Fixture clearances and types shall be removed and replaced with new as required.

5.5.1.5 Watch Alarm Area: Expansion into existing apparatus area with rated observation window and frame into new apparatus bay area. The existing doorway shall have a Dutch door installed to allow personnel to monitor existing corridor. Door function shall be confirmed with Fire Personnel.

5.5.1.6 Corridors: Corridors shall be minimum 6'-0" net clear width.

5.5.1.7 Administration Area: Fire personnel offices connected to existing main corridor and kitchen/dining area. Area to include Fire Chief Suite with Bunk and personal bathroom, storage room, Inspector's Office and Assistant Chief Captains Office.

5.5.1.8 Kitchen and Dining Area: New kitchen shall have commercial grade cabinets and countertops with individual food storage lockers. Existing appliances to be reused shall include refrigerator/freezer and six-burner range. New commercial grade dishwasher, stainless steel range hood, 24 inch gas griddle (beside stove and under hood) and double sink with garbage disposal shall be provided and integrated into new layout. Dining area to have direct access to kitchen with buffet style serving capability.

5.5.1.9 Dayroom: Fire Personnel lounge with dimmer switch lighting and organization to allow for seating and television viewing. Existing door to exterior to be removed and new window and wall infill to be provided to match existing.

5.5.1.10 Dorm Room Area: Sleeping rooms with lockable closets for each shift shall be organized around a private corridor with connection to women and men's toilet room. All doors leading to private corridor shall have posted signage reading "Fire Department Personnel Only". Public to have no access to this area. Direct egress from this area to new apparatus bays shall accommodate required fire response time. A private laundry room shall be accessible by all rooms for use by the fire personnel. See table below for staff per shift and sleeping accommodations:

Staffing

	Staffing Per shift -----	Typical Min. Staffing -----	No. Beds -----
FIRE PROTECTION SECTION			
Assistant Chief and Crew Chief	1	3	1
Driver/Firefighter	10	21	10
Firefighter		Incl. above	
ADMINISTRATIVE SECTION			
Chief	1	1	1
Secretary	1	1	-
FIRE PREVENTION SECTION			
Fire Inspectors		Incl. above	1

TOTALS	13	26	13

5.5.1.11 Apparatus Area: Provide five bays base on vehicle size and clearances required and verified by fire personnel. Provide bay size based on vehicle size as follows:

Vehicle List

No.	Description	Length/Width
----	-----	-----
1	Engine 501-1250 GPM Structural pumper	28'-5" X 9'-4"
1	Engine 502-1250 GPM Structural pumper	30'-0" X 9'-2"
1	Engine 503-1250 GPM MACI Crash Vehicle	27'-6" X 9'-2"
1	Hazmat Vehicle -20 FT Rescue Body (estimated)	39'-0" X 9'-0"
1	Engine 19-reserve Engine	27'-0" X 9'-0"
1	Utility-50-Special response Vehicle	21'-5" X 9'-1"
1	GSA-Chief's Vehicle	18'-6" X 8'-0"
2	GSA-General Purpose Vehicles	16'-0" X 7'-0"
1	Confined Space trailer	20'-4" X 8'-4"

5.5.1.11.1 High windows shall be introduced to provide natural light into entire apparatus bay area.

5.5.1.11.2 SCBA compressor, hose storage racks, electric hose dryer and fire extinguisher storage shall be located on the western side of the apparatus area with no obstruction to vehicle access. Location of all equipment shall be coordinated and confirmed with the Fire Personnel.

5.5.1.11.3 Walls to be a masonry material with a protective coating that provides a durable finish and moisture resistance.

5.5.1.11.4 Adjacent watch room to have rated observation glass into the apparatus area for monitoring control.

5.5.1.11.5 Apparatus bays shall have power, air and exhaust collection system drops for each vehicle.

5.5.1.11.6 Minimum 14' wide by 16' high insulated steel overhead doors with partial or full view glass and automatic openers with necessary controls. Controls shall be manual and Watch Alarm Room controlled as required for fire response. Doors shall be provided with wind-locks and necessary measures to stabilize doors.

5.5.1.11.7 Each overhead door jamb shall be protected by 3'-0" high painted steel bollards (concrete filled) for resistance to vehicle impact.

5.5.1.11.8 Radiant gas heat shall be provided between each vehicle bay.

5.5.1.11.9 Fluorescent lighting shall be provided for entire area.

5.5.1.12 Women's Toilet Room: Wall Hung Lavatories, Wall Hung Toilets, Wall and Floor Mounted Partitions and Shower Stall.

5.5.1.13 Men's Toilet Room: Wall Hung Lavatories, Wall Hung Urinals, Wall Hung Toilets, Wall and Floor Mounted Partitions and Shower Stall.

5.5.1.14 Training Room: Training room shall be capable of being divided into two separate rooms by way of an operable partition. Each half of the training room shall be accessible from an interior corridor. The training room shall accommodate 20 people. Space shall be equipped with an overhead projector and a projection screen, and a visual board.

5.5.1.14.1.1 Projector and Screen: Projector screen shall be ceiling recessed, motorized, sized to accommodate viewing and room orientation. Projector shall be capable of being tied into personnel computers (PC) for presentations and instruction by way of communications ports every 8 feet along all walls. These items shall be purchased and installed by the construction contractor under this RFP. Items should be purchased from the GSA Federal Supply schedule ([HTTP://fss.gsa.gov](http://fss.gsa.gov)).

5.5.1.14.1.2 Visual Board: Visual wall-mounted board with tack able and porcelain marker surfaces shall be provided approximately 3'-6" high x 9' wide. This item shall be purchased and installed by the construction

contractor under this RFP. Items should be purchased from the GSA Federal Supply schedule ([HTTP://fss.gsa.gov](http://fss.gsa.gov)).

5.5.1.15 Women's and Men's Toilet Rooms: Toilet rooms shall be provided with floor drains.

5.5.1.15.1.1 Toilets: Toilets shall be provided in accordance with the *National Standard Plumbing Code*. Existing public handicapped toilet shall be evaluated for accessibility. Fire Personnel do not require handicapped accessible toilets in personnel toilets. Toilets shall be vitreous china.

5.5.1.15.2 Lavatories: Lavatories shall be provided in accordance with the *National Standard Plumbing Code*. Lavatories shall be vitreous china mounted under counter. Counter shall be, wall mounted, solid surface polymer as described below in "Solid Surfaces", or other nonporous, hard surface, easily maintained product at least 1 inch thick with side panels, intermediate supports, with 4 inch back splash and 4" end splashes at walls. Counters shall be sealed to walls.

5.5.1.15.3 Urinals: Urinals for men's room shall be provided in accordance with the *National Standard Plumbing Code*. Urinals shall be vitreous china.

5.5.1.15.4 Shower/Shower Rooms: Provide at least one shower in each toilet room or adjacent to each toilet room in separate room with door. Shower units shall be one-piece acrylic with built-in soap dish and glass shower door with stainless steel. Shower shall be provided with a recessed low-voltage, recessed ceiling mounted light fixture, switched from outside the shower compartment. Shower units shall be provided with a full soffit to the ceiling with an access panel for access to the shower light transformer. Shower rooms shall be provided with floor drains.

5.5.1.15.5 Toilet Partitions: Toilet partitions shall be solid plastic non-porous polymer as described below in "Solid Surfaces". Partitions shall be floor and wall mounted, not ceiling mounted. All hardware for toilet partitions shall be stainless steel.

5.5.1.15.6 Toilet Accessories: All toilet accessories shall be satin finish stainless steel. All toilet accessories shall be blocked in walls. Toilet accessory finishes shall be compatible with one another and shall be coordinated.

5.5.1.15.6.1 Grab Bars: Grab bars shall be evaluated and provided (if required) in existing handicapped toilet room in accordance with ADA and Uniform Federal Accessibility Standards and in conformance with FS WW-P-541.

5.5.1.15.6.2 Glass Mirrors: Shall be provided in conformance with FS DD-M-411. Provide mirrors in each toilet room. Provide one 18 inch x 30 inch tilt mirror in existing toilet room above handicap lavatory.

5.5.1.15.6.3 Toilet Seat Cover Dispenser: Provide one toilet seat cover dispenser with a capacity of 200 seat covers in each toilet room. Dispenser shall be stainless steel.

5.5.1.15.6.4 Sanitary Napkin Dispenser/Disposer: Provide one sanitary napkin dispenser in the women's room and a sanitary napkin disposer in each toilet compartment. Dispenser shall be coin operated, cost as per user requirements. Dispenser and disposer shall be stainless steel.

5.5.1.15.6.5 Toilet Tissue Dispenser: Provide a wall mounted, stainless steel toilet tissue dispenser in each toilet compartment. Toilet tissue dispensers shall have two rolls of tissue stacked vertically and shall be roller mounted on two support brackets. Brackets shall be stainless steel.

5.5.1.15.6.6 Soap Dispenser: Provide one soap dispenser for each lavatory. Soap dispensers shall be liquid type consisting of Type 304 stainless steel tank with holding capacity of 32 fluid ounces with a corrosion-resistant all-purpose valve that dispenses liquid soaps, provided in combination with a wall mounted glass mirror over each lavatory. All toilet rooms shall be handicapped accessible per ADA and UFAS requirements.

5.5.1.15.6.7 Paper Towel Dispenser/Disposer: Provide semi-recessed, wall mounted, stainless steel, combination paper towel dispenser and disposal near lavatory in each toilet room. Dispenser/receptacle shall have a capacity of 400 sheets of C-fold, single-fold, or quarter-fold paper towels. Waste receptacle shall be designed to be locked in unit and removable for service. Locking mechanism shall be tumbler key lock. Waste receptacle shall have a capacity of 12 gallons. Unit shall be fabricated of not less than 0.030-inch stainless steel welded construction with all exposed surfaces having a satin finish. Waste receptacle that accepts reusable liner standard for unit manufacturer shall be provided.

5.5.1.16 Janitor Closet: Shall have fixed, wall-mounted shelving and a floor mounted mop sink with mop rack. Mop sink shall be provided with a backsplash. Closet shall be located by Designer and approved by Fire Personnel.

5.5.1.17 The construction contractor shall relocate one existing SCBA compressor and related items from the existing facility to the new apparatus room. Existing washer and dryer shall be relocated from existing space into new Workroom. All required plumbing and electrical shall be provide.

5.6 GENERAL REQUIREMENTS:

5.6.1 "Summary of Program Activity and Gross Area" and Attachment 1, "Conceptual Floor Plan" required by this RFP for organizational guidelines.

5.6.2 Minimum Ceiling Height: The minimum ceiling height shall be 8'-0".

5.6.3 Vision Panels: Doors to all enclosed offices shall have vision panels.

5.6.4 Accessibility: All areas and rooms, except mechanical, electrical rooms shall be handicapped accessible per the Uniform Federal Accessibility Standards and ADAAG. Access walks, ramps and public ways shall also be accessible per the above stated criteria.

5.6.5 Sprinkler System: All expansion and renovated areas of the fire station, excluding PMO, shall be equipped with a wet sprinkler system.

5.6.6 Provide all rooms with PA Speaker system. Bedrooms will be equipped with volume control. New equipment shall be compatible with existing system.

5.6.7 HVAC System: Heating and cooling will provided in renovated areas by expansion of existing equipment. All dorm rooms shall have individual thermostats. Heating shall be provided in the apparatus bays.

5.6.8 Acoustical Design: The designers must address isolation of noise from a variety of sources, including but not limited to; office to office, office to training rooms, training room to physical fitness room, corridors to work rooms/offices/training, mechanical/electrical equipment and apparatus bays to all adjacent spaces. Acoustical treatment of the walls and ceiling must be designed to provide an STC rating that isolates the noises from the sources listed above. Walls between rooms and corridors must have a sound transmission class (STC) of at least 50. Doors in those walls must have an STC of at least 45. Ceiling assemblies must have an STC of at least 55. Sufficient insulating material shall be provided in the attic space to meet both the thermal and acoustical requirements specified herein.

5.6.9 Interior Finishes:

5.6.9.1 Floors

5.6.9.1.1 Carpets: Unless indicated in other sections of this RFP, carpets shall be provided in all individual offices, open offices, corridors, conference/training rooms, dorm rooms and private corridor.

5.6.9.1.2 Vinyl Composition Tile: Unless indicated in other sections of this RFP, vinyl composition tile shall be provided in storage rooms, kitchen, workroom, dining area and equipment maintenance rooms.

5.6.9.1.3 Ceramic/Porcelain Tile: Unless indicated in other sections of this RFP, tile shall be provided in toilet rooms, shower rooms, janitor closet, and entry vestibule.

5.6.9.1.4 Epoxy Floor Coating: "Fire House Flooring" or equal non-slip floor coating shall be provided at entire concrete floor area at Apparatus Bays. Visual guidelines for vehicle parking shall be integrated into design and color selected by fire personnel.

5.6.9.2 Walls

5.6.9.2.1 Vinyl Wall Coverings: Unless indicated in other sections of this RFP, vinyl wall coverings shall be provided in individual offices, open offices, corridors and conference/training rooms.

5.6.9.2.2 Ceramic Tile Walls: Unless indicated in other sections of this RFP, ceramic tile shall be provided in toilet rooms, shower rooms, and janitor closet.

5.6.9.2.3 Painted Walls: Unless indicated in other sections of this RFP, paint shall be provided on all walls except where vinyl wall covering or ceramic tile is being provided.

5.6.9.2.4 Chair Rails and Corner Guards: Unless indicated in other sections of this RFP, chair rails and corner guards shall be provided in individual offices, open offices, corridors, and conference/training rooms.

5.6.9.3 Ceilings

5.6.9.3.1 Acoustical Ceiling Tile: Unless indicated in other sections of this RFP, acoustical ceiling tile shall be provided in all areas except toilet rooms, shower rooms and janitor closet.

5.6.9.3.2 Paint: Painted gypsum board shall be provided on ceilings in all utility rooms, toilet rooms, shower rooms, and janitor closet.

5.6.9.3.3 All exposed steel structure and steel decking shall be painted at Apparatus Bay Area.

5.7 BUILDING SHELL

5.7.1 Foundation & Floor Construction: The building will be permanent construction of concrete foundation and floor slab.

5.7.2 Steel Doors and Frames: Exterior doors shall be heavy-duty 1 3/4" thick steel, commercial style steel doors and steel frames, except for aluminum/glass storefront-type doors at entrances. Exterior doors shall be insulated and weather-stripped.

5.7.3 Aluminum Store-Front Type Doors and Exterior Windows: Doors and windows shall be glazed with *laminated insulated glass in accordance with the Interim Department of Defense Antiterrorism/Force Protection Construction Standards and shall conform to ASTM E 773 and ASTM E 74*. Glazing shall be bronze tinted. Glazing shall have a maximum condensation factor of 48% in accordance with AAMA 1502.7. Frame shall have bronze anodized finish with a minimum of 0.4- mil thick. Organic coating shall be manufacturer's standard acrylic or polyester, bake-on, electrostatically applied enamel coating of 1.0 +.2 mils) dry film thickness minimum. All coatings shall be factory applied.

5.7.4 Windows bronze tinted glass and bronze anodized finished frames. All windows shall be heavy commercial class 40 (HC-40) grade. All window frames shall have *laminated glazing units in accordance with the Interim Department of Defense Antiterrorism/Force Protection Construction Standards*. All window frames shall be constructed with a thermal break feature. All window frames shall be designed to withstand a 90 mile per hour wind velocity. Windowsills shall be solid surface polymer or other nonporous, hard surface, easily maintained product. Window operation shall be coordinated with Fire Personnel preference.

5.7.5 Interior Glazing: Glass shall conform to the requirements of ASTM C1036. Glass in doors and adjacent to doors shall conform to the requirements of CFR 16 Part 1201. Glazing of interior vision panels shall conform to CFR 16 Part 1201.

5.7.6 Roof for the expansion area shall be a standing seam metal roof or other roof system may be proposed. SSRS Roof slope and finish shall match

both color and configuration of adjacent buildings. Provide continuous roof slope to the perimeter of the building. Do not design interior valleys or depressions that will form ponds. The new roof shall have no roof drains but shall dispose of water by gutters and downspouts to underground collection system into base storm sewer system.

5.7.6.1 Roof Panels: Panels shall be 22 - 24 gauge standing seam metal steel and shall have a factory color finish. Finish shall be Kynar 5000 coating technology *or equal and must meet the performance requirements stated herein*. Roof deck assemblies shall be Class 90 as defined in UL 580. Length of sheet shall be sufficient to cover the entire length of any unbroken roof slope when such slope is 30 feet or less. When length of run exceeds 30 feet and panel splices are provided, each sheet in the run shall extend over three of more supports. Sheets longer than 30 feet may be furnished if approved by the Contracting officer. Width of sheets shall provide not more than 18 inches of coverage in place. SSMRS with roofing panels greater than 12 inches in width shall have standing seams rolled during installation by an electrically driven seaming machine. Height of standing seams shall be not less than 2-1/2 inches. All sheets shall be cut in the shop to correspond to the roof slope and may have a horizontal joint at the eave line.

5.7.6.1.1 Steel Panels: Zinc-coated steel conforming to ASTM A 446, G 90 coating designation. Panels shall be 22 - 24 gauge.

5.7.6.1.2 Aluminum Panels: Alloy conforming to ASTM B 209, temper as required for the forming operation, minimum 0.032-inch thick.

5.7.6.2 Performance Standards: The uplift resistance of the SSMRS shall be established as indicated in the "STANDARD TEST METHOD FOR STRUCTURAL PERFORMANCE OF SSMRS BY UNIFORM STATIC AIR PRESSURE DIFFERENCE". The SSMRS design shall be adequate for uplift if the established allowable pressure from testing causes no failure as defined in the STANDARD TEST METHOD FOR STRUCTURAL PERFORMANCE OF SSMRS BY UNIFORM STATIC AIR PRESSURE DIFFERENCE. Testing to ultimate capacity is not required.

5.7.6.3 Factory Color Finish: Roof panels shall have a factory finish on the exposed side. The exterior finish shall consist of a polyvinylidene fluoride coating. Finish shall be coil-coated custom color. The contracting officer shall approve color. The dry film thickness of the exterior coating shall be not less than 0.8 mil over a primer coat with a dry film thickness of 0.3 mils. The interior color finish shall consist of a mill finish. The exterior color finish shall meet the test requirements specified below. The manufacturer shall have conducted tests on previously manufactured sheets of the same type and finish as proposed for the project. The term "appearance of base metal" refers to the metal coating on the steel base metal. The dry film thickness of the interior prime coat shall be not less than 0.3 mils.

5.7.6.4 Testing Requirements

5.7.6.4.1 Salt Spray Test: A Sample of the sheets shall withstand a salt spray test for a minimum of 1000 Hours in accordance with ASTM B 117, including the scribe requirements in the test. Immediately upon removal of the panel from the test, the coating shall receive a rating of 10, no

blistering, as determined by ASTM D 714; And rating of 7, 1/16-inch failure at scribe, as determined by ASTM D 1654.

5.7.6.4.2 Formability Test: When subjected to a 180-degree bend over a 3/8-inch diameter mandrel in accordance with ASTM D 522, Exterior coating film shall show no evidence of fracturing to the naked eye.

5.7.6.4.3 Accelerated Weathering, Chalking Resistance and Color Change: A sample of the sheets shall withstand a weathering Test a minimum of 2000 hours in accordance with ASTM G 23 using a Type D apparatus, without cracking, peeling, blistering, loss of adhesion of the protective coating, or corrosion of the base metal. Protective coating that can be readily removed from the base metal with tape in accordance with ASTM D 3359, Test Method B, shall be considered as an area indicating loss of adhesion. After the 2000-hour weatherometer test, exterior coating shall not chalk greater than No. 8 rating in accordance with ASTM D 4214 test procedures. After the 2000-hour weather meter test, exterior coating color change shall not exceed 2 NBS units in accordance with ASTM D 2244.

5.7.6.4.4 Humidity Test: When subjected to a humidity cabinet test in accordance with ASTM D 2247 for 1000 hours, a scored panel shall show no signs of blistering, cracking, creep age or corrosion.

5.7.6.4.5 Impact Resistance: Factory-painted sheet shall withstand direct and reverse impact in accordance with ASTM D 2794 equal to 1.5 times metal thickness in mils, expressed in inch-pounds, with no loss of adhesion.

5.7.6.4.6 Abrasion Resistance Test: When subjected to the failing sand test in accordance with ASTM D 968 the coating system shall withstand a minimum of 80 liters of sand before the appearance of the base metal.

5.7.6.4.7 Specular Gloss: Finished surfaces shall have a specular gloss of 20 or less at an angle of 60 degrees when measured in accordance with ASTM D 523.

5.7.6.4.8 Pollution Resistance: Coating shall show no visual effects when immersion tested in a 10 percent hydrochloric acid solution for 24 hours in accordance with ASTM D 1308.

5.7.6.5 Accessories: Accessories shall be furnished with the Standing Seam Metal Roof System. Flashing, gutters, soffits, fascias, trim, metal closure strips, caps, snow guards, and similar metal accessories shall be not less than the minimum thickness specified for roofing panels. Exposed metal accessories shall be finished to match the panels furnished. Molded closure strips shall be closed-cell or solid-cell synthetic rubber or neoprene, or polyvinyl chloride; premolded to match configuration of the covering and shall not absorb or retain water. Thermal spacer blocks and other thermal barriers at concealed clip fasteners shall be as recommended by the manufacturer.

5.7.6.6 Fasteners: Concealed fasteners for steel roof panels shall be zinc-coated steel, aluminum, corrosion resisting steel, or nylon capped steel, type and size specified below or as otherwise approved for the applicable requirements. Concealed fasteners for aluminum roof panels shall be aluminum

or corrosion resisting steel. Fasteners for structural connections shall provide both tensile and shear strength of not less than 750 pounds per fastener. Fasteners for accessories shall be the manufacturer's standard. Exposed roof fasteners shall be gasketed or have gasketed washers on the exterior side of the covering to waterproof the fastener penetration. Washer material shall be compatible with the covering; have a minimum diameter of 3/8 inch for structural connections; and gasketed portion of fasteners or washers shall be neoprene or other equally durable elastomeric material approximately 1/8-inch thick.

5.7.6.6.1 Screws: Screws shall be as recommended by the manufacturer to meet the strength design requirements of the panels.

5.7.6.6.2 Bolts: Bolts shall be not less than 1/4-inch diameter, shouldered or plain shank as required, with locking washers and nuts.

5.7.6.6.3 Structural Blind Fasteners: Blind screw-type expandable fasteners shall be not less than 1/4-inch diameter. Blind rivets shall be 9/32-inch minimum diameter.

5.7.6.7 Insulation: Thermal resistance of insulation shall be not less than the R-values determined from the "U" values indicated in Table II below. R-values shall be determined at 75 degrees F in accordance with ASTM C 518. Insulation shall have a flame spread not in excess of 25 and a smoke developed rating not in excess of 50 when tested in accordance with ASTM E 84; shall be a standard product of a manufacturer, factory-marked or identified with manufacturer's name or trademark and R-value. Identification shall be on individual pieces or individual packages. Insulation shall have a facing providing a permeability of 0.1 perm or less when tested in accordance with ASTM E 96. Facing shall be white, either of reinforced foil with a vinyl finish or sheet vinyl except unreinforced foil with a natural finish may be used in concealed locations. Insulation shall have a facing providing a permeability of 0.02 perm or less when tested in accordance with ASTM E 96. Facing shall be of 2 mil thick white vinyl backed with 6 inch by 6 inch glass scrim and 0.7 mil thick metal foil laminate. Reinforced foil with a natural finish may be used for facing in concealed locations. Facings and finishes shall be factory applied

5.7.6.7.1 Rigid or Semi-rigid Board Insulation: Rigid board insulation shall conform to ASTM C 612, Form A, Class 1.

5.7.6.7.2 Blanket Insulation: Blanket insulation shall conform to FS HH-I-SS8, Form B, Type I, Class 6. Exposed insulation shall have a white sheet vinyl face.

5.7.6.7.3 Insulation Retainers: Insulation retainers shall be type, size, and design necessary to adequately hold the insulation and to provide a neat appearance. Metallic retaining members shall be nonferrous or have a nonferrous coating. Nonmetallic retaining members, including adhesives used in conjunction with mechanical retainers or at insulation seams shall have a fire resistance classification not less than that permitted for the insulation.

5.7.6.8 Concealed Anchor Clips: Concealed anchor Clips shall be as recommended by the manufacturer for the roofing system furnished. Clip bases shall have factory punched or drilled holes for attachment. Clips used with panel width greater than 12 inches shall be made from multiple pieces with the allowance for the total thermal movement required to take place within the clip.

5.7.6.9 Sealant: Except as stated below, sealants shall be elastomeric type containing no oil or asphalt. Exposed sealant shall cure to a rubber like consistency. All sealants shall be the non-hardening type. Roof panel standing seam ribs shall have continuous sealant that is factory installed.

5.7.6.10 Gaskets and Insulating Compounds: Gaskets and insulating compounds shall be non-absorptive and suitable for insulating contact points of incompatible materials. Insulating compounds shall be non-running after drying.

5.7.6.11 Sub-purlins: Sub-purlins, when required by the system design, shall be formed from steel sheet as standard with the manufacturer. The uncoated thickness may be a minimum of 0.059-inches if bolts or structural blind fasteners are used for attachment of the concealed anchor Clips to the sub purlins.

5.7.6.12 Vapor Retarder: Vapor retarder material shall be polyethylene sheeting conforming to the requirements of ASTM D 4397. A fully compatible tape shall be provided which has equal or better water vapor control characteristics than the vapor retarder material. A general-purpose tape, which has some resiliency and cushioning abilities, shall also be provided.

5.7.6.13 EPDM Rubber Boots: Flashing devices around pipe penetrations shall be flexible, one-piece devices molded from weather-resistant EPDM rubber. Rubber boot material shall be as recommended by the manufacturer. The boots shall have base rings made of aluminum or corrosion resisting steel that conform to the contours of the roof panel to form a weather-tight seal.

5.7.6.14 Gutters and Downspouts: Provide eave-mounted gutters on all roof sections. Provide downspouts for all gutter locations. Roof water shall be channeled into an underground storm water collection system by way of cast iron boots (at grade) and underground PVC piping connected to the base storm water system.

5.7.6.15 Warranties: The SSSMR system shall be warranted as outlined below. Any emergency temporary repairs conducted by the owner shall not negate the warranties. Such warranties shall start upon final acceptance of the work or the date the Government takes possession, whichever is earlier.

5.7.6.15.1 Contractor's Weather Tightness Warranty: The SSSMR system shall be warranted by the Contractor on a no penal sum basis for a period of five years against material and workmanship deficiencies; system deterioration caused by exposure to the elements and/or inadequate resistance to specified service design loads, water leaks, and wind uplift damage. The SSSMR system covered under this warranty shall include the entire roofing system including, but not limited to, the standing seam metal roof panels,

fasteners, connectors, roof securement components, and assemblies tested and approved in. In addition, the system shall consist of panel finishes, slip sheet, insulation, vapor retarder, all accessories, components, and trim and all connections with roof panels. This includes roof penetration items such as vents, curbs, and skylights; gutters and downspouts; eaves, ridge, hip, valley, rake, gable, wall, or other roof system flashings installed and any other components specified within the contract to provide a weather tight roof system; and items specified in other sections of the specifications that are part of the SSSMR system. All material and workmanship deficiencies, system deterioration caused by exposure to the elements and/or inadequate resistance to specified design loads, water leaks and wind uplift damage shall be repaired. This warranty shall warrant and cover the entire cost of repair or replacement, including all material, labor, and related markups. The Contractor shall supplement this warranty with written warranties from the installer and system manufacturer, which shall be submitted along with Contractor's warranty; however, the Contractor shall be ultimately responsible for this warranty. The Contractor's written warranty shall be as outlined in the Corps Of Engineers Guide Specifications *SECTION 07416, STRUCTURAL STANDING SEAM METAL ROOF (SSSMR) SYSTEM* for warranty and shall start upon final acceptance of the facility. It shall be required that the Contractor provide a separate bond in an amount equal to the installed total roofing system cost in favor of the owner (Government) covering the Contractor's warranty responsibilities effective throughout the five year Contractor's warranty period for the entire SSSMR system as outlined above.

5.7.6.15.2 Manufacturer's Material Warranties: Contractor shall furnish, in writing, the following manufacturer's material warranties which cover all SSSMR system components such as roof panels, anchor clips and fasteners, flashing, accessories, and trim, fabricated from coil material.

5.7.6.15.2.1 A manufacturer's 20 year material warranty warranting that the aluminum, zinc-coated steel, aluminum-zinc alloy coated steel or aluminum-coated steel as specified herein will not rupture, structurally fail, fracture, deteriorate, or become perforated under normal design atmospheric conditions and service design loads. Liability under this warranty shall be limited exclusively to the cost of either repairing or replacing nonconforming, ruptured, perforated, or structurally failed coil material.

5.7.6.15.2.2 A manufacturer's 20 year exterior material finish warranty on the factory colored finish warranting that the finish, under normal atmospheric conditions at the site, will not crack, peel, or delaminate; chalk in excess of a numerical rating of eight as determined in ASTM D 4214 test procedures; or change color in excess of five CIE or Hunter Lab color difference (ΔE) units in accordance with ASTM D 2244. Liability under this warranty is exclusively limited to refinishing with an air-drying version of the specified finish or replacing the defective coated material.

5.7.6.15.2.3 A roofing system manufacturer's 20-year system weather tightness warranty.

5.7.6.16 Sheet Metalwork: Flashing shall be installed in conformance with the SMACNA Architectural Sheet Metal Manual.

5.7.6.17 Insulation

5.7.6.17.1 Provide the minimum insulation values based on ASHRAE 90.1-2001 as follows:

	RSI Value	"U" Value Equivalent
Gross Wall	19	.052
Roof	30	.033

TABLE II - Minimum Insulation Values

5.7.6.17.2 Gross Wall U-factor is the U-factor sum of each wall component (opaque wall, windows, doors, openings, etc.) times the area of that wall component, the sum divided by the total wall area.

5.7.6.17.3 Thermal and sound insulation shall have a flame spread rating of 25 or less and a smoke development rating of 50 or less exclusive of the barrier when tested in accordance with ASTM E-84. A vapor barrier shall be provided on the warm side of exterior and ceiling/roof insulation where occurs. Insulation shall have a facing providing permeability of 0.1 perm or less when tested in accordance with ASTM E 96.

5.7.6.17.4

5.7.6.18 As a minimum, exterior wall construction shall conform to all Force Protection measures. Design shall be coordinated with Installation Design Guidelines. Vertical expansion joints in masonry walls shall be placed between wall openings and pilasters, not adjacent to pilasters or at the end of lintels.

5.7.6.18.1 Brick Veneer: Grade SW shall be used for brick in contact with earth or grade and for all exterior work. Grade SW or MW shall be used in other brickwork. Brick shall be tested for efflorescence. Clay or shale brick units shall be delivered factory-blended to provide a uniform appearance and color range in the completed wall. Solid clay or shale brick shall conform to ASTM C 216, Type FBX. Minimum compressive strength of the brick shall be 3000 psi.

5.7.6.18.2 Concrete Masonry Units: If used, hollow and solid concrete masonry units shall conform to ASTM C 90, Type I, Normal weight. Cement shall have low alkali content and be of one brand. Units shall be modular in size and shall include closer, jamb, header, lintel, and bond beam units and special shapes and sizes to complete the work. Units used in exposed masonry surfaces shall have a uniform fine to medium texture and a uniform color. Concrete masonry units used in fire-rated construction shall be of minimum equivalent thickness for the fire rating indicated.

5.7.6.18.3 Steel Framing: If used, steel framing shall conform to American Iron and Steel Institute (AISI), Cold Formed Steel Design Manual, American Institute of Steel Construction (AISC) ASD, Manual of Steel Construction, Allowable Stress Design, and TI 809-07, Design of Cold-Formed Load Bearing Steel Systems and Masonry Veneer/Steel Stud Walls. Cold-formed framing shall consist of steel studs, top and bottom tracks, runners, horizontal bridging, and other cold-formed members and other accessories. All members and

components made of sheet steel shall be hot-dip galvanized in accordance with ASTM A 653/A 653M with a minimum coating thickness of G 60. This framing shall be used only in framing the exterior masonry veneer steel stud wall system.

5.7.6.18.4 Wood Framing: If used, wood framing shall conform to American Forest and Paper Association (AF & PA) Manual For Wood Frame Construction and National Design Specification For Wood Construction, AF & PA T01.

5.7.6.19 Caulking and Sealants: Caulking and sealants shall be selected according to materials it is being applied to for compatibility. These sealants and caulks shall be of either a two-component, rubber base; chemical-curing compound based on polysulfide and/or polyurethane; or a single-component, rubber base, chemical curing compound such as polysulfides, polyurethanes, and silicones. Caulking shall occur around all door frames, all window frames, and at all material changes. The minimum joint width shall be 1/4 inch, and joint widths in excess of 1/4 inch shall have a backstop material provided in the joint, and the depth of all joints shall be equal to the width. Color to match adjacent materials.

5.8 INTERIOR CONSTRUCTION

5.8.1 Interior Partitions: Heights shall be minimum 8 feet 0 inch. Interior partitions shall either be steel stud or Concrete Masonry Unit Partitions (CMU) with gypsum wallboard finish.

5.8.1.1 Steel Framing: If used, Cold-formed framing shall consist of steel studs, top and bottom tracks, runners, horizontal bridging, and other cold-formed members and other accessories. All members and components made of sheet steel shall be hot-dip galvanized in accordance with ASTM A 653/A 653M with a minimum coating thickness of G40. Studs shall conform to ASTM C 645. Studs shall be C-shaped, roll formed steel with minimum uncoated design thickness of 0.0284 inch.

5.8.1.2 Concrete Masonry Unit Partitions (CMU): If used, hollow and solid concrete masonry units shall conform to ASTM C 90, Type I, Normal weight. Cement shall have low alkali content and be of one brand. Units shall be modular in size and shall include closer, jamb, header, lintel, and bond beam units and special shapes and sizes to complete the work. Units used in exposed masonry surfaces shall have a uniform fine to medium texture and a uniform color. Concrete masonry units used in fire-rated construction shall be of minimum equivalent thickness for the fire rating indicated.

5.8.1.3 Gypsum Wallboard: Gypsum wallboard shall conform to the requirements of ASTM C36 and be 48" wide, 5/8" thick and tapered edged. Steel framing, furring, and related items shall conform to the requirements of ASTM C645 and C955 where applicable. Joint treatment materials shall conform to the requirements of ASTM C475. Screws shall conform to the requirements of ASTM C 1002 and C 954 where applicable. Corner beads, edge trim, and control (expansion) joints shall conform to the requirements of ASTM C1047, and shall be corrosion protective-coated steel design 11 for its intended use. Flanges shall be free of dirt, grease, and other materials that may adversely affect the bond of joint treatment.

5.8.1.4 Acoustical Ceilings: Acoustical ceiling tile shall conform to ASTM E1264; Class A. Panel size shall be 2 feet by 2 feet. The suspension system shall conform to ASTM C635. Compression struts shall be provided at 12'-0" intervals in both directions and shall be provided 4'-0" from each wall. Hanger wires shall be provided, splayed in four directions from each compression strut and through the compression strut to the structure above per TI 809-04, Seismic Design for Buildings. Size and diameter of strut shall be derived from a standard table or arrived at by engineering calculations.

5.8.1.5 Wood Doors: Interior doors shall be 1 3/4" solid core flush wood doors, stain to match wood finish throughout the facility, laminated solid core doors. Door lites on interior doors shall be sized in accordance with building codes and positioned at a height above finished floor to allow vision on both sides.

5.8.1.5.1 Hardware: All interior hardware in this building shall be consistent and shall be a brushed aluminum finish.

5.8.1.5.2 Hinges: Exterior hinges shall have non-removable pins and be stainless steel, Grade 1; anti-friction or ball bearing; and 3 each of 4-1/2" x 4-1/2" per leaf up to 3' wide door 5" x 5" for doors 3' to 4' wide. Interior hinges shall be Grade 1; antifriction or ball bearing; and 3 each of 4-1/2" x 4-1/2" Per leaf up to 3' wide door 5" x 5" for doors 3' to 4' wide Hinges for labeled fire doors must be either steel or stainless steel. Exterior hinges for aluminum/glass storefront type doors shall be Divot hinges or offset Divot hinges (3 per leaf). Hinges shall conform to ANSI/BHMA A156.1 and A156.7.

5.8.1.5.3 Locksets, Latchets, Exit Devices, and Push and Pull Plates: Exterior doors shall have mortise locks conforming to ANSI/BHMA A156.13 for metal doors and conforming to ANSI/BHMA A156.5 for aluminum/glass store front-type doors, Grade 1. Emergency exit devices shall be Grade 1, flush-mounted type. Interior doors shall have mortise locksets conforming to ANSI/BHMA A156.13, Series 1000, Grade 1. All locks and latchsets shall be the product of the same manufacturer. Locksets and latchsets shall be provided, as required, with lever handles on each side.

5.8.1.5.4 Cylinders: Lock cylinders shall comply with BHMA A156.5 and be compatible with BEST. Lock cylinder shall have seven pins. Cylinders shall have key removable type cores. Provide an extension of the existing keying system. Construction cores shall be provided. All locksets, exit devices, and padlocks shall accept same interchangeable cores. Fire Personnel prefer "Cipher" locksets throughout the building to be integrated into existing system. Coordination shall be with Jim Martz (301) 619-2886 at the Directorate of Installation Support (DIS).

5.8.1.5.5 Closers: Closers shall be provided on all exterior doors and fire-rated doors. Closers shall conform to ANSI/BHMA A156.4, Grade 1. Closers shall be surface-mounted, modern type, with cover. Closers shall be provided with options PT-4F and PT-4H (delayed action and barrier free).

5.8.1.5.6 Keying: Keying shall be in accordance with the existing Best lock system and shall be coordinated with Jim Martz (301) 619-2886 at the DIS. All

keying shall be done at the factory. All locks shall be furnished with removable core cylinders. Replacement cores shall be BEST removable cores. Keys and permanent cores shall be shipped directly to the DIS, Ft Detrick, MD. All exterior doors shall be keyed alike in one group. All interior doors shall be keyed as specified by the facility user. All submittals/shop drawings referring to keys and keying shall be submitted to the DIS for coordination and approval. A key cabinet shall be provided with a capacity 50% greater than the number of key changes used for door locks. Location of Key cabinet shall as directed by user.

5.8.1.5.7 Thresholds: All exterior doors (except Mech/Elec rooms) shall be provided with aluminum thresholds conforming to ANSI/BHMA A156.21 and are handicapped accessible; color to be bronze. Doors at ceramic tile flooring shall be provided with marble thresholds that are handicapped accessible.

5.8.1.5.8 Kick Plates and Mop Plates: Metal Kick plates or mop plates shall be provided on all wood doors. Match metal finish with door hardware finish as specified in this section. Kick plates and mop plates shall comply with ANSI/BHMA A156.6, shall be 16" high by 2" less than width of door. Edges shall be beveled.

5.8.1.5.9 Door Stops: Doorstops shall be provided on all exterior and interior doors. Doorstops shall comply with ANSI/BHMA A156.16 and shall be bronze, Grade 1.

5.8.1.6 Glazing: Glass shall conform to the requirements of ASTM C1036. Glass in doors and adjacent to doors shall conform to the requirements of CFR 16 Part 1201. Glazing of interior vision panels shall conform to CFR 16 Part 1201. All glazing shall be laminated.

5.8.1.7 Ceramic Tile: Tile shall be standard grade conforming to ANSI A137.1. Tile shall be impact resistant with a minimum breaking strength for wall tile of 90 lbs and 250 lbs for floor tile in accordance with ASTM C 648. Water absorption shall be 0.5 maximum percent in accordance with ASTM C 373. Floor tile shall have a minimum static coefficient of friction of 0.5 in accordance with ASTM C 1028. Tile shall be Class III as rated by the manufacturer when tested in accordance with ASTM C 1027 for abrasion resistance as related to foot traffic. Ceramic mosaic tile and trim shall be unglazed natural clay with cushion edges. Tile size shall be 2 x 2 inches. Glazed wall tile and trim shall be cushion edged with matte glaze. Tile shall be 4-1/4 x 4-1/4 or 6 x 6 inches.

5.8.1.7.1 Tile setting Bed: The setting-bed shall be composed of portland cement, sand, water, and hydrated lime. Portland cement shall conform to ASTM C 150, Type I, white for wall mortar and gray for other uses. Sand shall conform to ASTM C 144. Hydrated lime shall conform to ASTM C 206, Type S or ASTM C 207, Type S. Water shall be potable.

5.8.1.7.2 Tile Backer Board: All ceramic wall tile shall be backed with cementitious backer board.

5.8.1.7.3 Mortar and Grout: Dry-set portland cement Mortar shall conform to ANSI A118.1. Latex portland cement Mortar shall conform to ANSI A118.4.

Ceramic tile Grout shall conform to ANSI A118.6. Tile Backer Board shall comply with ANSI A118.9. Tile adhesives shall not be used for this project.

5.8.1.7.4 Marble Thresholds: Marble shall be Group A as classified by MIA-01. Marble shall have a fine sand-rubbed finish and shall be white in color as approved by the Contracting Officer. Marble abrasion shall be not less than 12.0 when tested in accordance with ASTM C 241.

5.8.1.7.5 Porcelain Paver Tiles: Porcelain paver tiles shall be of standard grade quality and shall conform to requirements of ANSI A137.1, ASTM C373, ASTM C501, and ASTM C648. Coefficient of friction shall be minimum 0.5. Unglazed porcelain tile shall be unpolished. Porcelain tile shall be furnished in nominal 12" x 12" size. Base shall be cove type with inside and outside corners.

5.8.1.8 Resilient Flooring: Sheet vinyl shall conform to FS LF 475A (3) Type II; Grade A. Static load limit according to ASTM F 970 shall be not less than 12,5 psi. Sheet vinyl flooring shall be not less than 72 inches wide and shall have an alkali and moisture resistant backing. Color and pattern shall be dispensed uniformly throughout the thickness of the wear layer. Integral (flash) cove is created by extending the sheet vinyl 4 inches up the wall supported by a cove stick having a minimum radius of 7/8 inch and adhering to the wall with manufacturer's suggested adhesive and heat welding the seams. The integral coving shall be capped with an approved cap strip installed in accordance with the manufacturer's recommendations. Wall base shall conform to FS SS-W-40, Type I or Type II; Style B. Base shall be 4-inches high, minimum 0.080-inch thick. Edge strips of vinyl plastic, 1 inch wide and of thickness to match flooring. Adhesive for flooring, integral coving and wall base shall be as recommended by the flooring manufacturer. To create seams that provide a strong barrier against dirt and moisture penetration, the seams shall be heat welded per manufacturer's recommendations. Polish shall conform to FS 2F 430 or FS PW 155.

5.8.1.9 Carpet: Solid color carpets are NOT acceptable unless used as an accent or border. Carpet shall be a multi-colored, non-directional pattern with a minimum of 3 distinct colors. Bold tweed design containing a combination of shades of same color does not meet pattern requirements and will not be accepted. Carpet shall be of commercial quality. If carpet and carpet borders are specified, they shall be of same manufacturer, appearance, colors, etc. A 4" carpet base may be substituted for resilient base. The match carpet shall be used to form the carpet base. The carpet base edge shall be finished (bonded or surged) and capped with vinyl molding strip that is designed for the type of carpet being installed. The vinyl cap shall coordinate with the carpet and wall finishes. Carpet shall have an attached enhanced performance cushion. Molding shall be vinyl. Vinyl molding shall be heavy-duty and design for the type of carpet being installed. Color shall coordinate with carpet and adjacent surface. Carpet grade and quality shall be similar to "Lee's Facility Four" or approved equal. Carpet and padding shall be "non-off-gassing". The following are minimum physical characteristics:

5.8.1.9.1 Carpet Fabrication: Tufted

5.8.1.9.2 Carpet Category: Broadloom

5.8.1.9.3 Pile Type: Level Loop.

5.8.1.9.4 Pile Fiber: Branded commercial, 100% nylon with soil hiding and static control properties.

5.8.1.9.5 Gauge Pitch: 1/10 inch

5.8.1.9.6 Face Weight: minimum 32 oz. per square yard. This does not include weight of backings. Weight of actual surface yarn exposed to wear above carpet backing shall be determined in accordance with ASTM D 418.

5.8.1.9.7 Dye Method: Solution, Space Dyed are recommended.

5.8.1.9.8 Backing: Carpet shall be backed with an attached cushion.
Following are minimum performance requirements:

5.8.1.9.9 Static Control: Shall be provided to permanently 'control static buildup to less than 3.0KV when tested at 20 percent Relative humidity and 21 degrees C (70 degrees F) in accordance with AATCC 134.

5.8.1.9.10 Flammability and Critical Radiant Flux Requirements: Carpet shall comply with CFR 16 Part 1630. Carpet in corridors and exits shall have a minimum average critical radiant flux of 0.45 watts per square centimeter when tested in accordance with ASTM E 648.

5.8.1.9.11 Flame Resistance: Shall pass DOC-FF1-70

5.8.1.9.12 Tuft Bind: Shall be minimum 40 N (9-pound) average force when tested in accordance with ASTM D 1335.

5.8.1.9.13 Colorfastness to Crocking: Dry and wet crocking shall comply with AATCC 16 and shall have a minimum 4 gray scale rating after 40 hours.

5.8.1.9.14 Delamination Strength: Delamination strength for tufted carpet with secondary back shall be minimum of 2.5 lb/inch in accordance with ASTM D 3936.

5.8.1.9.15 Antimicrobial: Nontoxic antimicrobial treatment guaranteed by the carpet manufacturer to last the life of the carpet.

5.8.1.9.16 Density shall be minimum 4500 as determined by using the following formula: $Density = (W) (36)/T$. W is pile yarn weight, T is pile thickness.

5.8.1.10 Firestopping: Material shall have a flame spread of 25 or less, a smoke developed rating of 50 or less, and a fuel contribution of 50 or less when tested in accordance with ASTM E 84 or UL 723. The materials shall be nontoxic to human beings at all stages of applications and during fire conditions. Firestopping materials for through penetrations of fire resistance rated construction shall provide fire resistance rating in accordance to ASTM E 814 or UL 1479. Firestopping materials for construction joints in fire resistance rated construction shall provide a fire resistance rating in accordance to ASTM E 119 or UL 263. Construction joints include

those joints used to accommodate expansion, contraction, wind or seismic movement of the building. Material shall be non-combustible when tested in accordance with ASTM E 136.

5.8.1.11 Painting: Interior surfaces, except factory prefinished material or interior surfaces receiving acoustical wallcovering or vinyl wallcovering, shall be painted a minimum of two prime coats and one finish coat. The prime coats for concrete masonry units shall be TT-F-1098. All spaces shall have satin or eggshell or semi-gloss finish on walls, semi-gloss finish on trim and eggshell or semi-gloss finish on ceilings. Stain or natural finished interior wood doors are preferable. Multi-colored paint systems shall be applied according to manufacturer's installation instructions and warranty. All exterior surfaces to be painted, including all utility appendages shall receive a minimum of one prime coat and two finish coats of paint. Water repellent sealer shall be clear, water repellent solution designed to protect vertical concrete masonry surfaces from water penetration. Application of paint. Paint shall be applied by brush or roller. Spray painting method shall be used only under approved conditions. Before start of spraying, all surfaces that do not require painting shall be completely masked and protected. Adequate drop cloths shall be provided over floors that may be stained or damaged from the spray work. The Contractor shall be liable for all damage resulting from the spray painting operation. All such damages shall be satisfactorily repaired and resolved at no additional cost to the Government. Adequate ventilation shall be provided during paint application. All persons engaged in spray painting shall wear respirators. Adjacent areas shall be protected by approved precautionary measures. Paints shall comply with State Regulations and the following Federal and Military Specifications. No lead paints are acceptable. Interior latex paints are not permitted in toilet rooms. Colors shall be as approved from schemes submitted with proposal. Each proposal shall include one basic exterior and interior color coordinated schemes and color samples. Pipes in exposed areas and in accessible pipe spaces shall be provided with color band and titles in accordance with Mil-Std. Coat floor of mechanical room with a polyurethane coating to resist oil and chemical spillage and stains.

5.8.1.12 Fire Extinguishers: Fire extinguisher cabinets shall be provided complete with 10-pound ABC fire extinguishers. Cabinets shall be located in accordance with NFPA standards. Fire extinguisher cabinets shall be recessed and cabinet is to have factory-finished color to match adjacent wall with a clear, break glass door. Cabinet box shall be 18 gauge steel with baked enamel finish. Steel door and trim shall be one-piece construction with a continuous hinge and door shall be lockable. Trim shall be rolled edge and finished in white baked enamel. Door shall be 5/8-inch thick, one-piece hollow steel, full glazed steel frame with rubber roller catch and satin finish door handle, and white baked enamel finish. As a minimum, provide fire extinguisher cabinets in the following quantities: one each in Mechanical/Electrical room(s) and in each corridor. Cabinets shall be located in accordance with the provisions of NFPA 10, which may require more than those listed here due to travel distance.

5.8.1.13 Expansion Joint Covers: Expansion joint covers if required, shall be constructed of extruded aluminum with anodized satin finish for walls and ceilings and with standard mill-finish for floor covers and exterior covers.

5.8.1.14 Casework: All Casework shall meet the requirements of the Architectural Woodwork Quality Standards, Guide Specifications and Quality Certification Program as set forth by the Architectural Woodwork Institute for architectural cabinets with high-pressure decorative laminate (HPDL) Quality shall be custom grade. See section below for solid surface countertops and solid surface countertops with integral sinks.

5.8.1.15 Blinds shall be provided at all exterior windows with the exception of entrance. Horizontal blinds shall conform to FS AA-V-00200, Type 11, 1 inch slats, except as modified below. Blind units shall be capable of nominally 190-degree partial tilting operation and full-height raising. Blinds shall be inside mount. Head Channel and Slats: Head channel shall be steel not less than 0.024 inch for Type II. Slats shall be aluminum, not less than 0.0080 inch thick, and of sufficient strength to prevent sag or bow in the finished blind. A sufficient amount of slats shall be provided to assure proper control, uniform spacing, and adequate overlap. Controls: The slats shall be tilted by a transparent tilting wand, hung vertically by its own weight, and shall swivel for easy operation. The ?tilter control shall be of enclosed construction. All moving parts and mechanical drive shall be made of compatible materials, which do not require lubrication during normal expected life. The tilter shall tilt the slats to any desired angle and hold them at that angle so that any vibration or movement of ladders and slats will not drive the tilter and change the angle of slats. A mechanism shall be included to prevent over tightening. The wand shall be of sufficient length to reach to within 5 feet of the floor. Cord Manager shall be installed 54 inches above the finished floor. Intermediate Brackets: Intermediate brackets shall be provided for installation of blinds over 84 inches wide or over 100 inches long and shall be installed as recommended by the manufacturer.

5.8.1.16 Chair Rails and Corner Guards: Chair rails and corner guards shall be provided in areas as indicated above. Corner guards shall be used on all outside corners where vinyl wall covering or paint system occurs. Chair rails shall be wood to match wood finishes throughout this facility. Corner guards shall be high impact, plastic in accordance with ASTM D 256. Corner guards shall be floor (top of wall base) to ceiling in rooms with 9'-0" or less ceilings. Exposed surfaces are unacceptable. To the maximum extent possible, the products shall be the standard products of a single manufacturer. Installation shall be in accordance with the manufacturer's written instructions.

5.8.1.17 Signage

5.8.1.17.1 Interior Signs: Interior signage shall be provided so that a visitor entering the facility would be able to use them to find a given destination. Interior signs are to be provided as follows:

5.8.1.17.1.1 Identification Signs. Signs shall be provided for all rooms and be compatible with the IDG. Office identification signs consist of a permanent header panel with the room number and an insert panel that identifies the occupant. The insert panel is a clear sleeve, which will accept a plastic insert with the name of the occupant. Permanent header panel dimensions: 9 inch x 3 inch. The insert panel dimensions: 9 inch X 3 inch overall sign dimensions: 9 inch x 6 inch. Room number shall be Helvetica medium, 1-1/2 inch numbers, flush left. Occupant name shall be upper and

lower case Helvetica medium, 1/2 inch capital letter height, flush left. Insert area will accommodate two lines with a maximum of 21 tiles or characters per line.

5.8.1.17.1.1.1 Service identification signs are used to identify toilet rooms, shower rooms, and other like services. Service signs dimensions: 6 inch x 9 inch. The standard pictograph symbols shall be used. Service name shall be helvetica medium upper and lower case, 1 inch capital letter height, centered. Identification signs shall consist of a permanent header panel with the room number. There will be one insert panel. The panel will contain the room name. Overall sign dimension shall be 6 inch x 6 inch. Room number shall be helvetica medium, 1-1/2 inch numbers, flush left.

5.8.1.17.2 Interior Signage Products: Aluminum extrusions shall be at least 1/16 inch thick, and aluminum plate or sheet shall be at least 16 gauge, .051 inch thick. Extrusions shall conform to ASTM B 221; plate and sheet shall conform to ASTM B 209. Vinyl sheeting for graphics shall conform to MS MIL-M-43719, minimum 3 mil film thickness. Film shall include a precoated pressure sensitive adhesive backing (Class 3). Acrylic sheet shall conform to ASTM D 702, Type III. Changeable message strip plaque signs shall consist of acrylic or plexiglas back laminated to matte finish acrylic plastic face with message slots as detailed for insertion of changeable message strips. Individual .062 inch thick message strips to permit removal, change and reinsertion shall be provided. Signage that provides emergency information, general circulation directions or identification of rooms and spaces shall be tactile (perceptible to touch) and shall comply with ANSI A117.1, paragraph 4.27. Characters, symbols or pictographs on tactile signs shall be recessed or raised .032 inch minimum. Tactile letters and numbers shall be sans serif upper case. Tactile characters or symbols shall be at least 5/8 inch high, but no higher than a nominal 2 inches. Characters and symbols shall contrast with their background. Signage vendor shall provide lettering machine so user can change signage as needed.

5.8.1.17.3 Exterior Signs: Provide signs that comply with the Installation Design Guide and comply with sign standards provided in TM 5-807-10; "Signage". The contracting officer shall approve exterior signage.

5.8.1.18 Recessed Foot Grille: Recessed foot grille shall be carpet tread, mechanically secured in tread rails. Carpet shall be 100 percent nylon. Tread rails shall be spaced 1 1/2" inches on center running perpendicular to traffic flow. Tread rails, keylock bars, and framing shall be extruded aluminum. Framing shall have standard mill finish. All grille and framing sections when installed shall be designed to support a minimum uniform load of 200 pounds per square foot. Drain pan application shall include a 16-gauge aluminum waterproof pan with a 2" inch drain and strainer; pan shall be securely attached to the bottom surface of the frame. Recessed floor grid shall be as manufactured by Arden Architectural Specialties, Inc., Balco Inc., Construction" Specialties Inc. or approved equal.

5.8.1.19 Solid Surfaces: Solid surface components shall be solid, non-porous polymer, not coated, laminated or of composite construction similar to "Santana" or approved equal. Materials shall have minimum physical and performance properties specified. Superficial damage to a depth of 1/10th inch shall be repairable by sanding or polishing. Material for toilet partitions

shall be standard 1 inch thick. Material for Counter tops and windowsills shall be standard 1/2 inch thick. Lavatory/sinks shall be an integral part of the counter top. Lavatory/sinks shall be attached by a seamed under mount method. Material shall be a small scale, variegated pattern to the extent possible. Solid color solid surface shall not be used. Color should be in light to medium tones as dark colors tend to show scratches and water spots more readily. Lavatory counters and toilet partitions shall be of a color to accent the finish colors in the room in which the solid surfacing material is scheduled. Sheen shall be matte satin. Edge treatment shall be eased, rounded edges.

5.8.1.20 Vinyl Wall Covering: Vinyl wall covering shall be a vinyl coated woven or nonwoven fabric with mildew and germicidal additives and shall conform to FS CCC-W-408, Type 11, 13.1 to 24 ounces total weight per yard and width of 54 inches. Pattern and color of vinyl wall covering shall be as selected from manufacturer's standard colors and patterns.

5.9 INTERIOR FINISHES

5.9.1 Interior finishes and materials shall be specified with durability, maintenance, function, life cycle costs, code requirements and aesthetics being considered. Finishes and materials shall support the architectural elements and reflect the image and style of the using agency.

5.9.2 One species of wood and/or stain to represent one species of wood shall be specified throughout the entire facility. This encompasses doors, casework, chair rails, trim etc.

5.9.3 Submittal requirements for finishes and approvals are listed in Attachment Structural Interior Design, Submittal Requirements.

5.9.4 Upon the completion of construction, the Contractor shall provide and deliver at no additional cost, to the Contracting Officer, one percent extra of each color and texture of paver tile, ceramic tile, base, carpet, acoustical ceiling tile, wall covering and sheet vinyl of each total amount of each item used on the project.

5.9.5 Interior finishes shall be selected to meet the Federal Procurement Policy guidelines to comply with Section 6002 of the Resource Conservation and Recovery Act (RCRA), "Federal Procurement"; and Executive Order (EO) 12873, "Federal Acquisition Recycling and Waste Prevention, 1 May 1996 as well as ETL 1110-3-491, Sustainable Design for Military Facilities. (ETLs may be accessed at <http://www.usace.army.mil/inet/usace-docs/ena-tech~ltrs/>). Within parameter of performance, cost, aesthetics and availability, carefully select and specify building materials that limit impacts on the environment and occupant health. Building shall be free of asbestos containing material pursuant to OSHA asbestos regulations governing building owners, 29 CFR Part 1926, including Section 1926 (k). Limit VOC content in adhesives. At a minimum all adhesives must meet the Air Quality Management rules. Limit the VOC content in architectural sealants (material with "adhesive" characteristics used as filler; not material used as a "coating") At a minimum, all sealants must meet the limits of Regulation 8, Rule 51 of the Bay Area Air Resources Board. Limit the VOC content in paints and coatings. At a minimum all paints and coatings must meet the requirements of Rule 1113,

Mojave Desert Air Quality Management District. Consider using the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) Building Rating System as an outline of environmental performance targets for the project. (U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) Building Rating System can be accessed at: <http://www.usgbc.org/programs>. Elements to be considered during design and specification are:

5.9.5.1 Sustainable Design: The contractor shall comply with and provide for the requirements of sustainable design with a minimum design target of "Bronze Spirit".

5.9.5.2 Elimination of virgin material requirements

5.9.5.3 Use of recovered materials

5.9.5.4 Reuse of products

5.9.5.5 Life cycle costs

Recyclability

Environmental preferability

Waste prevention, including toxicity reduction

Disposal

Buy locally to minimize impact of transporting

5.10 INTERIOR COLORS

5.10.1 Finish and color selection shall be appropriate to the interior design intent to support the occupants, their activities and their customers.

5.10.2 Permanent finishes include paver tile, ceramic tile, chair rails, plastic laminates, solid surface materials, sheet vinyl and horizontal blinds.

5.10.3 Non-permanent finishes include carpet, paint and other items that are relatively easy and inexpensive to replace.

5.10.4 Colors and finishes shall be selected based on durability, maintenance, life cycle costs, code requirements, appearance and functional considerations. Variegated finishes and patterns are recommended to be implemented to the maximum extent possible as solids show wear and tear. Integral color and color through finishes shall be specified where applicable.

5.10.5 The colors and textures specified shall not date the facility and shall create an interior that will remain aesthetically pleasing over time. Finishes and materials shall support the architectural elements and reflect the image and style of the using agency.

CHAPTER 7

HVAC

7.0 HEATING, VENTILATING AND AIR CONDITIONING (HVAC)

Project consists of renovation of the air and hot water distribution systems in the existing fire station area and the installation of new heating and ventilating systems in the new apparatus building (refer to chapter 4, ARCHITECTURAL, for locations). During the renovation, openings of the ductwork and piping shall be capped immediately so that the central air systems will be able to continuously serve rest of the building. New systems shall be designed and constructed in accordance with the following requirements:

7.1 GENERAL REQUIREMENTS

7.1.1 Design Standards

Heating, ventilation and air conditioning systems shall comply with the latest provisions, unless other indicated, of the following standards and specifications:

- a. TI 800-01, Technical Instructions - Design Criteria
- b. TI 800-03, Technical Requirements for Design-Build
- c. TI 809-04, Technical Instructions - Seismic Design for Buildings
- d. TI 810-10, Mechanical Design - HVAC
- e. TI 810-11, HVAC Control Systems
- f. TM 5-785, Weather Data
- g. TM 5-805-4, Noise and Vibration
- h. ANSI Standards
- i. ASHRAE Handbooks
- j. ASHRAE Standard 62-2001, Ventilation
- k. ASHRAE Standard 90.1-2001, Energy Efficient Design of New Buildings
- l. ASME Standards
- m. ASTM Standards
- n. UL Standards
- o. NFPA Standards
- p. NFPA 90A, Air Conditioning and Ventilation Systems
- q. OSHA Safety and Health Standards

q. SMACNA Manuals and Guides

r. NIOSH Guidance for Protecting Building Environments from Airborne Chemical, Biological, or Radiological Attacks

7.1.2 Submittals

Submittals shall be in accordance with Section 01330, Submittal Procedures. HVAC system construction shall not begin until HVAC final design has been reviewed and cleared for construction by the government. All submittals shall include adequate descriptive literature, catalog cuts, and other data for the government to ascertain that the proposed equipment and materials comply with this RFP.

7.1.3 Equipment

All equipment shall be factory packaged and tested. Use products of one manufacturer where two or more items of the same kind of equipment are required. Equipment efficiencies shall meet the minimum efficiency requirements indicated from ASHRAE 90.1-2001, unless indicated otherwise in this RFP.

7.2 Design Criteria

7.2.1 Outdoor Conditions (Temperatures indicated are dry bulb unless otherwise indicated.)

7.2.1.1 General -

Latitude - 39 degrees, 3 minutes
Longitude - 77 degrees, 43 minutes
Elevation - 294 feet
Degree Days -
 Heating - 5087
Daily Range - 22 degrees F

7.2.1.2 Heating Season

Design Temperature - 12 degrees F
Design Temperature for Outside Air Coils - -5 degrees F

7.2.1.3 Cooling Season

Design Temperature - 91 degrees F
Wet Bulb - 75 degrees F

7.2.2 Indoor Heating and Cooling Conditions

a. Offices, living, kitchen, dining, and day rooms:

Summer - 75 degrees F, 50% RH maximum
Winter - 68 degrees F, 30% RH minimum

b. Mechanical Room:

Summer - ventilate only, 10 degrees F above ambient
Winter - 55 degrees F

c. Watch/Alarm Room:

Summer/Winter - 75 degrees F, 50% RH maximum (Humidification shall be provided).

d. Toilet Rooms:

Summer - None (Indirect Cooling from adjacent spaces)
Winter - 68 degrees F

e. Janitor Closet:

Summer - None (Indirect Cooling from adjacent spaces)
Winter - None (Indirect Heating from adjacent spaces)

g. Storage:

Summer - not to exceed 96 degrees F
Winter - 55 degrees F

h. Apparatus Bays:

Summer - not to exceed 96 degrees F
Winter - 55 degrees F

i. Training Rooms:

Summer - 75 degrees F - 50% RH plus/minus 5%
Winter - 68 degrees F - 30% RH Minimum

j. Work Room:

Summer - Not to exceed 96 degrees F.
Winter - 60 degrees F.

k. Corridors:

Summer - 75 degrees F.
Winter - 68 degrees F.

7.2.3 Ventilation

7.2.3.1 General

The following definitions apply: recirculated air is room air that can be returned for reuse. Non-recirculated air is room air that cannot be returned for reuse. All areas located on the exterior wall shall be provided with positive pressure to prevent infiltration.

7.2.3.1.1 Recirculated air from offices, living rooms, dining/kitchen area, dayroom, corridor, training rooms, and watch/alarm room

7.2.3.1.2 Non-recirculated air (Exhausted air) from toilet rooms and Janitor's Closet.

7.2.3.1.3 Kitchen

Ventilation for hoods shall be designed for vapor hoods and in accordance with NFPA 96 for grease hoods. Exhaust for grease and vapor hoods shall be discharged vertically through the roof using a hinged, upblast exhaust fan. The exhaust for the grease and vapor hoods shall be enclosed in a 2 hour rated fire separation. The termination of the exhaust shall be at least 10 feet from air intakes.

7.2.3.2 Minimum outside air quantities

- a. Offices - 20 cfm per occupant.
- b. Living Rooms - 30 cfm per room
- c. Kitchen and dining area: 20 cfm per occupant.
- d. Day rooms: 20 cfm per occupant.
- e. Watch/Alarm Room - 20 cfm per occupant.
- f. Toilet Rooms - 50 cfm per water closet or urinal.
- g. Janitor closet - 50 cfm
- h. Storage - 0.15 cfm per square foot.
- i. Workroom - 1.5 cfm per square foot.
- j. Training Rooms - 20 cfm per occupant.
- l. Mechanical Room - cfm shall be based on combustion and temperature reduction requirements.
- m. Corridors - 0.1 cfm per square foot

7.2.4 Filtration of Circulated Air

The existing air filters in the air handling units are adequate for air filtration.

7.2.5 Heating and Cooling Loads

Submit computer program generated heating and cooling loads including building air balance (positive pressure to be provided to preclude any infiltration in the office and living areas) to substantiate design guidelines were met and to size the necessary HVAC equipment. Use a nationally recognized heating and cooling load program such as Trane Trace 700, DOE-2.1E or other program that performs 8760 hourly calculations.

7.2.6 Special Equipment Loads

Obtain heat gain information from the manufacturer for the equipment. Where no information is available, use ASHRAE Fundamentals. The following is, but not limited to, a list of possible equipment (refer to room description for location of equipment):

- a. Copiers
- b. Faxes
- c. Laser Printers
- d. Computers/Monitors
- e. Televisions
- f. VCRs/DVDs
- g. Communication Equipment
- h. Cocking range
- i. Cocking Grill
- j. Refrigerator
- k. Oven
- l. Washer and Dryer
- m. Vending machines
- n. Water cooler
- o. Microwaves

7.2.7 Sound and Vibration Criteria

7.2.7.1 General

ASHRAE Applications Handbook and TM 5-805-4 shall be used for selecting heating and air conditioning equipment, ductwork and air supply devices.

7.2.7.2 Room Requirements

The following NC requirements apply:

Offices, living rooms, and dayroom.	NC-30
Training Rooms	NC-35
Kitchen, dining area, and corridor, workroom	NC-45

7.3 Source of Heating and Cooling

7.3.1 Heating - Heating shall be provided by natural gas. The existing gas meter is at the mechanical room. If required, a new meter may be installed at the apparatus building.

7.3.2 Cooling - Direct Expansion (Dx) systems were used in the existing and new A/C systems.

7.4 Occupancy

Refer to Chapter 5, architectural, for occupancy and hours of operations, and equipment to be included, etc. No reduction in the heating load shall be taken for the internal heat gain due to lighting, equipment and occupancy. People sensible and latent loads for all areas shall be based on light office work conditions as indicated in ASHRAE.

7.5 Antiterrorist and Security Measures

7.5.1 A shutoff switch for the air handler units shall be located in the watch/alarm room for easy access by on duty personnel in the building. See also the NIOSH Publication, Protecting Building Environments for Airborne

Chemical, Biological, or Radiological Attacks, for additional requirements. This publication can be obtained by calling 1-800-356-4674 or E-mail at pubstaft@cdc.gov.

7.5.2 Utilities shall not be located on external walls.

7.5.3 All outside air intake louvers shall be at least 10 feet above grade.

7.6 Testing, Adjusting and Balancing (TAB)

TAB of HVAC systems shall meet the requirements of the UFGS specification 15990A.

7.7 Commissioning

The commissioning of the HVAC system shall meet the requirements of UFGS specification 15995.

7.8 Seismic

All equipment shall be seismically protected in accordance with UFGS 13080, Seismic Protection for Miscellaneous Equipment, TI 809-04, Seismic Design for buildings, and UFGS 15070A, Seismic Protection for Mechanical Equipment.

7.9 Room Systems

Generally, systems can be divided into two areas, the renovated area and the expanded apparatus bays. In addition to the existing equipment, a new rooftop unit is required for heating and air conditioning the renovated area. A new heating and ventilation system shall be added for the new expanded apparatus bays.

7.9.1 Renovated area

7.9.1.1 The renovated spaces, except the apparatus rooms, of the existing building are air conditioned by two existing roof top A/C units. One unit serves the original building and the other serves the previous addition of a two stories section. Both are variable air volume (VAV) system with direct expansion DX cooling and bypass. The former is a recent replacement with hot water preheating coil, the later is heated with a natural gas furnace. They are functioning well and adequate in capacity for the spaces they are serving. New air redistribution in accordance with the new room layout is required in this area.

7.9.1.2 The new dorm and day room to be located in the existing apparatus area that is not air conditioned shall be provided with a new rooftop A/C unit. The new A/C unit shall be of DX cooling, gas pre-heating, and bypass VAV type.

7.9.1.3 Except the storage, workroom and bathrooms, Variable air volume system shall be used for air distribution. Air shall be supplied and returned to the air handling units. Reheat coils shall be provided to each of the VAV terminals. Each room shall be provided with a thermostat for individual room temperature control. All ceiling diffusers grilles, and thermostat shall be new.

7.9.1.4 Separate heating and ventilation systems shall be provided for the storage and workroom. Heat source may be either hot water or natural gas from the existing mechanical room.

7.9.2 New expanded apparatus bays

7.9.2.1 Natural gas fired infrared radiant heaters with temperature controls shall be provided between the bays for heating. Nature gas may be run from the existing meter at the mechanical room or, if the capacity of the existing meter is limited, a new gas meter to be installed at the bay area (refer to Chapter 8, PLUMBING). Exhaust from the heaters shall be discharged to the outside of the building.

7.9.2.2 Provide ventilation system for space fume and heat deduction.

7.9.2.3 A vehicle exhaust system shall be provided. System shall include central exhaust fan, exhaust manifold, and hose reels. Each hose reel shall be equipped with tail pipe adaptor and emergency disconnection mechanism and shall be located overhead at the center of the interspaces between the bays. System shall be provided with pressure and temperature sensors for exhaust fan activation.

7.9.3 Exhaust

7.9.3.1 Locations

Exhaust fans for toilet, kitchen, vehicle exhaust and miscellaneous rooms shall be located on the roof.

7.10 Equipment and Materials

Final specification to be developed in accordance with the UFGS specifications and as indicated in this RFP.

7.11 Operation and Maintenance (O&M) Manuals

Complete O&M manuals and training for all HVAC equipment shall be provided as indicated in each technical section of the UFGS specifications.

(Chapter End)

CHAPTER 10 ELECTRICAL

10.0 ELECTRICAL

10.1 GENERAL REQUIREMENTS

10.1.1 Design Standards

Design and installation of electrical, and other systems listed herein, for the facility shall comply with the applicable requirements of the following latest standards listed in the reference standards paragraphs of this proposal:

- a. DoD Form 1391, Military Construction Project Data
- b. DoD 4270.1 M, Construction Criteria Manual
- c. DoD 6055.6, Department of Defense Fire Protection Program
- d. MIL-HDBK-1008C, Fire Protection for Facilities Engineering, Design, and Construction
- e. AR 190-13, Army Physical Security Manual
- f. NFPA, National Fire Protection Association
- g. NFPA 70, National Electrical Code
- h. NFPA 70E, Standard for Electrical Safety Requirements for Employee Workplaces
- i. NFPA 72, Standard for Fire Protection Signaling Systems
- j. NFPA 72E, Standard for Automatic Fire Detectors
- k. NFPA 101, Code for Safety to Life from Fire in Building and Structures
- l. TM 5-811-1, Electrical Power Supply and Distribution
- m. TM 5-811-2, Electrical Design, Interior Electrical Systems
- n. TI 800-01, Design Criteria
- o. TI 811-16, Lighting Design
- p. Illuminating Engineering Society Application and Reference Handbooks (IES Handbook)
- q. Institute of Electrical and Electronics Engineers Standards (IEEE)

- r. National Electrical Manufacturer's Association Standards (NEMA)
- s. American Society for Testing and Materials (ASTM)
- t. Underwriters' Laboratories Inc. Standards (UL)
- u. American National Standards Institute (ANSI)
- v. Americans with Disabilities Act (ADA)
- w. Telecommunication and Electronic Industries Association Standards
- x. TIA/EIA 568-A, Cabling Standard
- y. TIA/EIA 569, Telecommunications Pathways and Spaces
- z. TIA/EIA 606, Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
- aa. Insulated Cable Engineers Association Standards
- bb. ICEA S-80-576, Communications Wire and Cable for Premises Wiring
- cc. I3A - Design and Implementation Guide

10.1.2 PCB Standards

All new electrical equipment shall be supplied with no detectable PCB's. New fluorescent lighting fixture ballasts shall be clearly marked "NO PCB". Certified PCB tests from an independent laboratory with the serial number of test results on the unit, shall be obtained by the Contractor.

10.1.3 Seismic Protection

The electrical equipment and systems listed below shall be seismically protected:

- Control Panels
- Air Handling Units
- Pumps with Motors
- Lighting Fixtures

10.1.4 Demolition/Relocation/New Work

Feeders to existing electrical systems at the area(s) to be renovated, shall be removed up to the source panel. Panels 'LB' shall be relocated to the new partition immediated to the existing to be demolished. Existing equipment (hose dryer, clothes washer/dryer, compressor, galley equipment, etc) scheduled to be re-used shall be disconnected from its present location, be relocated and provided with power at new location. New work will be conducted in phases to minimize disruption of the fire department operations. Contractor

shall coordinate work with other trades for work phasing, and the new location of equipment with Contracting Officer.

10.1.5 Temporary Power

Contractor shall provide Fire Department temporary trailers with power from the existing building distribution system in the electrical room.

10.1.6 Corrosion Control

Provide cathodic protection for any buried/submerged metallic utility system (piping or tanks). A soil resistivity test shall be conducted. The cathodic protection survey and design must be performed by a National Association of Corrosion Engineers (NACE) Accredited Corrosion Specialist, NACE Certified Cathodic Protection Specialist, or a Registered Professional Corrosion Engineer. This accreditation and/or registration must have been obtained in the field of cathodic protection. Cathodic protection system shall be in accordance with NACE RP-01-69, NACE RP-01, TM 5-811-7, and ETL 1110-3-474. Design anodes for a 20 year life minimum.

10.2 POWER AND LIGHTING REQUIREMENTS

10.2.1 Electrical Service

This project will be the third expansion of the facility since the original construction completion in 1987. Per PW, the existing 150 KVA electrical service is adequate to support the new load from the alteration/addition.

10.2.2 Secondary Distribution

Secondary distribution equipment provided shall be connected to the existing electrical distribution system in the electrical room.

10.2.3 Equipment Interrupting Capacity

Electrical equipment provided shall match the short circuit rating of the existing electrical distribution system.

10.2.4 Interior Power Distribution

Electrical panelboards shall be of the distribution type. Voltage drop shall be limited to 3% for branch circuits and 1% for feeders. Overall allowable voltage drop shall not be greater than 5% (assuming existing 2% for the existing service entrance conductors).

10.2.4.1 Motors

Motors greater than $\frac{3}{4}$ -horsepower (HP) shall be provided in 3-phase configuration with phase failure relay protection. Power factor correction capacitor(s) shall be provided for motors larger than 3HP. Motors efficiencies shall be as specified in the table "MINIMUM NOMINAL EFFICIENCIES" below.

MINIMUM NOMINAL MOTOR EFFICIENCIES OPEN DRIP PROOF MOTORS

<u>HP</u>	<u>1200 RPM</u>	<u>1800 RPM</u>	<u>3600 RPM</u>
1	82.5	85.5	80.0
1.5	86.5	86.5	85.5
2	87.5	86.5	86.5
3	89.5	89.5	86.5
5	89.5	89.5	89.5
7.5	91.5	91.0	89.5
10	91.7	91.7	90.2
15	92.4	93.0	91.0
20	92.4	93.0	92.4
25	93.0	93.6	93.0
30	93.6	93.6	93.0
40	94.1	94.1	93.6
50	94.1	94.5	93.6

10.2.4.2 Cables and Wires

No. 8 AWG and larger diameter conductors shall be stranded. Conductors No. 10 AWG and smaller diameter shall be solid, except that conductors for remote control, alarm, and signal circuits, classes 1 (No. 14 AWG, Nom), 2 (No. 16 AWG, Nom), and 3 (No. 22 AWG, Nom), shall be stranded. All conductors shall be copper.

10.2.4.3 Conduits and Tubing System

10.2.4.3.1 Minimum size of raceways shall be $\frac{3}{4}$ " for power, and $\frac{1}{2}$ " for low energy, control and signal circuits. Electrical metallic tubing (EMT) may be installed only within buildings. EMT may be installed in concrete and grout in dry locations. EMT installed in concrete or grout shall be provided with concrete tight fittings. EMT shall not be installed in damp or wet locations, or the air space of exterior masonry cavity walls. Aluminum conduit may be used only where installed exposed in dry locations. Penetrations of above grade floor slabs, time-rated partitions and fire walls shall be firestopped. Intermediate metal conduit (IMC) may be used as an option for rigid steel conduit. Raceways shall be kept 6 inches away from parallel runs of flues, steam pipes and hot-water pipes.

10.2.4.3.2 Raceways shall be concealed within finished walls, ceilings, and floors. Raceways crossing structural expansion joints or seismic joints shall be provided with suitable expansion fittings or other suitable means to compensate for the building expansion and contraction and to provide for continuity of grounding. Conduit installed in slabs-on-grade shall be rigid steel or IMC. Changes in direction of runs shall be made with symmetrical bends or cast-metal fittings. Metallic conduits and tubing, and the support system to which they are attached, shall be securely and rigidly fastened in place to prevent vertical and horizontal movement. Exposed raceways shall be installed parallel or perpendicular to walls, structural members, or intersections of vertical planes and ceilings.

10.2.4.4 Circuit Breakers

10.2.4.4.1 Circuit breakers shall be installed in panelboards, switchboards, enclosures, or combination motor controllers. Circuit breakers shall be fully rated type.

10.2.4.4.2 Circuit breakers rated 15 amperes and intended to switch 120 volts or less fluorescent lighting loads shall be marked "SWD."

10.2.4.4.3 Circuit breakers 60 amperes or below, 208 volts, 1-pole or 2-pole, intended to protect multi-motor and combination-load installations involved in heating, air conditioning, and refrigerating equipment shall be marked "Listed HACR Type."

10.2.4.5 Receptacles

10.2.4.5.1 Each circuit shall be provided with an isolated ground and dedicated neutral conductor. Convenience receptacles in administrative and maintenance shop areas shall be provided at 10 feet on centers along perimeter walls and within 5 feet from doors. Outlets along perimeter wall of corridors, lobby, and circulation areas for use of janitorial or other equipment, shall be installed at 30 feet (max) on centers. Where counters are provided in rooms, receptacles shall be provided above the counter top back splash at 18 inches from counter-ends. In kitchen counter tops and island-type (or peninsula type) counter tops, the minimum number of receptacles and small appliance branch circuits as required by NFPA 70 Article 210-52(b)(2) and (c), shall be provided, except that the countertop small appliance circuits shall not be limited to two and the circuits shall be dedicated to just the kitchen area. At least one receptacle shall be provided in storage rooms, janitor closets, and bathrooms. In bathrooms, one additional receptacle shall be provided above the countertop back splash and adjacent to each basin area. Bathroom receptacle outlets shall be supplied by at least one 20-ampere branch circuit.

10.2.4.5.2 Ground-fault circuit-interrupter (GFCI) receptacles shall be provided where receptacles are located within 6 feet of sinks such as in the toilets, janitor's closets and other wet areas. Weatherproof GFCI wall mounted receptacle outlets shall be provided inside and outside the equipment bays.

10.2.4.5.3 Maximum of six convenience receptacles shall be circuited to a 20-ampere branch circuit. Each administrative area workstation shall be circuited to a 20-ampere branch circuit. In accordance with UBC 4304, outlets in the same stud space and on opposite sides of fire rated walls or partitions must be separated by a minimum of 2 feet horizontal distance. Device face plates inside the building shall be nylon impact resistant type and ivory colored.

10.2.4.6 Galley Electrical Equipment

Power to cooking equipment (stove/range, oven, solenoid to natural gas supply, fryer, heat lamps, etc) except refrigeration shall be connected to a panelboard protected by a contactor and emergency-power-out (epo) mushroom switch at the galley exit. In the event of an emergency, when activated, the

epo switch shall disable the power to the panelboard serving the galley equipment.

10.2.4.7 HVAC Equipment

New HVAC equipment being installed to support the new addition/alteration shall be provided with new feeder(s) from the existing MDP panel.

10.2.4.8 Equipment Bay

10.2.4.8.1 Power: 120V receptacle outlets on retractable drop cords attached to the roof trusses, shall be provided in-between bays to power electrical systems on-board fire-fighting vehicles. Haz-Mat equipment bay shall be provided with a weatherproof 30A twist-lock dedicated receptacle outlet mounted on the north wall of the equipment bay. Convenience receptacle outlets shall be provided at front and rear columns.

10.2.4.8.2 Roll-Up Doors: Provide front roll-up doors with electric opener with local, remote/override, and radio operators. Local (raise-off-lower) control switch shall be mounted on the wall facing the driver of the vehicle exiting the bay. Controller/starter shall be provided with door position indicating signal light mentioned below. Remote radio operator shall be provided for each roll-up door and shall be unique (in operating frequency) from other operators. A remote mounted red-mushroom override switch in the alarm/watch room, shall operate (open only) all the front roll-up door at the same time in the event of an emergency regardless of the position of the doors. Front roll-up doors shall be circuited to a source supported by the emergency generator. Provide rear roll-up door with local (raise-off-lower) control switch with red/green indicator light to operate as indicated above.

10.2.5 Lighting

10.2.5.1 Interior Lighting

Lighting intensity levels shall be provided in accordance with MIL-HDBK 1190 and IES Lighting Handbook as shown on the table below. The majority of rooms shall be provided with 2L or 3L recessed fluorescent fixtures equipped with energy saving 4 foot, 32-watt T8 lamps and energy efficient electronic ballasts. Parabolic fluorescent fixtures shall be provided for hallways, administrative offices, dining and lounge areas. General occupancy areas like bedrooms, bunk rooms and toilets shall be provided with prismatic troffers, and mechanical/electrical room or similar spaces shall be provided with industrial grade fluorescent luminaires. Open type fluorescent luminaires shall be provided with tube and wire guards. Toilets shall be provided with wet/damp listed lighting luminaires. Each area lighting system shall be switched locally and as indicated below. Multi egressed/accessed areas will be provided with three-way/four-way switching accordingly. Devices will mounted in accordance with the ADA applicable standards. Design footcandle levels and other lighting requirements shall be provided according to Table 3-6 in AFP 88-38 as shown below:

Area	Footcandle	Multiple	Dimming
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	<u>Level</u>	<u>Switching</u>	<u>Capability</u>
Corridors	10	Yes (i)	No
Dining/Day Room*	25	Yes	Yes
Admin/Offices	50	No	No
Bunk/Bed Rooms**	50	No (i)	No
Toilets	20	No	No
Storage/Closets	5	No	No
Equipment Bay***	20	Yes (i)	No
Maint/Work Room	30	Yes	No
Mech/Elec	15	Yes	No
Outdoors	0.5	No (ii)	No

- * Dining/Day room lighting system shall include compact fluorescent lighting luminaires controlled by dimming switches. Recessed 2'X4' overhead parabolic luminaires shall be controlled by the a local switch.
- ** Bed/Bunk room lighting system includes wall mounted 4'-2L over-bed luminaire with pull chain switch. Recessed 2'X4' 2L overhead prismatic luminaires shall be controlled by the local switch and the programmable low-voltage lighting control system mentioned below
- *** Truss mounted equipment bay industrial fluorescent luminaires shall be circuited for 2-level switching (every-other fixture), controlled by switches at each egresses to the bay, in the watch/alarm room, and by the programmable low-voltage lighting control system mentioned below.
- i Lighting system shall be controlled by the local switch(es) serving the area, the programmable low-voltage lighting controls system (activated by a red-mushroom momentary switch), and the existing tone alert system (Motorola) in the watch/alarm room. In the event of an emergency, the activation of the switch and/or the tone alert system shall turn-on the overhead lighting fixtures regardless of the setting of the local switch(es). Power to the lighting systems controlled by the programmable low-voltage lighting control system shall be circuited to a panelboard supported by the emergency generator.
- ii Provide each building mounted outdoor luminaires with photocell.

10.2.5.2 Signal Lights

Roll-Up Doors: Each equipment bay roll-up door shall be provided with a red/green position indicator lights mounted on the wall facing the driver of the vehicle exiting the bay. Red/Upper light shall indicate other than 'not-fully-open' roll-up door position, and the green/lower light only when the roll-up door is fully open. Lighting shall be integrated with the roll-up door controller/starter. Provide upper and lower limit switches accordingly.

Beacon: Inside, front and rear of equipment bay, and the north parking area of the fire house shall be provided with red rotating 0-5 minute(s) timed beacon lights controlled by an emergency mushroom switch in the alarm/watch room. Flashing lights shall also be provided on top of the fire emergency signal signs along Porter Street. System shall be circuited to a panelboard source supported by the emergency generator and, be incorporated into the low-voltage lighting control system mentioned above. See Contracting Officer for the time setting of switch.

10.2.5.3 Exterior Lighting

Building mounted, perimeter and parking area lighting shall be provided with High Pressure Sodium (HPS) fixtures. Parking lot luminaires shall be mounted on 30' aluminum poles cast-in-place, reinforced concrete foundation. Lighting fixtures and poles shall match existing equipment. Pole exterior lighting fixtures shall be controlled by existing combination photocell/timer in the electrical room.

10.2.5.4 Exit Lights

Illuminated (Red LED type) exit lighting fixtures shall be provided with self contained emergency backup units. Night lighting shall be provided in the watch/alarm room and hallways. Illuminated exit signs and night lights shall be connected to a source panel supported by the existing emergency generator.

10.2.6 Emergency Lighting

Emergency lighting in areas not supported by the emergency generators shall be 12-volt emergency lighting battery units with 2-sealed beam lamps.

10.2.7 Emergency Power

Equipment/System requiring continuous power shall be connected to the existing emergency standby generator (Kato Light - 37KW 208Y/120V 3P 4W). Existing Police/Fire Department loads connected to the generator shall be audited. Non-essential load(s) shall be shed, and reconnected to a non-emergency generator supported source. Coordinate police office generator loads with the Provost. Fire department generator loads shall be as indicated on this document.

10.3 DATA/COMMUNICATIONS

10.3.1 Scope

Contractor shall provide premises distribution system consisting of vertical/horizontal telephone and data (including LAN) signal runs from the end-user terminals to the existing tie-in point in the existing electrical room. Government will conduct final connection to the existing system in the electrical room. Cables shall be compatible with the existing system.

10.3.2 Building Communication Requirements

10.3.2.1 Materials and equipment shall be the standard products of a manufacturer regularly engaged in the manufacture of the products and shall be the manufacturer's latest standard design that has been in satisfactory use for at least 1 year prior to installation. Materials and equipment shall conform to respective publications of Telecommunications Industry Association/Electronic Industries Association TIA/EIA 568-A, TIA/EIA 569, TIA/EIA 607, EIA TSB 67, Insulated Cable Engineers Association ICEA S-80-576, and ICEA S-83-596, and other requirements specified below and to the applicable requirements of NFPA 70.

10.3.2.2 Coordinate with the local Director of Information Management (DOIM) or equivalent personnel to determine existing telecommunication capability and whether or not the existing facilities will need to be upgraded to support any new telecommunications equipment and distribution systems associated with this project. Involve the DOIM during the design process. Contractor shall coordinate communication requirements with Mr. John Bennett, telephone number(s) (310) 619-3287 or (301) 619-3205 of DOIM/Bldg 810.

10.3.3 Installer Qualifications

Installer shall have a minimum of three years experience in the application, installation, and testing of communications system and equipment, including the installation of copper and fiber optic cable and components.

10.3.4 Inside Plant

Telephone and Local Area Network (LAN) systems shall be pre-wired in accordance with ETL 1110-3-502 to include two 8-pin RJ-45 voice/data jacks. One RJ-45 jack shall be for voice (upper) and the other RJ-45 jack will be for data (lower). Wiring to each RJ45 jacks shall consist of Category 6 UTP cables. Recessed wall-mounted outlets shall be wired by running plenum rated UTP cables through the overhead cable tray system and then in concealed conduits from the cable trays over to and down to the outlets. Voice cables shall be terminated on the existing 110 connector blocks mounted on TTB plywood backboards, and the data cable on the data patch panels in the electrical room.

10.3.5 Quantities

Number of data/comm outlets shall be in accordance with the table shown below.

<u>Area Description</u>	<u>No. of jacks</u>
Offices	2 (Each)
Chief/Asst. Chief Offices	4 (Each)
Bunk/Dorm Rooms	1 (Each)
Dining/Day Room	4 (Each)
Alarm/Watch Room	6 (Each)
Kitchen	1 (Voice Only)
Work Room/Area	1 (Each)
Equipment Bay	2 (Voice Only)

10.4 INTRUSION DETECTION SYSTEM

The existing PELCO intrusion detection system (IDS) located in the provost offices side of the facility shall be extended to cover the renovated areas. New equipment shall be compatible with the existing system. Cameras shall be provided to monitor exterior doors including the front and rear of the equipment bay. System power, alarm, and signal cable runs shall be installed in raceways. Existing IDS system shall be provided with the necessary equipment to integrate the new equipment from the addition/renovation. Contractor shall coordinated IDS requirements with the base provost offices.

10.5 INTERIOR CABLE TELEVISION

Contractor shall provide cable system premises distribution system (coaxial cable and connecting hardware) to transport television signals throughout the building from the existing CATV patch panel in the electrical room to the end user locations. Watch/alarm room, dining/day room, bunk and bed rooms, and other designated areas shall be provided with female connector to accept the connecting coaxial cable from the user's television set. The above ceiling cable tray designated for low energy cable runs (voice and data) shall be used for the routing of coaxial cable to the end user terminals. The Contractor shall coordinate CATV requirements with the local provider (Adelphia) and the Contracting Officer.

10.6 PUBLIC ADDRESS (PA) SYSTEM

A new PA system shall be provided for the Fire Department side of the facility. Head-end equipment shall be mounted in the watch/alarm room, and shall include an amplifier, tuner, CD/cassette player and microphone. All bed/bunk rooms and offices shall be provided with speaker and wall mounted volume control. Hallways, day/dining room, toilets, inside/front/rear of equipment bay and the parking area north of the offices shall be provided with speakers. System shall be powered from a source supported by the emergency standby generator.

10.7 CABLE TRAY

Above ceiling 10" wide aluminum ladder type cable tray (suspended from the trusses) shall be provided for horizontal cable runs of power limited systems (data/comm, CATV, PA, etc) except fire alarm and IDS system. Each cable tray section shall be provided with a grounding strap to be connected to the next tray section. Section closest to the TTB shall be connected to the grounding system.

10.8 GROUNDING

An insulated green grounding conductor shall be installed to each receptacle. Grounding shall be provided as specified NFPA 70 for grounding panels, transformers and systems.

10.9 FIRE ALARM SYSTEM

The existing fire alarm system (Simplex 4002) shall be updated to cover the new addition/renovation. Renovated areas shall be zoned, that is, initiating devices in the bunk/bed rooms shall be connected as one loop, the equipment bay and maintenance shop as another loop, and the non-berthing area hallway, day/dining room as another loop. A remote annunciator shall be provided and be mounted in the alarm/watch room. The existing fire alarm control panel shall be provided with the necessary equipment to integrate the new remote annunciator and the zones from the addition/renovation. Contractor shall coordinated fire alarm requirements with the base fire department.

10.10 PARKING LOT ACCESS

A new parking lot access system shall be provided to access the east and west ends of the parking area north of the building. System shall include electric barriers with sensors and proximity transponder(s). Sensor shall detect and automatically open the gate due the presence of a transponder from an incoming vehicle and distinguish other transponders from transient traffic along Porter Street.