Solicitation Number: W5J9LE-12-B-0013

U.S. Army Corps
of Engineers
Afghanistan Engineer District

ANP UP Provincial HQ And PRC #1

Kandahar, Afghanistan

Project Specifications And Drawings

June 2012

THIS IS A INVITATION FOR BID

SECTION 00555
DESIGN CONCEPT DOCUMENTS

1. GENERAL

This section identifies documents issued with this solicitation which establish the concept, basis for the project design and/or the basis of construction. These requirements are minimum standards and may be exceeded by the Offeror. Deviations from these concepts and standards may be approved if considered by the Government to be in its best interests.

The extent of development of these requirements in no way relieves the successful Offeror from the responsibility of completing the design, construction documentation, and construction of the facility in conformance with applicable criteria and codes.

1.1 ENGINEERING AND DESIGN CRITERIA

Contractor shall develop complete construction Specifications for the project, utilizing the Unified Facilities Guidelines specification Divisions 02 thru 48 available at Construction Criteria Base (CCB) or 'Techinfo' website http://www.wbdg.org/ccb/ as the primary specifications criteria.

All design, unless otherwise specified, shall be based on nationally recognized industry standard, criteria, and practice.

1.2 APPENDIX DOCUMENTS

See Appendices for further technical requirements, criteria, and parameters that are a part of this contract.

1.3 SPECIFICATIONS

The successful Offeror shall develop complete construction specifications for all required Work. Specifications shall be submitted for review per Section 01335 SUBMITTAL PROCEDURES.

The Government will provide Division 1 specifications sections this Solicitation as required, to the successful Offeror; and these sections shall be included in the final construction specifications without change. The Contractor shall furnish these specifications on electronic media for the production of construction specifications when requested. These specifications shall be submitted together with other required contractor prepared project construction documents and specifications in the 100% Design Submittal per Section 01335 SUBMITTAL PROCEDURES.

1.4 ORDER OF PRECEDENCE

In case of conflict, duplication, or overlap of design criteria specified in the contract documents or government-provided drawings, the following order of precedence shall be followed:

1. All requirements of Section 01010 Scope of Work

   Any requirements as set forth in Section 01010 which are not included in the Technical Requirements Section 01015and/or Appendix drawings, shall be considered as set forth in all contract documents

2. Technical Specifications for the construction of Government-provided Standard Facility designs. Section 01015 Technical Requirements for all Work designed by the Contractor

3. Government-provided standard drawings

Where question or conflict occurs regarding any construction document, Contractor shall notify the Contracting Officer (KO) immediately. KO shall furnish decision or resolution of questions in writing at the requested by the Contractor.

1.5 ADDITIONAL DOCUMENTS/CRITERIA FURNISHED BY THE GOVERNMENT

The following documents will be furnished to the Contractor when requested by the Offeror or Contractor:

Design Criteria published by the Government such as Technical Manuals (TM), Engineer Manuals (EM), Engineer Technical Letters (ETL) and other documents related to the design referenced herein which are not available on the Internet, including the CCB website.

The following will not be furnished to the Contractor.

Commercial design criteria and specifications will not be furnished by the Government.

Conversion of electronic media to other formats shall be the responsibility of the Contractor.

-- END OF SECTION --

SECTION 01010
SCOPE OF WORK

1.0 PROJECT REQUIREMENTS

This project consists of the design and construction of site improvements and construction of facilities to support the Afghanistan National Police (ANP) program. This project includes one (1) Uniformed Police Provincial Headquarters (UP Provincial HQ) Compound serving a population of approximately two-hundred (200) personnel, and one (1) Provincial Response Company #1 (PRC #1) compound serving a population of approximately one-hundred thirty-one (131) personnel. This project is located in Kandahar Province, Afghanistan. The project is defined as the management, planning, design, material, labor, and equipment, to site adapt and construct all utilities, vehicular access, buildings, force protection measures, site security, de-mining activities, and other features as required herein.

The Work within this contract shall be designed and constructed in accordance with the most recent editions of building and life safety codes, force protection requirements and security standards and other references as listed in 01015 Technical Requirements. A partial listing of references includes:

IBC, International Building Codes

NFPA 101, Life Safety Codes

UFC 4-010-01, DoD Minimum Anti-Terrorism Standards for Buildings

Standard Design drawings are provided in Appendices B. All Work shall be performed in accordance with the Standard Design drawings, except as specifically indicated in this RFP.

1.1 LOCATION

The project consists of two sites, adjacent to each other with a “buffer area” in between. The sites are located in Kandahar Province, Afghanistan, as shown in “04_Satellite Imagery” of Appendix C – Site Assessment, with numbered points corresponding to the following coordinates:

The corner coordinates of the UP Provincial HQ compound boundaries are these:

Corner	Latitude (N)	Longitude (E)
Point 1	31° 36' 38.599" N	65° 45' 45.500" E
Point 2	31° 36' 50.400" N	65° 45' 52.999" E
Point 3	31° 36' 44.244" N	65° 45' 44.640" E
Point 4	31° 36' 43.344" N	65° 45' 51.840" E

The corner coordinates of the Buffer Area boundaries are these:

Corner	Latitude (N)	Longitude (E)
Point 3	31° 36' 44.244" N	65° 45' 44.640" E
Point 4	31° 36' 43.344" N	65° 45' 51.840" E
Point 5	31° 36' 41.472" N	65° 45' 44.460" E
Point 6	31° 36' 40.500" N	65° 45' 51.550" E

The corner coordinates of the PRC #1 compound boundaries are these:

Corner	Latitude (N)	Longitude (E)
Point 5	31° 36' 41.472" N	65° 45' 44.460" E
Point 6	31° 36' 40.500" N	65° 45' 51.550" E
Point 7	31° 36' 38.599" N	65° 45' 43.801" E
Point 8	31° 36' 35.499" N	65° 45' 50.698" E

There are new features at the site that are not shown in Appendix C. Specifically, a new compound has recently been constructed at the northwest corner of the UP Provincial HQ site. These new features have been coordinated in the concept site plans included in Appendix A.

The terms limit of work, project boundaries, and contract limits that are stated throughout this contract shall be defined as the coordinates stated above and on the concept plan within the appendix.

1.2 ENGLISH LANGUAGE REQUIREMENT

All information shall be presented in English. The Contractor shall have a minimum of one English-speaking representative present to communicate with the Contracting Officer's Representative (COR) at all times when work is in progress.

1.3 SUBMITTALS

Submittals and a Submittal Register are required as specified in Section 01335.

1.4 CQM TRAINING REQUIREMENT

Refer to Section 01451 Contractor Quality Control for Construction Quality Management (CQM) Training requirements.

1.5 GENERAL REQUIREMENTS

Construct all facilities and other features in strict accordance with the provided Standard Design drawings and all applicable references herein. Standard Design items may require design adaptations to meet site conditions; these adaptations shall be designed and constructed in accordance with all requirements herein, and shall be submitted for approval. If specific requirements are absent from the Standard Design drawings refer to Section 01015 Technical Requirements.

Where designs are not furnished, complete the design and construction per the requirements of Section 01015 Technical Requirements, and all applicable references herein.

The UP Provincial HQ compound shall be designed with utilities sized for a population of two-hundred (200) persons.

The PRC #1 compound shall be designed with utilities sized for a population of one-hundred thirty-one (131) persons.

The COR shall be notified immediately of any inconsistencies discovered in this solicitation. All requirements set forth in this Section, but not included in the Technical Requirements and/or drawings, shall be considered as set forth in both and vice versa.

Verify all provided dimensions and all existing conditions described in this solicitation, including its Appendices prior to the start of any construction. The Contractor is highly encouraged to verify existing site conditions before submitting proposals.

All construction activities such as underground utilities, site grading, electrical, communications infrastructure, detailing etc. shall be the Contractor's responsibility for design and construction.

The Contractor is encouraged to use Afghan labor and subcontractors to the maximum extent possible commensurate with technical, security or other requirements or necessary considerations. The intent of this Contract is also to use locally procured materials and labor to the maximum extent possible, but this does not allow the Contractor to make changes to the Standard Design drawings, Technical Specifications or design analysis, except where specifically indicated herein.

Any standard that can be determined to be substantially equivalent to the standards specified in this document may be used, but it is the Contractor's responsibility to show the equivalency of the alternate standard. Reviewable documentation must be provided to the Contracting Officer (KO) for approval prior to use; no part of any time lost due to such actions shall be made the subject of claim for extension of time, excess costs, or damages by the Contractor.

Window screens shall not be provided, with exceptions as indicated herein.

The finish of wet room walls and floors (including all rooms of the Latrine(s), and all rooms of the Dining Facility), shall be either sealed concrete or sealed concrete masonry units (CMU), per the construction as detailed in the Standard Design drawings. Wall tile and floor tile, as shown in the Standard Design drawings, shall be omitted.

"GSM" is the abbreviation for "gross square meters" and is used throughout this Request for Proposal for identification purposes only, not as a measure of the scope of work.

1.5.1 LIFE SAFETY REQUIREMENTS

Fire sprinkler systems are not required. Install hardwired smoke detectors per the requirements referenced herein; fire alarm control panels are not required. Wall-mounted A-B-C 6kg portable fire extinguishers shall be provided in each building in accordance with Section 01015. The facilities shall comply with all other safety requirements as required within the Standard Design drawings and applicable references.

2.0 SUMMARY OF WORK –

UP PROVINCIAL HQ COMPOUND AND BUFFER AREA

2.1 GENERAL

2.1.1 MOBILIZATION / DEMOBILIZATION

Mobilization and Demobilization shall consist of all labor, equipment, supplies and facilities required to stage all equipment and facilities needed for construction of this project. All mobilization and staging areas shall be located within the limit of work and shall be coordinated with the Contracting Officer. The location of all mobilization and staging areas is the responsibility of the Contractor. Requirements for mobilization and temporary structures are set forth in 01060 Special Clauses.

2.1.2 SECURITY

Security is critical to construction in Afghanistan, especially on roads and remote areas away from Coalition Force bases. The Contractor must have an appropriate amount of security/protection to match the threat in the project area and along the supply routes. **The Contractor shall develop detailed static and dynamic security plans in accordance with Section 01040 and submit them for Government approval.** The Government will not issue Clearance for Construction until security plans have been submitted and approved. **Refer to Section 01040 for detailed security requirements.**

The Contractor shall list static security and dynamic security under separate bid items as shown in Section 00010 Proposal Schedule.

2.1.3 UNEXPLODED ORDNANCE (UXO) REMOVAL AND CLEARANCE

Contractor IS responsible for initial clearance/removal.

The Contractor shall search for, identify and clear all mines and unexploded ordnance (UXO) from the entire site. The Contractor may only provide clearance/removal services via UN Mine Action Center for Afghanistan (UNMACA) accredited entities, and clearance shall be accomplished to the anticipated foundation depth as indicated in the contract. If sub-surface construction activities are to be performed on this site the minimum clearance depth will be 1 meter. Sub-surface clearance for construction activities in excess of 1 meter as defined by the contract parameters will also be the responsibility of the Contractor. Clearance by definition is an investigation and clearance of all sub-surface metallic anomalies on the site. Clearance/removal may only be undertaken in accordance with International Mine Action Standards (IMAS), Afghanistan Mine Action Standards (AMAS), and applicable U.S. Army Corps of Engineer (USACE) Ordnance & Explosives (OE) safety standards. When mines and/or UXO's are identified, the Contractor shall place them in a location in accordance with IMAS/AMAS/USACE until destruction of the items can take place. Construction work shall not occur inside the safety exclusion zone

based on the most probable munition (MPM) expected on the site. Construction will not commence in any area that has not been cleared to the specified depth.

The Contractor will provide a standard UXO/Demining safety work plan to the US Army Corps of Engineers UXO / Demining COR for review prior to commencement of all UXO clearance / demining activities on the project sites. Once the UXO/ Demining clearance has concluded, the Contractor shall provide the US Army Corps of Engineers UXO / Demining COR a clearance certificate for review and approval before any construction activities are to commence.

NOTE 1: The USACE does not need written clearance certificate approval from the UNMACA to approve the construction start activities. However, the Contractor is responsible for providing a copy of the clearance certificate to the UNMACA for entry into their country wide database. A final signed copy of the UNMACE certificate must then be provided to the USACE UXO/Demining COR.

It is the responsibility of the Contractor to be aware of the risk of encountering UXO/mines and to take all actions necessary to assure a safe work area to perform the requirements of this contract. The Contractor assumes the risk of any and all personal injury, property damage or other liability arising out of or resulting from any Contractor action taken hereunder. The Contractor and its subcontractors may not handle, work with, move, transport, render safe, or disarm any UXO/mine, unless they have appropriate accreditations under the IMAS/AMAS from the UNMACA.

If a UXO/mine is encountered after a UNMACA-approved clearance certificate is provided to the Government, UXO/mine disposal shall be handled in accordance with Section 01015, Technical Requirements.

NOTE 2: Point of Contact for UXO/Demining Safety Work Plan review and approval shall be directed to the US Army Corps of Engineers Demining Safety/COR:

UXO Safety/ Demining COR, USACE
tas.uxo.demining.safety@usace.army.mil, Roshan:079-403-1452 Comm:540-723-6129

2.2 DESIGN PROGRAM

2.2.1 SITE SURVEY

The Site Survey shall consist of all labor, equipment and supplies necessary to produce the topographical and other data in accordance with the requirements specified in Sections 01015 and 01335.

2.2.2 GEOTECHNICAL REPORT

The Contractor shall produce a Geotechnical Report which contains the results of a geotechnical investigation conducted in accordance with the requirements specified in Section 01015. All labor, equipment and supplies necessary to conduct a geotechnical investigation shall be considered a part of the Geotechnical Report.

2.2.2.1 FOUNDATION DESIGN

The foundations of Standard Design buildings and structures have been designed for a maximum soil bearing capacity of 0.75 kg/cm^2. The geotechnical investigation shall confirm bearing capacity to be no less than 0.75 kg/cm^2. If geotechnical investigation shows less than 0.75 kg/cm^2, the Contractor shall redesign the foundation based on the values provided in the geotechnical investigations.

2.2.3 A/E DESIGN

A/E (Architectural/Engineering) Design shall consist of all labor, equipment and supplies required to furnish a completed project design in accordance with the requirements specified herein, and in Section 01015 and Section 01335.

2.2.3.1 MASTER SITE PLAN

Contractor shall utilize "001 Concept Site Plans" provided in Appendix B to produce a Master Site Plan which shall include all requirements of this section 01010 and Section 01015.

The proposed costs of the Master Site Plan shall be included as part of the line item "A/E Design" in the 00010 Proposal Schedule.

2.2.4 RECORD DRAWINGS

Record Drawings shall consist of all labor, equipment and supplies required to produce Record (As-Built) Drawings in accordance with the requirements specified in Section 01335 and 01780A.

2.3 SITE DEVELOPMENT

2.3.1 SITE DEMOLITION

For the entire UP Provincial HQ site and for the Buffer Area, the Contractor shall demolish and dispose all existing site structures, perimeter walls, vegetation, debris, concrete and partial concrete structures, utilities, Hesco barriers, foundations and structures, at the site prior to commencement of new work. For the Buffer Area, several existing structures and features are indicated to remain in the Concept Site Plan and shall remain accordingly and shall not be disturbed. For the UP Provincial HQ site, the recently constructed compound in the northwest corner of the site shall remain. Also for the UP Provincial HQ site, the existing compound in the north center of the site shall remain except where demolition of features is required for construction of the dividing wall (dividing wall is a bid option). Removal of vehicles, trucks, buses, or connex boxes shall be performed by others and shall not be the responsibility of the Contractor.

No demolition work shall be done outside the coordinates given in paragraph 1.1 of this Section 01010. Where an existing wall runs along adjacent property boundary to the eastern side of the UP Provincial HQ site and the buffer area, this wall shall remain intact and shall not be disturbed.

The Contractor shall prepare a Stained Soil Removal/Replacement Plan as part of the 10% design submittal. The Contractor shall remove and dispose of all visibly stained soil to a depth within the upper one (1) meter from the project site. The Contractor shall be responsible for locating and paying all fees associated with removal and relocation of all soil and shall verify the location of soil disposal with the Contracting Officer.

All areas where soil is excavated shall be backfilled according to the requirements in Section 01015.

If there are any issues removing and disposing of contaminated soil from the site, the Contractor shall immediately notify the COR for resolution.

For bidding purposes the contractor shall assume 1,000 m^3 of contaminated soil will be excavated and removed from the site for disposal. The contractor shall also assume a like quantity of clean import material will be required to backfill the contaminated soils. The contractor shall document all soil removal and backfill quantities with appropriate photographs, bill of lading and logs. This documentation must be presented if the contractor negotiates for additional costs associated with the contaminated soil removal.

For the location indicated in the Concept Site Plan, Buffer Area, as "Existing well shall be plugged," the Contractor shall prepare a plan for plugging the well based upon the existing conditions and construction of the well. This plan shall be submitted as part of the 10% design submittal. The Contractor shall be responsible to plug this well once the plan is approved.

2.3.2 SITE GRADING AND STORMWATER MANAGEMENT

Site grading and drainage features shall conform to the requirements and references specified in the 01015 Technical Requirements. The Contractor shall design and submit a Site Grading and Drainage Plan showing the location of all required drainage structures. Site grading shall be compatible with existing terrain/grading. Provide adequate drainage to minimize flooding and promote drainage to the nearest wadi or adequate drainage ditch for the entire

development. All drainage shall be conveyed off site; stormwater retention is not permitted as a drainage solution.

2.3.3 WELL

The Contractor shall drill and construct one water well, to minimum depth of 120 m and a maximum depth of 150m, in accordance with Section 01015. The first 30m of the well shall be cased using Schedule 80 PVC. Provide electric pump and hand pump as specified in Section 01015.

Construction of the well shall provide an adequate sanitary seal of the annulus, and the casing shall extend high enough and be adequately sealed to avoid intrusion from potential flooding.

2.3.4 POTABLE WATER SYSTEM AND STORAGE

The Contractor shall design and construct a Potable Water System (PWS), served by the Well, to include the water well pump, one (1) elevated water storage tank, booster pump and controls with enclosure, disinfection/chlorination system, and an underground pipe distribution network system.

Construct the elevated water storage tank in accordance with the standard design drawing entitled "113 20-Meter Water Tower (U05)." Locate the water tower adjacent to the water well as illustrated on the concept site plans. The ladder rung spacing for the elevated storage tank shall be at 300 mm on center.

The water system shall be constructed in conformance with Section 01015, the Standard Design drawings, Technical Specifications, AED Design Requirements, and UFC 3-230-03A Water Supply.

2.3.5 WASTEWATER COLLECTION AND TREATMENT SYSTEM

The Contractor shall design and construct the Wastewater Collection and Treatment system in accordance with 01015 Technical Requirements. The Wastewater Collection System shall consist of gravity sewer pipe network and all accessories such as manholes, cleanouts, and building service connections. The Collection System shall connect to the Wastewater Treatment System, which shall be a traditional septic tank absorption field effluent disposal system. The capacity of the wastewater treatment system for the UP Provincial HQ shall be 37,500 liters per day. The holding tank shall be sized for five days' storage capacity and shall be located as shown in the Concept Site Plans for direct accessibility of a pumping truck. The associated absorption field is a bid option item; if awarded, it shall be designed and constructed in the Buffer Area in the orientation indicated in the Concept Site Plans.

Geotechnical investigation of the proposed sewage treatment site is required and the Contractor shall design the sewage treatment system to be compatible with site and soil conditions.

2.3.6 ELECTRICAL GENERATION AND DISTRIBUTION SYSTEM

The Contractor shall design and construct all components of an Electrical Generation and Distribution System, to include generators, fuel tanks, switchgear, transformer, connection to nearby primary overhead distribution, automatic transfer switch, and all other necessary components in accordance with Section 01015 including the referenced codes and publications and illustrated for reference in drawings titled "114 Fuel Storage and Refueling Point (U02)" Generators shall be located as illustrated on the Concept Site Plan. Generator fuel storage capacity shall be in accordance with Section 01015.

The Contractor shall provide fuel for commissioning and fill generator tank(s) with fuel at project turnover, after successful completion of commissioning.

2.3.7 COMMUNICATION SYSTEM

The Contractor shall design and construct the communication infrastructure in accordance with Section 01015. Provide communication conduits (backbone only), space requirements, and feeds in designated facilities as well as a communication system for perimeter security functions. Feeds shall run to all guard shacks/houses and back to a central communications room in the designated communications room of the compound. In the Administration Building – Floor 2, room 217 Situation Room shall be the location for the central communications equipment (see sheet A2 Key Note 6 for location). The communications wiring shall be installed by others.

Backbone Pathway: Telecommunication pathways from the telecommunications entrance facility to telecommunications room(s), and, telecommunications equipment rooms (backbone conduits) shall be installed.

At the Detention Cell Building compound, install 100mm communication conduit from the adjacent 110 Guard Shack to the exterior side of each corner of the outer fence and to the outer access gate (exterior side).

2.3.8 FUEL STORAGE, GENERATOR CANOPY, AND VEHICLE FUEL POINT

The Contractor shall design and construct a structure to house the generator, generator switchgear, fuel tank(s), and diesel fuel tank(s), in accordance with the Appendix drawings entitled "114 Fuel Storage and Refueling Point (U02)." Electrical generator(s), fuel tank(s), and switchgear as described in Paragraph "Electrical Generation and Distribution System" shall be located in this structure.

All fuel tanks and generators shall be located within a walled enclosure of fully-grouted reinforced concrete masonry walls that extend to a height 0.5m higher than the top of the tanks (minimum 3m height). Provide containment dike(s) around fuel tanks. Generator(s) and switchgear shall be located within a fenced area (with triple-strand concertina wire), with lockable personnel gate, congruent to the fuel tank enclosure. All equipment shall be housed under one common, steel pole mounted, galvanized corrugated metal canopy. Canopy shall be at a height to allow access over enclosure wall. Provide fixed steel access ladder on the inside of the enclosure, and provide clearances as recommended by fuel tank manufacturers.

Design and construct a diesel fuel storage and dispensing system, and all pertinent components. This system shall be designed to serve both the vehicle fuel point and the generator plant. Provide 40,000 liters of diesel fuel storage; capacity may be achieved by single or multiple tanks. Dispenser, with a single dispensing pump, shall be located adjacent to interior roadway/driveway, and covered with a steel pole-mounted galvanized corrugated metal canopy. Provide a manual hand pump for refueling vehicles with diesel fuel in the event of a power failure.

A MOGAS storage/dispensing system shall not be included in the scope of work for this project. Disregard any reference to a MOGAS storage/dispensing system in the Appendix drawings.

Provide concrete bollards to protect the generator area, the fuel dispensing unit, and as necessary to protect the fuel tank enclosure.

The Contractor shall fill each fuel tank with fuel at project turnover after successful completion of commissioning.

2.3.9 CONCRETE SIDEWALKS

The Contractor shall design and construct a network of unreinforced concrete sidewalks (foot paths) to connect the facilities and other amenities, as illustrated on Concept Site Plan. Sidewalks shall be 1.5 m in width and 100mm thick.

Provide concrete slab on grade at DFAC service yard as illustrated on Concept Site plan.

2.3.10 ASPHALT ROADWAYS

The Contractor shall design and construct asphalt roadways in accordance with Section 01015 of configuration to include all interior roads and ECP access roads as illustrated on Concept Site Plan.

2.3.11 AGGREGATE GROUNDCOVER, PARKING AND STORAGE AREAS

A. The Contractor shall construct parking and storage areas with continuous aggregate paving in accordance with Section 01015.

B. The Contractor shall construct aggregate ground cover with 100mm deep native crushed stone within the fenced well house and water storage area in accordance with Section 01015.

C. The Contractor shall construct a 3-meter perimeter around all buildings and structures, consisting of native crushed stone, 100mm in depth, except where concrete sidewalks are shown around buildings on the Concept Site Plan.

2.3.12 MISCELLANEOUS SITE ELEMENTS

A. The Contractor shall construct (2) Flagpoles on the entrance side of 100A Administration Building – Floor 1 as illustrated on the Concept Site Plan. Flagpoles shall be constructed in accordance with the Appendix B standard design drawings entitled "Flagpoles."

B. The Contractor shall construct (21) Clotheslines as illustrated on the Concept Site Plan and as called out for specific facilities in this Scope of Work. Clotheslines shall be constructed in accordance with the Appendix B standard design drawings entitled "Clotheslines."

2.4 FORCE PROTECTION

2.4.1 PERIMETER SECURITY WALL

The Contractor shall design and construct the Perimeter Security Walls for the entire UP Provincial HQ compound and for the east and west sides of the Buffer Area. The walls shall be constructed in the configuration illustrated on the Concept Site Plan, in accordance with the Appendix B standard design drawing entitled "Site Details," and in accordance with Section 01015 including requirements for a sniper screen system.

2.4.2 GUARD TOWERS

The Contractor shall construct six (6) Guard Towers in accordance with the Appendix B standard design drawings entitled "108 Guard Tower (FP04A – 12 GSM)" with additional Design/Build requirements for bulletproof glazing, metal frames and interior/exterior lighting as noted on drawings and in accordance with Section 01015. Each Guard Tower shall have a manually operated search light that can be operated and switched from within the Guard Tower. Guard Towers shall be located as illustrated on the Concept Site Plan. Guard Tower design shall be rotated or mirrored so orientations match those shown on the Concept Site Plan.

2.4.3 GUARD HOUSE

The Contractor shall construct one (1) Guard House in accordance with the Appendix B standard design drawings entitled "109 Guard House (FP07 – 54 GSM)." The Guard House shall be located as illustrated on the Concept Site Plan.

2.4.4 GUARD SHACKS

The Contractor shall construct three (3) Guard Shacks in accordance with the Appendix B standard design drawings entitled "110 Guard Shack (FP05 – 12 GSM)" with additional Design/ Build requirements for bulletproof glazing and metal frames as noted on drawings. Guard Shacks shall be located as illustrated on the Concept Site Plan.

2.4.5 FENCING, GATES, AND BARRIERS

The Contractor shall construct fencing, gates and barriers in accordance with Section 01015 and the Appendix B standard design drawings entitled "Fence and Gate Details – Typical."

A. Chainlink Fencing and gates: Provide continuous 3.0 m tall chain-link fencing with lockable gates at each of the following locations as illustrated on the Concept Site Plan:

   Surrounding power generation area: (1) double-leaf swing gate
   Surrounding DFAC service: (1) double-leaf swing gate
   Surrounding water storage area: (1) double-leaf swing gate
   Surrounding 106 Women's Barracks: (1) personnel gate with sniper screen
   Surrounding 118 FRU Building: Fencing with gate between this building and the main compound.
   Surrounding 121 Leach Field: (1) double-leaf swing gate.

B. Steel Gates: As illustrated on the Concept Site Plan, provide steel personnel and vehicular gates at Entry Control Points; provide a steel vehicular gate at the west wall of the Buffer Area; provide steel personnel and vehicular gates at the southern boundary of the UP Provincial HQ compound.

C. Concrete Barriers: Provide 1m tall continuous concrete barriers of approximate configuration at ECPs as illustrated on the Concept Site Plan.

D. Drop-Arm Gates: Provide and install six (9) Drop-Arm gates at ECPs as illustrated on the Concept Site Plan.

E. Speed Bump: Provide speed bumps on the road surface at the approach to the outer drop-arm gate at each ECP. Coordinate with COR for locations.

F. As part of the base bid, provide continuous 3.0 meter tall chain-link fencing with a lockable personnel gate and a lockable vehicle gate along the south side of the UP Provincial HQ site. The Concept Site Plan shows a perimeter wall along this side of the UP Provincial HQ site (bid option); the base bid shall have fence in this location along the interface between the UP Provincial HQ interior and the interior of the Buffer Area.

G. Security Features at Detention Cell Compound:

a. Around the three Detention Cell Buildings, install 4m tall chain link fence with gate. Install three (3) coils of concertina razor wire on outriggers on top of the fence. Concertina razor wire shall be secured to outrigger every 3 meters. Fence shall be 6 gauge (4.88mm) minimum and no larger than 50mm mesh. Gate shall be steel and shall have a key or manual cipher lock on each side.

b. Install a second 4m tall chain link fence with gate, identical to the first, offset 4 meters to the outside of the first as shown in the Concept Site Plan. Additionally, install one coil of concertina wire 2m above ground and secured to the fence every 0.5m or less. Gate shall be steel and shall have a key or manual cipher lock on each side.

c. Install 7m light poles with LED lights every 10 meters. Light poles shall be mounted on the perimeter security wall and shall illuminate the Detention Cell Compound.

2.5 FACILITIES

2.5.1 GENERAL

A. All facilities below shall be constructed in accordance with Technical Specifications and provided Standard drawings unless noted otherwise. Standard drawings shall be adapted to site conditions as required per paragraph “Site Adapting of Government Standard Drawings” above.

B. Work required to be designed as well as constructed by Contractor as described below shall be in accordance with Section 01015 and Conceptual drawings provided in Appendix A.

C. Contractor shall provide and install wood stoves for heating in accordance with the standard drawings of Appendix B, and in those areas of facilities as defined in Section 01015 Paragraph “Wood Stove Heaters”. Electric heaters shall be provided as shown in the standard design drawings. Outside air intake, ventilation and exhaust shall designed and constructed be in accordance with Section 01015.

D. All toilets except those in Women’s Barracks and FRU Building shall be Eastern style and face either North or South.

E. Window screens shall be provided only at DFAC and medical offices of Administration building, all other screens shall be omitted from designs.

F. The finish of wet room walls and floors (including all rooms of the Latrine(s), and all rooms of the Dining Facility), shall be either sealed concrete or sealed concrete masonry units (CMU), per the construction as detailed in the Standard Design drawings. Wall tile and floor tile, as shown in the Standard Design drawings, shall be omitted throughout.

2.5.2 ADMINISTRATION BUILDING – FLOOR 1

The Contractor shall construct one (1) Administration Building – Floor 1, located as illustrated on the Concept Site Plan. Based closely on the standard design drawings "100 Administration Bldg (AD 13 Type 2 – 1446 GSM)," the contractor shall fully design and construct Floor 1 of this facility as an independent structure. Facility floor plans, utility infrastructure, and architectural/structural systems shall match the standard design to the maximum extent possible. The stairwell spaces shall be designed as storage rooms. Provide window screens for windows of all Medical rooms.

The Contractor shall provide interior features for the detention cells (101 and 102) in accordance with the following requirements:

A. Water closet and lavatory fixtures shall be rated for use in a detention facility. Eastern toilets shall be enameled cast iron or stainless steel securely mounted to the floor. Lavatory shall be constructed entirely of stainless steel and mounted securely to the interior wall. No supply or drain plumbing may be exposed. Provide flush-mounted push-button valves and a spigot-less faucet. Soap holder shall not be a 'mounted' item, but shall be molded into the wall during construction.
B. All electrical devices shall be tamper proof; the Contractor shall provide a tamper resistant cage or security grill to protect light and smoke detector fixtures from damage. Exhaust fans shall be detention-grade, tamper-proof.
C. No ceramic tile may be used throughout the detention cells. Surfaces shall be epoxy painted concrete finish.
D. Installation shall include welding of all nuts/bolts and use of tamper-resistant mounting hardware.

2.5.3 ADMINISTRATION BUILDING – FLOOR 2

The Contractor shall construct one (1) Administration Building – Floor 2, located as illustrated on the Concept Site Plan. Based closely on the standard design drawings "100 Administration Bldg (AD 13 Type 2 – 1446 GSM)," the contractor shall fully design and construct Floor 2 of this facility as an independent structure. Facility floor plans, utility infrastructure, and architectural/structural systems shall match the standard design to the maximum extent possible. Building entrances/exits shall be designed to meet life safety code requirements.

2.5.4 DINING FACILITY

The Contractor shall construct one (1) Dining Facility with a Wood Stove Annex, located as illustrated on the Concept Site Plan. Dining Facility with Wood Stove Annex shall be constructed in accordance with the Appendix B standard design drawings entitled "101 Dining Facility (D07 Type 2 – 559 GSM)."

Provide window screens in all windows throughout the building.

2.5.5 TRAINING BUILDING

The Contractor shall construct one (1) Training Building, located as illustrated on the Concept Site Plan. Training Building shall be constructed in accordance with the Appendix B standard design drawings entitled "102 Training Bldg (CL06 – 319 GSM)."

The operable partition shall be omitted from the design.

2.5.6 BARRACKS BUILDING

The Contractor shall construct four (4) Barracks Buildings, located as illustrated on the Concept Site Plan. Barracks Buildings shall be constructed in accordance with the Appendix B standard design drawings entitled "103 Barracks Bldg (CL06 – 319 GSM)."

Provide three (3) clotheslines adjacent to each Barracks Building as illustrated on the Concept Site Plan. Clotheslines shall be constructed in accordance with the Appendix B standard design drawings entitled "Clothesline."

2.5.7 SENIOR BARRACKS – FLOOR 1

The Contractor shall construct one (1) Senior Barracks – Floor 1, located as illustrated on the Concept Site Plan. Based closely on the standard design drawings "104 Senior Barracks (B12 Type 1 – 862 GSM)," the contractor shall fully design and construct Floor 1 of this facility as an independent structure. Facility floor plans, utility infrastructure, and architectural/structural systems shall match the standard design to the maximum extent possible. Building entrances/exits shall be designed to meet life safety code requirements.

Provide three (3) clotheslines adjacent to the Senior Barracks – Floor 1 as illustrated on the Concept Site Plan. Clotheslines shall be constructed in accordance with the Appendix B standard design drawings entitled "Clothesline."

2.5.8 SENIOR BARRACKS – FLOOR 2

The Contractor shall construct one (1) Senior Barracks – Floor 2, located as illustrated on the Concept Site Plan. Based closely on the standard design drawings "104 Senior Barracks (B12 Type 1 – 862 GSM)," the contractor shall fully design and construct Floor 2 of this facility as an independent structure. Facility floor plans, utility infrastructure, and architectural/structural systems shall match the standard design to the maximum extent possible. Building entrances/exits shall be designed to meet life safety code requirements.

The Contractor shall construct three (3) clotheslines adjacent to the Senior Barracks – Floor 2 as illustrated on the Concept Site Plan. Clotheslines shall be constructed in accordance with the Appendix B standard design drawings entitled "Clothesline."

2.5.9 LATRINES

The Contractor shall construct two (2) Latrines, located in accordance with the Concept Site Plan. Latrines shall be constructed in accordance with the Appendix B standard design drawings entitled "105 Latrine (L02 Medium – 180 GSM)."

Toilets shall be orientated in a general direction of North or South; toilets shall be rotated within stalls as necessary per this requirement. Shower rods, rings and anti-microbial shower curtains, shall be provided and installed in lieu of shower stall and toilet stall doors.

2.5.10 WOMEN'S BARRACKS

The Contractor shall construct one (1) Women's Barracks, located as illustrated on the Concept Site Plan. Female Barracks shall be constructed in accordance with the Appendix B standard design drawings entitled "106 Women's Barracks (B25 Medium – 280 GSM)."

The Contractor shall construct three (3) clotheslines adjacent to the Women's Barracks as illustrated on the Concept Site Plan. Clotheslines shall be constructed in accordance with the Appendix B standard design drawings entitled "Clothesline."

2.5.11 DETENTION CELL BUILDING

The Contractor shall construct three (3) detention cell buildings, located as illustrated on the Concept Site Plan. Detention Cell Buildings shall be constructed in accordance with the Appendix B standard design drawings entitled "107 Detention Cell Building (MS04 – 180 GSM)."

Installation shall include welding of all nuts/bolts and use of tamper-resistant mounting hardware throughout detention cell spaces. The Contractor shall provide a tamper-resistant cage or security grille to protect light fixtures from damage.

2.5.12 TRASH COLLECTION POINT

The Contractor shall construct two (2) Trash Collection Points, located as illustrated on the Concept Site Plan. Trash Collection Points shall be constructed in accordance with the Appendix B standard design drawings entitled "111 Trash Collection Point (G01)."

2.5.13 WELL HOUSE

The Contractor shall construct one (1) Well House, in the general location shown on the Concept Site Plan. The Well House shall be located at the successfully drilled Well site and shall be constructed in accordance with the Appendix B standard design drawings entitled "112 Well House with Well (U03 – 20 GSM)."

2.5.14 VEHICLE MAINTENANCE AND POL BUILDING

The Contractor shall construct one (1) Vehicle Maintenance Building and one (1) Petroleum, Oil and Lubricant (POL) Building, located as illustrated on the Concept Site Plan. The Vehicle Maintenance Building and POL Building shall be constructed in accordance with the Appendix B standard design drawings entitled "115 Vehicle Maint and POL (VM05 – 206 GSM)."

2.5.15 WAREHOUSE

The Contractor shall construct two (2) Warehouses, located as illustrated on the Concept Site Plan. The Warehouse shall be constructed in accordance with the Appendix B standard design drawings entitled "116 Warehouse Building (S06 Small – 65 GSM)." The Warehouse shall be oriented such that the overhead door is facing the adjacent roadway.

2.5.16 SECURE STORAGE BUILDING (ASP)

The Contractor shall construct one (1) Secure Storage Buildings (Ammunition Supply Point), located as illustrated on the Concept Site Plan. The Secure Storage Building shall be constructed in accordance with the Appendix B standard design drawings entitled "117 Secure Storage ASP (S07 – 90 GSM)." No other buildings or structures shall be located within a 45 meter standoff distance from the Secure Storage Building.

2.5.17 FRU OFFICES

The Contractor shall design shall construct one (1) FRU Offices building, located as illustrated on the Concept Site Plan. The FRU (Family Response Unit) Offices shall be constructed in accordance with the Appendix B standard design drawings entitled "118 FRU Offices (AD20 – 60 GSM)."

2.5.18 TOILET BUILDING

The Contractor shall design and construct one (1) Toilet Building, located as illustrated on the Concept Site Plan. The contractor shall fully design this building with five (5) water closets and five (5) sinks. The structure, architecture, and utility systems (mechanical, electrical, plumbing) shall closely match those of facility 105 Latrine.

2.5.19 ECP CANOPY

The Contractor shall construct one (1) Entry Control Point (ECP) Canopy, located at the Primary ECP as illustrated on the Concept Site Plan. The Entry Control Point Canopy shall be constructed in accordance with the Appendix B standard design drawings entitled "Entry Control Point Canopy."

3.0 SUMMARY OF WORK –

PRC #1 COMPOUND

3.1 GENERAL

3.1.1 MOBILIZATION / DEMOBILIZATION

Mobilization and Demobilization shall consist of all labor, equipment, supplies and facilities required to stage all equipment and facilities needed for construction of this project. All mobilization and staging areas shall be located within the limit of work and shall be coordinated with the Contracting Officer. The location of all mobilization and staging areas is the responsibility of the Contractor. Requirements for mobilization and temporary structures are set forth in 01060 Special Clauses.

3.1.2 SECURITY

Security is critical to construction in Afghanistan, especially on roads and remote areas away from Coalition Force bases. The Contractor must have an appropriate amount of security/protection to match the threat in the project area and along the supply routes. **The Contractor shall develop detailed static and dynamic security plans in accordance with Section 01040 and submit them for Government approval.** The Government will not issue Clearance for Construction until security plans have been submitted and approved. **Refer to Section 01040 for detailed security requirements.**

The Contractor shall list static security and dynamic security under separate bid items as shown in Section 00010 Proposal Schedule.

3.1.3 UNEXPLODED ORDNANCE (UXO) REMOVAL AND CLEARANCE

Contractor IS responsible for initial clearance/removal.

The Contractor shall search for, identify and clear all mines and unexploded ordnance (UXO) from the entire site. The Contractor may only provide clearance/removal services via UN Mine Action Center for Afghanistan (UNMACA) accredited entities, and clearance shall be accomplished to the anticipated foundation depth as indicated in the contract. If sub-surface construction activities are to be performed on this site the minimum clearance depth will be 1 meter. Sub-surface clearance for construction activities in excess of 1 meter as defined by the contract parameters will also be the responsibility of the Contractor. Clearance by definition is an investigation and clearance of all sub-surface metallic anomalies on the site. Clearance/removal may only be undertaken in accordance with International Mine Action Standards (IMAS), Afghanistan Mine Action Standards (AMAS), and applicable U.S. Army Corps of Engineer (USACE) Ordnance & Explosives (OE) safety standards. When mines and/or UXO's are identified, the Contractor shall place them in a location in accordance with IMAS/AMAS/USACE until destruction of the items can take place. Construction work shall not occur inside the safety exclusion zone based on the most probable munition (MPM) expected on the site. Construction will not commence in any area that has not been cleared to the specified depth.

The Contractor will provide a standard UXO/Demining safety work plan to the US Army Corps of Engineers UXO / Demining COR for review prior to commencement of all UXO clearance / demining activities on the project sites. Once the UXO/ Demining clearance has concluded, the Contractor shall provide the US Army Corps of Engineers UXO / Demining COR a clearance certificate for review and approval before any construction activities are to commence.

NOTE 1: The USACE does not need written clearance certificate approval from the UNMACA to approve the construction start activities. However, the Contractor is responsible for providing a copy of the clearance certificate to the UNMACA for entry into their country wide database. A final signed copy of the UNMACE certificate must then be provided to the USACE UXO/Demining COR.

It is the responsibility of the Contractor to be aware of the risk of encountering UXO/mines and to take all actions necessary to assure a safe work area to perform the requirements of this contract. The Contractor assumes the risk of

any and all personal injury, property damage or other liability arising out of or resulting from any Contractor action taken hereunder. The Contractor and its subcontractors may not handle, work with, move, transport, render safe, or disarm any UXO/mine, unless they have appropriate accreditations under the IMAS/AMAS from the UNMACA.

If a UXO/mine is encountered after a UNMACA-approved clearance certificate is provided to the Government, UXO/mine disposal shall be handled in accordance with Section 01015, Technical Requirements.

NOTE 2: Point of Contact for UXO/Demining Safety Work Plan review and approval shall be directed to the US Army Corps of Engineers Demining Safety/COR:

UXO Safety/ Demining COR, USACE
tas.uxo.demining.safety@usace.army.mil, Roshan:079-403-1452 Comm:540-723-6129

3.2 DESIGN PROGRAM

3.2.1 SITE SURVEY

The Site Survey shall consist of all labor, equipment and supplies necessary to produce the topographical and other data in accordance with the requirements specified in Sections 01015 and 01335.

3.2.2 GEOTECHNICAL REPORT

The Contractor shall produce a Geotechnical Report which contains the results of a geotechnical investigation conducted in accordance with the requirements specified in Section 01015. All labor, equipment and supplies necessary to conduct a geotechnical investigation shall be considered a part of the Geotechnical Report.

3.2.2.1 FOUNDATION DESIGN

The foundations of Standard Design buildings and structures have been designed for a maximum soil bearing capacity of 0.75 kg/cm^2. The geotechnical investigation shall confirm bearing capacity to be no less than 0.75 kg/cm^2. If geotechnical investigation shows less than 0.75 kg/cm^2, the Contractor shall redesign the foundation based on the values provided in the geotechnical investigations.

3.2.3 A/E DESIGN

A/E (Architectural/Engineering) Design shall consist of all labor, equipment and supplies required to furnish a completed project design in accordance with the requirements specified herein, and in Section 01015 and Section 01335.

3.2.3.1 MASTER SITE PLAN

Contractor shall utilize “001 Concept Site Plans” provided in Appendix B to produce a Master Site Plan which shall include all requirements of this section 01010 and Section 01015.

The proposed costs of the Master Site Plan shall be included as part of the line item “A/E Design” in the 00010 Proposal Schedule.

3.2.4 RECORD DRAWINGS

Record Drawings shall consist of all labor, equipment and supplies required to produce Record (As-Built) Drawings in accordance with the requirements specified in Section 01335 and 01780A.

3.3 SITE DEVELOPMENT

3.3.1 SITE DEMOLITION

The Contractor shall demolish and dispose all existing site structures, perimeter walls, vegetation, debris, Hesco barriers, concrete and concrete structures, utilities, foundations and structures, at the site prior to commencement of new work. Removal of vehicles, trucks, buses, or connex boxes shall be performed by others and shall not be the responsibility of the Contractor.

No demolition work shall be done outside the coordinates given in paragraph 1.1 of this Section 01010. Where an existing wall runs along adjacent property boundary to the eastern side of the PRC#1 compound, this wall shall remain intact and shall not be disturbed.

The Contractor shall prepare a Stained Soil Removal/Replacement Plan as part of the 10% design submittal. The Contractor shall remove and dispose of all visibly stained soil to a depth within the upper one (1) meter from the project site. The Contractor shall be responsible for locating and paying all fees associated with removal and relocation of all soil and shall verify the location of soil disposal with the Contracting Officer.

All areas where soil is excavated shall be backfilled according to the requirements in Section 01015.

If there are any issues removing and disposing of contaminated soil from the site, the Contractor shall immediately notify the COR for resolution.

For bidding purposes the contractor shall assume 1,000 m^3 of contaminated soil will be excavated and removed from the site for disposal. The contractor shall also assume a like quantity of clean import material will be required to backfill the contaminated soils. The contractor shall document all soil removal and backfill quantities with appropriate photographs, bill of lading and logs. This documentation must be presented if the contractor negotiates for additional costs associated with the contaminated soil removal.

3.3.2 SITE GRADING AND STORMWATER MANAGEMENT

Site grading and drainage features shall conform to the requirements and references specified in the 01015 Technical Requirements. The Contractor shall design and submit a Site Grading and Drainage Plan showing the location of all required drainage structures. Site grading shall be compatible with existing terrain/grading. Provide adequate drainage to minimize flooding and promote drainage to the nearest wadi or adequate drainage ditch for the entire development. All drainage shall be conveyed off site; stormwater retention is not permitted as a drainage solution.

3.3.3 WELL

The Contractor shall drill and construct one water well, to minimum depth of 120 m and a maximum depth of 150m, in accordance with Section 01015. The first 30m of the well shall be cased using Schedule 80 PVC. Provide electric pump and hand pump as specified in Section 01015.

Construction of the well shall provide an adequate sanitary seal of the annulus, and the casing shall extend high enough and be adequately sealed to avoid intrusion from potential flooding.

3.3.4 POTABLE WATER SYSTEM AND STORAGE

The Contractor shall design and construct a Potable Water System (PWS), served by the Well, to include the water well pump, one (1) elevated water storage tank, booster pump and controls with enclosure, disinfection/chlorination system, and an underground pipe distribution network system.

Construct the elevated water storage tank in accordance with the standard design drawing entitled “113 20-Meter Water Tower (U05).” Locate the water tower adjacent to the water well as illustrated on the concept site plans.

The water system shall be constructed in conformance with Section 01015, the Standard Design drawings, Technical Specifications, AED Design Requirements, and UFC 3-230-03A Water Supply.

3.3.5 WASTEWATER COLLECTION AND TREATMENT SYSTEM

The Contractor shall design and construct the Wastewater Collection and Treatment system in accordance with 01015 Technical Requirements. The Wastewater Collection System shall consist of gravity sewer pipe network and all accessories such as manholes, cleanouts, and building service connections. The Collection System shall connect to the Wastewater Treatment System, which shall be a traditional septic tank absorption field effluent disposal system. The capacity of the wastewater treatment plant for the PRC #1 Compound shall be 24,500 liters per day. The holding tank shall be sized for five day's storage capacity and shall be located as shown in the Concept Site Plans for direct accessibility of a pumping truck. The associated absorption field is a bid option item; if awarded, it shall be designed and constructed in the Buffer Area in the orientation indicated in the Concept Site Plans.

Geotechnical investigation of the proposed sewage treatment site is required and the Contractor shall design the sewage treatment system to be compatible with site and soil conditions.

3.3.6 ELECTRICAL GENERATION AND DISTRIBUTION SYSTEM

The Contractor shall design and construct all components of an Electrical Generation and Distribution System, to include generators, fuel tanks, switchgear, transformer, connection to nearby primary overhead distribution, automatic transfer switch, and all other necessary components in accordance with Section 01015 including the referenced codes and publications and illustrated for reference in drawings titled "114 Fuel Storage and Refueling Point (U02)" Generators shall be located as illustrated on the Concept Site Plan. Generator fuel storage capacity shall be in accordance with section 01015.

The Contractor shall provide fuel for commissioning and fill generator tank(s) with fuel at project turnover, after successful completion of commissioning.

3.3.7 COMMUNICATION SYSTEM

The Contractor shall design and construct the communications infrastructure in accordance with Section 01015. Provide communication conduits (backbone only), space requirements, and feeds in designated facilities as well as a communication system for perimeter security functions. Feeds shall run to all guard shacks/houses and back to a central communications room in the designated communications room of the compound. In the Administration Building, room 109 Operations/Comms Center shall be the location for the central communications equipment. The communications wiring shall be installed by others.

Backbone Pathway: The Contractor shall install telecommunication pathways (backbone conduits) from the telecommunications entrance facility to telecommunications room(s).

3.3.8 FUEL STORAGE, GENERATOR CANOPY, AND VEHICLE FUEL POINT

The Contractor shall design and construct a structure to house the generator, generator switchgear, fuel tank(s), and diesel fuel tank(s), in accordance with the Appendix drawings entitled "114 Fuel Storage and Refueling Point (U02)." Electrical generator(s), fuel tank(s), and switchgear as described in Paragraph "Electrical Generation and Distribution System" shall be located in this structure.

All fuel tanks and generators shall be located within a walled enclosure of fully-grouted reinforced concrete masonry walls that extend to a height 0.5m higher than the top of the tanks (minimum 3m height). Provide containment dike(s) around fuel tanks. Generator(s) and switchgear shall be located within a fenced area (with triple-strand concertina wire), with lockable personnel gate, congruent to the fuel tank enclosure. All equipment shall be housed under one common, steel pole mounted, galvanized corrugated metal canopy. Canopy shall be at a height to allow access over enclosure wall. Provide fixed steel access ladder on the inside of the enclosure, and provide clearances as recommended by fuel tank manufacturers.

Design and construct a diesel fuel storage and dispensing system, and all pertinent components. This system shall be designed to serve both the vehicle fuel point and the generator. Provide 40,000 liters of diesel fuel storage; capacity may be achieved by single or multiple tanks. Dispenser, with a single dispensing pump, shall be located adjacent to interior roadway/driveway, and covered with a steel pole-mounted galvanized corrugated metal canopy. Provide a manual hand pump for refueling vehicles with diesel fuel in the event of a power failure.

A MOGAS storage/dispensing system shall not be included in the scope of work for this project. Disregard any reference to a MOGAS storage/dispensing system in the Appendix drawings.

Provide concrete bollards to protect the generator area, the fuel dispensing unit, and as necessary to protect the fuel tank enclosure.

The Contractor shall fill each fuel tank with fuel at project turnover after successful completion of commissioning.

3.3.9 CONCRETE SIDEWALKS

The Contractor shall design and construct a network of unreinforced concrete sidewalks (foot paths) to connect the facilities and other amenities, as illustrated on Concept Site Plan. Sidewalks shall be minimum 1.5 m in width and 100mm thick.

Provide concrete slab on grade at DFAC service yard as illustrated on Concept Site plan.

3.3.10 ASPHALT ROADWAYS

The Contractor shall design and construct asphalt roadways in accordance with Section 01015 of configuration to include all interior roads and ECP access roads as illustrated on Concept Site Plan.

3.3.11 AGGREGATE GROUNDCOVER, PARKING AND STORAGE AREAS

A. The Contractor shall construct parking and storage areas shall receive continuous aggregate paving in accordance with Section 01015.

B. The Contractor shall construct aggregate ground cover with 100mm deep native crushed stone within the fenced well house and water storage area in accordance with Section 01015.

C. The Contractor shall construct a 3-meter perimeter around all buildings and structures, consisting of native crushed stone, 100 mm depth, except where concrete sidewalks are shown around buildings on the Concept Site Plan.

3.3.12 MISCELLANEOUS SITE ELEMENTS

A. The Contractor shall construct (2) Flagpoles on the entrance side of 201 Administration Building as illustrated on the Concept Site Plan. Flagpoles shall be constructed in accordance with the Appendix B standard design drawings entitled “Flagpoles.”

B. The Contractor shall construct (21) Clotheslines as illustrated on the Concept Site Plan and as called out for specific facilities in this Scope of Work. Clotheslines shall be constructed in accordance with the Appendix B standard design drawings entitled “Clotheslines.”

C. The Contractor shall design and construct a parade field located adjacent to 100A Administration Building – Floor 2 as illustrated on the Concept Site Plan.

3.4 FORCE PROTECTION

3.4.1 PERIMETER SECURITY WALL

The Contractor shall design and construct the Perimeter Security Walls for the entire PRC #1 compound. The walls shall be constructed Perimeter Security Walls in the configuration illustrated on the Concept Site Plan, in accordance with the Appendix B standard design drawing entitled “Site Details,” and in accordance with Section 01015 including requirements for a sniper screen system.

3.4.2 GUARD TOWERS

The Contractor shall construct four (4) Guard Towers in accordance with the Appendix B standard design drawings entitled "108 Guard Tower (FP04A – 12 GSM)" with additional Design/Build requirements for bulletproof glazing, metal frames and interior/exterior lighting as noted on drawings and in accordance with Section 01015. Each Guard Tower shall have a manually operated search light that can be operated and switched from within the Guard Tower. Guard Towers shall be located as illustrated on the Concept Site Plan. Guard Tower design shall be rotated or mirrored so orientations match those shown on the Concept Site Plan.

3.4.3 GUARD HOUSE

The Contractor shall construct one (1) Guard House in accordance with the Appendix B standard design drawings entitled "109 Guard House (FP07 – 54 GSM)." The Guard House shall be located as illustrated on the Concept Site Plan.

3.4.4 GUARD SHACKS

The Contractor shall construct two (2) Guard Shacks in accordance with the Appendix B standard design drawings entitled "110 Guard Shack (FP05 – 12 GSM)" with additional Design/ Build requirements for bulletproof glazing and metal frames as noted on drawings. Guard Shacks shall be located as illustrated on the Concept Site Plan.

3.4.5 FENCING, GATES, AND BARRIERS

The Contractor shall construct the following fencing, gates and barriers in accordance with Section 01015 and Standard drawings titled "Fence and Gate Details – Typical."

A. Chainlink Fencing and gates: Provide continuous 3.0 m tall chain-link fencing with lockable gates at each of the following locations as illustrated on the Concept Site Plan:

   Surrounding power generation area: (1) double-leaf swing gate
   Surrounding DFAC service: (1) double-leaf swing gate
   Surrounding water storage area: (1) double-leaf swing gate
   Surrounding 203 Female Barracks: (1) personnel gate each with sniper screens
   Surrounding 217 Leach Field: (1) double-leaf swing gate

B. Steel Gates: As illustrated on the Concept Site Plan, provide steel personnel and vehicular gates at Entry Control Points and at the northern boundary of the PRC #1 compound.

C. Concrete Barriers: Provide 1m tall continuous concrete barriers of approximate configuration at ECPs as illustrated on the Concept Site Plan.

D. Drop-Arm Gates: Provide and install nine (9) Drop-Arm gates at ECPs as illustrated on the Concept Site Plan.

E. Speed Bump: Provide four (4) speed bumps at ECPs as illustrated on the Concept Site Plan.

F. Anti-vehicle Trench: Provide continuous trench along perimeter of site as illustrated on Concept Site Plan.

G. As part of the base bid, provide continuous 3.0 meter tall chain-link fencing with a lockable personnel gate and a lockable vehicle gate along the north side of the PRC#1 site. The Concept Site Plan shows a perimeter wall along this side of the PRC#1 site (bid option); the base bid shall have fence in this location along the interface between the PRC#1 interior and the interior of the Buffer Area.

3.5 FACILITIES

3.5.1 GENERAL

A. All facilities below shall be constructed in accordance with Technical Specifications and provided Standard drawings unless noted otherwise. Standard drawings shall be adapted to site conditions as required per paragraph "Site Adapting of Government Standard Drawings" above.
B. Work required to be designed as well as constructed by Contractor as described below shall be in accordance with Section 01015 and Conceptual drawings provided in Appendix A.
C. Contractor shall provide and install wood stoves for heating in accordance with the standard drawings of Appendix B, and in those areas of facilities as defined in Section 01015 Paragraph "Wood Stove Heaters". Electric heaters shall be provided as shown in the standard design drawings. Outside air intake, ventilation and exhaust shall designed and constructed be in accordance with Section 01015.
D. All toilets except those in Women's Barracks and FRU Building shall be Eastern style and face either North or South.
E. Window screens shall be provided only at DFAC and medical offices of Administration building, all other screens shall be omitted from designs.
F. The finish of wet room walls and floors (including all rooms of the Latrine(s), and all rooms of the Dining Facility), shall be either sealed concrete or sealed concrete masonry units (CMU), per the construction as detailed in the Standard Design drawings. Wall tile and floor tile, as shown in the Standard Design drawings, shall be omitted throughout.

3.5.2 ADMINISTRATION BUILDING

The Contractor shall construct one (1) Administration Building, located as illustrated on the Concept Site Plan. The Administration Building shall be constructed in accordance with the Appendix B standard design drawings entitled "200 Administration Building (AD16 Type 5 – 508 GSM)."

Provide window screens for windows of all Medical rooms.

The Contractor shall provide interior features for the detention cells (102 and 103) in accordance with the following requirements:

A. Water closet and lavatory fixtures shall be rated for use in a detention facility. Eastern toilets shall be enameled cast iron or stainless steel securely mounted to the floor. Lavatory shall be constructed entirely of stainless steel and mounted securely to the interior wall. No supply or drain plumbing may be exposed. Provide flush-mounted push-button valves and a spigot-less faucet. Soap holder shall not be a 'mounted' item, but shall be molded into the wall during construction.
B. All electrical devices shall be tamper proof; the Contractor shall provide a tamper resistant cage or security grill to protect light and smoke detector fixtures from damage. Exhaust fans shall be detention-grade, tamper-proof.
C. No ceramic tile may be used throughout the detention cells. Surfaces shall be epoxy painted concrete finish.
D. Installation shall include welding of all nuts/bolts and use of tamper-resistant mounting hardware.

3.5.3 OPEN BAY BARRACKS

The Contractor shall construct one (1) Open Bay Barracks, located as illustrated on the Concept Site Plan. The Open Bay Barracks shall be constructed in accordance with the Appendix B standard design drawings entitled "201 Open Bay Barracks (B13 Type 2 – 579 GSM)."

The Contractor shall construct three (3) clotheslines adjacent to the Open Bay Barracks as illustrated on the Concept Site Plan. Clotheslines shall be constructed in accordance with the Appendix B standard design drawings entitled "Clothesline."

3.5.4 SENIOR/HIGH BARRACKS

The Contractor shall construct one (1) Senior/High Barracks, located as illustrated on the Concept Site Plan. The Senior/High Barracks shall be constructed in accordance with the Appendix B standard design drawings entitled "202 Senior/High Barracks (B14 Type 3 – 384 GSM).

The Contractor shall construct three (3) clotheslines adjacent to the Senior/High Barracks as illustrated on the Concept Site Plan. Clotheslines shall be constructed in accordance with the Appendix B standard design drawings entitled "Clothesline."

3.5.5 FEMALE BARRACKS

The Contractor shall construct two (2) Female Barracks, located as illustrated on the Concept Site Plan. The Female Barracks shall be constructed in accordance with the Appendix B standard design drawings entitled "203 Female Barracks (B26 Small – 48 GSM)."

The Contractor shall construct three (3) clotheslines adjacent to the Female Barracks as illustrated on the Concept Site Plan. Clotheslines shall be constructed in accordance with the Appendix B standard design drawings entitled "Clothesline."

3.5.6 DINING FACILITY

The Contractor shall construct one (1) Dining Facility with a Wood Stove Annex, located as illustrated on the Concept Site plan. The Dining Facility shall be constructed in accordance with the Appendix B standard design drawings entitled "204 Dining Facility (D08 Type 3 – 384 GSM)."

Provide window screens in all windows throughout the building.

3.5.7 TRASH COLLECTION POINT

The Contractor shall construct two (2) Trash Collection Points, located as illustrated on the Concept Site Plan. The Trash Collection Points shall be constructed in accordance with the Appendix B standard design drawings entitled "111 Trash Collection Point (G01)."

3.5.8 LATRINES

The Contractor shall construct one (1) Latrine building, located as illustrated on the Concept Site Plan. The Latrine shall be constructed in accordance with the Appendix B standard design drawings entitled "105 Latrine (L02 Medium – 180 GSM)."

3.5.9 WAREHOUSE

The Contractor shall construct one (1) Warehouse, located as illustrated on the Concept Site Plan. The Warehouse shall be constructed in accordance with the Appendix B standard design drawings entitled "116 Warehouse Building (S06 Small – 65 GSM)."

The Warehouse shall be oriented such that the overhead door is facing the adjacent roadway.

3.5.10 SECURE STORAGE BUILDING (ASP)

The Contractor shall construct one (1) Secure Storage Buildings (Ammunition Supply Point), located as illustrated on the Concept Site Plan. The Secure Storage Building shall be constructed in accordance with the Appendix B standard design drawings entitled "117 Secure Storage ASP (S07 – 90 GSM)." No other buildings or structures shall be located within a 45 meter standoff distance from the Secure Storage Building.

3.5.11 WELL HOUSE

The Contractor shall construct one (1) Well House in the general location shown on the Concept Site Plan. The Well House shall be located at the successfully drilled Well site and shall be constructed in accordance with the Appendix B standard design drawings entitled "112 Well House with Well (U03 – 20 GSM)."

3.5.12 POL BUILDING

The Contractor shall construct one (1) POL Building, located as illustrated on the Concept Site Plan. The POL Building shall be constructed in accordance with the Appendix B standard design drawings entitled "215 POL Storage Building (VM06 – 25 GSM)."

3.5.13 ECP CANOPY

The Contractor shall construct one (1) Entry Control Point (ECP) Canopy, located at the Primary ECP as illustrated on the Concept Site Plan. The ECP Canopy shall be constructed in accordance with the Appendix B standard design drawings entitled "Entry Control Point Canopy."

4.0 OPTIONAL BID ITEMS

Each Optional Bid Item shall include all necessary A/E Design work, all extensions of and connections to the Compound's utilities, and extensions and/or reconfiguration of sidewalks as illustrated on the Concept Site Plan.

4.1 *UP PROVINCIAL HQ COMPOUND*

4.1.1 UPGRADE DIVIDING FENCE TO MASONRY DIVIDING WALL

Along the southern boundary of the UP Provincial HQ compound, the base bid requires a chain link fence with a lockable personnel gate and a lockable vehicle gate. Under this optional bid item, the Contractor shall provide a masonry wall along this boundary in lieu of the chain link fence. The masonry wall shall be constructed in accordance with the Appendix B standard design drawings entitled "Site Details" and shall be identical to the perimeter security wall. However, no sniper screen shall be provided on this segment of masonry wall. A lockable personnel gate and lockable vehicle gate shall be provided.

4.1.2 INSTALL MASONRY DIVIDING WALL FOR EXISTING COMPOUND

The contractor shall install a masonry wall with a lockable vehicle gate and personnel gate to divide an existing compound in the north center of the UP Provincial HQ site. The location of this dividing wall is shown in the Concept Site Plan. The wall shall be constructed in accordance with the Appendix B standard design drawings entitled "Site Details" and shall be identical to the perimeter security wall, including the sniper screen requirement.

4.1.3 INSTALL LEACH FIELD

The contractor shall install an absorption field (leach field) in accordance with the requirements of paragraph 2.3.5 Wastewater Treatment and Collection System. The location of the leach field is shown in the Concept Site Plan as "121 Leach Field (Option)."

4.2 *PRC #1 COMPOUND*

4.2.1 UPGRADE DIVIDING FENCE TO MASONRY DIVIDING WALL

Along the northern boundary of the PRC #1 compound, the base bid requires a chain link fence with a lockable personnel gate and a lockable vehicle gate. Under this optional bid item, the Contractor shall provide a masonry wall along this boundary in lieu of the chain link fence. The masonry wall shall be constructed in accordance with the Appendix B standard design drawings entitled "Site Details" and shall be identical to the perimeter security wall.

However, no sniper screen shall be provided on this segment of masonry wall. A lockable personnel gate and lockable vehicle gate shall be provided.

4.2.2 INSTALL LEACH FIELD

The contractor shall install an absorption field (leach field) in accordance with the requirements of paragraph 3.3.5 Wastewater Treatment and Collection System. The location of the leach field is shown in the Concept Site Plan as "217 Leach Field (Option)."

-- END OF SECTION –

SECTION 01015
TECHNICAL REQUIREMENTS

1.0 GENERAL

1.1 COMPLIANCE

All Work required for design by the Contractor shall comply with the Technical Requirements contained herein.

Construction of Government-provided Standard Drawings in Appendix shall be built per those drawings in accordance with the Technical Specifications compiled by Contractor as required per Section 00555.

The Contractor's designer shall have a minimum of 5 years experience with the design and construction of the same magnitude and complexity as required in this project. Design and construction performed by Contractor shall incorporate the best blend of cost, construction efficiency, system durability, ease of maintenance and environmental compatibility.

1.2 MINIMUM & ALTERNATE REQUIREMENTS

The design and product requirements stated in these documents are minimum requirements. Exceeding the minimum requirements for the equipment and products as improvements to the design stated herein is highly encouraged at no additional cost and as approved by the government. The technical requirements listed in Codes and Technical Criteria, Section 1.8, apply to this project. Any deviation from the technical requirements shall be approved by the Contracting Officer. Request for deviations shall be submitted for approval. Variations shall furnish the same system safety, durability, ease of maintenance and environmental compatibility. The Contractor will be required to submit information as specified in Section 01335, 3.6.4 Variations, for all proposed variations with which to make a comprehensive comparison of the proposed alternate. All variations of approved designs must be approved by the Contracting Officer.

1.3 ASBESTOS CONTAINING MATERIALS

Asbestos containing material (ACM) shall not be used in the design and construction of this project. If no other material is available which will perform the required function or where the use of other material would be cost prohibitive, a waiver for the use of asbestos containing materials must be obtained from the Contracting Officer.

1.4 SAFETY

1.4.1 UNEXPLODED ORDNANCE (UXO)

1.4.2 UXO/MINE DISCOVERY DURING PROJECT CONSTRUCTION

It is highly recommended that all construction ground guide/ground observation personnel maintain a minimum 16 m buffer zone from all heavy equipment during excavation activities. A daily check of the area for signs of recently emplaced UXO/IED's is also highly recommended, to include unusual disturbed soil areas or mounds of soil from the previous day. If during construction, the contractor becomes aware of or encounters UXO/Mine or potential UXO/Mine, the contractor shall immediately stop work at the site of encounter, clearly mark the area of UXO/Mine, move to a safe location, notify the COR, and mitigate any delays to scheduled or unscheduled contract work. Once the contractor has informed the COR, the contractor will await further direction. UXO/Mine disposal **will be** the responsibility of the Contractor in accordance with Section 01010.

1.5 LIMITATION OF WORKING SPACE

The Contractor shall, except where required for service connections or other special reason(s), confine his operations strictly within the boundaries of the site. Workmen will not be permitted to trespass on adjoining property. Any operations or use of space outside the boundaries of the site shall be by arrangement with all interested parties. It

must be emphasized that the Contractor must take all practical steps to prevent his workmen from entering adjoining property and in the event of trespass occurring the Contractor will be held entirely responsible.

Areas located immediately outside the construction area are known to contain mines and unexploded ordnance (UXO). Contractors assume all risks when venturing in or out of the designated work area.

1.6 TEMPORARY STRUCTURES

The Contractor shall erect suitable temporary fences, lighting, and necessary structures to safeguard the site, materials and plant against damage or theft and for the protection of the general public and shall adequately maintain the same throughout the course of the contract.

1.7 SUBCONTRACTORS

Compliance with the provisions of this section by subcontractors will be the responsibility of the contractor.

1.8 LIST OF CODES AND TECHNICAL CRITERIA

The following codes and technical criteria and those referenced therein shall be required for this project. References within each reference below shall be required and adhered to. If there is conflict in the criteria the most stringent requirement shall be applied. This list is not exhaustive and is not necessarily complete. The publications to be taken into consideration shall be those of the most recent editions.

AABC - Associated Air Balance Council (National Standards for total System

Balance)

ACI 301M Specifications for Structural Concrete, latest edition, American Concrete Institute

ACI 318 Building Code Requirements for Structural Concrete, latest edition, American Concrete Institute

ACI 530/ASCE 5/TMS 402, Building Code Requirements for Masonry Structures, latest edition

Air Force Manual 32-1071, Security Engineering, volumes 1-4, 1 May 1994

American Institute of Steel Construction (AISC), Specifications for Structural Steel Buildings (latest edition)

AISC 360 Specification for Structural Steel Buildings, latest edition, American Institute of Steel Construction

AISC 341 Seismic Provisions for Structural Steel Buildings, latest edition

American Petroleum Institute (API) Codes

American Water Works Association, ANSI/AWWA C651-99 standard

American Water Works Association, ANSI/AWWA C651-99 standard

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

ASCE 7-05, Minimum Design Loads for Buildings and Other Structures

ASHRAE - American Society of Heating, Refrigeration and Air-Conditioning

Engineers Handbooks latest editions: Fundamentals; HVAC Systems and Equipment; HVAC Applications; Refrigeration.

ASHRAE Standard 55-latest edition, Thermal Environmental Conditions for Human Occupancy

ASHRAE Standard 62.1-latest edition, Ventilation for Acceptable Indoor Air Quality

ASHRAE Standard 62.2-latest edition, Ventilation and Acceptable Indoor Air Quality for Low-Rise Residential

ASHRAE Standard 90.1-latest edition, Energy Standard for Buildings Except Low-Rise Residential Buildings

ASHRAE Standard 90.2-latest edition with Supplement, Energy-Efficient Design of Low-Rise Residential Buildings

ASME - American Society for Mechanical Engineering

ASTM - American Society for Testing and Materials

ASTM-D-1586 Standard Test Method for Standard Penetration Test

ASTM-D-5299 Standard Guide for Decommissioning Ground Water Wells

AWS D1.1, Structural Welding Code – Steel, American Welding Society

DCID 6/9 Physical Security Standards for Sensitive Compartmented Information Facilities

DCID 1/21, Manual for Physical Security Standards For Sensitive Compartmented Information Facilities (SCIF)

Design Standard per Memorandum for Record, Design Standards, DTD 16 August 2009 BT, Appendix B-1 and B-2

DoD Ammunition and Explosives Safety Standards

EIA ANSI/TIA/EIA-607: Commercial Building Grounding/Bonding Requirement Standard

Factory Mutual (FM) Approval Guide-Fire Protection (2002)

IBC – International Building Code, latest edition

BS 7671 British Standard for Electrical Installations requirements

IEEE C2, National Electrical Safety Code (NESC), latest edition

IFGC – International Fuel Gas Code, latest edition

IMC – International Mechanical Code, latest edition

IPC – International Plumbing Code, latest edition

Lighting Handbook, IESNA, latest edition

MIL-HDBK-1190, Facility Planning and Design Guide

National Association of Corrosions Engineers (NACE) Codes

Codes and Standards of the National Fire Protection Association (NFPA), as applicable and enacted in 2002 or later.

NFPA 1, General Fire Protection, latest edition

NFPA 10, Portable Fire Extinguishers, latest edition

NFPA 30, Flammable and Combustible Liquids Code, latest edition

NFPA 30A, Code for Motor Fuel Dispensing Facilities and Repair Garages, latest edition

NFPA 54, National Fuel Gas Code, latest edition

NFPA 58, Liquefied Petroleum Gas Code, latest edition

NFPA 70, National Electrical Code, latest edition

NFPA 72, National Fire Alarm Code, latest edition

NFPA 75, Standard for the Protection of Information Technology Equipment

NFPA 80, Fire Rated Doors and Windows, latest edition

NFPA 90A, Air Conditioning and Ventilating Systems, latest edition

NFPA 96, Fire Protection for Commercial Kitchens, latest edition

NFPA 101, Life Safety Code, latest edition

NFPA 110, Standard for Emergency and Standby Power Systems, latest edition

NFPA 221, Standard for Chimneys, Fireplaces, Vents, And Solid Fuel–Burning Appliances, latest edition

NFPA 1141, Site Fire Protection, latest edition

Plumbing and Drainage Institute (PDI-WH-201) water hammer arrestors

International Mine Action Standards, latest edition; (see http://www.mineactionstandards.org for copy of standards)

SMACNA-Sheet Metal and Air Conditioning Contractors' national Association, Standards and Guides

SDI – Steel Deck Institute – Design Manual for Composite Decks, Form Decks, and Roof Decks

SDI – Steel Door Institute (SDI/DOOR), Latest Edition (Referenced as "DOOR")

SDO – Steel Joist Institute – Standard Specifications and Load Tables, Open Web Steel Joists

TM 5-785 Weather Data

TM 5-805-4 Noise and Vibration

UFC 1-200-01, Design: General Building Requirements

UFC 1-300-07A, Design Build Technical Requirements

UFC 1-300-09N, Design Procedures

UFC 3-220-03fa, Soils and Geology

UFC 3-230-03a, Water Supply, latest edition

UFC 3-230-04a, Water Distribution, latest edition

UFC 3-230-06a, Subsurface Drainage, latest edition

UFC 3-230-07a, Water Supply: Sources and General Considerations, latest edition

UFC 3-230-08a, Water Supply: Water Treatment, latest edition

UFC 3-230-09a, Water Supply: Water Storage, latest edition

UFC 3-230-10a, Water Supply: Water Distribution, latest edition

UFC 3-230-13a, Water Supply: Pumping Stations, latest edition

UFC 3-230-17FA, Drainage in Areas Other than Airfields, latest edition

UFC 3-240-03N, Operation and Maintenance: Wastewater Treatment System Augmenting Handbook, latest edition

UFC 3-240-09fa Domestic Wastewater Treatment, latest edition

UFC 3-240-07fa Gravity Sewers, latest edition

UFC 3-240-04A Wastewater Collection latest edition

UFC 3-310-01, Structural Load Data

UFC 3-310-02A, Structural Design Criteria for Buildings

UFC 3-301-01 Structural Design Criteria for Buildings

UFC 3-410-01FA, Heating, Ventilation and Air Conditioning

UFC 3-410-02A, HVAC Control Systems, latest edition

UFC 3-410-04N, Industrial Ventilation

UFC 3-420-01, Plumbing Systems Design

UFC 3-420-02FA, Compressed Air

UFC 3-430-01FA, Heating and Cooling Distribution Systems

UFC 3-460-01, Petroleum Fuel Facilities

UFC 3-520-05, Stationary Battery Areas, latest edition

UFC 3-530-01AN, Design: Interior and Exterior Lighting and Controls, latest edition

UFC 3-535-01, Visual Air Navigation Facilities, latest edition

UFC 3-540-04N Design: Diesel Electric Generating Plants, latest edition

UFC 3-600-01, Design: Fire Protection Engineering for Facilities, 14 Jul 2009

UFC 4-010-01, Design: Minimum DoD Antiterrorism Standards for Buildings, latest edition

UFC 4-010-02, DoD Minimum Antiterrorism Standoff Distances for Buildings, latest edition

UFC 4-020-03, Security Engineering: Fences, Gates, and Guard Facilities, 14 June 2007

UFC 4-020-01FA, Security Engineering: Project Development, latest edition

UFC 4-020-02FA, Security Engineering: Concept Design, latest edition

UFC 4-020-03FA, Security Engineering: Final Design, latest edition

UFC 4-020-04FA, Electronic Security Systems: Security Engineering, latest edition

UFC 4-021-01, Design and O&M: Mass Notification Systems, latest draft version

UFC 4-022-01, Security Engineering: Entry Control Facilities/Access Control Points, latest edition

UFC 4-229-01N, Design: General Maintenance Facilities, latest edition

UFC 4-022-03, Security Engineering: Fences, Gates, and Guard Facilities, latest edition

UFC 4-722-01, Design: Dining Facilities, 27 January 2003

UL Standards (as applicable)UL 142, Steel Aboveground Tanks for Flammable and Combustible Liquids

Underwriters' Laboratories (UL) Fire Protection Equipment Directory (2002)UL 710, Exhaust Hood for Commercial Cooking Equipment, latest edition

UL 752, Bullet Resisting Equipment, 2000 or later

USCINCCENT OPORD 97-1

Overseas Environmental Baseline Guidance Document, Department of Defense, May 2007

Unified Facility Criteria (UFC) is available online at http://www.wbdg.org/ccb/browse_cat.php?o=29&c=4

In addition, technical criteria provided in USACE-AED Design Requirements (most recent version) shall be required for use in design and construction specifications as indicated in the following documents. The following design criteria shall be used:

AED Design Requirements – Voltage Drop Calculations Process, latest version

AED Design Requirements - Site Layout Guidance, latest version

AED Design Requirements - Well Pumps & Well Design/Specifications, latest version

AED Design Requirements – Water Tank and Water Distribution Systems, latest version

AED Design Requirements – Chlorinators, latest version

AED Design Requirements - Jockey Pumps, latest version

AED Design Requirements - Water Tanks, latest version

AED Design Requirements – Hydrology, latest version

AED Design Requirements - Culvert and Causeway Design, latest version

AED Design Requirements - Sanitary Sewer and Septic Systems, latest version

AED Design Requirements - Grease Trap, latest version

AED Design Requirements - Oil-Water Separator, latest version

AED Design Requirements - Package Wastewater Treatment Plants and Lagoons, latest version

AED Design Requirements - Vertical Curves, latest version

AED Design Requirements – Horizontal Curves & Super elevation, latest version

AED Design Requirements – Geotechnical Investigations for USACE Projects, latest version

The AED Design Requirement documents can be downloaded at Afghanistan Engineering District's website located at http://www.aed.usace.army.mil/engineeringtop2010.asp

Standards other than those mentioned above may be accepted if the standards chosen are internationally recognized and meet the minimum requirements of the specified standards. The Contractor shall be prepared to submit proof of this if requested by the Contracting Officer.

1.9 AED DESIGN REQUIREMENTS DOCUMENTS

AED Design Requirements documents (latest version) listed above shall be adhered to in this contract. These documents are available from the AED-N website located at: http://www.aed.usace.army.mil/engineeringtop2010.asp. These documents shall be used as the basis for design and construction, and for selecting options within the United Facilities Guide Specifications (UFGS). It is the contractor's option to use specifications contained in the AED Design Requirements Documents, when provided, or to adapt the UFGS specifications to match the requirements provided in the AED Design Documents and specifications. Site or project specific data and requirements in the AED Design Requirements documents shall supersede UFGS language where there are differing criteria which must be evaluated and selected. AED-N Electrical Standards shall not be used as the basis for design.

2.0 SITE DEVELOPMENT

2.1 ENVIRONMENTAL PROTECTION

2.1.1 APPLICABLE REGULATIONS

The Contractor shall comply with all Host Nation laws, rules, regulations or standards concerning environmental pollution control and abatement with regard to discharge of liquid waste into natural streams or manmade channels. The contractor shall review host nation and U.S. Government environmental regulations with the contracting officer prior to design and discharge of any liquid wastes into natural streams or manmade channels.

2.1.2 NOTIFICATION

The Contracting Officer will notify the Contractor in writing of any observed non-compliance with the foregoing provisions. The Contractor shall immediately take corrective action. If the Contractor fails or refuses to promptly take corrective action, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No extension of time or damages will be awarded to the Contractor unless it was later determined that the Contractor was in compliance.

2.1.3 SPILLAGES

Measures shall be taken to prevent chemicals, fuels, oils, greases, bituminous materials, waste washings, herbicides and insecticides, and construction materials from polluting the construction site and surrounding area.

2.1.4 DISPOSAL

Disposal of any materials, wastes, effluents, trash, garbage, oil, grease, chemicals, etc., shall be taken to a dumpsite off site and subject to the approval of the Contracting Officer. Burning at the project site for the disposal of refuse and debris will not be permitted.

2.2 CIVIL SITE DEVELOPMENT

2.2.1 SITE PLANS

2.2.1.1 PLAT PLAN

The Contractor shall prepare a plat or plan of property consisting of a Boundary and Site Survey. The survey shall show the closure of the property boundary consisting of identifying all property corners, establishing horizontal and vertical control, listing all bearing and distances of property lines from all property corners, and tie-ins (showing bearing and distance) from at least two (2) major offsite man-made or natural features. This survey shall meet the requirements of World Geodetic System 1984 (WGS 1984 UTM Zone 41North in decimal degrees).

The survey design shall include topographic information with existing contour lines and spot elevations of relevant topographic features, and show the locations of all existing buildings and structures including all walls, fences and gates, Concrete barriers, paving areas, storage containers, stoops, sidewalks and walkways, widths of roads, names of roads, easements, right of ways, setbacks, parking, all existing above-ground and underground utilities, all trees, drainage features and dry creek beds (wadis), drainage channels, and hydroplogical, geological,or other physical conditions that could impact design.

If there are areas where offsite surface water runoff has the potential to affect this project, topographic information of these areas will be required to be provided.

2.2.1.2 MASTER SITE PLAN

Based on the Boundary Survey and the provided Concept Site Plan, the Contractor shall prepare a separate Master Site Plan showing the property boundary, and all proposed surface features including but not limited to buildings/facilities, roads, setbacks, parking and paving areas, storage containers, stoops, sidewalks and walkways, above ground utilities locations. The Contractor shall identify and show perimeter walls, fences and gates, guard towers and entry control point structures.

Also shown on the Master Site Plan shall be pertinent existing features (on-site and off-site) that will have an influence or impact on the development of the site.

The Contractor shall locate the facilities in general agreement with the Concept Site Plan and any requirements in Section 01010. All site features shall be clearly defined and dimensioned on the Master Site Plan. Buildings shall be located to provide access for emergency vehicles and fire fighting. Roads and parking areas shall be designed for turning radius of the largest vehicle entering the compound. The site plan shall show geometric design of the site, including applicable dimensions of all exterior facilities, mechanical equipment, pavements, utilities, etc. Required facilities are described in the following sections of this specification. All roads and areas where tractor-trailer vehicles will travel shall be designed for the worst case turning radius. Design and construction of roads and pavements shall be based on recommendations from geotechnical investigation required herein.

Master Site Plan design should utilize the most suitable land for construction, and shall be planned in accordance with the provided Concept Site Plan in Appendix. Facilities shall not be located in wadis or dry river beds.

The Master Site Plan shall include all locations of construction office/storage containers, lay-down and construction debris removal area.

The Master Site Plan shall be drawn in the following projection and datum for incorporation into the U.S. Army Corps of Engineers GIS system:

WGS 1984 UTM Zone 41 North

2.2.2 SITE PREPARATION / DEMOLITION

Site preparation shall include the clearing and grubbing of the entire site. All refuse and debris shall be disposed of off-site as described in paragraph DISPOSAL. Holes and depressions shall be backfilled and compacted in lifts not to exceed 2000 mm in height unless specified otherwise. Fill materials shall be composed of satisfactory soils or aggregates defined in ASTM D 2487 as GW, GM, GC, GP, SP, SW, SM, and SC. Minimum soil compaction shall be 95 percent of maximum density as defined in ASTM D 1557.

Scrap metal shall be the property of the Host Government. The scrap metal on site shall be moved to an area away from the site perimeter as directed by the Contracting Officer's Representative and left for the Host Government to remove and/or salvage. Demolished fencing and concertina wire shall be neatly rolled up for reuse by the host government. Likewise, used fence posts and outriggers shall be neatly stockpiled for reuse by the host government.

Site demolition shall include removal of any and all structures which may be found within the site boundaries including foundations, pavements, and utilities, with the exception of existing buildings that are indicated "to remain" on the Site Concept Plan and in accordance with Section 01010. Removal of vehicles, trucks, buses, or connex boxes shall be performed by others and shall not be the responsibility of the Contractor.

2.2.3 SITE GRADING & DRAINAGE (STORMWATER MANAGEMENT)

Contractor shall produce and submit a Site Grading and Drainage Plan design in accordance with requirements herein and Section 01335.

Contractor shall design and construct all necessary site grading to insure adequate drainage so that no areas will be flooded due to a 24-hour rainfall of a 20-year frequency. Drainage of the area should be compatible with the existing terrain. Provide adequate drainage to minimize flooding, and promote drainage to the nearest wadi or adequate drainage ditch for the entire development. Building floor elevation shall be a minimum 150 mm above grade and slope away from the building on all sides at a minimum of five percent for a distance of 3 m.

Site Grading and Drainage design shall not include slopes greater than 7% at any location within the compound.

Any slopes on site greater than 7% will need to be stabilized using erosion control measures or be supported by a retaining structure.

Rainfall data utilized for hydrology calculations shall be based on data obtained from meteorological records collected in Afghanistan. National agencies may be consulted for data. In the absence of site specific data, intensity-duration-frequency curves contained in the AED Design Requirements – Hydrology, latest edition shall be used by extrapolating the rainfall intensity information from the stations in closest proximity to the project. Under no circumstances will relationships developed by extrapolation from foreign countries be used for hydrologic studies.

The installation of culverts, sized for maximum stormwater flows, shall be required at all road and walkway locations which cross drainage ditches. All culverts at the Perimeter Security Wall shall include personnel access denial system(s). Culvert shall be designed for HS-20 loading.

The sides of all new earthen storm drainage (including canals, trenches, ditches, swales, etc) shall not have a slope greater than 1:3 (vertical: horizontal). The sides of storm drainage with greater slope is allowed, but the drainage must be lined with a stone and mortar finish or concrete lined to prevent erosion.

Place aggregate groundcover (native crushed stone) in areas to reduce erosion and to provide dust control. Contractor shall compact underlying subgrade to a minimum 95 percent of the laboratory maximum dry density as determined by ASTM D 1557, Modified Proctor test.

2.2.4 ROADS, PARKING AREAS, STORAGE AREAS, AND FOOT PATHS

Location, type, and width of roads, parking, maneuver, and storage areas required are stated in Section 01010. Roads, parking, maneuver, and storage areas shall be geometrically designed, graded for proper drainage, and provided with necessary drainage structures. Contractor shall notify the Contracting Officer immediately if initial site survey determines that area hydrology requires major drainage structures or bridges. Also, the Contracting Officer shall be immediately notified if the required lengths of road, parking, maneuver, and storage area preexisting conditions are determined to be substantially or materially different than the above-described conditions/estimates.

All intersecting roads, parking, maneuver areas, storage areas, and foot paths, driveways, and culvert crossings are required to end with a smooth transition with new road profiles.

All roads and areas indicated in Section 01010 to be asphalt paved shall be surfaced with minimum 50 mm thick hot mix asphalt concrete compacted at 98% maximum density placed above a minimum 200 mm thick base course minimum compacted at 95% maximum proctor density placed above 150 mm thick of scarified sub-grade compacted to 95% maximum density, unless otherwise noted.

All roads and areas indicated in Section 01010 to have aggregate surface shall consist of minimum 100 mm thick compacted aggregate base course compacted to 95% maximum density placed above minimum 150 mm thick of scarified sub-grade compacted to 95% maximum density, unless otherwise noted.

For all asphalt and aggregate roads, the Contractor shall provide 1.0 m wide, aggregate base shoulder compacted to 95% maximum density that is 150 mm thick at 2.0% slope on both sides of the roadway. Provide 1.0 m wide shoulder around all parking areas, storage areas, convoy assembly area, and motor pools consisting of 150 mm thick aggregate base course material at 2.0% slope. The centerline of all roads shall be sloped a minimum of 1% and a maximum of 8%.

The roads shall be designed for HS-20 loading. All roads shall be designed geometrically with applicable sections of UFC 3-250-18FA and UFC 3-250-01FA to accommodate WB-50 vehicles with a maximum speed of 20 kilometers per hour. Pavement surfaces shall be designed for a design life of 25 years, Road Class F, Category IV.

The above pavement structures dictated above are minimum requirements. Design of roads, parking, maneuver, and storage areas shall be conducted based on geotechnical data. The geotechnical data shall be used to calculate the pavement structure using the minimum pavement structure as dictated above as a reference. Reference Section "Geotechnical" below.

Aggregate Base Course (ABC) material must be well graded, durable, uniformly moistened, and mechanically stabilized by compaction. Degree of compaction shall be expressed as a percentage of the maximum density obtained by the test procedure in ASTM D 1557.

The Contractor shall design and construct 100 mm thick by 1.5 m wide concrete foot paths along roads, between buildings, parking areas, and other logically anticipated areas to serve as pedestrian foot paths and fire lanes. The Contractor shall assume these above stated standards throughout this document unless otherwise noted. If footpaths are to be used as fire lanes, the fire lane shall be a minimum of 3 m wide and shall be designed for HS-20 loading.

2.2.4.1 SITE GRADING AND DRAINAGE

The road shall be built up above existing grade for storm water drainage and protection where necessary. Poor subgrade material shall be removed and replaced with clean, compactable gravel.

2.2.4.1.1 STORM DRAINS

New storm drain pipes shall be designed for gravity flow during the design storm having a recurrence interval of no less than 20 years. 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 UFC 3-230-17A. Storm drain systems shall be designed to provide a minimum flow velocity of 0.75 meters per second when the drains are one-third or more full.

2.2.4.1.2 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 surface water are 150 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 surface water 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 1 m of cover during construction to prevent damage by heavy construction equipment.

2.2.4.2 ROAD SIGNS

The roadway shall have proper road signage. All road signage shall be in English, Pashto and Dari. Signage shall be required to notify drivers of speed limits, approaching curves, schools, towns, speed bumps, etc. Road signs are required at every intersection of the road. Regulatory signs shall be placed such that all traffic entering the main roads from side roads will be required to stop. The bottom edge of the sign shall be a minimum of 2 meters above the road surface at the shoulder. Signage type, size and placement shall be in accordance with the UNCRSS;

positioning sequence shall be standard. (Pashto is the predominate language in Kandahar.) Details of all signs with dimensions and either coloring or notes describing the colors shall be provided.

2.2.5 FORCE PROTECTION DESIGN

The Contractor shall design and construct force protection measures. The Force Protection design shall incorporate minimum setbacks for new facilities to maximum extent possible as permitted by size of the site and the requirements of the user. Force Protection design shall also meet the requirements of UFC 4-010-01, Design: Minimum DoD Antiterrorism Standards for Buildings, 8 Oct 2003 and UFC 4-010-02, DoD Minimum Antiterrorism Standoff Distances for Buildings, 8 Oct 2003.

2.2.5.1 PERIMETER SECURITY WALL

The Perimeter Security Wall shall be constructed according to the Standard Design detail in the appendix.~~.~~ Inside grade shall in all cases be higher than outside grade. The ground grade shall slope away from the wall for at least 5 meters and shall be kept a minimum of 3.0 meters below the top of wall for a minimum distance of 10 meters. The wall shall be designed to prevent visual access to the inside of compound by all pedestrian and vehicular traffic outside the compound which may require the wall to be built at a higher level in some locations. Any penetrations through the Perimeter Security Wall shall only be for site drainage purposes and shall have force protection such as a welded bar grill, welded grating, or other pre-engineered barrier.

The Contractor shall design and provide a sniper screen system for the entire perimeter security wall system. The sniper screen system shall consist of chain-link fencing mounted to the inside of the perimeter security wall and extending to an elevation 1.5 meters above the top surface of the wall. Sniper screen shall be securely fastened to the exterior side of the chain-link fencing for full visual protection from the top of the wall to the top of the fencing. Sniper screen color shall be light tan in color and shall match the color of the perimeter security wall.

2.2.5.2 OUTRIGGERS

Outrigger supporting arms shall be “Y” shaped with middle post, securely embedded 400mm by a 50mm diameter metal tube into the top of the wall. Posts shall conform to ASTM F 1083, Pipe, Steel, Hot Dipped Zinc Coated (Galvanized) Welded. Outriggers shall be spaced a maximum of 3000mm on center.

2.2.5.3 ECP GATES

ECP vehicular gate shall be single leaf manually operated. Vehicular gate and pedestrian gate shall be constructed in accordance with provided standard drawings.

2.2.5.4 REINFORCED BARBED TAPE

Reinforced barbed tape shall be 600 mm diameter concertina style coil consisting of 31 loops. Each loop shall consist of 19 barb clusters per loop. Adjacent coils loops shall be alternately clipped together at three points about the circumference to produce the concertina effect upon deployment. Spacing between attachments points when deployed shall be 400 mm. The reinforced barbed tape shall be fabricated from 430 series stainless steel with hardness range of Rockwell (30N) 37-45 conforming to the requirements of ASTM A 176. Each barb shall be a minimum of 30.5 mm (1.2 inch) in length, in groups of 4, spaced on 102 mm (4 in) centers. The stainless steel core wire shall have a 2.5 mm (0.098 in) diameter with a minimum tensile strength of 895 MPa. Sixteen gauge stainless steel twistable wire ties shall be used for attaching the barbed tape to the barbed wire. The reinforced barbed tape shall be equivalent to NSN: 5660-01-457-9852.

2.2.5.5 CHAIN-LINK FENCE AND GATES

Chain link fence and gate fabric shall be No. 9 gage wires woven into a 50 mm diamond mesh. Fabric shall be coated with 366 grams per square meter zinc galvanizing. Posts shall be ASTM F 1083 Pipe, Steel, Hot Dipped Zinc Coated (Galvanized) Welded or equal. Top of fence and gates shall be provided with outriggers and reinforced barbed tape as indicated above.

The gates shall be swing type. Hinged gates shall be a pair of 3 m wide x 2.4 m high leafs, constructed of a steel tube frame and steel tube intermediate posts and rails. The design of the gates shall insure that it is dimensionally

stable, square, true and planar. Gate leafs shall not rack or deflect when install on its hinges. Gates shall have a sufficient number of hinges; anchor mounted to the exterior masonry walls, to support each gate leaf. Gates should include locking mechanisms that can be secured with a padlock, Provide a locking mechanism that holds the gates together when in the closed position as well as a drop bolt that engages a steel sleeve embedded in the pavement.

2.2.5.6 PRIMARY ECP

Primary ECP shall be laid out and constructed as illustrated in the Concept Site Plan. The gate shall be considered the Active Vehicular Barrier (AVB). Drop arms and guard shack shall be provided and located at a minimum distance of one and a half vehicles away from the entrance to serve as a checkpoint. Concrete Jersey Barriers or other approved alternatives shall be used to design and construct Passive Vehicular Barriers (PVB) of approximate configuration as shown on Concept Site Plan.

Provide rejection lanes as shown on Concept Site plan where vehicles following inspection and before entrance to the compound are routed back to the entrance road without interruption of the queue.

2.2.5.6.1 CONCRETE PVB

Barriers shall be concrete blocks of one meter by one meter by one meter dimensions. Similar arrangements of large stones (one cubic meter size), jersey barriers or equal sized obstacles may be used.

2.3 CIVIL UTILITIES

2.3.1 WATER

2.3.1.1 GENERAL

The Contractor shall provide water distribution mains, branches, service connections to include all pipe, valves, bends, thrust blocking, fittings and appurtenances. Exterior water line construction shall include service to all buildings and facilities as described in the Scope of Work Section 01010. Independent, complete systems shall be provided for the UP Provincial HQ Compound and for the PRC #1 Compound in accordance with Section 01010.

The required average daily flow (ADF) shall be the average daily demand (ADD) per person - derived from 155 liters per capita per day (lpcd) – multiplied by a capacity factor of 1.5, multiplied by the design population.

In the event potable or non-potable use water is required prior to completion of the water facilities infrastructure the Contractor may be issued a Request for Proposal to provide non-potable (tank truck) and potable (bottled or other reliable source) consumption.

Provide a minimum of one (1) outside water hydrant (hose spigot) for all buildings with water service. Every hose spigot shall have a lockable valve on its water line located inside an adjacent building or in a valve box. All buildings with water supply shall have a water meter installed in a locked cabinet area inside the building.

The water system shall be designed to operate between 345-414 kPa. Minimum pressures of 207 kPa will be allowed at peak domestic flow conditions.

Features of the water system shall be sized to provide flow or storage capacity as follows:

- Water Well Pump Capacity - Capacity and total dynamic head (TDH) shall be based on filling the water storage tank in six (6) hours.

- Water Storage Tank - Capacity for the elevated tank shall be 26,500 liters in accordance with the 20-meter Water Tower standard design drawings.

- Water Mains – Diameter based on the installation fixture unit flow or two times the ADF (ADD x c x CF) and velocity requirements per this guide unless a minimum diameter is specified which is adequate to provide flow and meet the specified maximum velocity. The flow through the system shall be distributed on the basis of fixture unit flow in each the buildings serviced or per contract.

- Water Service Lines - Diameter based on fixture units of the building serviced.

2.3.1.2 WATER WELLS

Construct water well(s) inside the compound, to provide sufficient supply for the population of the facility. The water well capacity shall be based on the allowable safe yield of the new well determined by a well pump test as described in the USACE-AED Design Requirements - Well Pumps & Well Design/Specifications, latest version. The new well site shall be at a location approved by the Government. The new well site shall be no closer than 60 m from any existing wells. Well construction shall be in accordance with the USACE-AED Well Design Guide and Water Well Guide Specification.

After de-mining (if applicable), but prior to the construction of any structures, the Contractor shall submit a well test plan, drill and test the water well, conduct well design activities, conduct a chemical analysis of the water, and submit all required information to AES for review prior to installing any permanent well features. A plan for decommissioning dry wells, per ASTM D 5299, shall be included with the well drilling plan. It is acknowledged that water may not be available at the site despite Contractor good faith efforts to find it.

Well construction shall be in accordance with AED Design Requirements - Well Pumps & Well Design/Specifications, latest version - which includes, but is not limited to, requirements for well screen, casing, gravel pack, well pump, disinfection, water meters and testing requirements. All design requirements, material specifications, and testing contained in this document shall be used and submittals shall be made promptly in accordance with Section 01335. Failure to follow the construction and submittal procedures outlined may, at AED's discretion, result in rejection of the well and, the Contractor having to remove the well casing and screen, re-drill the well and reinstall the proper features per the approved design.

Well Depth. The well shall be drilled to a minimum depth as described in the 01010 Scope of Work in an attempt to find potable water meeting WHO water quality requirements. The depth of the permanent well shall take into consideration the drawdown depth, screen depth and pump submergence as described in the AED Design Requirements document. If water cannot be found at a sufficient yield after drilling to that linear depth, the Contractor will be considered to have fulfilled the terms of the contract and will be entitled to the full price of the contract CLIN for Well. However, the Contractor must still furnish all other parts of the water distribution system as described in the specifications.

Casing. Selection of the casing diameter, material and depth shall be per the AED Design Requirements document. In unconsolidated material, casing shall extend to the top of the well screen. In rock formations (drilled wells) the hole may be left open (i.e., well screen not required) with casing extended 3 m into the rock formation. All wells will be cased 610 mm above grade (i.e., base of pit, ground surface, etc.) and be fitted with a lockable cap with air gap (vacuum relief during pumping). Each section of casing will be joined with standard couplings and full-threaded joints, or by proper welding, so that all joints are sound and watertight. Well casing alignment shall not interfere with the proper installation and operation of the pump. The bottom of the casing shall be fitted with a metal or PVC well screen that will permit maximum transmission of water without clogging. The minimum length of screen shall be at least 3 m.

Screen. The casing will be fitted with a well screen that will permit maximum transmission of water without clogging. Screen shall only be placed in the interval of the aquifer targeted. Screen shall not be placed at intervals throughout the well depth. The material of construction, opening requirements, minimum lengths and placement shall be per the AED Design Requirements document.

Sealing - The drilling process will create a hole (borehole) larger than the casing (minimum of 50mm). The annular space between the casing and the borehole will be filled with gravel, overburden, or concrete as follows:

1) The annular space between the well screen and borehole shall be filled with material that will form a filter to minimize production of fines and not clog the slots in the screen (e.g., washed, well-graded silica sand).
2) The annular space above the filter pack up to the base of the grout seal may be backfilled with overburden or other clean earth material.
3) The upper 3 m of the well bore shall be sealed with neat cement grout. The grout shall be placed in one continuous mass and shall be impermeable.

4) Crushed stone for well sealing shall consist of crushed stone containing angular shapes and surfaces with no rounded surfaces with the following gradation:

Sieve Size	% Total Wt. Passing
12.5 mm	100
4.75 mm	75 ± 13
1.18 mm	25 ± 15
75 µm	8 ± 4

5) All aggregate shall contain less than 5 percent of shale, clay lumps, coal, lignite, soft or unfragmented stone, or other deleterious materials.

Well screen, casing, gravel pack, well pump, disinfection, and testing requirements for well construction shall meet the specifications and design requirements in AED *Design Requirements - Well Pumps & Well Design/Specifications*, June 2009, or most recent version.

Source protection - Surface drainage within 30 m of wellhead shall ensure no ponding, flooding or collection of runoff adjacent to the well. This can be accomplished through surface grading or use of gravel drains to modify site drainage in the vicinity of the well. Identify all sources of contamination and ensure the proposed well site meets minimum standoff distances as indicated below:

a. Sewage storage areas (outhouses, tanks, individual sewage pits, lagoons, and WWTP) – 30 m
b. Septic fields (infiltration galleries) – 30 m
c. Fuel storage, engine maintenance/repair – 30 m

Well Pump – A submersible, centrifugal pump shall be installed inside the casing set no less than 2.0 m from the base of the excavation. Control of the pump shall be by means of a Hand-Off-Auto (HOA) switch. In the "Auto" position, the pump shall be started and stopped automatically by water levels in the water storage tank. Pump shall start at low level and shall stop at high level. Level controls shall be adjustable. Manual start shall be the Hand position.

Hand Pump – The Contractor shall provide a backup hand pump, with separate intake piping, installed in the same well casing as the downhole vertical turbine submersible pump, to allow water supply during periods without electricity. Water drawn from the well by the hand pump shall not flow through the electric well pump. The pump shall be valved so that it can be used to fill the water storage tank or discharge to a spigot outside the well house. The hand pump shall be the Deep Well Type Hand Pump such as the Afridev Pump or India MK II Extra Deepwell Pump, or equal, capable of lifting water from depths of up to 90 meters. The bottom of the hand pump shaft shall be placed at least 15 meters below the static groundwater table, but no deeper than 90 meters and at least 5 meters above the top of the submersible vertical turbine pump.
The backup hand pump shall be lever operated while standing in the well house. The bottom of the hand pump shaft shall be placed 5 to 10 meters above the top of the submersible vertical turbine pump.

Expansion Tank – Provide bladder style expansion tank for well pump to minimize pressure surges and water hammer effects.

2.3.1.3 WELL PUMP TESTING

Well pump testing and water clarity testing after well development shall be per the requirements in AED Design Requirements - Well Pumps & Well Design/Specifications, latest version or most recent version.

2.3.1.4 WATER QUALITY SAMPLING AND ANALYSIS

The Contractor shall perform water quality sampling and testing at the source. The Contractor shall utilize well-qualified and equipped testing capability in the project site area, if available. If professional testing services are not available in the area, the Contractor will submit an alternative practical testing source for approval.

See USACE-AED Well Pumps & Well Design Guide with Attachment A – Guide Specifications for Drinking Water Wells, latest version and Appendix A of TM 5-813-3 (UFC 3 230 08a Water Supply Water Treatment, January 2004) for requirements for laboratory testing.

2.3.1.5 RAW WATER DISINFECTION

Contractor shall perform disinfection of the well water in accordance with AED Design Requirements - Well Pumps & Well Design/Specifications, latest version. Bacteriological samples shall be collected and examined in accordance with Standard Methods for the Examination of Water and Wastewater by a qualified lab as approved by the Contracting Officer.

2.3.1.6 WATER STORAGE TANK

Contractor shall provide commercially fabricated, steel, elevated water storage tank(s). The elevated water storage tank(s) and supporting structures shall be constructed in strict conformance with the furnished drawings and specifications. The tank shall meet all applicable codes for potable water storage. The interior coatings for the tank shall meet NSF/ANSI 61 requirements. Contractor shall ensure that all elements of the Water Tank have been designed, fabricated, and erected in accordance with AWWA D100-05 Welded Carbon Steel Tanks for Water Storage and AWWA D102-06 Coating Steel Water Storage Tank.

The following geotechnical investigation will be conducted at the proposed location of the water tanks:

Current geotechnical requirements as outlined in the AED Design Guide for Geotechnical Investigations provide geotechnical information for shallow foundation structures constructed on AED projects. The geotechnical characteristics of the soils at the location of the water towers must be adequate to support the deep loadings generated by the tower and water tank. The following are required prior to approval for construction of water towers using the design provided by AED. Information listed below should be submitted to AED as soon as practicable to allow construction of the tower in a timely manner.

1. Site Characteristics Information
   - A. Site plan showing location of each tower.
   - B. Elevation of original and finished grade at the center of each tower foundation.
   - C. Finished floor elevations of every building on the site receiving water.
   - D. Top of concrete of pedestal containing anchor bolts used to secure each tower.

2. Bore Hole Information
   - A. Boring log for each water tower foundation. Diameter shall be 150 mm or 200 mm diameter. Depth shall be 16.5 m from finished grade. Location shall be center of water tower foundation.
   - B. Samples shall be collected every 0.75 m.
   - C. Sample results for EVERY sample taken during boring operation.
     - (1) Penetration Test and Split-Barrel Sampling of Soils using ASTM D 1586.
     - (2) Lab Determination of Water (Moisture) Content of Soils using ASTM D 2216.
     - (3) Liquid Limit, Plastic Limit, and Plasticity Index of Soils using ASTM D 4318.
     - (4) Classification of Soils for Engineering Purposes (Unified Soil Classification System) using ASTM D 2487.

The water system shall be designed and constructed in accordance with the AED Design Requirements, latest version, and UFC 3-230-03A Water Supply which include the use of a capacity factor. Water demand required for fire fighting and for irrigation and landscaping needs shall not be included in design demand calculations.

2.3.1.7 DISINFECTION & CHLORINATION SYSTEM

Use hypochlorite compounds for disinfection. A manufacturer assembled, self-contained, skid-mounted, hypo-chlorinator consisting of mixer, mixing tank, pump pipe injector, and control panel shall be used to feed a sodium hypochlorite solution of 1- 5 percent available chlorine into the system. Hypochlorite compound may be a liquid or solid form. The pump shall feed a hypochlorite solution in proportion to the water demand. The hypo-chlorinator shall have a pumping rate, liters per day (lpd) (gallons per day (gpd)) adequate to deliver 5 percent available hypochlorite solution adjustable to the quantity of water being produced from the source. The chlorine-feeding system shall consist of controls and devices necessary for a complete operating system. Dosage rate will vary somewhat depending on actual pump production rate and available residual chlorine in the system. Contractor shall determine the required dosage rate milligrams per liter (mg/l) to maintain the required chlorine residual (usually 0.2-0.4 mg/l) in the distribution system. Chlorine solution tank shall be large enough to hold a three days supply of hypochlorite solution. A fresh solution shall be prepared every two or three days because the solution may lose its strength over time and this will affect the actual chlorine feed rate. The hypochlorite shall be stored in a cool dry

place. Sodium hypochlorite can lose from two to four percent of its available chlorine content per month at room temperature. Contractor shall verify required minimum residual chlorine in accordance with local requirements verified and approved by the Contracting Officer. The chlorination system shall have the capability for manually adjusting the dosage rate and be installed in such a manner that the system can be easily disconnected and bypassed in the event of health safety or routine maintenance and repair. Disinfection of water mains shall be in accordance with AWWA standard C651-86 and disinfection of storage facilities in accordance with AWWA standard C652-86. The package disinfection system shall be located in the well pump house.

2.3.2 WATER DISTRIBUTION SYSTEM

2.3.2.1 GENERAL

The Contractor shall provide a water distribution system. The distribution network shall be laid out in a combination grid and looped pattern with dead ends not exceeding 30 m. Use similar piping materials for all buildings and pipe runs in the distribution system for efficiency of future maintenance activities. Dead end sections shall not be less than 150 mm diameter and shall either have blow off valves or fire hydrants (flushing valves) installed for periodic flushing of the line. Any pipe with a fire hydrant on the line shall be at least 150 mm in diameter. Water supply distribution shall connect to a building service at a point approximately 1.5 m outside the building or structure to which the service is required. All piping and joints shall be capable of at least 1.03 MPa leakage testing and 1.38 MPa hydrostatic test pressure, unless otherwise specified. Pipe diameters shall be adequate to carry the maximum flow of water at velocities less than 1.5 m/sec. Piping segments where velocities less than 0.15 m/sec are anticipated shall be noted and brought to the attention of AES. The operating pressure range shall be between 276 kPa to 414 kPa at all points of the distribution system. If pressures greater than 690 kPa (100 psi) cannot be avoided, pressure-reducing valves shall be used.

A system pressure of 207 kPa (30 psi) is acceptable at extreme peak flow conditions. A system pressure below 207 kPa shall be considered a deviation in the technical requirements requiring Contracting Officer approval.

Adequate cover must be provided for frost protection. A minimum cover of 800 mm is required to protect the water distribution system against freezing. Water lines less than 1.25 m deep under roadway/driveway crossings (to include parking areas) shall be encased in concrete of at least 150 mm thickness around the pipe extending out to one m from each road edge.

2.3.2.2 PIPE

The Contractor shall provide Ductile Iron or PVC pipe of adequate strength, durability and be corrosion resistant with no adverse effect on water quality.

2.3.2.2.1 WATER MAINS AND BRANCHES

Pipe material for water mains and branches shall be PVC or Ductile Iron (DI). The exterior surface of the pipe must be corrosion resistant. Distribution lines shall be 100 mm (4 in) and larger and shall be reduced only at the junction of building connections. Pipe diameters shall be selected to meet the previously specified flow, velocity, and pressure conditions. If Ductile Iron (DI) pipe is installed underground the pipe shall be encased with polyethylene in accordance with AWWA C105. Ductile iron pipe shall conform to AWWA C104. DI fittings shall be suitable for 1.03 MPa (150 psi) pressure unless otherwise specified. Fittings for mechanical joint pipe shall conform to AWWA C110. Fittings for use with push-on joint pipe shall conform to AWWA C110 and C111. DI fittings shall be cement mortar lined (standard thickness) in accordance with C104. All pipes and joints shall be capable of at least 1.03 MPa (150 psi) and 1.38 MPa (200 psi) hydrostatic test pressure unless otherwise specified herein. Polyvinyl Chloride (PVC) pipe shall conform to ASTM D 1785. Plastic pipe coupling and fittings shall be manufactured of material conforming to ASTM D 1784, Class 12454B. PVC screw joint shall be in accordance with ASTM D 1785, Schedules 40, 80 and 120. PVCu pipe couplings and fittings shall be manufactured of material conforming to ASTM D 1784, Class 12454B. Pipe less than 80mm (3 inch), screw joint, shall conform to dimensional requirements of ASTM D schedule 80. Elastomeric gasket-joint, shall conform to dimensional requirements of ASTM D 1785 Schedule 40, PVCu (or uPVC) pipe and fittings shall have SDR that provide equal or superior strength properties to ASTM 1785 SCH 40 or SCH 80 pipe and fittings.

2.3.2.2.2 WATER SERVICE

Water service line diameter shall be based on fixture units of the building serviced or per contract Building service lines will be sized according to the following guidance. Water service connections from the mains to the buildings shall vary from 19 mm, 25 mm, 38 mm, 75 mm, to 100 mm as calculated, depending on the maximum flow velocity and minimum pressure requirements as determined by hydraulic analysis of fixture flows. Pipe service connections from the distribution main to the building shall be either Polyvinyl Chloride (PVC) plastic Schedule 80 ASTM D 1785 or copper tubing conforming to ASTM B 88M, Type K, annealed. PVC pipe couplings and fittings shall be manufactured of material conforming to ASTM D 1784, Class 12454B. Contractor shall not use HDPE for any of the water pipes.

2.3.2.2.3 HYDROSTATIC, LEAKAGE, AND DISINFECTION TESTS

The Contracting Officer will be notified not less than 48 hours in advance of any water piping test and will be given full access for monitoring testing procedures and results. Where any section of water line is provided with concrete thrust blocking for fittings or hydrants, tests shall not be made until at least 5 days after installation of concrete thrust blocking, unless otherwise approved. Pressure and leakage testing shall be as specified in AED Design Requirements – Water Tank and Water Distribution Systems, latest version.

2.3.2.2.4 HYDRO STATIC (PRESSURE) TEST

After the pipe is laid, the joints completed, and the trench partially backfilled leaving the joints exposed for examination, the newly laid piping or any valved section of piping shall, unless otherwise specified, be subjected for 1 hour to a hydrostatic pressure test of 1.38 MPa (200 psi). Each valve shall be opened and closed several times during the test. Exposed pipe, joints, fittings, hydrants and valves shall be carefully examined during the partially opened trench test. Joints showing visible leakage shall be replaced or remade as necessary. Cracked or defective pipe, joints, fittings, hydrants and valves discovered following this pressure test shall be removed and replaced and retested until the test results are satisfactory.

2.3.2.2.5 LEAKAGE TEST

Leakage tests shall be conducted after all pressure tests have been satisfactorily completed. The duration of each leakage test shall be at least 2 hours, and, during the test, water lines shall be subjected to not less than 1.38 MPa (200 psi). Leakage is defined as the quantity of water to be supplied into the newly laid pipe, or any valved or approved section, necessary to maintain pressure to within 34.5 kPa of the specified leakage test pressure after the pipe has been filled with water and all air expelled. Pipe installation will not be accepted if leakage exceeds the allowable leakage, as determined by the following formula:

METRIC UNITS:

$L = 0.00042454*N*D*P^{1/2}$ where:

L = Allowable leakage in liters per hour
N = Number of joints in the length of pipeline tested
D = Nominal diameter of the pipe in mm
P = Average test pressure during the leakage test, in MPa gauge

US UNITS:

$L = 0.0001351*N*D*P^{1/2}$ where:

L = Allowable leakage in gallons per hour
N = Number of joints in the length of pipeline tested
D = Nominal diameter of the pipe in inches
P = Average test pressure during the leakage test, in psi gauge

Should any test of pipe disclose leakage greater than that calculated by the above formula, the defective joints shall be located and repaired until the leakage is within the specified allowance, without additional cost to the government.

2.3.2.2.6 PIPELINE DISINFECTION TESTS

2.3.2.2.6.1 DISINFECTION PROCEDURE

Before acceptance of potable water operation, each unit of completed waterline shall be disinfected as prescribed by AWWA C651. After pressure tests have been completed, the unit to be disinfected shall be thoroughly flushed with water until all entrained dirt and mud have been removed before introducing the chlorinating material. Flushing will be performed in a manner and sequence that will prevent recontamination of pipe that has previously been disinfected. The chlorinating material shall be liquid chlorine, calcium hypochlorite, or sodium hypochlorite. The chlorinating material shall provide a dosage of not less than 50 ppm and shall be introduced into the water lines in an approved manner. Polyvinyl Chloride (PVC) pipelines shall be chlorinated using only the above-specified chlorinating material in solution. The agent shall not be introduced into the line in a dry solid state. The treated water shall be retained in the pipe long enough to destroy all non-spore forming bacteria. Except where a shorter period is approved, the retention time shall be at least 24 hours and shall produce not less than 25 ppm of free chlorine residual throughout the line at the end of the retention period. Valves on the lines being disinfected shall be opened and closed several times during the contact period. The line shall then be flushed with clean water until the residual chlorine is reduced to less than one ppm. During the flushing period, each fire hydrant on the line shall be opened and closed several times.

2.3.2.2.6.2 SAMPLING

For each building connected to the water system, personnel from the Contractor's commercial laboratory shall take at least 3 water samples from different points, approved by the Contracting Officer, in proper sterilized containers and perform a bacterial examination in accordance with approved methods. The commercial laboratory shall be verified to be qualified by the appropriate authority for examination of potable water. Contractor shall submit a water sampling protocol for approval. This shall include at a minimum the name of the laboratory, parameters to be tested, the Company conducting the sampling, and the sample locations.

2.3.2.2.6.3 ACCEPTANCE REQUIREMENTS

The disinfection shall be repeated until tests indicate the absence of bacteria for at least 2 full days. The unit will not be accepted until satisfactory bacteriological results have been obtained. All retests shall be conducted at the Contractor’s expense.

2.3.2.2.6.4 TIME FOR MAKING (HYDROSTATIC/PRESSURE) TESTS

Except for joint material setting or where concrete thrust blocks necessitate a five (5) day delay, pipeline jointed with rubber gaskets, mechanical or push-on joints, or couplings may be subjected to hydrostatic pressure, inspected, and tested for leakage at any time after partial completion of backfill.

2.3.2.2.6.5 CONCURRENT (HYDROSTATIC AND LEAKAGE) TESTS

The Contractor may elect to conduct the hydrostatic tests using either or both of the following procedures. Regardless of the sequence of tests employed, the results of pressure tests, leakage tests, and disinfection shall be recorded for submission and approval. Replacement, repair or retesting required shall be accomplished by the Contractor at no additional cost to the Government. Pressure and leakage testing may be conducted concurrently. Hydrostatic tests and disinfection may be conducted concurrently using water treated for disinfection to accomplish the hydrostatic tests. If water is lost when treated for disinfection and air is admitted to the unit being tested, or if any repair procedure results in contamination of the unit, disinfection shall be re-accomplished.

2.3.3 VALVES

2.3.3.1.1 GATE AND BUTTERFLY VALVES

Valves (Gate valves w/box) shall be placed at all pipe network tees and cross intersections, and the number of valves shall be one less than the number of lines leading into and away from the intersection. For isolation purposes valves shall be spaced not to exceed 40 m. Gate valves shall be in accordance with AWWA C 500 and/or C509. Butterfly valves (rubber seated) shall be in accordance with AWWA C504 et. al. The valves and valve boxes shall be

constructed to allow a normal valve key to be readily used to open or close the valve. Provide traffic-rated valve boxes. Provide concrete pad, one m square, for all valve boxes. Valves shall be pressure rated to 1.38 MPa (200 psi).

2.3.3.1.2 VACUUM AND AIR RELEASE VALVES

Air release valves are required to evacuate air from the main high points in the line when it is filled with water, and to allow the discharge of air accumulated under pressure. Vacuum relief valves are needed to permit air to enter a line when it is being emptied of water or subjected to vacuum. Contractor shall submit manufacturer's data for properly sized combination air and vacuum release valves and determine their locations on the distribution system subject to review and approval of the Contracting Officer.

2.3.3.1.3 BLOW-OFF VALVES

The Contractor shall provide 40-50 mm blow-off valves at ends of dead end mains. Valves should be installed at low points in the mains where the flushing water can be readily discharged to natural or manmade drainage ditches, swales or other.

2.3.3.1.4 THRUST BLOCKING

Contractor shall provide concrete thrust blocking at any point where the layout of the system changes the direction of the flow, increases the velocity, or decreases or stops the flow. At these points, the pipes and fittings must be anchored and kept from moving or pulling apart by the use of thrust blocks installed against undisturbed earth.

2.3.4 SANITARY SEWER (WASTEWATER SYSTEM)

2.3.4.1 GENERAL

Sanitary sewers less than 1.25 meters under road crossings shall have reinforced concrete cover at least 150 mm thick around the pipe. Concrete cover will extend out to at least 1 m from each road edge.

Exterior sanitary sewer line construction shall include service to all buildings as described in the Scope of Work Section 01010. Contractor shall design sanitary sewer collection system using approved field survey data and finished floor elevations. Depending upon the topography and building location, the most practical location of sanitary sewer lines is along one side of the street. In other cases they may be located behind buildings midway between streets. Main collection sewers will follow the most feasible route to the point of discharge. The sewer collection system shall be designed to accommodate the initial occupancy and a reasonable expansion capability. Sewer collection capacity shall be based on the two times the average daily wastewater flow unless minimum diameter specified is adequate to provide flow and required maximum velocity; wastewater flow through the system shall be distributed on the basis of fixture unit flow in each the buildings serviced by multiplying the proportion of the total fixture flow from each building or facility times the total wastewater flow for the project or installation as determined above.

All sewers shall be located outside of the roadways as much as practical, and minimize the number of roadway crossings. To the extent practical, a sewer from one building shall not be constructed under another building, or remain in service where a building is subsequently constructed over it.

The Contractor shall use the following criteria where possible to provide a layout which is practical, economical and meets hydraulic requirements:

a. Follow slopes of natural topography for gravity sewers.
b. Check subsurface investigations for groundwater levels and types of subsoil encountered. If possible, avoid areas of high groundwater and the placement of sewers below the groundwater table.
c. Avoid routing sewers through areas which require extensive restoration or underground demolition
d. Depending upon the topography and building locates, the most practical location of sanitary sewer lines is along one side of the roadway/driveway. In other cases they may be located behind buildings midway between roadways. The intent is to provide future access to the lines for maintenance without impacting vehicular traffic.

e. Avoid placing manholes in low-lying areas where they could be submerged by surface water or subject to surface water inflow. In addition, all manholes shall be constructed 50 mm higher than the finished grade, with the ground sloped away from each manhole for drainage.
f. Sewer lines shall have a minimum of 800 mm of cover for frost protection.
g. Locate manholes at change in direction, pipe size, or slope of gravity sewers.
h. Sewer sections between manholes shall be straight. The use of a curved alignment shall not be permitted.
i. If required by the design, locate manholes at intersections of roadways/driveways where possible. This minimizes vehicular traffic disruptions if maintenance is required.
j. Sewer lines less than 1.25 m deep under road crossings shall have a reinforced concrete cover of at least 150 mm thickness around the pipe or shall utilize a steel or ductile iron carrier pipe. It is recommended to continue the reinforced concrete cover or carrier pipe a minimum of one m beyond the designated roadway.
k. Verify that final routing selected is the most cost effective alternative that meets service requirements.

2.3.4.2 PROTECTION OF WATER SUPPLIES

The Contractor shall ensure that the sewer design meets the following criteria:

a. Sanitary sewers shall be located no closer than 30 m horizontally to water wells or reservoirs to be used for potable water supply.
b. Sanitary sewers shall be no closer than 3 m horizontally to potable water lines; where the bottom of the water pipe will be at least 300 mm above the top of the sanitary sewer, horizontal spacing shall be a minimum of 1.8 m.
c. Sanitary sewers crossing above potable water lines shall be constructed of suitable pressure pipe or fully encased in concrete for a distance of 2.7 m (9 ft) on each side of the crossing. Pressure pipe will be as required for force mains in accordance with local standards and shall have no joint closer than 1 m (3 ft) horizontally to the crossing, unless the joint is fully encased in concrete.
d. When sanitary sewers cross water lines the designer shall cross the water line above the sewer line whenever possible. In such cases the water line shall be located a minimum distance of 450 mm above the sewer line or shall be fully encased in concrete for a distance of 3 m on each side of the crossing.

2.3.4.3 QUANTITY OF WASTEWATER

System capacity shall be calculated as 80% of the calculated daily water use.

2.3.4.4 GRAVITY SEWER

Sanitary sewers shall be designed in accordance with the AED Design Requirements for Sanitary Sewer and Septic Systems, latest version to flow at a maximum in the following way:

a. Sanitary sewer laterals, mains and trunk lines flow velocities shall be designed to provide a minimum velocity of 0.6 m per second (mps)
b. A minimum velocity of 0.8 to 1.05 mps at the peak diurnal flow rate
c. Flows shall be based on allocating the proportion of the average daily or peak daily flow to each building or facility on the basis of fixture unit flow developed for the plumbing design.
d. Minimum pipe slopes shall be provided regardless of the calculated flow velocities to prevent settlement of solids suspended in the wastewater. Minimum pipe slopes are provided in the AED Design Requirements for Sanitary Sewer and Septic Systems. (A partial listing of requirements is listed in the cart below.)

Minimum Slopes for Sewers	
Sewer Pipe Size (mm)	Minimum Slope in meters per 100 meters
100	1.00
150	0.62
200	0.40

250	0.28
300	0.22
350	0.17
400	0.15

Unless otherwise indicated (see Building Connections and Service Lines), gravity sewer pipe shall be installed in straight and true runs in between manholes with constant slope and direction. Adequate cover must be provided for frost protection. A minimum cover of 800 mm will be required to protect the sewer against freezing.

2.3.4.4.1 MANHOLES

The Contractor shall provide standard depth manholes (MH), (depth may vary) with an inside dimension of 1.2 m. Manholes shall be made of either a cast-in-place reinforced concrete with reinforced concrete cover, or of pre-cast reinforced concrete manhole that tapers to a 750 mm (30 in) cast iron frame that provides a minimum clear opening of 600 mm (24 in). In every case, the manholes, frames and covers shall be traffic rated, H-20 load rating. All manholes shall be provided with a concrete bench with a flow line trough, smoothly formed to guide waste flow to the outlet pipe from the inlet pipe(s). The top surface of the bench shall be above the crown of all pipes within the manhole. All surfaces of the bench shall be sloped smoothly toward the trough to guide flow, even under peak flow conditions. Sanitary sewer lines shall enter at the manhole flow line. Where the invert of the inlet pipe would be more than 0.5 m above the manhole floor, a drop inlet shall be provided. No internal drop structures shall be permitted at lift stations. Inlet to lift station wet wells shall enter below the lowest water level of the pump operating range, and if necessary a drop inlet approach pipe external to the lift station may be used to avoid cascading influent flow. The angle between inflow and outflow pipes converging at a manhole shall not be less than 90^0.

2.3.4.4.2 MANHOLE DESIGN REQUIREMENTS

Manholes are required at junctions of gravity sewers and at each change in pipe direction, size or slope, except as noted hereinafter for building connections. Manholes shall be installed at start of all main runs.

2.3.4.4.3 SPACING

The distance between manholes must not exceed 120 m in sewers of less than 460 mm in diameter. For sewers 460 mm and larger, and for outfalls from wastewater treatment facilities, a spacing of up to 180 m is allowed, provided the velocity is sufficient to prevent sedimentation of solids.

2.3.4.4.4 PIPE CONNECTIONS

The crown of the outlet pipe from a manhole shall be on line with or below the crown of the inlet pipe.

2.3.4.4.5 FRAMES AND COVERS

Frames and covers shall be cast iron, ductile iron or reinforced concrete, traffic rated in any case to an H-20 load rating. Cast iron frames and covers shall be traffic rated, circular with vent holes.

2.3.4.4.6 STEPS FOR MANHOLES

Steps shall be cast iron, polyethylene coated, at least 15 mm thick, not less than 400 mm in width, and spaced 300 mm on center.

2.3.4.5 PIPE

Pipe shall conform to the respective specifications and other requirements as follows: Provide Polyvinyl Vinyl Chloride (PVC) conforming to ASTM D 3034, Type PSM with a maximum SDR of 35, size 380 mm or less in diameter. PVC shall be certified as meeting the requirements of ASTM D 1784, cell Class 12454 B. Minimum pipe sizes for the main lines shall be 200 mm (8 in) diameter and service lines/laterals shall be a minimum of 150 mm

diameter. Smaller diameters shall not be used. Contractor may use PVC or HDPE pipe provided the SDR and strength properties of the pipe equal or exceed the properties of ASTM D 1784 for PVC.

2.3.4.5.1 FITTINGS

Fittings shall be compatible with pipe supplied and shall have a strength not less than that of the pipe. Fittings shall conform to the respective specifications and requirements as follows: provide PVC fittings conforming to ASTM D 3034 for type PSM pipe.

2.3.4.5.2 JOINTS

Joints installation requirements shall comply with the manufacturers installation instructions. Flexible plastic pipe (PVC or high density polyethylene pipe) gasket joints shall conform to ASTM D3212.

2.3.4.5.3 BRANCH CONNECTIONS

Branch connections shall be made using regular fittings or solvent-cemented saddles as approved. Saddles for PVC pipe shall conform to Table 4 of ASTM D 3034. The minimum depth of the cover over the pipe crown shall be 0.8 m.

2.3.4.5.4 BUILDING CONNECTIONS AND SERVICE LINES

Building connections and service lines will be planned to eliminate as many bends as practical and provide convenience in rodding. Bends greater than 45 degrees made with one fitting should be avoided; combinations of elbows such as 45-45 or 30-60 degrees should be used with a cleanout provided. Connections to other sewers will be made directly to the pipe with standard fittings rather than through manholes. However, a manhole must be used if the connection is more than 30 m from the building cleanout. Tee connections to the main or branch are not allowed. Service connection lines will be a minimum of 150 mm diameter and laid at a minimum one percent grade. Service laterals shall be at least 200 mm and sloped to maintain the minimum velocity as described in paragraph "Gravity Sewer."

2.3.4.5.5 CLEANOUTS

Cleanouts must be installed on all bends of sewer-building connections to provide a means for inserting cleaning rods into the underground pipe. Install manufactured wye fittings. In lieu of a wye fitting, an inspection chamber may be installed. The inspection chamber shall be of the same construction as a manhole. The cleanout will be of the same diameter as the building sewer, and never be smaller than 150 mm. If there are no bends in the sewer building connection, a cleanouts shall be installed within 1 m from the building.

2.3.4.6 GREASE TRAPS

Grease traps are used to remove grease from wastewater to prevent it from entering the sanitary sewer and septic systems. All Dining Facilities (DFACs) shall incorporate preliminary treatment with use of a grease trap prior to the sanitary sewer system. The only waste lines upstream of the grease trap shall be grease laden waste from the kitchen or other areas. Grease trap design shall be based on AED Design Requirements - Grease Trap, latest version. The grease trap shall be of reinforced cast-in-place concrete, reinforced precast concrete or equivalent capacity commercially available steel, with removable three-section, 9.5 mm checker-plate cover, and shall be installed outside the building. Steel grease traps shall in be installed in a concrete pit and shall be epoxy-coated to resist corrosion as recommended by the manufacturer. Concrete shall have 28MPa minimum compressive strength at 28 days. The grease trap shall connect to the sanitary sewer system.

Contractor shall provide bollards around the tank and construct a minimum 4 m wide access road from the closest roadway to the grease trap for a pump truck. The access road shall be of the same material as the main roads in the compound. Under no circumstance shall the grease trap be installed inside the building. Provide outside water spigot for cleaning.

2.3.4.7 FIELD QUALITY CONTROL

2.3.4.7.1 FIELD TESTS AND INSPECTIONS

The Contracting Officer will conduct field inspections and witness field tests specified in this section. The Contractor shall perform field tests and provide labor, equipment and incidentals required for testing.

Check each straight run of pipeline for gross deficiencies by holding a light in a manhole; it shall show a practically a full circle of light through the pipeline when viewed from the adjoining end of the line. When pressure piping is used in a non-pressure line for non-pressure use, test this piping as specified for non-pressure pipe.

Test lines for leakage by either infiltration tests or exfiltration tests. Prior to testing for leakage, backfill trench up to at least lower half of the pipe. When necessary to prevent pipeline movement during testing, place additional backfill around pipe to prevent movement during testing, but leaving joints uncovered to permit inspection. When leakage or pressure drop exceeds the allowable amount specified, make satisfactory correction and retest pipeline section in the same manner. Correct visible leaks regardless of leakage test results.

Infiltration tests and ex-filtration tests: Perform these tests for sewer lines made of specified material, not only concrete, in accordance with ASTM C 969M, ASTM C 969. Make calculations in accordance with the Appendix to ASTM C 969M and ASTM 969.

Perform tests as follows:

a. Concrete pipe: Test in accordance with ASTM C 924M, ASTM C 924. Allowable pressure drop shall be given in ASTM C 924M ASTM C 924. Make calculations in accordance with the Appendix to ASTM C 924M, ASTM C 924;
b. Ductile-iron pipe: Test in accordance with the applicable requirements of ASTM C 924M, ASTM C 924. Allowable pressure drop shall be as given in ASTM C 924M, ASTM C 924. Make calculations in accordance with the Appendix to ASTM C 924M, ASTM C 924;
c. PVC Plastic pipe: Test in accordance with applicable requirements of UBPPA UNI-B-6. Allowable pressure drop shall be as given in UBPPA UNI-B-6. Make calculations in accordance with the Appendix to UBPPA UNI-B-6.

2.3.4.7.2 DEFLECTION TESTING

Deflection testing will not be required however; field quality control shall ensure that all piping is installed in accordance with deflection requirements established by the manufacturer.

2.3.5 SEPTIC SYSTEM

Generally when determining an appropriate septic tank location, the Contractor shall provide protection for the septic system by ensuring that vehicles, material storage, and future expansion shall be kept away from the area. Signage or other prevention methods (i.e. pipe bollards) shall be used to provide this protection. The finished grade for the site shall ensure that storm water runoff shall drain away from the site to prevent ponding, inflow, and infiltration. Once an appropriate site is located, the Contractor shall conduct soil investigations for the site to determine ground water levels, soil conditions, and the percolation rate. Septic systems shall be designed and installed in accordance with UFC 3-240-09A, Domestic Wastewater Treatment, latest edition, and the following guidance:

2.3.5.1 PERCOLATION TESTING

At proposed sites for holding ponds and the absorption field, the Contractor shall perform percolation tests. Percolation testing may be carried out with a shovel, posthole digger, solid auger or other appropriate digging instruments. Percolation tests shall be accomplished uniformly throughout the area where the absorption field is to be located. Percolation tests determine the acceptability of the site and serve as the basis of design for the liquid absorption. Percolation tests will be made as follows (see Figure 1). All percolation testing shall be submitted promptly according to the submittal schedule in Section 01335.

Six or more tests shall be made in separate test holes uniformly spaced over the proposed absorption field site. The average of the six tests shall be determined and will be used as the final result. The location of each test shall be clearly and accurately shown on the site plan submitted to AES.

Dig or bore a hole to the required depth of the proposed trenches or bed, with dimensions necessary to enable visual inspection during percolation testing.

Carefully scratch the bottom and sides of the excavation with a knife blade or sharp-pointed instrument to remove any smeared soil surfaces and to provide natural soil interface into which water may percolate. Add 50 mm of gravel (of the same size that is to be used in the absorption field) to the bottom of the hole. In some types of soils the sidewalls of the test holes tend to cave in or slough off and settle to the bottom of the hole. It is most likely to occur when the soil is dry or when overnight soaking is required. The caving can be prevented and more accurate results obtained by placing in the test hole a wire cylinder surrounded by a minimum 25 mm layer of gravel (of the same size that is to be used in the absorption field.).

Carefully fill the hole with clear water to a minimum depth of 300 mm above the gravel or sand. Keep water in the hole at least 4 hours and preferably overnight. In most soils it will be necessary to augment the water as time progresses. Determine the percolation rate 24 hours after water was first added to the hole. In sandy soils containing little clay, this pre-filling procedure is not essential and the test may be made after water from one filling of the hole has completely seeped away.

The percolation rate measurement is determine by one of the following methods:

i. If water remains in the test hole overnight, adjust the water depth to approximately 150 mm above the gravel. From a reference batter board, as shown in Figure 1, measure the drop in water level over a 30-minute period. This drop is used to calculate the percolation rate.

ii. If no water remains in the hole the next day, add clean water to bring the depth to approximately 150 mm over the gravel. From the batter board, measure the drop in water level at 30-minute intervals for 4 hours, refilling to 150mm over the gravel as necessary. The drop in water level that occurs during the final 30-minute period is used to calculate the percolation rate.

iii. In sandy soils (or other soils in which the first 150 mm of water seeps away in less than 30 minutes after the overnight period), the time interval between measurements will be taken as 10 minutes and the test run for 1 hour. The drop in water level that occurs during the final 10 minutes is used to calculate the percolation rate.

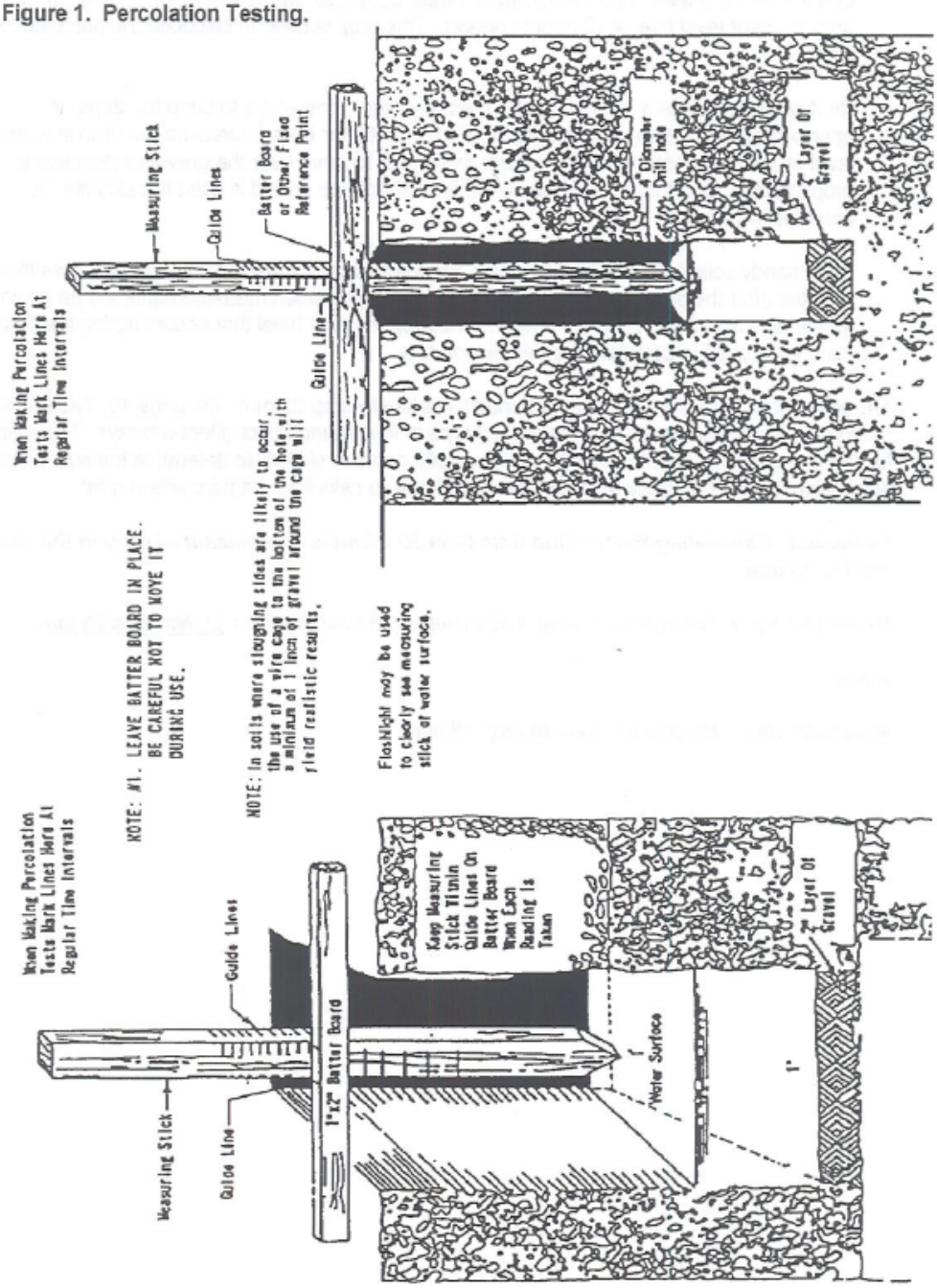
iv. The percolation rate is the number of minutes it takes to drop 25 mm. Table 2 lists percolation rates and the corresponding leaching field sizing factor (liters/m^2/day). The sizing factors are used, in conjunction with average daily demand (ADD), to determine the size of the leaching field.

Example: Calculating the percolation rate:

v. In 30 minutes, the measured drop in the water level is 15 mm.

vi. Minutes/25mm = Time/ (drop/25mm) = 30 minutes/ (15mm/25mm) = 50 Minutes/25 mm, where Minutes/25mm = Minutes for water to drop 25 mm.

Figure 1. Percolation Testing.



2.3.5.2 SEPTIC HOLDING TANK

Septic holding tank shall be sized and equipped in accordance with the AED Design Requirements for Sanitary Sewer and Septic System, with the following modifications:

Septic holding tank shall be designed to hold five days' worth of wastewater and serve as a holding tank in the event leach fields become dysfunctional. Septic holding tank shall have three access manholes and shall be configured such that it can be pumped by a typical sanitary waste removal truck. Septic holding tank shall be equipped with an access riser and effluent filter to filter particles larger than 4mm. Riser may be cast into the reinforced concrete septic holding tank or added as a retrofit. If retrofitted, it may be a "PTE filter container kit", including adaptor, riser, and access lid with effluent filter in a filter container located directly below the access lid.

2.3.5.3 DISTRIBUTION BOXES

The Contractor shall design the system such that no single Distribution Box shall have more than five (5) exiting leach field lines.

2.3.6 STORM SEWER SYSTEMS

2.3.6.1 DESIGN STORM RETURN PERIOD (BASELINE FREQUENCY)

Developed portions of the site installation such as administration, industrial and barracks areas, shall be based on a rainfall of 20-year frequency. Basic system design shall be in accordance with UFC 3-230-17A, Chapter 2. Potential damage or operational requirements may warrant a more severe criterion or in certain areas a lesser criterion may be appropriate. The design of roadway culverts and other on-site storm drainage features & structures will normally be based on 20-year rainfall event. Protection of installations against flood flows originating from areas exterior to the base installation shall be based on a 20-year or greater rainfall.

2.3.6.2 STORM DRAINAGE SYSTEM DESIGN

The Contractor shall be responsible for the complete design of the storm drainage system. Drainage of runoff from unpaved areas onto pavements shall be minimized. If storm drain piping is required it shall comply with the requirements in this section. Where storm drain pipes are of different diameters, the pipe crown elevations should be matched at the drainage structure. Storm drain lines shall be located outside of paved areas to the extent possible. Under no circumstance shall storm drain lines be located beneath buildings. All open storm drainage channels shall be concrete lined. Erosion control shall be provided for all storm drain structures during construction. Water from roof down spouts shall be drained off building site. All storm drain pipe and structures shall comply with the requirements specified in UFGS Specification Section 33 40 00 Storm Drainage Utilities. For cases when there is a need to penetrate the perimeter wall for drainage purposes (outfall), multiple wall penetrations shall be used to provide redundancy. Each drainage penetration through the perimeter wall shall be protected from unauthorized ingress/egress through the use of grates or rebar.

2.3.6.3 HYDRAULIC DESIGN

New storm drain pipes shall be designed for gravity flow during the design storm baseline 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 UFC 3-230-17A. Storm drain systems shall be designed to provide a maximum velocity of 2m/s.

2.3.6.4 AREA INLETS

Area inlets shall be properly sized and designed to accommodate the design flows. All grates shall be of a "bicycle safe" design.

2.3.6.4.1 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 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 one m of cover during construction to prevent damage by heavy construction equipment.

2.3.6.4.2 CORRUGATED METAL PIPE

Corrugated metal pipe shall not be used.

2.3.6.4.3 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 one m of cover during construction to prevent damage by heavy construction equipment. Split couplers shall not be allowed for corrugated high-density polyethylene pipe. Plastic 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 (then plastic pipe shall not be used).

2.3.7 OIL WATER SEPERATORS

Oil/water separators shall be utilized for all drains from the vehicle wash racks. Separators shall be located for easy maintenance and cleaning. Drain water from the separator shall drain to the surface drainage system.

Contractor shall size the oil/water separator, per UFC 3-240-02N and UFC 3-240-03N.

2.4 GEOTECHNICAL

2.4.1 SOIL INVESTIGATION

Existing geotechnical information is not available at the project site. Any site-specific geotechnical data required to develop foundations, materials, earthwork, and other geotechnical related design and construction activities for this project shall be the Contractor's responsibility. The Contractor shall develop all pertinent geotechnical design and construction parameters by appropriate field and laboratory investigations and analyses. The Contractor shall produce a detailed geotechnical report that includes:

a. Clear description of the anticipated construction including planned grading and structural details to provide an estimation of foundation loads (compression, uplift, lateral, and moment) and settlement tolerance.

b. Detailed site and area reconnaissance that includes a description of local geology and origin of sediments, surface features (e.g., ditches or other excavations, existing structures, vegetation, rock outcrops, seeps or springs), surface soil type(s), and subsurface lithology).

c. Justification of number and depth of borings.

d. Site plan illustrating exploratory boring locations.

e. Boring logs that include groundwater levels (if encountered).

f. Field tests and analyses (e.g., Unified Soil Classification System, field density, SPT).

g. Analytical laboratory test results in accordance with ASTM or other recognized standards (e.g., sieve analysis, Atterberg Limits (plastic and liquid), moisture content, hydrometer, consolidation/collapse potential, specific gravity of solids, direct shear, density, chemical [sulfate, chloride, pH, lime], K values)

and any other tests as needed to properly conduct necessary calculations to determine the engineering properties of the soil.

h. A summary of the results of the subsurface geotechnical conditions including allowable soil bearing capacity, foundation recommendations, pavement design criteria, and construction materials (e.g. concrete cement, asphalt, and aggregates).

Two copies of the geotechnical report shall be submitted to the COR. Foundations, including sub-grade, shall be designed and constructed based on calculations and recommendations from a licensed structural engineer provided by the Contractor.

For standard penetration test (SPT), the Contractor shall use ASTM D1586. All geotechnical laboratory and field work shall be based on standards set forth in the ASTM. Contractor shall not use any DIN standards for penetration tests in lieu of ASTM D 1586. Soil investigations shall be in accordance with AED Design Requirements: Geotechnical Investigations for USACE Projects, latest version, or most recent version.

For foundation design, allowable soil bearing pressures shall be determined by calculations made based on the physical and mechanical properties obtained from laboratory testing. The soil bearing pressures calculated shall be compared with the International Building Code (IBC) 2006 Table 1804.2. The lower of the two bearing pressures, calculated or Table 1804.2, shall be chosen for the allowable soil bearing pressure.

California Bearing Ratio (CBR) tests shall be conducted on the existing soils throughout the proposed road alignment and vehicle parking and maneuver areas. Results from the tests shall be used to calculate the pavement structure using the minimum pavement structure as dictated in paragraph 2.3 as a reference. In the event that the calculations based on the CBR tests reveal that the pavement structure dictated in paragraph 2.3 is insufficient to carry the design load, the Contractor shall design and construct a subbase layer for the pavement structure.

The Contractor shall conduct soils classification per ASTM D 2487-06.

No design review submittal shall be considered complete without an approved geotechnical report. Geotechnical investigation plans and report of investigations shall be submitted promptly in accordance with Section 01335.

2.4.2 GEOTECHNICAL QUALIFICATIONS

A geotechnical engineer that is a member of a geotechnical firm responsible to the Contractor shall oversee all geotechnical engineering design parameters. The geotechnical engineer shall be qualified by:

a. Education in geotechnical engineering;

b. Professional registration;

c. Minimum of ten (10) years of experience in geotechnical engineering design.

The geotechnical firm conducting the field investigation and laboratory work shall be certified by the Chief, Quality Assurance Branch USACE-AES or Chief, Quality Assurance Branch USACE-AEN. Certification document shall be submitted as part of the Geotechnical Report.

3.0 STRUCTURAL

3.1 GENERAL

Field welding shall not be used for any part of the Main Structural Force Resisting System for significant structures. The Main Structural Force Resisting System is that part of the structural system providing the required resistance to all gravity loads (dead; live) and all lateral loads (wind; seismic). Bolted connections in lieu of welding are recommended. Exemptions to these guidelines would be minor structural connections; including metal trusses bearing on a reinforced concrete roof, and non-load bearing applications. Certified shop welding of pre-engineered buildings and various structural members shall be permitted.

3.2 DESIGN

For any structure that is designed, rather than provided, the design shall be performed by or under the direct supervision of the Contractor's structural engineer. All structural design documents shall be stamped and signed by a licensed professional engineer with 10 years of experience.

Calculations shall be in SI (metric) units of measurements. All components of the structures shall be designed and constructed to safely support all loads without exceeding the allowable stress for the materials of construction in the structural members and connections.

3.3 STANDARDS

The Contractor should use the following American standards to provide structural design if local standards are not available, relevant, or applicable. The Contractor shall follow American Concrete Institute Standards (ACI) for design and installation of all concrete structures.

Concrete	ASTM C 39 and ACI 318; 28 MPa (f'_c = 4,000 psi) minimum specified compressive strength @ 28 days, and maximum water-cement ratio of 0.45.
Steel Reinforcement	ASTM A 615; 420 MPa (F_y = 60 ksi) yield strength.
Welded Wire Fabric	ASTM A 185.
Anchor Bolts	ASTM F 1554; Grade 36 steel.
Bolts and Studs	ASTM A 307.
Plaster	ASTM C 926.
Concrete Masonry Units	ASTM C 90; Type I (normal weight, moisture control).
Mortar	ASTM C 270; Type S (ultimate compressive strength of 13 MPa).
Grout	ASTM C 476; 14 MPa (2,000 psi) minimum compressive strength @ 28 days (slump between 200 mm to 250 mm).
Structural Steel	ASTM A 36; 250 MPa (F_y = 36,000 psi).
Welding	AWS D1.1 (American Welding Society)
Cold-Formed Steel	AISI Specification for the Design of Cold-formed Steel Structural Members

3.4 DEAD AND LIVE LOADS

Design loads shall be in accordance with ASCE 7 Minimum Design Loads for Buildings and Other Structures. Dead loads consist of the weight of all materials of construction incorporated in the buildings. Live loads shall be per Chapter 4. All facilities shall be classified as a minimum of Category II in accordance with Table 1-1.

3.5 WIND LOADS

Wind loads shall be calculated in accordance with ASCE 7-2005 using a "3-second gust" wind speed of 135 km/hr. Exposure = C. Importance Factor = 1.0.

3.6 SNOW LOADS

Snow Loads shall be calculated per local standard practice where known and shall not be reduced based on tributary area. Structures shall be designed for roof snow load where it exceeds the roof live load.

3.7 SEISMIC

Seismic design of all structures shall be in accordance with ASCE 7.

Spectral ordinates shall be S_s = 1.28g and S_1 = 0.51g; I = 1.0

3.8 REINFORCED CONCRETE

All concrete members shall be designed and constructed in accordance with the provisions of the American Concrete Institute, Building Code Requirements for Structural Concrete, ACI 318. A minimum 28 day compressive strength of 28 MPa shall be used for design and construction of all concrete. Concrete shall have maximum water-cement ratio (w/c) of 0.45. Reinforcing steel shall be deformed bars conforming to American Society for Testing and Materials publication ASTM A 615, Deformed and Plain Billet-Steel Bars for Concrete Reinforcement. The minimum yield strength Fy shall be 420 MPa.

No concrete shall be placed when the ambient air temperature exceeds 32 degrees C unless an appropriate chemical retardant is used. In all cases when concrete is placed at 32 degrees C or hotter it shall be covered and kept continuously wet for a minimum of 48 hours. Except with authorization, do not place concrete when ambient temperature is below 5 degrees C or when concrete is likely to be subjected to freezing temperatures within 24 hours. When authorized, when concrete is likely to be subjected to freezing within 24 hours after placing, heat concrete materials so that temperature of concrete when deposited is between 18 and 27 degrees C. Methods of heating materials are subject to approval of the Contracting Officer. Do not heat mixing water above 74 degrees C. Remove lumps of frozen material and ice from aggregates before placing aggregates in mixer. Follow practices found in ACI 306.1.

3.9 MASONRY

Masonry shall be designed and constructed in accordance with the provisions of the latest editions of Building Code Requirements for Masonry Structures, ACI 530/ASCE 5/TMS 402. Mortar shall be Type S and conform to ASTM C 270. All masonry used below grade shall me fully grouted. All cells of exterior CMU walls shall be fully grouted. For interior CMU walls, only the reinforced cells shall be grouted. All interior and exterior CMU walls shall have reinforced horizontal bond beams at a maximum spacing of 1,200 mm on center.

3.10 STRUCTURAL STEEL

Structural steel shall be designed and constructed in accordance with the provisions of American Institute of Steel Construction (AISC), Specifications for Structural Steel Buildings.

3.11 COLD-FORMED LIGHT GUAGE STEEL

Design of cold-formed steel structural members shall be in accordance with the provisions of American Iron and Steel Institute (AISI), Specifications for Design of Cold-Formed Steel Structural Members.

3.12 STEEL ROOF JOISTS

Steel roof joists shall be placed according to the roof design and roof manufacturer specifications. Steel purlins shall be installed perpendicular to the steel beams. Use continuous metal roof sheets from ridge to eave to avoid constructing roof seams. In lieu of the continuous metal roof sheets, the Contractor can submit a plan for roofing seams; however, the plan must show a detail of how leaks will be avoided, and the Contracting Officer before application must approve the plan. Steel “hat channels” can be installed for the connection to the CONEX box module. Provide all necessary metal framing for roof fascia and soffits. See structural paragraph for structural characteristics of steel joists.

3.13 OPEN WEB STEEL JOISTS

Open web steel joists shall conform to SJI Specifications and Tables. Joists shall be designed to support the loads given in the standard load tables of SJI Specifications and Tables.

3.14 METAL DECK

Deck units shall conform to SDI Publication Number 29. Panels of maximum possible lengths shall be used to minimize end laps. Deck units shall be fabricated in lengths to span three or more supports with flush, telescoped or nested 50 mm (2 in) laps at ends, and interlocking, or nested side laps. Metal deck units shall be fabricated of steel thickness required by the design and shall be galvanized.

3.15 CORRUGATED METAL ROOFING

Design of cold-formed steel structural members shall be in accordance with the provisions of American Iron and Steel Institute (AISI), Specifications for Design of Cold-Formed Steel Structural Members.

3.16 FOUNDATIONS

All structures shall be provided with a reinforced concrete foundation properly placed on suitable native or compacted earth and shall be prepared in accordance with the recommendations from the geotechnical investigation. Where frost protection is required, the perimeter foundation shall be founded a minimum of 800 mm below finished grade. Foundation designs shall be corroborated with the geotechnical findings and recommendations.

All foundations have been or shall be designed for a maximum soil bearing capacity of 0.72 kPa (1500 psf). If the geotechnical investigation indicates a lower soil bearing capacity, the Contractor shall redesign the foundation based on the values provided in the geotechnical investigations.

3.17 EARTHWORK AND FOUNDATION PREPARATION

3.18 CAPILLARY WATER BARRIER

Bedding material for slabs on grade shall be coarse-graded gravel with little or no fines in order to prevent surface water from migrating up and maintaining contact with the bottom surface of the building slab. Graded material shall comply with ASTM C136 test method for sieve analysis of gravels with only 3 percent by weight passing the 37.5mm (1.5 inch) mesh size sieve, and no more than 2 percent by weight passing the 75 micrometers (No. 200) mesh size sieve, and conforming to the soil quality requirements specified in the paragraph entitled “Satisfactory Materials.”

Capillary water barriers shall be placed under floor slabs (not under footings) and be a minimum of 150 mm thick.

3.19 SATISFACTORY MATERIALS

Any materials classified by ASTM D 2487 as GW, GM, GC, GP, SP, SW, SM, and SC and free of debris, roots, wood, scrap material, vegetation, refuse, soft unsound particles, or objectionable materials. Unless specified otherwise, the maximum particle diameter shall be one-half the lift thickness at the intended location.

3.20 UNSATISFACTORY MATERIALS

Any materials which do not comply with the requirements set forth in the Satisfactory Materials paragraph. Unsatisfactory materials also include man-made fills, trash, refuse, or backfills from previous construction. Unsatisfactory material also includes material classified as satisfactory which contains root and other organic matter, frozen material, and stones larger than 75mm. The Contracting Officer shall be notified of any unsatisfactory materials.

3.21 CLEARING AND GRUBBING

Unless indicated otherwise, remove tress, stumps, logs, shrubs, brush and vegetation, and other items that would interfere with construction operations within lines 1.5 m outside of the building and structure line. Remove stumps entirely. Grub out matted roots and roots over 50 mm in diameter to at least 460mm below existing surface.

3.22 STRIPPING

Strip suitable soil from the site where excavation or grading is indicated and stockpile separately from other excavated material. Material unsuitable for use as topsoil shall be stockpiled and used for backfilling. Locate topsoil so that the material can be used readily for the finished grading. Where sufficient existing topsoil conforming to the material requirements is not available on site, provide borrow materials suitable for use as topsoil. Protect topsoil and keep in segregated piles until needed.

3.23 EXCAVATION AND COMPACTION OF FILL

Excavate to contours, elevation, and dimensions indicated. Reuse excavated materials that meet the specified requirements for the material type required at the intended location. Keep excavations free from water. Excavate soil disturbed or weakened by Contractor's operations, soils softened or made unsuitable for subsequent construction due to exposure to weather. Excavations below indicated depths will not be permitted except to remove unsatisfactory material. Unsatisfactory material encountered below the grades shown shall be removed as directed. Refill with satisfactory material and compact to at least 95 percent of the maximum dry density, as determined by the Modified Proctor laboratory procedure. ASTM D 1557 shall be used for producing the Modified Proctor moisture-density curve, unless the soil to be compacted includes more than 30 percent retained on the 19 mm (3/4"in) sieve. In this case, the Contractor must replace the ASTM D 1557 laboratory compaction procedure with AASHTO T 180, Method D, corrected with AASHTO T 224.

During compaction, the moisture content of the soil shall be within 1.5 percent of the optimum moisture content, as determined by the Modified Proctor laboratory procedure. The thickness of compacted lifts shall not exceed 15 cm and the dry density of each compacted lift shall be tested by either sand cone (ASTM D 1556) or nuclear gage (ASTM D 2292). If the nuclear gage is used, it must first be compared to sand cone tests for each soil type to verify the accuracy of the nuclear gage measurements for moisture content, wet density, and dry density. Furthermore, every tenth nuclear gage test must be accompanied by a sand cone test and these verification data must be summarized and submitted to the Contracting Officer. Density tests shall be performed at a frequency of not less than one test for each 200 square meters and not less than two tests per compacted lift.

3.24 STRUCTURES WITH SPREAD FOOTINGS

Ensure that footing subgrades have been inspected and approved by the Contracting Officer prior to concrete placement. Fill over excavations with concrete during foundation placement.

4.0 ARCHITECTURAL REQUIREMENTS

4.1 GENERAL

All materials and products to be used throughout the facilities under contract are to be in accordance with the Appendix drawings and sections 01010 and 01015. Different sub-contractors shall not use different material or standards under the contract. Intent of the project is to use locally procured materials (unless specified otherwise) and labor to the maximum extent possible while satisfying seismic, international building code, and national fire protection agency life safety code. Conflicts between criteria shall be brought to the attention of the Contracting Officer for resolution. In such instances, the Contractor shall furnish all available information with justification to the Contracting Officer.

4.2 DESIGN CRITERIA

Designs for the facility types requested in this proposal are provided in the Appendix. These designs shall be used to create a complete and usable facility meeting the minimum requirements stated in these documents. The Codes, Standards, and Regulations listed in these documents shall be used in the construction of this project. The publications shall be the most recent editions. Standards other than those mentioned may be accepted provided they meet the minimum requirements and the contractor shall submit proof of equivalency to the Contracting Officer for approval.

IBC - International Building Code, latest edition

NFPA 101 - Life Safety Code, latest edition

4.3 LIFE SAFETY/ FIRE PROTECTION/ HANDICAPPED ACCESSIBILITY

A life safety and fire protection analysis shall be completed prior to construction commencement for all buildings designed by the Contractor. This analysis shall be documented in plans and in the design analysis. All spaces shall be classified following NFPA 101 or IBC. Whichever code is used shall be stated and referenced in the life safety plan. The facilities of this contract shall comply with all safety requirements of the NFPA 101.

4.4 CONCRETE

4.4.1 FINISH

If finish is exposed concrete, then the floor shall be a broom finish for texture and shall not interfere with sloping for drainage of the surface. Vertical work shall have a form finish. Exposed concrete shall be sealed with an approved sealer.

4.4.2 PRECAST

Storage of precast units shall be in a dry place or materials shall be covered with a plastic or protective layer. Units shall be detailed to provide size, shape and location of installation. Precast units shall meet the minimum concrete strength requirements.

4.5 MASONRY

Storage of masonry materials shall be in a dry place or materials shall be covered with a plastic protective layer. Cover open walls each day to keep them protected and dry. Masonry construction systems shall be reinforced.

4.5.1 CONCRETE MASONRY UNITS

Concrete masonry units (CMU) for exterior walls shall be either 290 mm wide x 390 mm x 190 mm high or otherwise as shown on the standard drawings. They shall be installed in running bond level and plumb. Mortar joints shall be 10 mm on all sides between CMU. Joints shall be struck with a concave tool to provide a smooth recessed curved surface. Install only quality units. The surface shall be free of chips, cracks, or other imperfections that would detract from the overall appearance of the finished wall. Defective CMU or mortar shall be rejected. All CMU for internal or exterior walls shall be reinforced. CMU shall be sealed in all wet areas/rooms.

4.6 STONE

Stone type shall be identified for approval in design. Mortar shall be of lower strength than stone and weep holes shall be provided in cavity wall systems.

4.7 THERMAL PERFORMANCE OF EXTERNAL BUILDING ASSEMBLIES

External building assemblies shall meet the requirements of TI-800, Design Criteria, UFC 3-400-01 Design: Energy Conservation, and ASHRAE Standard 90.1, latest editions, but shall meet the following minimum requirements:

Assembly	Minimum Thermal Value
Exterior walls (above grade)	RSI 2.280 (R 13)
Ceilings/roof	RSI 5.284 (R 30)
Floor (over unheated space)	RSI 3.346 (R 19)
Exterior doors	RSI 0.252 (R 1.43)
Exterior windows/(glazing within doors)	RSI 0.308(R 1.75)
Skylights	RSI 0.180 (R 1.02)

This table is a summary of ANSI/ ASHRAE 90.1 Table 5.5-5, Climate Zone 5 (A,B,C)

RSI measured in K-m2/W, R measured in SF-F-hr/BTU. 1 K-m2/W = 5.678 SF-F-hr/BTU.

4.8 ANTITERRORISM / FORCE PROTECTION

Force protection/anti-terrorism measures for this location shall be as defined in 01010.

4.9 ROOFING AND WEATHERPROOFING

All buildings shall have a sloped metal roof. Buildings with pitched roofs shall be provided with metal eaves, and soffits. All exterior entry ways to be covered and protected by rain gutters and diverters to exclude water from falling on the entry ways to all buildings.

4.9.1 SLOPING METAL ROOFING

Building shall be weatherproofed in accordance with manufacturer's recommendations, and shall be provided with prefinished sloping metal roofing system (including structural support) with a minimum 2:12 slope. Install soffit and ridge venting. Provide rigid insulation over concrete roof slab, in accordance with contract drawings. Roof shall have a gutter and downspout system, or a diverter, at main entrances only to evacuate rain accumulation. Downspouts shall be attached securely to building exterior wall utilizing wall straps, as required. Metal roofing shall be prefinished in manufacturer's standard white color. All roof components (ridge vents, exhaust fans hoods, gutters, metal fascia, metal roof trim, etc.) shall be prefinished to match metal roof color.

4.9.2 METAL FASCIA

No wood fascias and/or soffits are allowed. Use metal fascias throughout. Attach drip flashing to metal fascia so that it extends past bottom of metal fascia to 50mm over stucco fascia, as indicated on contract drawings. Concrete soffits shall be a minimum width of 600mm extending from the building exterior wall and shall include a formed drip edge.

4.9.3 METAL SOFFIT VENT

Provide perforated lay-in type metal soffit venting where indicated on drawings provided by the government. Soffit vents shall be prefinished to match color of metal fascia.

4.9.4 CONCRETE SOFFIT VENT

Provide venting through concrete soffit. Vent openings shall be 50mm diameter and spaced 2000 mm and set in a minimum of 200 mm from the exterior fascia edge. Provide insect screen over vent opening.

4.9.5 OPTIONAL STRIP VENT AT METAL FASCIA

Contractor may use optional continuous strip vent to provide attic ventilation in lieu of concrete soffit vent openings described above. Metal fascia will be required to be extended forward 40mm (1.5 in.) of the original detail location to accommodate the continuous strip vent. This will be accomplished by attaching purlins of 40 mm (1.5 in.) height to eave steel stud fascia support, and then attaching fascia to purlins. Strip vent shall be mechanically fastened to eave steel studs above the top edge of concrete soffit such that metal fascia drip edge will overlap to provide closure and hide vent strip. The completed installation shall allow continuous venting between metal fascia and concrete soffit. Attachment of strip vent shall be in accordance with vent strip manufacturer's recommended installation instructions. Strip vent shall be prefinished to match fascia color.

4.9.6 CONTINUOUS RIDGE VENT

For sloping roofs, provide continues metal ridge vent at the top of roof along the ridge. Ridge vent shall be sized to provide adequate ventilation of the roofing system.

4.9.7 FLASHING &SHEET METAL

4.9.7.1 MATERIALS

Any metal listed by ASTM, DIN, BS or EN standards. Manual for a particular item may be used, unless otherwise specified or indicated. Materials shall conform to the requirements specified below and to the thicknesses and

configurations established in ASTM, DIN, BS or EN standards. Different items need not be of the same metal, except that if copper is selected for any exposed item, all exposed items shall be copper.

4.9.7.2 STEEL SHEET, ZINC-COATED (GALVANIZED)

Zinc coated steel conforming to ASTM A 525, DIN BS or EN Standards.

4.9.7.3 CONNECTIONS AND JOINTING

4.9.7.3.1 SOLDERING

Soldering shall apply to copper and stainless steel items. Edges of sheet metal shall be pre-tinned before soldering is begun. Soldering shall be done slowly with well heated soldering irons so as to thoroughly heat the seams and completely sweat the solder through the full width of the seam. Edges of stainless steel to be pre-tinned shall be treated with soldering acid flux. Soldering shall follow immediately after application of the flux. Upon completion of soldering, the acid flux residue shall be thoroughly cleaned from the sheet metal with a water solution of washing soda and rinsed with clean water.

4.9.7.3.2 SEAMING

Flat-lock and soldered-lap seams shall finish not less than 25 mm. wide. Unsoldered plain-lap seams shall lap not less than 75 mm. unless otherwise specified. Flat seams shall be made in the direction of the flow.

4.9.7.3.3 CLEATS

A continuous cleat shall be provided where indicated or specified to secure loose edges of the sheet metalwork. Butt joints of cleats shall be spaced approximately 3 mm. apart. The cleat shall be fastened to supporting wood construction with nails evenly spaced not over 300 mm. on centers. Where the fastening is to be made to concrete or masonry, screws shall be used and shall be driven in expansion shields set in concrete or masonry.

4.9.8 PROTECTED MEMBRANE ROOFING SYSTEM

Contractor shall install protected membrane roofing system in accordance with government provided specifications. Components of the roofing system shall comply with the technical specifications.

4.9.9 SEALANTS

Provide a sealant compatible with the material(s) to which it is applied. Do not use a sealant that has exceeded shelf life or has jelled and cannot be discharged in a continuous flow from the gun. Apply the sealant in accordance with the manufacturer's instructions with a gun having a nozzle that fits the joint width. Force sealant into joints to fill the joints solidly without air pockets. Tool smooth fresh sealant after application to ensure adhesion. Sealant shall be uniformly smooth and free of wrinkles. Upon completion of sealant application, roughen partially filled or unfilled joints; apply sealant, and tool smooth as specified. Sealer shall be applied over the sealant when and as specified by the sealant manufacturer.

4.9.9.1 INTERIOR SEALANT

ASTM C 834 or ASTM C 920, Type S or M, Grade NS, Class 12.5. Use NT, DIN, BS, or EN equal standards.

4.9.9.2 EXTERIOR SEALANT

For joints in vertical and horizontal surfaces, provide ASTM C 920, Type S or M, Grade NS, DIN, BS, or EN equal standards.

4.9.9.3 FLOOR JOINT SEALANT

(ASTM C 920) Type S or M, Grade P, class 25, use T.

4.9.9.4 PRIMERS

Provide a non-staining, quick-drying type and consistency recommended by the sealant manufacturer for the particular application.
Immediately prior to application of the sealant, clean out loose particles from joints. Where recommended by sealant manufacturer, apply primer to joints in concrete masonry units, wood, and other porous surfaces in accordance with sealant manufacturer's instructions. Do not apply primer to exposed finish surfaces.

4.9.9.5 BOND BREAKERS

Provide the type and consistency recommended by the sealant manufacturer to prevent adhesion of the sealant to backing or to bottom of the joint. Provide bond breakers to the back or bottom of joint cavities, as recommended by the sealant manufacturer for each type of joint and sealant used, to prevent sealant from adhering to these surfaces. Carefully apply the bond breaker to avoid contamination of adjoining surfaces or breaking bond with surfaces other than those covered by the bond breaker.

4.9.9.6 BACKING

Backing shall be 25 to 33 percent oversize for closed cell and 40 to 50 percent oversize for open cell material, unless otherwise indicated.

4.9.9.7 CLEANING SOLVENTS

Provide type(s) recommended by the sealant manufacturer except for aluminum and bronze surfaces that will be in contact with sealant.

4.9.9.8 SURFACE PREPARATION

Surfaces shall be clean, dry to the touch, and free from dirt frost, moisture, grease, oil, wax, lacquer, paint, or other foreign matter that would tend to destroy or impair adhesion. Oil and grease shall be removed with solvent and surfaces shall be wiped dry with clean cloths. When resealing an existing joint, remove existing calk or sealant prior to applying new sealant. For surface types not listed below, the sealant manufacturer shall be contacted for specific recommendations.

4.9.9.9 MASKING TAPE

Masking tape shall be placed on the finish surface on one or both sides of a joint cavity to protect adjacent finish surfaces from primer or sealant smears. Masking tape shall be removed within 10 minutes after joint has been filled and tooled.

4.9.9.10 BACKSTOPS

Install backstops dry and free of tears or holes. Tightly pack the back or bottom of joint cavities with backstop material to provide a joint of the depth specified.

4.9.9.11 PROTECTION

Protect areas adjacent to joints from sealant smears. Masking tape may be used for this purpose if removed 5 to 10 minutes after the joint is filled.

4.9.9.12 FINAL CLEANING

Provide cleaning solvent type(s) recommended by the sealant manufacturer except for aluminum and bronze surfaces that will be in contact with sealant. Upon completion of sealant application, remove remaining smears and stains and leave the work in a clean and neat condition. Remove excess sealant with a solvent-moistened cloth on metal and other non-porous surfaces.

4.10 LOUVERS

4.10.1 INTERIOR LOUVERS

SDI/DOOR 111-C, Louvers shall be stationary sight-proof or lightproof type as required. Louvers for lightproof doors shall not transmit light. Detachable moldings on room or non security side of door; on security side of door, moldings to be integral part of louver. Form louver frames of 0.90 mm thick steel and louver blades of a minimum 0.60 mm. Louvers for lightproof doors shall have minimum of 20 percent net-free opening. Sight-proof louvers shall be inverted "V" blade design with minimum 55 or inverted "Y" blade design with minimum 40 percent net-free opening.

4.10.2 EXTERIOR LOUVERS

Louvers shall be inverted "Y", "V" or "Z" type. Weld or tenon louver blades to continuous channel frame and weld assembly to door to form watertight assembly. Form louvers of hot-dip galvanized steel of same gage as door facings. Louvers shall have steel-framed insect screens secured to room side and readily removable. Provide aluminum wire cloth, 7 by 7 per 10 mm or 7 by 6 per 10 mm mesh, for insect screens.

4.11 WINDOWS, DOORS & GLAZING

4.11.1 WINDOWS

Windows shall be operable: side-hinged, horizontal sliding, awning type complying with NFPA101. Glazing in windows shall be laminated in accordance with the force protection criteria, UFC 4-010-01.

Provide insect screens only in Dining Facilities and medical-related rooms. Insect screens shall be removable type.

4.11.1.1 MATERIALS

4.11.1.1.1 ALUMINUM EXTRUSIONS

Provide alloy and temper recommended by the window manufacturer for the strength, corrosion resistance, and application of required finish, meeting the DIN 1725 raw material requirements, but not less than 215 N/mm2 ultimate tensile strength and not less than 1.5 mm thick at any location for main frame and sash members.

4.11.1.1.2 FASTENERS

Provide aluminum, nonmagnetic stainless steel, epoxy adhesive, or other materials warranted by the manufacturer to be non-corrosive and compatible with aluminum window members, trim, hardware, anchors, and other components of window units.

4.11.1.1.3 REINFORCEMENT

Where fasteners screw-anchor into aluminum less than 3 mm thick, reinforce the interior with aluminum or nonmagnetic stainless steel to receive screw threads or provide standard non-corrosive pressed-in splined grommet nuts.

4.11.1.1.4 EXPOSED FASTENERS

Except where unavoidable for application of hardware, do not use exposed fasteners. For application of hardware, use fasteners that match the finish of the member or hardware being fastened, as appropriate.

4.11.1.1.5 ANCHORS, CLIPS, AND WINDOW ACCESSORIES

Fabricate anchors, clips, and window accessories of aluminum, nonmagnetic stainless steel, or hot-dip zinc-coated steel or iron complying with the requirements of DIN 1748; provide sufficient strength to withstand design pressure indicated. As a minimum provide 3 anchors on each side of the frame.

4.11.1.1.6 COMPRESSION-TYPE GLAZING STRIPS AND WEATHERSTRIPPING

Unless otherwise indicated, and at the manufacturer's option, provide compressible stripping for glazing and weather stripping such as molded EPDM or neoprene gaskets.

4.11.1.1.7 SEALANT

For sealants required within fabricated window units, provide type recommended by the manufacturer for joint size and movement. Sealant shall remain permanently elastic non-shrinking, and non-migrating. Comply with Sealants of these specifications for selection and installation of sealants.

4.11.1.1.8 WIRE FABRIC INSECT SCREEN

Wire Fabric Insect Screen shall be permanently fixed to the exterior of operable windows, as required in the 01010.

4.11.1.2 HARDWARE

Provide the manufacturer's standard hardware fabricated from aluminum, stainless steel, or other corrosion-resistant material compatible with aluminum and of sufficient strength to perform the function for which it is intended. Provide at a minimum one locking device on the interior of each window. Any operable window over 2 square meters shall have two locking devices as a minimum.

4.11.1.3 FABRICATION

Provide aluminum windows with factory finish in all buildings as indicated in the design drawings. Provide a locking device on the interior of each window. Provide anchors on each side of the frame into the adjoining structure, 3 on each side. Provide weather stripping system for all exterior windows and doors.

4.11.1.4 METAL WINDOW SILLS

Galvanized metal window sills, 0.90 mm, shall be installed on the exterior of all windows. The metal window sills shall have a turn down of 50 mm over the exterior masonry and stucco. Metal sills shall extend from side to side of the masonry opening in a single piece. Extend the metal window sill a minimum of 20 mm under the bottom of the aluminum windows. Install masonry mortar as required for a smooth surface under the window sills. Sills shall slope a minimum of 6 mm to the exterior and not allow water to puddle.

4.11.1.5 FINISHES

Apply baked enamel in compliance with paint manufacturer's specifications for cleaning, conversion coating, and painting. Color shall be white meeting the requirements of DIN 50018

4.11.1.6 INSPECTION

Inspect openings before beginning installation. Verify that rough or masonry opening is correct and the sill plate is level. Masonry surfaces shall be visibly dry and free of excess mortar, sand, and other construction debris.

4.11.1.7 INSTALLATION

Comply with manufacturer's specifications and recommendations for installation of window units, hardware, operators, and other components of the work. Set window units plumb, level, and true to line, without warp or rack of frames or sash. Provide proper support and anchor securely in place. Set sill members and other members in a bed of compound or with joint fillers or gaskets, as shown, to provide weather tight construction. Refer to the Sealant sections for compounds, fillers, and gaskets to be installed concurrently with window units. Coordinate installation with wall flashings and other components of the work.

4.11.1.8 ADJUSTING

Adjust operating sash and hardware to provide a tight fit at contact points and at weather stripping for smooth operation and a weather tight closure.

4.11.1.9 CLEANING

Clean aluminum surfaces promptly after installation of windows. Exercise care to avoid damage to protective coatings and finishes. Remove excess glazing and sealant compounds, dirt, and other substances. Lubricate hardware and other moving parts.

4.11.1.10 BULLETPROOF GLAZING

All windows at Guard Towers, Guard Shack and guard House shall meet requirements of UL 752 for bullet resistance.

4.11.2 DOORS

Fire rated doors and frames shall be tested and approved as an assembly and shall be provided by a single manufacturer/distributor. Hardware for fire rated door assemblies shall be labeled as appropriate for fire rated applications and shall be coordinated with door manufacturer. All exterior doors shall be heavy duty metal doors with metal frames. Interior door shall be hollow metal doors with hollow metal frames. Commercial duty lock sets and hardware shall be used on all doors. Hinges shall be the 5 knuckle type or equivalent. Provide door handles and locksets that can be locked with a key on all doors. All door locks shall have a thumb latch on inside of door such that no key is necessary to exit the room or building. Coordinate the final keying schedule with Contracting Officer prior to ordering lock sets. Generally each building should have 8 master keys fitting all locks, 8 sub-master keys fitting all exterior doors and 3 keys each for each interior door. Include 25% spare key blanks for the amount of keys provided per building. Provide numbering system identifying key to associated room door. Provide weather stripping system for all exterior doors.

4.11.2.1 STEEL DOORS

SDI/DOOR A250.8, except as specified otherwise. Prepare doors to receive specified hardware. Undercut where indicated. Exterior doors shall have top edge closed flush and sealed to prevent water intrusion. Doors shall be 44.5 mm thick, unless otherwise indicated. Doors shall be constructed using heavy gauge steel with minimum thickness of 1.2 mm.

4.11.2.2 SOLID PLASTIC DOORS

Panels:

Shop fabricated solid plastic doors, water resistant, graffiti resistant, non-absorbent, with plastic laminate sheets permanently fused to plastic core. Panel 25mm minimum thickness with 6mm radius beveled edges with minimum panel clearance of 13 mm. Color per CoR

Hardware:

All hardware shall be pre-drilled per manufacturer, tamper-proof, no-ferrous corrosion-resistant and alkali–resistant. Mounting brackets shall be installed in accordance with manufactures instructions for wall mounted condition and shall include no less than (2) brackets. Hardware shall include latching device, gravity type cast pivot hinges, adjustable for closed door position, door strike, keeper with rubber bumper and tamper proof screws and bolts and all fittings and fasteners necessary for a complete installation.

Partitions, doors and hardware shall per requirements of CID A-A-60003.

All wet areas are to receive plastic doors. Doors shall be installed rigid, straight, plumb and level.

Verify all door openings prior to fabrication. Notify CoR of any wall irregularities affecting door configuration.

4.11.2.3 FIRE AND SMOKE DOORS AND FRAMES

The requirements of NFPA 80 and NFPA 105 respectfully shall take precedence over details indicated or specified.

4.11.2.4 THRESHOLDS

All exterior doors (except Mech/Elect rooms) shall be provided with manufactured metal thresholds conforming to ANSI/BHMA A156.21. Thresholds shall span continuously from jamb to jamb.

4.11.2.5 STANDARD STEEL FRAMES

SDI A250.8, except as otherwise specified. Form frames to sizes and shapes indicated, with welded corners or knock-down field-assembled corners. Provide steel frames for doors, transoms, sidelights, mullions, cased openings, and interior glazed panels, unless otherwise indicated.

4.11.2.6 WELDED FRAMES

Continuously weld frame faces at corner joints. Mechanically interlock or continuously weld stops and rabbets. Grind welds smooth.

4.11.2.7 STOPS AND BEADS

Form stops and beads from 0.9 mm thick steel. Provide for glazed and other openings in standard steel frames. Secure beads to frames with oval-head, countersunk Phillips self-tapping sheet metal screws or concealed clips and fasteners. Space the fasteners approximately 300 to 400 mm on centers. Miter molded shapes at corners. Use butt or miter square or rectangular beads at corners.

4.11.2.8 WEATHER-STRIPPING, INTEGRAL GASKET

Provide weather-stripping that is a standard cataloged product of a manufacturer regularly engaged in the manufacture of this specialized item. Black synthetic rubber gasket with tabs for factory fitting into factory slotted frames, or extruded neoprene foam gasket made to fit into a continuous groove formed in the frame, may be provided in lieu of head and jamb seals. Weather stripping shall be looped neoprene, synthetic rubber gasket, or vinyl held in an extruded non-ferrous metal housing. Air leakage of weather stripped doors shall not exceed 0.003125 cubic meters per second of air per square meter of door area when tested in accordance with ASTM E 283.

4.11.2.9 ANCHORS

Provide anchors to secure the frame to adjoining construction. Provide steel anchors, zinc-coated or painted with rust-inhibitive paint, anchors not lighter than 1.2 mm thick.

4.11.2.10 WALL ANCHORS

Provide at least three anchors for each jamb. For frames which are more than 2285 mm in height, provide one additional anchor for each jamb for each additional 760 mm or fraction thereof.

4.11.2.10.1 FLOOR ANCHORS

Provide floor anchors drilled for 10 mm anchor bolts at bottom of each jamb member. Where floor fill occurs, terminate bottom of frames at the indicated finished floor levels and support by adjustable extension clips resting on and anchored to the structural slabs.

4.11.2.11 HARDWARE PREPARATION

Provide minimum hardware reinforcing gages as specified in ANSI A250.6. Drill and tap doors and frames to receive finish hardware. Prepare doors and frames for hardware in accordance with the applicable requirements of SDI/DOOR A250.8 and ANSI A250.6. For additional requirements refer to BHMA A115. Drill and tap for surface-applied hardware at the project site. Build additional reinforcing for surface-applied hardware into the door at the factory. Locate hardware in accordance with the requirements of SDI/DOOR A250.8, as applicable. Punch door frames, with the exception of frames that will have weather-stripping or lightproof or soundproof gasketing, to receive a minimum of two rubber or vinyl door silencers on lock side of single doors and one silencer for each leaf at heads of double doors. Set lock strikes out to provide clearance for silencers.

4.11.2.12 HINGES

Exterior hinges shall have non-removable pins and be satin-chrome steel or stainless steel; Grade 1 anti-friction or ball bearing; and 3 each of 115 mm x 115 mm per leaf up to 900 mm wide door 125 mm x 125 mm for doors 900 mm to 1,200 mm wide. Interior hinges shall be Grade 1; antifriction or ball bearing; and 3 each of 115 mm x 115 mm per leaf up to 900 mm wide door 125 mm x 125 mm for doors 900 mm to 1,200mm wide. Hinges for labeled fire doors must be either steel or stainless steel. Hinges shall conform to ANSI/BHMA A156.1 and A156.7.

4.11.2.13 LOCKSETS, LATCHETS, EXIT DEVICES, AND PUSH AND PULL PLATES

Exterior doors shall have mortise locks conforming to ANSI/BHMA A156.13 for metal doors. Emergency exit devices shall be Grade 1, flush mounted type. Interior doors shall have mortise locksets conforming to ANSI/BHMA A156.13, Series1000, Grade 1. All locks and latch sets shall be the product of the same manufacturer. Locksets, padlocks and latch sets shall be provided, as required, with lever handles on each side. Provide heavy duty hasp and locks at all fuel storage tanks.

4.11.2.14 CLOSERS

Closers shall be provided on all exterior doors and fire-rated doors. All exterior doors and interior doors that require security or privacy such as toilet room shall be provided with heavy-duty hydraulic closers. Closers shall conform to ANSI/BHMA A156.4, Grade 1. Closers shall be surface-mounted, modern type, with cover. Closer shall be adjustable type and have slow-down control to prevent door leaf from slamming to frame. Provide door silencers on all door frames provided with closers.

4.11.2.15 DOOR STOPS

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

4.11.2.16 KEYING SYSTEM & LOCK CYLINDERS

Provide locks for all doors. A Master key system shall be provided. Master key system shall include a separate & different key for each door with a master key provided to open any & all doors.

Cylinders: Lock cylinders shall comply with BHMA A156.5. Lock cylinder shall have six pins. Cylinders shall have key removable type cores. All locksets, exit devices, and padlocks shall accept same interchangeable cores.

4.11.2.17 FINISHES

All surfaces of doors and frames shall be thoroughly cleaned, chemically treated and factory primed with a rust inhibiting coating as specified in SDI/DOOR A250.8, or paintable A25 galvanize-annealed steel without primer. Where coating is removed by welding, apply touchup of factory primer.

4.11.2.18 WATER-RESISTANT SEALER

Provide a water-resistant sealer compatible with the specified finish as approved and as recommended by the door manufacturer.

4.11.2.19 FABRICATION AND WORKMANSHIP

Finished doors and frames shall be strong and rigid, neat in appearance, and free from defects, waves, scratches, cuts, dents, ridges, holes, warp, and buckle. Molded members shall be clean cut, straight, and true, with joints coped or mitered, well formed, and in true alignment. Dress exposed welded and soldered joints smooth. Design door frame sections for use with the wall construction provided. Corner joints shall be well formed and in true alignment. Conceal fastenings where practicable. On wraparound frames for masonry partitions, provide a throat opening 3 mm larger than the actual masonry thickness. Design other frames in exposed masonry walls or partitions to allow sufficient space between the inside back of trim and masonry to receive caulking compound.

4.11.2.20 INSTALLATION

Before installation, seal top and bottom edges of doors with the approved water-resistant sealer. Seal cuts made on the job immediately after cutting using approved water-resistant sealer. Fit, trim, and hang doors with a 2 mm minimum, 3 mm maximum clearance at sides and top, and a 5 mm minimum, 6 mm maximum clearance over thresholds. Provide 10 mm minimum, 11 mm maximum clearance at bottom where no threshold occurs. Bevel edges of doors at the rate of 3 mm in 50 mm. Door warp shall not exceed 6 mm when measured in accordance with WDMA I.S. 1-A. Hang doors in accordance with clearances specified in SDI/DOOR A250.8. After erection and glazing, clean and adjust hardware.

4.11.2.20.1 FRAMES

Set frames in accordance with SDI/DOOR 105. Plumb, align, and brace securely until permanent anchors are set. Anchor bottoms of frames with expansion bolts or powder-actuated fasteners. Build in or secure wall anchors to adjoining construction. Backfill frames with mortar. When an additive is provided in the mortar, coat inside of frames with corrosion-inhibiting bituminous material. For frames in exterior walls, ensure that stops are filled with rigid insulation before grout is placed.

4.11.2.20.2 GROUTED FRAMES

For frames to be installed in exterior walls and to be filled with mortar or grout, fill the stops with strips of rigid insulation to keep the grout out of the stops and to facilitate installation of stop-applied head and jamb seals.

4.11.2.21 PROTECTION AND CLEANING

Protect doors and frames from damage. Repair damaged doors and frames prior to completion and acceptance of the project or replace with new, as directed. Wire brush rusted frames until rust is completely removed. Clean thoroughly. Apply an all-over coat of rust-inhibitive paint of the same type used for shop coat. Upon completion, clean exposed surfaces of doors and frames thoroughly. Remove mastic smears and other unsightly marks.

4.11.2.22 WEATHERSTRIPPING

Provide weather-stripping that is a standard cataloged product of a manufacturer regularly engaged in the manufacture of this specialized item. Weather stripping shall be looped neoprene or vinyl held in an extruded non-ferrous metal housing. Air leakage of weather stripped doors shall not exceed 0.003125 cubic meters per second of air per square meter of door area when tested in accordance with ASTM E 283. Install doors in strict accordance with the manufacturer's printed instructions and details. Weather strip the exterior swing-type doors at sills, heads and jambs to provide weather tight installation. Apply weather stripping at sills to bottom rails of doors and hold in place with a brass or bronze plate. Apply weather stripping to door frames at jambs and head. Shape weather stripping at sills to suit the threshold.

4.11.2.23 PRE-FITTING

At the Contractor's option, doors may be provided factory pre-fit. Doors shall be sized and machined at the factory by the door manufacturer in accordance with the standards under which they are produced. The work shall include sizing, beveled edges, mortising, and drilling for hardware and providing necessary beaded openings for glass and louvers. Provide the door manufacturer with the necessary hardware samples, and frame and hardware schedules as required to coordinate the work.

4.11.2.24 FINISHES

Provide door finish colors as selected by the Contracting Officer from the color selection samples.

4.11.3 GLAZING

All glazing shall be double laminated and insulating. Laminated glazing shall be constructed of two panes of minimum 3mm annealed glass laminated to a minimum 0.75mm polyvinyl-butyral (PVB) interlayer, in accordance with UFC 4-010-01. Two panes of laminated glazing shall be installed in each window with hermetically sealed 13mm airspace between them. After installation of windows, the contractor shall install a minimum 3mil tinted film

(Scotch shield Ultra Safety and Security Window Film or approved equal) to the inside face of the glazing in accordance with manufacturer's instructions.

4.11.3.1 TEMPERED GLAZING

Tempered glass shall be kind FT fully tempered flat type. Class 1 clear, condition A uncoated surface, Quality q3-glazing select, conforming to ASTM, DIN, BS or EN standards. Color shall be clear.

4.11.3.2 GLAZING ACCESSORIES

4.11.3.2.1 SEALANT

Sealant shall be elastomeric conforming to ASTM, DIN, BS, or EN standards. Type S or M, Grade NS, Class 12.5, Use G, of type chemically compatible with setting blocks, preformed sealing tape and sealants used in manufacturing insulation glass. Color of sealant shall be as selected from manufacturer's full range of standard colors by Contracting Officer.

4.11.3.2.2 GLAZING GASKETS

Glazing gaskets shall be extruded with continuous integral locking projection designed to engage into metal glass holding members to provide a watertight seal during dynamic loading, building movements and thermal movements. Glazing gaskets for a single glazed opening shall be continuous one-piece units with factory-fabricated injection-molded corners free of flashing and burrs. Glazing gaskets shall be in lengths or units recommended by manufacturer to ensure against pull-back at corners.

4.11.3.2.3 FIXED GLAZING GASKETS

Fixed glazing gaskets shall be closed-cell (sponge) smooth extruded compression gaskets of cured elastomeric virgin neoprene compounds conforming to ASTM, DIN, BS or EN standards.

4.11.3.2.4 WEDGE GLAZING GASKETS

Wedge glazing gaskets shall be high-quality extrusions of cured elastomeric virgin neoprene compounds, ozone resistant, conforming to ASTM, DIN, BS, or EN standards.

4.11.3.2.5 PUTTY AND GLAZING COMPOUND

Glazing compound shall conform to ASTM, DIN, BS, or EN standards for face-glazing metal sash. Putty shall be linseed oil type conforming to DIN, BS, or EN standards for face-glazing primed wood sash. Putty and glazing compounds shall not be used with insulating glass or laminated glass.

4.11.3.2.6 SETTING AND EDGE BLOCKING

Neoprene setting blocks shall be dense extruded type conforming to ASTM, DIN, BS, or EN standards. Silicone setting blocks shall be required when blocks are in contact with silicone sealant. Profiles, lengths and locations shall be as required and recommended in writing by glass manufacturer.

4.11.3.2.7 PREPARATION

Openings and framing systems scheduled to receive glass shall be examined for compliance with glass manufacturer's recommendations including size, squareness, offsets at corners, presence and function of weep system, face and edge clearance requirements and effective sealing between joints of glass-framing members. Detrimental materials shall be removed from glazing rabbet and glass surfaced and wiped dry with solvent. Glazing surfaces shall be dry and free of frost.

4.11.3.2.8 INSTALLATION

Glass and glazing work shall be performed in accordance with, glass manufacturer's instructions and warranty requirements. Glass shall be installed with factory labels intact and removed only when instructed. Edges and

corners shall not be ground, nipped or cut after leaving factory. Springing, forcing or twisting of units during installation will not be permitted.

4.11.3.2.9 CLEANING

Upon completion of project, outside surfaces of glass shall be washed clean and the inside surfaces of glass shall be washed and polished in accordance with glass manufacturer's recommendations.

4.11.3.3 PROTECTION

Glass work shall be protected immediately after installation. Glazed openings shall be identified with suitable warning tapes, cloth, or paper flags, attached with non-staining adhesives. Reflective glass shall be protected with a protective material to eliminate any contamination of the reflective coating. Protective material shall be placed far enough away from the coated glass to allow air to circulate to reduce heat buildup and moisture accumulation on the glass. Glass units which are broken chipped, cracked, abraded, or otherwise damaged during construction activities shall be removed and replaced with new units.

4.12 FINISHES

All exterior and interior surfaces, including facility exterior shall be selected from or match standard RLB manufacturer's colors. Flooring shall be sheet vinyl. Provide color boards with all materials for COR approval prior to ordering materials.

4.12.1 PAINTS & COATINGS

Paints and coatings shall be provided per the UFGS Specification 09 90 00 Paints and Coatings.

4.12.2 CONCRETE HARDENER

Concrete sealers shall be a liquid chemical sealer-hardener compound. Apply a minimum of two coats. Sealer shall be compatible with climate temperatures and not reduce the adhesion of resilient flooring, tile, paint, roofing, waterproofing or other materials applied to the concrete.

4.12.3 PAINT

Paint shall be oil based or latex. A primer shall be placed prior to any coats of paint. A minimum of two (2) coats of paint shall be used for each surface. Existing painted material shall be cleaned, cracks patched, and prepared for new paint. Existing sealant shall be inspected, cleaned or removed and new sealant placed.

4.12.4 EXPOSED EXTERIOR STEEL TRIM, FRAMES, DOORS AND PIPE RAILINGS

Exposed exterior steel shall include items such as trim, frames, door, pipe rails and other exposed steel surfaces. Provide manufacturers standard baked on finish where possible. For unfinished steel items, paint with one coat oil-based primer, with 2 coats of oil-based alkyd gloss enamel, color to be selected by the Contracting Officer from the color board provided by the Contractor.

4.12.5 EXPOSED WOOD TRIM, FRAMES AND DOORS

Exposed wood shall include items such as trim, frames, doors and other exposed wood surfaces. Paint with one coat oil-based primer, 2 coats of gloss enamel, color to be selected by the Contracting Officer from the color board provided by the Contractor

4.12.6 EXPANSION JOINTS IN PLASTER & STUCCO

Expansion joints shall be provided as specified in ASTM, DIN 18339, BS or EN Standards for all walls, floors and ceilings.

4.12.7 EXTERIOR WALLS

The exterior of all buildings shall be stucco and/or plaster conforming to ASTM C926 where indicated in standard

building design. A temperature of between 4 and 27 degrees C shall exist for a period of not less than 48 hours prior to application of plaster and for a period of at least 48 hours after plaster has set. Control joints shall be designed for expansion and contraction of plaster work due to thermal exposure. Control joints shall comprise of back to back casing beads. Install new stucco in 2 coats. The first coat shall be a scratch coat approximately 10 mm thick. Allow 7 days to cure. The second coat shall be finish stucco, smooth finish, approximately 10 mm thick. Allow 7 days to cure before painting. Stucco showing over sanding, cracks, blisters, pits, checks, discoloration or other defects is not acceptable. Defective plaster work shall be removed and replaced with new plaster at the expense of the Contractor. Patching of defective work will be permitted only when approved by the Contracting Officer. Patching shall match existing adjacent work in texture and color. All exterior color finish shall be integral with the stucco finish. No painted stucco shall be permitted.

4.12.8 INTERIOR WALLS

4.12.8.1 PLASTER WALLS

Interior walls shall be plaster applied in a similar manner as exterior stucco. Paint with 2 coats of semi-gloss off-white with less than 0.06% lead by weight color to be selected by the Contracting Officer from the color board provided by the Contractor.

4.12.8.2 SOUND CONTROL

Walls between sleeping rooms shall have a Sound Transmission Class (STC) minimum 45-55 or better, An STC value is a single number rating used to characterize the sound insulating value of a partition (wall, floor, or ceiling). All walls shall be caulked at floor and ceiling prior to installing wall base. All openings between rooms shall be caulked or sealed. Doors shall have rubber seal around frames and threshold.

4.12.8.3 HARDENED (CMU) INTERIOR WALLS

Interior walls intended to be CMU shall be a minimum thickness of 100 mm. Interior CMU walls shall be plaster applied in a similar manner as exterior stucco. Paint with 2 coats of flat off-white paint with less than 0.06% lead by weight color to be selected by the Contracting Officer from the color board provided by the Contractor.

4.12.9 INTERIOR CEILINGS

4.12.9.1 CONCRETE CEILINGS

Concrete ceilings shall be exposed concrete painted with 2 coats of flat white, with less than 0.06% lead by weight.

4.12.9.2 SUSPENDED CEILINGS

Suspended ceilings shall be 13 mm Gypsum Wall Board (GWB) supported by metal grid system per manufacturer's standard. Fire rated GWB, where required, shall be type X per NFPA 252 requirements or approved foreign equivalent.

4.13 TILE WORK

Tile work shall not be performed unless the substrate and ambient temperature is at least 10 degrees C and rising. Temperature shall be maintained above 10 degrees C while the work is being performed and for at least 7 days after completion of work. Upon completion, tile surfaces shall be thoroughly cleaned in accordance with manufacturer's approved cleaning instructions. Acid shall not be used for cleaning glazed tile. Floor tile with resinous grout or with factory mixed grout shall be cleaned in accordance with instructions of the grout manufacturer. After the grout has set, tile wall surfaces shall be given a protective coat of a non-corrosive soap or other approved method of protection.

4.14 SPECIALTIES

4.14.1 MIRRORS

600 mm x 900 mm, 6 mm plate glass shall be mounted above all lavatories. Mount bottom of mirrors 1100 mm

above finished floor.

4.14.2 TOILET PAPER HOLDERS

Toilet paper holders with removable pin shall be stainless steel, installed approximately 200 mm above floor by eastern toilets and 600 mm above floor by western toilets.

4.14.3 SHOWER CURTAIN RODS & SHOWER CURTAIN

Shower curtain rods, stainless steel, heavy duty, 1.20 mm shall be mounted between the walls of each shower stall. Mount rod 2000 mm above finished floor. Provide a shower curtain with support rings for each shower stall.

4.14.4 GRAB-BARS

Stainless steel grab-bars, heavy duty, 1.20 mm, two each 900 mm and 1050 mm long, 40 mm diameter shall be mounted behind and beside all eastern toilets, and bathtubs as they occur. Mount grab-bars between 610mm - 900 mm height on the walls. Each bar shall support no less than 91 Kg in any direction.

4.14.5 PAPER TOWEL DISPENSERS

Paper towel dispensers, 0.683 mm Type 304 stainless steel, surface mounted. Furnish tumbler key lock locking mechanism.

4.14.6 LIGHT DUTY METAL SHELF

Provide a 600 mm long x 150 mm wide, light duty stainless steel shelf with integral brackets over each lavatory and laundry sink.

4.14.7 ROBE HOOKS

Provide a minimum of two robe hooks on all toilet and shower stalls.

4.14.8 CLOTHESLINES

Fabricate clothes line assembly in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling imitations. Clearly mark units for reassembly and coordinated installation. Wire-rope assemblies (clothes line cable) shall minimize the amount of turnbuckle take-up used for dimensional adjustment so the maximum amount is available for tensioning wire ropes. Wire rope shall be nylon covered. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of ~1 mm, unless otherwise indicated. Remove sharp or rough areas on exposed surfaces. Form work true to line and level with accurate angles and surfaces. Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate. Cut, reinforce drill, and tap as indicated to receive finish hardware, screws, and similar items. Welded connections: cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

5.0 MECHANICAL

5.1 GENERAL

Provide complete heating, ventilating and air-conditioning (HVAC) systems. Where systems and equipment are fully designed and specified in the appendix drawings, provide in strict accordance with the Standard Design drawings. Where any system or equipment is not fully designed or specified, provide the necessary engineering services to complete the design.

5.2 HVAC INSTALLER QUALIFICATIONS

The HVAC works shall be executed by a heating and cooling specialist experienced in the design and construction HVAC equipment to include conventional refrigerant systems, heat pump units, space heaters and knowledge in

fabricating specialized units consisting of supplemental electric resistance heaters in satisfying the specified indoor design conditions.

5.3 STANDARD PRODUCTS

All materials and equipment shall be standard products of manufacturers regularly engaged in the manufacture of the product and shall duplicate products that have been in satisfactory use for at least two (2) years prior to bid opening.

The Contractor shall submit the following for equipment to be provided under this section of the specification: Manufacturer's data including performance characteristics at design conditions; Catalog cuts showing dimensions, performance data, electrical requirements, compliance with the codes, standards and regulations; Drawings, as necessary, indicating location and installation details.

5.4 CODES, STANDARDS AND REGULATIONS

The design and installation of all HVAC systems shall conform to the standards, codes, and regulations provided in the paragraph, List of Codes and Technical Criteria, where applicable, except where otherwise indicated under particular clause(s). The publications to be taken into consideration shall be those of the most recent editions and primarily in accordance with the American Society of Heating, Refrigeration, and Air-Conditioning (ASHRAE). Standards other than those mentioned may be accepted provided that the standards chosen are internationally recognized and meet the minimum requirements of the specified standards. The Contractor shall submit proof of equivalency if requested by the Contracting Officer.

5.5 EQUIPMENT PROTECTION

Provide exterior pad-mounted mechanical equipment with either protective fences and concrete-filled steel bollards or protective screen walls to prevent accumulation of debris and vandalism.

5.5.1 OUTDOOR DESIGN CONDITIONS

Contractor shall use the below weather data for equipment compatibility with the site conditions). The Outdoor Design Conditions given are for purposes of sizing HVAC equipment. Generators shall be designed to operate in an ambient Temperature of 50 Degrees Celsius due to annual maximum temperature as well the loss of performance due to dusty conditions and less than ideal installation conditions.

Kandahar Area:

Latitude – (approx.) 31.5 deg. North

Longitude – (approx.) 65.85 deg. East

Elevation – (approx.) 1,010 m (3,314 ft)

Summer – 41 C (106 F) Dry Bulb (DB) & 21.7 C (71 F)] Wet Bulb (WB)

Winter – -1.7 C (29 F)

Daily Range – 12 C (21 F)

5.5.2 INDOOR DESIGN CONDITIONS

Facility Type	Summer Temperature	Winter Temperature
Headquarters / Administration Buildings	Communications room only: Cooling 25 C (78 F)	Heating 20 C (68 F)
Barracks	No Cooling	Heating 20 C (68 F)

Facility Type	Summer Temperature	Winter Temperature
Latrines	No Cooling	Heating 20 C (68 F)
Training Building	No Cooling	Heating 20 C (68 F)
DFAC	No Cooling	Heating 20 C (68 F)
POL Storage Building	No Cooling	Heating 20 C (68 F)
Fuel Operator's Building	No Cooling	Heating 20 C (68 F)
Guard Towers	No Cooling	Heating 20 C (68 F)
Guard House	No Cooling	Heating 20 C (68 F)
Small Arm Storage	No Cooling	Heating 20 C (68 F)
Vehicle Maintenance Building	No Cooling	Heating 20 C (68 F) in Offices Heating 13 C (55 F) in Maintenance Areas
Well House	No Cooling	Heating 13 C (55 F)
Storage Buildings / Warehouses	No Cooling	Heating 20 C (68 F); Offices Only

Warehouses , storage buildings and vehicle maintenance bays shall be provided with ventilation to maintain the indoor conditions to 10 F above the summer ambient DB temperature.

5.5.3 NOISE LEVEL

Noise levels inside occupied spaces generated by HVAC systems indoors shall not exceed NC 35.

5.5.4 INTERNAL LOADS

Occupancy: ASHRAE standards shall be used to calculate sensible and latent heat from people. In general, light/moderate office work is 73 W (250 Btuh) sensible and 45 W (155 Btuh) latent.

Lighting: 21.5 W/sq.m (2 W/sq.ft) maximum (however lighting levels shall meet minimum requirements and shall be accounted for in the cooling loads based on the actual lighting design).

Outdoor Air: Outdoor ventilation air shall be provided per ASHRAE Standard 62.1. Minimum outside ventilation requirements for offices and bedroom sleeping quarters shall be 2.5 lps/person (5.3 cfm/person) plus 0.3 lps/sq.m of floor space (0.6 cfm/sq.ft). Outdoor air requirements can be satisfied by windows that open to the outside. Enclosed occupied areas without windows shall have outside air ventilation rates based on occupancy using the formula above in combination with a means for providing outside make-up air by means of forced-air outside air ventilation systems or forced-air exhaust systems.

Communication (Comm) Rooms: Comm rooms containing computer servers and other heat-producing electronic equipment shall be provided with independently controlled cooling. See Electrical for comm room equipment requirements.

Toilet/Shower Exhaust: 85 cmh (50 cfm) per toilet, urinal, and shower head.

Ablution Exhaust: 35 cmh/sq.m (2 cfm/sq.ft).

Building Pressurization: 1.3 mm wg (or 12,5 Pa or 0.05" wg); Maintain negative pressure in latrine areas. Pressurization is only applicable for buildings provided with central ducted forced air systems

5.6 HVAC EQUIPMENT

The Contractor shall size and select all heating and cooling equipment based on equipment manufacturer's performance data for the project site location and elevation.

5.6.1 EXTERIOR HVAC EQUIPMENT

For exterior pad-mounted mechanical equipment, provide protective fences, concrete-filled steel bollards, and/or protective screen walls to prevent vandalism and damage by natural elements.

5.6.2 AIR COOLING & HEATING EQUIPMENT

Environmental control of the facilities shall be achieved by HVAC equipment as listed below and approved by the U.S. Government. Contractor shall size and select equipment based on equipment manufacturer's performance data at the project site elevation and temperature conditions and ensure the equipment's performance meets the design heating and cooling sizing requirements. The following table represents, as a minimum, facility-specific system requirements and does not limit the applicability of general system requirements stated elsewhere in this specification.

* Indirect-tempering of outside make-up air shall be accomplished by locating heating and/or cooling equipment in close proximity to outside air louvers (fitted with filters, screens, and dampers as a minimum) for minor conditioning of raw outside air.

5.6.3 CONTROL WIRING AND PROTECTION DEVICES

HVAC controls shall be products of the equipment manufacturers and shall be installed in accordance with the manufacturers' recommendations. Thermostats of individual units shall be located near the unit return intakes; thermostats of units serving multiple areas shall be located near the return of the space with the highest heat generation. For each thermostat, provide a lockable housing that allows viewing of settings without permitting access. Thermostats shall be mounted 1.5 meters (5 feet) above the finished floor and shall be easily accessible.

5.6.4 EQUIPMENT FANS

All HVAC fans shall be heavy-duty centrifugal forward curved, backward inclined, or airfoil fans with overload protection. Each fan shall be provided complete with vibration isolator, external lubricators, individual wall on/off switches, and all accessories as necessary and indicated.

5.6.5 CEILING FANS

Ceiling fans shall be 5-bladed, 1320 mm (52"), minimum, in diameter, and provided at one 40 sq.m of floor space, or as indicated. Fans shall have reversible motors. Fans shall be centered or distributed evenly throughout the room. Coordinate placement with the lighting plan to prevent conflict or casting shadows. Fan mount shall be flush, standard, or angle mount depending on ceiling height. Fan shall be mounted such that the fan blade is a minimum 2.5 m (98") above the finished floor. The fans shall be provided without light kits. The finish shall be factory painted white. The controls shall be wall-mounted from either a single pole switch or from two (2) 3-way switches to provide on/off operation. Install per manufacturers' instructions.

5.6.6 UNIT HEATERS

Provide commercial, self-contained unit heaters with fans and heating elements. Heating elements shall be nickel chromium and shall have overload protection. Unit heaters shall have integral thermostats.

5.6.7 WOOD STOVE HEATERS

Provide wood stoves for room heating in all occupied or operating spaces larger than 8 m^2 in floor area (subject to the limitations of the following paragraphs), in addition to the electric heaters shown in the Appendix drawings. Also, provide these wood stoves in all locations specifically shown with wall thimbles (flue locations) in Appendix drawings.

Do not install wood stoves for room heating in wet areas, such as latrines, ablution, laundry rooms or wet Janitors closets.
Do not install wood stoves for room heating in spaces that require tighter control of temperature or security requirements such as communication rooms, electrical rooms, mechanical rooms, ammunition storage, secure storage, Detention Cells and critical spaces in medical facilities.
Do not install wood stoves in warehouse and storage facilities containing flammable materials.
Do not provide wood stoves for room heat in locations that require mechanical cooling. Mechanical cooling is achieved by equipment that requires a compressor and refrigerant, ventilation and air movement equipment such as ceiling fans and exhaust fans are not considered mechanical cooling. Do not provide wood stoves in Vehicle Maintenance Facility, POL building or Well house.

Wood stoves for room heating shall be standalone type wood stoves, they shall not be recessed or connected to any part of the building structure other than non-combustible floor surface. Wood stove heaters shall have both a chimney and combustion make-up air. In no case, shall a wood stove heater receive combustion air from the room or interior space without the room receiving make-up air directly from the outside. All wood stove heaters shall be made of cast iron with fire brick interior. All wood stove heaters shall be manufactured in accordance to UL or EN standards as listed in the technical specifications. In no case, will a “homemade” or site built wood stove heater be accepted. The chimney vent shall penetrate through the wall at all wood stove locations. For a roof penetration, the contractor shall submit written request to USACE engineering no later than at 65% design submittal, approval shall be in writing from USACE, until written approval is received from USACE, the contractor shall not assume the roof penetration is approved. The chimney venting shall pass through a wall thimble at least 24” above stove flue collar connection. Chimney venting shall meet UL 103 High Temperature or as required by manufacturer. The chimney shall be routed up the exterior side of the wall of the building and shall clear eve and terminate as required by manufacturer installation requirements. The rain cap shall not have any moving parts or hinges, field installed dampers are not allowed at any location within the chimney duct. The only acceptable damper is a wood stove manufacturer installed damper.

Clearance to Combustibles: The wood stove heater shall be located on a non-combustible surface with clearances to combustibles as required by manufacturer. All venting shall maintain clearance to combustibles as required by manufacturer and the IMC and UL or EN standards. The Contractor shall submit drawings showing clearances along with cut sheets of stove and venting at 65% submittal.

5.7 AIR TRANSFER SYSTEMS

5.7.1 DUCTWORK

Ductwork systems include ductwork, fittings, manual volume control dampers, grills, and/or registers. Ductwork shall be constructed of galvanized steel or aluminum sheets and installed in accordance with SMACNA “HVAC Duct Construction Standards (Metals and Flexible).

5.7.2 DUCT INSULATION, VAPOR BARRIER, AND JACKETING

Duct insulation shall be provided for all makeup air ductwork that is located in the conditioned space. All ductwork exterior to the building shall be insulated with a minimum RSI=0.88 (R5).

Makeup air duct systems shall be provided with vapor barrier protection to prevent condensation. Insulation exposed to weather or physical damage shall be protected with aluminum jacketing.

5.7.3 REGISTERS AND GRILLES

Registers and grilles shall be factory fabricated of steel or aluminum and distribute the specified air quality evenly over the space intended. The devices shall be square, rectangular, or with perforated face. Units will be mounted in ceilings, high sidewalls, or directly to ductwork and shall be sized for the airflow to be delivered with a maximum NC rating of 35.

5.7.4 AIR FILTRATION

All supply air shall be filtered using manufacturer's standard washable filters mounted inside the unit. In addition, all outdoor air intakes shall be equipped with 50 mm (2 inch) thick washable filters. Outdoor air intakes shall be installed as high as is reasonably possible in order to minimize dust entrainment. The intakes shall be sized so that free air velocities are below 2.5 m/s (500 fpm).

5.7.5 WALL PENETRATIONS

Building wall penetrations for fans, exhaust duct, vents, louvers, etc. shall be carefully made so as not to deteriorate the structural integrity of the wall system. The Contractor is encouraged to locate exterior wall louvers above doors, whenever possible, to take advantage of the structural framing void located above doors. The Contracting Officer shall be consulted and the recommendations strictly adhered to.

5.7.6 OUTSIDE AIR INTAKE, MAKE-UP, AND EXHAUST LOUVERS

Outside air louvers shall be factory fabricated of steel, stainless steel, or aluminum and allow the specified air quantity into the intended space. Louvers shall be square or rectangular with rain-proof exterior face blades and internal grille. To reduce sand and dirt migration, outside air intakes shall be installed as high as possible within architectural constraints or a minimum of 1.5 m (5') above the ground. Consideration shall be given to locating the louvers near the heating and cooling units (for indirect tempering of air) and encourage air flow across the room in conjunction with the exhaust fan. Outside air intake louvers shall be provided with air filter (See Air Filtration), insect screen, and, if indicated, motorized dampers interlocked to open when the toilet-shower room exhaust fans operate. Minimum louver dimensions shall be 300 mm x 300 mm (12" x 12") on the exhaust fans and submitted in the design analysis (DA) calculations.

All supply air shall be filtered using manufacturer's standard washable filters mounted inside the unit. In addition, all outside make-up air intakes shall be equipped with 50 mm (2") thick washable filters. Control wiring and protection of the air conditioning units shall be the manufacturer's standard, pre-wired factory installed or as recommended.

5.7.7 VENTILATION & EXHAUST FAN SYSTEMS

All fans used for building ventilation, exhaust, and pressurization shall be selected for minimum noise level generation. All fans used for supply or roof/wall exhaust, including toilets, showers, and ablutions, shall be **centrifugal** forward curved, backward inclined, or airfoil fans with non-overloading characteristics of high efficiency and quiet running design. The fans shall be of the heavy-duty type with durable construction and proved performance in a desert environment. Each wall exhaust fan shall be provided with motorized or gravity dampers which close automatically when the fan is not running. Each ventilation or intake air fan shall be provided with an interlocked motorized damper which closes automatically when the fan is not running and shall be sized for and provided with filter and insect screen. Each fan shall be provided complete with vibration isolator, external lubricators, individual wall on/off switches, and all accessories and sound attenuators as necessary.

Intake or outside make-up air openings for exhaust fans shall be provided with motorized dampers which are interlocked with the exhaust fans and provided with air filters and insect screens. The motorized dampers shall open or close when the ventilation or exhaust fan is on or off respectively. Louvered openings for ventilation or exhaust fan systems shall be sized for a maximum static pressure (SP) drop (that includes filter resistance) of 25 Pa (0.10" wg) to prevent excessive negative pressurization of the building. **Exterior outside door louvers and undercuts are not permitted except under special circumstances.**

Maintenance shops and similar spaces that use solvents and oils shall be provided with mechanical exhaust air systems. Intake or outside make-up air openings for an exhaust fan system shall be provided as indicated above. The exhaust systems shall consist of a fan, ductwork, exhaust grills, and interlock controls. Design shall be in

compliance with the latest addition of the Industrial Ventilation UFC 3-410-04N or ACGIH Industrial Ventilation manual.

All occupied windowless rooms, without connections to a ducted central HVAC system (or without an avenue for obtaining outside ventilation air) shall be provided with forced-air outside air ventilation systems or forced-air exhaust systems.

5.7.8 WALL TRANSFER GRILLES

Wall penetrations for air transfer between two spaces shall be provided with a factory fabricated grille on both the inlet and outlet sides of the opening. For fire-rated walls in accordance with NFPA-90A with air transfer penetrations, fire dampers shall be installed between the inlet and outlet grilles.

5.8 SPECIAL SYSTEMS

5.8.1 KITCHEN HOOD EXHAUST AND MAKE-UP AIR

Provide a commercial kitchen exhaust hood and make-up air system in strict accordance with the appendix drawings. The installation shall be in accordance with NFPA 96, SMACNA, and equipment manufacturer recommendations. The exhaust hoods shall be selected for Type I (grease smoke) operation and shall be provided with baffle grease filters. The hoods and all associated ductwork shall be constructed from 1.0mm (20-gauge) stainless steel material.

All exhaust duct joints and seams shall be continuously welded or brazed. Brazing and supports shall be constructed of non-combustible material securely fastened to the structure. Bolts, screws, rivets, and other fasteners shall not penetrate the duct walls. Ducts shall be placed a minimum of 450mm (18 inches) from combustible material or 75mm (3 inches) from gypsum wallboard attached to non-combustible structures. Ductwork terminating through the roof shall extend a minimum of 450mm (18 inches) above the roof. Ductwork shall be pitched to drain back to the hood.

The roof-mounted centrifugal exhaust fan shall be the upblast type with fan motor located outside the airstream. The fan discharge shall be a minimum 1000 mm (40”) above the roof and shall not impinge on other equipment or nearby building surfaces. The fan shall be manufactured in such a way as to permit easy inspection and cleaning. The connection between ductwork and exhaust fan shall be flanged, gasketed, and bolted. The exhaust fan shall be electrically interlocked with its corresponding makeup air fan to prevent system operation without both fans in service.

The make-up air grille shall be integral with the hood system as detailed in the appendix drawings.

5.8.2 LPG/PROPANE STOVE EXHAUST

Each LPG/propane stove shall be provided with a dedicated chimney as indicated. The minimum flue thickness for metal chimneys shall be not less than 1.5 mm (16-gauge) thick steel. High temperature metal flues shall be guarded against human contact and protected from potential damage from large cooking pots by means of metal guards or masonry walls. All metal chimney flues shall be insulated and be sized as indicated for the stove flue gases to keep warm and flow quickly through the system. The chimney shall run straight up without offsets because each change in direction presents resistance to flow. The chimney system shall be reasonably well-sealed to prevent leaks that introduce cool air and make the system more vulnerable to adverse pressures. The LPG/propane stove kitchen shall be well vented with louvers located high on the walls on the building ends as indicated. The Contractor must submit shop drawings for approval.

5.9 WOOD COOKING STOVES FOR DINING FACILITIES

A separate wood burning cooking stove kitchen annex building shall be provided within the DFAC yard with commercial grade built-in-place wood-fired cooking stoves. The annex shall be located adjacent to the kitchen as indicated. The annex shall be provided with a concrete slab, a sloped metal or concrete roof slab, and a minimum of three (3) reinforced CMU walls. Walls shall have a minimum height of 3.0 m (10') from floor to finished ceiling). The wood stove kitchen shall be well vented with louvers elevated a minimum of 1.5 m (5') on the end or side

walls. Exhaust fans shall NOT be provided because of the effects on the chimney draft. A covered wood storage area, equal to a minimum of 0.3 cu.m (10 cu.ft) of volume per stove, shall be provided for rain shielding. Security fencing with gates with locks shall be provided around the entire annex kitchen complex.

The annex kitchen concrete floors shall be provided with trench drains that extends the length of the cooking area for cleaning purposes. Water service shall be provided for the cooking annex. Water piping shall be buried to prevent pipe freezing. Freeze-proof yard hydrants (where the actual valve is located below the frost line) shall be provided.

The kitchen annex shall be provided with power for light fixtures, receptacles, and other electrical devices required for a complete functional facility, see Electrical.

5.9.1 STOVES

Stoves shall be constructed from masonry fire bricks and cooking stove tops shall be wide enough for a person to walk and accessible by small movable stairs. The stove firebox shall be shaped to maximize the heat absorbed by the cooking pots above and lined with an 15 mm (1/4") cast-iron insert to protect the fire brick. A 40 mm (1.5") toe space shall be provided for the entire interior length of floor in front of the stove lineup.

The minimum height of the stove shall be 950 mm (37") with a minimum stove-to-finished-ceiling clearance of 2.0 m (80"). Stoves shall be topped with a minimum 50 mm (2") thick cast-iron plate. The cast-iron stove top shall be a minimum of 1,000 mm x 1,000 mm (40" x 40") square with a 750 mm (30") diameter hole in the center to accommodate a similar diameter stove plate insert. The 750 mm (30") metal insert shall also have a 450 mm (18") diameter hole in the center that accommodates a second smaller stove plate insert. The second insert shall have a 250 mm (10") diameter hole in the center that accommodates a final stove plate insert.

A minimum 25 mm (1") thick cast-iron fire grate (grid plate or fire basket) shall be provided in the wood firebox not less than 100 mm (4") nor more than 150 mm (6") above the firebox floor . The fire grate grill spacing shall not be less than 50 mm (2"). The wood feeding and ash removal doors shall be located on the exterior. The doors shall be constructed of not less than 7.0 mm (1/4") thick steel and provided with 40 mm (1.5") thick metal frames. One (1) exterior wood loading door shall have at least one (1) smaller peek door on the door itself that is approximately 100 mm x 100 mm (4" x 4").

5.9.2 STOVE CHIMNEYS

Each stove shall be provided with a dedicated chimney routed inside the building envelope (or kitchen space) for the maximum allowable distance; hotter exhaust gases produce better chimney drafts. The main chimney shall be constructed using a stainless steel vent (or flue) enclosed with face brick. The face brick shall protect the user from accidental human contact and the metal flue from potential damage from large cooking pots; metal rails may be provide with approval. The minimum flue diameter shall not be less than 200 mm (8") diameter and thickness shall not be less than 3.0 mm (12-gauge). Chimneys penetrating and exiting through walls shall be provided with a 16 mm (5/8") thick steel lentil and exterior escutcheon type pipe sleeve for wall anchoring. All exterior portions of a chimney that exits through a wall shall be double-wall stainless steel with a minimum 25 mm (1") gap filled with fire-proof insulation.

All chimneys shall rise a minimum of 60 cm (24") above the roof ridge so a stable draft can be produced. In addition, the chimney shall be provided with rain cap to reduce the chances of adverse wind pressures. The chimney system shall be reasonably well-sealed to prevent leaks that introduce cool air and make the system more vulnerable to adverse pressures. When the chimney system is installed in a building kitchen with a fan powered exhaust and ventilation systems, the wood stove area shall be under positive pressure to facilitate the chimney draft. Contractor must submit shop drawings for approval prior to starting construction.

5.9.3 MECHANICAL REQUIREMENTS FOR GENERATORS

Note: The full specification for the generator consists of this section, Mechanical Requirements for Generators, in combination with Generator Power System-Electrical Requirements for Generators specification found in the Electrical portion of this Section 01015.

The following shall be provided in the Mechanical design and installation for prime stationary generator sets and related mechanical systems with their interface with the facility. This includes, but not limited to, the following:

Foundations, mountings, exhaust systems, cooling systems, ventilation, noise attenuation, and equipment configuration. See Electrical Section for power and electrical equipment requirements and Plumbing Section for fuel system requirements.

The generator set(s) shall be the manufacturer's design for outdoor weatherproof installation with skid-mounted high-ambient temperature radiator rated for 50 C (120 F).. Weatherproof generator set(s) shall be protected from the elements with a structural cover as indicated.

Heating devices for the generator set engine coolant and starter batteries shall be provided as per manufacturer's recommendation for cold starting. Ambient temperature and elevation derating calculations shall be clearly shown in the design analysis (DA).

Generator noise levels shall be based on the location and operating at 100% load. All generator sets, regardless of location, shall be provided with the manufacturer's factory installed sound attenuation enclosure cabinets, the manufacturer's integral muffler system, as a minimum, to reduce noise.

All exterior installed generator sets (i.e. With three or fewer walls) shall be provided with, as a minimum, the manufacturer's factory installed weather-proof enclosure cabinet, the manufacturer's integral muffler system, vibration isolators, and vibration isolating foundation to reduce noise and prevent damage to the overhead structure. Generator set(s) shall be oriented with the prevailing winds when possible (with the alternator upwind) to promote heat removing air flow across the alternator and engine by the radiator fan.

All exterior weather-proof generator sets shall be provided with a covered structure and enclosed with a chain link security fence. A structural cover shall also be provided over the generator accessories (i.e. Switch gear, etc.) and bulk fuel storage tanks. The overhead structure shall have a minimum clearance of 2.0 m (6.5’) above the equipment and extend out with a minimum overhang of 1.0 m (40”) beyond the equipment and any spill containment dikes.

Exterior exhaust system shall be with minimal backpressure, directed to disperse the noise away from people and occupied buildings, and located near the radiator air discharge.

For fuel and day tank requirements, see Plumbing paragraph, "GENERATOR FUEL STORAGE/DISTRIBUTION."

For fire emergencies, see Fire Protection paragraph, "PORTABLE FIRE EXTINGUISHERS."

5.10 TEST ON COMPLETION

Upon completion of the work, the Contractor shall demonstrate to the Contracting Officer that the installation is adjusted and regulated correctly to fulfill the function for which it has been designed. The Contractor shall test, adjust, balance and regulate the section or sections of concern as necessary until the required conditions are obtained. Contractor shall coordinate with the Contracting Officer to schedule the tests. Tests shall include all interlocks, safety cutouts, and other protective devices to ensure correct functioning. All such tests shall be carried out with full written records of the values obtained and the final settings. All test results shall be submitted to the Contracting Officer in tabulated form. The following tests and measurements shall be performed:

Outdoor Conditions:	DB and WB temperatures
Indoor Conditions:	DB and WB temperatures
Heat Pumps and Unit Heaters:	Fan motor speed and input ampere reading
	Supply and return air temperature.
Ducted Make-Up Air Heaters:	Fan motor speed and input ampere reading
	Air flow rate
Exhaust Fans:	Fan motor speed and input ampere reading
	Air flow rate

6.0 PLUMBING

6.1 GENERAL

Provide complete plumbing systems. Where any system or equipment is not fully designed or specified, provide the necessary engineering services to complete the design.

The Contractor shall design and build domestic cold and hot water systems, waste, drain and vent systems, fuel-oil storage and distribution systems required in the facilities identified in Section 01010 Scope of Work and as described herein. The Contractor shall also be responsible for complete design and construction of all domestic and special plumbing systems required for full and safe operations in the Generator Plant, Water Storage and other facility or structures required in this contract.

The work covered in this scope also includes the delivery to site, erection, adjusting, testing and balancing, and handing over in full operating condition all equipment and associated works.

6.1.1 QUALIFICATIONS

The plumbing systems shall be executed by a specialist experienced in the installation of these systems.

6.1.2 STANDARD PRODUCTS AND SUBMITTALS

All materials and equipment shall be standard product of a manufacturer regularly engaged in the manufacture of the product and shall duplicate items that have been in satisfactory use for at least two (2) years prior to bid opening.

The Contractor shall submit the following for equipment to be provided under this section of the specification: Manufacturer's data including performance characteristics at design conditions; Catalog cuts showing dimensions, performance data, electrical requirements, compliance with the codes, standards and regulations; Drawings, as necessary, indicating location and installation details.

6.2 CODES, STANDARDS AND REGULATIONS

The design and installation of equipment, materials and work covered under the plumbing services shall conform to the standards, codes, and regulations provide in the paragraph, List of Codes and Technical Criteria, where applicable except where otherwise indicated under particular clause(s). The publications to be taken into consideration shall be those of the most recent editions and primarily in accordance with the ICC International Plumbing Code (IPC) and ASHRAE Handbook-HVAC Applications for Service Water Heating. Standards other than those mentioned may be accepted provided that the standards chosen are internationally recognized and meet the minimum requirements of the specified standards. The Contractor shall submit proof of equivalency if requested by the Contracting Officer.

6.3 EQUIPMENT PROTECTION

Exterior plumbing equipment shall be pad-mounted. In addition, security fences and traffic bollards, designed overhead structure/shelters for exterior generators, and 45-kg LP gas-propane tank storage areas shall be provided.

6.4 PLUMBING SYSTEMS

6.4.1 WATER

Domestic cold and hot water shall be provided in the facilities to serve the water usage and plumbing fixtures provided for the facility. Water service to each facility shall enter the building in a mechanical, toilet, storage, or similar type space. A pressure reducer shall be placed at the water entry if the supplied pressure exceeds 80 PSI. The building service line shall be provided with a shut off valve installed either outside in a valve pit or inside the mechanical room or similar spaces. Water piping shall not be installed in or under the concrete foundation except for the service line. All water piping shall be routed parallel to the building lines and concealed in all finished areas. Insulation shall be provided where required to control sweating of pipes or to provide protection from freezing. Electric heat trace cable for freeze protection shall not be provided as a substitute for space heating systems.

6.4.1.1 PIPING MATERIALS

Domestic cold water shall be distributed by means of standard weight schedule 40 galvanized steel pipe, Polyvinyl Vinyl Chloride (PVC) or Polyethylene (PE) (ASTM D 2737) plastic piping. Domestic hot water shall be distributed by means of standard weight schedule 40 galvanized steel pipe, or Chlorinated Polyvinyl Vinyl Chloride (CPVC) piping. Domestic water joints shall be connected using either solvent cement or mechanical threads. Polypropylene (PP) pipe is not permitted for either domestic hot or cold water piping.

Waste and vent piping shall be either galvanized steel pipe (schedule 40) or Polyvinyl Vinyl Chloride (PVC) conforming to ASTM D 2665. Flexible waste and vent lines from fixtures (i.e. lavatories, water closets, etc.) and inserted into an adjacent pipe are not allowed except for clothes washer installations.

Corrosion protection shall be provided if galvanized piping comes in contact with earth or masonry floors, walls or ceilings. The Contractor shall attempt to route all piping beyond the grasp of the occupants. All exposed domestic water, sanitary waste, and vent piping shall be schedule 40 galvanized steel when surface mounted. Wall-mounting brackets for exposed domestic water, waste, and vent piping shall be spaced a maximum of 40 cm (16") apart to minimize vandalism.

6.4.2 PLUMBING FIXTURES

The following typical plumbing fixtures shall be provided:

a. Eastern Water Closet shall be provided with flush tank assembly. Provide acid resisting fired porcelain enameled cast iron water closet complete with rotating No-Hub 'P' trap and No-Hub coupling to meet piping requirements. Eastern Style water closet shall be furnished with integral non-skid foot pads and bowl wash down non-splashing flushing rim. The water closet shall be completely self supporting requiring no external mounting hardware and shall be flush with floor. The Eastern Style water closet shall incorporate waterproofing membrane flashing flange. Provide a cold water spigot 300mm above finished floor on the right (from a perspective of standing inside of the cubicle and looking out) sidewall of the cubicle. Spigot shall have a flexible hose and spray nozzle such that the occupant can wash over the water closet. Toilets shall be oriented north and south. Toilets shall not face east or west.

b. Lavatories. All sinks shall be trough type constructed of block and concrete with ceramic tile exterior and lining capable of withstanding abuse. Provide maintenance access to waste piping and P-traps from under the sink. Trough-type sink faucets shall be similar to service (mop or janitor's) sink faucets with one-piece brass body construction, fixed short integral spout, hot and cold water manual mixing valves, and capabilities for withstanding abuse. Lavatories inside the prison cells shall be tamper-proof with integral spout, soap depression, and outlet connection to slip 40mm OD tubing.

c. Sink Faucets. LN faucets shall be chrome plated brass or bronze alloy with hot and cold water valves for manual mixing. Faucet handles shall be chrome plated brass or bronze alloy. No goose neck faucet fixtures shall be used. Fixtures shall have flow restrictors not to exceed 4.0 lpm (1.0 gpm) (Note: Provide flow restrictor to achieve designated flow at available water pressure)

d. Service (Mop or Janitor’s) Sinks. Floor mount janitor, enameled cast iron with copper alloy rim guard. Provide hot and cold water valves with manual mixing. Faucet handles shall be copper alloy. Include a stainless steel shelf and three mop holders.

e. Shower. Showerhead and faucet handles shall be stainless steel prison grade for LN facilities and regular stainless steel for coalition facilities. Provide hot and cold water valves for manual mixing. In addition to a shower head, provide each shower stall with a threaded faucet approximately 1.2 m above finished floor with hot and cold-water controls, mixing valve and a diverter type valve so water can be directed to either the shower or to the lower faucet. Shower shall be provided with low flow shower head. The shower head shall be heavy duty type and securely fastened to the wall.

f. Emergency Shower and Eye Wash Assembly. Provide emergency shower and or eye wash assembly in Power Plant and in other facilities where appropriate. Provide a floor drain in the area, if appropriate (where

emergency water flowing on the floor may lead to additional safety or operational complications).

g. Kitchen Sink. Sinks shall be corrosion resisting formed stainless steel. Faucet bodies and spout shall be cast or wrought copper alloy. Handles, drain assembly, and stopper shall be corrosion resisting steel or copper alloy.

h. Ablution Trench. Provide trench drains, as indicated on drawings, with brass grating and strainer. Provide each station with hot and cold water valves with manual mixing. Faucet handles shall be copper alloy.

i. Grease Interceptor (Exterior only). Shall be steel construction manual cleaning type with removable checker-plate cover complete with flow control valve. Tested and rated in accordance with PDI G-101. Concrete shall have a minimum compressive strength of 21 MPa (3045 psi) in 28 days (kitchen use only).

j. Floor Sink: Provide floor sink, circular or square, with 300mm overall width or diameter and 250mm nominal overall depth. They shall have acid resistant enamel interior with cast iron body, aluminum sediment bucket and perforated grate of cast iron. Outlet size as indicated on plans.

k. Floor or Shower Drain: Cast iron construction with galvanized body, integral seepage pan, and adjustable perforated or slotted chromium plated bronze, nickel-bronze, or nickel brass strainer consisting of a grate and threaded collar. Toilet room floor drains are similar except are provided with built-in, solid, hinged grate.

l. Trench Drains: Floor trench shall be concrete construction with a cast iron grate. The cast iron grate shall be sectionalized and hinged so that it can easily be opened to clean out the trench. Iron grates shall be fabricated in sections in length not greater than 1500 mm. The floor trench shall be provided with perforated aluminum pan inserts which can be removed to clean out large food particles. The floor trench drain shall be adjustable perforated or slotted chromium plated bronze, nickel-bronze, or nickel brass strainer consisting of a grate and threaded collar. This style of floor trench shall be installed in the kitchen area of the DFACs in response to kitchen cleaning practices of the local national staff.

m. Room hose bibs and floor drains shall be provided as required. Afghan dining facility kitchen area clean-up hose bib to be supplied with connecting hose on reel including approximately 12 meters of hose. Provide clean-up spray nozzle with hose assembly.

n. Provide P-Traps per International Plumbing Code IPC for all fixture drains, floor and trench drains, and shower drains. P-traps shall have minimum of 50 mm water seal.

o. Large Pot sink, provide clean-up spray nozzle with hose assembly.

6.4.3 HOT WATER

Where domestic hot water systems are required to be designed by the Contractor, design these systems to supply 50°C (120°F) hot water to fixtures and outlets requiring hot water. Water of a higher temperature, 60 C (140 F) and above, shall be provided for special uses or processes as in kitchens (except hand wash lavatories) and for sterilization. All hot water piping shall be insulated. A hot water re-circulating pump shall be provided if hot water piping run exceeds 30 m (100). All water heaters shall be set to generate/store hot water at no less than 60 C (140 F).

6.4.3.1 WATER HEATERS

Domestic hot water shall be generated by electric water heaters (WHs). All WHs shall be factory insulated. Each water heater shall be equipped with a vacuum relief valve and temperature and pressure (T&P) relief valve that discharge into a nearby floor drain; discharge piping shall terminate 50 mm (2") above the floor drain. The larger floor-mounted unit(s) shall be typically located inside a mechanical room, storage room, toilet/janitor room or similar type space. Smaller wall-mounted units may be located in toilet-lavatory areas for single remote water closets. Multiple water heaters (two or more) shall be of equal size and connected by common inlet and outlet manifolds in a "reverse return" configuration to ensure equal flow and drawdown rates. All floor-mounted WHs shall be elevated on a 100 mm (4") raised concrete pads. In cases where the pressure of the water system violates the manufacturer’s recommendations, a pressure reducer shall be installed in the line before the water heater.

Water heater storage capacity (liters) and recovery capacity elements (kW or liters per hour) shall be sized in accordance with ASHRAE Fundamentals Handbook-HVAC Applications, "Service Water Heating." Provide water heater sizing according to the following chart:

Building Type	ASHRAE Category
Barracks, Latrine	Hotel
HQ, Administration	Office
DFAC	Hotel

The unit(s) capacities shall be for commercially available tank and electric heating element sizes.

6.5 WASTE, DRAIN AND VENT SYSTEM

6.5.1 GENERAL

Every trap and trapped fixture shall be vented in accordance with the IPC. In order to minimize vent piping, incorporate either "Circuit Venting," "Combination Drain & Vent," or "Wet Venting" options systems in accordance with the IPC.

6.5.2 DESIGN CONSIDERATIONS

The Designer shall have in mind a vent option (i.e. Fixture Venting, Circuit Venting, Wet Venting, etc.) before designing the route of the waste line(s) in a building in order to comply and avoid inconsistencies with the IPC. Vent piping shall not be routed horizontally under the floor. Every dry vent connection shall rise up vertically from the waste pipe no less than 45 degrees with the horizontal (Note: In most cases, the connection will be 90 degrees for the horizontal or straight up. See IPC). Every dry vent shall rise up vertically at least 15 cm above the flood level rim, of the fixture being vented, before going horizontally.

6.5.2.1 FLOOR DRAINS

Floor drains shall be provided in each room that contains a water source. Floor drains shall be provided in the mechanical equipment and toilet/shower/ablution rooms. Floor drains shall be provided next to water heaters. In mechanical rooms, floor drains shall be provided to avoid running drain piping long distances above or over the floor. Drain outlet shall use a P-trap system to trap sewer gases and shall be a one-piece system without removable parts.

6.5.2.2 CLEANOUTS

Cleanouts shall be provided no more than 8 m (25') apart when measured from the upstream entrance of the cleanout.

6.6 SPECIAL PLUMBING SYSTEMS

6.6.1 GENERATOR FUEL STORAGE / DISTRIBUTION

The Contractor shall design and provide a complete generator fuel storage/distribution system.

6.6.1.1 FUEL OIL STORAGE AND CONTAINMENT

Tanks shall be installed in accordance with NFPA 37 and shall be of the capacities required in Section 01010 paragraphs 2.3.8 and3.3.8, “Fuel Storage, Generator Canopy, and Vehicle Fuel Point.” Design and provide above-

ground horizontal steel tank(s) with single-walls and a secondary containment dike. Under NO circumstances shall GALVANIZED tanks be provided for storage of fuel oil or diesel.

Tanks shall be complete with fill tube and cap, suction tube, tank gauge, vent, and other fittings and appurtenances required for full and safe operation. Tanks shall be provided with support saddles, platform/stair and concrete pad. Molded neoprene isolation pads shall be provided at locations where steel contacts concrete to isolate the tank. Steel tank supports specifically are prone to encounter premature rusting due to constant exposure to moisture and their incompatibility with concrete.

The containment dike shall be sized to contain the entire contents of the largest tank plus 20 percent. The dike structure shall be constructed of reinforced concrete.

Tanks shall have a minimum of one (1) 760 mm (30") diameter manway to allow for internal tank access. Piping shall not penetrate through access manways. Tank shall be provided with a combination cleanout and gauge connection.

Vent pipe sizing shall be not less than 32 mm (1-1/4") nominal inside diameter. Vent shall be the rupture disc type calibrated to burst at 14 kPa (2 psi) pressure, and operate at 80 percent of burst setting. Tank shall be provided with an overfill alarm system. Tank shall be provided with two (2) stick gauges graduated in m and mm. Stick gauge shall be of wood and treated after graduating to prevent swelling or damage from the fuel being stored. Cathodic protection shall be provided for metal components in accordance with the manufacturer's recommendations. Storage tanks shall be handled with extreme care to prevent damage during placement and shall be installed in accordance with the manufacturer's installation instructions.

For each tank, at least one (1) external platform/ladder access to tank top (i.e. manway) shall be provided and installed on a concrete pad. The platform shall be designed to allow diesel supply truck operators to safely fill the tanks by manually feeding the hose into a fill port on the top of the tank.

6.6.1.2 FUEL DISTRIBUTION SYSTEM

Design and provide a complete fuel distribution system to supply clean fuel to the generators and vehicle fuel point. Fuel shall be transferred from the bulk storage tank(s) by either the generator engine fuel pump(s) and vehicle fuel point pump, by bulk tank submersible pump(s), and/or by duplex-fuel pumps as determined by the designer and/or manufacturer, and be fitted with in-line fuel filters within 2 m (7') of the tank shell.

Fuel piping shall be black steel for all piping above grade and either steel or fiberglass for underground piping segments. Rubber hoses shall not be allowed. Galvanized piping, fittings, valves, or other equipment shall not be used for fuel oil or diesel conveyance. Secondary containment for underground fuel piping shall be provided with either double-wall fiberglass, double-wall black steel inner and steel outer with cathodic protection, double-wall black steel inner and fiberglass outer, or either black steel or fiberglass piping located in a concrete secondary containment trench with applied POL-resistant coating and removable covers (traffic-rated as applicable). Piping shall be installed straight and shall bear evenly on supports. Piping shall be free of traps, not embedded in concrete or pavement, and drain toward the corresponding storage tank when elevation permits. Belowground nonmetallic pipe shall be installed in accordance with pipe manufacturer's instructions. Belowground piping shall be laid with a minimum pitch of 0.4 m per 100 m (0.4 percent slope).

Provide complete fuel piping hydraulic calculations and all equipment product data in the 65% design analysis.

6.6.2 FUEL OFF-LOAD SYSTEM

A fuel filling system shall be provided for unloading fuel from fuel tanker into individual bulk storage tanks comprising of truck pad(s), duplex fuel transfer pumps, piping manifold and valves all in weather-proof cabinets. The system shall provide remote fuel level monitoring panels at the pad(s). Lockable containment box shall be provided to contain any spillage encountered during tank filling. Before construction begins, the Contractor shall coordinate with the Contracting Officer Representative and locate the fuel off-loading point outside of the perimeter wall to facilitate transfer of fuel from the commercial tanker trucks to the bulk storage tanks. The Contractor shall provide a full supply of fuel for EACH tank at the time of turnover to the Government.

Provide complete fuel piping hydraulic calculations and all equipment product data in the 65% design analysis.

6.6.3 LPG COOKING STOVES

Cooking areas shall be provided with canopy type exhaust and associated exhaust and outside make-up air fans. See paragraph “Mechanical” in this Section. New stoves shall be set into formed concrete openings such that they can easily be removed for replacement, maintenance, and cleaning.

6.6.3.1 COOKING STOVES/BURNERS

Each LPG-propane stove shall be provided with three (3) burners and metal frame with four (4) legs. The stoves shall be of commercial quality and be capable of producing the highest heat output with all three (3) burners on. The center burner is low heat, center and middle burner is medium heat and all three burners is high heat. A gas flow regulating-adjusting valves shall be provided for each burner at the face of the appliance.

Stove dimensions are approximately 720 mm (28”) long by 720 mm (28”) wide by 500 mm (20”) high.

6.6.3.2 GAS PIPING

Gas piping from the LPG/propane tanks to the respective gas stoves shall be wrought iron, ASTM B36.10M or steel (black or galvanized), ASTM A53. The steel piping shall terminate in front of the stoves with a shut off valve and quick disconnect nipple. A stainless steel flexible hose shall connect from the LPG/propane stove to the steel piping. Each end of the flexible hose shall be provided with quick disconnect fittings.

The LPG/propane piping shall not be embedded in the concrete floor. Installation of the LPG/propane piping in concrete trenches is highly recommended. The piping may be surface mounted provided that it is not susceptible to damage or causes any safety hazards.

Piping passing through the exterior wall shall be provided with pipe sleeves.

New stoves shall be set into formed concrete openings such that they can easily be removed for replacement, maintenance, and cleaning. Stove dimensions are 720 mm long by 720 mm wide by 500 mm high. The height includes the grill.

6.6.3.3 PROPANE FUEL STORAGE (45 KG BOTTLES)

LPG-propane storage tanks shall be located outside and exterior to the building in a storage yard.

The storage of fuels shall consist of individual 45 kg (100-pound) portable bottle tanks. For a 30-day supply of fuel, provide four (4) bottles per cook stove. The Contractor shall provide all tanks filled with LPG/propane fuel at time of completion.

Remote Storage Area: Stored filled and empty LPG/propane storage tanks shall be installed on a concrete pad and placed within a covered, secure, enclosure located a minimum of 8.0 m (26') from any occupied building. Portable bottle tanks shall be secured with chains to prevent tipping, and have caps on all bottles. Chain link enclosure with two (2) walkways and four (4) rows of tanks is recommended for ready access and easy securing of the bottles. Enclosed buildings are discouraged due to the potential for the buildup of propane in the event of a leak. Chain link fences with a visibility barrier are acceptable if the visibility barrier allows minimally impeded airflow.

Connected Storage: Connected Portable Tanks shall be located outdoors near or adjacent to the building behind a fire rated exterior wall. Tank area shall have a cover and be located in a chain link secured enclosure. One (1) tank per stove will be allowed in this location, with all tanks manifolded together (For facilities with three (3) or fewer stoves, the stoves may be individually piped.). The tanks shall be complete with fill fittings, tank gauge, vent, 2-stage and line regulators, and other fittings and appurtenances required for full and safe operation. Portable bottle tanks shall be secured with chains to prevent tipping.

6.7 TESTING AND COMMISSIONING

The Contractor shall test all piping systems in accordance with IPC International Plumbing Code. The final test shall include a smoke test for drainage and vent system and pressure test for the domestic water piping. After completing the work, the Contractor shall demonstrate that all plumbing systems operate to fully satisfy the function for which these systems have been designed. The Contractor shall test, adjust, balance and regulate the system and its controls as necessary until the required designed conditions are met. The Contractor shall include tests for interlocks, safety

cutouts and other protective devices to demonstrate safe operation. All such tests shall be carried out in the presence of the Contracting Officer and full written records of the test data and final settings shall be submitted to the Contracting Officer. After all tests are complete, the entire domestic hot and cold water distribution system shall be disinfected. The system shall not be accepted until satisfactory bacteriological results have been obtained.

7.0 FIRE PROTECTION

7.1 PORTABLE FIRE EXTINGUISHERS

Portable fire extinguishers shall be provided inside all facilities and at exterior locations. Provide extinguishers per the greater requirement of A) as required in accordance with NFPA 10, or B) minimum of one (1) A-B-C 6kg fire extinguishers for every 100sm of floor space. Generally, extinguishers will be of the multi-purpose dry chemical type except for occupancies requiring a special type extinguisher (e.g., carbon dioxide portable fire extinguishers for electrical rooms). Where located in the presence of fuel, the fire extinguisher shall be rated for extinguishing fuel fires for the types of fuel used.

8.0 ELECTRICAL

8.1 GENERAL

Contractor shall design and construct all electrical systems for the facilities to be provided. This includes design, construction, all necessary labor, equipment, and material for a fully functional system.

8.2 ELECTRICAL WORKERS QUALIFICATIONS

Electrical work shall be performed by qualified persons with verifiable credentials who are thoroughly knowledgeable with applicable code requirements. Verifiable credentials consist of a certificate of graduations from an approved trade school and required amount of experience, depending on work being performed, and should be identified in the proposal that is submitted. A qualified person is one who has received training in and has demonstrated skills and knowledge in the construction and operation of electrical equipment and installations and the hazards involved. This includes the skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment, to determine the nominal voltage of exposed live parts, the clearance distances and corresponding voltages to which the qualified person will be exposed.

8.2.1 SUPERVISORY ELECTRICIAN

Supervisory electricians must be graduates of an approved trade school, and must have two years of relevant electrician experience. Approved programs include but are not limited to the Afghanistan Technical and Vocational Institute (in Kabul), the Kunar Trades Training Center, and the Commercial Technical Training Center (in Jalalabad). Work experience resumes and graduation certificates shall be submitted and approved prior to commencement of any design or construction involving electrical work. Approval is granted by the Contracting Officer’s Representative with guidance by the Quality Assurance Branch and/or the Safety Office of the US Army Corps of Engineers Afghanistan Engineer District – South.. Supervisory electricians shall be on site at all times when electrical work activities are in progress.

8.2.2 ELECTRICIANS

Electricians must be graduates of an approved trade school and must be able to provide upon request a certification of successful course work completion and graduation in addition to a resume of work experience.

8.3 DESIGN CRITERIA

8.3.1 APPLICABLE STANDARDS

Design shall be in the required units as stipulated herein. Conflicts between criteria and/or local standards shall be brought to the attention of the Contracting Officer for resolution. In such instances, all available information shall be furnished to the Contracting Officer for approval.

All electrical systems and equipment shall be installed in accordance with the requirements set forth in the documents referenced herein.

8.3.2 ACCEPTANCE TESTING

Contractor shall develop and submit for approval complete acceptance test procedures on all systems provided. As a minimum the testing procedures shall comply with the requirements of the National Fire Protection Association (NFPA) and the International Electrical Testing Association Inc. (NETA).

8.4 MATERIAL

8.4.1 GENERAL

Unless noted otherwise, all material used shall be in compliance with the requirements of UL standards. In the event that UL compliant materials are not available, Contractor may then select applicable British Standards (BS), IEC, CE, CSA, GS, DIN listed material (or equivalent), but the contractor must prove equivalence and must provide the government with a full copy of the relevant specification(s)/standard(s). Material and equipment installed under this contract shall be for the appropriate application and installed in accordance with manufacturers recommendations.

Equipment enclosure types shall be in compliance with the National Electrical Manufacturer's Association (NEMA) or the International Electro-Technical Committee (IEC) standards.

Major components of equipment shall have the manufacturer's name, address, type or style, voltage and current rating, and catalog number on a non-corrosive and non-heat sensitive plate, securely attached to the equipment. All equipment delivered and placed in storage, prior to installation, shall be protected from the weather, humidity and temperature variation, dirt and dust, and any other contaminants. All equipment shall be in new condition, undamaged and unused.

8.5 STANDARD PRODUCT

All material and equipment shall be a standard product of a manufacturer regularly engaged in the manufacture of the product and shall essentially duplicate items that have been in satisfactory use for at least two (2) years prior to bid opening.

8.5.1 DESIGN CONDITIONS

All equipment shall be rated and designed for the maximum ambient temperature and altitude of the construction site. Equipment that is altitude and temperature sensitive, such as generators, shall be de-rated according to the manufacturer’s recommendations. Generic de-rating criteria for altitude and for ambient temperature may be used to approximate the required size of such equipment during the design phase, but a stipulation shall be placed on the construction plans to adjust the size according to the de-rating criteria specific to the manufacturer’s equipment chosen before the equipment is ordered.

8.5.2 RESTRICTIONS

Aluminum shall not be specified or used as conductor except in the case of overhead conductors in aerial primary distribution systems, where ACSR (aluminum conductor, steel reinforced) may be used. Aluminum windings shall not be used in transformers.

8.6 DESIGN REQUIREMENTS

8.6.1 ELECTRICAL DISTRIBUTION SYSTEM

The Contractor shall utilize the existing 20kV overhead distribution feeder 514-South as the prime source of power. The distribution lines run overhead along the south side of Route 1, which is adjacent to the PHQ site. The Contractor shall provide an overhead feeder running along the gravel road on the west side of the PHQ/PRC#1 site. The PHQ site shall be provided with a 700kVA step-down transformer and the PRC site be provided with a 300kVA step-down transformer.

Each site shall have a back-up generator that is equivalent in size to their corresponding transformers. The generator power system shall be provided with a make-before-break, 4-pole, automatic transfer switch (ATS) rated for the full capacity of the system. The ATS shall be capable of automatically transferring the site's distribution system between the generator(s) and utility power. The electrical distribution system shall be designed based on the latest edition of NEC and the requirements or standards stipulated herein.

Transformers shall be mineral oil liquid-filled, self-cooled and sized as indicated above. The transformer shall be suitable for, certified, and installed to meet all applicable seismic requirements of the International Building Code (IBC). The transformer shall be anchored to steel skids, perpendicular to the transformer access doors to facilitate ease or removal. The steel skids shall be attached to the unit substation structural base rails. All transformers shall have copper windings.

Provide transformer with the following accessories: Ground pads, liquid level indicators, pressure vacuum gauge, drain and filter valves, pressure relief device, diagrammatic stainless steel or anodized aluminum nameplate in accordance with IEEE C57.12.00, and lifting provisions. Transformer selection, design, and installation shall be governed by NEC, NESC, ETL 1110-3-412, IEEE C57.12.28, ANSI/IEEE C57.12.22, IEEE C57.12.34, and C57.12.80.

The 20kV medium voltage 20kV distribution feeder shall be overhead for the portions that are outside the vicinity of PHQ and PRC sites. All 20kV feeders within the PHQ and PRC sites shall be underground and installed in conduits.

Secondary electrical distribution system shall be 380/220 volt, 3-phase, 5 wire, 50Hz. Design of the electrical system within facilities shall include, but is not limited to (a) interior secondary power distribution system, (b) lighting and power branch circuit and devices, and (c) fire detection and alarm system. All electrical panelboards and feeders shall be designed for the ultimate demand loads, plus 25% spare capacity.

The underground medium voltage and low voltage distribution system shall be in direct buried schedule 80 UPVC duct-banks for non-traffic areas and concrete-encased under roadways and vehicular traffic areas. Ductbanks shall have 100mm minimum diameter and be buried at not less than 1220mm below grade. A spare conduit of equal size shall be provided for all duct-banks.

Manholes and handholes shall be provided at changes of direction of more than 40 degrees and elsewhere as required to limit the pulling tension and sidewall pressure on the cables during installation to acceptable levels as defined by the cable ,manufacturer. Manholes shall be provided for duct-banks with more than 2 ducts. Handholes shall be provided wherever a manhole is not required by quantity of ducts or by cable manufacturer's installation recommendations.

Manholes and handholes for ductbanks shall be constructed in accordance with UFC 3-550-03, Plates UG-1 through UG-7 for both traffic and non-traffic applications.

All panelboards shall be circuit breaker 'bolt-on' type panels. Minimum size circuit breaker shall be rated at no less than 20-amperes. All panels shall have copper bus bars. Circuit breakers shall be connected to bus bar(s) within the panelboards. Daisy chain (breaker-to-breaker) connection(s) are not acceptable. Indoor distribution panels shall be flush mounted in finished areas and surface mounted in unfinished areas. All circuit breakers shall be labeled with an identification number corresponding to the panel schedule. A 3-pole circuit breaker shall be a single unit and not made up of 3 single pole circuit breakers connected with a wire or bridge to make a 3-pole breaker. All branch circuit wiring shall be copper, minimum #4 mm^2 (#12 AWG) installed in metal conduit. Wiring shall be surface mounted in all areas. Power receptacles (outlets) shall be duplex type 220 V, 50 hertz, type CEE 7/7 with Earth Ground rated for 16A or better and shall be compatible with the required secondary power.

All splicing and terminations of wires shall be performed in junction or device boxes. Proper wire nuts/connectors shall be used for splicing wire. No twist-wire connections with electrical tape wrapped around it shall be acceptable. All electrical installation shall be in accordance with NEC. All building service entrance (service intake) panels shall be provided with kilowatt-hour (kWh) meters. A voltmeter and ammeter shall be provided also. All metering shall read true RMS values. Series rated equipment is not permitted. A digital power meter in lieu of a kWh meter, ammeter and voltmeter may be provided. Digital power meters shall meet or exceed ANSI/IEEE C37.90.1 All loads shall be coordinated to provide balanced loading. Phase imbalance at each panel shall not exceed 5%.

Voltage Drop for branch circuits shall be limited to no more than 3%; voltage drop from power source to loads shall be limited to no more than 5%.

All circuit breakers shall use down-stream coordination to ensure the breaker nearest a fault or overload is the first to trip.

8.6.1.1 GENERATOR POWER SYSTEM

Note: The full specification for the generator consists of this section, Generator Power System-Electrical Requirements for Generators, in combination with the Mechanical Requirements for Generators specification found in the Mechanical portion of this Section 01015.

The generator for the PHQ and PRC sites hall be rated at700kVA and 300kVA respectively. Generators shall have a radiator nameplate ambient temperature rating of 50 degrees centigrade and be derated as necessary for the altitude of the site. Installing a generator with a lower ambient temperature and de-rating it for 50 degrees centigrade is not acceptable. Generator shall be provided inside “weather-proof” (IP54 or better) enclosure. Each generator system shall be provided with a canopy and security fencing with access gate.

Generator fuel storage capacity shall be in accordance with Section 01010. For fuel storage requirements, see Mechanical paragraph: Generator Fuel Storage/Distribution.

8.6.1.2 GENERATOR POWER TESTING AND COMMISSIONING

The Contractor shall test generator power system in accordance with the Technical Specifications.

8.6.2 LIGHTING

Lighting shall be provided as indicated in the attached Standard Designs, except at buildings without complete design. In those facilities, the Contractor shall provide and design the lighting system. Design levels shall be per IES standards as a minimum. For convenience, the following lighting level table is listed. Note: all spaces listed below may not be within the work required within this contract.

Living room/Quarters	30 FC (350 Lux)
Toilets, Showers, Latrines, washrooms	20 FC (200 Lux)
Mechanical/Electrical rooms	30 FC (300 Lux)
Corridors and Stairways	20 FC (200 Lux)
Offices (private)	30 h/3 v FC (300 h/30 v Lux)
Office areas (open)	30 h/5 v FC (300 h/50 v Lux)
Kitchens (commercial)	50 h/3 v FC (500 h/30 v Lux)
Dining Areas	20 h/3 v FC (200 h/30 h Lux)
Auditoriums (social)	5 h/3 v FC (50 h/30 v Lux)
Conference/Training	30 h/5 v FC (300 h/50 v Lux)
Armories	30 h/3 v FC (100 h/30 v Lux)
Patient Rooms (general)	Per UFC 4-510-01
Patient Rooms (critical)	Per UFC 4-510-01
Egress path (incl. exterior)	10 Lux
Areas adjacent to egress path	0.5 Lux

FC = Foot Candle

h = horizontal component

v = vertical component

Area lighting for the Motor Pool shall have photocell controlled switches.

Indoor lighting for all areas shall consist of fluorescent surface mounted light fixtures. Exterior lighting shall be HID high pressure sodium Area lighting for the Motor Pool shall have photocell controlled switches. Moisture resistant/waterproof fluorescent light fixtures shall be provided in high humidity and wet areas such as latrines, showers and at exterior applications. Battery powered 'emergency' and 'exit' lights shall be provided within each building, as applicable, for safe egress during a power outage. All light fixtures shall be factory finished, complete and operational, to include but not be limited to, lens, globe, lamp, ballast etc. Industrial type fluorescent light fixtures shall not be used. Every room shall be provided with a minimum of one light switch. Light fixtures shall be mounted approximately 2.5-meters (8 feet) above finished floor (AFF) minimum. Fixtures may be pendant or ceiling mounted, depending on the ceiling type and height.

8.6.3 LIGHT FIXTURES

Lighting fixtures shall be a standard manufacturer's product. Fluorescent surface mounted light fixtures shall be power factor corrected and equipped with standard electronic ballast(s). All light fixtures shall properly operate using standard lamps available locally. Fixtures shall be fully factory wired and designed for appropriate application i.e. appropriate for that location where installed.

8.6.4 EMERGENCY "EXIT" LIGHT FIXTURES

Emergency "EXIT" light fixture shall be provided in accordance with NFPA requirements. Fixtures shall be single or double sided as required by the location and for wall/ceiling mounting. Unit shall illuminate continuously and be provided with self-contained nickel cadmium battery pack, to operate on floated-battery or trickle charge circuit. Fixture shall operate satisfactorily for 90 minutes during a power outage. Unit shall have test/re-set button and failure indication lamp. Primary operating voltage shall be 220 volts. Lettering "EXIT" in both Pasto and Dari, shall be color red and not less than 6 inches (150 mm) in height and on matte white background. Illuminations shall be with LEDs.

8.6.5 SEARCH LIGHTS

Searchlights shall be equivalent to the following:

- Prison grade
- Nickel reflectors (bullet resistant)
- 65 million candlepower (1,000 watts)
- Manual operation from below with one hand
- Xenon lamp
- Weatherproof design

8.6.6 EMERGENCY LIGHTING

Battery powered emergency lights shall be provided within each building per NFPA for safe egress during power outage. Fixtures shall be provided with self-contained nickel cadmium battery pack to operate on stand-by circuit for 90-minute minimum. Unit shall have test/re-set button and failure indication lamp. Normal operating voltage shall be 220volts. Emergency lighting fixtures shall be connected to the normal lighting system.

8.6.7 LIGHT SWITCHES

Light switch shall be single pole. Minimum of one light switch shall be provided in every room. Lighting in large rooms/areas may be controlled from multiple switches.

8.6.8 RECEPTACLES

All receptacles shall be duplex, unless otherwise specified in this section, the NEC, or other referenced standard.

Receptacles shall be spaced per NEC at a maximum of 2 meters (6 feet). Areas with computer work-stations or similar equipment will have additional receptacles. All circuits in wet/damp areas or within 1 meter (~3 feet) of sinks, lavatories, or wash-down areas shall have ground fault circuit interrupter (GFCI) type or residual current

disconnect (RCD) type, as required per NEC. Total number of duplex receptacles shall be limited to six (6) per 16-ampere circuit breaker.

8.6.9 CONDUCTORS

All cable and wire conductors shall be copper. Conductor jacket and insulation shall be color coded to satisfy NEC requirements. The use of 75 or 90 degree C (minimum) terminals and insulated conductors is required. Use of higher degree C rated conductors on circuits with protective device terminals rated at a lower degree C is allowed but must be de-rated to the rating of the device terminals. Conductors sized No. 8mm and larger diameter shall be stranded. Conductors sizes No. 6mm and smaller diameter shall be solid, except that conductors for remote control, alarm, and signal circuits, classes 1, 2, and 3, shall be stranded unless specifically indicated otherwise. Conductors shall be sized per NEC requirements.

8.6.10 GROUNDING AND BONDING

Grounding and bonding shall comply with the requirements of NEC. Underground connections shall be exothermally welded. All exposed non-current carrying metallic parts of electrical equipment in the electrical system shall be grounded. Insulated grounding conductor (separate from the electrical system neutral conductor) shall be installed in all feeder and branch circuit raceways. Grounding conductor shall be green-colored, unless the local authority requires a different color-coded conductor. Ground rods shall be 20 millimeters (0.75 inches) in diameter and 3 meters (~10 feet) long made of copper-clad steel. Final measurement of the ground resistance shall be in compliance with the requirements of the local authority but shall not exceed 25 ohms when measured more than 48 hours after rainfall.

8.6.11 ENCLOSURES

Enclosures for exterior and interior applications shall be NEMA Type 3S (IEC Classification IP54) and NEMA Type 1 (IEC Classification IP10) respectively.

8.6.12 FIRE DETECTION & ALARM SYSTEM

The Contractor shall install hardwired initiating devices and notification appliances to provide local alarm only.

Initiating devices and notification appliances shall be provided as required by the latest edition of NFPA 72. Each initiating device shall be capable of alarming all notification devices within the same building/structure when activated. All initiating devices and notification appliances shall be interconnected per NFPA 72 and hard-wired to AC power supply. The initiating devices and notification appliances will operate on battery only if site power is lost.

8.6.13 TRANSIENT VOLTAGE SURGE SUPPRESSION (TVSS)

Transient Voltage Surge Suppression shall be provided utilizing surge arresters to protect sensitive and critical equipment. As a minimum TVSS protection shall be provided at each panel serving electronic loads and shall be shown on the panel schedule. It is recommended that Metal Oxide Varistors (MOV) technology be used for such applications.

8.6.14 CONDUIT RACEWAY SYSTEM

Metal conduit (EMT) system shall be complete, to include but not limited to, necessary junction and pull boxes for all surface mounted conduit systems. Surface mounted nonmetallic raceways shall not be allowed. Smallest conduit size shall be no less than 20mm in diameter. All empty conduits shall be furnished with pull wire or cord or rope (depending on the size of conduit and length of run). System design and installation shall be per NEC requirements. Exterior conductors below grade shall be installed in concrete encased PVC conduit at a depth of 1220 millimeters.

8.6.15 CABLE TRAY RACEWAY SYSTEM

Cable trays shall be galvanized steel or aluminum wire mesh type and provided with, but not limited to, splices, end plates, dropouts and miscellaneous hardware. System shall be complete with manufacturer’s minimum standard

radius and shall be free of burrs and sharp edges. Nominal width of cable tray shall be 300mm. Nominal depth shall be 100mm. System design and installation shall be per NEC requirements.

8.6.16 IDENTIFICATION NAMEPLATES

Major electrical equipment, such as transformers, panelboards, and load centers, etc. shall be provided with permanently installed engraved identification nameplates. Nameplates or labels shall indicate the source feeding each piece of major electrical equipment.

8.6.17 SCHEDULES

All panel boards and load centers shall be provided with a directory. Directory shall be typed written in English, Dari and Pashto. The directory shall identify the conductor color code present in the panel. The directory shall also indicate the source where the panelboard/loadcenter is fed from.

8.6.18 SINGLE LINE DIAGRAM

Complete single line diagrams shall be provided for all systems installed. All major items in each system shall be identified and labeled for respective ratings. Single line diagrams for each system, installed in a clear plastic frame, shall be provided. Most current version of design, based on current design review, shall be kept on project site at all times for reference, and updated with redline edits to show any and all variations from the drawings.

9.0 COMMUNICATIONS

9.1 APPLICABLE SPECIFICATIONS

The Publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by designation only.

United States Department of Agriculture, Rural Utilities Service

RUS Bulletin 1751F-643 (2002) Underground Plant Design

RUS Bulletin 1751F-644 (2002) Underground Plant Construction

RUS Bulletin 1753F-151 (2001) Construction of Underground Plant, Parts II & III

ANSI TIA/EIA 606-A (2002) Administration Standard for The Telecommunications Infrastructure

ANSI TIA/EIA 607-A (2002) Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications

ANSI TIA/EIA 569-B (2004) Commercial Building Standard for Telecommunications Pathways and Spaces

ANSI TIA/EIA 758-A (2004) Customer-owned Outside Plant Telecommunications Infrastructure Standard

9.2 COMMUNICATION SYSTEM

The communications system for this project is to be RJ45 outlets (for telephone and data), and empty conduits designed, supplied and constructed by the Contractor. Communications wiring is by others. The design and construction of the systems shall be in accordance with the references and the requirements contained herein.

9.3 EXTERIOR COMMUNICATION SYSTEM

The Contractor shall design, provide and install the exterior communications infrastructure system. The system shall include but is not limited to communications manholes, hand-holes, and underground ductbank. The Contractor shall coordinate the communication system with the power distribution system to distribute communications to the compound’s facilities as required. The distribution system shall be an underground system. Communications manholes and handholes shall not be shared with other utilities. Manholes and handholes shall be either cast-in-place or precast concrete. Manholes minimal interior dimensions shall be 3.66m L x 1.83m W x 2.13m H. Hand-holes minimal interior dimensions shall be 1.22m L x 1.22m W x 1.22m H. The minimum concrete thickness shall be

127mm for walls, 152mm for roof, and 127mm for the floor. The quality of the concrete pour and the construction of the manhole and hand-hole shall be such that the rebar or visible rock shall not be seen in the surface of a wall. In other words, the pour shall not have any voids. The maximum distance between manholes and/or hand-holes shall be 170 m. Place a manhole or hand-hole at all 90 degree turns. The ducts shall be direct buried with a minimum of 600 mm of properly tamped dirt/backfill on the top. Hand-holes shall be installed in laterals in between manholes and buildings and only where the distance between the main duct system and the building is 100 meters or more. The maximum number of ducts in a hand-hole wall shall be two, with one having four (4) inner ducts installed unless there are two buildings close by and can be fed from one hand-hole. In this case, four (two with inner ducts) conduits can be installed in the walls. Manholes and hand-holes shall be installed on a leveled, crushed, washed gravel base of sufficient depth, i.e., a minimum thickness of 150 mm under the entire manhole, to allow for drainage and stability. Where manholes and hand-holes are installed in roadways or areas subject to vehicular traffic, the structure and lid (cover) shall support heavy vehicular traffic. Manholes and hand-holes shall be equipped with corrosion-resistant pulling irons and cable racks that are grounded and with a sump for drainage. Cable racking diagrams (manhole/hand-hole butterflies) shall be provided for the manholes and hand-holes. See accessories chart below for additional requirements.

Manhole and Hand-hole Accessories	HANDHOLE 1.22m X 1.22m X 1.22m	MANHOLE 3.66m X 1.83m X 2.13m
Bonding Ribbon 16mm	20	65
Bonding Ribbon Clamps	12	20
Cable Rack 762mm	4	
Cable Rack 47 Hole		14
Corner Cable Rack Support		8
Cable Rack Hook 191mm	8	14 minimum
Cable Rack Standoff Bracket	9	12
Concrete Collar 152mm	1	1
Cover (Lid) 762 Diameter	1	1
Frame Support Structure for Lid	1	1
Ground Rod 19mm X 3m	1	1
Ground Rod Clamp 19mm	1	1
Metal Hit Anchor	10	20
Pull-In Irons	4	4
Sump	1	1

9.4 EXTERIOR CONDUIT

The underground conduit for the manhole and duct system shall be direct buried (600 mm below surface), 100 mm DB type PVC or schedule 80, PVC. Inner ducts shall be four (4) 25 mm PVC or PE inner ducts field installed in the outer-duct. The inner ducts shall be installed in the duct face and secured with properly sized duct plugs which expand to seal the duct. The ducts shall be stubbed up, sealed, capped and tagged in the communications equipment room, and shall be sealed, capped, tagged and marked at the other end. Empty ducts shall be sealed with a mechanical, screw-type, reusable duct plug. The ducts will be concrete encased when install under roadways or areas subject to vehicular traffic. The ducts (inner and outer) shall be listed on the RUS list of materials acceptable for use on RUS projects. The minimum duct configuration in the main duct system (manhole to manhole) shall be a

four (4) way ductbank, two conduits wide by two conduits deep (2 X 2) with one of the conduits having inner-ducts installed. Laterals off of the main duct system (manhole/hand hole to building) shall be a 2 way (1x2) with one duct having inner ducts. All conduits shall be terminated in ABS plastic terminators cast into the walls of the concrete structures. In manholes, all conduit windows shall be recessed. Pull wire/rope must be provided in all conduits. Conduits shall enter the manholes and hand-holes in the lower portion of the knockout window to simplify future conduit additions.

9.5 TELEPHONE/DATA CABLING DISTRIBUTION SYSTEM FOR EACH BUILDING

The Contractor shall design, provide and install the building communications infrastructure system. The system shall include but is not limited to communications equipment racks, conduit, pull boxes, communications outlet boxes, and communications grounding/bonding infrastructure. Provide communications outlet boxes at all workstation locations in the open office, private office and receptionist areas. Outlet boxes shall be a single gang box (51 mm x 102 mm x 57 mm) or double gang box (119 mm x 119 mm x 57 mm boxes). The Contractor may use an equivalent sized outlet box. Conduit shall be installed from each outlet box location to the communications equipment rack location. Label the conduit on both ends with room number and outlet box number. Equipment racks shall be standard 475mm wide steel telecommunications racks. Provide all empty conduits with a pull rope. Properly sized metallic conduit and cable tray shall be used as appropriate to distribute the telephone/data cabling throughout the building. Minimum conduit size shall be 20 mm inside diameter. Pull boxes shall be placed in conduit runs where a continuous conduit length exceeds 30 meters or where there are more than two 90-degree bends. Pull boxes shall be placed in straight runs of conduit and shall not be used in lieu of a bend. Equipment racks shall have a minimum 900 mm of space both in front of and behind the rack and behind any installed equipment. A minimum side clearance of 600 mm shall be provided on end racks.

9.6 TELECOMMUNICATION GROUNDING AND BONDING

The Contractor shall provide a grounding and bonding system in accordance with ANSI TIA/EIA 607-A. The grounding system shall include but is not limited to a Telecommunications Main Grounding Busbar (TMGB), Telecommunications Grounding Busbars (TGB) where applicable, Telecommunications Bonding Backbone (TBB), Grounding Equalizer (GE), and Bonding Conductors.

9.7 LOUDSPEAKER AND ALARM SYSTEM

Install Loud Speaker & Alarm System that can alert the entire compound via panic button from any tower or guard post station. Loud Speaker & Alarm System shall include, but is not limited to central control stations, high power speaker arrays (HPSA), communication links, and ancillary equipment. Central control stations shall operate and control the system. Loud Speaker & Alarm System shall be capable of providing intelligible live and pre-recorded voice signals. The system shall include tones for conventional attack warning, non-conventional attack warning, all clear, and a system test tone. Speaker & Alarm System shall be exterior grade components to withstand severe weather conditions of cold, heat, rain, sleet, and dust storms and to be completely understandable during these conditions from any point within the compound. All wires shall be installed in conduits.

9.7.1 CENTRAL CONTROL STATIONS

Loud Speaker & Alarm System shall be provided with at least one primary and one redundant central control station. The locations of the central control stations shall be coordinated with the Contracting Officer's Representative. The primary central control station should be located at the command post or similar location. The redundant central control center should be located at a physically separate location such as a security forces building, military police station, fire station, or emergency services office. The central control stations shall control the operation of outdoor speakers. Each central control station shall be equipped with batteries to supply power for a minimum of 4 hours of full-load operation. Control stations shall be capable to provide automatic status reporting for each HPSA and for all activations and the status of the activations. The controls shall provide an alarm summary report that provides a historical report for all changes of status, including all troubles, equipment failure, power system trouble (including normal and emergency power), unsolicited messages, tamper/supervision of the enclosure for the HPSA electronics, amplifier status, last activation and synchronization error, operator log on and log off, and configurable reports for time-based events such as "report all troubles from 1/01/04 to 6/30/04." Control stations shall feature multiple levels

of password protection, including levels for system operators, maintainers, supervisors, and military commanders. The control stations shall be capable to deliver at least two essentially concurrent voice messages: one for threatened areas or buildings and one for adjacent areas or buildings. This includes the capability for two pre-recorded voice messages, or one live and one pre-recorded voice message. The control station shall have the capability to target specific messages to any individual HPSA, zone of HPSAs, or to all areas on the installation

9.7.2 HIGH POWER SPEAKER ARRAYS (HPSA)

HPSAs shall be arranged into zones so that each zone can be individually controlled by the control station. HPSAs shall be designed with directional characteristics that will minimize the distortion of voice signals by interface from other zones. HPSAs shall be designed to maintain the intelligibility of voice signals within the zone at a level no less than 0.8 on the Common Intelligibility Scale (CIS) or 0.7 on the Speech Transmission Index (STI) during normal weather conditions in special outdoor areas such as those with a high concentration of multi-story buildings in close proximity. Parade grounds, training fields, and similar outdoor areas should also be provided with this higher intelligibility. Intelligibility may be less than 0.8 CIS in areas of the zone if personnel can determine that a voice signal is being broadcast and could walk less than 25 m to find a location in the zone with a CIS score of at least 0.8. It is necessary to control the occupational noise exposure to personnel from the HPSA. Sound levels at any location where personnel may be located, including directly underneath the HPSA, shall not exceed 120 decibels (adjusted) (dBA) when measured on the A-scale of a standard sound level meter at slow response. Do not exceed 85 dBA at the location of the individual HPSA equipment cabinet for those HPSAs designated to be furnished with a local microphone. Each HPSA site for each zone shall include a field-mounted local control unit, microprocessor, amplifier, standby batteries, charger, power supply, radio, mounting brackets and loudspeaker assembly for pole or building mounting. Designated HPSA sites shall be capable of microphone input and shall be provided with a microphone designed to prevent feedback at that particular microphone location. All external conductors (conductors passing outside of the HPSA equipment cabinet) shall be provided with surge suppression tested to Underwriters Laboratories, Inc. (UL) standards. The HPSA control units shall feature a digitally addressable controller. The HPSA control units shall receive and store messages via the primary (and redundant, if required) communication link with a confirmation signal sent back to the primary and redundant central control stations. Provide a charger/ power supply that will accept alternating current (AC) input, backup electrical power generator input, battery input, or solar power cell input. The HPSA control units shall have the capability of storing pre-recorded messages. The HPSA control units shall provide a minimum of 7 standard tones. In addition, the systems shall have the capability to provide custom tones. Provide a tamper switch that will signal the central control station that the HPSA enclosure door is open. All equipment for each HPSA speaker site shall be housed in modular, mountable cabinets suitable for the local environmental conditions, including space heaters and ventilation fans, as appropriate. Speakers shall be able to operate between temperatures of -40 degrees Celsius (C) (-40 degrees Fahrenheit (F)) to +60 degrees C (+140 degrees F). Enclosures shall protect the HPSA control unit from external temperatures ranging from -40 degrees C (-40 degrees F) to +60 degrees C (+140 degrees F). The height shall not be less than 9 m (30 ft) or greater than 18 m (60 ft) above ground level. Poles shall be spun aluminum or galvanized steel poles. HPSA equipment cabinets shall be mounted on the elevated supporting structure with the top of the enclosure no more than 3 m (10 ft) above ground level. The equipment cabinet and power boxes must be capable of being locked shut.

9.7.3 COMMUNICATIONS LINKS

Primary communications shall use radio frequency-type systems that comply with National Telecommunications and Information Administration (NTIA) requirements. The systems shall be designed to minimize the potential for interference, jamming, eavesdropping, and spoofing. Confirm that the devices conform to regulations and obtain the approval from the authority having jurisdiction prior to using radio frequency-type devices. Redundant communication means (when required) should be established using several alternate wireless radio frequency paths to the radios. The redundant communication means might be accomplished by using the communications backbone network (e.g., optical fiber cable). In this case, the central control units should accomplish this by being directly connected to the backbone network. Communications equipment furnished as part of the wide area MNS shall be commercial off-the-shelf (COTS). All programming codes or passwords required to access, update, modify, and maintain the communications equipment shall be provided no later than the date of final system acceptance. Full system supervision shall be provided. Notification of system alarm, supervisory, and trouble signals shall be provided to the central control stations within a time period not to exceed 200 seconds. The communications

systems shall provide self-test and diagnostics capabilities. Local diagnostics information shall be transmitted to the central control stations.

-END OF SECTION-

SECTION 01040
SECURITY

1.0 SPECIFIC CONTRACT SECURITY ASSESSMENT

The Contractor will construct the Project in an active war zone where International Security Assistance Forces (ISAF) may conduct offensive and defensive operations against a variety of hostile forces, to include members of the Taliban. The Contractor understands that it may not receive any support whatsoever in securing the Project site and in securing the transportation of materials to the Project site. Neither U.S. Government nor other ISAF forces are available to provide exclusive security for the Project. The Contractor is responsible for securing the Project site and in securing the transportation of materials to the Project site. The Contracting Officer possesses no ability to control the operations of either ISAF or hostile forces. The Government, acting in its sovereign capacity in its prosecution of its operations, may take actions which directly or indirectly affect the Contractor. These kinds of acts are general in application, not specifically directed at the Contractor. The Contractor recognizes that such actions may be taken, and that they will not entitle the Contractor to make claims for excusable or compensable delays. The Contractor possesses sufficient information about the specific security situation at the site to enable it to formulate an appropriate security plan. The Contractor understands that the security situation at the Project is subject to significant transformation in a short time span based on the changing operational picture in the region. The Contractor's security plan will take this factor into account.

At Afghanistan National Police Program project sites, it is anticipated the contractor's Life Support Areas (LSA) will be situated within the area defined by the License for Construction (LfC). It is the contractor's sole responsibility to ensure that the location of the LSA is acceptable to ANP. The Government shall not be responsible for the cost of moving LSA, unless the move is directed by the Contracting Officer in writing

GOVERNMENT PREREQUISITES TO CONTRACTOR DEPLOYMENT OF SITE SECURITY PERSONNEL

The following regulations and policies apply to Contractor-Provided Site Security Personnel:

a. DODI 3020.41; **Contractor Personnel Authorized to Accompany the U.S. Armed Forces**; 3 OCT 2005 (available at www.dtic.mil/whs/directives/corres/pdf/302041p.pdf).

b. DODI 3020.50; **Private Security Contractors (PSCs) Operating in Contingency Operations**; 22 JUL 2009 (available at www.dtic.mil/whs/directives/corres/pdf/302050p.pdf).

c. USCENTCOM Contracting Command, **Acquisition Instruction**; 5 NOV 2010 (available at http://c3-training.net/policy.html).

d. DFARS Subpart 225.74, Defense Contractors Outside the United States.

The Contractor understands its responsibilities under these regulations, policies, and standard contract clauses, as well as its responsibilities under Afghan law, with regard to its contracts for and employment of security personnel. The Contractor is not authorized to deploy any site security personnel until it complies with all prerequisites identified in these references. The Contractor acknowledges that its repeated failure to comply with these regulations, policies, and standard contract clauses constitute grounds for the Government to terminate the Contractor for default.

2.0 GOVERNMENT REPRESENTATIVES

During the Project, USACE may disseminate essential security information to the Contractor and will attempt to assist with any Contractor's questions and concerns. The USACE Area Office OIC/NCOIC will serve as the Area Office Security Officer and the Resident Office OIC/NCOIC will serve as the Resident Office Security Officer (collectively "the Security Officers").

3.0 SECURITY COORDINATION

Contractor will be required to coordinate construction site security with any Afghan or Coalition Forces and Local Governments that are available, if any, to assist the Contractor on a case-by-case basis. Coordination does **not** include nor imply making any unauthorized or illegal payments to the local ANA/ANP or Local/Provincial Government Officials for permission or protection to construct the project. The Contractor will immediately inform the Government if asked to make any such payments, and the Government will provide further direction to the Contractor. Corruption will not be tolerated at any level, under any circumstances. Conducting business in this manner will be grounds for termination of the contract.

4.0 SECURITY PLAN

The Security Officers will review and approve all current and future Contractor security plans prior to submittal approval by the authorized representative of the Contracting Officer. The Security Officers shall ensure that all Contractor security plans are in accordance with the Contract requirements. The security plans shall address movement of Contractor labor, material, and equipment. The Security Officers will lead the quality assurance program to ensure Contractors are executing their approved security plans. The Government will not allow the Contractor to start work on the Project site without an approved security plan.

4.1 SECURITY RATING

Each contract or task order will be assigned a rating by the Area Office Security Officer. This rating will determine the level of approval for the security plan. Assistance from the District's J2/J3 may be required to assess the rating. Ratings and approval levels are below:

a. Extremely High Risk: District Commander

b. High Risk: Deputy CDR, Chief of E&C, Area OIC, J2 OIC, or J3 OIC

c. Moderate Risk: Chief of Construction, Area OIC/NCOIC, or Area Engineer

d. Low Risk: Resident OIC/NCIOC, Resident Engineer

The rating assigned is in no way an indication that the security situation at the site will remain at a constant level throughout the Project.

4.2 SITE SECURITY FOR PROJECTS OUTSIDE OF ACTIVE COALITION FORCE BASES

4.2.1 STATIC REQUIREMENTS FOR SITE SECURITY

The Contractor is shall develop a site security plan and program to provide 24 hr/7 days a week security for the project site throughout the performance of the contract. The security plan must consider all construction-related sites; batch plants, material sources, stockpiles, worker camps and any other location where there is a major construction effort. The Contractor shall perform all required actions to protect the construction site compound from theft and vandalism and personnel from physical harm. Site perimeter security shall prevent unauthorized site access and provide safety protection to the Contractor workforce and government personnel for the duration of the project. These measures are strictly for the protection and defense of the on-site people and property; Contractors are not authorized to conduct any type of offensive operations.

4.2.2 DYNAMIC REQUIREMENTS FOR TRANSPORTATION

The Contractor shall develop a transportation security plan and program to provide continuous security for all transportation movements for the Project throughout the performance of the contract. The transportation security plan must consider all construction-related transportation movements, including the transportation of materials, equipment, personnel, and other items and individuals to the site. The Contractor shall perform all required actions to protect the construction transportation movements from theft and vandalism and personnel from physical harm. These measures are strictly for the protection and defense of the people and property being transported; Contractors are not authorized to conduct any type of offensive operations.

4.3 ESTIMATED THREAT ASSESSMENT

For both the site security plan and the transportation security plan, the Contractor shall develop a site security plan to cover a range of security operations from low to high threat. Included in this security plan will be the capability for a surge of manpower and equipment required during high threat conditions. The Contractor shall to notify all on-site personnel of increased threats and protective action to take.

4.4 ADDITIONAL CIVILIAN ARMING REQUIREMENTS

The Contractor must include in its security plans, and must continue to maintain throughout the Project, current information on the following items for all its armed civilian personnel:

a. MOI license number,
b. AISA license,
c. Armed Contractor & subcontractor company names,
d. Contract number/title
e. Contracting agency (USACE-AES)
f. Type of work
g. Number/type of weapons authorized,
h. POC for company with contact details
i. Government Contracting Officer and COR with contact details
j. Number of security personnel by type (U.S., Afghan, Other),
k. Company's country of registration/origin, names,
l. Photos
m. Tazkira numbers of security personnel as well as those personnel with access to weapons/ammo and those persons who will be handling or transporting explosives.

In addition the Contractor will immediately update any change to the coordinates of the Contractor's base camps, quarries, and current work locations. The Contractor shall include in both the site security plan and the transportation security plan a list of the chain of command.

5.0 SECURITY PLAN SUBMITTAL REQUIREMENTS

Contractors will submit all security plans in accordance with contract Section 01335 – Submittal Procedures for Projects.

6.0 COMMUNICATION

The Contractor will operate a 24/7 security operations center with communication capability to each guard on duty and the ability to notify all on-site personnel of increased threats and protective actions to take. The operations center will also have 24/7 communication with the local Coalition, ANA, or ANP security forces. The Contractor shall have communication with the Resident Office Security Officer at all times for rapid emergency response; the Resident Office Security Officer will give the Contractor the District J2/J3 contact information. Communication can be via cell phone, email, satellite phones, VHF, HF, CODAN, text, or other communication technologies compatible with the Government's capabilities. The Contractor will provide the Government with their contact information (names, numbers, frequencies, email addresses, transponder IDs, etc.) for the site encompassing all available communication means.

7.0 CONTRACTOR PROVIDED EQUIPMENT

The Contractor will provide the operational security equipment including but not limited to weapons, radios, uniforms, vehicles, vehicle fuel, phones, and other equipment as proposed by the Contractor to provide complete site and transportation security.

8.0 KEY CONTROL

The Contractor shall establish and implement methods in writing to ensure that all keys issued by the Contractor are not lost or misplaced and are not used by unauthorized persons. The Contractor shall develop procedures covering key control that will be included in their quality control system (See Section 01451). The project managers will keep a master log of all keys and provide a copy to the contracting officer's representative (COR) for verification. If a key is lost or stolen, the Contractor shall pay to have all impacted locks changed/rekeyed immediately.

9.0 CRITICAL INFORMATION TO REPORT

The Government is responsible for the management and oversight of DOD Contracted AC/PSCs delivering services throughout Afghanistan. Given the impact of either Contractor misbehavior or catastrophic attacks against Contractors, it is critical that information regarding AC/PSC incidents is communicated quickly and accurately to the Government for purposes of management, fact-finding, and mitigation where necessary. The Government must receive the information addressed below. The Contractor will report any of these information requirements immediately to the Resident Office Security Officer:

a. AC/PSC Escalation of Force to include the use of weapons resulting in the death or injury of an Afghan citizen, coalition, or U.S. service member, other government official, or Contractor

b. AC/PSC accidents, traffic, or otherwise, resulting in the death or injury of an Afghan citizen, coalition, or U.S. service member, governmental official, or Contractor.

c. Attacks against AC/PSC activities by Anti-Afghan Forces resulting in the death or injury of an Afghan citizen, coalition or US service member, governmental official, or Contractor.

d. Reports of "lost convoys." These are AC/PSC escort or independent activities which have lost contact with their companies.

e. AC/PSC Escalation of Force, accidents, or other activities that result in significant damage to Afghan or USG vehicles, materials or facilities.

f. Anti-Afghan Force actions including small arms fires (SAF), RPG fire, indirect fire (IDF), improvised explosive devices (IEDs), and/or complex attacks against AC/PSC activities.

g. Contractor accidental or negligent discharge of a weapon.

--END OF SECTION--

SECTION 01060
SPECIAL CLAUSES

1. GENERAL

1.1 PRECONSTRUCTION CONFERENCE

1.1.1 SCHEDULE OF MEETING

At the earliest practicable time, prior to commencement of the work, the Contractor and any Subcontractors whose presence is necessary or requested, shall meet in conference with representatives of the Contracting Officer to discuss and develop a mutual understanding relative to the details of the administration and execution of this contract. This will include but not necessarily be limited to the Contractor's Quality Control (CQC) Program, the Contractors Accident Prevention Program, submittals, correspondence, schedule, access to the work site, security requirements, interface requirements, temporary facilities and services, hazards and risks, working after normal hours or on weekends or holidays, assignment of inspectors, representations, special requirements, phasing, and other aspects of this project that warrant clarification and understanding.

1.1.2 MEETING MINUTES

It shall be the responsibility of the Contractors CQC System Manager to prepare detailed minutes of this meeting and submit those minutes to the Contracting Officer for approval within three (3) workdays. Any corrections deemed necessary by the Contracting Officer shall be incorporated and resubmitted within two (2) calendar days after receipt. Upon approval of the minutes by the Contracting Officer, the Contractor shall distribute the minutes to all parties present or concerned.

1.2 PROJECT MANAGEMENT & SUPERVISION

Provide at least one (1) qualified Project Manager and one (1) on-site Project Superintendent. Both shall comply with the English speaking requirements. The Project Manager must have a minimum 5 years experience as a Project Manager or Superintendent on projects like this contract or similar in size and complexity. The Project Superintendent must have a minimum of 5 years experience as a Superintendent on projects similar in size and complexity.

The Project Manager in this context shall mean the individual with the responsibility for the overall management of the project and the Project Superintendent shall mean the individual with the responsibility for quality and production. Both the Project Manager and Project Superintendent are subject to removal by the Contracting Officer for non-compliance with requirements specified in the contract and for failure to manage the project to insure timely completion. Furthermore, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time for excess costs or damages by the Contractor.

Approval of Project Manager and on-site Project Superintendent is required prior to start of construction. Provide resumes for the proposed Project Manager and on-site Project Superintendent describing their experience with references and qualifications to the Contracting Officer for approval. The Contracting Officer reserves the right to interview the proposed Project Manager and on-site Project Superintendent at any time in order to verify the submitted qualifications.

1.3 AREA USE PLAN

The Contractor shall submit to the Contracting Officer, within ten (10) calendar days after award of this contract, an Area Use Plan designating intended use of all areas within the project boundaries. This plan shall include, but not necessarily be limited to the following: the proposed location and dimensions of any area to be fenced and used by the Contractor; construction plant and building installations/the number of trailers and facilities to be used; avenues of ingress/egress to the fenced areas and details of the fence installation; drawings showing temporary electrical installations; temporary water and sewage disposal installations; material storage areas; hazardous storage areas.

Any areas that may have to be graveled shall also be identified. The plan shall also include a narrative description of the building structural system, the site utility system and the office or administration facilities. The Contractor shall also indicate if the use of a supplemental or other staging area is desired. The Contractor shall not begin construction of the mobilization facilities prior to approval by the Contracting Officer of the Area Use Plan described herein.

1.4 CONTRACTOR'S MOBILIZATION AREA

The Contractor will be permitted to use an area approved by the Contracting Officer within the contract limits for operation of his construction equipment and plants, shops, warehouses, and offices. Utilities will be provided for the Contractor as described below. The Contractor is responsible for obtaining any required additional mobilization area above that designated. The construction site shall be cleared of construction debris and other materials and the area restored to its final grade.

1.4.1 CONTRACTOR'S TEMPORARY FACILITIES

1.4.1.1 GENERAL

All facilities within the Contractor's mobilization area shall be of substantial construction suitable for the local weather conditions. Sanitary facilities shall meet the requirements of Corps of Engineers, Safety and Health Requirements Manual EM 385-1-1. Local nationals will not be granted any privileges under this contract. Government provided services are for American and Foreign national contractors only.

1.4.1.2 ADMINISTRATIVE FIELD OFFICES

The Contractor may provide and maintain administrative field office facilities within the mobilization area at the designated site. Government office and warehouse facilities will not be available to the Contractor's personnel.

1.4.1.3 STORAGE AREA

The Contractor shall construct a temporary 1.8 meter (6 foot) high chain link fence around trailers and materials. The fence shall include plastic strip inserts, colored green or brown, so that visibility through the fence is obstructed. Fence posts may be driven, in lieu of concrete bases, where soil conditions permit. Trailers, materials, or equipment shall not be placed or stored outside the fenced area unless approved in writing by the Contracting Officer.

1.4.1.4 PLANT COMMUNICATION

Whenever the Contractor has the individual elements of its plant so located that operation by normal voice between these elements is not satisfactory, the Contractor shall install a satisfactory means of communication, such as telephone or other suitable devices. If radio communication is approved by Contracting Officer / installation security office, frequency selection shall be approved by Contracting Officer to prevent interference with installation operations. Such devices shall be provided by the Contractor and made available for use by Government personnel as requested.

1.4.1.5 APPEARANCE OF MOBILIZATION SITE FACILITIES AND/OR TRAILERS

Mobilization Site Facilities and/or Trailers utilized by the Contractor for administrative or material storage purposes shall present a clean and neat exterior appearance and shall be in a state of good repair. Trailers or other transportable structures which, in the opinion of the Contracting Officer, require exterior painting or maintenance will not be allowed on the construction site until such work or maintenance has been performed to the satisfaction of the Contracting Officer.

1.4.1.6 MAINTENANCE OF STORAGE AREA

Fencing shall be kept in a state of good repair and proper alignment. Should the Contractor elect to traverse unpaved areas which are not established roadways with construction equipment or other vehicles, such areas shall be covered

with a layer of gravel as necessary to prevent rutting and the tracking of soil onto paved or established roadways; gravel gradation shall be at the Contractor's discretion.

1.4.1.7 SECURITY PROVISIONS

Adequate outside security lighting shall be provided at the Contractor's temporary facilities. The Contractor shall be responsible for the security of its own facilities and equipment in accordance with Contract Section 01040.

1.4.1.8 SANITATION

a. Sanitary Facilities: The Contractor shall be responsible for maintaining such facilities at no expense to the Government.
b. Trash Disposal: The Contractor shall be responsible for collection and disposal of trash from the work areas and from the mobilization area. General construction debris and demolition debris shall be collected and transported by the Contractor to a location designated by the Government. Construction debris, waste materials, packaging material and the like shall be removed from the work site daily. Loose debris capable of being windblown, shall be immediately placed in sealed or covered containers to prevent it from being blown onto taxiways or runways. Any dirt or soil that is tracked onto paved or surfaced roadways shall be cleaned daily. Materials resulting from demolition activities that are salvageable shall be stored within the fenced area described above. Stored material not indoors, whether new or salvaged, shall be neatly stacked when stored.

1.4.1.9 TELEPHONE

The Contractor shall make arrangements to install and pay all costs for telephone facilities desired.

1.4.1.10 RESTORATION OF STORAGE AREA

Upon completion of the project and after removal of mobilization facilities, trailers, materials, and equipment from within the fenced area, the fence shall be removed and will become the property of the Contractor. Areas used by the Contractor for the storage of equipment or material, or other use, shall be restored to the original or better condition. Gravel used to traverse unpaved areas shall be removed and all such areas restored to their original conditions.

1.4.2 PROTECTION AND MAINTENANCE OF TRAFFIC

During construction the Contractor shall provide access and temporary relocated roads as necessary to maintain traffic. The Contractor shall maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the Contracting Officer. Measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, erection of barricades, placing of lights around and in front of equipment and the work, and the erection and maintenance of adequate warning, danger, and direction signs, shall be as required by the Host Nation and base authorities having jurisdiction. The traveling public shall be protected from damage to person and property. The Contractor's traffic on roads selected for hauling material to and from the site shall interfere as little as possible with base traffic. The Contractor shall investigate the adequacy of existing roads and the allowable load limit on these roads. The Contractor shall be responsible for the repair of any damage to roads caused by construction operations.

1.4.2.1 USE OF EXISTING ROADS AS HAUL ROUTES

The Contractor shall be responsible for coordinating with the base authorities for use of any existing roads as haul routes. Construction, and routing of new haul roads, and/or upgrading of existing roads to carry anticipated construction traffic shall be coordinated with the Base authorities and is the sole responsibility of the Contractor.

1.4.2.2 EMPLOYEE PARKING

The Contractor’s employees may be allowed parking on the military installation. The Contractor is responsible for transporting workers (local nationals) from off post to the worksite, coordinating security identification screening,

and cooperating in gate searches with the base authorities. The government reserves the right to terminate any and all contractor parking at any time.

1.4.3 TEMPORARY PROJECT SAFETY FENCING AND BARRICADES

The Contractor shall impose all measures necessary to limit public access to hazardous areas and to ensure the restriction of workers to the immediate area of the construction and mobilization site. The Contracting Officer may require in writing that the Contractor remove from the work any employee found to be in violation of this requirement.

1.4.3.1 BARRICADES

Barricades shall be required whenever safe public access to paved areas such as roads, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic. Barricades shall be securely placed, clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night. Travel to and from the project site shall be restricted to a route approved by the Contracting Officer.

1.4.4 HOST NATION AUTHORIZATIONS, PERMITS AND LICENSES

It shall be the Contractor's responsibility to obtain such local authorizations, permits and licenses necessary to establish his quarry operations, batching operations and haul routes (See Special Clause entitled: COMPLIANCE WITH HOST COUNTRY RULES AND CUSTOMS).

1.5 RESPONSIBILITY FOR PHYSICAL SECURITY

Prior to mobilization, the Contractor shall submit his proposed means of providing project security to meet the requirements of Contract Section 01040 and prevent unauthorized access to equipment, facilities, materials and documents, and to safeguard them against sabotage, damage, and theft. The Contractor shall be responsible for physical security of all materials, supplies, and equipment of every description, including property which may be Government-furnished or owned, for all areas occupied jointly by the Contractor and the Government, as well as for all work performed.

1.6 DUST CONTROL

The Contractor shall be required to control objectionable dust in the work areas, access roadways, and haul roads by means of controlled vehicle speeds or dust palliatives. Vehicles transporting sand, cement, gravel or other materials creating a dust problem shall be covered, as directed by the Contracting Officer, or in accordance with local Laws, codes, and regulations.

1.7 DIGGING PERMITS

1.7.1 REQUIREMENTS FOR DIGGING PERMITS

Prior to the start of any work activity that requires excavation within the current base; the Contractor shall obtain a digging permit.

1.7.2 REQUESTS FOR DIGGING PERMITS

Requests for Digging Permits shall be submitted to Contracting Officer a minimum of seven (7) days prior to the start of the work activity covered by the permit. The request for a Digging Permit shall include a narrative description of the work to be performed and a detailed map of the area of the excavation clearly marking the location of all known utilities or other obstructions. If the work activity covered by the Digging Permit request also requires a utility outage, a separate request for the outage shall be submitted in accordance with the paragraph entitled CONNECTIONS TO EXISTING UTILITIES.

1.7.3 PREPARATION OF REQUESTS FOR DIGGING PERMITS

Prior to submitting a request for a Digging Permit, the Contractor shall carefully review the area to be excavated to determine the location of existing utilities and other obstructions. The Contractor will review available drawings and will conduct a visual inspection of the site. The Contractor will utilize underground utility detecting devices such as metal and cable detectors to determine the location of existing utilities. All utility lines found shall be clearly flagged or marked and the location of the utility shall be shown on the drawing to be submitted with the request for Digging Permit.

1.7.4 EXISTING UNDERGROUND UTILITIES

The Contractor shall exercise utmost care in researching locations of existing utilities and reducing damage to existing utilities. Any utilities damaged by the Contractor shall be promptly repaired by the Contractor. The Contracting Officer will review and approve any proposed repairs. Any damage to existing utilities will be immediately reported to the Contracting Officer and the Base Commander.

1.8 CONNECTIONS TO EXISTING UTILITIES

1.8.1 GENERAL

Any outage involving disruption of electrical service beyond the site area shall be requested in writing at least ten (10) days in advance of the date requested for the commencement of the outage. The Contractor shall provide a request, detailing the type of outage needed (water, sewer, electrical, steam, etc.), the time needed to perform the work, the reason for the outage, and the known affected facilities. The Contracting Officer shall be contacted prior to the outage to confirm the time and date. If the Contractor fails to initiate work at the approved time, the Contracting Officer may cancel the approved outage and may direct the Contractor to resubmit a new request. No part of the time lost due to the Contractors failure to properly schedule an outage shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

1.8.2 EXISTING UNDERGROUND UTILITIES

The Contractor is provided notice that existing utilities may be present in the construction area. The Contractor shall exercise the utmost care in researching locations of existing utility lines by implementing control measures to eliminate, or reduce to a level acceptable to the Contracting Officer, the chance of damaging or destroying existing utilities.

1.8.3 USE OF UNDERGROUND UTILITY DETECTING DEVICE

Prior to any excavation, a metal and/or cable-detecting device shall be used along the route of the excavation. All underground utilities discovered by this method will be flagged a minimum distance of one-half (1/2) meter on each side of the location.

1.8.4 HAND EXCAVATION

Hand excavation methods and special supervisory care shall be used between any flagged markers, in areas of known or suspected hazards, and in areas known or suspected to have multiple and/or concentrated utility lines or connections.

1.8.5 REPAIR OF DAMAGED UTILITIES

The Contractor shall be responsible to repair any utilities damaged by him. The method of repair and schedule for performance of the repair shall be coordinated with, and subject to the approval of, the Contracting Officer. The repair work and any temporary work required to keep the system operational while repairs are being completed, shall be performed at no cost to the Government.

1.9 TEMPORARY OUTAGES OF EXISTING SERVICES

To minimize outage impact to the mission of the installation, all outages shall be scheduled on weekends or from 2100 – 0530 hours on duty days and/or as directed by Contracting Officer Representative (COR). The period proposed for performance of the outage shall include sufficient contingencies to preclude impact to the peak working hours 0530 – 1800 hours during the workweek.

1.10 WATER

The Contractor shall install and maintain necessary supply connections and piping for same, but only at such locations and in such manner as may be approved by the Contracting Officer. Water required for final testing, adjusting and balancing of HVAC systems will be furnished by the Government. Before final acceptance of systems, or facilities, all temporary connections and piping installed by the Contractor shall be removed at his expense in a manner satisfactory to the Contracting Officer.

1.11 ELECTRICITY (CONTRACTOR PROVIDED)

Electrical service is not available for use under this contract; therefore all electric current required by the Contractor shall be the responsibility of the Contractor, furnished at his own expense. The Contractor shall provide diesel generators to meet his demand requirements. Electricity required for final testing systems will be furnished by the Government. [The Government will provide permanent high voltage electricity to a point indicated by the Contracting Officer for use by the Contractor in the performance of final testing of systems.] The means of doing so, such as by temporary distribution systems, shall be the responsibility of the Contractor. All temporary connections for electricity shall be subject to the approval of the Contracting Officer and shall comply with Corps of Engineers manual EM 385-1-1 entitled Safety and Health Requirements Manual. All temporary lines shall be furnished, installed, connected and maintained by the Contractor in a workmanlike manner satisfactory to the Contracting Officer. Before final acceptance of systems, or facilities, all temporary connections installed by the Contractor shall be removed at his expense in a manner satisfactory to the Contracting Officer.

1.12 WORK OUTSIDE REGULAR HOURS

If the Contractor desires to carry on work outside regular duty hours, or on holidays, including the following U.S. holidays: New Year's Day, Memorial Day, Independence Day, Thanksgiving and Christmas. The Contractor shall submit an application to the Contracting Officer. Due to reliance upon local national laborers and time off due to local observances, there may be disruptions. Potentials dates are the following local observances: National Islamic Holiday of Ashura, Ramadan (actual date varies – check with local authorities). The Contractor shall allow ample time to enable satisfactory arrangements to be made by the Government for inspecting the work in progress. At night, exterior lighting shall be provided in conformance with EM-385-1-1 entitled "Safety and Health Requirements Manual".

1.12.1 EXTERIOR NIGHT LIGHTING

Exterior night lighting shall be provided in conformance with EM-385-1-1 entitled Safety and Health Requirements Manual.

1.13 SCHEDULING OF WORK IN EXISTING FACILITIES

As soon as practicable, but in any event not later than thirty (30) calendar days after award of this contract, the Contractor shall meet in conference with the Contracting Officer, or his duly authorized representatives, to discuss and develop mutual understanding relative to the scheduling of work in and access to the existing facilities where work has to be performed under this contract, so that the Contractor's proposed construction schedule is coordinated with the operating and security requirements of the installation.

1.14 CERTIFICATES OF COMPLIANCE

Any certificates required for demonstrating proof of compliance of materials with specification requirements shall be executed in accordance with Section 01335 SUBMITTAL PROCEDURES FOR DESIGN/BUILD. Each certificate shall be signed by an official authorized to certify in behalf of the manufacturing company involved and shall contain the name and address of the Contractor, the project name and location, description and the quantity of the items involved, and date or dates of shipment or delivery to which the certificates apply. Copies of laboratory test reports submitted with certificates shall contain the name and address of the testing laboratory and the date or dates of the tests to which the report applies. Certification shall not be construed as relieving the Contractor from furnishing satisfactory material.

1.15 ACCIDENT PREVENTION

The Contractor shall comply with all applicable Host Country laws and with such additional measures as the Contracting Officer may find necessary in accordance with CONTRACT CLAUSE 52.236-13 entitled ACCIDENT PREVENTION (NOV1991)-ALTERNATE 1 (APR 1984). Applicable provisions of the Corps of Engineers manual entitled Safety and Health Requirements Manual EM 385-1-1 will be applied to all work under this contract. The referenced manual may be obtained from the Contracting Officer at the jobsite or from the Afghanistan Engineer District at Kabul, Afghanistan.

1.15.1 ACCIDENT PREVENTION PROGRAM

Within fifteen (15) days after award of this contract, and at least ten (10) days prior to the accident prevention pre-work conference, four (4) copies of the Accident Prevention Plan required by the CONTRACT CLAUSE 52.236-13 entitled ACCIDENT PREVENTION (NOV 1991)- ALTERNATE I shall be submitted for review by the Contracting Officer. The Contractor shall not commence physical work at the site until the Accident Prevention Plan (APP) has been reviewed and accepted by the Contracting Officer. The APP shall meet the requirements listed in Appendix "A" of EM385-1-1. The program shall include the following: TAC Form 61 “Accident Prevention Program Hazard Analysis (Activity Hazard Analysis)" fully completed and signed by an executive officer of the company in block No. 13. The Activity Hazard Analysis is a method in which those hazards likely to cause a serious injury or fatality are analyzed for each phase of operations. Corrective action is planned in advance, which will eliminate the hazards. An analysis is required for each new phase of work. On large or complex jobs the first phase may be presented in detail with the submittal of the Accident Prevention Plan rather than presenting the complete analysis. If the plan is to be presented in phases, a proposed outline for future phases must be submitted as a part of the initial Accident Prevention Plan submittal. Accident Prevention Plans will be reviewed for timeliness and adequacy at least monthly with a signature sheet signed and dated documenting that these reviews took place. Copy of company policy statement of Accident Prevention and any other guidance as required by EM 385-1-1, Appendix A.

1.15.2 GROUND FAULT CIRCUIT INTERRUPTER (GFCI) REQUIREMENT – OVERSEAS CONSTRUCTION

The Corps of Engineers Health and Safety Manual, EM 385-1-1, section 11.D.05.b. states: "The GFCI device shall be calibrated to trip within the threshold values of 5 ma +/- 1 ma as specified in Underwriters Laboratory (UL) Standard 943." A variance from USACE has been granted allowing 10 ma, in lieu of 5 ma, for overseas activities that use 220 Volts (V)/50 hertz (Hz) electrical power.

1.15.3 TEMPORARY POWER - ELECTRICAL DISTRIBUTION BOXES

EM 385-1-1 section 11.A.01.a. states, "All electrical wiring and equipment shall be a type listed by a nationally recognized testing laboratory for the specific application for which it is to be used." This includes temporary electrical distribution boxes. Locally manufactured electrical boxes will not be allowed. Only manufactured electrical distribution boxes that meet the European CE requirements, with 10 ma CE type GFCIs installed shall be allowed.

Contractors shall:

a. Make no modifications that might void any CE or manufacturer certification.
b. Test the installed systems to demonstrate that they operate properly and provide the 10 ma earth leakage protection.
c. Ensure GFCIs will have an integral push-to-test function. The testing shall be performed on a regular basis.
d. Check that proper grounding is checked regularly and flexible cords, connectors, and sockets inspected before each use.

1.16 HAZARDOUS MATERIALS

Should the Contractor encounter asbestos or other hazardous materials, during the construction period of this contract, he shall immediately stop all work activities in the area where the hazardous material is discovered. The Contractor shall then notify the Contracting Officer; identify the area of danger; and not proceed with work in that area until given approval from the Contracting Officer to continue work activities. Hazardous material is considered to be asbestos, explosive devices, toxic waste, or material hazardous to health and safety. The Contractor shall secure the area from daily traffic until it is safe to resume normal activities.

1. SPARE PARTS

1.16.1 GENERAL

The requirements of this clause are in addition to any requirements for the provision of specific spare parts to be provided by the Contractor included in Technical Provisions. The Contractor shall furnish spare parts under the provisions of this clause for all equipment for which O&M data is to be provided under Clause OPERATION AND MAINTENANCE (O&M) DATA of this contract. The term "spare parts" as used herein shall include spare parts, special tools and test equipment.

1.16.2 SELECTION OF SPARE PARTS TO BE FURNISHED

The Contractor shall provide a one (1) year’s supply of spare parts based upon the Manufacturer’s recommendations. The Contractor shall provide master parts lists and lists of special tools and test equipment as a part of the equipment O&M data required by Clause OPERATION AND MAINTENANCE (O&M) DATA. The master parts list shall include the supplier's price for each part.

1.16.3 PROCUREMENT AND DELIVERY OF SPARE PARTS

The Contractor shall procure and be responsible for delivery, receipt, handling, placing in storage, inventory, and turnover to the Contracting Officer all spare parts selected by the Contracting Officer. The Contractor is responsible to have one (1) year supply of manufacturer's recommended spare parts on site ready to turn over to the Contracting Officer at the time of acceptance of the facility.

1.16.3.1 SHIPMENT AND DELIVERY

The Contractor shall be responsible for the shipment and delivery of spare parts to the location on or near the site in Afghanistan as selected by the Contracting Officer. The Contractor shall provide all manpower and equipment required to receive and place into designated storage areas all spare parts purchased under this clause. The Contractor shall give the Contracting Officer thirty (30) calendar days notice of arrival at the site of the first shipment.

1.16.3.2 TURNOVER OF SPARE PARTS

The Contractor shall notify the Contracting Officer seventy-two (72) hours prior to delivery of spare parts to the designated storage area. The Contractor and the Contracting Officer will perform a joint inventory of the spare parts and the spare parts will be turned over to the Contracting Officer. Spare parts purchased under this clause shall not be used by the Contractor.

1.16.3.3 PARTS AND PACKAGE IDENTIFICATION

Prior to shipment from point of purchase, each spare part shall be tagged or otherwise marked or labeled. Such labeling may be placed or affixed to the container, box or packaging in which spare parts are located when it is not feasible to place or affix such labeling directly on each spare part. Tags or labels shall include, but not necessarily be limited to; part number, description, parent equipment name and number location, project and/or other data as directed by the Contracting Officer.

1.16.3.4 PRESERVATION AND PACKAGING INSTRUCTION

a. Items ordered under this contract shall be preserved and packed for a minimum of three (3) years shelf life storage. All items shall be individually packaged except when the manufacturer specifies that the items are to be used in sets. Appropriate identification labels must be affixed to the items protective box or package. After the spare parts are packaged, the manufacturer shall weigh the spare parts and packaging and place the weight and size of the packaged container on the label with other information as outlined herein. Each item, not normally identified with manufacturer's name and part number, shall have an appropriate label affixed to it with manufacturer's name and part number.

b. Machined spare parts shall be lubricated or coated in order to withstand extensive periods of storage in a highly corrosive atmosphere.

c. Large items (greater than 22.7 kg (50 lbs.), or larger than 0.03 CM (one cubic foot) shall be packaged in waterproof wooden boxes and properly braced. Cushioning shall be used to prevent damage to the item and to the packaging material.

d. Solid state components, such as diodes, transistors, integrated circuits or equipment consisting of such parts that can be damaged as a result of static electricity and other stray electro-magnetic fields shall be packaged in heat-sealed, aluminum foil, laminated, flexible packages.

e. All other spare parts shall be packaged in heat sealed plastic bags or wrap. Delicate and more fragile items such as test equipment shall be cushioned or wrapped with transparent bubble wrap material prior to being inserted into the plastic package.

1.16.4 WARRANTY

All spare parts provided by the Contractor under this clause are subject to the general warranty clauses of this contract.

1.16.5 PAYMENTS FOR SPARE PARTS

Payments for spare parts specifically required in this contract shall be considered as part of those equipment costs and shall be included in bid items as appropriate. Payment for handling, delivery, inventory, turnover, customs, overhead or profit shall not be paid or allowed under this Contract Provision, and shall be included in the cost for installation of this equipment under the other appropriate bid items of this contract. Payment for the spare parts portion of the appropriate bid items will be made after the spare parts have been accepted at the site by the Contracting Officer. Payments for equipment costs under this clause shall constitute full payment for all cost of the spare parts and associated cost of preservation and packaging, and cost of surface shipment to the site. Other ancillary costs shall be included by the Contractor under the other appropriate bid items of this contract and no additional cost except as provided herein will be allowed.

1.17 OPERATION AND MAINTENANCE (O&M) DATA

1.17.1 GENERAL

The requirements contained herein are in addition to all shop drawings submission requirements stated in other

sections of the specifications. The Contractor shall include the provisions for all items required under this clause in all purchase orders and sub-contract agreements. Submittals required hereinafter will not relieve the Contractor of any responsibilities under the Warranty of Construction Provisions of this contract or under the various Guarantee Clauses of the Technical Provisions.

1.17.2 SUBMITTALS

The Contractor shall submit all items requiring submission of O&M data under this and other sections of these specifications in accordance with Section 01335 SUBMITTAL PROCEDURES FOR DESIGN/BUILD of the specifications.

1.17.3 OPERATION AND MAINTENANCE (O&M) DATA

The Contractor shall furnish operation and maintenance manuals for all facilities constructed under this contract. The manuals shall be loose leaf, indexed and shall consist of manufacturer's brochures, manufacturer's operation and maintenance manuals, service and repair manuals, catalogs, service bulletins, instruction charts, diagrams, other information as necessary to support the operation and maintenance of the end items of equipment, assemblies and systems. Each type of facility (housing, barracks, mosque, etc.) shall be covered by a separate manual (or manuals) consisting of all data pertaining to the equipment and/or systems within that facility. Identical equipment within a single major system shall require only one submittal of data. The Contractor shall furnish all O&M manuals to the Contracting Officer not less than thirty (30) calendar days prior to contract completion. Required number of submittals (number of sets) shall be as specified in Section 01335 SUBMITTAL PROCEDURES FOR DESIGN/BUILD.

1.17.4 RECOMMENDED SPARE PARTS LIST

The Contractor shall furnish a recommended spare parts list containing equipment manufacturers' recommendations for five (5) years; two (2) years and one (1) year spare parts stock levels in Afghanistan. Current unit price and effective date, lead time, shelf life for each individual part, and total cost of all recommended parts shall be furnished.

1.17.5 SUPPLEMENTAL SUBMITTALS OF DATA

After initial submittal of O&M manuals and until final acceptance of all equipment, the Contractor shall prepare and deliver to the Contracting Officer supplemental technical data as previously described for all changes, modifications, revisions and substitutions to equipment and components. For equipment or systems introduced into the contract under change order, or modified by change order, supplemental data shall be furnished within forty-five (45) calendar days after issuance of the change order. The supplemental data furnished shall be properly prepared and identified for insertion into the O&M manuals.

1.17.6 FRAMED INSTRUCTIONS FOR SYSTEMS

Approved wiring and control diagrams showing the complete layout of the entire system, including equipment, piping, valves and control sequence, framed under glass or in approved laminated plastic, shall be posted, where applicable, in all mechanical equipment rooms. In addition, detailed operating instructions explaining safe starting and stopping procedures for all systems shall be prepared in typed form along with the inspections required to insure normal safe operations. The instructions shall be framed as specified above for the wiring and control diagrams and posted beside the diagram. Proposed diagrams, instructions, and other sheets shall be submitted for approval prior to posting. Operating instructions shall be posted before acceptance testing of the systems and verified during acceptance testing.

1.17.7 ADDITIONAL SUBMITTALS/RE-SUBMITTALS

The Contracting Officer reserves the right to determine whether the above specified information, as furnished by the Contractor, is adequate and complete and to require such additional submittals by the Contractor as necessary to

insure that adequate information has been furnished to provide the satisfactory operation and maintenance of the various items of equipment and to fulfill the intent of the specifications. Additional submittals or resubmittals supplementing incorrect or incomplete data shall be made within thirty (30) calendar days after receiving notice by the Contracting Officer. All costs arising from these resubmissions shall be borne by the Contractor.

1.18 INSTRUCTIONS AND TRAINING FOR OPERATION AND MAINTENANCE

1.18.1 GENERAL

The Contractor shall be responsible for the instruction and training of operating and maintenance personnel as specified below and in the Technical Provisions of the specifications. Unless otherwise indicated in the Technical Provisions, operating and maintenance instructions shall be given for a minimum period as follows:

Title	Duration of Training
Mechanical Systems	5 Days
Electrical Systems	5 Days

1.18.2 OPERATION AND MAINTENANCE TRAINING

The Contractor shall provide competent instructors for training of personnel designated by the Contracting Officer to operate mechanical and electrical building systems and equipment, perform the required preventive maintenance to minimize breakdown, and to perform necessary repairs when malfunction or breakdown of equipment occurs. Such training shall consist of classroom and on-the-equipment training for the period specified, which shall be completed prior to acceptance of a system or equipment, as applicable. The instructor(s) shall have no other duties during the period of training. Classroom instruction shall not exceed fifty percent (50%) of the total training time, with the balance devoted to on-the-equipment demonstration and familiarization. Emphasis will be given to both electrical and mechanical features, in accordance with approved training plans.

1.18.3 ARRANGEMENTS

The training shall be for not less than the periods of time specified, five (5) days per week, and eight (8) hours per day, subject to review and approval by the Contracting Officer. Each individual training session shall be presented one time only, shall be videotaped in a television system compatible with the local area, and be scheduled in a manner acceptable to the Contracting Officer. At the completion of training, the videotapes shall become the property of the Government. In addition to the Contractor's requirements to video tape each training section, the Government reserves the right to record, in any manner, the subject training material, or training sessions given by the Contractor, without additional cost to the Government.

Recordings obtained will be used in future training by the Government. The operating and maintenance manual data, as specified to be furnished in these Special Clauses, shall be used as the base material for training.

1.18.4 SCHEDULING

The Contractor shall contact the Contracting Officer for the purpose of preliminary planning, scheduling, and coordination of training, to maximize effectiveness of the training program for available operating and maintenance personnel. The Contractor shall initiate and make arrangements for such contact within thirty (30) calendar days after receipt of notification of award of contract; and shall include all significant times in scheduling and completing training in his PROJECT SCHEDULE. The Contractor shall provide a draft outline of training outline in sufficient detail to provide a broad indication of the type of scope of training to be given. It shall include but not be limited to; (a) a list of subjects to be presented; (b) estimated amounts of classroom and on-the-equipment instruction for each subject; (c) a list of minimum qualifications for instructors; and (d) discussions concerning the types and amounts of visual aids, reference materials, tools and test equipment, mock-up and other training materials that will be employed during training.

1.18.5 PRELIMINARY PLAN

The Contractor shall submit seven (7) copies of an outline of his proposed training plan to the Contracting Officer for review and approval not later than 60 calendar days after award of this contract. The plan will be reviewed and coordinated with the content of the O&M manuals.

1.18.6 PLAN

The Contractor shall submit seven (7) copies of his proposed training plan to the Contracting Officer for approval not later than ninety (90) calendar days prior to start of any training. The plan shall include the following; (a) a weekly outline showing overall form and design of training presentation; (b) a day-by-day schedule showing time intervals, the major and subordinate subjects to be covered in each, the name of the instructor(s) and qualification summary of each, and identification of related handouts; (c) summary of the number of hours of classroom and on-the-equipment training; (d) a list of reference materials to be provided by the Contractor to the trainees; and (e) a list and description of the training materials to be used, such as text, visual aids, mock-up, tools, etc. The Contractor shall be responsible for furnishing all training materials except the following: The Government will provide space, chairs, and tables for classroom training, and three (3) sets of the five (5) sets of O&M Manuals required by the Contractor per Section 01335 SUBMITTAL PROCEDURES FOR DESIGN/BUILD of the specifications. Provision of these manuals is solely for reference purposes, and in no way relieves the Contractor from providing all instruction and materials necessary for training personnel designated by the Government. All costs for resubmission of training plans, training materials, etc., as requested by the Contracting Officer shall be borne by the Contractor. Resubmittals shall be made within twenty (20) days of notice from the Contracting Officer.

1.18.7 ATTENDANCE ROSTER/TAC FORM 356

The Contractor shall develop an attendance roster or a similar document indicating each student’s attendance, prior to the start of each class, subject and/or topic. This includes both "Hands-On" and classroom training. It is strongly recommended that each student trained be required to sign this document at the beginning of each class day for each and every class, subject and/or topic taught on that day. The Contractor's failure to have student attendance verified in writing may be cause for the Government to order the Contractor to repeat schooling where evidence of attendance cannot be verified. No part of the time lost due to such repeat instruction shall be made the subject of claim for extension of time or for excess costs or damage by the Contractor. Within ten (10) working days after completion of Operation and Maintenance Training conducted in accordance with this clause and/or applicable Technical Provision section, the Contractor shall complete and submit TAC Form 356 "Operation and Maintenance Training Validation Certificate". The attendance roster shall be included as an attachment to TAC Form 356.

1.19 CONTRACTOR FURNISHED EQUIPMENT LISTS

The Contractor shall furnish a list of all items, other than integral construction type items, furnished under the contract. Items such as furniture, drapes, rugs, vehicles, office machines, appliances, etc., shall fall under this category. The Contractor's list shall describe the item; give the unit price and total quantities of each. Model and serial numbers for equipment shall be provided when applicable. The Contractor shall keep an up-to-date register of all covered items and make this information available to the Contracting Officer at all times. Prior to acceptance, the Contractor shall submit the complete register to the Contracting Officer.

1.20 TIME EXTENSIONS

1.20.1 GENERAL

This provision specifies the procedure for determination of time extensions for unusually severe weather in accordance with the Contract Clause 52.249-10 entitled DEFAULT (FIXED-PRICE CONSTRUCTION) APR 1984. The listing below defines the anticipated monthly unusually severe weather for the contract period and is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the geographic location of the project. The schedule of anticipated unusually severe weather will constitute the baseline for determining monthly weather time evaluations. Upon award of this contract and continuing throughout the contract each month, actual

unusually severe weather days will be recorded on a calendar day basis (including weekends and holidays) and compared to the monthly anticipated unusually severe weather in the schedule below. The term "actual unusually severe weather days" shall include days actually impacted by unusually severe weather. The Contractor's schedule must reflect the anticipated unusually severe weather days on all weather dependent activities.

Kandahar Province - Kandahar

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
14	7	4	6	1	0	1	1	0	1	6	12	53

1.20.2 WEATHER DELAYS

The number of actual unusually severe weather days shall be calculated chronologically from the first to the last day in each month. Unusually severe weather days must prevent work for fifty percent (50%) or more of the Contractor's workday and delay work critical to the timely completion of the project. If the number of actual unusually severe weather days exceeds the number of days anticipated in the paragraph above, the Contracting Officer will determine whether the Contractor is entitled to a time extension. The Contracting Officer will convert any qualifying delays to calendar days and issue a modification in accordance with the Contract Clause 52.249-10 entitled DEFAULT (FIXED-PRICE CONSTRUCTION) APR 1984.

1.20.3 OTHER DELAYS

Construction delays due to full or partial base closures due to incidents such as demonstrations, civil unrest and outright attacks will be examined on an individual basis for consideration of time extensions.

1.21 STANDARDIZATION

Where two or more items of the same type or class of product, system or equipment furnished in this project are required, the units shall be products of the same manufacturer and shall be interchangeable when of the same size, capacity, performance characteristics, and rating. The only exception to this requirement is where the items are interchangeable due to conformance with industry standards (valves, fittings, etc.); they need not be by the same manufacturer. This requirement applies to all manufactured items in the project that normally require repair or replacement during the life of the equipment.

1.22 COMPLIANCE WITH HOST-COUNTRY RULES AND CUSTOMS

The laws of Host Country may prohibit access to certain areas of the country that are under military control. The Contractor shall furnish the Contracting Officer the names of personnel, type, and amounts of equipment, dates and length of time required at the site, and the purpose of entering the host country. It is understood that areas to which rights of entry are provided by the Host Government are to be used only for work carried out under the contract and no destruction or damages shall be caused, except through normal usage, without concurrence of the Host Government.

1.22.1 CONTRACTOR'S RESPONSIBILITIES

The following items are the sole responsibility of the Contractor to investigate, estimate as to cost, and assume the risk, as normally encountered by Contractors. The Contractor shall be responsible for determining the effect of the following on his own cost of performance of the contract and for including sufficient amount in the contract price:

a. Official language and type of accounts required to satisfy the officials of the Local Government.
b. Entry and exit visas, residence permits, and residence laws applicable to aliens. This includes any special requirements of the Host Government, including those required by local Labor Offices, which the Contractor may have to fulfill before an application for a regular block of visas will be accepted.

c. Passports, health and immunization certificates, and quarantine clearance.
d. Compliance with local labor and insurance laws, including payment of employer's share of contribution, collecting balance from employee and paying into insurance funds.
e. Strikes, demonstrations and work stoppage.
f. Collection through withholding and payment to local Government, of any Host Country income tax on employees subject to tax.
g. Arranging to perform work in the Host Country, to import personnel, to employ non-indigenous labor, to receive payments and to remove such funds from the country.
h. Operating under local laws, practices, customs and controls, and with local unions, in connection with hiring and firing, mandatory wage scales, vacation pay, severance pay, overtime, holiday pay, 7th day of rest, legal notice or pay in lieu thereof for dismissal of employees, slowdown and curtailed schedules during religious holidays and ratio of local labor employed in comparison to others.
i. Possibility of claims in local bureaus, litigation in local courts, or attachment of local bank accounts.
j. Compliance with workmen's compensation laws and contributions into funds. Provisions of necessary medical service for Contractor employees.
k. Special license required by the local Government for setting up and operating any manufacturing plant in the Host Country, e.g. concrete batching, precast concrete, concrete blocks, etc.
l. Sales within the host country of Contractor-owned materials, and equipment.
m. Special licenses for physicians, mechanics, tradesmen, drivers, etc.
n. Identification and/or registration with local police of imported personnel.
o. Stamp tax on documents, payments and payrolls.
p. Base passes for permanent staff, day laborers, motor vehicles, etc.
q. Compliance with all customs and import rules, regulations and restrictions, including, but not limited to, local purchase requirements.

1.23 EMPLOYEE ACCESS TO PROJECT SITE

1.23.1 EMPLOYEE IDENTIFICATION

The Contractor shall be responsible for furnishing to each employee and for requiring each employee engaged on the work, to display identification as approved and directed by the Contracting Officer. Prescribed identification shall immediately be delivered to the Contracting Officer for cancellation upon release of any employee. When required, the Contractor shall obtain and provide fingerprints of persons employed on the project. Contractor and subcontractor personnel shall wear identifying markings on hard hats clearly identifying the company for whom the employee works.

1.23.1.1 PREPARATION OF IDENTIFICATION BADGES

The Contractor shall be required to prepare a written application inclusive color photographs and provide all materials and labor necessary to prepare an identification badge, laminated in plastic, containing the employee's name, badge number, color photo, height and weight, the name of the Contractor's organization and for requiring each employee engaged on the work to display this identification as directed by the Contracting Officer. The Contractor shall submit each application and draft badge through the Contracting Officer to the Base Security Office. A minimum of thirty-five workdays shall be allowed for Government review and certification of badges. The Base Security Office will certify each draft badge by signature, stamp, seal or any combination thereof. Upon certification by the Base Security Office, the badges will be returned to the Contractor for final preparation, lamination, and issuance. Badges shall not be taken out of country during periods of travel or absence. During such periods, the Contractor may be permitted to issue temporary identification badges.

1.23.1.2 EMPLOYEE BACKGROUND AND HISTORICAL INFORMATION

The Contractor shall be required to prepare and maintain personal background and historical information forms on each employee. These forms may be reviewed by the Base Security Office. The required information shall include but not necessarily be limited to the following:

a. Full name.

b. Place and date of birth.
c. Three (3) current color photographs.
d. Copy of Citizenship/Nationality identification.
e. Copy of Passport.
f. Copy of driver’s license.
g. Police Background Check.
h. Work History.
i. Personal background information.
j. Copy of Work Permit and/or Visa.
k. Permanent home of record and in-country address.
l. Other information mandated by local law, the Base Security Regulations or that may be required to coordinate and process the necessary documentation with the government offices responsible for the approval.
m. Registration, insurance company, policy number and expiration date for each vehicle.

1.23.2 IDENTIFICATION OF CONTRACTOR VEHICLES

The Contractor shall be responsible for requiring each vehicle engaged in the work to display permanent vehicular identification as approved and directed by the Contracting Officer. If acceptable to the Base Security Office and approved by the Contracting Officer, the Contractor may institute a system of non-permanent temporary identification for one-time delivery and transit vehicles. Each Contractor vehicle, machine, piece of equipment, or towed trailers, shall show the Contractor's name such that it is clearly visible on both front doors of the vehicle and both sides of a towed trailer. A valid license plate shall be displayed at all times. Contractor vehicles operated on Government property shall be maintained in a good state of repair, shall be insured, and shall be registered in accordance with Afghan Law.

1.23.3 SECURITY PLAN

The Contractor shall submit to the Contracting Officer a security plan as required in Contract Section 01040.

1.24 RADIO TRANSMITTER RESTRICTIONS

To preclude accidental actuation of sensitive electronic equipment, the Contractor shall not use radio-transmitting equipment without prior approval of the Contracting Officer.

1.25 PUBLIC RELEASE OF INFORMATION

1.25.1 PROHIBITION

There shall be no public release of information or photographs concerning any aspect of the materials or services relating to this bid, contract, purchase order, or other documents resulting there from without the prior written approval of the Contracting Officer.

1.25.2 SUBCONTRACT AND PURCHASE ORDERS

The Contractor agrees to insert the substance of this clause in all purchase orders and subcontract agreements issued under this contract.

1.26 ATTACHMENTS

TAC FORM 61 - Accident Prevention Program Hazard Analysis

TAC FORM 356 - Operation and Maintenance Training Validation Certificate

2. LOCAL CLAUSES

2.1 APPLICATION OF US CRIMINAL JURISDICTION

Reference DODI 5525.11. The contractor is directed to provide all of its personnel working under this contract, and to require all of its subcontractors to provide their personnel, with written notification that - with the exception of nationals of Afghanistan and those ordinarily resident in Afghanistan - contractor and subcontractor personnel, and the dependents of contractor and subcontractor personnel who are residing with such personnel, may be subject to US criminal jurisdiction as provided for in the Military Extraterritorial Jurisdiction Act, 18 USC 3261-3267; see Section 3267(1)(A)(iii)(I) and (2)(A)(iii). A copy of the notice ***shall be furnished to the contracting officer upon award of the contract***, along with a certification by an authorized company representative attesting to the provision of the notification to contractor personnel.

2.2 ATTACKS FROM HOSTILE ENTITIES

This contract is firm fixed-price. Costs incurred in the performance of project execution that arise from the attacks of hostile entities, such as costs arising from damage to or destruction of contractor equipment and facilities, and damage to or destruction of the project prior to Government acceptance, are the sole responsibility of the contractor. The Government makes no guarantee to provide the contractor with security, and bears no obligation to reimburse the contractor for costs arising from the attacks of hostile entities. When appropriate, the Contracting Officer may provide the contractor with an equitable adjustment with respect to time – but not cost – in accordance with clause 52.249-10; see 52.249-10(b)(1)(i) and (2).

2.3 INSTALLATION ACCESS AND BADGING

This contract is firm fixed-price. It is the responsibility of the contractor to be knowledgeable of and to abide by any and all applicable installation access procedures and requirements, to include any and all badging procedures and requirements that may be necessary for contractor access to the project site. Such procedures and requirements may change over the course of contract performance; it is the responsibility of the contractor to plan accordingly in order to meet its existing obligations under this contract. The US Army Corps of Engineers, Afghanistan Engineer District, neither controls nor is responsible for any such installation access procedures, requirements or changes thereto.

2.4 CUSTOMS CLEARANCE

Reference clauses 52.229-6 and 52.225-13. This contract is firm fixed-price. It is the responsibility of the contractor to be knowledgeable of and to abide by any and all applicable customs clearance procedures and requirements that may be necessary for the transportation of supplies and equipment into Afghanistan. Such procedures and requirements may change over the course of contract performance; it is the responsibility of the contractor to plan accordingly in order to meet its existing obligations under this contract. The US Army Corps of Engineers, Afghanistan Engineer District, neither controls nor is responsible for any such customs clearance procedures, requirements or changes thereto.

2.5 TRAVEL WARNINGS

The contractor shall provide all personnel working under this contract, and shall require subcontractors to provide their personnel, with a written notification advising such personnel to be aware of US State Department Travel Warnings with respect to Afghanistan, available at http://travel.state.gov, in the event they wish to consider bringing their dependants into Afghanistan. A copy of the notice ***shall be furnished to the contracting officer upon award of the contract***, along with a certification by an authorized company representative attesting to the provision of the notification to contractor personnel. At no time, subject to the written approval of the contracting officer, may the contractor allow such dependants, or any other unauthorized individuals, to be present on the project site grounds, whether in transit or otherwise.

2.6 DRUG-FREE WORKFORCE

Documentation of the contractor's drug-free workforce program as required by clause 252.223-7004(b) ***shall be furnished to the contracting officer upon award of the contract***.

2.7 COMBATING TRAFFICKING IN PERSONS, COMMERCIAL SEX ACTS, FORCED LABOR

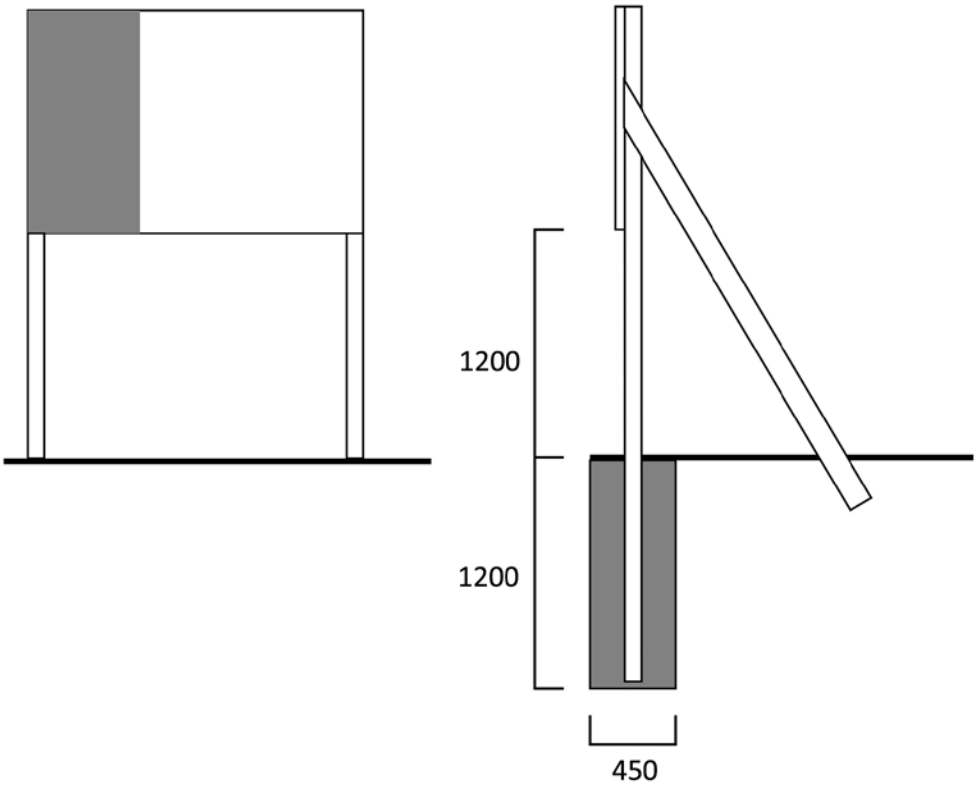
A copy of the employee notification statement as required by clause 252.222-7006(d) ***shall be furnished to the contracting officer upon award of the contract***, along with a certification by an authorized company representative attesting to the provision of the notification to contractor personnel.

-- END OF SECTION --

Construction Project Sign Dimensions (mm)

T1:	Text Group 1	Typeface: 150mm Large Standard Dari Font Color: White
T2:	Text Group 2	Typeface: 150mm Large Standard Dari Font Color: Black
T3:	Text Group 3	75mm Small Standard Dari Font Color: Black
T4:	Text Group 4	35mm Helvetica Bold, all capital letters Color: Light Yellow, matching GIROA logo
T5:	Text Group 5	35mm Helvetica Bold Color: Green, Pantone 370 PC
T6:	Text Group 6	45mm Helvetica Bold Color: Green, Pantone 370 PC

Mounting Diagram



Ministry of Interior

Government of the Islamic Republic of Afghanistan

ACCIDENT PREVENTION PROGRAM
HAZARD ANALYSIS

1. Contract No.	2. Project	3. Facility
4. Date	5. Major Phase	6. Estmated Start Date
7. PRINCIPAL STEPS	8. POTENTIAL HAZARDS	9. RECOMMENDED CONTROLS
10. EQUIPMENT TO BE USED	11. INSPECTION REQUIREMENTS	12. TRAINING REQUIREMENTS
13. Contractor (Signature & Date)		
14. Report discussed with contractor/superintendant on _____ _____ Area/Resident Engineer (Signature)		15. Contracting Officer (Signature & Date) or Contracting Officer Representative

TAC Form 61

C E R T I F I C A T E

OPERATION AND MAINTENANCE TRAINING VALIDATION

References: **1. Special Clause: Instructions and Training for Operations and Maintenance**
2. Technical Provision(s) _____

Equipment for which training conducted: _____

_____

_____

Description of Training:

1. Number of Classroom Hours: _____
2. Number of Hands-on Equipment Hours: _____
3. Location of Training: _____

Training Instructors: _____

Trainees: _____

_____

Contractor Certifying Official _____

Corps of Engineers Representative _____

User Acknowledgement _____

TAC Form 356
NOV 1999

SECTION 01312
QUALITY CONTROL SYSTEM (QCS)

1. GENERAL

1.1 GENERAL

The Government will use the Resident Management System for Windows (RMS) to assist in its monitoring and administration of this contract. The Contractor shall use the Government-furnished Construction Contractor Module of RMS, referred to as QCS, to record, maintain, and submit various information throughout the contract period. The Contractor module, user manuals, updates, and training information can be downloaded from the RMS web site: the Contractor can obtain the current address from the Government. This joint Government-Contractor use of RMS and QCS will facilitate electronic exchange of information and overall management of the contract. QCS provides the means for the Contractor to input, track, and electronically share information with the Government in the following areas:

Administration	Submittal Monitoring
Finances	Scheduling
Quality Control	Import/Export of Data

1.1.1 CORRESPONDENCE AND ELECTRONIC COMMUNICATIONS

For ease and speed of communications, both Government and Contractor will, to the maximum extent feasible, exchange correspondence and other documents in electronic format. Correspondence, pay requests and other documents comprising the official contract record shall also be provided in paper format, with signatures and dates where necessary. Paper documents will govern, in the event of discrepancy with the electronic version.

1.1.2 OTHER FACTORS

Particular attention is directed to specifications “SUBMITTAL PROCEDURES”, “CONTRACTOR QUALITY CONTROL”, "PROJECT SCHEDULE", and Contract Clause, "Payments", which have a direct relationship to the reporting to be accomplished through QCS. Also, there is no separate payment for establishing and maintaining the QCS database; all costs associated therewith shall be included in the contract pricing for the work.

1.2 QCS SOFTWARE

QCS is a Windows-based program that can be run on a stand-alone personal computer or on a network. Prior to the Pre-Construction Conference, the Contractor shall be responsible to download, install and use the latest version of the QCS software from the Government's RMS Internet Website. Any program updates of QCS will be made available to the Contractor via the Government RMS Website as they become available. It shall be the responsibility of the contractor to maintain the QCS software and install updates as they become available.

1.3 SYSTEM REQUIREMENTS

The following listed hardware and software is the minimum system configuration that the Contractor shall have to run QCS. No separate payment shall be made for updating or maintaining the necessary hardware configurations necessary to run QCS:

Hardware

IBM-compatible PC with 1000 MHz Pentium or higher processor

256+ MB RAM for workstation / 512+ MB RAM for server

1 GB hard drive disk space for sole use by the QCS system

Digital Video Disk (DVD)-Compact Disk (CD) Reader-Writer (RW/ROM)

Monitor with a resolution of AT LEAST 1024x768, 16bit colors

Mouse or other pointing device

Windows compatible printer. (Laser printer must have 4 MB+ of RAM)

Connection to the Internet, minimum 56k BPS

Software

MS Windows 2000 or higher

QAS-Word Processing software: MS Word 2000 or newer

Internet browser supporting HTML 4.0 or higher

Electronic mail (E-mail) MAPI compatible

Virus protection software regularly upgraded with all issued manufacturer's updates

1.4 RELATED INFORMATION

1.4.1 QCS USER GUIDE

After contract award, the Contractor shall download instructions for the installation and use of QCS from the Government RMS Internet Website; the Contractor can obtain the current address from the Government. In case of justifiable difficulties, the Government will provide the Contractor with a CD-ROM containing these instructions.

1.4.2 CONTRACTOR QUALITY CONTROL (CQC) TRAINING

The use of QCS will be discussed with the Contractor's QC System Manager during the mandatory CQC Training class. The government will provide QCS training if requested by the contractor.

1.5 CONTRACT DATABASE

Prior to the pre-construction conference, the Government shall provide the Contractor with basic contract award data to use for QCS. The Government will provide data updates to the Contractor as needed, generally by files attached to E-mail or via CD-ROM. These updates will generally consist of submittal reviews, correspondence status, QA comments, and other administrative and QA data.

1.6 DATABASE MAINTENANCE

The Contractor shall establish, maintain, and update data for the contract in the QCS database throughout the duration of the contract. Data updates to the Government shall be submitted via either E-mail or electronic media with printed/file attachments, e.g., daily reports, schedule updates, payment requests. If permitted by the Contracting Officer. The QCS database typically shall include current data on the following items:

1.6.1 ADMINISTRATION

1.6.1.1 CONTRACTOR INFORMATION

The database shall contain the Contractor's name, address, telephone numbers, management staff, and other required items. Within 14 calendar days of receipt of QCS software from the Government, the Contractor shall deliver Contractor administrative data in electronic format via E-mail.

1.6.1.2 SUBCONTRACTOR INFORMATION

The database shall contain the name, trade, address, phone numbers, and other required information for all subcontractors. A subcontractor must be listed separately for each trade to be performed. Each subcontractor/trade shall be assigned a unique Responsibility Code, provided in QCS. Within 14 calendar days of receipt of QCS software from the Government, the Contractor shall deliver subcontractor administrative data in electronic format via E-mail.

1.6.1.3 CORRESPONDENCE

All Contractor correspondence to the Government shall be identified with a serial number. Correspondence initiated by the Contractor's site office shall be prefixed with "S". Letters initiated by the Contractor's home (main) office shall be prefixed with "H". Letters shall be numbered starting from 0001. (e.g., H-0001 or S-0001). The Government's letters to the Contractor will be prefixed with "C".

1.6.1.4 EQUIPMENT

The Contractor's QCS database shall contain a current list of equipment planned for use or being used on the jobsite, including the most recent and planned equipment inspection dates.

1.6.1.5 MANAGEMENT REPORTING

QCS includes a number of reports that Contractor management can use to track the status of the project. The value of these reports is reflective of the quality of the data input, and is maintained in the various sections of QCS. Among these reports are: Progress Payment Request worksheet, QA/QC comments, Submittal Register Status, Three-Phase Inspection checklists.

1.6.2 FINANCES

1.6.2.1 PAY ACTIVITY DATA

The QCS database shall include a list of pay activities that the Contractor shall develop in conjunction with the construction schedule. The sum of all pay activities shall be equal to the total contract amount, including modifications. Pay activities shall be grouped by Contract Line Item Number (CLIN), and the sum of the activities shall equal the amount of each CLIN. The total of all CLINs equals the Contract Amount.

1.6.2.2 PAYMENT REQUESTS

All progress payment requests shall be prepared using QCS. The Contractor shall complete the payment request worksheet and include it with the payment request. The work completed under the contract, measured as percent or as specific quantities, shall be updated at least monthly. After the update, the Contractor shall generate a payment request report using QCS. A signed paper copy of the approved payment request is also required, which shall govern in the event of discrepancy with the electronic version.

1.6.3 QUALITY CONTROL (QC)

QCS provides a means to track implementation of the 3-phase QC Control System, prepare daily reports, identify and track deficiencies, document progress of work, and support other contractor QC requirements. The Contractor shall maintain this data on a daily basis. Entered data will automatically output to the QCS generated daily report.

1.6.3.1 DAILY CONTRACTOR QUALITY CONTROL (CQC) REPORTS.

QCS includes the means to produce the Daily CQC Report. The Daily CQC Report generated by QCS shall be the Contractor's official report. Data from any supplemental reports by the Contractor shall be summarized and

consolidated onto the QCS-generated Daily CQC Report. Daily CQC Reports shall be submitted as required by specification 01451 “CONTRACTOR QUALITY CONTROL”.

1.6.3.2 DEFICIENCY TRACKING.

The Contractor shall use QCS to track deficiencies. Deficiencies identified by the Contractor will be numerically tracked using QC punch list items. The Contractor shall maintain a current log of its QC punch list items in the QCS database. The Government will log the deficiencies it has identified using its QA punch list items. The Government's QA punch list items will be included in its export file to the Contractor. The Contractor shall regularly update the correction status of both QC and QA punch list items.

1.6.3.3 THREE-PHASE CONTROL MEETINGS

The Contractor shall maintain scheduled and actual dates and times of preparatory and initial control meetings in QCS.

1.6.3.4 ACCIDENT/SAFETY TRACKING.

The Government will issue safety comments, directions, or guidance whenever safety deficiencies are observed. The Government's safety comments will be included in its export file to the Contractor. The Contractor shall regularly update the correction status of the safety comments. In addition, the Contractor shall utilize QCS to advise the Government of any accidents occurring on the jobsite. This brief supplemental entry is not to be considered as a substitute for completion of mandatory reports.

1.6.3.5 FEATURES OF WORK

The Contractor shall include a complete list of the features of work in the QCS database. A feature of work may be associated with multiple pay activities. However, each pay activity (see subparagraph "Pay Activity Data" of paragraph "Finances") will only be linked to a single feature of work.

1.6.3.6 QC REQUIREMENTS

The Contractor shall develop and maintain a complete list of QC testing, transferred and installed property, and user training requirements in QCS. The Contractor shall update all data on these QC requirements as work progresses, and shall promptly provide this information to the Government via QCS.

1.6.4 SUBMITTAL MANAGEMENT

The Contractor shall maintain a complete list of all submittals, including completion of all data columns. Dates on which submittals are received and returned by the Government will be included in its export file to the Contractor. The Contractor shall use QCS to track and transmit all submittals. ENG Form 4025, submittal transmittal form, and the submittal register update, ENG Form 4288, shall be produced using QCS. RMS will be used to update, store and exchange submittal registers and transmittals, but will not be used for storage of actual submittals.

1.6.5 SCHEDULE

The Contractor shall develop a construction schedule consisting of pay activities, in accordance with Specification Section Project Schedule. This schedule shall be input and maintained in the QCS database either manually or by using the Standard Data Exchange Format (SDEF). The updated schedule data shall be included with each pay request submitted by the Contractor.

1.6.6 REQUESTS FOR INFORMATION (RFI)

The Contractor shall use the two-way RFI system contained in QCS for tracking all RFI's generated during the contract. Hard copies of all RFI's shall be provided to the government, and will govern in the event of a discrepancy between electronic and printed mediums.

1.6.7 IMPORT/EXPORT OF DATA

QCS includes the ability to export Contractor data to the Government and to import submittal register and other Government-provided data, and schedule data using SDEF.

1.7 IMPLEMENTATION

Contractor use of QCS as described in the preceding paragraphs is mandatory. The Contractor shall ensure that sufficient resources are available to maintain its QCS database, and to provide the Government with regular database updates. QCS shall be an integral part of the Contractor's management of quality control.

1.8 DATA SUBMISSION VIA COMPUTER DISKETTE OR CD-ROM

The Government-preferred method for Contractor's submission of updates, payment requests, correspondence and other data is by E-mail with file attachment(s). For locations where this is not feasible, the Contracting Officer may permit use of computer diskettes or CD-ROM for data transfer. Data on the disks or CDs shall be exported using the QCS built-in export function.

1.9 MONTHLY COORDINATION MEETING

The Contractor shall update the QCS database each workday. At least monthly, the Contractor shall generate and submit an export file to the Government with schedule update and progress payment request. As required in Contract Clause "Payments", at least one week prior to submittal, the Contractor shall meet with the Government representative to review the planned progress payment data submission for errors and omissions. The Contractor shall make all required corrections prior to Government acceptance of the export file and progress payment request. Payment requests accompanied by incomplete or incorrect data submittals will be returned. The Government will not process progress payments until an acceptable QCS export file is received.

1.10 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the requirements of this specification. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification.

-- END OF SECTION --

SECTION 01320
CONSTRUCTION PROGRESS DOCUMENTATION

1.0 GENERAL

The Contractor shall construct the buildings included in this contract according to the Government issued drawings (included in the Appendices) unless otherwise specified to be designed by Contractor per Section 01010 Scope of Work.

All Work required to be designed by the Contractor, including all site features shall provide fully functioning facilities as described in Section 01010. Any building designs not included as part of this solicitation, but stated as part of this contract, are the responsibility of the Contractor to design as well as build.

The facility shall be designed and built by a single Contractor.

The Contractor shall be responsible for all Contractor furnished designs, whether the Contractor utilizes services of licensed architects and engineers employed by its firm or subcontracts with independent architectural and/or engineering firm(s). The Contractor shall be solely liable for design errors and/or omissions and should be insured as the A-E firm against design errors and omissions. For this specification, the term "Government" is defined as the Contracting Officer for the US Army Corps of Engineers, Afghanistan Engineering District-South.

The Contractor may be a single firm or a Joint Venture that includes licensed Architects and Engineers either employed by or subcontracted to the Contractor. Licensing jurisdiction of Architects and Engineers of record shall be shall be verifiable. The Contractor shall be the Architect/Engineer-of-Record for all work not associated with the furnished drawings, whether the Contractor utilizes services of licensed architects and engineers employed by its firm or subcontracts with independent architectural and/or engineering firm(s).

Section 00555, DESIGN CONCEPT DOCUMENTS identifies project documents furnished herewith to be used as the basis for the project design and construction documents. The successful Offeror shall be required to complete the design and construction documentation, and construct the project in compliance with these completed requirements.

2.0 NETWORK ANALYSIS SCHEDULE

The Contractor shall develop a Project schedule in accordance with Section 01321 NETWORK ANALYSIS SCHEDULE (NAS).

Overall construction priority milestones are required and cannot be changed except by contract modification. Prospective Offerors shall be required to submit a complete schedule for design and construction that meets or exceeds the milestone goals of the Government for this project. (All days are in calendar days.)

Notice to Proceed (NTP)	written notification following Award of Contract
Pre-design Meeting	within 10 days following NTP

A. DESIGN PHASE

The successful contractor shall develop and submit for formal review Design Submittals as called for in Section 01321 NETWORK ANALYSIS SCHEDULE and Table 1 DESIGN SUBMITTALS. Each Design Submittal shall meet requirements as delineated in Section 01335 SUBMITTAL PROCEDURES. The Contractor shall submit his Design Submittals for both the Uniformed Police Provincial HQ and PRC #1 in accordance with schedule listed below in Table 1.

Table 1 DESIGN SUBMITTALS

SUBMITAL	# OF DAYS FOLLOWING NTP	INCLUDED IN SUBMITTAL
10% Design Submittal	40	Geotechnical Subsurface Investigation Topographical survey 100% As Planned Network Analysis Schedule(NAS) Submittal Register
35% Design Submittal	70	Force protection design 100% Water well design 35% Site Plan 35% Grading and Stormwater Drainage Plan & Specifications 35% Utility Plans and Specifications 35% Site Electrical Plans and Specifications 35% Communication Plans and Specifications 35% Fuel Storage System Plans and Specifications 100% Foundation Designs
65% Design Submittal	105	65% Site/Civil design 65% Grading and Stormwater Drainage Plan & Specifications 65% Utility Plans and Specifications 65% Site Electrical Plans and Specifications 65% Communication Plans and Specifications 65% Fuel Storage System Plans and Specifications 100% Schedule of Long Lead Items Procurements in NAS
95% Design Submittal	140	95% plans and specifications
100% Design Submittal	170	100% construction documents

B. PRE-CONSTRUCTION

Subsequent to NTP, the Contractor shall submit his Accident Prevention Plan, Mine Clearance Safety Work Plan, and all personnel qualification submittals within 10 days following NTP. Upon approval of these plans, the Government may issue clearance for UXO / Mine Removal and Clearance ahead of topographic surveying and geotechnical subsurface investigation.

C. CONSTRUCTION PHASE

The Construction Phase will be initiated by the Clearance For Construction (CFC) letter issued by the Contracting Officer and instruction to baseline the As-Planned NAS. A CFC will be provided separately by the Contracting Officer for each phase of the work. The Government may give the Contractor authorization for the Construction Phase for portions of the work following review and approval of the particular design submittal. No work can begin on any phase of the process until an official CFC for that phase is issued.

ANP Uniformed Police Provincial HQ

Full Clearance for Construction	After acceptance of 100% construction documents
Complete Construction	within 450 days following NTP
All work required by this contract	within 450 days following NTP
Total Contract Period	**450** days

Provincial Response Company (PRC)

Full Clearance for Construction	After acceptance of 100% construction documents
Complete Construction	within 365 days following NTP
All work required by this contract	within 365 days following NTP
Total Contract Period	**365** days

The Required Period of Performance is stated in Calendar Days following the NTP and includes all design and construction priority milestones.

3.0 PROGRESS MEETINGS

Weekly progress meetings will be held at which, as a minimum, the contractor's Project Manager, a representative of the designer, the site superintendent, Quality Control Manager, and Site Safety and Health Officer (SSHO) shall be present. The meetings will occur at the USACE Resident Office. The day for conducting meetings shall be mutually agreed to between the Contractor and the Government within 10 calendar days after receipt of the notice to proceed. The Contractor shall be a required participant in the progress meeting. Progress meeting shall consist of a written agenda of topics and issues to be discussed during the meeting and followed up with draft meeting minutes prepared by the Contractor. The draft meeting minutes shall be emailed out to all attendees one (1) day after the meeting for review and approval. The review and approval process will allow for mutual acceptance of the draft minutes as written, or editing to add, delete, and/or correct items that were covered in the weekly meeting. The edited draft meeting minutes shall be published and handed out by the Contractor at each following week's progress meeting. When all attendees agree the minutes have been properly edited; then those minutes become the official final minutes of the previous week's progress meeting. All attendees will be required to sign an attendance sheet that will become an attachment to the official final meeting minutes.
The progress meeting agendas shall at a minimum contain the following items (*Italic wording represents example input per item*):

1. Network Analysis Schedule and S-curve status. The Contractor shall provide an as-built NAS statused to a data date of the progress meeting in both digital XER file and hard copy illustrating both actualized stats bars and baseline bars on the same Gant chart.
    a. Dollar driven schedule how much will the Contractor need in the next three months
    b. Status of the contract and funds
2. Weather days for the last two weeks
3. Go over Punch/Discrepancy list Items
    a. Not in contract compliance
    b. Methods of correction
    c. Where does it fit in the schedule?
    d. Is it holding up a critical path item?
    e. Is it a critical path item?
4. Status of stored materials
    a. When to fund stored materials and when to subtract materials from the stored state
    b. Where is the item on the scheduled?
5. Work performed since last progress meeting
    a. Last week did we do what we said we were going to do?
    b. Is there some slippage according to schedule?
6. Two week look ahead.
7. Submittal register open / closed items.
    a. Status of needed submittals
    b. Missing/overdue
8. Status of long lead items procurement
9. Visit any open items from previous week's agenda.
10. Pay estimate
    a. Questions
    b. Concerns

c. Progress

11. Status of safety plan and accident prevention
12. Review of the QCS program
    a. Questions
    b. Problems
    c. Observations
13. Status and review of testing
    a. Concrete
    b. Soil
    c. Asphalt
14. RFI's / RFC's
    a. New
    b. Unanswered
15. RFP's
    a. New
    b. Unanswered
16. Differing Site Conditions
17. Security issues
    a. Status of coordination with the Others/Local Sponsor, Any Item
18. Other

During the first progress meeting the agenda format will be reviewed and agreed to by all parties in attendance.

4.0 CONSTRUCTION PRIORITY MILESTONES

Construction priority milestones shall be indicated on the contractor's network analysis schedule. Each feature of work shall be completed and commissioned on or before the milestone day indicated below. The commissioning of each system shall be coordinated by the Contractor including but not limited to which trads must be completed in other systems or provide temporary facilities to support the commissioning. Construction Priority Milestone facility work shall begin upon the clearance for construction and design approval of that feature of work.

The order of construction for all buildings and facilities shall be prioritized in accordance with the Construction Priority table as follows. All Work under this contract shall be completed and commissioned; each facility indicated shall be ready for beneficial occupancy in accordance with Tables 2.1 and 2.2 CONSTRUCTION PRIORITIES TABLE.

ANP Uniformed Police Provincial HQ

Table 2.1 CONSTRUCTION PRIORITIES TABLE

PRIORITY 1: 150 Days Completion from NTP		
Summary of Work	**Feature of Work**	**Reference to Appendix A Concept Plan & Appendix B Drawings**
Site Preparation	Site Preparation	NA
	Rough Site Grading and Storm Water Drainage	NA
	Force Protection Foundations	Walls, Fences, Gates & Barriers
	Schedule of long lead items procured	NA
PRIORITY 2: 210 Days Completion from NTP		

Force Protection / Water Well	Entry Control Points	Wall, Fences, Gates & Barriers
	Perimeter Wall	Wall, Fences, Gates & Barriers
	Guard Towers	108 Guard Tower, Concrete Walk & Fence (FP04A – 12 GSM)
	Water well drilling	NA
	Well House (U03), Pump House, construction, and commissioning	112 Well House (U03 -20 GSM) & Pump House
PRIORITY 3: 270 Days Completion from NTP		
Infrastructure/Utilities	Potable Water Distribution System and Storage	Misc Site Details
	Wastewater Collection and Treatment System	Misc Site Details
	Water Tower, 20 M	113 Water Tower (U05 – 20M)
	Electrical Generation and Distribution System	NA
	Communication System	NA
	Fuel Storage, Generator Canopy, and Vehicle Fuel Point	114 Fuel, Generator, Canopy (U02)
	Building footprint grading	All structures
	Foundation installation	All structures
PRIORITY 4: 360 Days Completion from NTP		
Facilities: Billeting, DFAC, Latrine	Administration Building	100A Administration Building, Type 2 (1446 GSM) AD13 100B Administration Building, Type 2 (1446 GSM) AD13
	Dining Facility (DFAC)	101 Dining Facilities Building Type 2 (559 GSM) (D07)
	Senior/High Barracks,	Barracks Building (B12 – 862 GSM) Site Adapt Design
	Barracks (Open Bay)	Barrack Building Type 2 – Open Bay (CL0613 – 319 GSM)
	Women's Barracks	Women's Barracks (B-25 - 280 GSM)
	Latrines, Medium	105 Latrine Building (L02, Medium – 180 GSM)
	Toilet Building	
PRIORITY 5: 400 Days Completion from NTP		
Remaining Facilities (for the UP PHQ)	Training Building	102 Training Building (CL06), (319 GSM)

	Family Response Unit (FRU) Office	118 FRU Office (AD20) (60 GSM)
	Vehicle Maintenance Facility & POL	115 Vehicle Maintenance (3 Bay) and POL Building (VM05 – 206 GSM)
	Warehouse Building, Small	116 Storage-Small (S06 -65 GSM)
	Secure Storage (ASP)	117 Secure Storage (S07-90 GSM)
	Trash Collection Points	111 Trash Collection Point (G01)
	Guard Houses	109 Guard House (FP07-54 GSM)
	Guard Shacks	110 Guard Shack (FP05 – 12 GSM)
	Aggregate Roadways/Driveways, Parking (within perimeter wall)	NA
	Access Road and Structures (outside perimeter wall)	NA
PRIORITY 6: 450 Days Completion from NTP		
	All remaining work: including but not limited to testing & commissioning, as-built drawings, and O&M manuals	NA

<u>Provincial Response Company (PRC)</u>

Table 2.2 CONSTRUCTION PRIORITIES TABLE

PRIORITY 1: 125 Days Completion from NTP		
Summary of Work	**Feature of Work**	**Reference to Appendix A Concept Plan & Appendix B Drawings**
Site Preparation	Site Preparation	NA
	Rough Site Grading and Storm Water Drainage	NA
	Force Protection Foundations	Wall, Fences, Gates & Barriers
	Schedule of long lead items procured	NA
PRIORITY 2: 170 Days Completion from NTP		
Force Protection / Water Well	Entry Control Points	Wall, Fences, Gates & Barriers
	Perimeter Wall	Wall, Fences, Gates & Barriers
	Guard Towers	207 Guard Tower (FP04A – 12 GSM), Concrete Walk & Fence
	Water well drilling	NA

	Well House (U03), Pump House, construction, and commissioning	212 Well House (U03 – 20 GSM), Pump House
PRIORITY 3: 220 Days Completion from NTP		
Infrastructure/Utilities	Potable Water Distribution System and Storage	Misc Site Details
	Water Tower, 20 M	213 Water Tower (U05 – 20M)
	Wastewater Collection and Treatment System	Misc Site Details
	Electrical Generation and Distribution System	NA
	Communication System	NA
	Fuel Storage, Generator Canopy, and Vehicle Fuel Point	214 Fuel, Generator, Canopy (U02)
	Building footprint grading	All structures
	Foundation installation	All structures
PRIORITY 4: 295 Days Completion from NTP		
Facilities: Billeting, DFAC, Latrine	Administration Building	200 Administration Building Type 5 (AD16 - 508 GSM)
	Dining Facility (DFAC)	204 Dining Facility Building Type 3 (D08 - 384 GSM)
	Senior/High Barracks, 2-story	202 Barracks Building Type 3, (B14 - 384 GSM)
	Barracks (Open Bay)	201 Barrack Building Type 2 – Open Bay (B13 – 579 GSM)
	Women's Barracks	203 Female Barracks, Small (B-26 – 48 GSM)
	Latrines, Medium	209 Latrine Building, Medium (L02 – 180 GSM)
PRIORITY 5: 325 Days Completion from NTP		
Remaining Facilities (for PRC)	Warehouse Building, Small	210 Storage-Small (S06 -65 GSM)
	POL Storage Building	215 POL Building (VM06 – 25 GSM)
	Secure Storage (ASP)	211 Secure Storage (S07-90 GSM)
	Trash Collection Points	208 Trash Collection Point (G01)
	Guard Houses	205 Guard House (FP07-54 GSM)
	Guard Shacks	206 Guard Shack (FP05 – 12 GSM)
	Aggregate Roadways/Driveways, Parking (within perimeter wall)	NA

	Access Road and Structures (outside perimeter wall)	NA
PRIORITY 6: 365 Days Completion from NTP		
	All remaining work: including but not limited to testing & commissioning, as-built drawings, and O&M manuals	NA

--END OF SECTION--

SECTION 01321
PROJECT SCHEDULE

1. GENERAL

1.1 REFERENCES

The publications listed below form a part of the specification to the extent referenced. The publications are referenced in the text by basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE) ER 1-1-11 (1995) Progress, Schedules, and Network Analysis Systems

1.2 QUALIFICATIONS

The Contractor shall designate an authorized representative who shall be responsible for the preparation of all required project schedule reports.

2. PRODUCTS (Not Applicable)

3. EXECUTION

3.1 GENERAL REQUIREMENTS

Pursuant to the Contract Clause, SCHEDULE FOR CONSTRUCTION CONTRACTS, a Project Schedule as described below shall be prepared. The scheduling of Construction design and construction shall be the responsibility of the Contractor. Contractor management personnel shall actively participate in its development. Designers, Subcontractors and suppliers working on the project shall also contribute in developing and maintaining an accurate Project Schedule. The Contractor is responsible for scheduling the construction contract work to include procurement of critical materials and equipment, Contractor quality control and construction, acceptance testing and training. The approved Project Schedule shall be used to measure the progress of the work, to aid in evaluating time extensions, and to provide the basis of all progress payments.

3.2 BASIS FOR PAYMENT

The schedule shall be the basis for measuring Contractor progress. Lack of an approved schedule or scheduling personnel will result in an inability of the Contracting Officer to evaluate Contractor's progress for the purposes of payment. Failure of the Contractor to provide all information, as specified below, shall result in the disapproval of the entire Project Schedule submission and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes. In the case where Project Schedule revisions have been directed by the Contracting Officer and those revisions have not been included in the Project Schedule, the Contracting Officer may hold, retain up to the maximum allowed by contract, each payment period, until revisions to the Project Schedule have been made. Resource loading of cost is required and will be used as the cost breakdown for progress payments.

3.3 PROJECT SCHEDULE

The computer software system utilized by the Contractor to produce the Project Schedule shall be capable of providing all requirements of this specification. Failure of the Contractor to meet the requirements of this specification shall result in the disapproval of the schedule. Manual methods used to produce any required information shall require approval by the Contracting Officer. Project schedules must be prepared and maintained in a software compatible with current versions of the government’s systems RMS and

Primavera Project Manager. Contracts with price value over $500,000 will use Primavera Project Manager P6. The Licensed copy of scheduling software shall be submitted for acceptance to the Contracting Officer within two weeks after Contract Award.

3.3.1 Use of the Critical Path Method

The Critical Path Method (CPM) of network calculation shall be used to generate the Project Schedule. The Contractor shall provide the Project Schedule in the Precedence Diagram Method (PDM).

3.3.2 Level of Detail Required

The Project Schedule shall include an appropriate level of detail. Failure to develop or update the Project Schedule or provide data to the Contracting Officer at the appropriate level of detail, as specified by the Contracting Officer, shall result in the disapproval of the schedule.

The Network Analysis System (NAS) shall identify all Government, Construction Quality Management (CQM) Construction activities planned for the project and all other activities that could impact project completion if delayed. Refer to 3.5.5.4 Banding for further detail in grouping activities.

With the exception of the Contract Award and Contract Completion Date (CCD) milestone activities, no activity shall be open-ended; each activity shall have predecessor and successor ties. Once an activity exists on the schedule it may not be deleted or renamed to change the scope of the activity and shall not be removed from the schedule logic without approval from the Contracting Officer. The ID number for a deleted activity shall not be re-used for another activity. No more than 20 percent of the activities shall be critical or near critical. Critical is defined as having zero days of Total Float. "Near Critical" is defined as having Total Float of 1 to 14 days. Contractor activities shall be driven by calendars that reflect Saturdays, Sundays and all Federal Holidays as non-work days.

The Contracting Officer will use, but is not limited to, the following conditions to determine the appropriate level of detail to be used in the Project Schedule:

3.3.2.1 Activity Durations

Contractor submissions shall follow the direction of the Contracting Officer regarding reasonable activity durations. Reasonable durations are those that allow the progress of activities to be accurately determined between payment periods (usually less than 2 percent of all non-procurement activities' Original Durations are greater than 20 days).

3.3.2.2 Design and Permit Activities

Design and permitting activities, including necessary conferences and follow up actions and design package submission dates, shall be integrated into the schedule.

3.3.2.3 Procurement Activities

Tasks related to the procurement of long lead materials or equipment shall be included as separate activities in the project schedule. Long lead materials and equipment are those materials that have a procurement cycle of over 90 days. Examples of procurement process activities include, but are not limited to: submittals, approvals, procurement, fabrication, and delivery. The Contractor shall show each delivery with relationship tie to the Construction Activity specifically for the delivery. For rejected material/equipment not in compliance with approved submittals a new procurement activity shall be inserted in the schedule.

3.3.2.4 Critical Activities

The following activities, as applicable, shall be listed as separate line activities on the Contractor's project schedule:

a. Submission and approval of mechanical/electrical layout drawings.
b. Submission and approval of O & M manuals.
c. Submission and approval of as-built drawings.
d. Submission and approval of 1354 data and installed equipment lists.
e. Submission and approval of testing and air balance (TAB).
f. Submission of TAB specialist design review report.
g. Submission and approval of fire protection specialist.
h. Submission and approval of testing and balancing of HVAC plus commissioning plans and data.
i. Air and water balance dates.
j. HVAC commissioning dates.
k. Controls testing plan.
l. Controls testing.
m. Performance Verification testing.
n. Other systems testing, if required.
o. Pre-final inspection.
p. Correction of punch list from pre-final inspection.
q. Final inspection.

3.3.2.5 Government Activities

Government and other agency activities germane to the contract shall be shown. These activities include, but are not limited to: design reviews, environmental permit approvals by State regulators, inspections, proposals and pay estimates reviews, and utility tie in.

3.3.2.6 Responsibility

All activities shall be identified in the project schedule by the party responsible to perform the work. Responsibility includes, but is not limited to, the subcontracting firm, contractor work force, or government agency performing a given task. Activities shall not belong to more than one responsible party. The responsible party for each activity shall be identified by the Responsibility Code.

3.3.2.7 Work Areas

All activities shall be identified in the project schedule by the work area in which the activity occurs. Activities shall not be allowed to cover more than one work area. The work area of each activity shall be identified by the Work Area Code.

3.3.2.8 Modification or Claim Number

Any activity that is added or changed by contract modification or used to justify claimed time shall be identified by a mod or claim code that changed the activity. Activities shall not belong to more than one modification or claim item. The modification or claim number of each activity shall be identified by the Mod or Claim Number. Whenever possible, changes shall be added to the schedule by adding new activities. Existing activities shall not normally be changed to reflect modifications. A new current approved baseline shall be created to reflect the changes to the previous approved baseline (see item 3.5.5.6 Baseline Network Analysis Schedule.)

3.3.2.9 Work Item

All activities shall be identified in the project schedule by the Work Item to which the activity belongs. An activity shall not contain work in more than one work item. The work item for each appropriate activity shall be identified by the Work Item Code.

3.3.2.10 Phase of Work

All activities shall be identified in the project schedule by the phases of work in which the activity occurs. Activities shall not contain work in more than one phase of work. The project phase of each activity shall be by the unique Phase of Work Code.

3.3.2.11 Category of Work

All Activities shall be identified in the project schedule according to the category of work which best describes the activity. Category of work refers, but is not limited, to the procurement chain of activities including such items as designs, design package submissions design reviews, review conferences, permits, submittals, approvals, procurement, fabrication, delivery, installation, start-up, and testing. The category of work for each activity shall be identified by the Category of Work Code.

3.3.2.12 Feature of Work

All activities shall be identified in the project schedule according to the feature of work to which the activity belongs. Feature of work refers, but is not limited to, a work breakdown structure for the project. The feature of work for each activity shall be identified by the Feature of Work Code.

3.3.3 Scheduled Project Completion

The schedule interval shall extend from award of contract to the contract completion date.

3.3.3.1 Project Start Date

The schedule shall start no earlier than the date on which award of contract was acknowledged. The Contractor shall include as the first activity in the project schedule an activity called "Start Project". The "Start Project" activity shall have an "ES" constraint date equal to the date that the award of task order was acknowledged, and a zero day duration.

3.3.3.2 Constraint of Last Activity

Completion of the last activity in the schedule shall be constrained by the contract completion date. Calculation on project updates shall be such that if the early finish of the last activity falls after the contract completion date, then the float calculation shall reflect a negative float on the critical path. The Contractor shall include as the last activity in the project schedule an activity called "End Project". The "End Project" activity shall have an "LF" constraint date equal to the completion date for the project, and a zero day duration.

3.3.3.3 Early Project Completion

In the event the project schedule shows completion of the project prior to the contract completion date, the Contractor shall identify those activities that have been accelerated and/or those activities that are scheduled in parallel to support the Contractor's "early" completion. Contractor shall specifically address each of the activities noted in the narrative report at every project schedule update period to assist the Contracting Officer in evaluating the Contractor's ability to actually complete prior to the contract period.

3.3.4 Interim Completion Dates

Contractually specified interim completion dates shall also be constrained to show negative float if the early finish date of the last activity in that phase falls after the interim completion date.

3.3.4.1 Start Phase

The Contractor shall include as the first activity for a project phase an activity called "Start Phase X" where "X" refers to the phase of work. The "Start Phase X" activity shall have an "ES" constraint date equal to the date on which the award of task order was acknowledged, and a zero day duration.

3.3.4.2 End Phase

The Contractor shall include as the last activity in a project phase an activity called "End Phase X" where "X" refers to the phase of work. The "End Phase X" activity shall have an "LF" constraint date equal to the completion date for the project, and a zero day duration.

3.3.4.3 Phase X

The Contractor shall include a hammock type activity for each project phase called "Phase X" where "X" refers to the phase of work. The "Phase X" activity shall be logically tied to the earliest and latest activities in the phase.

3.3.5 Default Progress Data Disallowed

Actual Start and Finish dates shall not be automatically updated by default mechanisms that may be included in CPM scheduling software systems. Actual Start and Finish dates on the CPM schedule shall match those dates provided from Contractor Quality Control Reports. Failure of the Contractor to document the Actual Start and Finish dates on the Daily Quality Control report for every in-progress or completed activity, and failure to ensure that the data contained on the Daily Quality Control reports is the sole basis for schedule updating shall result in the disapproval of the Contractor's schedule and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes. Updating of the percent complete and the remaining duration of any activity shall be independent functions. Program features which calculate one of these parameters from the other shall be disabled.

3.3.6 Out-of-Sequence Progress

Activities that have posted progress without all preceding logic being satisfied (Out-of-Sequence Progress) will be allowed only on a case-by-case approval of the Contracting Officer. The Contractor shall propose logic corrections to eliminate all out of sequence progress or justify not changing the sequencing for approval prior to submitting an updated project schedule.

3.3.7 Negative Lags

Lag durations contained in the project schedule shall not have a negative value.

3.4 PROJECT SCHEDULE SUBMISSIONS

The Contractor shall provide the submissions as described below. The data disk, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS.

3.4.1 Initial Project Schedule Submission

The Initial Project Schedule shall be submitted for approval within 30 calendar days after award of contract. The schedule shall provide a reasonable sequence of activities which represent work through the entire project and shall be at a reasonable level of detail. The baseline schedule shall be reviewed and deemed acceptable prior to the contractor entering (manually or electronically via SDEF file) in QCS.

3.4.2 Periodic Schedule Updates

Based on the result of progress meetings, specified in "Periodic Progress Meetings," the Contractor shall submit periodic schedule updates. These submissions shall enable the Contracting Officer to assess Contractor's progress. If the Contractor fails or refuses to furnish the information and project schedule data, which in the judgment of the Contracting Officer or authorized representative is necessary for verifying the Contractor's progress, the Contractor shall be deemed not to have provided an estimate upon which progress payment may be made.

3.4.3 Standard Activity Coding Dictionary

The Contractor shall use the activity coding structure defined in the Standard Data Exchange Format (SDEF) in ER 1-1-11, Appendix A. This exact structure is mandatory, even if some fields are not used. The contractor shall assure the schedule contains the holidays, fiscal year starting month, work day start and finish shift and preferences for units of time, observed by the government.

3.5 SUBMISSION REQUIREMENTS

The following items shall be submitted by the Contractor for the preliminary submission, initial submission, and every periodic project schedule update throughout the life of the project:

3.5.1 Data Disks

Two (2) Data Compact Disks containing the project schedule shall be provided. Data on the disks shall adhere to the SDEF format specified in ER 1-1-11, Appendix A.

3.5.1.1 File Medium

Required data shall be submitted on Compact Disk, formatted to hold 700 MB of data, under the MS-DOS Version 5. or 6.x, unless otherwise approved by the Contracting Officer.

3.5.1.2 Disk Label

A permanent exterior label shall be affixed to each disk submitted. The label shall indicate the type of schedule (Preliminary, Initial, Update, or Change), full contract number, project name, project location, data date, name and telephone number of person responsible for the schedule, and the MSDOS version used to format the disk.

1. Two (2) Data Compact Disks containing the project schedule shall be provided. Data on the disks shall adhere to the SDEF format specified in ER 1-1-11, Appendix A.

2. File Medium - Required data shall be submitted on Compact Disk, formatted to hold 700 MB of data, under the MS-DOS Version 5. or 6.x, unless otherwise approved by the Contracting Officer.

3. Disk Label - A permanent exterior label shall be affixed to each disk submitted. The label shall indicate the type of schedule (Preliminary, Initial, Update, or Change), full contract number, project name, project location, data date, name and telephone number of person responsible for the schedule, and the MSDOS version used to format the disk.

4. File Name - Each file submitted shall have a name related to either the schedule data date, project name, or contract number. The Contractor shall develop a naming convention that will ensure that the names of the files submitted are unique. The Contractor shall submit the file naming convention to the Contracting Officer for approval.

3.5.1.3 File Name

Each file submitted shall have a name related to the schedule data date, project name, or contract number. The Contractor shall develop a naming convention that will ensure that the names of the files submitted are unique. The Contractor shall submit the file naming convention to the Contracting Officer for approval.

3.5.2 Narrative Report

A Narrative Report shall be provided with the preliminary, initial, and each update of the project schedule. This report shall be provided as the basis of the Contractor's progress payment request. The Narrative Report shall include: a description of activities along the 2 most critical paths, a description of current and anticipated problem areas or delaying factors and their impact, and an explanation of corrective actions taken or required to be taken. The narrative report is expected to relay to the Government, the Contractor's thorough analysis of the schedule output and its plans to compensate for any problems, either current or potential, which are revealed through that analysis.

3.5.3 Approved Changes Verification

Only project schedule changes that have been previously approved by the Contracting Officer shall be included in the schedule submission. The Narrative Report shall specifically reference, on an activity by activity basis, all changes made since the previous period and relate each change to documented, approved schedule changes.

3.5.4 Schedule Reports

The format for each activity for the schedule reports listed below shall contain: Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date, and Total Float. Actual Start and Actual Finish Dates shall be printed for those activities in progress or completed.

3.5.4.1 Activity Report

A list of all activities sorted according to activity number.

3.5.4.2 Logic Report

A Logic Report is a list of Preceding and Succeeding activities for every activity in ascending order by activity number. Preceding and succeeding activities shall include all information listed above in paragraph Schedule Reports. A blank line shall be left between each activity grouping.

3.5.4.3 Total Float Report

A list of all incomplete activities sorted in ascending order of total float. Activities which have the same amount of total float shall be listed in ascending order of Early Start Dates. Completed activities shall not be shown on this report.

3.5.4.4 Earnings Report

An Earnings Report is a compilation of the Contractor's Total Earnings on the project from award of contract until the most recent Monthly Progress Meeting. This report shall reflect the Earnings of specific activities based on the agreements made in the field and approved between the Contractor and Contracting Officer at the most recent Monthly Progress Meeting. Provided that the Contractor has provided a complete schedule update, this report shall serve as the basis of determining Contractor Payment. Activities shall be grouped by work item and sorted by activity numbers. This report shall: sum all activities in a work item and provide a work item percent; and complete and sum all work items to provide a total project percent complete. The printed report shall contain, for each activity: the Activity Number, Activity Description, Original Budgeted Amount, Total Quantity, Quantity to Date, Percent Complete (based on cost), and Earnings to Date.

3.5.5 Network Diagram

The network diagram shall be required on the initial schedule submission and on monthly schedule update submissions. The network diagram shall depict and display the order and interdependence of activities and

the sequence in which the work is to be accomplished. The Contracting Officer will use, but is not limited to, the following conditions to review compliance with this paragraph:

3.5.5.1 Continuous Flow

Diagrams shall show a continuous flow from left to right with no arrows from right to left. The activity number, description, duration, and estimated earned value shall be shown on the diagram.

3.5.5.2 Project Milestone Dates

Dates shall be shown on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

3.5.5.3 Critical Path

The critical path shall be clearly shown.

3.5.5.4 Banding

Activities shall be grouped to assist in the understanding of the activity sequence. Typically, this flow will group activities by category of work, work area and/or responsibility. Separate activities shall be created for each Phase, Area, Floor Level and Location in which the activity is occurring. Each set of activities identified as a separate group shall be included in a Work Breakdown Structure to avoid confusion with similar activities repeated in other phases, floors, or locations.

3.5.5.5 S-Curves

Earnings curves showing projected early and late earnings and earnings to date.

3.5.5.6 Baseline Network Analysis Schedule

The original approved baseline shall not change through the duration of the contract. The original baseline naming convention is B/L – Contract Name – (Date created). A second revised baseline shall be maintained to reflect approved time extensions, and/or changes to the contract; this could be named as Current Approved Baseline and follow the naming convention: C/A - Contract Name – (Date changed). A third monthly baseline shall be maintained to reflect the monthly updates submitted by the contractor for payment. Naming convention is Mmm- Contract Name-(Date created). Submittal of the Baseline Network Analysis Schedule, and subsequent schedule updates, shall be understood to be the Contractor's certification that the submitted schedule meets all of the requirements of the Contract Documents, represents the Contractor's plan on how the work shall be accomplished, and accurately reflects the work that has been accomplished and how it was sequenced (as-built logic).

Samples of baselines naming conventions:

Field Description in Primavera	Baseline Type	Naming Convention
Project Baseline	Current Approved Baseline	CA – Cerrillos Dam – (12-Jan-1992)
Primary	Monthly Baseline	M02 – Cerillos Dam – (1-Feb-1992)
Secondary	Original Baseline	BL – Cerrillos Dam – (12-Jan-1992)

3.6 PERIODIC PROGRESS MEETINGS

Progress meetings to discuss payment shall include a monthly onsite meeting or other regular intervals mutually agreed to at the preconstruction conference. During this meeting the Contractor shall describe, on an activity by activity basis, all proposed revisions and adjustments to the project schedule required to reflect the current status of the project. The Contracting Officer will approve activity progress, proposed revisions, and adjustments as appropriate.

3.6.1 Meeting Attendance

The Contractor's Project Manager and Scheduler shall attend the regular progress meeting.

3.6.2 Update Submission Following Progress Meeting

A complete update of the project schedule containing all approved progress, revisions, and adjustments, based on the regular progress meeting, shall be submitted not later than 4 working days after the monthly progress meeting.

3.6.3 Progress Meeting Contents

Update information, including Actual Start Dates, Actual Finish Dates, Remaining Durations, and Cost-to-Date shall be subject to the approval of the Contracting Officer. As a minimum, the Contractor shall address the following items on an activity by activity basis during each progress meeting.

3.6.3.1 Start and Finish Dates

The Actual Start and Actual Finish date for each activity currently in progress or completed.

3.6.3.2 Time Completion

The estimated Remaining Duration for each activity in-progress. Time-based progress calculations shall be based on Remaining Duration for each activity.

3.6.3.3 Cost Completion

The earnings for each activity started. Payment will be based on earnings for each in-progress or completed activity. Payment for individual activities will not be made for work that contains quality defects. A portion of the overall project amount may be retained based on delays of activities.

3.6.3.4 Logic Changes

All logic changes pertaining to change orders, change orders to be incorporated into the schedule, contractor proposed changes in work sequence, corrections to schedule logic for out-of-sequence progress, lag durations, and other changes that have been made pursuant to contract provisions shall be specifically identified and discussed.

3.6.3.5 Other Changes

Other changes required due to delays in completion of any activity or group of activities include:

a. Delays beyond the Contractor's control, such as strikes and unusual weather.
b. Delays encountered due to submittals, Government Activities, deliveries or work stoppages which make re-planning the work necessary.
c. Changes required in order to correct a schedule which does not represent the actual or planned prosecution and progress of the work.

3.7 REQUESTS FOR TIME EXTENSIONS

In the event the Contractor requests an extension of the contract completion date, or any interim milestone date, the Contractor shall furnish the following for a determination as to whether or not the Contractor is entitled to an extension of time under the provisions of the contract: justification, project schedule data, and supporting evidence as the Contracting Officer may deem necessary. Submission of proof of delay, based on revised activity logic, duration, and costs (updated to the specific date that the delay occurred) is obligatory to any approvals.

3.7.1 Justification of Delay

The project schedule shall clearly display that the Contractor has used, in full, all the float time available for the work involved with this request. The Contracting Officer's determination as to the number of allowable days of contract extension shall be based upon the project schedule updates in effect for the time period in question, and other factual information. Actual delays that are found to be caused by the Contractor's own actions, which result in the extension of the schedule, will not be a cause for a time extension to the contract completion date.

3.7.2 Submission Requirements

The Contractor shall submit a justification for each request for a change in the contract completion date of less than 2 weeks based upon the most recent schedule update at the time of the constructive direction issued for the change. Such a request shall be in accordance with the requirements of other appropriate Contract Clauses and shall include, as a minimum:

a. A list of affected activities, with their associated project schedule activity number.
b. A brief explanation of the causes of the change.
c. An analysis of the overall impact of the changes proposed.
d. A sub-network of the affected area.

Activities impacted in each justification for change shall be identified by a unique activity code contained in the required data file.

3.7.3 Additional Submission Requirements

For any requested time extension greater than 2 weeks, the Contracting Officer may request an interim update with revised activities for a specific change request. The Contractor shall provide this disk within 4 days of the Contracting Officer's request.

3.8 DIRECTED CHANGES

If changes are issued prior to settlement of price and/or time, the Contractor shall submit proposed schedule revisions to the Contracting Officer within 2 weeks of this task order being issued. The proposed revisions to the schedule will be approved by the Contracting Officer prior to inclusion of those changes within the project schedule. If the Contractor fails to submit the proposed revisions, the Contracting Officer may furnish the Contractor with suggested revisions to the project schedule. The Contractor shall include these revisions in the project schedule until revisions are submitted, and final changes and impacts have been negotiated. If the Contractor has any objections to the revisions furnished by the Contracting Officer, the Contractor shall advise the Contracting Officer within 2 weeks of receipt of the revisions. Regardless of the objections, the Contractor shall continue to update the schedule with the Contracting Officer's revisions until a mutual agreement in the revisions is reached. If the Contractor fails to submit alternative revisions within 2 weeks of receipt of the Contracting Officer's proposed revisions, the Contractor will be deemed to have concurred with the Contracting Officer's proposed revisions. The proposed revisions will then be the basis for an equitable adjustment for performance of the work.

3.9 OWNERSHIP OF FLOAT

Float available in the schedule, at any time, shall not be considered for the exclusive use of either the Government or the Contractor.

-- END OF SECTION –

ADDENDUM

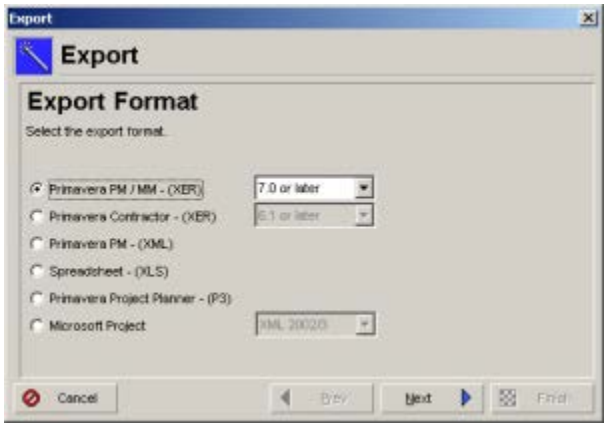
Exporting and Importing Project Information
October 25th, 2009 Activities, EPS primaverarena

As you know Primavera P6 is not a File based system, you need to export Project files if you wish to share your project with someone not in your network via email or other electronic delivery system. Export a Project file is simple and the exported file is a compressed file of all you project

As you know Primavera P6 is not a *File based system*, you need to export Project files if you wish to share your project with someone not in your network via email or other electronic delivery system. Export a Project file is simple and the exported file is a compressed file of all you project information which the other party needs to import in order to see it.

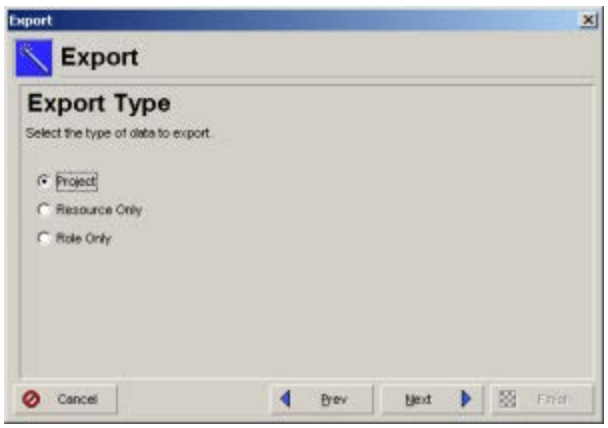
Export

To export a project file, you can go to File menu and click on Export.

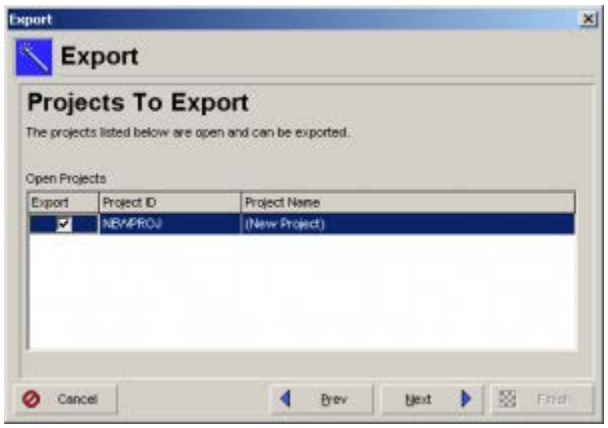


Select Primavera PM/MM format.

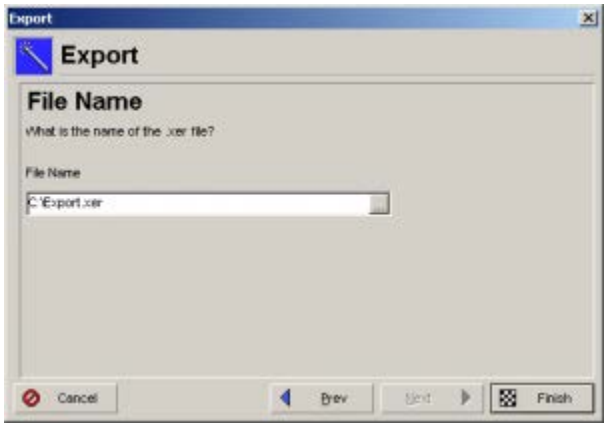
Choose which type of data you wish to export.



Select the Project.



Select the location of the exported file to be placed in.



Click on the “Finish” key.

And you will find the*.XER file on your desktop (or the location you chose).

Import

To Import the file just double clicking the *.xer file would take you through the same steps and help you successfully update or create a new Project in your EPS.

Key definitions

1. Earned value is a technique for measuring project performance according to both project cost and schedule. This technique compares the budgeted or planned cost of the work to the actual cost. While earned value analyses are typically performed for WBS elements, you can also perform an earned value analysis for activities and groups of activities.

    a. In order to perform an earned value analysis, you must specify two calculation techniques. These techniques apply to activities that are currently in progress. The first technique is used to calculate an activity's percent complete. The second technique is used to calculate an activity's Estimate To Complete (ETC). A set of options is provided for both of these techniques, and you can set these options for each WBS element.

    b. The fundamental earned value parameters used to calculate an activity's Estimate to Complete are: Earned Value Cost; Budget at Completion; Planned Value Cost; and, Actual Cost. You can derive an activity's Estimate to Complete and other earned value indexes from these parameters.

    c. If you are the administrator for your organization, you can specify default earned value techniques for WBS elements.

2. Critical path: The critical path is a series of activities that determines a project's completion time. The duration of the activities on the critical path controls the duration of the entire project; a delay to any of these activities will delay the finish date of the entire project. Critical activities are defined by either the total float or the longest path in the project network.

3. Critical Path Method (CPM) scheduling: The method by which activity durations and the relationships between activities are used to mathematically calculate a schedule for the entire project. CPM focuses your attention on the critical path of activities that affect the completion date for the project or an intermediate deadline.

    Early dates, the earliest possible dates each activity can start and finish, and late dates, the latest possible dates each activity can start and finish without delaying the project finish or an intermediate deadline (constraint) are also calculated.

SECTION 01335
SUBMITTAL PROCEDURES

1.0 GENERAL

1.1 REFERENCE

The publication listed below forms a part of this specification to the extent referenced. The publication is referenced to in the text by basic designation only.

CONSTRUCTION SPECIFICATIONS INSTITUTE

Manual of Practice	Construction Specifications Institute http://www.csinet.org/s_csi/index.asp 601 Madison Street Alexandria, Virginia 22314-1791

NATIONAL INSTITUTE OF BUILDING SCIENCES (NIBS)

Unified Master Reference List (UMRL)	National Institute of Building Sciences 1090 Vermont Avenue, NW, Suite 700 Washington, DC 20005-4905 Email: nibs@nibs.org FAX: (202) 289-1092 Tele: (202) 289-7800

1.2 SUBMITTAL CLASSIFICATION

Submittals are classified as follows.

1.2.1 DESIGN SUBMITTALS

Contractor furnished design submittals are the various design documents which primarily consist of field investigations, calculations, design analysis, drawings and specifications.

In addition, for each design submittal, the contractor shall submit all non-administrative modifications issued for the contract as part of the Design Submittal package to enable AED to validate that these modifications have been incorporated into this design submittal.

Design submittals should only address Contract requirements not shown on plans and any specifications already furnished to the Contractor as part of this contract. Plans and specifications furnished to the Contractor shall NOT be included as part of any Design Submittal. The Contractor shall complete all work as shown in these furnished drawings without deviation, unless site conditions mandate changes (larger building foundations per geotechnical investigations, etc.).

The Contractor shall clearly label and date all design submittals to reflect the current design stage and date of submission to the Government to avoid confusion between current and previous submittals. The Contractor shall not begin construction work until the Government has reviewed and approved the work presented in each Design Submittal, including complete resolution of all DrChecks comments, and the Contracting Officer has cleared work for construction. Clearance for construction shall not be construed as meaning Government approval. Unless otherwise indicated, the risk for the design is the sole responsibility of the Contractor.

The sole responsibility of ensuring that the design submittals comply with contract documents remains with the Contractor, in accordance with this section of the contract. The Government retains the right to comment on the

design at any design stage, and the lack of Government comments at a given review cannot be used as a basis for the Contractor to fail to address the Government's comments on subsequent reviews, regardless of design stage. Furthermore, approval of incomplete designs will not relieve the Contractor of the responsibility for any error which may exist, and which may require rework or other appropriate adjustment to the contract terms, as determined at the sole discretion of the Government. It is the sole responsibility of the Contractor to ensure that submittals do or do not comply with the contract documents. Government review, clearance for construction, or approval by the Contracting Officer shall not relieve the Contractor from responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this contract. Government review, clearance for construction, or approval of post design construction submittals shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory.

As a minimum, design submittals shall be submitted at the following intervals:

Preliminary design reports – 10%

General Design review - 65%

Design review - 95%

Cleared For Construction review - 100%

1.2.1.1 PRELIMINARY DESIGN REPORTS – (10%)

The review of this submittal is primarily to ensure that the Contractor has at a minimum developed the test well and completed the sub-surface investigation. **Failure to do so at the satisfaction of the Government shall constitute grounds for withholding of all progress payments.**

a. Geotechnical Report, indicating appropriate information for various site characteristics, soil parameters as determined by certified lab tests, allowable soil bearing capacities, correlation with foundation design parameters, and any changes in foundation design of structures furnished in the Contract; estimated settlement for building foundation loads; and all other project feature changes due to the Geotechnical Report conclusions.

b. Well design at each project site location to include a determination of water demand, water availability evaluation, and water quality analysis produced from a test well. Water demand evaluation shall be determined based on the requirements of the 01010 Scope of Work and 01015 Technical Requirements. Water availability evaluation shall include data concerning study of existing water wells in the vicinity, study of hydrological data, and study of geological data. Well hydraulics data shall also be included from the test well or if available from vicinity wells. Water quality analysis shall include physical, chemical, and bacteriological analyses of water from either a test well or an existing well within the same aquifer of the proposed well.

c. Drawing for the well design shall include, at a minimum, material and dimensions of well pipe and casing, type and dimensions of screen, type and range of sizes of gravel surrounding screen and at bottom of well shaft, type of grouting for well seal, well pad, location and connection detail for hand pump if required by the 1010. Also required would be a detail of the wellhead with all associated valves, pumps, flowmeters, and chlorination system.

d. Percolation test locations and results, and complete leachfield design (if required by Section 01010 of the SOW), which indicate the site will accommodate such a system for the given project requirements, and alternatives proposed if, and only if, the site characteristics will not support such a system.

e. The Contractor shall design and submit a Site Grading and Drainage Plan showing the location of all required drainage structures. The Grading and Drainage Plan shall be properly contoured showing existing and proposed contour lines, swales and ditches, and building finished floor elevations. There shall be spot elevations shown at the beginning and end of all drainage structures, at inflection points, and spaced every 25 meters along the alignment. Proposed contour lines shall meet with existing contour lines on the

Grading and Drainage Plan. The Grading and Drainage Plan shall be at a scale that all lines and structures can be easily seen and ascertained.

The Concept Plan attached in the Appendix is for conceptual purposes only and does not constitute a design. The Contractor shall prepare a site Master Plan based on information contained in this document. The Contractor shall participate in a Master Plan design charrette that shall be conducted at the Corps of Engineers Kandahar Area Office at Kandahar Airfield, if deemed necessary by the Government. If necessary, the Contractor shall modify and implement changes to the Master Plan based on the information gathered during the design charrette process. Current site conditions are only partially indicated in the Concept Plan. The Contractor is responsible to identify all buildings, facilities and site features.

The Contactor must verify all space requirements and code compliance in accordance of Section and Section 01015 of this contract. The final Master Plan shall be site-specific and it shall include the location of all temporary structures such as the construction office/storage containers and lay-down and construction debris removal areas. The Contractor shall indicate all other site features on the Master Plan regardless of whether they are indicated on the Government supplied Concept Plan or not. The Contractor shall include all information pertinent to this project into the Master Plan to achieve a complete design in accordance with the requirements of this document.

1.2.1.2 GENERAL DESIGN (65%)

This Design Submittal presents all information necessary to integrate the fully designed and detailed buildings and other project features to the project site. It is crucial that the submittal is complete and includes all components noted below and any other pertinent information not listed which the Contractor requires to enable construction to begin as soon as possible. As a minimum, for each Contract project location the submittal shall contain:

a. Results of the site topographic survey which shall include highlighting of significant features (wadis, adjacent properties and structures, roads, etc.) to provide a detailed, overall understanding of the project site and surrounding area; demolition plan for existing site features; complete grading and drainage plan with existing grades, proposed grades, and building finished floor elevations based on Contract technical requirements;

b. Any necessary adaptations of the Concept (Generic) Site Plan and detailed design drawings furnished with this Contract that might be required due to actual site constraints, to include: water supply/storage, disinfection location and distribution layout plan; wastewater collection or treatment layout plan including tie-in to all required buildings; electrical generation and distribution plan; connection of existing roads with ECP location(s); and any other changes required due to adjacent property or existing topography. As noted in Paragraph 1.2.1, this would also include proposed changes to the detailed drawings if, and only if, site conditions mandate revisions.

c. Septic Tank drawings and details (if required by Section 01010 of the SOW or not provided as part of this contract), showing tank depth and sizing based on expected sanitary load, and all connecting piping, with dimensions.

d. Complete design analysis, plans and specifications for any contract feature(s) not already provided in the Contract that the Contractor would like Partial Clearance for Construction on once the Design Submittal has been approved, including project components with long ordering, fabrication and delivery times.

e. Outline of Construction Specification Sections to be used for other work yet to be submitted at the 95% Final Design Review submittal, and those Specification items requiring Government Approval (GA), unless 100% Technical Specifications were provided with the Contract.

f. Preliminary drawing and details of any grease interceptors and oil-water separators required. Grease interceptors should either be gravity or hydro-mechanical types. Drawings would show sizing, depth, and all connecting piping. Design analysis shall include calculations for sizing both the interceptor/separator and connecting piping.

g. Preliminary cross sections of roads and sidewalks, showing all essential dimensions, materials, layers, and proposed fore and back slopes of adjacent drainage features.

h. All preliminary sketches of site storm drainage structures, including calculations in the design analysis for sizing and sloping of pipe runs and ditches. Provide cross sections of drainage structures such as ditches and culverts.

i. Draft Design Analysis for any designed facility or feature of work.

j. Design drawings of the designed facilities to include floor plans, elevations, life safety plans, sections, finish and hardware schedules, plumbing and HVAC, electrical and communications.

1.2.1.3 FINAL DESIGN REVIEW (95%)

The review of this submittal is primarily to insure that the contract documents and design analysis are proceeding in a timely manner and that the Contract requirements and design criteria are being correctly understood and adhered to. The submittal shall consist of the following:

a. Design Analysis complete. Detailed analyses and calculations of any designed component, feature, system or building.

b. Construction Specifications complete - all anticipated sections, edited to include only applicable requirements, if not provided as part of the Contract.

c. Construction Drawings complete with all 65% comments incorporated. The Contractor is expected to have completed all of his coordination checks and have the drawings in a design complete condition. The drawings shall be finalized at this time including the incorporation of any design review comments generated by all past design reviews. The drawings shall contain all the details necessary to assure a clear understanding of the work throughout construction.

1.2.1.4 “CLEARED FOR CONSTRUCTION” SUBMITTAL (100%)

The review of this submittal is to insure that the design is in accordance with directions provided the Contractor during the design process. The only effort remaining between the Final Design Review Submittal and the "Cleared For Construction" Design Review Submittal is the incorporation of all Government review comments. The Contractor shall submit the following documents for this review:

a. Design Analysis, only if changes have occurred since 95% Design Submittal. The Design Analysis shall contain all explanatory material giving the design rationale for any design decisions which would not be obvious to an engineer reviewing the Final Drawings and Specifications.

b. Construction Specifications, complete.

c. Construction Drawings, complete.

Once the design documents have been "Cleared for Construction" by the Contracting Officer, the Contractor shall clearly identify each document by annotating it as "Cleared for Construction."

1.2.2 PARTIAL DESIGN SUBMITTALS

In the interest of expediting construction, the Contracting Officer may approve partial design submittals, procurement of materials and equipment, as well as issue the Notice To Proceed (NTP) for construction of those elements of the design which have been cleared for construction. Such partial notices to proceed shall be solely at the discretion of the Contracting Officer. The Contractor must obtain the approval of the Designer of Record (DOR) and the Government’s concurrence for any Contractor proposed revision to the professionally stamped and sealed design reviewed and Cleared for Construction by the Government, before proceeding with the revision. The

Government reserves the right to non-concur with any revision to the design, which may impact furniture, furnishings, equipment selections or operations decisions that were made, based on the reviewed and cleared for construction design. Any revision to the design, which deviates from the contract requirements (i.e., the RFP and the accepted proposal), will require a modification, pursuant to the Changes clause, in addition to Government concurrence. The Government reserves the right to disapprove such a revision. Unless the Government initiates a change to the contract requirements, or the Government determines that the Government furnished design criteria are incorrect and must be revised, any Contractor initiated proposed change to the contract requirements, which results in additional cost, shall strictly be at the Contractor's expense. The Contractor shall track all approved revisions to the reviewed and cleared for construction design and shall incorporate them into the As-Built design documentation, in accordance with Section 01780A, CLOSEOUT SUBMITTALS, Paragraphs 1.1 and 1.2, which lists all requirements associated with submission of editable CADD format As-Builts (record Drawings) required as part of this contract. The Designer of Record shall document its professional concurrence on the As-Builts (record drawings) for any revisions by affixing its stamp and seal on the drawings and specifications.

1.2.3 DEVIATIONS AND CHANGES TO THE STANDARD DESIGNS

Contractor shall construct standard building designs as indicated. Any request to deviate or change the standard building designs must be due to changed site conditions ONLY and submitted to the AED Resident Office administering the contract. Contractor shall indicate the changes and provide a narrative justification for the changes proposed, but shall not proceed with deviations without written approval.

1.2.4 USE OF DRCHECKS$_{SM}$ FOR DESIGN SUBMITTAL COMMENT AND RESPONSE

1.2.4.1 DRCHECKS$_{SM}$ WEB LINK

All AED Design Submittal review comments will be documented using the standard design review tool for the U.S. Army Corps of Engineers, a web-based application called "DrChecks$_{SM}$". The web link to DrChecks$_{SM}$ is:

https://www.projnet.org/projnet/binKornHome/index.cfm

1.2.4.2 DRCHECKS$_{SM}$ VENDOR IDENTIFICATION AND TUTORIAL

Upon notification of award, the contractor shall immediately coordinate with the Chief, Engineering Branch, AED to acquire a vendor identification and a brief tutorial on the use of DrChecks$_{SM}$. The contractor is responsible for providing their own DrChecks$_{SM}$ Administrator within their own design staff personnel to access and accomplish actions within DrChecks$_{SM}$.

1.2.4.3 NOTIFICATION OF DRCHECKS$_{SM}$ FILE ACCESS

The Afghanistan Engineer District will complete a review at every Design Submittal stage for conformance with the technical requirements of the Contract and document all comments in DrChecks$_{SM}$. At completion of the review, a notification will be issued to the Contractor by the Contracting Officer's representative that the particular DrChecks$_{SM}$ file will be opened to the Contractor. Until this time, the Contractor is not able to view any AED comments for that particular Design Submittal.

1.2.4.4 FURTHER CONTRACTOR INFORMATION AFTER DRCHECKS$_{SM}$ REVIEWS

See Paragraph 3.7.4, Government Review, for further procedures and requirements associated with Design Submittal reviews.

1.2.5 CONSTRUCTION SUBMITTALS

1.2.5.1 CONTRACTOR FURNISHED GOVERNMENT APPROVED CONSTRUCTION SUBMITTALS (GA)

Government approved construction submittals are primarily related to plans (Contractor Quality Control, Accident Prevention, Resident Management System, Area Use, etc.), schedules (Project Schedule/Network Analysis), and certificates of compliance, reports and records/statements. They may also include proposed variations to approved design documents in accordance with the paragraph entitled "VARIATIONS".

In addition, GA construction submittals are required for the following:

a. CIVIL FEATURES

TESTING RESULTS: Data will include information on the locations and depths of all viable water supply sources at the site(s) involved and a water quantity and water quality analysis for each source from the Ministry of Public Health or other certified testing firm.

b. MECHANICAL FEATURES

EQUIPMENT SUBMITTALS: Manufacturer's standard catalog data, installation, Operation and Maintenance (O&M) manuals and construction details for water wells, water tanks, control valves, pipe insulation, water pumps, air handling units, condensers, variable air volume (VAV) boxes.

TESTING RESULTS: For water tanks, water pumps (including instrumentation), water piping, sprinkler systems, and oxygen systems, submit six (6) copies of each test containing the following information in bound letter-size booklets:

1) The date the tests were performed.

2) A list of equipment used, with calibration certifications.

3) A copy of measurements taken.

4) The parameters to be verified.

5) The condition specified for the parameter.

6) The inspection results, signed, dated, and certified by the installer. The certification shall state that required procedures were accomplished, that the procedures were conducted in compliance the plans and specifications.

7) A description of adjustments performed.

Individual reports shall be provided for storage tank tests, piping tests, system performance tests, high level alarm test, and the system leak tests. Drawings shall be folded blue lines, with the title block visible.

c. ELECTRICAL FEATURES

PRODUCT DATA and SHOP DRAWINGS: generators (and its auxiliaries), load bank, transformers, substations, panels/switchboards/motor control centers, lightning protection, receptacles, circuit breakers.

DESIGN DATA: lightning protection and grounding.

TEST DATA: Lightning protection and grounding.

d. ARCHITECTURAL FEATURES

PRODUCT DATA/CATALOGUE CUTS/SHOP DRAWINGS/SCHEDULES: Specialty doors and frames (fire rated, sound rated, bullet resistant, security, overhead rolling); door hardware; windows; metal roofing (including fasteners, flashing, and accessories); building insulation; fire-rated and water-resistant gypsum board; and other specialty products (bullet resistant glazing/panels).

COLOR BOARD: Architectural finishes

PRODUCT DATA/CATALOGUE CUTS/INSTALLATION INSTRUCTIONS: Exterior Insulation and Finish System (EIFS)

SHOP DRAWINGS: Casework/Cabinetry

e. STRUCTURAL FEATURES

DESIGN DATA and SHOP DRAWINGS: Building structural systems.

1.2.5.2 FOR INFORMATION ONLY CONSTRUCTION SUBMITTALS (FIO)

All submittals not requiring Designer of Record or Government approval will be for information only. These construction submittals shall be checked, stamped, signed and dated by the Contractor's Quality Control Engineer, certifying that such submittal complies with the contract requirements. All Contractor submittals shall be subject to review by the Government at any time during the course of the contract. Any Contractor submittal found to contain errors or omissions shall be resubmitted as one requiring "approval". No adjustment for time or money will be allowed for corrections required as a result of noncompliance with plans or specifications. Normally submittals For Information Only will not be returned. Approval of the Contracting Officer is not required on FIO submittals. These submittals will be used for information purposes. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications and will not prevent the Contracting Officer from requiring removal and replacement if nonconforming material is incorporated in the work.

1.2.5.3 VARIATIONS

After design submittals have been reviewed and cleared for construction by the Contracting Officer, no submittal for variation shall be considered by the Government.

1.2.5.4 ADDITIONAL SHOP DRAWINGS AND SUBMITTALS

In accordance with the paragraph entitled DESIGN DISCREPANCIES, the Government may request the Contractor to provide additional shop drawing and submittal type data subsequent to completion of the design.

1.2.5.5 INCOMPLETE DESIGN

The Contractor shall not use construction submittals as a means to supplant and/or supplement an incomplete design effort.

1.3 SUBMITTAL CERTIFICATION

The CQC organization shall be responsible for certifying that all submittals and deliverables have been reviewed in detail for completeness, are correct, and are in strict conformance with the contract drawings, specifications, and reference documents.

1.3.1 EFFECTIVE QUALITY CONTROL SYSTEM

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with Contract Clause 52.236-21 SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION - ALTERNATE I, and SECTION 01451 CONTRACTOR QUALITY CONTROL.

1.3.1.1 ORGANIZATIONAL RESPONSIBILITY

The quality control system shall cover all design, construction, subcontractor, manufacturer, vendor, and supplier operations at any tier, both onsite and offsite.

1.3.1.2 CQC SYSTEM MANAGER REVIEW AND APPROVAL

Prior to submittal, all items shall be checked and approved by the Contractor's Quality Control (CQC) System Manager. If found to be in strict conformance with the contract requirement, each item shall be stamped, signed, and dated by the CQC System Manager. Copies of the CQC organizations review comments indicating action taken shall be included within each submittal.

1.3.1.3 DETERMINATION OF COMPLIANCE

Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements by the Contracting Officer. The contractor shall submit all required documentation with submittals. The U.S. Army Corps of Engineer (USACE) will not accept partial submittals.

1.3.2 RESPONSIBILITY FOR ERRORS OR OMISSIONS

It is the sole responsibility of the Contractor to ensure that submittals do or do not comply with the contract documents. Government review, clearance for construction, or approval by the Contracting Officer shall not relieve the Contractor from responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this contract.

1.3.2.1 GOVERNMENT REVIEW

Government review, clearance for construction, or approval of post design construction submittals shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory.

1.3.3 SUBSTITUTIONS

No submittals for the purpose of substituting materials or equipment specified in the contract drawings, specifications, and reference documents shall be considered by the Government.

1.3.4 ADDITIONAL SUBMITTALS

In conjunction with Contract Clause 52.236-5 MATERIAL AND WORKMANSHIP, the Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work.

1.3.5 UNTIMELY AND UNACCEPTABLE SUBMITTALS

If the Contractor fails to submit submittals in a timely fashion, or repetitively submits submittals that are incomplete or not in strict conformance with the contract documents, no part of the time lost due to such actions shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

1.3.6 STAMPS

Stamps shall be used by the Contractor on all design and post design construction submittals to certify that the submittal meets contract requirements and shall be similar to the following:

Contractor (Firm Name)
Contract Number
Contract Name

I certify that this submittal accurate, is in strict conformance with all contract requirements, has been thoroughly coordinated and cross checked against all other applicable disciplines to prevent the omission of vital information, that all conflicts have been resolved, and that repetition has been avoided and, it is complete and in sufficient detail to allow ready determination of compliance with contract requirements by the Contracting Officer.

Name of CQC System Manager: _____
Signature of CQC System Manager: _____
Date: _____

1.4 ENGLISH LANGUAGE

All specifications, drawings, design analysis, design calculations, shop drawings, catalog data, materials lists, and equipment schedules submitted shall be in the English language.

1.5 UNITS OF MEASUREMENT

Design documents shall be prepared in accordance with the guidance offered in SECTION 01415 METRIC MEASUREMENTS.

The metric units used are the International System of Units (SI) developed and maintained by the General Conference on Weights and Measures (CGPM); the name International System of Units and the international abbreviation SI were adopted by the 11th CGPM in 1960.

1.5.1 DRAWINGS

1.5.1.1 SITE LAYOUT

All site layout data shall be dimensioned in meters or coordinates, as appropriate. All details and pipe sizes shall be dimensioned in millimeters.

EXAMPLE: Masonry openings shall be a U.S. module to suit a standard U.S. door. The dimensions of the opening shall be given in SI units. Metric dimensions for site plans shall be in meters and fraction thereof. Dimensions for all other drawings shall be in millimeters using hard metric designations (example: 12 meters = 12 000). Hard metric is defined as utilizing standard metric products and the use of measurements in increments of fifty (50) and one hundred (100) millimeters.

1.5.1.2 GEO-REFERENCE

All site plans shall be geo-referenced using the WGS 1984 coordinate system, specifically the following: WGS 1984 UTM Zone 41 or 42 N as applicable. If the designer is not able to use the stated coordinate system the coordinate system used shall be correlated to the stated coordinate system. A table shall be provided within the site drawing set cross referencing the WGS84 system to that utilized. This is required to allow AES to incorporate the plans into GIS for storage, map production, and possible geospatial analysis of the different work sites.

1.5.2 DESIGN CALCULATIONS

Calculations shall be in SI units to meet the requirements of the design. Quantities on the contract drawings stated in SI units shall also be stated in SI units in the design analysis to match the drawings.

1.5.3 SPECIFICATIONS

All equipment and products shall be specified according to U.S. standards and described by appropriate units as required herein.

1.6 WITHHOLDING OF PAYMENT FOR SUBMITTALS

1.6.1 DESIGN SUBMITTALS

Payment for Design work will not be made in whole or in part until the Government has reviewed and cleared the design for construction.

1.6.2 CONSTRUCTION SUBMITTALS

Payment for materials incorporated in the work will not be made if required approvals have not been obtained. In event under separate clause of the contract, the Contractor is allowed partial or total invoice payment for materials shipped from the Continental United States (CONUS), and/or stored at the site, the Contractor shall with his request for such payment, submit copies of approvals (ENG Form 4025) certifying that the materials that are being shipped and/or stored have been approved and are in full compliance with the contract technical specifications.

2.0 PRODUCTS

2.1 GENERAL

The following are contract deliverables which expound upon and finalize the design parameters/requirements outlined within the contract documents. They shall be prepared in such a fashion that the Prime Contractor is responsible to the Government and not as an internal document between the Prime Contractor and its Subcontractors, Vendors, Suppliers, etc.

2.2 PROJECT NARRATIVE

The Project Narrative shall be a bound set and shall contain the contract Sections 01010 and 01015 (and any additional sections that are appropriate). The Section 01010 and 01015 shall be the latest version. Any subsequent changes to the contract shall be clearly marked and highlighted with explanation for the changes. The Project Narrative shall also contain the general description of the project and a discussion of the design approach and design features for the project.

2.3 DESIGN ANALYSIS

2.3.1 SUBMITTAL

Only design analyses associated with the features of this contract design by the Contractor shall be submitted for review. It shall be written in the English language with SI units of measure. The design analysis is a written explanation of the project design which is expanded and revised (updated) as the design progresses. The design analysis shall contain all explanatory material giving the design rationale for any design decisions which would not be obvious to an engineer reviewing the final drawings and specifications. The design analysis contains the criteria for, and the history of, the project design, including criteria furnished by the Government, letters, codes, references, conference minutes, and pertinent research. Design calculations, computerized and manual, are included in the design analysis. Narrative descriptions of design solutions are also included. Written material may be illustrated by diagrams and sketches to convey design concepts. Catalog cuts and manufacturer's data for all equipment items, shall be submitted. Specific requirements for the design analysis, listed by submittal phase, are noted in Paragraph 1.2.1.

2.3.2 FORMAT

Format of design analysis shall closely match the standard format referenced within this document.

2.4 DESIGN CALCULATIONS

Only calculations associated with the features of this contract designed by the Contractor shall be submitted for review, unless site conditions mandate changes to drawings and specifications furnished with this Contract. All design calculations shall be presented such that they are easily understood, correlated with the requirements (Section 01010 and 01015 criteria; codes; all other applicable or pertinent criteria) and all final conclusions clearly documented and summarized. The Design Submittal must include complete information (Soil Report, percolation test results, concrete design strengths, steel material properties, electrical loads, heat gain/loss assumptions, etc.) necessary to support all design calculations in order to easily and efficiently verify the accuracy of this information and the resulting project components shown in plans and specifications.

2.4.1 SUBMITTAL

When design calculations are voluminous, they shall be bound separately from the narrative part of the design analysis. Design calculations will include a title page, table of contents, and be indexed (tabbed) to separate distinct parts of the various analysis and design actions being accomplished to support plan drawings submitted. They shall be presented in a clear, consistent and legible format in order to quickly understand the analysis and design accomplished. Presentation shall be such that a person unfamiliar with the project features and associated analysis and design can quickly understand the overall design process and procedures, review the information in conjunction with the given set of plans and specifications, and verify the suitability of all information submitted.

All design calculations shall explain the source of loading conditions with assumptions and conclusions explained. The analysis and design methods shall also be explained, including assumptions, theories and formulae. Include applicable diagrams that are clearly explained and correlated with related computations, whether computer or hand generated. The design calculations shall include a complete and comprehensive list of the criteria (and date or version of the criteria) that the design/analysis will be compared to (codes, Corps of Engineers Engineering Regulations, Engineering Manuals, etc.). Within the separable elements of design calculations, the engineer shall cite the specific code or reference paragraph or section as appropriate to indicate conformance to requirements.

At the beginning of each project component design section, present a summary of all load conditions and combinations required per applicable code or Corps of Engineers manual or regulation. Then clearly identify the particular load case governing the design and clearly show how the particular analysis, construction materials to be used, and the specific design meet the governing load combination.

Calculation sheets shall carry the names or initials of the engineer and the checker and the dates of calculations and checking. No portion of the calculations shall be computed and checked by the same person.

2.4.2 COMPUTER ANALYSIS

Provide a clear summary of all computer outputs and highlight in the outputs information used in the analysis and design accomplished elsewhere in the calculations.

If a computerized analysis or design program is used (either commercial software packages or unique, designer-written computer analysis/design tools), the computations shall provide clear reference to the software program and version being used and an explanation of the validity of the particular program to the given application (where has the program been used before, what input and output does the program provide, is the program a recognized Corps of Engineers or industry standard). If the program is proprietary to the Contractor (not recognized by the Corps of Engineers or industry), the Contractor shall provide a sample hand calculation to verify the results of one set of data generated by the computer program.

State exactly the computation performed by the computer. Include applicable diagrams, adequately identified. Provide all necessary explanations of the computer printout format, symbols, and abbreviations. Use adequate and consistent notation. Provide sufficient information to permit manual checks of the results.

Each set of computer printouts shall be preceded by an index and by a description of the computation performed. If several sets of computations are submitted, they shall be accompanied by a general table of contents in addition to the individual indices.

When the computer output is large, it shall be divided into volumes at logical division points. All final computer results used in design shall be separated from the total pages of computer output that might be included in the design calculations for ease of review.

2.5 SPECIFICATIONS

Specifications produced by the Contractor shall be submitted for review. Specifications shall be prepared in accordance with the UFGS (Uniform Facilities Guide Specifications) format. The Contractor-prepared specifications shall include as a minimum, all applicable specification sections referenced by the UFGS. Where the UFGS does not reference a specification section for specific work to be performed by this contract, the Design-Build Contractor shall be responsible for creating the required specification in the UFGS format.

2.5.1 USE OF UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

UFGS (Uniform Federal Guide Specifications) are required. Current UFGS information may be obtained at the following location: http://www.wbdg.org/ccb/.

Specifications for UFGS are in SpecsIntact format. SpecsIntact is government sponsored software used to edit specifications for government contracts. The software is available at the following link: http://specsintact.ksc.nasa.gov/index.asp.

2.5.2 QUALITY CONTROL AND TESTING

Any additional specifications deemed necessary by the Contractor shall include required quality control and further indicate all testing to be conducted by the Contractor, its subcontractors, vendors and/or suppliers.

2.5.3 AMBIGUITIES AND INDEFINITE SPECIFICATIONS

Ambiguities, indefinite specification requirements (e.g., highest quality, workmanlike manner, as necessary, where appropriate, as directed etc) and language open to interpretation is unacceptable.

2.5.4 INDUSTRY STANDARDS

2.5.4.1 U.S. INDUSTRY STANDARDS

The Specifications shall be based on internationally accepted U.S. industry Standards. Customarily accepted publications may be found in the UNIFIED MASTER REFERENCE LIST (UMRL) which may be located at the following URL: http://www.hnd.usace.army.mil/techinfo/UFGS/UFGSref.htm.

To access the UMRL select the “Unified Facilities Guide Specifications” tab and scroll down to Unified Master Reference List (UMRL) (PDF version).

Examples of U.S. standards are: National Fire Protection Association (NFPA), International Building Code (IBC), American Concrete Institute (ACI), American Water Works Association (AWWA), ADAAG (ADA Accessibility Guidelines) for Buildings and Facilities, etc. Standards referenced shall be by specific issue; the revision letter, date or other specific identification shall be included.

This document lists publications referenced in the Unified Facilities Guide Specifications (UFGS) of the Corps of Engineers (USACE), the Naval Facilities Engineering Command (NAVFAC), the Air Force Civil Engineer Support Agency (AFCESA), and the guide specifications of the National Aeronautics and Space Administration (NASA). This document is maintained by the National Institute of Building Sciences (NIBS) based on information provided by the agencies involved and the standards producing organizations. The listing is current with information available to NIBS on the date of this publication.

Standards referenced in specifications and drawings prepared by the Contractor shall be by specific issue; the revision letter, date or other specific identification shall be included.

2.5.5 AED DESIGN REQUIREMENTS DOCUMENTS

AED Design Requirements (latest version) documents listed in section 01015, shall be adhered to in this contract. These documents are available from the COR. These documents shall be used as the basis for design and construction, and for selecting options within the United Facilities Guide Specifications (UFGS). It is the contractor's option to use specifications contained in the AED Design Requirements Documents, when provided, or to adapt the UFGS specifications to match the requirements provided in the AED Design Documents and specifications. Site or project specific data and requirements in the AED Design Requirements documents shall supersede UFGS language where there are perceived conflicts.

2.6 DRAWINGS

2.6.1 COMPUTER ASSISTED DESIGN AND DRAFTING (CAD)

Computer Assisted Design and Drafting (CAD) is required for all Afghanistan Engineer District South contracts. Only personnel proficient in the preparation of CAD drawings shall be employed to modify the contract drawings or prepare new drawings. The CAD deliverables shall meet the requirements of the A/E/C CAD Standards (V 3.0 or newer). The A/E/C CAD Standards may be downloaded at the CAD/BIM Technology Center at the following link: https://cadbim.usace.army.mil/default.aspx?p=s&t=13&i=4 or the website http://www.aed.usace.army.mil/engineeringtop2010.asp under the "Government Provided CAD Files" link.

The Contractor shall furnish all softcopy design submittals (and As-Builts) using software applications in either DWG format (Auto Desk, AutoCad Release 2009 or newer) or DGN format (Bentley Systems, MicroStation, version 8.0 or newer). Use of unregistered or student copies of software applications to prepare design drawings **IS NOT PERMITTED**. In addition, the Contractor is required to submit the softcopy design submittals in PDF (Adobe Acrobat) format.

CD media submitted containing the softcopy design submittals shall be organized per the instructions below and the diagram in Section 1335a:

CD Title:

Project Name and Location:
Project Number:
Submittal Number:
Date:
Contractor Name, Address, Telephone Number and email

Folders and Folder Contents/Structure:

Main Folder Name	Subfolders, Files and File Format	Description
Administrative	Multiple PDF files	Files shall include the contract, task order, approved modifications, approved BCDs, approved variations and non-administrative modifications (do not provide time extensions, COR appointments, and Requests for Information/responses, etc).
Design Analysis	One pdf file with identical contents as the printed document of the submittal.	All data, discussion, calculations and information presented in the printed Design analysis.
Specifications	One folder specifications in word format. One folder with specifications in pdf format.	All specification sections including table of contents edited as appropriate for the submittal stage of the project[2].
Geotechnical Report	One file in pdf format	All data, graphs, charts and tables generated during the geotechnical investigation.
PDF Drawings	One Binder of pdf files.	PDF Drawings. Files will be saved in a Binder and organized in the same order as indicated on the sheet index
CAD Drawings	DGN or DWG files organized in the following folders. Each folder shall contain only drawings pertaining to that discipline. General (Cover Sheet/ Index of Drawings, Vicinity Maps) Civil Architectural Structural Mechanical Plumbing Electrical Telecommunications	CAD Drawings. All referenced files are to be attached without drive or directories and placed in the same folder it is referencing. Do not save or use paths. Do not use live nesting when attaching reference files.

Notes:
1. The administrative folder shall provide documents submitted by the contractor and received from the COR related to the contract. These documents shall include Requests for Information related to design issues, Variation Requests, Modifications to the Contract. In addition, the folder shall contain a copy of the signed contract, relevant task orders and change orders.
2. DO NOT INCLUDE standard drawings or specifications provided to the Contractor as part of this document or as part of the contract.

2.6.2 DRAWINGS

Drawings shall be prepared in the English language with metric (SI) units of measure. All the drawings and details of the working drawings shall be adequately labeled, cross-referenced, and thoroughly checked and coordinated with other engineering disciplines. At the final design submittal (100%) the Contractor shall have incorporated all design review comments generated by previous design review(s), have completed all of the constructability and coordination comments, and have the drawings in a Ready-to-Build condition. The drawings shall be complete at this time and contain all the details necessary to ensure a clear understanding of the work throughout construction.

Prior to submitting the 100% Final Design drawings, the Contractor shall follow the procedures as described in Section 3 of the AED Design Requirements for CAD Design Guide.

2.6.3 DRAWING SIZE BORDER SHEETS

All drawings shall be prepared in size "A1" border sheets (594mm by 841mm). Hardcopy design submissions may be printed on half size drawing sheets ("A3", 279 mm by 420 mm) for purposes of saving paper and for ease of review. If drawings are not readable in the half size reduction, the Contractor shall submit all drawings in A1 border sheets. All final contract drawing sets (As-Builts) shall be submitted on A1 border sheets. Drawing sheets shall be trimmed to specified size if necessary.

2.6.4 SEQUENCE OF DESIGN DRAWINGS

Referencing the A/E/C CADD Standard (pg. 13, Table 2-1 of the A/E/C CADD standards) the sequence of drawings shall follow the sequence as shown below:

Discipline

1. General
2. Hazardous Materials
3. Survey/Mapping
4. Geotechnical
5. Civil
6. Landscape
7. Structural
8. Architectural
9. Interiors
10. Equipment
11. Fire Protection
12. Plumbing
13. Process
14. Mechanical
15. Electrical
16. Telecommunications
17. Resource
18. Other Disciplines
19. Sub-Contractor/Shop Drawings
20. Operations

2.6.5 DRAWING FOLDER STRUCTURE

CADD files shall be organized in folder names as described in Paragraph 2.6.4. For multi-building projects, a folder of each building type shall be created and the applicable folders shown in each building type folder.

2.6.6 DRAWING SHEET ASSEMBLY

CAD files will be organized in what is described as "**Option 1a**" (page 9 in the A/E/C CAD Standards Drawing Sheet Assembly manual), normally referred to as "Model Space and Paper Space" in Autodesk Autocad applications and "Design Model and Sheet Model" in Bentley Microstation applications. All files will be drawn consistently in the same manner using this option throughout the entire project.

2.6.7 MODEL FILES

Model files represent the building's physical layout and components such as floor plans, elevations and details. Model files shall be drawn to full size (1:1) in metric units in the default model view. Floor Plan Model files represent one floor. Example: do not use one model drawing file to draw several floor plan drawings with several border files. One paper space layout shall be provided per plotted sheet. Model files being referenced into another shall have insertion coordinates (x,y,z) of 0,0,0 in model space. The exception for model files with insertion coordinates other than 0,0,0 shall be the civil site plans (using Georeferencing and real-world coordinates.) Dimensioning shall be in millimeters unless noted otherwise, drawn associatively, and not be "forced". Example: if a wall is drawn 1:1, as 150 mm but the dimensioned number is modified to 200, this is unacceptable.

2.6.8 BORDER SHEET FILES

Border sheet files are referenced into drawing files (in Paper Space) for plotting and viewing purposes. Every border sheet file has a drawing area, Title Block information and sheet trim border. The Afghanistan Engineer District – South uses a common Title Block sheet border for each project. The project Title Block sheet border with "sheet independent" data is referenced into each drawing. When a drawing file is created, "sheet dependent" Title Block data, such as the Sheet Identification and Title, is added to the specific drawing file and located in Paper Space where the Title Block is referenced and viewed. AED-S Title Block drawings may be downloaded at : http://www.aed.usace.army.mil/engineeringtop2010.asp under the "Government Provided CAD Files" link.

2.6.9 LAYER/LEVEL NAMES

Layer or level files names shall follow the guidelines of the A/E/C CAD Standards V4.0. For AutoCAD, [discipline].dwt (drawing template files) shall be used to import the proper layers that will be inclusive of the correct line type, color, and line thickness of the respective layer. Templates to be used are found on the CAD/BIM Technology Center at the following link: https://cadbim.usace.army.mil/default.aspx?p=s&t=13&i=4, or at the website: http://www.aed.usace.army.mil/engineeringtop2010.asp under the "Government Provided CAD Files" link.

2.6.10 DRAWING FILE NAMING CONVENTION

The sheet identifier will consist of the discipline designator, the sheet type designator and the sheet sequence number as referenced in the A/E/C CAD Standards V4.0.

2.6.11 SHEET IDENTIFICATION BLOCK

The sheet identifier will follow the format of the border sheet file. This will consist of the discipline designator, the sheet type designator and the sheet sequence number as referenced in the A/E/C CAD Standards Manual.

2.6.12 DRAWING SCALES

The scales indicated on the following list shall, in general, be used for all drawings. Bar scales shall be provided on drawings as printed copies may lose their plotted scale through generational copying.

TYPICAL DRAWING SCALES	
DRAWING TYPE	**METRIC**
SITE PLAN	1:200
	1:400
	1:500
	1:600
	1:700
	1:1000
	1:2000
	1:5000
	1:6000
	1:10000
	1:20000
FLOOR PLAN	1:50
	1:100
	1:200
ROOF PLAN	1:200
EXTERIOR ELEVATIONS	1:100
	1:200
INTERIOR ELEVATIONS	1:50
	1:100
CROSS SECTIONS	1:50
	1:100
	1:200
WALL SECTIONS	1:20
STAIR DETAILS	1:10
DETAILS	1:5

2.6.13 SYMBOLS, LINE STYLES, & PATTERNS

Approved symbols, line styles, and patterns shall be in accordance with AEC CAD Standard Release 3.0 or current version (see Appendix D of the A/E/C CADD Standards). The approved symbols, line styles, and patterns associated with AutoCAD software maybe downloaded in the following link:

https://tsc.wes.army.mil/products/standards/aec/aecstdsym.asp

2.6.14 PLOTTER PREPARED ORIGINAL DRAWINGS A ND PDF FILES

Design files shall be developed in anticipation of plotting on a monochrome, vector plotter. Line density shall be equivalent to that produced by black India ink: half tone plots are only acceptable where the half-tone color setting of RGB (red, green blue) settings equal a value of 153. (Please refer to the A/E/C CAD Standards). Drawings

plotted in color are not acceptable. Manual changes to plotted originals are not acceptable. A separate Adobe PDF file shall be made of each drawing file oriented in "Landscape". Each PDF drawing file shall then be compiled into one "binder" PDF file for each set of drawings following the order of the Sheet Index.

2.6.15 TITLE AND REVISION BLOCK

Only AED-S Title and Revision Blocks are allowed. These are available at the website for download at: http://www.aed.usace.army.mil/engineeringtop2010.asp under the "Government Provided CAD Files" link.

2.6.16 LEGENDS

For each submittal, legends of symbols and lists of abbreviations shall be placed on the drawings. They shall include all of the symbols and abbreviations used in the drawing set, but shall exclude any symbols and abbreviations not used. Since many symbols are limited to certain design disciplines, there is a definite advantage to the use of separate legends on the initial sheet of each design discipline or in the Standard Details package for each discipline. If legends have not been shown by discipline, a legend shall be placed on the first drawing.

2.6.17 LOCATION/COLUMN GRID

To facilitate the location of project elements and the coordination of the various disciplines' drawings, all plans shall indicate a column line or planning grid, and all floor plans (except structural plans) shall show room numbers.

2.6.18 COMPOSITE AND KEY PLANS

If the plan of a large building or structure must be placed on two or more sheets in order to maintain proper scale, the overall plan (key plan) shall be placed on one sheet at a smaller scale to accommodate entire building/site. Key plans shall be used not only to relate large scale plans to total floor plans but also to relate individual buildings to large complexes of buildings. This key plan with match lines shall be referenced on all segmented drawings and shall be placed in a convenient location to indicate the relative location of the represented plan area by crosshatching.

2.6.19 SPECIFICATIONS PLACED ON THE DRAWINGS

Details of standard products or items which are adequately covered by specifications shall not be included on the drawings.

2.6.20 REVISIONS

Drawing revisions shall be prepared only on the original CAD files. A revision history (located in the Title Block) is required on all sheets.

2.6.21 BINDING

All volumes of drawing prints shall be firmly bound and shall have covers of heavier bond than the drawing sheets. If posts are used to fasten sheets together, the drilled holes on the bond edges of the sheets shall be on 8-1/2-inch centers.

2.6.22 GOVERNMENT PROVIDED FILES

All CAD related files provided by the Government to the Contractor (AutoCad and MicroStation Afghanistan Engineering District-South Title Block and Cover/Index sheet files, AutoCAD template files) may be downloaded through the following website:

http://www.aed.usace.army.mil/engineeringtop2010.asp under the "Government Provided CAD Files" link.

If Contractor is unable to access this site, a CD will be provided upon request to the Project Manager.

3.0 EXECUTION

3.1 GENERAL

3.1.1 DESIGN CONCEPT COORDINATION MEETING

Shortly after Notice To Proceed (NTP) the Government may require meeting(s) to review the Design Submittal process or discuss various aspects of the contract to enable prompt and efficient initiation of contract actions. Meeting(s) will be held to assure attention is focused on key project requirements (necessary Contractor design and Government review that is required to provide Construction Clearance), to discuss features and items of work that need to be submitted early due to long lead time items, or discuss other concepts/ideas that will help accelerate the contract work. Other Design Coordination meetings may be requested throughout the contract period if Government review of various Contractor Design Submittals indicate poor design and plan or specification quality in order to clearly explain the changes and improvements required of the contractor, assure understanding of Government comments, code references and required investigations and calculations, to move forward with acceptable design and satisfactory plans and specifications.

3.1.2 GOVERNMENT DESIGN CHANGES

Government design changes which do not increase construction costs shall be made at no charge to the Government. The Contracting Officer may request design submittals in addition to those listed when deemed necessary to adequately describe the work covered in the contract documents. Submittals shall be made in the respective number of copies and to the respective addresses set forth in the paragraph entitled SUBMITTAL PROCEDURE. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements.

3.2 SUBMITTAL REGISTER

3.2.1 DESIGN SUBMITTALS

The Contractor shall submit as part of his Project Schedule Design Submittal milestone dates. The Contractor shall post all actual dates of submittal actions (including clearance for construction) as they occur.

3.2.2 CONSTRUCTION SUBMITTAL REGISTER (ENG FORM 4288)

Attached to this section is ENG Form 4288 which the Contractor is responsible for developing for this contract. All design and construction submittals shall be shown on this register. The submittal register shall be the controlling document and will be used to control all submittals throughout the life of the contract. The Contractor shall maintain and update the register on a monthly basis for the Contracting Officer's approval.

3.3 TRANSMITTAL FORM (ENG FORM 4025)

The sample transmittal form (ENG Form 4025) attached to this section shall be used for submitting both design and construction submittals in accordance with the instructions on the reverse side of the form. These forms will be furnished to the Contractor. This form shall be properly completed by filling out all the heading blank spaces and identifying each item submitted. Special care will be exercised to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item.

3.4 PROGRESS SCHEDULE

The Contractor shall prepare and submit a design progress schedule to the Contracting Officer. The Critical Path Method (CPM) of network calculation shall be used to generate the Project Schedule. The progress schedule shall show, as a percentage of the total design price, the various items included in the contract and the order in which the Contractor proposes to carry on the work, with dates on which he will start the features of the work and the contemplated dates for completing same. Significant milestones such as review submittals shall be annotated. The

Contractor shall assign sufficient technical, supervisory and administrative personnel to insure the prosecution of the work in accordance with the progress schedule. The Contractor shall correct the progress schedule at the end of each month and submit as required to the Contracting Officer. The approved Project Schedule shall be used to measure the progress of the work, to aid in evaluating time extensions, and to provide the basis of all progress payments.

3.5 SCHEDULING

3.5.1 DESIGN SUBMITTALS

Adequate time (a minimum of fourteen (14) full calendar days exclusive of mailing time) shall be allowed for AES review and comment in DrChecks$_{SM}$. **This time period starts on the next full day after delivery of the Design Submittal to both AES and the Area Office. If a Design Review is received by AES or the Area Office but not the other, the design review does not start until both AES and the Area Office have full design submittals.** If the Contractor fails to submit design submittals in a timely fashion, or repetitively submits design submittals that are not in strict conformance with the Contract documents, no part of the time lost due to such actions shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

3.5.2 CONSTRUCTION SUBMITTALS

Contractor furnished Government Approved Construction Submittals (GA) for items noted in Paragraph 1.2.5 of this Section, or others as required by the COR, shall be submitted to the Area or Resident Office, per directions given at the Pre-Construction meeting. Adequate time (a minimum of fourteen (14) full calendar days exclusive of mailing time) shall be allowed for AED review and comment.

3.5.3 POST DESIGN CONSTRUCTION SUBMITTALS

Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of fourteen (14) full calendar days exclusive of mailing time) shall be allowed for review and approval. If the Contractor fails to submit post design construction submittals in a timely fashion, or repetitively submits submittals that are not in strict conformance with the Contract documents, no part of the time lost due to actions shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

3.6 SUBMITTAL PROCEDURE

3.6.1 DESIGN SUBMITTALS

3.6.1.1 AFGHANISTAN ENGINEER DISTRICT SOUTH (AES)

One (1) half-size hard copy and two (2) soft copies (electronic version) of all design submittals (calculations, reports of field tests, design analysis, plans, specifications, etc) shall be transmitted to the Government at the following address, by means of ENG Form 4025:

AFGHANISTAN ENGINEER DISTRICT SOUTH (AES)

(1) DHL, FEDEX, UPS or any other courier service:
U.S. Army Corps of Engineers
Afghanistan Engineer District-South
Kandahar Air Field
USACE-TAS
APO AE 09355
Attention: Chief, Engineering Branch

The soft copy (electronic version) and CD case shall both be clearly labeled (hand written information is not acceptable – typed labels are required) with contract information (contract #, title, contractor name, specific design submittal stage including if it is a Resubmittal, date of submission, components of the submittal – design analysis, plans, specifications, and if more than one CD then state 1 of "X", 2 of "X", etc., anti-virus information below, etc.)

The Contractor shall scan the soft copy (electronic version) of each Design Submittal using most up-to-date version of recognized Industry-standard anti-virus software (Symantec, Norton, etc.) to insure that no viruses are contained in it prior to acceptance by AES. The label shall indicate it has been scanned for viruses and the anti-virus software and version clearly indicated.

3.6.1.2 RESIDENT/AREA ENGINEER OFFICE

Complete design submittals shall be provided to the Area and/or Resident Engineer Office such that these are received **at the same time** as these submittals are delivered to the AES address in Para. 3.6.1.1. At the Pre-Construction meeting, the Contractor will be furnished the Area and/or Resident Office address to which these submittals shall be provided along with the number and size of hard and soft (electronic version) copies required for these offices. As per Paragraph 3.6.1.1, soft copies are to be properly labeled and checked for viruses by the contractor prior to delivery.

3.6.1.3 EDITABLE CAD FORMAT AS-BUILTS

In accordance with Contract Clause 52.227-7022 GOVERNMENT RIGHTS (UNLIMITED), the Government has non-exclusive rights to use the design on other projects. Therefore, the As-Builts furnished to the Government must be in an editable format. See Section 01780A CLOSEOUT SUBMITTALS, Paragraphs 1.1 and 1.2, for all requirements associated with submission of editable CAD format As-Builts required as part of this contract.

3.6.2 POST DESIGN CONSTRUCTION SUBMITTALS

One (1) copy of all post design construction submittals shall be transmitted to:

AFGHANISTAN ENGINEER DISTRICT SOUTH (AES)

(1) DHL, FEDEX, UPS or any other courier service:
U.S. Army Corps of Engineers
Afghanistan Engineer District-south
Kandahar Air Field
USACE-TAS
APO AE 09355
Attention: Chief, Engineering Branch

3.6.3 SUBMITTAL NUMBERING SYSTEM

Instructions on the numbering system to be used for construction submittals follows.

3.6.3.1 SUBMITTALS

Shop drawings and materials are listed on the Submittal Register (ENG Form 4288) as follows:

1. List is prepared according to contract specifications and drawings, picking up all items involved in the project.
2. This list is divided into sections as indicated in the specifications. For example:

   Section 01015 "Technical Requirements"

   Section 01335 "Design Submittals"

Section 02831 "Chain-Link Fence"

Section 02710 "Sub-drainage System"

Section 03300 "Concrete For Building Construction"

Section 04200 "Masonry"

3.6.3.2 NUMBERING PROCEDURES FOR TRANSMITTAL ON ENG FORM 4025

Each Specification Section will have various requirements for submittals (design information, product data, test reports, procedures, etc.) to the Government for Approval (GA) or For Information Only (FIO). Items from different Sections cannot be submitted on the same ENG Form 4025. When furnishing one or more items from the same Section at a given time, a single ENG Form 4025 can be used to identify and submit these items. Block 'b" of the 4025 entitled "DESCRIPTION OF ITEM SUBMITTED" should provide an accurate and unique description of each item being proposed by the Contractor. Item numbers (block "a" of the 4025 entitled "ITEM NO.") will be automatically generated in QCS for each ENG Form 4025. QCS will track and automatically generate the "ITEM NO." for all following ENG Form 4025s for the same Section number. To illustrate, a transmittal for the 65% Design Submittal required by Section 01335 might have the following Items:

ITEM NO. 1 Topographic Information

ITEM NO. 2 Geotechnical Report

ITEM NO. 3 Foundation Design

ITEM NO. 4 65% Plans

ITEM NO. 5 Outline of Construction Specifications to be used

If this was the first submittal furnished by the Contractor for Section 03 31 00, for example, then a Transmittal Number of 03 31 00-1 would be generated using QCS. As new transmittals are generated in QCS, the last digit of the transmittal is increased incrementally, as follows:

Transmittal No. 03 31 00-2

Transmittal No. 03 31 00-3

Transmittal No. 03 31 00-4

and so forth. The first transmittal submitted from each Specification Section will be "-1", in other words, there will never be a "Transmittal No. 03 31 00-0".

The above illustration is true for all other Specification Sections included in the Request for Proposal or in the Construction Specifications compiled by the Contractor in the prosecution of work under the RFP.

3.6.3.3 RESUBMITTALS

Should the Contractor be required to resubmit any transmittal due to one or more items on that transmittal being Coded "C" (Cleared for Construction, except as noted in attached comments, Resubmission Required) or "E" (NOT Cleared for Construction, see attached comments, resubmission required) by the Government, QCS will be used to generate the same transmittal number followed by the number "-1" for the first re-submittal, "-2" for the second re-submittal, "-3" for the third re-submittal, etc.

As an example, assume the 65% Design Submittal is provided to the Government as Transmittal 01335-9. Due to omissions or errors in that Submittal which result in a Code "E" being given, then the subsequent 65% Design Re-submittal #1 would be "Transmittal 01335-9.1". Should a re-submittal again be necessary, it would be Design Re-submittal #2 and would be submitted as "Transmittal 01335-9.2".

The purpose of this system is to avoid deviations from the Submittal Register and to track submittals in both RMS and DrChecks$_{SM}$. <u>It should be noted that a new transmittal number following the above system CANNOT be generated in QCS unless the prior transmittal has been given a Code.</u> If the Contractor is having difficulty generating the correct transmittal number, contact the COR to resolve the matter.

The Contractor use the above nomenclature and date of submission to the Government for Plan Cover Sheets; title blocks for all drawings; all Specification Cover Sheets; all specification pages; all Design Analysis Cover Sheets and associated pages; and similar labeling for all other documents included in the submittal.

See the attachment titled “1335a-Attachments-AES.pdf” (Figures 1-4) for required Title Block Required Annotations drawing guidance.

3.6.4 VARIATIONS

If design or construction submittals show variations from the contract parameters and/or requirements due to site conditions, the Contractor shall justify such variations in writing, at the time of submission. Additionally, the Contractor shall also annotate block "h" entitled "variation" of ENG FORM 4025. After design submittals have been reviewed and cleared for construction by the Contracting Officer, no resubmittal for the purpose of substituting materials, equipment, systems, and patented processes shall be considered.

3.6.5 NON-COMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the requirements of this specification. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the worksite, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

3.7 REVIEW OF CONTRACTOR PREPARED DESIGN DOCUMENTS

3.7.1 GENERAL

The work under contract will be subject to continuous review by representatives of the Contracting Officer. Additionally, joint design review conferences with representation by all organizations having a direct interest in the items under review may be held. The Contractor shall furnish copies of all drawings and related documents to be reviewed at the review conference on or before the date indicated by the Government. Additional conferences pertaining to specific problems may be requested by the Contractor or may be directed by the Contracting Officer as necessary to progress the work. The Contractor shall prepare minutes of all conferences and shall furnish two copies to the Contracting Officer within seven (7) days after the conference.

3.7.2 INDEPENDENT DESIGN REVIEW

The Contractor shall have someone other than the Designer or Design Team perform an independent technical review of all specifications, drawings, design analysis, calculations, and other required data prior to submission to the Government. This review shall insure the professional quality, technical accuracy, and the coordination of all design analysis, drawings and specifications, and other services furnished under this contract have been accomplished. Work must be organized in a manner that will assure thorough coordination between various details on drawings, between the various sections of the specifications, and between the drawings and specifications. The Contractor shall thoroughly cross-check and coordinate all work until he is professionally satisfied that no conflicts exist, vital information has not been omitted, and that indefinite language open to interpretation has been resolved. Upon completion of this review, the Contractor shall certify that each design submittal is complete, accurate, is in strict conformance with all contract requirements, that repetition has been avoided, that all conflicts have been resolved, and that the documents have thoroughly coordinated and cross checked against all the applicable disciplines to prevent the omission of vital information.

3.7.3 CONTRACTOR'S QUALITY CONTROL ORGANIZATION REVIEW

The Contractor shall thoroughly review each submittal prior to submission to the Contracting Officer to assure it is complete, correct and unified. This review shall be for the purposes of eliminating errors, interferences, and

inconsistencies, and of incorporating design criteria, review comments, specifications, and any additional information required. The Contractor shall give evidence of such review of all items in each submittal ENG Form 4025, by annotating Column "g" (titled "For Contractor Use Code") of this Form with the letter "A," meaning the Contractor has reviewed it and is indicating it is "Approved as Submitted". Design submittals submitted to the Contracting Officer without evidence of the above requirements or the Contractor's certified approval will be returned for resubmission. No part of the time lost due to such resubmissions shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

3.7.4 GOVERNMENT REVIEW

3. Within 14 days after Notice to Proceed, the Contractor shall submit, for approval, a complete design schedule with all submittals and review times indicated in calendar dates. The Contractor shall update this schedule monthly. After receipt, the Government will be allowed fourteen (14) full days to review and comment on all Design Submittals, except as noted below. This time period starts on the next full day after delivery of the Design Submittal to AES.

4. If a design submittal is deficient (errors on ENG Form 4025; incorrect drawing title block information; missing or incomplete features required in the submittal; etc.), it will be returned immediately without further review for correction and resubmission. The review time will begin when the corrected submittal is received. The Contractor may be liable for liquidated damages owed to the Government for returned design submittals due to deficiencies.

5. The contractor shall not begin construction work until the Government has reviewed the Contractor's Design Submittal and cleared it for construction. Clearance for construction does not mean Government approval. Government review shall not be construed as a complete check but will evaluate the general design approach and adherence to contract parameters. The Government Review is often limited in time and scope. Therefore, the Contractor shall not consider any review performed by the Government as an excuse for incomplete work.

6. Upon completion of the review the Contractor will be notified by the Contracting Officer Representative that the DrChecks$_{SM}$ file is open for viewing and response to AES comments. The Contracting Officer will indicate whether the Design Submittal, or portions thereof, has or has not been cleared for construction using the following action codes:

   A – Cleared for Construction

   B – Cleared for Construction, except as noted in attached comments

   C – Cleared for Construction, except as noted in attached comments, resubmission required

   E - NOT Cleared for Construction, see attached comments, resubmission required

   FX – Receipt acknowledged, does not comply as noted with contract requirements.

These codes shall NOT be used by the Contractor.

Design submittals Cleared for Construction by the Contracting Officer shall not relieve the Contractor from responsibility for any design errors or omissions and any liability associated with such errors, nor from responsibility for complying with the requirements of this contract.

3.7.4.1 INCORPORATION OF GOVERNMENT REVIEW COMMENTS

7. The Contractor shall review each comment, furnish a complete response in DrChecks$_{SM}$ as to how the comment will be addressed in the Design Analysis, Plans and Specifications, or other Design Submittal

stipulations required in this Contract. The Contractor will then incorporate each comment into the design submittal along with other work required at the next Design Submittal stage. The Contractor shall furnish disposition of all comments in DrChecks$_{SM}$, with the next scheduled submittal. The disposition shall identify action taken with citation of location within the relevant design document. Generalized statements of intention such as "will comply" or "will revise the specification" are not acceptable. During the design review process, comments will be made on the design submittals that will change the drawings and specifications. The Government will make no additional payments to the Contractor for the incorporation of comments. Review comments are considered part of the contract administration process.

8. If the Contractor disagrees technically with any comment or comments and does not intend to comply with the comment, he must clearly outline, with ample justification, the reasons for noncompliance within five (5) days after close of review period in order that the comment can be resolved.

9. The Contractor is cautioned that if he believes the action required by any comment exceeds the requirements of this contract, he should flag the comment in DrChecks$_{SM}$ as a scope change, and notify the COR in writing immediately.

10. If a design submittal is over one (1) day late in accordance with the latest design schedule, the Government review period may be extended 7 days. Submittal date revisions must be made in writing at least five (5) days prior to the submittal.

3.7.4.2 CONFERENCES

As necessary, conferences will be conducted between the Contractor and the Government to resolve review comments.

A review conference may be held at the completion of AES review and subsequent Contractor response for each design submittal. The review conference will be held at the Corps District Office in Kandahar, Afghanistan. The Contractor shall bring the personnel that developed the design submittal to the review conference.

3.7.4.3 DESIGN DEFICIENCIES

Design deficiencies noted by the Government shall be corrected prior to the start of design for subsequent features of work which may be affected by, or need to be built upon, the deficient design work.

3.7.5 DESIGN DISCREPANCIES

The Contractor shall be responsible for the correction of incomplete design data, omissions, and design discrepancies which become apparent during construction. The Contractor shall provide the Contracting Officer with a proposed recommendation for correcting a design error, within three (3) calendar days after notification by the Contracting Officer. The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the worksite, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor. Should extensions of design, fabrication plans and/or specific manufacturer's details be required as a result of a Government issued Change Order, the Government will make an equitable adjustment in accordance with Contract Clause 52.243-4 entitled CHANGES.

3.8 PHASED OR "FAST-TRACK" DESIGN

3.8.1 GENERAL

If approved by the Government, design and construction sequencing may be effected on an incremental basis as each approved phase or portion (e.g., demolition, geotechnical, site work, exterior utilities, foundations, substructure, superstructure, exterior closure, roofing, interior construction, mechanical, electrical, etc.) of the design is completed.

3.8.2 SEQUENCE OF DESIGN-CONSTRUCTION (FAST-TRACK)

After receipt of the Contract Notice to Proceed (NTP) the Contractor shall initiate design, comply with all design submission requirements and obtain Government review of each submission. The contractor may begin construction on portions of the work for which the Government has reviewed the final design submission and has determined satisfactory for purposes of beginning construction. The Contracting Officer will notify the Contractor when the design is cleared for construction. The Government will not grant any time extension for any design resubmittal required when, in the opinion of the Government, the initial submission failed to meet the minimum quality requirements as set forth in the contract.

3.8.3 NOTICE-TO-PROCEED FOR LIMITED CONSTRUCTION

If the Government allows the Contractor to proceed with limited construction based on pending minor revisions to the reviewed Final Design submission, no payment will be made for any in-place construction related to the pending revisions until they are completed, resubmitted and are satisfactory to the Government.

3.8.4 IN-PLACE CONSTRUCTION PAYMENT

No payment will be made for any in-place construction until all required submittals have been made, reviewed and are satisfactory to the Government.

3.8.5 COMMENCEMENT OF CONSTRUCTION

Construction of work may begin after receipt of the clearance for construction (Notice to Proceed) for each design phase. Any work performed by the Contractor prior to receipt of the clearance for construction, shall be at the Contractor's own risk and expense. Work cleared for construction that does not conform to the design parameters and/or requirements of this contract shall be corrected by the Contractor at no additional cost or time to the Government.

3.9 CONDUCT OF WORK

3.9.1 PERFORMANCE

Perform the work diligently and aggressively, and promptly advise the Contracting Officer of all significant developments.

3.9.2 TELEPHONE CONVERSATIONS

Prepare a summary, and promptly furnish a copy thereof to the Contracting Officer, of all telephone conversations relating to the design work under this contract.

3.9.3 COOPERATION WITH OTHERS

Cooperate fully with other firms, consultants and contractors performing work under the program to which this contract pertains, upon being advised by the Contracting Officer that such firms or individuals have a legitimate interest in the program, have need-to-know status, and proper security clearance where required.

3.9.4 TECHNICAL CRITERIA

All designs, drawings, and specifications shall be prepared in accordance with the contract documents and with the applicable publications referenced therein. As soon as possible, the Contractor shall obtain copies of all publications applicable to this contract. Availability of publications (where to purchase) is contained in Specification Section 01420 entitled: SOURCES FOR REFERENCE PUBLICATIONS. Any deviations from the technical criteria contained in the contract documents or in the applicable publications, including the use of criteria obtained from the user or other sources, must receive prior approval of the Contracting Officer. Where the technical criteria contained or referred to herein are not met, the Contractor will be required to conform his design to the same at his own time and expense.

3.9.5 CONFLICTS

Any conflicts, ambiguities, questions or problems encountered by the Contractor in following the criteria shall be immediately submitted in writing to the Contracting Officer with the Contractor's recommendations. Prior to submission to the Government the Contractor shall take appropriate measures to obtain clarification of design criteria requirements, to acquire all pertinent design information, and to incorporate such information in the work being performed.

3.9.6 DESIGN PRIORITIES

The design of this project shall consider the remote location and harsh environment of this project and the impact this will have on sources of technical supply, the cost of construction, the low level of maintenance, and the difficulty of obtaining replacement parts. Unless stated otherwise in this contract, the following design priorities shall be followed.

3.9.6.1 CONSTRUCTION LIFE SPAN

Buildings and facilities shall be designed and constructed to serve a life expectancy of more than 25 years, to be energy efficient, and to have finishes, materials, and systems that are low maintenance and low life cycle cost.

3.9.6.2 OPERABILITY

Systems including but not necessarily limited to mechanical, electrical, communications, etc., must be simple to operate and easy to maintain.

3.9.6.3 STANDARDIZATION

Use of standardized materials, products, equipment, and systems is necessary to minimize the requirements for replacement parts, storage facilities, and service requirements.

3.9.6.4 TOPOGRAPHIC SURVEYS, EASEMENTS, AND UTILITIES

Unless otherwise stated in the contract, the Contractor will be responsible for detailed topographic mapping, available easements, and utility information for the project.

3.9.6.5 HORIZONTAL AND VERTICAL CONTROL

The mapping shall be based on the base coordinate system. If the base system cannot be found, the surveyor shall use any established monuments. If monuments have been destroyed or do not exist, an assumed horizontal and vertical datum shall be established, using arbitrary coordinates of 10,000n and 10,000e and an elevation of 1,000 meters. The horizontal and vertical control established on site shall be a closed loop with third order accuracy and procedures. Provide three (3) concrete survey monuments at the survey site. All of the control points established at the site shall be plotted at the appropriate coordinate point and shall be identified by name or number, and adjusted elevations. The location of the project site, as determined by the surveyor shall be submitted in writing to the Contracting Officer. The site location shall be identified by temporary markers, approved by the Contracting Officer before proceeding with the surveying work.

3.9.6.6 TOPOGRAPHY REQUIREMENTS

A sufficient quantity of horizontal and vertical control shall be established to provide a detailed topographic survey at 1:500 scale with one quarter meter contour intervals minimum. Intermediate elevations shall be provided as necessary to show breaks in grade and changes in terrain.

The contours shall accurately express the relief detail and topographic shapes. In addition, 90 percent of the elevations or profiles interpolated from the contours shall be correct to within one-half of the contour interval and spot elevations shall be correct within plus or minus 20 millimeters.

Spot elevations affecting design of facilities shall be provided. Specifically, break points or control points in grades of terrain such as tops of hills, bottoms of ditches and gullies, high bank elevations, etc.

All surface and sub-surface structures features within the area to be surveyed shall be shown and identified on the topographic maps. In addition, these features shall be located by sufficient distance ties and labeled on the topographic sheets to permit accurate scaling and identification.

The location and sizes of potable, sanitary, electrical and mechanical utilities within the survey site shall be shown on the survey map. Sanitary manholes and appurtenances shall show top elevations and invert elevations.

3.9.7 OCCUPATIONAL SAFETY AND HEALTH ACT

The facilities, systems, and equipment designed under this contract shall comply with the Occupational Safety and Health Act (OSHA), Code of Federal Regulations, Title 29, Chapter XVII, Parts 1910 and 1926. Any problems in incorporating these standards due to conflicts with other technical criteria shall be submitted to the Contracting Officer for resolution.

3.9.8 ASBESTOS CONTAINING MATERIALS

Asbestos containing material (ACM) will not be used in the design of new structures or systems. In the event no other material is available which will perform the required function or where the use of other material would be cost prohibitive, a waiver for the use of asbestos containing materials must be obtained from AED.

3.9.8.1 EXISTING CONSTRUCTION

Asbestos containing materials (ACM) presently included in existing construction to be rehabilitated or otherwise modified as a result of this project shall be removed and a non-asbestos containing material substituted in lieu thereof.

3.9.8.2 SUSPECTED ASBESTOS CONTAINING MATERIALS

All such structures and systems shall be inspected to determine the presence or probable presence of ACM. When ACM is suspected, a documented survey will be performed. The survey will be developed into an abatement design and will be made a part of the design documents. In the event no other material is available which will perform the required function or the use of a substitute material would be cost prohibitive due to initial cost and tear-out of

existing construction, a waiver for the retention of the asbestos containing material must be obtained from the Contracting Officer.

3.10 ATTACHMENTS

The following attachments form an integral part of this specification:

ENG FORM 4025-R, Mar 95 - Transmittal of Shop Drawings, Equipment Data, Material Samples, or Manufacturer's Certificate of Compliance (2 pages)

ENG FORM 4288-R, Mar 95 - Submittal Register

Figure 1 – AES Title Block

Figure 2 – AES Management Block

Figure 3 – AES Issue Block & Required Notations

Figure 4 – Border Sheet Size

-- END OF SECTION -

TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE *(Read instructions on the reverse side prior to initiating this form)*	DATE	TRANSMITTAL NO.

SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS *(This section will be initiated by the contractor)*

TO:	FROM:	CONTRACT NO.	CHECK ONE: ☐ THIS IS A NEW TRANSMITTAL ☐ THIS IS A RESUBMITTAL OF TRANSMITTAL _____
SPECIFICATION SEC. NO. *(Cover only one section with each transmittal)*	PROJECT TITLE AND LOCATION		CHECK ONE: THIS TRANSMITTAL IS FOR ☐ FIO ☐ GOV'T. APPROVAL

ITEM NO. *a.*	DESCRIPTION OF ITEM SUBMITTED *(Type size, model number/etc.)* *b.*	MFG OR CONTR. CAT., CURVE DRAWING OR BROCHURE NO. *(See instruction no. 8)* *c.*	NO. OF COPIES *d.*	CONTRACT REFERENCE DOCUMENT		FOR CONTRACTOR USE CODE *g.*	VARIATION *(See instruction No. 6)* *h.*	FOR CE USE CODE *i.*
				SPEC. PARA. NO. *e.*	DRAWING SHEET NO. *f.*			

REMARKS	I certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as other wise stated. _____ NAME AND SIGNATURE OF CONTRACTOR

SECTION II - APPROVAL ACTION

ENCLOSURES RETURNED *(List by Item No.)*	NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY	DATE

INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.

2. Each transmittal shall be numbered consecutively in the space provided for "Transmittal No.". This number, in addition to the contract number, will form a serial number for identifying each submittal. For new submittals or resubmittals mark the appropriate box; on resubmittals, insert transmittal number of last submission as well as the new submittal number.

3. The "Item No." will be the same "Item No." as indicated on ENG FORM 4288-R for each entry on this form.

4. Submittals requiring expeditious handling will be submitted on a separate form.

5. Separate transmittal form will be used for submittals under separate sections of the specifications.

6. A check shall be placed in the "Variation" column when a submittal is not in accordance with the plans and specifications--also, a written statement to that effect shall be included in the space provided for "Remarks".

7. Form is self-transmittal, letter of transmittal is not required.

8. When a sample of material or Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate" in column c, Section I.

9. U.S. Army Corps of Engineers approving authority will assign action codes as indicated below in space provided in Section I, column i to each item submitted. In addition they will ensure enclosures are indicated and attached to the form prior to return to the contractor. The Contractor will assign action codes as indicated below in Section I, column g, to each item submitted.

THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED

A	--	Approved as submitted.	E	--	Disapproved (See attached).
B	--	Approved, except as noted on drawings.	F	--	Receipt acknowledged.
C	--	Approved, except as noted on drawings. Refer to attached sheet resubmission required.	FX	--	Receipt acknowledged, does not comply as noted with contract requirements.
D	--	Will be returned by separate correspondence.	G	--	Other *(Specify)*

10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

(Reverse of ENG Form 4025-R)

SUBMITTAL REGISTER

(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION

CONTRACTOR

SPECIFICATION SECTION

ACTIVITY NO a.	TRANS-MITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	TYPE OF SUBMITTAL: DATA f.	DRAWINGS g.	INSTRUCTIONS h.	SCHEDULES i.	STATEMENTS j.	REPORTS k.	CERTIFICATES l.	SAMPLES m.	RECORDS n.	CLASSIFICATION: INFORMATION ONLY o.	GOVERNMENT APPROVED p.	REVIEWER q.	CONTRACTOR SCHEDULE DATES: SUBMIT r.	APPROVAL NEEDED BY s.	MATERIAL NEEDED BY t.	CONTRACTOR ACTION: CODE u.	DATE v.	SUBMIT TO GOVERN-MENT w.	GOVERNMENT ACTION: CODE x.	DATE y.	REMARKS z.

ENG FORM 4288-R, MAR 95 EDITION OF SEP 93 IS OBSOLETE. PAGE 1 OF ____ PAGES (Proponent: CEMP-CE)

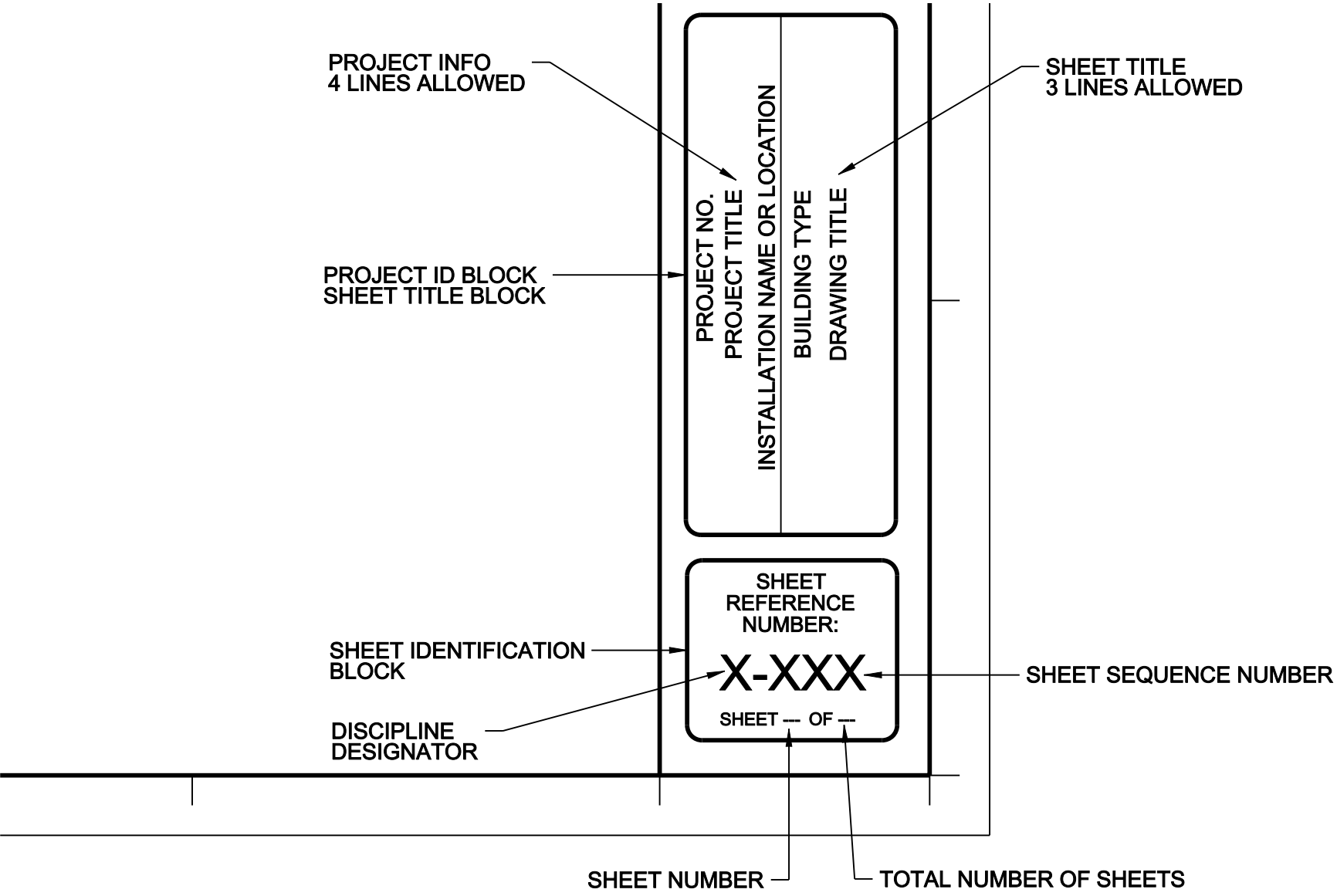


FIGURE 1 - AED TITLE BLOCK

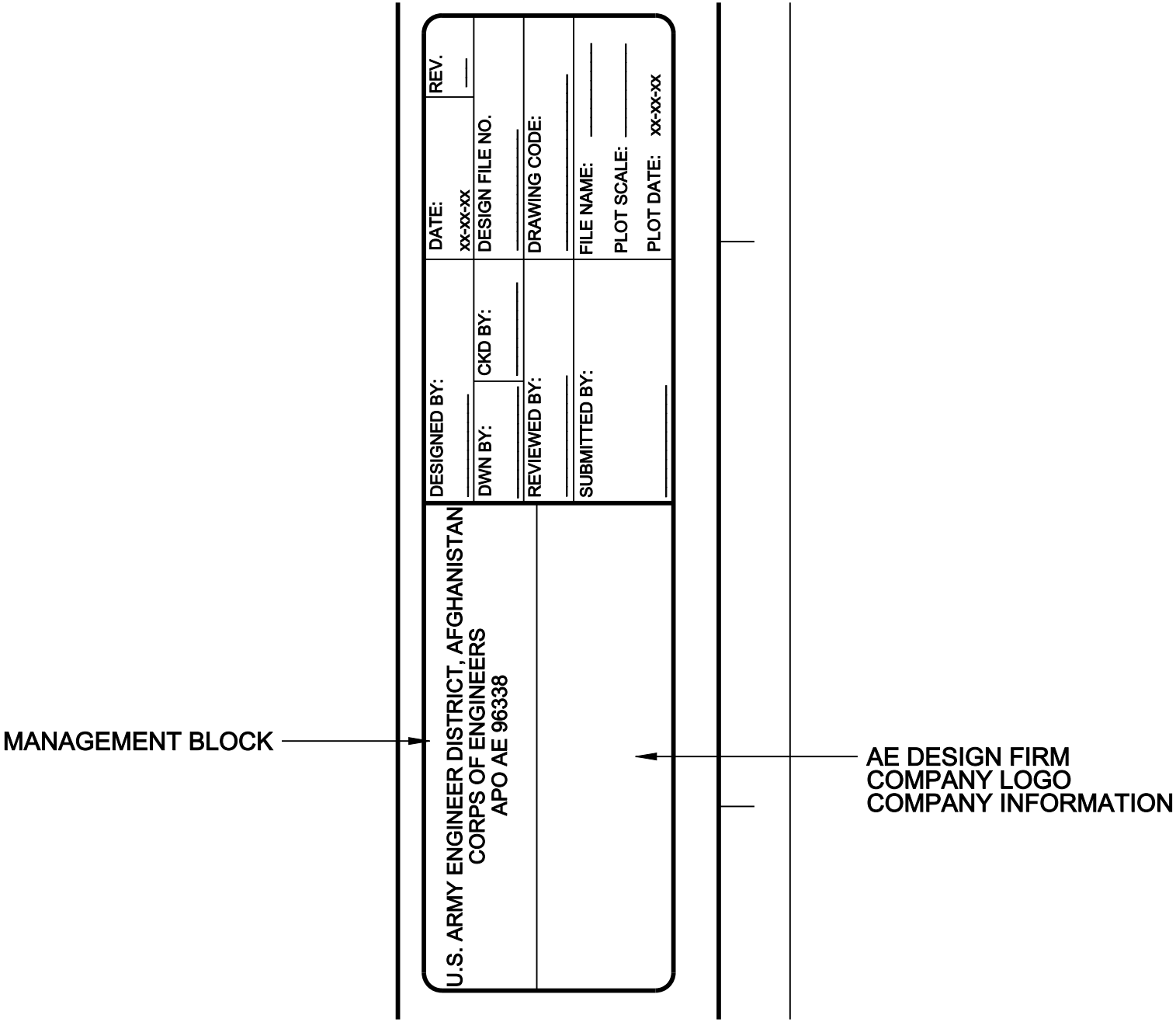


FIGURE 2 - AED MANAGEMENT BLOCK

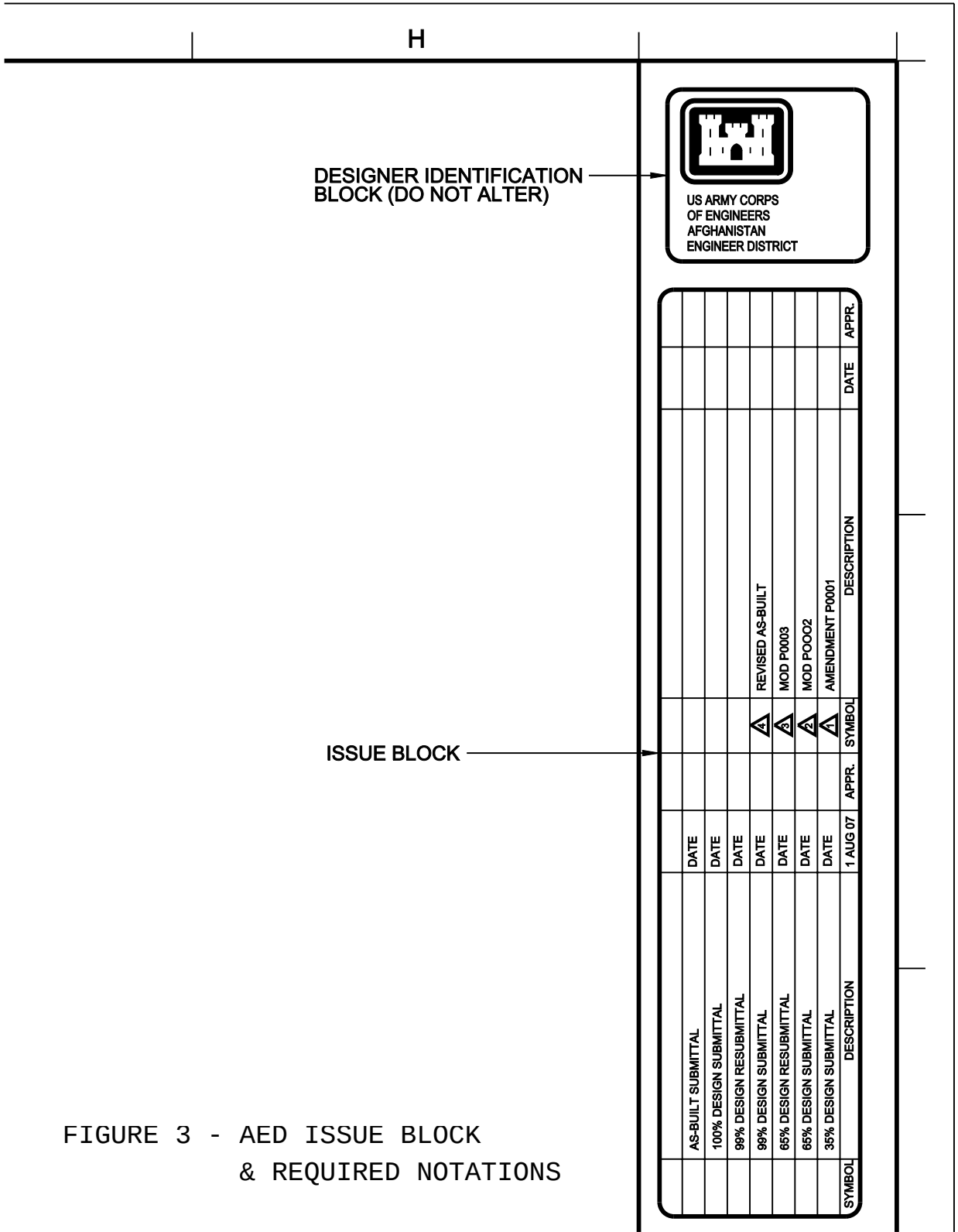


FIGURE 3 - AED ISSUE BLOCK
& REQUIRED NOTATIONS

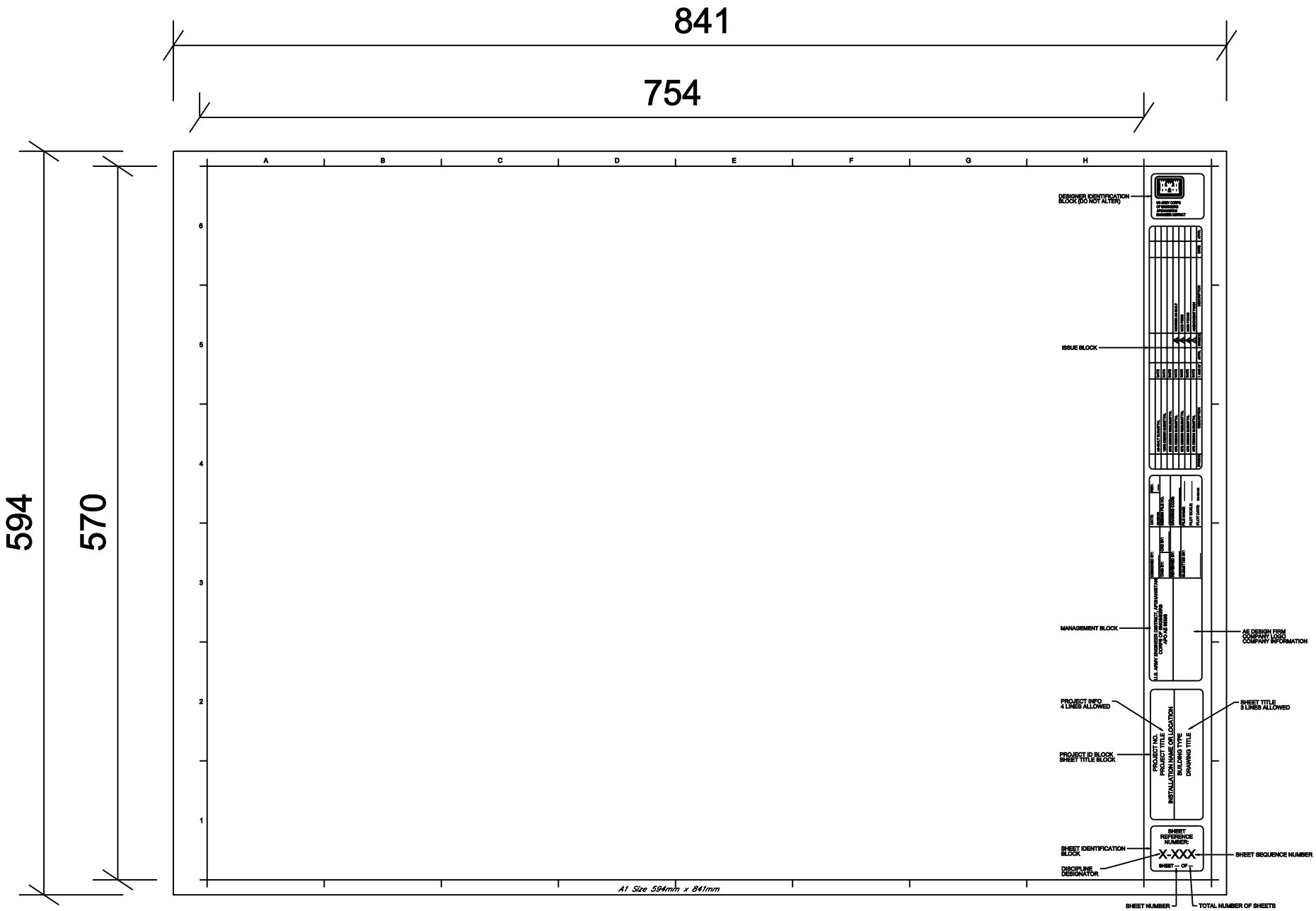


FIGURE 4 - BORDER SHEET SIZE

ELECTRONIC SUBMITTAL DOCUMENT FORMAT

PART 1 - GENERAL: Throughout the design process, the DB Contractor shall submit electronic packages for review at each Design Phase identified in the Request for Proposals. To facilitate reviews, submittal packages shall conform to the following file structure and format.

1.1. File Structure: Submittal packages that can be contained on a single disc shall use the file structure shown in Figure 1.

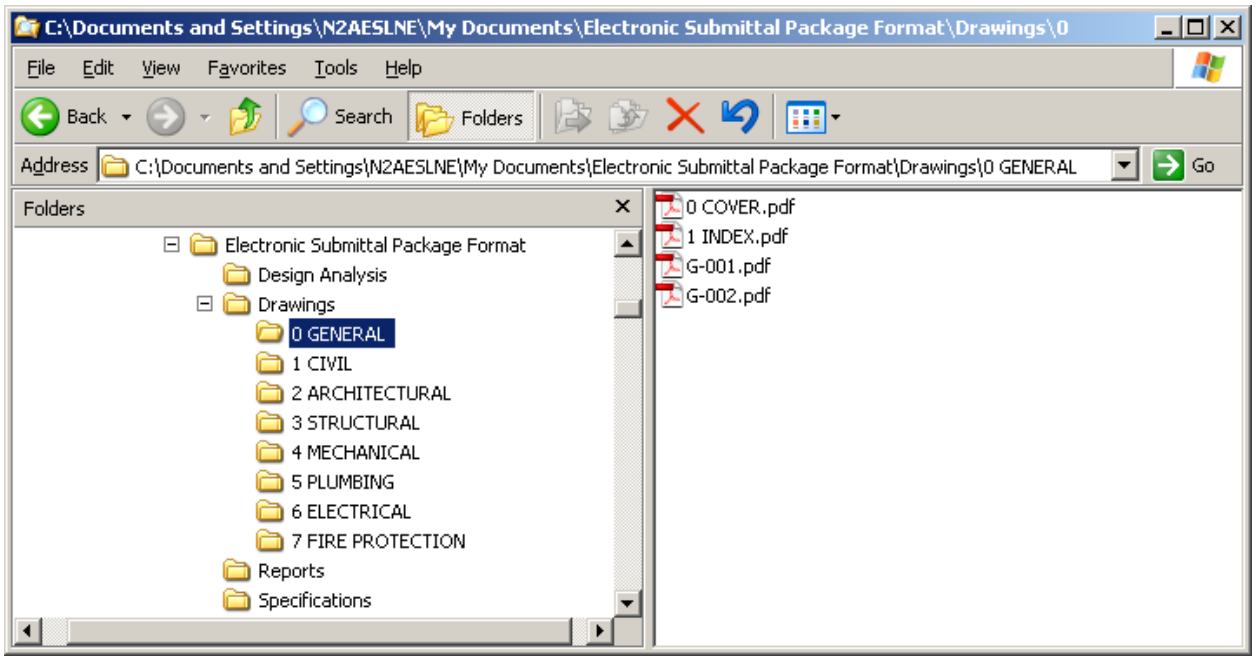


Figure 1: Submittal package file structure

1.2. Design Analysis: The design analysis directory shall contain all design analysis and calculation documents necessary for the current design stage. All design analysis and calculations shall be compiled into a single document containing a table of contents and page numbers. As additional analysis and calculation documents are created in progressive design phases, insert these documents into their appropriate section of the Design Analysis. Avoid lengthy appendices except in the case where numerical output sheets from analysis software are included. All documentation shall be organized by discipline: Civil, Architectural, Structural, Mechanical and Electrical.

1.2.A. Some projects requiring complex plumbing, communications and fire protection systems may require additional sections covering these specific systems. Note that water supply and sanitary sewer systems beyond 1.5 meters of the building envelope are Civil systems, not Plumbing systems.

1.2.B. If the project involves a compound comprised of several structures, clearly identify which building is being analyzed. In these cases, the major divisions of the Design Analysis shall be by discipline with subdivisions by building such that all

calculations for a particular discipline will be found in one section of the document. For example, a compound containing three separate buildings would have three separate seismic loading analysis calculations in the structural section.

1.3. Drawings: Drawings shall be arranged by discipline. Subdirectories shall be made corresponding to discipline only. Folders labeled for specific disciplines as shown in Figure 1 shall contain all drawings in the project applicable to that discipline. Note that these discipline specific folders are to contain only drawings and no other type of document. Drawings must be submitted in pdf form at a minimum. Files shall be named by reference number (i.e. C-101). If multiple file types for submittal drawings are provided, place all file types for each discipline in the same folder; do not subdivide the discipline specific folders for separate file types. Also, include a single pdf file containing all drawings in the project in this folder. The sheets in this file should follow the order indicated in the index sheet. This file should be named to indicate the contract number and submittal stage.

1.3.A. GENERAL: A folder labeled “0 GENERAL” shall contain the cover sheet, index sheet, list of legends and abbreviations sheet, project location and vicinity sheet, and site survey sheets.

1.3.B. CIVIL: A folder labeled “1 CIVIL” shall contain all site survey drawings and all civil drawings for the project. Note that the pipe networks for water supply systems, sanitary sewer systems and storm drainage systems are civil drawings, not plumbing drawings. Also note that gates, fences and small site structures are typically part of the civil discipline.

1.3.C. ARCHITECTURAL: A folder labeled “2 ARCHITECTURAL” shall contain all architectural drawings for the project. Note that life safety drawings denote architectural features and belong in this folder.

1.3.D. STRUCTURAL: A folder labeled “3 STRUCTURAL” shall contain all structural drawings for the project.

1.3.E. MECHANICAL: A folder labeled “4 MECHANICAL” shall contain all HVAC drawings for the project.

1.3.F. PLUMBING: A folder labeled “5 PLUMBING” shall contain all indoor plumbing systems (i.e. domestic water, waste & vent, LPG or propane, compressed air, diesel or fuel oil, etc.) for the project. Note that water supply and sanitary sewer systems beyond 1.5 meters of the building envelope are Civil systems, not Plumbing systems.

1.3.G. ELECTRICAL: A folder labeled “6 ELECTRICAL” shall contain all electrical drawings for the project. Note that communication and fire alarm systems are electrical systems and belong in this folder for most projects.

1.3.H. FIRE PROTECTION: A folder labeled “7 FIRE PROTECTION” shall contain all indoor fire protection systems (i.e. sprinklers, fire pumps, etc.) for the project.

1.4. Reports: The reports folder shall contain all certified reports required in the contract, including the Geotechnical Report, Water Quality Report and any other reports specifically called for in the contract. No subdirectories shall be created in this folder.

1.5. Specifications: All project specifications shall be contained in this folder. Include the project table of contents and name it so that it is easily identifiable (naming it “00000 Project Table of Contents” should ensure that it is at the top of the list). Specification sections should be named by number only so that they sort in ascending order as indicated on the project table of contents, or all project specifications shall be collated into a single file indexed at each section. No subdirectories shall be created in this folder.

PART 2 - PRODUCTS: (NOT APPLICABLE)

PART 3 - EXECUTION: (NOT APPLICABLE)

- - END SECTION - -

SECTION 01 35 26
SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS

1. GENERAL

For contractor safety on projects associated with this program, compliance with EM 385-1-1 safety requirements will be the long-term goal reached by growing a safety culture. This compliance will, by necessity, be achieved through a phased-in process. In the Commander's letter at the preface of the EM 385-1-1, he acknowledges that in OCONUS locations, strict compliance with the manual may not be possible – and through the hazard analysis process, safety measures can be developed to attain the same degree of safety. The latest edition of EM385-1-1 in effect at the time of contract award shall be followed for the duration of the contract.

This specification consists of two parts:

1) Sections 1.1 through 3.12.1, which are the standard safety specifications for work in Afghanistan Engineer District South and;

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A10.32	Personal Fall Protection - Safety Requirements for Construction and Demolition Operations
ANSI Z359 (2010)	Safety Requirements for Personal Fall Arrest Systems
ASME B30.3(1996)	Construction Tower Cranes

ASME INTERNATIONAL (ASME)

ASME B30.22(2000)	Articulating Boom Cranes
ASME B30.5(2004)	Mobile and Locomotive Cranes

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10(2002)	Portable Fire Extinguishers
NFPA 241(2000)	Safeguarding Construction, Alteration, and Demolition Operations
NFPA 51B(2003)	Fire Prevention During Welding, Cutting, and Other Hot Work
NFPA 70(2011)	National Electrical Code
NFPA 70E(2010)	Electrical Safety in the Workplace

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1(2008)	Safety and Health Requirements

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910	Occupational Safety and Health Standards (OSHA)

29 CFR 1910.146	Permit-required Confined Spaces
29 CFR 1915	Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment
29 CFR 1919	Gear Certification
29 CFR 1926	Safety and Health Regulations for Construction
29 CFR 1926.500	Fall Protection

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Accident Prevention Plan (APP); G, District Safety Office

Activity Hazard Analysis (AHA); G, District Safety Office

Crane Critical Lift Plan; G, District Safety Office

Proof of qualification for Crane Operators; G, District Safety Office

UXO/Demining Safety Work Plan; G, District Safety Office

SD-06 Test Reports

Reports: Submit reports as their incidence occurs, in accordance with the requirements of the paragraph entitled, "Reports."

Accident Reports

Monthly Exposure Reports

Crane Reports

Regulatory Citations and Violations

SD-07 Certificates

Confined Space Entry Permit

Contractor Safety Self-Evaluation Checklist; G, District Safety Office

UXO/Demining Clearance Certificate; G, District Safety Office

Submit one copy of each permit/certificate attached to each Daily Quality Control Report.

Certification of UXO clearance. Where excavations are to be performed in areas known or suspected to contain explosives, unexploded munitions, or military ordnance, surface and subsurface clearance by qualified explosive ordnance disposal (EOD) personnel shall be accomplished prior to excavation work. Clearance certificates must be forwarded to the TAS UXO QA Safety specialist, prior to the start of construction. If the site does not have an associated clearance certificate, the site will require an UXO/mine

clearance conducted to meet the certification of UXO clearance requirements EM 385-1-1 section 25.A.01.m.

Before initiation of work at the job site, all Accident Prevention Plans, Demining plans, and any other safety related plans shall be reviewed by the TAS Safety Office.

1.2 DEFINITIONS

a. Competent Person for Fall Protection- A person who is capable of identifying hazardous or dangerous conditions in the personal fall arrest system or any component thereof, as well as their application and use with related equipment, and has the authority to take prompt corrective measures to eliminate the hazards of falling.

b. High Visibility Accident- Any mishap which may generate publicity and/or high visibility.

c. Medical Treatment- Treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even through provided by a physician or registered personnel.

d. Qualified Person for Fall Protection- A person with a recognized degree or professional certificate, extensive knowledge, training and experience in the field of fall protection who is capable of performing design, analysis, and evaluation of fall protection systems and equipment.

e. Recordable Injuries or Illnesses- Any work-related injury or illness that results in:

(1) Death, regardless of the time between the injury and death, or the length of the illness;

(2) Days away from work (any time lost after day of injury/illness onset);

(3) Restricted work;

(4) Transfer to another job;

(5) Medical treatment beyond first aid;

(6) Loss of consciousness; or

(7) A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (1) through (6) above.

f. "USACE" property and equipment specified in USACE EM 385-1-1 should be interpreted as Government property and equipment.

1.3 DRUG PREVENTION PROGRAM

Conduct a proactive drug and alcohol use prevention program for all workers, prime and subcontractor, on the site. Ensure that no employee uses illegal drugs or consumes alcohol during work hours. Ensure there are no employees under the influence of drugs or alcohol during work hours. After accidents, collect blood, urine, or saliva specimens and test the injured and involved employees for the influence of drugs and alcohol. A copy of the test shall be made available to the Contracting Officer upon request.

1.4 REGULATORY REQUIREMENTS

In addition to the detailed requirements included in the provisions of this contract, work performed shall comply with USACE EM 385-1-1.

1.5 SITE QUALIFICATIONS, DUTIES AND MEETINGS

1.5.1 PERSONNEL QUALIFICATIONS

1.5.1.1 SITE SAFETY AND HEALTH OFFICER (SSHO)

Site Safety and Health Officer (SSHO) shall be provided at the work site at all times to perform safety and occupational health management, surveillance, inspections, and safety enforcement for the Contractor. The Contractor Quality Control (QC) person cannot be the SSHO on this project.

The SSHO shall meet the following requirements: Certification card for 30-hour OSHA construction safety class or equivalent within the last 3 years. SSHO must be fluent in English and the local language for communication with the GDA. Competent person training as needed.

Site Safety and Health Officer (SSHO)shall meet the requirements of EM 385-1-1

1. The SSHO is also required to have five (5) years of construction industry safety experience or three (3) years if he/she possesses a Certified Safety Professional (CSP) or safety and health degree. (For complex or high hazard projects, the SSHO shall have a minimum of ten (10) years of safety-related work with at least five (5) years experience on similar type projects.

2. The SSHO(s), as a minimum, must have completed the 30-hour OSHA Construction safety class or as an equivalent, 30 hours of formal construction safety and health training covering the subjects of the OSHA 30-hour course (see Appendix A, paragraph 4.b. in EM385-1-1 applicable to the work to be performed and given by qualified instructors.

3. SSHOs shall maintain this competency through 24 hours of formal safety and health related coursework every four (4) years.

The SSHO shall have the following level of experience:

1. A minimum of 5 years safety work on similar projects.
2. 30-hour OSHA construction safety class or equivalent within the last 5 years.
3. An average of at least 24 hours of formal safety training each year for the past 5 years.
4. Competent person training as needed.

1.5.1.2 COMPETENT PERSON FOR CONFINED SPACE ENTRY

Provide a competent person meeting the requirements of EM 385-1-1 who is assigned in writing by the Government Designated Authority (GDA) to assess confined spaces and who possesses demonstrated knowledge, skill and ability to:

a. Identify the structure, location, and designation of confined and permit-required confined spaces where work is done;

b. Calibrate and use testing equipment including but not limited to, oxygen indicators, combustible gas indicators, carbon monoxide indicators, and carbon dioxide indicators, and to interpret accurately the test results of that equipment;

c. Assess hazardous conditions including atmospheric hazards in confined space and adjacent spaces and specify the necessary protection and precautions to be taken;

d. Determine ventilation requirements for confined space entries and operations;

e. Assess hazards associated with hot work in confined and adjacent space and determine fire watch requirements; and,

f. Maintain records required.

1.5.1.3 CRANE OPERATORS AND SAFE CRANES

Safe crane inspections will be followed using the TAS safe crane inspection process that will be furnished at the preconstruction conference to the contractor.

Crane operators shall meet the requirements in USACE EM 385-1-1, Section 16.B.

1.5.2 PERSONNEL DUTIES

1.5.2.1 SITE SAFETY AND HEALTH OFFICER (SSHO)/SUPERINTENDENT

a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Safety inspection logs shall be attached to the Contractors' daily quality control report.

b. Conduct mishap investigations and complete required reports. Maintain an accident/injury log such as the OSHA Form 300 or host nation equivalent, and Daily Production reports for prime and sub-contractors.

c. Be on site at all times while work is being performed.

d. Attend the pre-construction conference, pre-work meetings including preparatory inspection meeting, and periodic in-progress meetings.

e. Implement and enforce accepted APPS and AHAs.

f. Maintain a safety and health deficiency tracking system that monitors outstanding deficiencies until resolution. A list of unresolved safety and health deficiencies shall be posted on the safety bulletin board.

g. Ensure sub-contractor compliance with safety and health requirements.

Failure to perform the above duties will result in dismissal of the superintendent and/or SSHO, and a project work stoppage. The project work stoppage will remain in effect pending approval of a suitable replacement.

1.5.3 MEETINGS

1.5.3.1 PRECONSTRUCTION CONFERENCE

a. Contractor representatives who have a responsibility or significant role in accident prevention on the project shall attend the preconstruction conference. This includes the project superintendent, site safety and health officer, quality control supervisor, or any other assigned safety and health professionals who participated in the development of the APP (including the Activity Hazard Analyses (AHAs) and special plans, program and procedures associated with it).

b. The Contractor shall discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the Contracting Officer's representative as to which phases will require an analysis. In addition, a schedule for the preparation, submittal, review, and acceptance of AHAs shall be established to preclude project delays.

c. Deficiencies in the submitted APP will be brought to the attention of the Contractor at the preconstruction conference, and the Contractor shall revise the plan to correct deficiencies and re-submit it for acceptance. Work shall not begin until there is an accepted APP.

d. The functions of a Preconstruction conference may take place at the Post-Award Kickoff meeting for Contracts.

1.5.3.2 SAFETY MEETINGS

Shall be conducted and documented as required by EM 385-1-1. Minutes showing contract title, signatures of attendees and a list of topics discussed shall be attached to the Contractors' daily quality control report.

1.6 TRAINING

1.6.1 NEW EMPLOYEE INDOCTRINATION

New employees (prime and sub-contractor) will be informed of specific site hazards before they begin work. Documentation of this orientation shall be kept on file at the project site.

1.6.2 PERIODIC TRAINING

Provide Safety and Health Training in accordance with USACE EM 385-1-1 and the accepted APP. Ensure all required training has been accomplished for all onsite employees.

1.6.3 TRAINING ON ACTIVITY HAZARD ANALYSIS (AHA)

Prior to beginning a new phase, training will be provided to all affected

1.7 ACCIDENT PREVENTION PLAN (APP)

The Contractor shall use a qualified person to prepare the written site-specific APP in both English and in the host nation language. Prepare the APP in accordance with the format and requirements of USACE EM 385-1-1 and as supplemented herein. A TAS Minimum Basic Outline for Contractor APP Template is provided at the end of this section. Cover all paragraph and subparagraph elements in USACE EM 385-1-1, Appendix A, "Minimum Basic Outline for Accident Prevention Plan". Specific requirements for some of the APP elements are described below. The APP shall be job-specific and shall address any unusual or unique aspects of the project or activity for which it is written. The APP shall interface with the Contractor's overall safety and health program. Any portions of the Contractor's overall safety and health program referenced in the APP shall be included in the applicable APP element and made site-specific. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The APP shall be signed by the person and firm (senior person) preparing the APP, the Contractor, the on-site superintendent, the designated site safety and health officer.

In addition to following the requirements defined by EM 385-1-1, the Contractor shall submit for approval as part of the APP a DBA Insurance Plan describing how the requirements in Section 00 80 00 Special Clauses paragraph 2.11 will be met including:

(1) properly and promptly submit an injury claim within seven days of the incident,

(2) provide Resident/Area Engineer with copies of submitted claim

(3) gathering contact information of workers and their family,

(4) follow-up on claim's status,

(5) provided weekly claims report status to the Resident/Area Engineer,

(6) providing prompt payment to an injured worker, or the family of a deceased worker, and

(7) provide Resident/Area Engineer confirmation that payment has been provided from DBA insurance provider.

Submit the APP to the Contracting Officer 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP.

Once accepted by the Contracting Officer, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP will be cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified.

Once work begins, changes to the accepted APP shall be made with the knowledge and concurrence of the Contracting Officer, project superintendent, SSHO and quality control manager. Should any hazard become evident, stop work in the area, secure the area, and develop a plan to remove the hazard. Notify the Contracting Officer within 24 hours of discovery. In the interim, all necessary action shall be taken to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public, and the environment.

Copies of the accepted plan will be maintained at the Contracting Officer's office and at the job site.

The APP shall be continuously reviewed and amended, as necessary, throughout the life of the contract. Unusual or high-hazard activities not identified in the original APP shall be incorporated in the plan as they are discovered.

1.7.1 EM 385-1-1 CONTENTS

In addition to the requirements outlines in Appendix A of USACE EM 385-1-1, the following is required:

a. Names and qualifications (resumes including education, training, experience and certifications) of all site safety and health personnel designated to perform work on this project to include the designated site safety and health officer and other competent and qualified personnel to be. The duties of each position shall be specified.

b. Qualifications of competent and of qualified persons. As a minimum, competent persons shall be designated and qualifications submitted for each of the following major areas: excavation; scaffolding; fall protection; hazardous energy; confined space; health hazard recognition, evaluation and control of chemical, physical and biological agents; personal protective equipment and clothing to include selection, use and maintenance.

c. Confined Space Entry Plan. Develop a confined space entry plan in accordance with USACE EM 385-1-1, Section 34, and any other federal, state and local regulatory requirements identified in this contract. Identify the qualified person's name and qualifications, training, and experience. Delineate the qualified person's authority to direct work stoppage in the event of hazardous conditions. Include procedure for rescue by contractor personnel and the coordination with emergency responders. (If there is no confined space work, include a statement that no confined space work exists and none will be created.)

d. Crane Critical Lift Plan. Prepare and sign weight handling critical lift plans for lifts over 75 percent of the capacity of the crane or hoist (or lifts over 50 percent of the capacity of a barge mounted mobile crane's hoists) at any radius of lift; lifts involving more than one crane or hoist; lifts of personnel; and lifts involving non-routine rigging or operation, sensitive equipment, or unusual safety risks. The plan shall be submitted 15 calendar days prior to on-site work and include the requirements of USACE EM 385-1-1, paragraph 16.H. and the following:

(1) For lifts of personnel, the plan shall demonstrate compliance with the requirements of EM 385-1-1, Section 16.T.

(2) For barge mounted mobile cranes, barge stability calculations identifying barge list and trim based on anticipated loading; and load charts based on calculated list and trim. The amount of list and trim shall be within the crane manufacturer's requirements.

e. Fall Protection and Prevention (FP&P) Plan. The plan shall be site specific and address all fall hazards in the work place and during different phases of construction. It shall address how to protect and prevent workers from falling to lower levels when they are exposed to fall hazards above 1.8 m (6 feet). A qualified person for fall protection shall prepare and sign the plan. The plan shall include fall protection and prevention systems, equipment and methods employed for every phase of work,

responsibilities, assisted rescue, self-rescue and evacuation procedures, training requirements, and monitoring methods. Fall Protection and Prevention Plan shall be revised every six months for lengthy projects, reflecting any changes during the course of construction due to changes in personnel, equipment, systems or work habits. The accepted Fall Protection and Prevention Plan shall be kept and maintained at the job site for the duration of the project. The Fall Protection and Prevention Plan shall be included in the Accident Prevention Plan (APP).

1.8 ACTIVITY HAZARD ANALYSIS (AHA)

The Activity Hazard Analysis (AHA) format shall be in accordance with USACE EM 385-1-1, and shall be written in both English and the host nation language. Submit the AHA for review at least 15 calendar days prior to the start of each phase. The Contractor shall format subsequent AHAs as amendments to the APP. The analysis should be used during daily inspections to ensure the implementation and effectiveness of the activity's safety and health controls.

The AHA list will be reviewed periodically (at least monthly) at the Contractor supervisory safety meeting and updated as necessary when procedures, scheduling, or hazards change.

The activity hazard analyses shall be developed using the project schedule as the basis for the activities performed. Any activities listed on the project schedule will require an AHA. The AHAs will be developed by the contractor, supplier or subcontractor and provided to the prime contractor for submittal to the Contracting Officer.

1.9 DISPLAY OF SAFETY INFORMATION

Within 1 calendar day after commencement of work, erect a safety bulletin board at the job site. The safety bulletin board shall include information and be maintained as required by EM 385-1-1, section 01.A.06.

1.10 SITE SAFETY REFERENCE MATERIALS

Maintain safety-related references applicable to the project. Maintain applicable equipment manufacturer's manuals.

1.11 EMERGENCY MEDICAL TREATMENT

Contractors will arrange for their own emergency medical treatment. The Government has no responsibility to provide emergency medical treatment. Military medical clinics may provide emergency treatment for serious injuries; the contractor is responsible for coordination with the local military medical clinic prior to mobilization.

1.12 REPORTS

1.12.1 ACCIDENT REPORTS

For recordable injuries, illnesses and property damage accidents resulting in at least $2,000 in damages, the Prime Contractor shall conduct an accident investigation to establish the root cause(s) of the accident and complete the USACE Accident Report Form 3394 and provide the report to the Contracting Officer within 5 calendar day(s) of the accident. The Contracting Officer will provide copies of any required or special forms.

1.12.2 ACCIDENT NOTIFICATION

Notify the Contracting Officer as soon as practical, but not later than eight hours, after any accident meeting the definition of Recordable Injuries or Illnesses or High Visibility Accidents, property damage equal to or greater than $2,000. Information shall include contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (to include type of construction equipment used, PPE used, etc.). For all accidents involving a fatality, permanent total disability, hospitalization of three or more persons, or property damage of $200,000 or more, the Contractor shall promptly suspend all operations at the scene of the accident and notify the Resident Engineer of the occurrence.

The Contractor shall immediately provide for the rescue and/or care of the injured. Except in situations where safety may be compromised, access to the area shall be restricted and the scene left undisturbed until investigated by a Government appointed board of investigation and until the Contractor is authorized to resume operations.

1.12.3 MONTHLY EXPOSURE REPORTS

Monthly exposure reporting to the Contracting Officer is required to be attached to the monthly billing request. This report is a compilation of employee-hours worked each month for all site workers, both prime and subcontractor. The Contracting Officer will provide copies of any special forms.

1.12.4 CRANE REPORTS

Submit crane inspection reports required in accordance with USACE EM 385-1-1, Appendix I and as specified herein with Daily Reports of Inspections.

1.13 HOT WORK

Prior to performing "Hot Work" (welding, cutting, etc.) or operating other flame-producing/spark producing devices, a written permit shall be requested from the Installation. CONTRACTORS ARE REQUIRED TO MEET ALL CRITERIA BEFORE A PERMIT IS ISSUED. The Contractor will provide at least two (2) six kilogram ABC rated extinguishers for normal "Hot Work". All extinguishers shall be current inspection tagged, approved safety pin and tamper resistant seal. It is also mandatory to have a designated FIRE WATCH for any "Hot Work" done at this activity. The Fire Watch shall be trained in fire fighting techniques and remain on-site for a minimum of 120 minutes after completion of the task or as specified on the hot work permit.

When starting work in the facility, Contractors shall require their personnel to familiarize themselves with the location of the nearest fire alarm boxes and place in memory the emergency phone numbers. ANY FIRE, NO MATTER HOW SMALL, SHALL BE REPORTED TO THE RESPONSIBLE FIRE DIVISION/DEPARTMENT IMMEDIATELY.

2. EXECUTION

2.1 CONSTRUCTION AND/OR OTHER WORK

Before initiation of work at the job site, an accident prevention plan, written by the Contractor for the specific work and hazards of the contract and implementing in detail the pertinent requirements of EM 385-1-1, will be reviewed and found acceptable by designated Government personnel. Specific requirements for development of the accident prevention plan are found in sections 01.A and Appendix A of EM 385-1-1.

Before beginning each activity involving a type of work presenting hazards not experienced in previous project operations or where a new work crew or subcontractor is to perform the work, activity hazard analysis (AHA) shall be prepared by the Contractor performing the work activity. See paragraph 01.A.13 of EM 385-1-1.

The Contractor shall require subcontractors to submit their plan of operations showing methods they propose to use in accomplishing major phases of work.

The Contractor shall be prepared to discuss the plans in conferences convened by the Contracting Officer prior to starting work on each major phase of operation. Plans shall include all pertinent information such as layout of haul roads, access roads, storage areas, electrical distribution lines, methods of providing minimum exposure to overhead loads, and methods of access to work areas. The plan for accomplishing the initial work phase shall be submitted within 15 calendar days after award of the contract. Plans for subsequent major phases of work shall be submitted not later than 15 calendar days prior to initiation of work on each major phase.

All areas where construction, demolition, alteration, building, or similarly related activities take place, all workers shall have the following minimum personal protective clothing and equipment:

1. Short sleeve shirt.
2. Long trousers.

3. Steel-toed safety boots.
4. Hard hat.
5. Eye protection

Eye and face protection equipment shall meet the requirements of ANSI/ American Society of Safety Engineers (ASSE) Z87.1, and bear a legible and permanent "Z87" logo to indicate compliance with the standard. Eye and face protection equipment shall be distinctly marked to facilitate identification of the manufacturer and provides side protection.

Persons involved in activities that subject the hands to injury (for example, cuts, abrasions, punctures, burns, chemical irritants, toxins, vibration, and forces that can restrict blood flow) shall select and use hand protection appropriate for the hazard in accordance with ANSI/International Safety Equipment Association (ISEA) 105.

Protective equipment shall be of heat, fire, chemical, and/or electrical-resistive material when conditions require protection against such hazards.

2.1.1 FALLING OBJECT PROTECTION

All areas must be barricaded to safeguard employees. When working overhead, barricade the area below to prevent entry by unauthorized employees. Construction warning tape and signs shall be posted so they are clearly visible from all possible access points. When employees are working overhead all tools and equipment shall be secured so that they will not fall. When using guardrail as falling object protection, all openings shall be small enough to prevent passage of potential falling objects.

2.1.2 HAZARDOUS MATERIAL USE

Each hazardous material must receive approval prior to being brought onto the job site or prior to any other use in connection with this contract. Allow a minimum of 10 working days for processing of the request for use of a hazardous material. Any work or storage involving hazardous chemicals or materials must be done in a manner that will not expose Government or Contractor employees to any unsafe or unhealthful conditions. Adequate protective measures must be taken to prevent Government or Contractor employees from being exposed to any hazardous condition that could result from the work or storage. The Prime Contractor shall keep a complete inventory of hazardous materials brought onto the work-site. Approval by the Contracting Officer of protective measures and storage area is required prior to the start of the work.

2.1.3 HAZARDOUS MATERIAL EXCLUSIONS

Notwithstanding any other hazardous material used in this contract, radioactive materials or instruments capable of producing ionizing/non-ionizing radiation (with the exception of radioactive material and devices used in accordance with USACE EM 385-1-1 such as nuclear density meters for compaction testing and laboratory equipment with radioactive sources) as well as materials which contain asbestos, mercury or polychlorinated biphenyls, di-isocynates, lead-based paint are prohibited. The Contracting Officer, upon written request by the Contractor, may consider exceptions to the use of any of the above excluded materials.

2.1.4 UNFORESEEN HAZARDOUS MATERIAL

The design should have identified materials such as PCB, lead paint, and friable and non-friable asbestos. If material, not indicated, that may be hazardous to human health upon disturbance during construction operations is encountered, stop that portion of work and notify the Contracting Officer immediately. Within 14 calendar days the Government will determine if the material is hazardous. If material is not hazardous or poses no danger, the Government will direct the Contractor to proceed without change. If material is hazardous and handling of the material is necessary to accomplish the work, the Government will issue a modification pursuant to "FAR 52.243-4, Changes" and "FAR 52.236-2, Differing Site Conditions."

2.2 FALL HAZARD PROTECTION AND PREVENTION PROGRAM

The Contractor shall establish a fall protection and prevention program, for the protection of all employees exposed to fall hazards. The program shall include company policy; identify responsibilities, education and training requirements, fall hazard identification, prevention and control measures, inspection, storage, care and maintenance of fall protection equipment and rescue and evacuation procedures.

2.2.1 TRAINING

The Contractor shall institute a fall protection training program. As part of the Fall Hazard Protection and Prevention Program, the Contractor shall provide training for each employee who might be exposed to fall hazards. A competent person for fall protection shall provide the training. Training requirements shall be in accordance with USACE EM 385-1-1, section 21.B.

2.2.2 FALL PROTECTION EQUIPMENT

The Contractor shall enforce use of the fall protection equipment designated for each specific work activity in the Fall Protection and Prevention Plan and/or AHA at all times when an employee is on a surface1.8 m(6 feet) or more above lower levels. Fall protection systems such as guardrails, personnel fall arrest system, safety nets, etc., are required when working within 1.8m (6 feet) of any leading edge. Personal fall arrest systems are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition, Elevating Work Platforms/Scissors Lifts: Scissors lifts shall be equipped with standard guardrails. In addition to the guardrail provided, if the scissor lift is equipped with a manufactured anchorage, a restraint system shall be used in addition to guardrails. Lanyards used with the restraint system shall be sufficiently short to prohibit workers from climbing out of, or being ejected from, the platform.

2.2.2.1 PERSONAL FALL ARREST EQUIPMENT

Personal fall arrest equipment, systems, subsystems, and components shall meet ANSI Z359.1 or European Union equivalent. Only a full-body harness with a shock-absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest body support device. Body belts may only be used as a positioning device system (for uses such as steel reinforcing assembly and in addition to an approved fall arrest system). Harnesses shall have a fall arrest attachment affixed to the body support (usually a Dorsal D-ring) and specifically designated for attachment to the rest of the system. Only locking snap hooks and carabiners shall be used. Webbing, straps, and ropes shall be made of synthetic fiber. The maximum free fall distance when using fall arrest equipment shall not exceed 1.8 m (6 feet). The total fall distance and any swinging of the worker (pendulum-like motion) that can occur during a fall shall always be taken into consideration when attaching a person to a fall arrest system.

2.2.3 FALL PROTECTION FOR ROOFING WORK

Fall protection controls shall be implemented based on the type of roof being constructed and work being performed. The roof area to be accessed shall be evaluated for its structural integrity including weight-bearing capabilities for the projected loading.

a. Low Sloped Roofs:

(1) For work within 1.8 m (6 feet) of an edge, on low-slope roofs, personnel shall be protected from falling by use of personal fall arrest systems, guardrails, or safety nets. A safety monitoring system is not adequate fall protection and is not authorized.

(2) For work greater than 1.8 m (6 feet) from an edge, warning lines shall be erected and installed in accordance with USACE EM 385-1-1.

b. Steep-Sloped Roofs: Work on steep-sloped roofs requires a personal fall arrest system, guardrails with toe-boards, or safety nets. This requirement also includes residential or housing type construction.

2.2.4 EXISTING ANCHORAGE

Existing anchorages, to be used for attachment of personal fall arrest equipment, shall be certified (or re-certified) by a qualified person for fall protection in accordance with ANSI Z359.1 or European Union equivalent. Exiting horizontal lifeline anchorages shall be certified (or re-certified) by a registered professional engineer with experience in designing horizontal lifeline systems.

2.2.5 HORIZONTAL LIFELINES

Horizontal lifelines shall be designed, installed, certified and used under the supervision of a qualified person for fall protection as part of a complete fall arrest system which maintains a safety factor of 2.

2.2.6 GUARDRAILS AND SAFETY NETS

Guardrails and safety nets shall be designed, installed and used in accordance with EM 385-1-1 or Host Nation requirements, whichever is more stringent.

2.2.7 RESCUE AND EVACUATION PROCEDURES

When personal fall arrest systems are used, the contractor must ensure that the mishap victim can self-rescue or can be rescued promptly should a fall occur. A Rescue and Evacuation Plan shall be prepared by the contractor and include a detailed discussion of the following: methods of rescue; methods of self-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility. The Rescue and Evacuation Plan shall be included in the Activity Hazard Analysis (AHA) for the phase of work, in the Fall Protection and Prevention (FP&P) Plan, and the Accident Prevention Plan (APP).

2.3 SCAFFOLDING

Employees shall be provided with a safe means of access to the work area on the scaffold. Climbing of any scaffold braces or supports not specifically designed for access is prohibited. Access to scaffold platforms greater than 6 m in height shall be accessed by use of a scaffold stair system. Vertical ladders commonly provided by scaffold system manufacturers shall not be used for accessing scaffold platforms greater than 6 m in height. The use of an adequate gate is required. Contractor shall ensure that employees are qualified to perform scaffold erection and dismantling. Do not use scaffold without the capability of supporting at least four times the maximum intended load or without appropriate fall protection as delineated in the accepted fall protection and prevention plan. Stationary scaffolds must be attached to structural building components to safeguard against tipping forward or backward. Special care shall be given to ensure scaffold systems are not overloaded. Side brackets used to extend scaffold platforms on self-supported scaffold systems for the storage of material are prohibited. The first tie-in shall be at the height equal to 4 times the width of the smallest dimension of the scaffold base. Work platforms shall be placed on mud sills. Scaffold or work platform erectors shall have fall protection during the erection and dismantling of scaffolding or work platforms that are more than six feet. Delineate fall protection requirements when working above six feet or above dangerous operations in the Fall Protection and Prevention (FP&P) Plan and Activity Hazard Analysis (AHA) for the phase of work.

2.4 EQUIPMENT

2.4.1 MATERIAL HANDLING EQUIPMENT

a. Material handling equipment such as forklifts shall not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions.

b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions.

c. Operators of forklifts or power industrial trucks shall be trained/licensed in accordance with Host Nation requirements.

2.4.2 WEIGHT HANDLING EQUIPMENT

a. Cranes and derricks shall be equipped as specified in EM-385-1-1 section 16.

b. The Contractor shall notify the Contracting Officer 15 days in advance of any cranes entering the activity so that necessary quality assurance spot checks can be coordinated. Contractor's operator shall remain with the crane during the spot check.

c. The Contractor shall comply with the crane manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Erection shall be performed under the supervision of a designated person. All testing shall be performed in accordance with the manufacturer's recommended procedures.

d. Under no circumstance shall a Contractor make a lift at or above 90% of the cranes rated capacity in any configuration.

e. When operating in the vicinity of overhead transmission lines, operators and riggers shall be alert to this special hazard and shall follow the requirements of USACE EM 385-1-1 section 11.

f. Crane suspended personnel work platforms (baskets) shall not be used unless the Contractor proves to the satisfaction of the Contracting Officer that using any other access to the work location would provide a greater hazard to the workers or is impossible. Personnel shall not be lifted with a line hoist or friction crane.

g. Portable fire extinguishers shall be inspected, maintained, and recharged.

h. All employees shall be kept clear of loads about to be lifted and of suspended loads.

i. The Contractor shall use cribbing when performing lifts on outriggers.

j. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.

k. A physical barricade must be positioned to prevent personnel from entering the counterweight swing (tail swing) area of the crane.

l. Certification records which include the date of inspection, signature of the person performing the inspection, and the serial number or other identifier of the crane that was inspected shall always be available for review by Contracting Officer personnel.

m. Written reports listing the load test procedures used along with any repairs or alterations performed on the crane shall be available for review by Contracting Officer personnel.

n. Certify that all crane operators have been trained in proper use of all safety devices (e.g. anti-two block devices).

o. Take steps to ensure that wind speed does not contribute to loss of control of the load during lifting operations. Prior to conducting lifting operations the contractor shall set a maximum wind speed at which a crane can be safely operated based on the equipment being used, the load being lifted, experience of operators and riggers, and hazards on the work site. This maximum wind speed determination shall be included as part of the activity hazard analysis plan for that operation.

2.5 EXCAVATIONS

The competent person for excavations performed as a result of contract work shall be on-site when excavation work is being performed, and shall inspect, and document the excavations daily prior to entry by workers. The competent person must evaluate all hazards, including atmospheric, that may be associated with the work, and shall have the resources necessary to correct hazards promptly. All excavations shall conform to the requirements of Section 25 of EM 385-1-1.

The competent person for excavations performed as a result of contract work shall be on-site when excavation work is being performed, and shall inspect the excavation, the adjacent areas, and protective systems daily; before each work shift; throughout the work shifts as dictated by the work being done; after every rainstorm; after other events that could increase hazards, e.g., snowstorm, windstorm, thaw, earthquake, etc.; when fissures, tension cracks, sloughing, undercutting, water seepage, bulging at the bottom or other similar conditions occur; when there is a change in size, location or placement of the spoil pile; and where there is any indication or change in adjacent structures. The competent person shall be able to demonstrate the following: training, experience, and knowledge of, soil analysis, use of protective systems; and requirements of EM 385-1-1 and 29 CFR 1926 Subpart P. They also need the ability to detect conditions that could result in cave-ins, failures in protective systems, hazardous atmospheres, and other hazards including those associated with confined spaces. They shall have the authority to take prompt corrective measures to eliminate existing and predictable hazards and stop work when required.

2.5.1 UTILITY LOCATIONS

Prior to any excavation, all underground utilities in the work area must be positively identified by the contractor utilizing a) a private utility locating service in addition to any station locating service, and/or b) a metal and/or cable-detecting device along the route of the excavation. All underground utilities discovered will be flagged a distance of one-half (1/2) meter on each side of the location, and any markings made during the utility investigation must be maintained throughout the contract.

Damage occurring to existing utilities, when the above procedures are not followed, will be repaired at the Contractor's expense.

2.5.2 UTILITY LOCATION VERIFICATION

The Contractor must physically verify underground utility locations by hand digging using wood or fiberglass handled tools when any adjacent construction work is expected to come within three feet of the underground system. Digging within 0.61 m (2 feet) of a known utility must not be performed by means of mechanical equipment; hand digging shall be used. If construction is parallel to an existing utility the utility shall be exposed by hand digging every 30.5 m (100 feet) if parallel within 1.5 m (5 feet) of the excavation.

2.5.3 SHORING SYSTEMS

Trench and shoring systems must be identified in the accepted safety plan and AHA. Manufacture tabulated data and specifications or registered engineer tabulated data for shoring or benching systems shall be readily available on-site for review. Job-made shoring or shielding shall have the registered professional engineer stamp, specifications, and tabulated data. Extreme care must be used when excavating near direct burial electric underground cables.

2.5.4 TRENCHING MACHINERY

Trenching machines with digging chain drives shall be operated only when the spotters/laborers are in plain view of the operator. Operator and spotters/laborers shall be provided training on the hazards of the digging chain drives with emphasis on the distance that needs to be maintained when the digging chain is operating. Documentation of the training shall be kept on file at the project site.

2.6 UTILITIES WITHIN CONCRETE SLABS

Utilities located within concrete slabs or pier structures, bridges, and the like, are extremely difficult to identify due to the reinforcing steel used in the construction of these structures. Whenever contract work involves concrete chipping, saw cutting, or core drilling, the existing utility location must be coordinated with station utility departments in addition to a private locating service. Outages to isolate utility systems shall be used in circumstances where utilities are unable to be positively identified. The use of historical drawings does not alleviate the contractor from meeting this requirement.

2.7 ELECTRICAL

2.7.1 CONDUCT OF ELECTRICAL WORK

Underground electrical spaces must be certified safe for entry before entering to conduct work. Cables that will be cut must be positively identified and de-energized prior to performing each cut. Positive cable identification must be made prior to submitting any outage request for electrical systems. Arrangements are to be coordinated with the Contracting Officer and Station Utilities for identification. The Contracting Officer will not accept an outage request until the Contractor satisfactorily documents that the circuits have been clearly identified. Perform all high voltage cable cutting remotely using hydraulic cutting tool. Energized work may never be performed without prior authorization. An energized work permit shall be submitted to GDA for acceptance in acceptance in accordance with 385-1-1, Section 11.A02.c. When racking in or live switching of circuit breakers, no additional person other than the switch operator will be allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method. When working in energized substations, only qualified electrical workers shall be permitted to enter. When work requires Contractor to work near energized circuits as defined by the NFPA 70, high voltage personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves with leather protective sleeves, fire retarding shirts, coveralls, face shields, and safety glasses. In addition, provide electrical arc flash protection for personnel as required by NFPA 70E. Insulating blankets, hearing protection, and switching suits may also be required, depending on the specific job and as delineated in the Contractor's AHA.

2.7.2 PORTABLE EXTENSION CORDS

Portable extension cords shall be sized in accordance with manufacturer ratings for the tool to be powered and protected from damage. All damaged extension cords shall be immediately removed from service. Portable extension cords shall meet the requirements of NFPA 70 or European Union equivalent.

2.8 WORK IN CONFINED SPACES

The Contractor shall comply with the requirements in Section 34 of USACE EM 385-1-1. Any potential for a hazard in the confined space requires a permit system to be used.

a. Entry Procedures. Prohibit entry into a confined space by personnel for any purpose, including hot work, until the qualified person has conducted appropriate tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. All hazards pertaining to the space shall be reviewed with each employee during review of the AHA.

b. Forced air ventilation is required for all confined space entry operations and the minimum air exchange requirements must be maintained to ensure exposure to any hazardous atmosphere is kept below its' action level. Ventilation shall conform to the requirements of Section 06.G of 385-1-1.

c. Ensure the use of rescue and retrieval devices in confined spaces greater than 1.5 m (5 feet) in depth. Conform to Section 34 of USACE EM 385-1-1.

d. Sewer wet wells require continuous atmosphere monitoring with audible alarm for toxic gas detection.

e. Include training information for employees who will be involved as entrants and attendants for the work. Conform to Section 34 of USACE EM 385-1-1.

f. Daily Entry Permit. Post the permit in a conspicuous place close to the confined space entrance.

2.9 CRYSTALLINE SILICA

Grinding, abrasive blasting, and foundry operations of construction materials containing crystalline silica, shall comply with USACE EM 385-1-1, Appendix 06.H. The Contractor shall develop and implement effective exposure control and elimination procedures to include dust control systems, engineering controls, and establishment of work area boundaries, as well as medical surveillance, training, air monitoring, and personal protective equipment.

2.10 DEMOLITION

2.10.1 DEMOLITION PLAN

The Contractor shall submit a written demolition plan for all demolition work to be carried on the site. In addition, the demolition plan shall be signed by a Professional Registered Engineer and meet the requirements of the Corps of Engineers Safety and Health Manual, EM 385-1-1, section 23. The demolition plan shall be submitted to the COR at least 1 week before the beginning of the work, including structural calculations for the demolition, if necessary. The demolition work shall not begin before the Contractor has received a written approval from the COR.

2.10.2 PROTECTION OF PERSONNEL

During the demolition work the Contractor shall continuously evaluate the condition of the structure being demolished and take immediate action to protect all personnel working in and around the demolition site. No area, section, or component of floors, roofs, walls, columns, pilasters, or other structural element will be allowed to be left standing without sufficient bracing, shoring, or lateral support to prevent collapse or failure while workers remove debris or perform other work in the immediate area.

2.10.3 PROTECTION OF STRUCTURES

Floors, roofs, walls, columns, pilasters, and other structural components that are designed and constructed to stand without lateral support or shoring, and are determined to be in stable condition, shall remain standing without additional bracing, shoring, or lateral support until demolished, unless directed otherwise by the COR. The Contractor shall ensure that no elements determined to be unstable are left unsupported and shall be responsible for placing and securing bracing, shoring, or lateral supports as may be required as a result of any cutting, removal, or demolition work performed under this contract.

Interior concrete or masonry walls shall be demolished from the top down unless a Registered Engineer can demonstrate that an alternate method poses no additional safety hazards

2.11 HOUSEKEEPING

2.11.1 CLEAN-UP

The Contractor shall be responsible for cleaning up. The Contractor shall require his personnel to keep the immediate work site clean of all dirt and debris resulting from work under this contract. Accumulated dirt and debris shall be hauled off and disposed of in accordance with local law and at least once a week by the Contractor. Additionally, all debris in work areas shall be cleaned up daily or more frequently if necessary. Construction debris may be temporarily located in an approved location; however garbage accumulation must be removed each day.

Stairwells used by the Contractor during execution of work shall be cleaned daily. Cloths, mops, and brushes containing combustible materials shall be disposed of or stored outside of the buildings in tight covered metal containers. Paints and thinners shall not be poured into inlets of the interior or exterior sewage system. Paint, stains, and other residues on adjacent surfaces or fixtures caused by the Contractor shall be carefully removed and cleaned to original finish. Upon completion of the work, the Contractor shall remove all construction equipment, materials and debris resulting from the work. The entire work site and the area used by Contractor personnel shall be left clean.

-- END OF SECTION --

SECTION 01355
ENVIRONMENTAL PROTECTION

1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ISLAMIC REPUBLIC OF AFGHANISTAN

Official Gazette No. 912 Environmental Law (2007)

U.S. DEPARTMENT OF DEFENSE (DoD)

DoD 4715.05-G Overseas Environmental Baseline Guidance Document (OEBGD) (2007)

U.S. ARMY (DA)

AR 200-1 Environmental Protection and Enhancement (2007)

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 Safety and Health Requirements Manual (2009)

1.2 DEFINITIONS

1.2.1 Environmental Pollution

The condition resulting from the presence of chemical, mineral, radioactive, or biological substances that
a. Alter the natural environment.
b. Adversely affect human health or the quality of life, biosystems, the environment, in structures and equipment, recreational opportunities, aesthetics, and/or natural beauty.

1.2.2 Environmental Protection

Environmental protection is the prevention/control of pollution.

1.2.3 Hazardous Material (HM)

A hazardous material is a useful product that requires special management because it has hazardous characteristics (ignitability, corrosivity, reactivity, or toxicity) that could pose dangers to human health or the environment. A HM becomes a Hazardous Waste when it can no longer be used for its intended purpose.

1.2.4 Hazardous Waste (HW)

A hazardous waste is a discarded material with hazardous characteristics that could pose dangers to human health or the environment.

1.2.5 Contractor Generated Hazardous Waste

Hazardous wastes generated or discarded by the Contractor. This includes materials not fully consumed during the course of construction - for example, paint thinners (i.e. methyl ethyl ketone, toluene etc.), waste thinners, excess paints, excess solvents, waste solvents, and fuel/oils/lubricants.

1.3 GENERAL REQUIREMENTS

The Contractor shall minimize environmental pollution and damage that may occur as the result of construction operations. The Contractor shall be responsible for delays resulting from failure to comply with environmental laws and regulations.

1.4 SUBCONTRACTORS

The Contractor shall ensure compliance with this section by all subcontractors, suppliers, and vendors.

1.5 LAWS AND REGULATIONS

The Contractor shall comply with all applicable Afghanistan environmental, natural and cultural resources, and historic preservation laws and regulations.

1.6 SUBMITTALS

1.6.1 Environmental Protection Plan

The Contractor shall submit an Environmental Protection Plan as part of the 10% design submittal for review and approval by the Contracting Officer. The purpose of the Environmental Protection Plan is to present an overview of known or potential environmental (natural and cultural) issues which the Contractor must address during construction. The Environmental Protection Plan shall be current and maintained onsite by the Contractor. The Environmental Protection Plan shall, at a minimum, contain the following:

1.6.1.1 Contents

The environmental protection plan shall include, but shall not be limited to, the following:

1. Name(s) of the on-site Environmental Manager who is responsible for ensuring adherence to the Environmental Protection Plan and monitoring and documenting environmental procedures.
2. An erosion and sediment control plan which identifies the type and location of the erosion and sediment controls to be provided. The plan shall include monitoring and reporting requirements to assure that the control measures are effective.
3. Work area plan showing the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas including methods for protection of features to be preserved within authorized work areas.
4. Spill Control plan shall include the procedures, instructions, and reports to be used in the event of an unforeseen spill of a hazardous material. This plan shall include as a minimum:
    a. The name of the individual who will immediately notify the Contracting Officer and report any spills or hazardous substance releases. The plan shall contain a list of the required reporting channels and telephone numbers.
    b. A list of materials and equipment contained in the job site spill kit (see Appendix for minimum requirements).
    c. The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency.
    d. The methods and procedures to be used for expeditious contaminant cleanup.
5. An air pollution control plan detailing how trash is disposed of without debris burning.
6. A non-hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
7. A contaminant prevention plan that identifies potentially hazardous substances to be used on the job site and identifies the intended actions to prevent introduction of such materials into the air, water, or ground. As new hazardous materials are brought on site or removed from the site, the plan shall be updated.
8. A hazardous waste plan that identifies potentially hazardous waste that may be generated by the project.
9. A waste water management plan that identifies the methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities.
10. A plan that defines procedures for identifying and protecting historical, archaeological, cultural resources known to be on the project site. The plan shall identify lines of communication between Contractor personnel and the Contracting Officer.

1.6.1.2 Unidentified issues

During Construction, the Contractor shall be responsible for identifying, implementing, and submitting, for approval, any additional requirements to be included in the Environmental Protection Plan.

1.7 PROTECTION FEATURES

The Contractor shall prepare a brief report including a plan describing the features requiring protection under the provisions of the Contract Clauses. This survey report shall be signed by both the Contractor and the Contracting Officer upon mutual agreement as to its accuracy and completeness.

1.8 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Any deviations, requested by the Contractor, from the drawings, plans and specifications which may have an environmental impact will be subject to approval by the Contracting Officer.

1.9 NOTIFICATION

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with elements of the Contractor's Environmental Protection plan. Upon notification or discovery of noncompliance, the Contractor shall propose corrective action to the COR and take such action when approved by the COR. The Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions shall be granted or equitable adjustments allowed to the Contractor for any such suspensions.

2 PRODUCTS (NOT USED)

3 EXECUTION

3.1 ENVIRONMENTAL PERMITS AND COMMITMENTS

The Contractor shall be responsible for obtaining and complying with all permits and commitments required by Afghanistan environmental, natural and cultural resources, and historic preservation laws and regulations.

3.2 LAND RESOURCES

The Contractor shall confine all activities to areas defined by the drawings and specifications. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. The Contractor shall provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs. Stone, soil, or other materials displaced into uncleared areas shall be removed by the Contractor.

3.2.1 Work Area Limits

Prior to commencing construction activities, the Contractor shall mark the areas that need not be disturbed under this contract. Where construction operations are to be conducted during darkness, any markers shall be visible in the dark. The Contractor's personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.

3.2.2 Landscape

Features indicated to be preserved shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques. The Contractor shall restore landscape features damaged or destroyed during construction operations outside the limits of the approved work area.

3.2.3 Erosion and Sediment Controls

The Contractor shall be responsible for providing erosion and sediment control measures. The COR shall approve erosion and sediment controls prior to installation. Any temporary measures shall be removed after the area has been stabilized.

3.2.4 Contractor Facilities and Work Areas

The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas designated on the drawings or as directed by the Contracting Officer. Temporary movement or relocation of Contractor facilities shall be made only when approved. Erosion and sediment controls shall be provided for on-site borrow and spoil areas to prevent sediment from entering nearby waters. Temporary excavation and embankments for plant and/or work areas shall be controlled to protect adjacent areas.

3.2.5 Tree Protection

All costs associated with tree protection requirements required by specifications and drawings are the full responsibility of the Contractor. The Contractor shall exercise care when excavating trenches in the vicinity of trees.

3.3 WATER RESOURCES

The Contractor shall monitor construction activities to prevent pollution of surface and ground waters. Toxic or hazardous chemicals shall not be applied to soil or vegetation unless otherwise indicated. All water areas affected by construction activities shall be monitored by the Contractor.

3.3.1 Cofferdams, Diversions, and Dewatering Operations

Construction operations surface waters shall be controlled at all times to maintain compliance with designated uses of the surface water body.

3.3.2 Stream Crossings

Constructed stream crossings (wet or dry) shall not block the natural flow of water when present.

3.4 AIR RESOURCES

3.4.1 Burning

All areas within facility perimeter fence line are designated as no burn areas.

3.5 CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL

3.5.1 Chemicals and Chemical Wastes

Chemicals shall not be spilled on the ground or water. Dispensing areas shall be clean and not subject to repetitive spills. Corrective action shall be quickly performed and documented. This documentation will be periodically reviewed by the Government. Chemical waste shall be collected in corrosion resistant, compatible containers. Wastes shall be classified, managed, stored, and disposed at an appropriate disposal site.

3.5.2 Contractor Hazardous Material / Generated Hazardous Wastes / Excess Hazardous Materials

The Contractor shall be responsible for storage, describing, packaging, labeling, and marking hazardous waste and hazardous material. The Contractor shall manage and store hazardous material and waste in a designated area designed to segregate and prevent mixing of incompatible chemicals. The area will be dry, securable and have warning signs appropriate for the wastes being accumulated. Facilities or areas shall provide adequate ventilation, containment, and protection from the elements. Contractor vehicles are not considered a proper storage facility. No HM or HW shall be stored in vehicles overnight or for any length of time. The Spills of hazardous or toxic materials shall be immediately reported to the Contracting Officer. Cleanup and cleanup costs due to spills shall be the Contractor's responsibility.

3.5.3 Fuel and Lubricants

Equipment and motor vehicle fueling, lubrication and storage shall be conducted on containment surfaces to minimize spills evaporation.

3.5.4 Waste Water

Disposal of waste water shall be as specified below.

a. Waste water from construction activities shall not be discharged prior to being treated to remove pollutants. The Contractor shall dispose of the construction related waste water off site, unless on-site disposal is approved by the Contracting Officers Representative.
b. Water generated from the flushing of lines after decontamination or decontamination in conjunction with hydrostatic testing or only hydrostatic testing shall be discharged into areas where the liquids will percolate into the ground.

3.6 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

If during construction activities any historical, archaeological, and cultural resources are discovered or found, all activities that may damage or alter such resources shall be temporarily suspended. Resources include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, the Contractor shall immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. The Contractor shall secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

3.7 BIOLOGICAL RESOURCES

The Contractor shall minimize interference with, disturbance to, and damage to fish, wildlife, and plants including their habitat. The Contractor shall protect animal and plant species including their habitat in accordance with Afghanistan regulations.

3.8 MAINTENANCE OF POLLUTION CONTROL

The Contractor shall maintain permanent and temporary pollution control facilities and devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

3.9 POST CONSTRUCTION CLEANUP

The Contractor shall clean up all areas used for construction in accordance with Contract Clause: "Cleaning Up". The Contractor shall, unless otherwise instructed in writing by the Contracting Officer, obliterate all signs of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. The disturbed area shall be graded, filled and the entire area restored to its original condition.

-- END OF SECTION --

SECTION 01415
METRIC MEASUREMENTS

1. REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM E 621	(1994; R 1999e1) Use of Metric (SI) Units in Building Design and Construction (Committee E-6 Supplement to E380)
ASTM SI 10	(2002) American National Standard for Use of the International System of Units (SI): The Modern Metric System

2. GENERAL

This project includes metric units of measurements. The metric units used are the International System of Units (SI) developed and maintained by the General Conference on Weights and Measures (CGPM); the name International System of Units and the international abbreviation SI were adopted by the11th CGPM in 1960. A number of circumstances require that both metric SI units and English inch-pound (I-P) units be included in a section of the specifications. When both metric and I-P measurements are included, the section may contain measurements for products that are manufactured to I-P dimensions and then expressed in mathematically converted metric value (soft metric) or, it may contain measurements for products that are manufactured to an industry recognized rounded metric (hard metric) dimensions but are allowed to be substituted by I-P products to comply with the law. Dual measurements are also included to indicate industry and/or Government standards, test values or other controlling factors, such as the code requirements where I-P values are needed for clarity or to trace back to the referenced standards, test values or codes.

3. USE OF MEASUREMENTS IN SPECIFICATIONS

Measurements in specifications shall be either in SI or I-P units as indicated, except for soft metric measurements or as otherwise authorized. When only SI or I-P measurements are specified for a product, the product shall be procured in the specified units (SI or I-P) unless otherwise authorized by the Contracting Officer. The Contractor shall be responsible for all associated labor and materials when authorized to substitute one system of units for another and for the final assembly and performance of the specified work and/or products.

3.1 HARD METRIC

A hard metric measurement is indicated by an SI value with no expressed correlation to an I-P value. Hard metric measurements are often used for field data such as distance from one point to another or distance above the floor. Products are considered to be hard metric when they are manufactured to metric dimensions or have an industry recognized metric designation.

3.2 SOFT METRIC

a. A soft metric measurement is indicated by an SI value which is a mathematical conversion of the I-P value shown in parentheses (e.g. 38.1 mm (1-1/2 inches)). Soft metric measurements are used for measurements pertaining to products, test values, and other situations where the I-P units are the standard for manufacture, verification, or other controlling factor. The I-P value shall govern while the metric measurement is provided for information.

b. A soft metric measurement is also indicated for products that are manufactured in industry designated metric dimensions but are required by law to allow substitute I-P products. These measurements are indicated by a manufacturing hard metric product dimension followed by the substitute I-P equivalent value in parentheses (e.g., 190 x 190 x 390 mm (7-5/8 x 7-5/8 x 15-5/8inches)).

3.3 NEUTRAL

A neutral measurement is indicated by an identifier which has no expressed relation to either an SI or an I-P value (e.g., American Wire Gage (AWG) which indicates thickness but in itself is neither SI nor I-P).

3.4 COORDINATION

Discrepancies, such as mismatches or product unavailability, arising from use of both metric and non-metric measurements and discrepancies between the measurements in the specifications and the measurements in the drawings shall be brought to the attention of the Contracting Officer for resolution.

3.5 RELATIONSHIP TO SUBMITTALS

Submittals for Government approval or for information only shall cover the SI or I-P products actually being furnished for the project. The Contractor shall submit the required drawings and calculations in the same units used in the contract documents describing the product or requirement unless otherwise instructed or approved. The Contractor shall use ASTM SI 10 and ASTM E 621 as the basis for establishing metric measurements required to be used in submittals.

-- END OF SECTION --

SECTION 01451
CONTRACTOR QUALITY CONTROL

1. GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

ER 1110-1-12 (1993)	Quality Management
EM 385-1-1	Safety and Health Requirements Manual

1.2 PAYMENT

Separate payment will not be made for providing and maintaining an effective Quality Control program, and all costs associated therewith shall be included in the applicable unit prices or lump-sum prices contained in the Bidding Schedule.

2. EXECUTION

2.1 GENERAL REQUIREMENTS

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clauses and this specification section. The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all construction operations, both onsite and offsite, and shall be keyed to the proposed construction sequence. The site project superintendent will be held responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the contract. The site project superintendent in this context shall be the highest level manager responsible for the overall construction activities at the site, including quality and production. The site project superintendent shall maintain a physical presence at the site at all times, except as otherwise acceptable to the Contracting Officer, and shall be responsible for all construction and construction related activities at the site.

2.2 CQM TRAINING REQUIREMENT

Before project design and construction begin, the Contractor's Quality Control Manager is required to have completed the U.S. Army Corps of Engineers (USACE) Construction Quality Management (CQM) course, or equivalent. The CQM course will be offered periodically by the Afghanistan Engineer District (AED), USACE. Additional approved CQM courses include those offered by the Commercial Technical Training Center (in Jalalabad) and the Champion Technical Training Center (in Kabul). The Quality Assurance Branch of the AED can provide information related to AED offerings of the CQM course, as well as contact information for training centers. Alternative CQM courses, other than those mentioned above, must be approved by the Quality Assurance Branch.

The Contractor's quality control plan, as defined in Section 01451, entitled "Contractor Quality Control", must include "The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function." For the QC Manager, qualifications must include a certificate demonstrating completion of an approved CQM course.

2.3 QUALITY CONTROL PLAN

The Contractor shall furnish for review by the Government, not later than five (5) days after receipt of Notice-to-Proceed (NTP) the proposed Contractor Quality Control (CQC) Plan. The plan shall identify personnel, procedures, control, instructions, records, and forms to be used.

2.3.1 CONTENT OF THE CQC PLAN

The CQC Plan shall include, as a minimum, the following to cover all construction operations, both onsite and off-site, including work by subcontractors, fabricators, suppliers and purchasing agents:

a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC System Manager who shall report to the project superintendent.

b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.

c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of these letters shall also be furnished to the Government.

d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, consultants, and purchasing agents. These procedures shall be in accordance with Specification 01335 SUBMITTAL PROCEDURES.

e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test.

f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures shall establish verification that identified deficiencies have been corrected.

h. Reporting procedures, including proposed reporting formats.

i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

2.3.2 ADDITIONAL REQUIREMENTS FOR DESIGN QUALITY CONTROL (DQC) PLAN

The following additional requirements apply to the Design Quality Control (DQC) plan:

(1) The Contractor shall provide and maintain a Design Quality Control (DQC) Plan as an effective quality control program which will assure that all services required by this design contract are performed and provided in a manner that meets professional architectural and engineering quality standards. As a minimum, all documents shall be technically reviewed by competent, independent reviewers identified in the DQC Plan. The same element that produced the product shall not perform the independent technical review (ITR). The Contractor shall correct errors and deficiencies in the design documents prior to submitting them to the Government.

(2) The Contractor shall include the design schedule in the master project schedule, showing the sequence of events involved in carrying out the project design tasks within the specific contract period. This should be at a detailed level of scheduling sufficient to identify all major design tasks, including those that control the flow of work. The schedule shall include review and correction periods associated with each item. This should be a forward planning as well as a project monitoring tool. The schedule reflects calendar days and not dates for each activity. If the schedule is changed, the Contractor shall submit a revised schedule reflecting the change within 7 calendar days. The Contractor shall include in the DQC Plan the discipline-specific checklists to be used during the design and quality control of each submittal. These completed checklists shall be submitted at each design phase as part of the project documentation. Example checklists can be found in ER 1110-1-12.

(3) The DQC Plan shall be implemented by an Design Quality Control Manager who has the responsibility of being cognizant of and assuring that all documents on the project have been coordinated. This individual shall be a person who has verifiable engineering or architectural design experience and is a registered professional engineer or architect. The Contractor shall notify the Contracting Officer, in writing, of the name of the individual, and the name of an alternate person assigned to the position.

The Contracting Officer will notify the Contractor in writing of the acceptance of the DQC Plan. After acceptance, any changes proposed by the Contractor are subject to the acceptance of the Contracting Officer.

2.3.3 ACCEPTANCE OF PLAN

Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes in the CQC plan and operations including removal of personnel, as necessary, to obtain the quality specified.

2.3.4 NOTIFICATION OF CHANGES

After acceptance of the QC plan, the Contractor shall notify the Contracting Officer in writing a minimum of seven calendar days prior to any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

2.4 COORDINATION MEETING

After the Pre-construction Conference, before start of construction, and prior to acceptance by the Government of the Quality Control Plan, the Contractor shall meet with the Contracting Officer or Authorized Representative and discuss the Contractor's quality control system. The CQC Plan shall be submitted for review a minimum of 5 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both on-site and off-site work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting shall be prepared by the Government and signed by both the Contractor and the Contracting Officer. The minutes shall become a part of the contract file. There may

be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures, which may require corrective action by the Contractor.

2.5 QUALITY CONTROL ORGANIZATION

2.5.1 PERSONNEL REQUIREMENTS

The requirements for the CQC organization are a CQC System Manager, and sufficient number of additional qualified personnel to ensure safety and contract compliance. Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly will also be included as part of the CQC organization. The Contractor's CQC staff shall maintain a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure contract compliance. The CQC staff shall be subject to acceptance by the Contracting Officer. The Contractor shall provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Complete records of all letters, material submittals, shop drawing submittals, schedules and all other project documentation shall be promptly furnished to the CQC organization by the Contractor. The CQC organization shall be responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

2.5.2 CQC SYSTEM MANAGER

The Contractor shall identify an individual within his organization at the site of the work who shall be responsible for overall management of the CQC and have the authority to act in all CQC matters for the Contractor. The CQC system manager shall be a graduate engineer, graduate architect, or a graduate construction manager, with experience on construction projects similar in type to this contract OR a construction person with a minimum of ten (10) years in related work. The CQC System Manager shall be on the site at all times during construction and shall be employed by the Contractor. The CQC System Manager shall be assigned no other duties. An alternate for the CQC System Manager will be identified in the plan to serve in the event of the CQC system manager’s absence. The requirements for the alternate will be the same as for the designated CQC manager.

2.5.3 ADDITIONAL REQUIREMENT

In addition to the above experience and/or education requirements, the CQC System Manager shall have completed the course entitled "Construction Quality Management For Contractors". This course is periodically offered by the government, and inquiries as to the next course offering may be directed to the local construction field office.

2.5.4 ORGANIZATIONAL CHANGES

The Contractor shall maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

2.6 SUBMITTALS AND DELIVERABLES

Submittals, if needed, shall be made as specified in the STR titled SUBMITTAL PROCEDURES. The CQC organization shall be responsible for certifying that all submittals and deliverables are in compliance with the contract requirements.

2.7 CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control shall be conducted by the CQC System Manager for each definable feature of the construction work as follows:

2.7.1 PREPARATORY PHASE.

This phase shall be performed prior to beginning work on each definable feature of work, after all required documents and materials are approved/accepted, and after copies are at the work site. This phase shall include:

a. A review of each paragraph of applicable specifications, reference codes, and standards. A copy of those sections of referenced codes and standards, in the English language unless specifically approved otherwise by the Contracting Officer, applicable to that portion of the work to be accomplished in the field shall be made available by the Contractor at the preparatory inspection. These copies shall be maintained in the field and available for use by Government personnel until final acceptance of the work.

b. A review of the contract drawings.

c. A check to assure that all materials and/or equipment have been tested, submitted, and approved.

d. A check to assure that provisions have been made to provide required control inspection and testing.

e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.

f. A physical examination of required materials, equipment, and sample work to verify that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

g. Reviews of the appropriate activity hazard analysis to ensure safety requirements are met.

h. Discussion of procedures for constructing the work including repetitive deficiencies, construction tolerances and workmanship standards for that feature of work.

i. A check to ensure that the Contracting Officer has accepted the portion of the plan for the work to be performed.

j. Discussion of the initial control phase.

k. The Government shall be notified at least 24 hours in advance of beginning any of the required action of the preparatory phase. This phase shall include a meeting conducted by the CQC system manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC system manager and attached to the daily QC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

2.7.2 INITIAL PHASE.

This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

a. A check of preliminary work to ensure that it is in compliance with contract requirements. Review minutes of the preparatory meeting.

b. Verification of full contract compliance. Verify required control inspection and testing.

c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with sample panels as appropriate.

d. Resolve all differences.

e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.

f. The Government shall be notified at least 24 hours in advance of beginning the initial phase. Separate minutes of this phase shall be prepared by the CQC system manager and attached to the daily QC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.

g. The initial phase should be repeated for each new crew to work on-site, or any time acceptable specified quality standards are not being met.

2.7.3 FOLLOW-UP PHASE.

Daily checks shall be performed to assure continuing compliance with contract requirements, including control testing, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted, and all noted deficiencies corrected, prior to the start of additional features of work that may be affected by the deficient work. The Contractor shall not build upon nor conceal non-conforming work.

2.7.4 ADDITIONAL PREPARATORY AND INITIAL PHASES

Additional preparatory and initial phases may be required by the Contracting Officer on the same definable features of work if the quality of on-going work is unacceptable; if there are changes in the applicable QC staff or in the on-site production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

2.8 TESTS

2.8.1 TESTING PROCEDURE

The Contractor shall perform tests specified or required to verify that control measures are adequate to provide a product that conforms to contract requirements. Upon request, the Contractor shall furnish to the Government duplicate samples of test specimens for possible testing by the Government. Costs incidental to the transportation of samples or materials shall be borne by the Contractor.

Testing includes operation and/or acceptance tests when specified. A list of tests to be performed shall be furnished as a part of the CQC plan. The list shall give the test name, frequency, specification paragraph containing the test requirements, the personnel and laboratory responsible for each type of test, and an estimate of the number of tests required. The Contractor shall perform the following activities and record and provide the following data:

a. Verify that testing procedures comply with contract requirements.

b. Verify that facilities and testing equipment are available and comply with testing standards.

c. Check test instrument calibration data against certified standards.

d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

e. Results of all tests taken, both passing and failing tests, shall be recorded on the Quality Control report for the date taken. Specification paragraph/item reference, location where tests were taken, and the sequential control number identifying the test will be given. Actual test reports may be submitted later, if approved by the Contracting Officer, with a reference to the test number and date taken. An information copy of tests performed by an off-site or commercial test facility will be provided directly to the Contracting Officer. Failure to submit timely test reports, as stated, may result in nonpayment for related work performed and disapproval of the test facility for this contract.

2.9 COMPLETION INSPECTION

2.9.1 PUNCH-OUT INSPECTION

Near the end of the work, or any increment of the work established by a time stated in the SPECIAL CONTRACT REQUIREMENTS Clause, "Commencement, Prosecution, and Completion of Work", or by the specifications, the CQC Manager shall conduct an inspection of the work. A punch list of items which do not conform to the approved drawings and specifications shall be prepared and included in the CQC documentation, as required by paragraph DOCUMENTATION. The list of deficiencies shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government Pre-Final inspection.

3.9.2 Pre-Final Inspection

The Government will perform the pre-final inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. The Contractor's CQC System Manager shall ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Any items noted on the Pre-Final inspection shall be corrected in a timely manner. These inspections and any deficiency corrections required by this paragraph shall be accomplished within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

2.9.2 FINAL ACCEPTANCE INSPECTION

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative shall be in attendance at the final acceptance inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups, and major commands may also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notice shall be given to the Contracting Officer at least 14 days prior to the final acceptance inspection and shall include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause titled "Inspection of Construction".

3. DOCUMENTATION

The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:

a. Contractor/subcontractor and their area of responsibility.

b. Operating plant/equipment with hours worked, idle, or down for repair.

c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.

d. Test and/or control activities performed with results and references to specifications/drawings requirements. The control phase shall be identified (Preparatory, Initial, Follow-up). List of deficiencies noted, along with corrective action.

e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.

f. Submittals and deliverables reviewed, with contract reference, by whom, and action taken.

g. Offsite surveillance activities, including actions taken.

h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.

i. Instructions given/received and conflicts in plans and/or specifications.

j. Contractor's verification statement.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and one copy of these records in report form shall be furnished to the Government daily within forty-eight (48) hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, one report shall be prepared and submitted for every 7 days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work shall be for that day only. Reports shall be signed and dated by the CQC System Manager. The report from the CQC System Manager shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel.

3.1 SAMPLE FORMS

In accordance with Specification 01312 QUALITY CONTROL SYSTEM, the contractor shall use the forms produced by and printed from QCS. Samples of any forms required to meet the requirements of this section which are not produced by that system shall be included in the contractors Quality Control Plan.

3.2 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until

satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

-- END OF SECTION --

SECTION 01770
CLOSEOUT PROCEDURES

1. GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01335 SUBMITTAL PROCEDURES:

SD-10 Operation and Maintenance Data

Equipment/Product Warranty List; G

Submit Data Package 1 in accordance with Section 01781 OPERATION AND MAINTENANCE DATA.

SD-11 Closeout Submittals

As-Built Drawings; G

Record Of Materials; G

Equipment/Product Warranty Tag; G

1.2 PROJECT RECORD DOCUMENTS

1.2.1 AS-BUILT DRAWINGS

As built drawings shall be submitted in accordance with Section 01780A CLOSEOUT SUBMITTALS

1.2.2 AS-BUILT RECORD OF MATERIALS

Furnish a record of materials.

Where several manufacturers' brands, types, or classes of the item listed have been used in the project, designate specific areas where each item was used. Designations shall be keyed to the areas and spaces depicted on the contract drawing. Furnish the record of materials used in the following format:

MATERIALS DESIGNATION	SPECIFICATION	MANUFACTURER	MATERIALS USED (MANUFACTURER'S DESIGNATION)	WHERE USED

1.3 EQUIPMENT/PRODUCT WARRANTIES

1.3.1 EQUIPMENT/PRODUCT WARRANTY LIST

The Contractor shall develop a warranty management plan which shall contain information relevant to the clause Warranty of Construction. At least 30 days before the planned pre-warranty conference, the Contractor shall submit the warranty management plan for Government approval. The warranty management plan shall include all required actions and documents to assure that the Government receives all warranties to which it is entitled. The plan shall be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. The term

"status" as indicated below shall include due date and whether item has been submitted or was accomplished. Warranty information made available during the construction phase shall be submitted to the Contracting Officer for approval prior to each monthly pay estimate. Approved information shall be assembled in a binder and shall be turned over to the Government upon acceptance of the work. The construction warranty period shall begin on the date of project acceptance and shall continue for the full product warranty period. A joint 4 month and 9 month warranty inspection shall be conducted, measured from time of acceptance, by the Contractor, Contracting Officer and the Customer Representative. Information contained in the warranty management plan shall include, but shall not be limited to, the following:

a. Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of the Contractors, subcontractors, manufacturers or suppliers involved.

b. Listing and status of delivery of all Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and for all commissioned systems such as fire protection and alarm systems, sprinkler systems, lightning protection systems, etc.

c. A list for each warranted equipment, item, feature of construction or system indicating:

1. Name of item.
2. Model and serial numbers.
3. Location where installed.
4. Name and phone numbers of manufacturers or suppliers.
5. Names, addresses and telephone numbers of sources of spare parts.
6. Warranties and terms of warranty. This shall include one-year overall warranty of construction. Items which have extended warranties shall be indicated with separate warranty expiration dates.
7. Cross-reference to warranty certificates as applicable.
8. Starting point and duration of warranty period.
9. Summary of maintenance procedures required to continue the warranty in force.
10. Cross-reference to specific pertinent Operation and Maintenance manuals.
11. Organization, names and phone numbers of persons to call for warranty service.
12. Typical response time and repair time expected for various warranted equipment.

d. The Contractor's plans for attendance at the 4 and 9 month post-construction warranty inspections conducted by the Government.

e. Procedure and status of tagging of all equipment covered by extended warranties.

f. Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

1.3.2 PERFORMANCE OF WARRANTY WORK

In the event the Contractor fails to commence and diligently pursue any construction warranty work required, the Contracting Officer will have the work performed by others, and after completion of the work, will charge the remaining construction warranty funds of expenses incurred by the Government while performing the work, including, but not limited to administrative expenses.

Following oral or written notification of required construction warranty repair work, the Contractor shall respond in a timely manner. Written verification will follow oral instructions. Failure of the Contractor to respond will be cause for the Contracting Officer to proceed against the Contractor.

1.3.3 PRE-WARRANTY CONFERENCE

Prior to contract completion, and at a time designated by the Contracting Officer, the Contractor shall meet with the Contracting Officer to develop a mutual understanding with respect to the requirements of this section. Communication procedures for Contractor notification of construction warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the Contracting Officer for the execution of the construction warranty shall be established/reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, the Contractor shall furnish the name, telephone number and address of a licensed and bonded company which is authorized to initiate and pursue construction warranty work action on behalf of the Contractor. This point of contact will be located within the local service area of the warranted construction, shall be continuously available, and shall be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of its responsibilities in connection with other portions of this provision.

1.3.4 WARRANTY TAGS

At the time of installation, each warranted item shall be tagged with a durable, oil and water resistant tag approved by the Contracting Officer. Each tag shall be attached with a copper wire and shall be sprayed with a silicone waterproof coating. The date of acceptance and the QC signature shall remain blank until project is accepted for beneficial occupancy. The tag shall show the following information.

a. Type of product/material _____

b. Model number _____

c. Serial number_____

d. Contract number_____

e. Warranty period _____ from _____ to_____

f. Inspector's signature_____

g. Construction Contractor_____

Address _____

Telephone number _____

h. Warranty contact _____

Address _____

Telephone number _____

i. Warranty response time priority code _____

j. WARNING - PROJECT PERSONNEL TO PERFORM ONLY OPERATIONAL MAINTENANCE DURING THE WARRANTY PERIOD.

1.4 MECHANICAL TESTING AND BALANCING

All contract requirements for testing/adjusting/balancing shall be fully completed, including all testing, prior to contract completion date. The time required to complete all testing/adjusting/balancing is included in the allotted calendar days for completion.

1.5 FINAL CLEANING

The premises shall be left broom clean. Stains, foreign substances, and temporary labels shall be removed from surfaces. Carpet and soft surfaces shall be vacuumed. Equipment and fixtures shall be cleaned to a sanitary condition. Filters of operating equipment shall be replaced. Debris shall be removed from roofs, drainage systems, gutters, and downspouts. Paved areas shall be swept and landscaped areas shall be raked clean. The site shall have

waste, surplus materials, and rubbish removed. The project area shall have temporary structures, barricades, project signs, and construction facilities removed. A list of completed clean-up items shall be submitted on the day of final inspection.

-- END OF SECTION --

SECTION 01780A
CLOSEOUT SUBMITTALS

1. GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01335 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

As-Built Drawings G

Drawings showing final as-built conditions of the project. The local language of Afghanistan, Pashto or Dari shall be added to project As-Built drawings. The final CADD as-built drawings shall consist of three (3) sets of electronic CADD drawing files in the specified format, and one (1) set of full size and one (1) set of half size paper copies of the approved as-built drawings. One electronic copy of the As-Built drawings and the paper copies of the As-Built drawings shall be delivered to the O&M Regional Site manager at the Resident Office or Area Office responsible for contract administration. Two electronic copies of the As-Built drawings shall be mailed or delivered to the KAF O&M Branch.

SD-03 Product Data

As-Built Record of Equipment and Materials G

Two copies of the record listing the as-built materials and equipment incorporated into the construction of the project.

Warranty Management Plan G

One set of the warranty management plan containing information relevant to the warranty of materials and equipment incorporated into the construction project, including the starting date of warranty of construction. The Contractor shall furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.

Warranty Tags G

Two record copies of the warranty tags showing the layout and design.

Final Cleaning

Two copies of the listing of completed final clean-up item

1.2 PROJECT RECORD DOCUMENTS

1.2.1 AS-BUILT DRAWINGS

This paragraph covers as-built drawings complete, as a requirement of the contract. The terms "drawings," "contract drawings," "drawing files," "working as-built drawings" and "final as-built drawings" refer to contract drawings which are revised to be used for final as-built drawings.

1.2.1.1 GOVERNMENT FURNISHED MATERIALS

One set of electronic CADD files in the specified software and format revised to reflect all bid amendments will be provided by the Government at the preconstruction conference for projects requiring CADD file as-built drawings.

1.2.1.2 WORKING AS-BUILT AND FINAL AS-BUILT DRAWINGS

a. The Contractor shall revise 2 sets of paper drawings by red-line process to show the as-built conditions during the prosecution of the project. These working as-built marked drawings shall be kept current on a weekly basis and at least one set shall be available on the jobsite at all times. Changes from the contract plans which are made in the work or additional information which might be uncovered in the course of construction shall be accurately and neatly recorded as they occur by means of details and notes. Final as-built drawings shall be prepared after the completion of each definable feature of work as listed in the Contractor Quality Control Plan (Foundations, Utilities, Structural Steel, etc., as appropriate for the project). The working as-built marked prints and final as-built drawings will be jointly reviewed for accuracy and completeness by the Contracting Officer and the Contractor prior to submission of each monthly pay estimate. If the Contractor fails to maintain the working and final as-built drawings as specified herein, the Contracting Officer will deduct from the monthly progress payment an amount representing the estimated cost of maintaining the as-built drawings. This monthly deduction will continue until an agreement can be reached between the Contracting Officer and the Contractor regarding the accuracy and completeness of updated drawings. The working and final as-built drawings shall show, but shall not be limited to, the following information:

b. The actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, the as-built drawings shall show, by offset dimensions to two permanently fixed surface features, the end of each run including each change in direction. Valves, splice boxes and similar appurtenances shall be located by dimensioning along the utility run from a reference point. The average depth below the surface of each run shall also be recorded.

c. The location and dimensions of any changes within the building structure.

d. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.

e. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor; including but not limited to fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.

f. The topography, invert elevations and grades of drainage installed or affected as part of the project construction.

g. Changes or modifications which result from the final inspection.

h. Where contract drawings or specifications present options, only the option selected for construction shall be shown on the final as-built prints.

i. If borrow material for this project is from sources on Government property, or if Government property is used as a spoil area, the Contractor shall furnish a contour map of the final borrow pit/spoil area elevations.

j. Systems designed or enhanced by the Contractor, such as HVAC controls, fire alarm, fire sprinkler, and irrigation systems.

k. Modifications (change order price shall include the Contractor's cost to change working and final as-built drawings to reflect modifications) and compliance with the following procedures.

1. Directions in the modification for posting descriptive changes shall be followed.

2. A Modification Circle shall be placed at the location of each deletion.
3. For new details or sections which are added to a drawing, a Modification Circle shall be placed by the detail or section title.
4. For minor changes, a Modification Circle shall be placed by the area changed on the drawing (each location).
5. For major changes to a drawing, a Modification Circle shall be placed by the title of the affected plan, section, or detail at each location.
6. For changes to schedules or drawings, a Modification Circle shall be placed either by the schedule heading or by the change in the schedule.
7. The Modification Circle size shall be 12.7 mm 1/2 inch diameter unless the area where the circle is to be placed is crowded. Smaller size circle shall be used for crowded areas.

1.2.1.3 DRAWING PREPARATION

The as-built drawings shall be modified as may be necessary to correctly show the features of the project as it has been constructed by bringing the contract set into agreement with approved working as-built prints, and adding such additional drawings as may be necessary. These working as-built marked prints shall be neat, legible and accurate. These drawings are part of the permanent records of this project and shall be returned to the Contracting Officer after approval by the Government. Any drawings damaged or lost by the Contractor shall be satisfactorily replaced by the Contractor at no expense to the Government.

1.2.1.4 COMPUTER AIDED DESIGN AND DRAFTING (CADD) DRAWINGS

a. Only personnel proficient in the preparation of CADD drawings shall be employed to modify the contract drawings or prepare additional new drawings. Additions and corrections to the contract drawings shall be equal in quality and detail to that of the originals. Line colors, line weights, lettering, layering conventions, and symbols shall be the same as the original line colors, line weights, lettering, layering conventions, and symbols. If additional drawings are required, they shall be prepared using the specified electronic file format applying the same graphic standards specified for original drawings. The title block and drawing border to be used for any new final as-built drawings shall be identical to that used on the contract drawings. Additions and corrections to the contract drawings shall be accomplished using CADD files. The Contractor will be furnished "as-designed" drawings in AutoCAD Release 2007 or Microstation VM format compatible with a Windows XP operating system. The electronic files will be supplied on compact disc, read-only memory (CD-ROM). The Contractor shall be responsible for providing all program files and hardware necessary to prepare final as-built drawings.

b. Prior to submittal of the first design submittal involving CADD drawings, the Contractor shall prepare one typical CADD drawing for the project and furnish, via ENG Form 4025, the electronic CADD drawing file for review and approval by the Contracting Officer. All Government comments involving changes to this single drawing shall be accomplished and resubmittal(s) made until the Government is satisfied that all CADD Standards are being followed and all subsequent drawings will also be in compliance with these Standards.

c. When final revisions have been completed, the cover sheet drawing shall show the wording "RECORD DRAWING AS-BUILT" followed by the name of the Contractor in letters at least 5 mm high. All other contract drawings shall be marked either "As-Built" drawing denoting no revisions on the sheet or "Revised As-Built" denoting one or more revisions. Original contract drawings shall be dated in the revision block.

d. After Government approval of all of the working as-built drawings for a phase of work, the Contractor shall prepare the final CADD as-built drawings for that phase of work and submit two sets of full size paper copy prints of these drawings for Government review, comparison with approved red-line marked up drawings, and approval. The Government will promptly return one set of prints annotated with any necessary corrections to the CADD file(s) if corrections are required prior to approval. Within 20 days

of substantial completion of all phases of work, the Contractor shall submit the final as-built drawing package for the entire project. The submittal shall consist of one set of electronic files on compact disc, read-only memory (CD-ROM), one set of full size paper prints and one set of the approved working as-built drawings. They shall be complete in all details and identical in form and function to the contract drawing files supplied by the Government. Any transactions or adjustments necessary to accomplish this is the responsibility of the Contractor. The Government reserves the right to reject any drawing files it deems incompatible with the CADD system. Upon approval by the Government of the final as-built drawing package for the entire project, the Contractor shall provide the number of as-built copies noted in Paragraph 1.1 of this Section.

e. Paper prints, drawing files and storage media submitted will become the property of the Government upon final approval. Failure to submit final as-built drawing files and marked prints as specified shall be cause for withholding any payment due the Contractor under this contract. Approval and acceptance of final as-built drawings shall be accomplished before final payment is made to the Contractor.

1.2.1.5 PAYMENT

No separate payment will be made for as-built drawings required under this contract, and all costs accrued in connection with such drawings shall be considered a subsidiary obligation of the Contractor.

1.2.2 AS-BUILT RECORD OF EQUIPMENT AND MATERIALS

The Contractor shall furnish one copy of preliminary record of equipment and materials used on the project 15 days prior to final inspection. This preliminary submittal will be reviewed and returned 2 days after final inspection with Government comments. Two sets of final record of equipment and materials shall be submitted 10 days after final inspection. The designations shall be keyed to the related area depicted on the contract drawings. The record shall list the following data:

Furnish the record of materials used in the following format:

MATERIALS DESIGNATION	SPECIFICATION	MANUFACTURER	MATERIALS USED (MANUFACTURER'S DESIGNATION)	WHERE USED

1.2.3 FINAL APPROVED SHOP DRAWINGS

The Contractor shall furnish final approved project shop drawings 30 days after transfer of the completed facility.

1.2.4 CONSTRUCTION CONTRACT SPECIFICATIONS

The Contractor shall furnish final as-built construction contract specifications, including modifications thereto, 30 days after transfer of the completed facility.

1.2.5 REAL PROPERTY EQUIPMENT

The Contractor shall furnish a list of installed equipment furnished under this contract. The list shall include all information usually listed on manufacturer's name plate. The "EQUIPMENT-IN-PLACE LIST" shall include, as applicable, the following for each piece of equipment installed: description of item, location (by room number), model number, serial number, capacity, name and address of manufacturer, name and address of equipment supplier, condition, spare parts list, manufacturer's catalog, and warranty. A draft list shall be furnished at time of transfer. The final list shall be furnished 30 days after transfer of the completed facility.

1.3 WARRANTY MANAGEMENT

1.3.1 WARRANTY MANAGEMENT PLAN

The Contractor shall develop a warranty management plan which shall contain information relevant to the clause Warranty of Construction. At least 30 days before the planned pre-warranty conference, the Contractor shall submit the warranty management plan for Government approval. The warranty management plan shall include all required actions and documents to assure that the Government receives all warranties to which it is entitled. The plan shall be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. The term "status" as indicated below shall include due date and whether item has been submitted or was accomplished. Warranty information made available during the construction phase shall be submitted to the Contracting Officer for approval prior to each monthly pay estimate. Approved information shall be assembled in a binder and shall be turned over to the Government upon acceptance of the work. The construction warranty period shall begin on the date of project acceptance and shall continue for the full product warranty period. A joint 4 month and 9 month warranty inspection shall be conducted, measured from time of acceptance, by the Contractor, Contracting Officer and the Customer Representative. Information contained in the warranty management plan shall include, but shall not be limited to, the following:

a. Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of the Contractors, subcontractors, manufacturers or suppliers involved.

b. Listing and status of delivery of all Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and for all commissioned systems such as fire protection and alarm systems, sprinkler systems, lightning protection systems, etc.

c. A list for each warranted equipment, item, feature of construction or system indicating:

1. Name of item.
2. Model and serial numbers.
3. Location where installed.
4. Name and phone numbers of manufacturers or suppliers.
5. Names, addresses and telephone numbers of sources of spare parts.
6. Warranties and terms of warranty. This shall include one-year overall warranty of construction. Items which have extended warranties shall be indicated with separate warranty expiration dates.
7. Cross-reference to warranty certificates as applicable.
8. Starting point and duration of warranty period.
9. Summary of maintenance procedures required to continue the warranty in force.
10. Cross-reference to specific pertinent Operation and Maintenance manuals.
11. Organization, names and phone numbers of persons to call for warranty service.
12. Typical response time and repair time expected for various warranted equipment.

d. The Contractor's plans for attendance at the 4 and 9 month post-construction warranty inspections conducted by the Government.

e. Procedure and status of tagging of all equipment covered by extended warranties.

f. Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

1.3.2 PRE-WARRANTY CONFERENCE

Prior to contract completion, and at a time designated by the Contracting Officer, the Contractor shall meet with the Contracting Officer to develop a mutual understanding with respect to the requirements of this section. Communication procedures for Contractor notification of construction warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the Contracting Officer for the execution of the construction warranty shall be established/reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, the Contractor shall furnish the name, telephone number and address of a licensed and bonded company which is authorized to initiate and pursue construction warranty work action on behalf of the Contractor. This point of contact will be located within the local service area of the warranted construction, shall be continuously available, and shall be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of its responsibilities in connection with other portions of this provision.

1.3.3 CONTRACTOR'S RESPONSE TO CONSTRUCTION WARRANTY SERVICE REQUIREMENTS

Following oral or written notification by the Contracting Officer, the Contractor shall respond to construction warranty service requirements in accordance with the "Construction Warranty Service Priority List" and the three categories of priorities listed below. The Contractor shall submit a report on any warranty item that has been repaired during the warranty period. The report shall include the cause of the problem, date reported, corrective action taken, and when the repair was completed. If the Contractor does not perform the construction warranty within the timeframes specified, the Government will perform the work and backcharge the construction warranty payment item established.

a. First Priority Code 1. Perform onsite inspection to evaluate situation, and determine course of action within 4 hours, initiate work within 6 hours and work continuously to completion or relief.

b. Second Priority Code 2. Perform onsite inspection to evaluate situation, and determine course of action within 8 hours, initiate work within 24 hours and work continuously to completion or relief.

c. Third Priority Code 3. All other work to be initiated within 3 work days and work continuously to completion or relief.

d. The "Construction Warranty Service Priority List" is as follows:

Code 1-Air Conditioning Systems
1) Recreational support.
2) Air conditioning leak in part of building, if causing damage.
3) Air conditioning system not cooling properly.

Code 1-Doors
1) Overhead doors not operational, causing a security, fire, or safety problem.
2) Interior, exterior personnel doors or hardware, not functioning properly, causing a security, fire, or safety problem.

Code 3-Doors
1) Overhead doors not operational.
2) Interior/exterior personnel doors or hardware not functioning properly.

Code 1-Electrical
1) Power failure (entire area or any building operational after 1600 hours).
2) Security lights
3) Smoke detectors

Code 2-Electrical

1) Power failure (no power to a room or part of building).
2) Receptacle and lights (in a room or part of building).

Code 3-
Electrical
Street lights.

Code 1-Gas
1) Leaks and breaks.
2) No gas to family housing unit or cantonment area.

Code 1-Heat
1) Area power failure affecting heat.
2) Heater in unit not working.

Code 2-Kitchen Equipment
1) Dishwasher not operating properly.
2) All other equipment hampering preparation of a meal.

Code 1-Plumbing
1) Hot water heater failure.
2) Leaking water supply pipes.

Code 2-Plumbing
1) Flush valves not operating properly.
2) Fixture drain, supply line to commode, or any water pipe leaking.
3) Commode leaking at base.

Code 3 –Plumbing
Leaky faucets.

Code 3-Interior
1) Floors damaged.
2) Paint chipping or peeling.
3) Casework.

Code 1-Roof Leaks
Temporary repairs will be made where major damage to property is occurring.

Code 2-Roof Leaks
Where major damage to property is not occurring, check for location of leak during rain and complete repairs on a Code 2 basis.

Code 2-Water (Exterior)
No water to facility.

Code 2-Water (Hot)
No hot water in portion of building listed.

Code 3-All other work not listed above.

1.3.4 WARRANTY TAGS

At the time of installation, each warranted item shall be tagged with a durable, oil and water resistant tag approved by the Contracting Officer. Each tag shall be attached with a copper wire and shall be sprayed with a silicone

waterproof coating. The date of acceptance and the QC signature shall remain blank until project is accepted for beneficial occupancy. The tag shall show the following information.

a. Type of product/material_____.

b. Model number_____.

c. Serial number_____.

d. Contract number_____.

e. Warranty period_____from_____to_____.

f. Inspector's signature_____.

g. Construction Contractor_____.
Address_____.
Telephone number_____.

h. Warranty contact_____.
Address_____.
Telephone number_____.

i. Warranty response time priority code_____.

j. WARNING - PROJECT PERSONNEL TO PERFORM ONLY OPERATIONAL MAINTENANCE DURING THE WARRANTY PERIOD.

1.4 MECHANICAL TESTING, ADJUSTING, BALANCING, AND COMMISSIONING

Prior to final inspection and transfer of the completed facility; all reports, statements, certificates, and completed checklists for testing, adjusting, balancing, and commissioning of mechanical systems shall be submitted to and approved by the Contracting Officer as specified inapplicable technical specification sections.

1.5 FINAL CLEANING

The premises shall be left broom clean. Stains, foreign substances, and temporary labels shall be removed from surfaces. Carpet and soft surfaces shall be vacuumed. Equipment and fixtures shall be cleaned to a sanitary condition. Filters of operating equipment shall be replaced. Debris shall be removed from roofs, drainage systems, gutters, and downspouts. Paved areas shall be swept and landscaped areas shall be raked clean. The site shall have waste, surplus materials, and rubbish removed. The project area shall have temporary structures, barricades, project signs, and construction facilities removed. A list of completed clean-up items shall be submitted on the day of final inspection.

1.6 OPERATION AND MAINTENANCE MANUALS

Two electronic copies in English of all Operation and Maintenance (O&M) manuals shall be submitted as follows:

U.S. Army Corps of Engineers
Afghanistan Engineering District – South
Att:, O&M

Kandahar Air Field, Afghanistan
APO, AE 09355

One hard paper copy and an electronic copy of the O&M manuals in English, Pashto, and Dari shall be delivered to the O&M Regional Site manager at the Resident Office or Area Office responsible for contract administration.

Operation manuals and maintenance manuals shall be provided in a common volume, complete, clearly differentiated and separately indexed.

-- END OF SECTION --

SECTION 01781
OPERATION AND MAINTENANCE DATA

1. GENERAL

1.1 SUBMISSION OF OPERATION AND MAINTENANCE DATA

Submit Operation and Maintenance (O&M) Data specifically applicable to this contract and a complete and concise depiction of the provided equipment, product, or system. Organize and present information in sufficient detail to clearly explain O&M requirements at the system, equipment, component, and subassembly level. Include an index preceding each submittal. Submit in accordance with this section and Section 01335 SUBMITTAL PROCEDURES.

1.1.1 PACKAGE QUALITY

Documents must be fully legible. Poor quality copies and material with hole punches obliterating the text or drawings will not be accepted.

1.1.2 PACKAGE CONTENT

Data package content shall be as shown in the paragraph titled "Schedule of Operation and Maintenance Data Packages." Comply with the data package requirements specified in the individual technical sections, including the content of the packages and addressing each product, component, and system designated for data package submission.

1.1.3 CHANGES TO SUBMITTALS

Manufacturer-originated changes or revisions to submitted data shall be furnished by the Contractor if a component of an item is so affected subsequent to acceptance of the O&M Data. Changes, additions, or revisions required by the Contracting Officer for final acceptance of submitted data, shall be submitted by the Contractor within 30 calendar days of the notification of this change requirement.

1.2 TYPES OF INFORMATION REQUIRED IN O&M DATA PACKAGES

1.2.1 OPERATING INSTRUCTIONS

Include specific instructions, procedures, and illustrations for the following phases of operation:

1.2.1.1 SAFETY PRECAUTIONS

List personnel hazards and equipment or product safety precautions for all operating conditions.

1.2.1.2 OPERATOR PRESTART

Include procedures required to set up and prepare each system for use.

1.2.1.3 STARTUP, SHUTDOWN, AND POST-SHUTDOWN PROCEDURES

Provide narrative description for Startup, Shutdown and Post-shutdown operating procedures including the control sequence for each procedure.

1.2.1.4 NORMAL OPERATIONS

Provide narrative description of Normal Operating Procedures. Include Control Diagrams with data to explain operation and control of systems and specific equipment.

1.2.1.5 EMERGENCY OPERATIONS

Include Emergency Procedures for equipment malfunctions to permit a short period of continued operation or to shut down the equipment to prevent further damage to systems and equipment. Include Emergency Shutdown Instructions for fire, explosion, spills, or other foreseeable contingencies. Provide guidance and procedures for emergency operation of all utility systems including required valve positions, valve locations and zones or portions of systems controlled.

1.2.1.6 OPERATOR SERVICE REQUIREMENTS

Include instructions for services to be performed by the operator such as lubrication, adjustment, inspection, and recording gage readings.

1.2.1.7 ENVIRONMENTAL CONDITIONS

Include a list of Environmental Conditions (temperature, humidity, and other relevant data) that are best suited for the operation of each product, component or system. Describe conditions under which the item equipment should not be allowed to run.

1.2.2 PREVENTIVE MAINTENANCE

Include the following information for preventive and scheduled maintenance to minimize corrective maintenance and repair.

1.2.2.1 LUBRICATION DATA

Include preventative maintenance lubrication data, in addition to instructions for lubrication provided under paragraph titled "Operator Service Requirements":

a. A table showing recommended lubricants for specific temperature ranges and applications.

b. Charts with a schematic diagram of the equipment showing lubrication points, recommended types and grades of lubricants, and capacities.

c. A Lubrication Schedule showing service interval frequency.

1.2.2.2 PREVENTIVE MAINTENANCE PLAN AND SCHEDULE

Include manufacturer's schedule for routine preventive maintenance, inspections, tests and adjustments required to ensure proper and economical operation and to minimize corrective maintenance. Provide manufacturer's projection of preventive maintenance work-hours on a daily, weekly, monthly, and annual basis including craft requirements by type of craft. For periodic calibrations, provide manufacturer's specified frequency and procedures for each separate operation.

1.2.3 CORRECTIVE MAINTENANCE (REPAIR)

Include manufacturer's recommended procedures and instructions for correcting problems and making repairs.

1.2.3.1 TROUBLESHOOTING GUIDES AND DIAGNOSTIC TECHNIQUES

Include step-by-step procedures to promptly isolate the cause of typical malfunctions. Describe clearly why the checkout is performed and what conditions are to be sought. Identify tests or inspections and test equipment required to determine whether parts and equipment may be reused or require replacement.

1.2.3.2 WIRING DIAGRAMS AND CONTROL DIAGRAMS

Wiring diagrams and control diagrams shall be point-to-point drawings of wiring and control circuits including factory-field interfaces. Provide a complete and accurate depiction of the actual job specific wiring and control work. On diagrams, number electrical and electronic wiring and pneumatic control tubing and the terminals for each type, identically to actual installation configuration and numbering.

1.2.3.3 MAINTENANCE AND REPAIR PROCEDURES

Include instructions and a list of tools required to repair or restore the product or equipment to proper condition or operating standards.

1.2.3.4 REMOVAL AND REPLACEMENT INSTRUCTIONS

Include step-by-step procedures and a list required tools and supplies for removal, replacement, disassembly, and assembly of components, assemblies, subassemblies, accessories, and attachments. Provide tolerances, dimensions, settings and adjustments required. Instructions shall include a combination of text and illustrations.

1.2.3.5 SPARE PARTS AND SUPPLY LISTS

Include lists of spare parts and supplies required for maintenance and repair to ensure continued service or operation without unreasonable delays. Special consideration is required for facilities at remote locations. List spare parts and supplies that have a long lead-time to obtain.

1.2.4 CORRECTIVE MAINTENANCE WORK-HOURS

Include manufacturer's projection of corrective maintenance work-hours including requirements by type of craft. Corrective maintenance that requires completion or participation of the equipment manufacturer shall be identified and tabulated separately.

1.2.5 APPENDICES

Provide information required below and information not specified in the preceding paragraphs but pertinent to the maintenance or operation of the product or equipment. Include the following:

1.2.6 PARTS IDENTIFICATION

Provide identification and coverage for all parts of each component, assembly, subassembly, and accessory of the end items subject to replacement. Include special hardware requirements, such as requirement to use high-strength bolts and nuts. Identify parts by make, model, serial number, and source of supply to allow reordering without further identification. Provide clear and legible illustrations, drawings, and exploded views to enable easy identification of the items. When illustrations omit the part numbers and description, both the illustrations and separate listing shall show the index, reference, or key number that will cross-reference the illustrated part to the listed part. Parts shown in the listings shall be grouped by components, assemblies, and subassemblies in accordance with the manufacturer's standard practice. Parts data may cover more than one model or series of equipment, components, assemblies, subassemblies, attachments, or accessories, such as typically shown in a master parts catalog.

1.2.6.1 WARRANTY INFORMATION

List and explain the various warranties and include the servicing and technical precautions prescribed by the manufacturers or contract documents in order to keep warranties in force. Include warranty information for primary components such as the compressor of air conditioning system.

1.2.6.2 PERSONNEL TRAINING REQUIREMENTS

Provide information available from the manufacturers that is needed for use in training designated personnel to properly operate and maintain the equipment and systems.

1.2.6.3 TESTING EQUIPMENT AND SPECIAL TOOL INFORMATION

Include information on test equipment required to perform specified tests and on special tools needed for the operation, maintenance, and repair of components.

1.2.6.4 CONTRACTOR INFORMATION

Provide a list that includes the name, address, email, and cell phone telephone number of the General Contractor and each Subcontractor who installed the product or equipment, or system. For each item, also provide the name address email, and cell phone telephone number of the manufacturer's representative and service organization most convenient to the project site. Provide the name, address, address email, and cell phone number of the product, equipment, and system manufacturers.

2. EXECUTION

2.1 TRAINING

Unless provided for elsewhere, the Contractor shall provide operational and maintenance training for all systems furnished under this contract in accordance with this section. The training shall not take place until the operation and maintenance manuals are submitted and approved.

Training will be given to personnel responsible for the operation and maintenance of the system at the installation. Orient training to the specific system being installed under this contract. Use operation and maintenance manual as the primary instructional aid in contractor provided activity personnel training. Manuals shall be delivered for each trainee with two additional sets delivered for archiving at the project site. Submit a training course schedule, syllabus, and training materials 14 days prior to the start of training. Obtain approval of the training course before beginning that phase of training. Furnish a qualified instructor approved by the system manufacturer to conduct training for the specific system. Manuals need to be translated and provided in Pashtu and Dari to the attendees.

Training manuals shall include an agenda, defined objectives and a detailed description of the subject matter for each lesson. Furnish audio-visual equipment and all other training materials and supplies. A training day is defined as 8 hours of classroom or lab instruction, including two 15 minute breaks and excluding lunch time, Monday through Friday, during the daytime shift in effect at the training facility. For guidance, the Contractor should assume the attendees will have a high school education.

The Contractor shall video record the training session on CD/DVD and provide the recordings to the Government.

-- END OF SECTION --