

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE	PAGE OF PAGES 1 7
2. AMENDMENT/MODIFICATION NO. 0001	3. EFFECTIVE DATE 25-Aug-2011	4. REQUISITION/PURCHASE REQ. NO.		5. PROJECT NO.(If applicable) O&M 10-0097A
6. ISSUED BY AFGHANISTAN DISTRICT SOUTH (AES) US ARMY CORPS OF ENGINEERS APO AE 09355	CODE W5J9LE	7. ADMINISTERED BY (If other than item 6) See Item 6		
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)		X	9A. AMENDMENT OF SOLICITATION NO. W5J9LE-11-R-0069	
		X	9B. DATED (SEE ITEM 11) 12-Aug-2011	
			10A. MOD. OF CONTRACT/ORDER NO.	
			10B. DATED (SEE ITEM 13)	
CODE	FACILITY CODE			
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS				
<input checked="" type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer <input checked="" type="checkbox"/> is extended, <input type="checkbox"/> is not extended. Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing Items 8 and 15, and returning <u>1</u> copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.				
12. ACCOUNTING AND APPROPRIATION DATA (If required)				
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.				
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.				
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).				
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:				
D. OTHER (Specify type of modification and authority)				
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input type="checkbox"/> is required to sign this document and return _____ copies to the issuing office.				
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) 1. Project: Adraskan Electrical Upgrades. 2. Purpose of this amendment is to extend the proposal due date to 1 September 2011, 4:30pm (local time). Answers to Bidder inquiry questions are also provided. A new Section 01010 is provided since paragraph 4.6.1(POWER SYSTEM) has been revised. 3. Point of contact is Mark Jones at mark.t.jones@usace.army.mil.				
Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.				
15A. NAME AND TITLE OF SIGNER (Type or print)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)		
		TEL:	EMAIL:	
15B. CONTRACTOR/OFFEROR _____ (Signature of person authorized to sign)	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY _____ (Signature of Contracting Officer)		16C. DATE SIGNED 25-Aug-2011

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

SECTION 00010 - SOLICITATION CONTRACT FORM

The required response date/time has changed from 27-Aug-2011 02:00 PM to 01-Sep-2011 04:30 PM.

The required performance has changed from O&M 10-0097A Andraskan Electrical UpgradesThe Government intends to award one Firm Fixed Price contract for the design and installation of an electrical system for the Afghanistan National Training Center in Herat Province, Adraskan, Afghanistan.This award will be made on the basis of lowest price technically acceptable to the responsible prospective contractor whose proposal is responsive to the solicitation requirements.The magnitude of this construction project is estimated between \$500,000.00 and \$1,000,000.00See instructions to offerors in Section 00100 for details.The point of contact for this solicitation is Mark Jones. For any questions, email mark.t.jones@usace.army.mil to O&M 10-0097A Andraskan Electrical UpgradesThe Government intends to award one Firm Fixed Price contract for the design and installation of an electrical system for the Afghanistan National Training Center in Herat Province, Adraskan, Afghanistan.This award will be made on the basis of lowest price technically acceptable to the responsible prospective contractor whose proposal is responsive to the solicitation requirements.The magnitude of this construction project is estimated between \$1,000,000.00 and \$5,000,000.00See instructions to offerors in Section 00100 for details.The point of contact for this solicitation is Mark Jones. For any questions, email mark.t.jones@usace.army.mil.

SECTION 00800 - SPECIAL CONTRACT REQUIREMENTS

The following have been added by full text:

Q&A AMENDMENT 0001

BIDDER INQUIRY QUESTIONS FOR W5J9LE-11-R-0069 ADRASKIN ELECTRICAL UPGRADES

1. What is the camp size length * Width for the voltage drop calculation.

Answer: The approximate camp size for building location and spacing is 200M x 750M. All available information is furnished on Appendix A, B, C & D contractor is responsible for all the elements of electrical design.

2. Location of south powerplant – Bldg 300?

Answer: Yes, see Appendix “A” Legend No. 300.

3. Is any power in 300 series bldgs?

Answer: Yes power is to be furnished to all buildings Scope of Work 01010, para 4.6.1

4. Is there any power going to 118-122?

Answer: Yes power will be furnished to all buildings see Scope of Work para 4.6.1

5. What is the square footage of barracks 205-220?

Answer: All available information is furnished on Appendix A, B, C & D contractor is responsible for all the elements of electrical design.

6. What is the square footage of classrooms?

Answer: All available information is furnished on Appendix A, B, C & D contractor is responsible for all the elements of electrical design.

7. What is the square footage of K spans?

Answer: 301 is approximately 33Mx 12M 300 approx 16Mx12M (see appendix A)

8. What is the square footage and layout of type a,b,c barracks?

Answer: All available information is furnished on Appendix A, B, C & D contractor is responsible for all the elements of electrical design.

9. What is the square footage of the admin building?

Answer: All available information is furnished on Appendix A, B, C & D contractor is responsible for all elements of the electrical design.

10. What is the amperage of the laundry facility?

Answer: All available information is furnished on Appendix A, B, C & D contractor is responsible for all the elements of electrical design.

11. In Scope of Work there is no mention of cables feeding Distribution Panels. In Appendix B and Appendix C, it is mentioned that size to be determined by load analysis. Are these cables existing to remain or existing to be replaced?

Answer: Replace all cables from the generators to building panels see Scope of Work para 4.6.1

12. Existing cables from generators to manual transfer switches to Main Switchboards, are these cables existing to remain or existing to be replaced?

Answer: Replace all cables from the generators to building panels see Scope of Work para 4.6.1

13. 2-600KVA generators are shown in Appendix C as standby rated, while in RFP section 01010 asks for Prime rated. Please clarify.

Answer: Prime rated per Scope of Work, para 4.6.1

14. Is there a survey for existing loads for all buildings? If not, I think 30 days for 100% design per Section 00150 is not enough, because the survey of existing building would take 2 weeks at least.

Answer: No survey contractor can use 60 days for 100% design per written request with justification to COR.

15. We assume that all Cables from distribution panels to existing buildings are to remain, unless they were found faulty or under sized. Please confirm.

Answer: Replace all cables from the generators to building panels see Scope of Work, para 4.6.1

16. In re-connecting old cables feeding different buildings to new distribution panels, cables may come short. Is it allowed to have straight splice just below the new distribution panel? Or shall we replace the cables completely?

Answer: No splicing will be permitted, replace all cables from the generators to building panels see Scope of Work, para 4.6.1

17. New fire alarm systems are required at DFAC buildings (4 buildings) please confirm

Answer: No fire alarm systems, only electrical distribution from generators to building panels

18. Do we have to remove/pull out un-used/abundant cables?

Answer: Remove all unused cables see Scope of Work para 4.6.1.

19. Do we replace the exterior conduit and cables of south part of site?

Answer: Yes, See Section 01010, para 4.6.1

20. Do we replace the exterior conduit and cables of north part of site?

Answer: Yes, See Section 01010, para 4.6.1

21. There is a number of buildings in (Final MACTEC Electrical Report) file and these buildings need interior upgrades (Architecture, Lighting, electrical outlets and communication outlets) do we upgrade the above parts under this contract.

Answer: No, interior work except building panel boxes and wire to panel box, this project is power distribution from the generators to the buildings, distribution panels and building panels

22. Do we replace cable and conduits for building 300, 301, 302, 303, 304, 305, 306, 307, 308, 309 Guard towers (505, 506, 507, 508, 509, 510, 511)

Answer: Replace all cables and conduits from generators to all buildings to panel boxes no interior work past building panel boxes.

23. Do we demolish the existing exterior conduit and cables?

Answer: Yes remove all unused cables and conduits.

24. Please provide complete Electrical drawings including actual loads for each building included in this project.

Answer: All available information is furnished on Appendix A, B, C & D contractor is responsible for all elements of electrical design.

25. Please confirm this project does not include Refurbishing/Rehabilitation of Interior Electrical Installations for buildings, only LV Panels and Main Feeders.

Answer: No interior building work this contract except main building Panels, breakers and conduit to panels.

26. Appendix "C" (North ANTC new SLD) is not mentioned in the SOW, please confirm it is included.

Answer: North ANTC and South ANTC are included in this contract

27. Some buildings are not included in provided SLDs (114, 115, 116, 117, 122, 212, 213, 214, 503, 504, 5050, 507, 510, and 513), please confirm they should be.

Answer: All existing buildings are included in this contract see Scope of Work para 4.6.1

28. Please provide updated drawings of existing Power Plants and Main Feeders for buildings.

Answer: All available information is furnished on Appendix A, B, C & D contractor is responsible for all elements of electrical design.

29. In the Scope of work defined the replacing of existing electrical distribution panel boards with approved electrical panel boards including main distribution panels; plus 20% spare for future loads. Also, for the south side, include conduit, branch circuit panel boards. Include all other items required for the installation of the system as shown on appendix B attached. In the Appendix B and Appendix C.

There is no panel schedule and specified ratings available in the bidding documents.

Answer All available information is furnished on Appendix A, B, C & D contractor is responsible for all elements of electrical design. All electrical design and installation shall meet British Standard BS 7671, 17th Edition requirements.

30. In the Scope of work defined the Contractor is responsible for supplying temporary power to the clinic, TOC, Security & Communication and DFAC buildings while replacing the panel boards for these buildings. There is no panel schedule and specified ratings available in the bidding documents.

Please provide panel schedule for these buildings.

Answer: All available information is furnished on Appendix A, B, C & D contractor is responsible for all elements of electrical design see General Section Scope of Work for Temporary Electrical requirements.

31. In the RFP package attached is Final MECTEC Electrical Report. Most issues according to this report doesn't exist in the Scope of work. Please verify if this report is for information only or a part of RFP?

Answer: The MECTEC Electrical Report is for information only not part of the contract.

The Scope of Work Section 01010 para 1 and 4.6.1 is primary description of work.

All primary, secondary wire is to be replaced on north and south sites and the distribution panel boards, main panels and complete design of the electrical system is to be replaced.

32. Do we need to construct new hand holes and manholes?

Answer: Yes your design must meet. All electrical design and installation shall meet British Standard BS 7671, 17th Edition requirements.

33. Are the outside feeder cables direct burial or conduit enclosed?

Answer: All exposed wiring shall be run and pulled through new conduits. Conductors and circuits shall be sized for the specific loads see scope of work para 4.6.1.

34. Do we need to design and install lightning protection system for all the buildings?

Answer: No lightning protection this contract.

35. Do we need fire alarm system?

Answer: No fire alarms this contract.

36. Can you send us a plan diagram for all buildings in this compound?

Answer: All available information is furnished on Appendix A, B, C & D contractor is responsible for all elements of electrical design.

37. Is there any conceptual drawing for electrical? If yes, kindly send it, please!

Answer: All available information is furnished on Appendix A, B, C & D contractor is responsible for all elements of electrical design.

38. Where is the exact location for north and south Power Plant in conceptual Master Plan ?

Answer: North power plant is on Appendix "A" legend No. 114 and South Plant is Legend No. 300.

39. The MECTEC report clearly mentions about upgrading interior electrical system but it is neither seen in the SOW nor in the bid schedule. The Sub-CLIN (0001AJ & 0001AK) do not suffice the requirement for upgrading interior system as no fixtures and other necessary items are included in.

If this is necessary, could you please clarify which CLIN the interior upgrading system be placed with, and kindly provide us with the drawings, number of stories and size of buildings.

Answer: There is no interior building work. All available information is furnished on Appendix A, B, C & D contractor is responsible for all elements of electrical design.

40. The SOW mentions about construction of 1 trash point, could you please identify the location?

Answer: The trash point will be designated by the COR upon request and shown on contractor's site plan.

41. Will the due date still remain on 27 Aug 2011 with consideration and clarification of all inquiries?

Answer: the due date is changed to 1 September 2011.

42. Where is the exact location for north and south Power Plant in conceptual Master Plan?

Answer: North power plant is on Appendix "A" legend No. 114 and South Plant is Legend No. 300.

43. Who will provide and install the new generators government or contractor?

Answer: The contractor shall provide and install the new generators, to include furnishing the cables, all panels.

44. What is the magnitude of construction for this project?

Answer: The magnitude of construction is **\$1,000,000 to \$5,000,000.**

(End of Summary of Changes)

SECTION 01010

SCOPE OF WORK

1. GENERAL

The project consists of the design and installation of an electrical system for the Afghanistan National Training Center in Adraskan, Afghanistan. The project is defined as the replacing of existing electrical distribution panelboards with approved electrical panelboards including main distribution panels; plus 20% spare for future loads. Also, for the South side, include conduit, branch circuit panel boards. Include all other items required for the installation of the system as shown on appendix B attached.

Replacement of two 600 kVA existing generators at the North power plant and two 545 kVA existing generators at the South power plant for a total of four (4) existing generators.

Contractor is responsible for supplying temporary power to the clinic, TOC, Security & Communication and DFAC buildings while replacing the panelboards for these buildings. A site map of the facility is illustrated in Appendix A. A single line diagram showing all panel boards associated with the required replacement (South Power Plant) and their location is located in Appendix B. The work within this contract shall meet and be constructed in accordance with current U.S. design and International Building Codes (IBC), Life Safety Codes (NFPA-101), Force Protection and security standards. A partial listing of references is included herein:

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

1.1 ENGLISH LANGUAGE REQUIREMENT

All information shall be presented in English. The Contractor shall have a minimum of one English-speaking representative to communicate with the COR at all times when work is in progress.

1.2 SUBMITTALS

Submittals and a Submittal Register are required as specified in Section 01335 SUBMITTAL PROCEDURES of the Basic Contract.

1.3 SECURITY

Security is critical to construction in Afghanistan, especially on roads and remote areas away from Coalition Force bases. The risk/threat level for the area surrounding this project site is **Moderate** relative to the chance of attack, improvised explosive devices (IEDs), kidnapping, theft, and vandalism. The Contractor must have an appropriate amount of security/protection to match the threat in the project area and along the supply routes. A detailed security plan in accordance with Section 01040 SECURITY shall be approved by the Government before construction notice to proceed.

1.4 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 USACE Guide Specification 01451 (or 01 45 04.00 10), 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.

1.5 ELECTRICAL WORKERS QUALIFICATIONS

Electrical work shall be performed by Qualified Personnel with verifiable credentials that are thoroughly knowledgeable with applicable code requirements. Verifiable credentials consist of a certificate of graduation 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.

1.5.1 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 Afghanistan Engineer District, US of the Army Corps of Engineers.

1.5.2 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.

1.6 AED DESIGN REQUIREMENTS DOCUMENTS

AED Design Requirements documents shall be adhered to in this contract. These documents are listed below (References) and 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) discussed below. 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. Data and requirements in the AED Design Requirements documents shall supersede UFGS language where there are conflicts.

1.7 CONSTRUCTION PROJECT SIGN

The contractor shall fabricate and display at least one sign to identify the project site as an Islamic Republic of Afghanistan sponsored project. The sign shall meet or exceed the requirements provided in Section 01060 SPECIAL CLAUSES. Exact placement of the sign at the project site shall be coordinated with the COR.

2. LOCATION

The site is located in Adraskan, Herat, at the following grid coordinates.

Corner 1	41S MT 30831 21132
Corner 2	41S MT 30681 20732
Corner 3	41S MT 30897 20642
Corner 4	41S MT 31056 21044

3. UNEXPLODED ORDNANCE (UXO)

3.1 UXO REMOVAL AND CLEARANCE

The contractor is not responsible for the clearance or removal of mines and unexploded ordnance (UXO) from the site prior to the commencement of construction. The site has been cleared to a minimum depth of 1 meter and the certificate of clearance is available for review. No construction activities are to be conducted without review of the written clearance certification for the site. If sub-surface construction activities will be performed on this site the clearance certification must state that the clearance depth was conducted to a minimum 1 meter in depth. ***If the contract parameters for sub-surface construction exceed the minimum 1 meter clearance depth the contractor WILL be responsible for clearance to these depths.*** The contractor may only provide clearance/removal services via UN Mine Action Center for Afghanistan (UNMACA) accredited entities and 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.

The Contractor shall obtain their initial mine clearance certificates during the initial dig permit request from the Base Engineer (NATO J-4 Offices). A secondary copy is presented to the contractor at the Pre-Construction Conference. The phone number for reporting a UXO on KAF is DSN 312-841-2004.

NOTE 1: For previous UXO/mine information, and a copy of the clearance certification the following points of contact from the UN Mine Action Center of Afghanistan are provided:

Mohammad Sediq, Chief of Operations,
Email: sediq@unmaca.org
Cell: +93 070 295207

Hansie Heymans, Chief Information Officer,
Email: hansie@unmaca.org
Cell: +93 070 294286

UXO Safety/ Demining COR, USACE
tan.uxo.demining.safety@usace.army.mil, Roshan:079-948-7559 Comm:540-722-5305

NOTE 2: ***For construction in excess of 1 meter in depth on areas previously cleared.*** 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 3: The contractor should be aware that many areas demined by NGOs and other groups may have only been cleared to a depth of 13 cm for humanitarian purposes. If construction will take place, a minimum of 1 meter in depth is mandatory.

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 from the MAC.

If a UXO/mine is encountered during project construction, the Contractor shall immediately stop work in the affected area, mark the area of the UXO/Mine and immediately notify the Contracting Officer, COR or the Government Construction Representative. UXO/Mine disposal will not be the responsibility of the Contractor unless the area exceeds the 1 meter clearance depth of the original clearance certificate.

4. SUMMARY OF WORK

4.1 BASE BID

- Mobilization
- Demobilization
- Temporary Power
- Replacement of 4 existing Generators
- Main Distribution Panels, metering
- Sub Distribution Panels
- PVC conduit
- Branch panels
- Branch circuits, metallic conduit
- Grounding equipment
- Testing and Commissioning
- As-Built Drawings

4.2 MECHANICAL

The work covered by this section consists of design, supply, fabrication, and installation of electrical generators systems. It also includes the delivery to site, erection, setting to work, adjusting, testing, balancing and handing over in perfect operating and running condition all of the equipment including all necessary associated mechanical works.

4.2.1 SPECIALIST SUB-CONTRACTORS QUALIFICATIONS

The generator works shall be executed by a specialist sub-contractor experienced in the design and installation of generator equipment to include ductwork and knowledge in fabricating specialized equipment for indoor design conditions.

4.2.2 STANDARD PRODUCTS & SUBMITTALS

All generators, materials, and equipment shall be standard product of a manufacturer regularly engaged in the manufacture of the product. **For standardization and commonality of equipment, all major equipment items shall be the same model and manufacturer as the existing caterpillar generator.**

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.

4.2.3 CODES, STANDARDS, & REGULATIONS

The design and installation of equipment, materials, and work covered under the mechanical services shall conform to the standards, codes, and regulations provide in the paragraph below where applicable

except where otherwise indicated under particular clause(s).

4.2.4 DESIGN CONDITIONS

Outside Design Conditions (Contractor shall use the below weather data for equipment compatibility with the site conditions).

Herat Area:

Latitude – (approx.) 33.63 deg. North

Longitude – (approx.) 62.25 deg. East

Elevation – (approx.) 1,336 m (4,385 ft)

Summer – 38 C (100 F) Dry Bulb (DB) & 20 C (68 F) Wet Bulb (WB)

Winter – (-6 C/21 F)

Daily Range – 9 C (17 F)

4.2.5 DUCT SYSTEMS

Air shall be moved by the generator cooling fans to achieve proper airflow through the alternator and prime mover and shall be introduced from the exterior louvers and building openings for removal by means of a ducted radiator fan system terminating at a second exterior louver.

4.2.5.1 DUCTWORK

Ductwork shall be comprised of generator heat removing exhaust air ducting, fittings and louvers. Ductwork shall be constructed of galvanized steel and installed as per SMACNA "HVAC Duct Construction Standards (Metal and Flexible)." Flexible non-metallic duct may be used for vibration isolation only.

4.2.5.2 OUTSIDE AIR INTAKE AND EXHAUST LOUVERS

Existing outside air louvers shall be reused.

4.2.6 MECHANICAL REQUIREMENTS FOR GENERATORS

Generator models, quantities, and sizes shall be as stated in this document. The following shall be provided in the Mechanical design and installation for **Prime** stationary generator sets and related mechanical systems. This includes, but not limited to: Isolation mountings, exhaust systems, cooling systems, ventilation, and equipment configuration. See Electrical for power and electrical equipment requirements and Plumbing for fuel system requirements.

The generator set(s) shall be the manufacturer's design for indoor installation with skid-mounted high-ambient temperature radiator rated for 50 C (120 F).

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).

4.2.6.1 INTERIOR INSTALLED GENERATORS

All interior installed generator sets (i.e. In a 4-wall enclosure with roof) shall be provided with, as a minimum, a muffler system and vibration isolators to prevent damage to the building structure.

Interior installed generator sets, with skid-mounted radiators and installed in an enclosed building, shall have the ventilation air drawn directly from the outside and discharged directly to the outside. All enclosed building housing generator sets shall be provided with intake and exhaust louvers. All radiator exhaust air shall be ducted to the exhaust louver assembly.

4.2.7 OPERATIONS & MAINTENANCE (O&M) FOR MECHANICAL

The O&M manuals must be provided prior to any training activities. Manuals shall be “tri-lingual” in Dari, Pashto, and English.

All control panels shall have tri-lingual name plates in Dari, Pashto and English.

(Paragraph 4.6.8)

4.3 PLUMBING

The Contractor shall design and install fuel-oil distribution systems required in the facilities as described herein. The Contractor shall reuse the existing fuel storage tanks and be responsible for complete design and construction of all fuel distribution systems required for full and safe operation as 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.

4.3.1 SUB-CONTRACTORS QUALIFICATIONS

The plumbing systems shall be executed by a generator specialist subcontractor experienced in the design and construction of these types of systems.

4.3.2 STANDARD PRODUCTS & 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.

4.3.3 CODES, STANDARDS, AND REGULATIONS

The design and installation of equipment, materials, and work covered under the mechanical services shall conform to the standards, codes, and regulations provide in the paragraph below where applicable except where otherwise indicated under particular clause(s).

4.3.4 GENERATOR FUEL STORAGE & DISTRIBUTION

The work shall include the fabrication and installation of the entire fuel distribution system. Existing storage tanks shall be reused.

4.3.4.1 FUEL DISTRIBUTION SYSTEM

Fuel system shall be designed to supply clean fuel to the generator(s). Fuel shall be transferred from the existing bulk storage tank(s) by either the generator engine fuel pump(s), bulk tank submersible pump(s), or 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. Rubber hoses shall not be allowed. Under NO circumstances shall GALVANIZED piping, fittings, valves, or other equipment 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 true to

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).

Day tank(s) shall be provided only if so determined by the designer and/or manufacturer and **shall be provided one (1) for each generator set** and with secondary containment (i.e. Double-wall tank, containment dike, etc.). Complete fuel piping hydraulic calculations shall be clearly shown in the design analysis (DA) with the generator engine fuel pump manufacturers specifications (in the form of a catalog cut). and, if provided, the submersible or in-line fuel pump manufacturer's specifications.

4.3.4.2 PIPE TESTING AND TURNOVER

A tightness test shall be performed on each storage tank and associated piping. The tank tests shall be performed prior to making piping connections. Tests shall be capable of detecting a 0.1 ml/s (0.0126 cu.ft/h) leak rate from any portion of the tank while accounting for effects of thermal expansion or contraction.

4.4 TESTING AND COMMISSIONING

The Contractor shall test and commission all equipment and systems. Prior to testing the Contractor shall submit a detailed testing plan to the Contracting Officer for approval. The testing shall demonstrate that the power plant generation and all mechanical and plumbing systems operate as a complete integrated system in accordance with manufacturer specifications.

The north power plant is connected thru a manual transfer switch MTS, while the south side power plant generators are connected and synchronized together on one grid. Both the MTS and synchronizing equipment will remain and tested as part of the system by Contractor.

4.5 DEMOLITION AND GRADING

Minor site demolition is required prior to construction of new work. If grading at the site is required, the contractor shall conform to requirements within references herein.

If existing ground is disturbed, native crushed stone 100 mm thick shall be placed around all buildings, from the building wall or building landscaping out 2m and all areas of anticipated foot or vehicle traffic to reduce erosion and to provide dust control. **SITE ELECTRICAL DISTRIBUTION SYSTEM**

4.6 ELECTRICAL DISTRIBUTION SYSTEM

4.6.1 POWER SYSTEM: The contractor shall design and construct a three phase 380/220 VAC power system for distribution to all existing buildings beginning at the existing power plants north and south electrical generator facilities and extending to all facilities requiring power. The project is defined as replacing existing electrical distribution panelboards with approved electrical panelboards including main distribution panels up to and including all building panels. There is no interior building work past the electric panel box for the building. All electrical design and installation shall meet British Standard BS 7671, 17th Edition requirements. All new wiring shall be run and pulled through new conduits and existing wires shall be removed from the project. Conductors and circuits shall be sized for the specific loads required. Voltage shall be 220/380 V, 50 hertz. MDP is 1000A. All panelboards must be listed as indicated in section 4.6.4.

EXISTING GENERATORS: The four (4) existing generators size are prime rated at 545kVA on the south end and 600kVA on the North side of camp. **The contractor shall be specifically responsible to remove and replace all four (4) existing generators with same size and specifications providing they meet the new design loads. The existing generators removed will be turned over to base according to COR instructions. The contractor shall ensure the power ratings for each new generator are a minimum of 545 kVA for the south plant and 600 KVA for the north plant. The**

contractor shall be specifically responsible to remove/replace all existing panel boards, and not re-use any existing electrical distribution equipment.

Generators shall be de-rated as necessary for the ambient temperature and altitude of the site.

Whenever a generator starts, it shall go through a cool down cycle prior to shutdown. All relaying shall be automatically reset for automatic restart and stopping of generators as the load increases or decreases.

Contractor is responsible for supplying temporary power while replacing existing panel-boards at the dining facility buildings 109, 204, 210, 214 and to the clinic building 203.

4.6.2 CONDUCTORS

All cable and wire conductors shall be copper. Conductor jacket or insulation shall be color coded to satisfy BS 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.

4.6.3 GROUNDING AND BONDING

Grounding and bonding shall comply with the requirements of NFPA 70. 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.

4.6.4 ENCLOSURES

Enclosures for exterior and interior applications shall be NEMA Type 3S (IEC Classification IP54) and NEMA Type 1 (IEC Classification IP10) respectively.

4.6.5 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.

4.6.6 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. PVC conduit, junction and pull boxes are allowed for raceways located in masonry walls. Smallest conduit size shall be no less than 20mm (0.75 inch) 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 NFPA 70 requirements. Exterior conductors below grade shall be installed in concrete encased PVC conduit at a depth of 1220 millimeters.

4.6.7 CABLE TRAY RACEWAY SYSTEM

Cable trays shall be ladder 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 (12 inch) and rung spaced at 150mm (6 inch). Nominal depth shall be 100mm (4 inch). System design and installation shall be per NFPA 70 requirements.

4.6.8 IDENTIFICATION NAMEPLATES

Major electrical equipment, such as transformers, panel-boards, and load centers, etc. shall be provided with permanently installed engraved identification nameplates.

4.6.9 SCHEDULES

All panel boards and load centers shall be provided with a directory. Directory shall be typed written in English, Dari and Pashto

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.

4.7 FACILITIES

This project shall consist of the facilities as defined on the single line diagram attached in Appendix B.

4.7.1 TRASH POINT

The Contractor shall design, in a location convenient for easy removal, a trash collection point. It shall be located inside the compound walls. The trash point shall be a 1.8 m X 1.8 m concrete pad with a 1.8 meter tall chain link fence around the perimeter. One side shall have a 1.2 m wide gate entrance. Trash Point shall have a metal roof covering.

5. COMPLETION OF WORK

All work required under this contract shall be completed within 180 calendar days from issuance of Notice to Proceed. The 180 calendar days includes government review time from Notice to Proceed for site work.

6. SPARE PARTS

Refer to other sections herein for requirements.

7. REFERENCES

7.1 CODES AND TECHNICAL CRITERIA

The work within this contract shall be designed and constructed in accordance with the most current below criteria:

1. International Code Commission (ICC) - International Building Codes (IBC).
2. Unified Facilities Criteria (UFC) - (Note: Unified Facility Criteria (UFC) is available online at: <http://www.wbdg.org/>)
3. U.S. Army Corps of Engineers (USACE) - Safety: Safety And Health Requirements (EM 385-1-1).

Additional guidance criteria:

1. International Electro-technical Commission (IEC) - Standards for Safety.

2. Electrical Power Distribution (UFC 3-550-01), Minimum DoD Antiterrorism Standards for Buildings (UFC 4-010-01), DoD Minimum Antiterrorism Standoff Distances for Buildings (UFC 4-010-02), Security Engineering: Fences, Gates, and Guard Facilities (UFC 4-020-03), Security Engineering: Entry Control Facilities/Access Control Points (UFC 4-022-01), **etc.** (Note: Unified Facility Criteria (UFC) is available online at: <http://www.wbdg.org/>)

- END OF SECTION -