

<b>SOLICITATION, OFFER, AND AWARD</b> <i>(Construction, Alteration, or Repair)</i>	1. SOLICITATION NO. W917PM-07-R-005736	2. TYPE OF SOLICITATION <input type="checkbox"/> SEALED BID (IFB) <input checked="" type="checkbox"/> NEGOTIATED (RFP)	3. DATE ISSUED 12-Mar-2007	PAGE OF PAGES 1 OF 372
	<b>IMPORTANT - The "offer" section on the reverse must be fully completed by offeror.</b>			

4. CONTRACT NO.	5. REQUISITION/PURCHASE REQUEST NO.	6. PROJECT NO.
-----------------	-------------------------------------	----------------

7. ISSUED BY AFGHANISTAN ENGINEER DISTRICT US ARMY CORPS OF ENGINEERS KABUL APO AE 09356	CODE W917PM	8. ADDRESS OFFER TO <i>(If Other Than Item 7)</i> CODE <b>See Item 7</b>
TEL:	FAX:	TEL: FAX:

9. FOR INFORMATION CALL:	A. NAME GEORGE W LOCKE	B. TELEPHONE NO. <i>(Include area code) (NO COLLECT CALLS)</i>
--------------------------	---------------------------	----------------------------------------------------------------

**SOLICITATION**

**NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".**

10. THE GOVERNMENT REQUIRES PERFORMANCE OF THE WORK DESCRIBED IN THESE DOCUMENTS *(Title, identifying no., date):*

Uthal and along the Makran Coast

Design and construction of a new Cargo & Vehicle Inspection Compound for the Pakistan Coast Guard Battalion # 1 in Uthal, Pakistan and ten (10) Coast Guard Outposts along Makran Coast, Pakistan (for operations and billeting use).

Estimated cost range of this project is between \$1,000,000.00 and \$5,000,000.00

If proposal is hand carried, deliver to: US Army Corps of Engineers, House 1 Street 1, West Wazir Akbar Khan (behind Aman High School), Kabul, Afghanistan, prior to the time and date specified for receipt of proposals.

Pre-proposal Conference will be held on 19 March 2007 at 11:00 AM Kabul time.

11. The Contractor shall begin performance within 7 calendar days and complete it within 360 calendar days after receiving  award,  notice to proceed. This performance period is  mandatory,  negotiable. (See SECTION 00800 \_\_\_\_\_.)

12 A. THE CONTRACTOR MUST FURNISH ANY REQUIRED PERFORMANCE AND PAYMENT BONDS? <i>(If "YES," indicate within how many calendar days after award in Item 12B.)</i> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	12B. CALENDAR DAYS
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------

13. ADDITIONAL SOLICITATION REQUIREMENTS:

A. Sealed offers in original and 3 copies to perform the work required are due at the place specified in Item 8 by 05:00 PM (hour) local time 12 Apr 2007 (date). If this is a sealed bid solicitation, offers must be publicly opened at that time. Sealed envelopes containing offers shall be marked to show the offeror's name and address, the solicitation number, and the date and time offers are due.

B. An offer guarantee  is,  is not required.

C. All offers are subject to the (1) work requirements, and (2) other provisions and clauses incorporated in the solicitation in full text or by reference.

D. Offers providing less than 120 calendar days for Government acceptance after the date offers are due will not be considered and will be rejected.

**SOLICITATION, OFFER, AND AWARD (Continued)***(Construction, Alteration, or Repair)***OFFER (Must be fully completed by offeror)**14. NAME AND ADDRESS OF OFFEROR *(Include ZIP Code)*15. TELEPHONE NO. *(Include area code)*16. REMITTANCE ADDRESS *(Include only if different than Item 14)***See Item 14**

CODE

FACILITY CODE

17. The offeror agrees to perform the work required at the prices specified below in strict accordance with the terms of this solicitation, if this offer is accepted by the Government in writing within \_\_\_\_\_ calendar days after the date offers are due. *(Insert any number equal to or greater than the minimum requirements stated in Item 13D. Failure to insert any number means the offeror accepts the minimum in Item 13D.)*

AMOUNTS

SEE SCHEDULE OF PRICES

18. The offeror agrees to furnish any required performance and payment bonds.

**19. ACKNOWLEDGMENT OF AMENDMENTS***(The offeror acknowledges receipt of amendments to the solicitation -- give number and date of each)*

AMENDMENT NO.

DATE

20A. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER *(Type or print)*

20B. SIGNATURE

20C. OFFER DATE

**AWARD (To be completed by Government)**

21. ITEMS ACCEPTED:

22. AMOUNT

23. ACCOUNTING AND APPROPRIATION DATA

24. SUBMIT INVOICES TO ADDRESS SHOWN IN *(4 copies unless otherwise specified)***ITEM**

25. OTHER THAN FULL AND OPEN COMPETITION PURSUANT TO

 10 U.S.C. 2304(c) 41 U.S.C. 253(c)

26. ADMINISTERED BY

CODE

27. PAYMENT WILL BE MADE BY:

CODE

**CONTRACTING OFFICER WILL COMPLETE ITEM 28 OR 29 AS APPLICABLE**

28. NEGOTIATED AGREEMENT *(Contractor is required to sign this document and return \_\_\_\_\_ copies to issuing office.)* Contractor agrees to furnish and deliver all items or perform all work, requisitions identified on this form and any continuation sheets for the consideration stated in this contract. The rights and obligations of the parties to this contract shall be governed by (a) this contract award, (b) the solicitation, and (c) the clauses, representations, certifications, and specifications or incorporated by reference in or attached to this contract.

29. AWARD *(Contractor is not required to sign this document.)*

Your offer on this solicitation, is hereby accepted as to the items listed. This award commutes the contract, which consists of (a) the Government solicitation and your offer, and (b) this contract award. No further contractual document is necessary.

30A. NAME AND TITLE OF CONTRACTOR OR PERSON AUTHORIZED TO SIGN *(Type or print)*31A. NAME OF CONTRACTING OFFICER *(Type or print)*

30B. SIGNATURE

30C. DATE

TEL:

EMAIL:

31B. UNITED STATES OF AMERICA BY

31C. AWARD DATE

## Section 00010 - Solicitation Contract Form

## TABLE OF CONTENTS

DESIGN AND BUILD PROPOSAL  
FOR  
COAST GUARD OUTPOSTS REFURBISHMENT  
AT  
Makran Coast, Pakistan

<u>Section</u>	<u>Title</u>
00010	Proposal Form
00110	Proposal Preparation
00120	Proposal Evaluation and Contract Award
00150	The Design-Build Process
00555	Design Concept Documents
01010	Scope of Work
01015	Technical Requirements
01060	Special Clauses
01312	Quality Control System (QCS)
01321	Project Schedule
01335	Submittal Procedures for Design/Build Projects
01415	Metric Measurements
01451	Contractor Quality Control
01780	Closeout Submittals
Appendix I	General Site Plan
Appendix II	Coastguard Sites 1 to 10 photos
Appendix III	Utahal Site General Floor Plan
Appendix IV	Eagle Gantry Info Utahal Site
Appendix V	Coastguard Site Gen Floor Plan

INFORMATION FOR CONTRACTORS

## SECTION 00010

## INFORMATION FOR CONTRACTORS

## INTERNATIONAL DUNS REQUEST INFORMATION:

Please follow the website below and fill in the International DUNS Request form.

<http://www.dnb.com/upik/uk/intldunsform.asp?link=request>

If you have problems with the form or require a DUNS number immediately, please contact your local D&B Office which can be found at the website below.

[http://www.dnb.com/US/customer\\_service/global\\_listing.asp](http://www.dnb.com/US/customer_service/global_listing.asp)

## Insurance

Do not add a separate line item for DBA Supplemental Insurance. DBA Supplemental Insurance must be allocated based on the labor cost for each line item. Your proposal will be considered non-responsive if you fail to comply with the directions above.

## Vice-a-Versa

All requirements set forth in the Scope of Work, but not included in the Technical Requirements, shall be considered as set forth in both, and vice versa.

## PROPOSAL SCHEDULE NOTES

1. Offeror shall submit prices on all items.
2. Only one contract for the entire schedule will be awarded under this solicitation. This project will be awarded as a lump sum contract. This Proposal Schedule is an accounting tool for allocating funds to applicable budget.
3. Costs associated with this project shall include design and construction costs for site, facilities and utilities preparation, but no less than all items as shown in proposal schedule.
4. **DESIGN COSTS DEFINITION:** Design costs shall consist of preparation of master planning and site **adapt** designs, plans, drawings, and specifications.
5. **NON-DESIGN COSTS DEFINITION:** Non-design costs shall include the following: initial site visits; field, topographic, property, boundary, utility, and right-of-way surveys; subsurface explorations and borings; feasibility, functional, and economic studies and other investigations; flow gauging and model testing; preparation or verification of as-built drawings; preparation of general and development criteria; preparation of general and feature design memoranda; services of consultants where not specifically applied to the preparation of working drawings or specifications; construction phase services; models, renderings, or photographs of completed designs;

reproduction of designs for review purposes; and travel and per diem allowances in connection with the above excludable services.

6. SEPARATION OF WORK: All work for Design and Construction shall be included in all Proposal Items.

7. EXERCISE OF OPTIONAL BID ITEMS: Optional bid items (if any) may, at the option of the Government, be added to the contract at any time within (120) calendar days after award of Base Proposal.

END OF SECTION

Caveats – Clauses Applicability

Section 100 – 52.222-23

Section 600 – 52.222-22

Section 700 – 52.222-21, 26, 27, 29, 35, 36, 37

- Only applicable if contractor recruits personnel within the US.

252.247-7024 - Only applicable if contractor gave a negative response to 252.247-7022.

52.204-3, 52.232-38, 52.204-6, 252.204-7001, 52.232-34

- Only applicable to contractors that are not to be registered in the CCR database.

252.229-7000, 252.229-7001

- Only applicable if contractor is a foreign concern.

-52.232-33, 252.204-7004

- Only applicable to contractors that are to be registered in the CCR Database.

END OF SECTION

PROPOSAL FORM

SECTION 00010  
PROPOSAL FORM

The Contractor shall provide a price for all items shown on this proposal schedule. The Government will evaluate the Contractor's entire proposal to determine price reasonableness of each CLIN.

No.	Description	Qty	Unit	Unit Price	Total Amount
-----	-------------	-----	------	------------	--------------

Cargo Inspection Compound, Uthal, Pakistan  
(Clins 0001 - 0017 )

0001 Design:

## Coast Guard Outposts Refurbishment

Makran Coast, Pakistan

0001AA Design Cost	1	LS	XXX	\$ _____
Total Design only				\$ _____
0002 Mobilization	1	LS	XXX	\$ _____
0003 Demobilization	1	LS	XXX	\$ _____
0004 As-Built Drawings	1	LS	XXX	\$ _____
<u>0005 Site Development (Construction)</u>				
0005AA Grading	1	LS	XXX	\$ _____
0005AB Roads with Security Measures	1	LS	XXX	\$ _____
0005AC Perimeter Walls & Guard Towers	1	LS	XXX	\$ _____
0005AD Entry Control Points	1	LS	XXX	\$ _____
0005AE General Power Plant & Elec Syst	1	LS	XXX	\$ _____
0005AF Water System	1	LS	XXX	\$ _____
0005AG Sanitary Sewer System	1	LS	XXX	\$ _____
Sub-Total Site Development Only				\$ _____
<u>0006 Uthal Facilities Buildings (item 4.1.2 of Sec 01010)</u>				
0006AA Latrine Facility	1	LS	XXX	\$ _____
0006AB Initial Search Facility Building	1	LS	XXX	\$ _____
0006AC Gantry Scanning Facility Building	1	LS	XXX	\$ _____
0006AD Detail Search Office/waiting Facility	1	LS	XXX	\$ _____
0006AE Storage Connex Containers	1	LS	XXX	\$ _____
Sub-Total Uthal Facilities Buildings				\$ _____
<u>Optional Bid Item 1:</u>				
<u>0007 Uthal Facilities Buildings (item 4.1.3 of Sec 01010)</u>				
0007AA General Waiting & Vending Facility	1	LS	XXX	\$ _____
0007AB Barracks	1	LS	XXX	\$ _____
0007AC K-9 Facility	1	LS	XXX	\$ _____

Coast Guard Outposts Refurbishment

Makran Coast, Pakistan

0007AD	Dining Facility (DFAC)	1	LS	XXX	\$ _____
0007AE	Office for Rapiscan staff	1	LS	XXX	\$ _____
0007AF	warehouse for Confiscated Material	1	LS	XXX	\$ _____
Sub-Total Optional Item 1 only					\$ _____

Coast Guard Outposts, Makran Coast:Optional Bid Item 2, Kumb Defile:

0008AA	Design	1	LS	XXX	\$_____
0008AB	Mobilization	1	LS	XXX	\$_____
0008AC	As-Built Drawings	1	LS	XXX	\$_____
0008AD	Electrical Distribution system	1	LS	XXX	\$_____
0008AE	Water System	1	LS	XXX	\$_____
0008AF	Sanitary Sewer System	1	LS	XXX	\$_____
0008AG	Outpost Building	1	LS	XXX	\$_____
Sub-Total Optional Item 2 only					\$_____

Optional Bid Item 3, Kulky:

0009AA	Design	1	LS	XXX	\$_____
0009AB	Mobilization	1	LS	XXX	\$_____
0009AC	As-Built Drawings	1	LS	XXX	\$_____
0009AD	Electrical Distribution system	1	LS	XXX	\$_____
0009AE	Water System	1	LS	XXX	\$_____
0009AF	Sanitary Sewer System	1	LS	XXX	\$_____
0009AG	Outpost Building	1	LS	XXX	\$_____
Sub-Total Optional Item 3 only					\$_____

Optional Bid Item 4, Kantani:

00010AA	Design	1	LS	XXX	\$_____
00010AB	Mobilization	1	LS	XXX	\$_____
00010AC	As-Built Drawings	1	LS	XXX	\$_____
00010AD	Electrical Distribution system	1	LS	XXX	\$_____
00010AE	Water System	1	LS	XXX	\$_____
00010AF	Sanitary Sewer System	1	LS	XXX	\$_____

## Coast Guard Outposts Refurbishment

Makran Coast, Pakistan

00010AG	Outpost Building	1	LS	XXX	\$ _____
Sub-Total Optional Item 4 only					\$ _____

Optional Bid Item 5, Old Marine:

00011AA	Design	1	LS	XXX	\$ _____
00011AB	Mobilization	1	LS	XXX	\$ _____
00011AC	As-Built Drawings	1	LS	XXX	\$ _____
00011AD	Electrical Distribution system	1	LS	XXX	\$ _____
00011AE	Water System	1	LS	XXX	\$ _____
00011AF	Sanitary Sewer System	1	LS	XXX	\$ _____
00011AG	Outpost Building	1	LS	XXX	\$ _____
Sub-Total Optional Item 5 only					\$ _____

Optional Bid Item 6, Shahabi:

00012AA	Design	1	LS	XXX	\$ _____
00012AB	Mobilization	1	LS	XXX	\$ _____
00012AC	As-Built Drawings	1	LS	XXX	\$ _____
00012AD	Electrical Distribution system	1	LS	XXX	\$ _____
00012AE	Water System	1	LS	XXX	\$ _____
00012AF	Sanitary Sewer System	1	LS	XXX	\$ _____
00012AG	Outpost Building	1	LS	XXX	\$ _____
Sub-Total Optional Item 6 only					\$ _____

Optional Bid Item 7, Passu:

00013AA	Design	1	LS	XXX	\$ _____
00013AB	Mobilization	1	LS	XXX	\$ _____
00013AC	As-Built Drawings	1	LS	XXX	\$ _____
00013AD	Electrical Distribution system	1	LS	XXX	\$ _____

## Coast Guard Outposts Refurbishment

Makran Coast, Pakistan

00013AE	Water System	1	LS	XXX	\$ _____
00013AF	Sanitary Sewer System	1	LS	XXX	\$ _____
00013AG	Outpost Building	1	LS	XXX	\$ _____
Sub-Total Optional Item 7 only					\$ _____

Optional Bid Item 8, Jhanda:

00014AA	Design	1	LS	XXX	\$ _____
00014AB	Mobilization	1	LS	XXX	\$ _____
00014AC	As-Built Drawings	1	LS	XXX	\$ _____
00014AD	Electrical Distribution system	1	LS	XXX	\$ _____
00014AE	Water System	1	LS	XXX	\$ _____
00014AF	Sanitary Sewer System	1	LS	XXX	\$ _____
00014AG	Outpost Building	1	LS	XXX	\$ _____
Sub-Total Optional Item 8 only					\$ _____

Optional Bid Item 9, Hammer Head:

00015AA	Design	1	LS	XXX	\$ _____
00015AB	Mobilization	1	LS	XXX	\$ _____
00015AC	As-Built Drawings	1	LS	XXX	\$ _____
00015AD	Electrical Distribution system	1	LS	XXX	\$ _____
00015AE	Water System	1	LS	XXX	\$ _____
00015AF	Sanitary Sewer System	1	LS	XXX	\$ _____
00015AG	Outpost Building	1	LS	XXX	\$ _____
Sub-Total Optional Item 9 only					\$ _____

Optional Bid Item 10, Gatti Dore:

00016AA	Design	1	LS	XXX	\$ _____
00016AB	Mobilization	1	LS	XXX	\$ _____
00016AC	As-Built Drawings	1	LS	XXX	\$ _____

## Coast Guard Outposts Refurbishment

Makran Coast, Pakistan

00016AD	Electrical Distribution system	1	LS	XXX	\$ _____
00016AE	Water System	1	LS	XXX	\$ _____
00016AF	Sanitary Sewer System	1	LS	XXX	\$ _____
00016AG	Outpost Building	1	LS	XXX	\$ _____
Sub-Total Optional Item 10 only					\$ _____

Optional Bid Item 11, Sur Bandar:

00017AA	Design	1	LS	XXX	\$ _____
00017AB	Mobilization	1	LS	XXX	\$ _____
00017AC	As-Built Drawings	1	LS	XXX	\$ _____
00017AD	Electrical Distribution system	1	LS	XXX	\$ _____
00017AE	Water System	1	LS	XXX	\$ _____
00017AF	Sanitary Sewer System	1	LS	XXX	\$ _____
00017AG	Outpost Building	1	LS	XXX	\$ _____
Sub-Total Optional Item 11 only					\$ _____

TOTAL of Clins 0001 – 0017AG \$ \_\_\_\_\_

(total of all base item costs - includes design and construction)

---

## Section 00100 - Bidding Schedule/Instructions to Bidders

INSTRUCTIONS TO OFFERORSSECTION 00100  
Bidding Schedule/Instructions to OfferorsKhost, Paktia and Paktika Provinces

PREPROPOSAL CONFERENCE WILL BE HELD **19 March 2007, 11:00AM KABUL TIME**. Offerors, who plan to participate, please email me at [george.w.locke@tac01.usace.army.mil](mailto:george.w.locke@tac01.usace.army.mil), no later than 16 March 2007, 5:00PM KABUL TIME.

Estimated cost range of this project is between \$1,000,000.00 and \$5,000,000.00.

NOTICE: Return Section 00600, "Representations and Certifications" and requested information from Sections 00010 "Solicitation Contract Form" and 00100 "Bidding Schedule/Instructions to Bidders", with your proposal. All amendments, if any, must be acknowledged and returned with the proposals. If you do not return these sections you will be considered Non-Responsive.

Request for information must be directed to the person listed in Item 9 of the 1442. Inquiries and request that are directed to any other person may not be relayed to the proper person and therefore, may not be answered. Please email all questions to [George.W.locke@tac01.usace.army.mil](mailto:George.W.locke@tac01.usace.army.mil).

All proposals must be delivered to: U.S. Army Corps of Engineers, House #1 Street #1, West Wazir Akbar Khan (Behind Amani High School), Kabul, Afghanistan, Attn: George W. Locke, prior to 5:00PM, Kabul Time, 12 April 2007, for receipt of proposals. Due to heightened security conditions, access to the building is controlled by security. Your packages will be opened and checked at the gate by the security guards. Electronic proposals will not be accepted.

Contractor Status and Notifications

- 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.
- 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 in accordance with clause 52.249-10; see 52.249-10(b)(1)(i) and (2).
- 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. When appropriate, the Contracting Officer may provide the contractor with an equitable adjustment with respect to time in accordance with clause 52.249-10; see 52.249-10(b)(1) and (2).

- 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.

#### CLAUSES INCORPORATED BY REFERENCE

52.204-6	Data Universal Numbering System (DUNS) Number	OCT 2003
52.214-34	Submission Of Offers In The English Language	APR 1991
52.214-35	Submission Of Offers In U.S. Currency	APR 1991
52.215-1	Instructions to Offerors--Competitive Acquisition	JAN 2004
52.217-5	Evaluation Of Options	JUL 1990
52.236-28	Preparation of Proposals--Construction	OCT 1997
252.204-7001	Commercial And Government Entity (CAGE) Code Reporting	AUG 1999

#### CLAUSES INCORPORATED BY FULL TEXT

##### 52.214-5000 APPARENT CLERICAL MISTAKES (MAR 1995)--EFARS

(a) For the purpose of initial evaluations of bids, the following will be utilized in the resolving arithmetic discrepancies found on the face of bidding schedule as submitted by the bidder:

- (1) Obviously misplaced decimal points will be corrected;
- (2) Discrepancy between unit price and extended price, the unit price will govern;
- (3) Apparent errors in extension of unit prices will be corrected;
- (4) Apparent errors in addition of lump-sum and extended prices will be corrected.

(b) For the purpose of bid evaluation, the government will proceed on the assumption that the bidder intends his bid to be evaluated on basis of the unit prices, the totals arrived at by resolution of arithmetic discrepancies as provided above and the bid will be so reflected on the abstract of bids.

(c) These correction procedures shall not be used to resolve any ambiguity concerning which bid is low.

(End of statement)

01415 – Page 13

## CLAUSES INCORPORATED BY FULL TEXT

## 52.215-20 REQUIREMENTS FOR COST OR PRICING DATA OR INFORMATION OTHER THAN COST OR PRICING DATA (OCT 1997)

(a) Exceptions from cost or pricing data. (1) In lieu of submitting cost or pricing data, offerors may submit a written request for exception by submitting the information described in the following subparagraphs. The Contracting Officer may require additional supporting information, but only to the extent necessary to determine whether an exception should be granted, and whether the price is fair and reasonable.

(i) Identification of the law or regulation establishing the price offered. If the price is controlled under law by periodic rulings, reviews, or similar actions of a governmental body, attach a copy of the controlling document, unless it was previously submitted to the contracting office.

(ii) Commercial item exception. For a commercial item exception, the offeror shall submit, at a minimum, information on prices at which the same item or similar items have previously been sold in the commercial market that is adequate for evaluating the reasonableness of the price for this acquisition. Such information may include--

(A) For catalog items, a copy of or identification of the catalog and its date, or the appropriate pages for the offered items, or a statement that the catalog is on file in the buying office to which the proposal is being submitted. Provide a copy or describe current discount policies and price lists (published or unpublished), e.g., wholesale, original equipment manufacturer, or reseller. Also explain the basis of each offered price and its relationship to the established catalog price, including how the proposed price relates to the price of recent sales in quantities similar to the proposed quantities;

(B) For market-priced items, the source and date or period of the market quotation or other basis for market price, the base amount, and applicable discounts. In addition, describe the nature of the market;

(C) For items included on an active Federal Supply Service Multiple Award Schedule contract, proof that an exception has been granted for the schedule item.

(2) The offeror grants the Contracting Officer or an authorized representative the right to examine, at any time before award, books, records, documents, or other directly pertinent records to verify any request for an exception under this provision, and the reasonableness of price. For items priced using catalog or market prices, or law or regulation, access does not extend to cost or profit information or other data relevant solely to the offeror's determination of the prices to be offered in the catalog or marketplace.

(b) Requirements for cost or pricing data. If the offeror is not granted an exception from the requirement to submit cost or pricing data, the following applies:

(1) The offeror shall prepare and submit cost or pricing data and supporting attachments in accordance with Table 15-2 of FAR 15.408.

As soon as practicable after agreement on price, but before contract award (except for unpriced actions such as letter contracts), the offeror shall submit a Certificate of Current Cost or Pricing Data, as prescribed by FAR 15.406-2.

(End of provision)

## CLAUSES INCORPORATED BY FULL TEXT

## 52.216-1 TYPE OF CONTRACT (APR 1984)

The Government contemplates award of a Firm Fixed Price contract resulting from this solicitation.

(End of clause)

## CLAUSES INCORPORATED BY FULL TEXT

## 52.222-23 NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY FOR CONSTRUCTION (FEB 1999)

(a) The offeror's attention is called to the Equal Opportunity clause and the Affirmative Action Compliance Requirements for Construction clause of this solicitation.

(b) The goals for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

“Please contact the Office of Federal Contract Compliance Programs as appropriate”.

These goals are applicable to all the Contractor's construction work performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, the Contractor shall apply the goals established for the geographical area where the work is actually performed. Goals are published periodically in the Federal Register in notice form, and these notices may be obtained from any Office of Federal Contract Compliance Programs office.

(c) The Contractor's compliance with Executive Order 11246, as amended, and the regulations in 41 CFR 60-4 shall be based on (1) its implementation of the Equal Opportunity clause, (2) specific affirmative action obligations required by the clause entitled "Affirmative Action Compliance Requirements for Construction," and (3) its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade. The Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor, or from project to project, for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, Executive Order 11246, as amended, and the regulations in 41 CFR 60-4. Compliance with the goals will be measured against the total work hours performed.

(d) The Contractor shall provide written notification to the Deputy Assistant Secretary for Federal Contract Compliance, U.S. Department of Labor, within 10 working days following award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the --

(1) Name, address, and telephone number of the subcontractor;

(2) Employer's identification number of the subcontractor;

(3) Estimated dollar amount of the subcontract;

(4) Estimated starting and completion dates of the subcontract; and

(5) Geographical area in which the subcontract is to be performed.

(e) As used in this Notice, and in any contract resulting from this solicitation, the "covered area" is Afghanistan.

(End of provision)

CLAUSES INCORPORATED BY FULL TEXT

52.233-2 SERVICE OF PROTEST (SEP 2006)

(a) Protests, as defined in section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the Government Accountability Office (GAO), shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgment of receipt from Contracting Officer, US Army Corps of Engineers, House 1, Street 1, West Wazir Akbar Khan, behind Amani High School, Kabul, Afghanistan.

(b) The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.

(End of provision)

CLAUSES INCORPORATED BY FULL TEXT

52.236-27 SITE VISIT (CONSTRUCTION) (FEB 1995) – ALTERNATE I (FEB 1995)

(a) The clauses at 52.236-2, Differing Site Conditions, and 52.236-3, Site Investigations and Conditions Affecting the Work, will be included in any contract awarded as a result of this solicitation. Accordingly, offerors or quoters are urged and expected to inspect the site where the work will be performed.

(b) An organized site visit has been scheduled for--

**No organized site visit has been scheduled.**

(c) Participants will meet at--

N/A

(End of provision)

CLAUSES INCORPORATED BY FULL TEXT

52.252-1 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FEB 1998)

This solicitation incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The offeror is cautioned that the listed provisions may include blocks that must be completed by the offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this/these address(es):

<http://www.farsite.hill.af.mil>

<http://www.acq.osd.mil/dpap/dars/index.htm>

(End of provision)

#### CLAUSES INCORPORATED BY FULL TEXT

##### 52.252-5 AUTHORIZED DEVIATIONS IN PROVISIONS (APR 1984)

(a) The use in this solicitation of any Federal Acquisition Regulation (48 CFR Chapter 1) provision with an authorized deviation is indicated by the addition of "(DEVIATION)" after the date of the provision.

(b) The use in this solicitation of any Defense FAR Supplement (48 CFR Chapter 2) provision with an authorized deviation is indicated by the addition of "(DEVIATION)" after the name of the regulation.

(End of provision)

PROPOSAL PREPARATION

## SECTION 00110

## PROPOSAL PREPARATION

## PART 1 – GENERAL

- A. PROPOSAL PREPARATION.** Instructions for the preparation and organization of each proposal are included herein. The proposal submittal shall include one original and three copies of the Volume I and one original and two copies of the Volume II proposal. Volume I and Volume II shall be clearly marked and sealed. The proposal shall be submitted as required herein and elsewhere in the solicitation.

Volume I shall be typed, with numbered pages and sections tabbed. A cover sheet shall identify the offeror and the project and the second sheet shall be a table of contents. The Volume I proposal is limited to no more than 50 single-sided or 25 double-sided pages, printed on 8-1/2" x 11" sheets, not including the cover sheet, designs/sketches, table of contents and letters of recommendation / evaluations / related certificates. Do not use condensed print. Do not submit any extraneous materials with your proposal.

Note: Templates. Model templates are provided below as a possible format available to assist offerors in the preparation of their proposals. Use of the template format is not required. Sections 110 and 120 of this RFP govern and the templates do not supplant or substitute the requirements stated in these sections.

**B. PROPOSAL EVALUATION & AWARD:**

**B.1** Proposals will be evaluated based on their technical merit of acceptability and lowest price for the work described herein. Award will be made to the offeror whose proposal is technically acceptable and is the lowest priced benefit to the Government. The technical factors of Factor 1-Past Performance; Factor 2- Construction Experience; Factor 3- Project Management and Factor 4- Personnel and Equipment Resources will be evaluated, as described below, for an acceptable or unacceptable technical rating. To be considered technically acceptable an offeror must be acceptable for all factors.

**B.2 VOLUME I – MANAGEMENT-TECHNICAL PROPOSAL PREPARATION.** The Management/Technical proposal shall include the information as described below and shall be presented in the sequence listed.

Factor 1- Past Performance: For Factor 1 provide the following information:

- Customer Point of Contact (name, telephone, email) for performance information
- List the problems encountered and the corrective actions taken
- List of change orders and circumstances associated with them
- Construction time duration beyond the original performance period and why.
- Construction cost in dollars beyond the original contract amount and why.
- Safety record and accident report

The offeror may also provide letters of recommendation, references, performance evaluations or other evidence of successful performance of the project.

Factor 2- Construction Experience: Demonstrate the experience of the team, including sub-contractors, on projects similar to that described in this RFP. Provide a list of no more than five similar and relevant projects underway or completed in the last four years that best demonstrates your experience. The list of projects shall include the following information:

- Project name and location.
- Nature of firm's responsibility (prime or subcontractor).
- Project owner's name, address, telephone, email (to be contacted by the Government).

- Project completion date and duration (estimated if in progress)
- Construction cost
- Brief explanation that illustrates the capabilities of the contractor or joint-venture and relevant job experiences.

Factor 3 - Project Management Plan: The Project Management Plan shall include the following:

- Procedures used to manage the construction process. Include a discussion of management of concurrent work at multiple job sites.
- Provide an organization chart.
- Quality control and safety management processes.
- Process to control cost and schedule growth.
- Interaction process with the Corps of Engineers and the roles that the team members will have in dealing with significant issues.
- Logistics Management - procedures for ordering and timely delivery of construction supplies. Include a plan to support concurrent construction at multiple sites.

Do NOT provide biographical information in this section.

Limit discussion to no more than ten pages.

Factor 4 – Personnel and Equipment Resources Plan: Provide professional resume data on the following individuals who will be key personnel on the project team. Key personnel identified in this section should be senior working-level people who will be involved in design and construction on a day-to-day basis, as opposed to departmental level supervisors or executives. By identifying these personnel, the offeror makes a commitment that, barring unforeseen circumstances; they are the personnel who shall be assigned to the project. All key personnel shall have a minimum of five years of professional experience.

- Project Manager for design and for construction
- Quality Control Manager
- Project Architect
- Senior Structural Engineer
- Senior Civil Engineer
- Senior Mechanical Engineer
- Senior Electrical Engineer
- Fire Protection Engineer
- Construction Superintendent
- Construction Foreman (if different from above)

Information to be provided for key personnel should be limited to no more than one page per person and shall include:

- Name and title
- Project assignment
- Name of firm with which associated
- Years experience with this firm and with other firms
- Education degree(s), year, specialization
- Active registration, year first registered
- Other experience and qualifications relevant to the proposed project
- Provide the proposed use of Afghan contractors and labor in numbers or percentages.

Provide equipment resources to be utilized for this project (i.e. offices, shops, warehouses, machinery, construction tools, vehicles, loaders, etc.) and other resources (i.e. cooperating companies supplying materials and/or services)

### B.3 VOLUME II - COST/PRICE PROPOSAL PREPARATION

Proposal Schedule. Offerors shall provide a signed cover letter and complete the Proposal Schedule by filling out the pricing data blanks. An executable Proposal Schedule is included in Section 00010 herein. Overhead and profit and all other costs associated with the execution of this project shall be applied proportionally to each category and shall not be required to be shown separately. All costs and prices shall be firm-fixed.

Cost/Price Supporting Information. In addition to the completed pricing schedule, the contractor shall provide supporting information in the way of cost breakdowns and assumptions made in determining the proposed prices for this project.

### B.4 CLARIFICATIONS AND PROPOSAL REVISION:

Clarifications Prior to Proposal Due Date: In the event that clarifications are required prior to submitting the proposal, contact the individuals listed on the solicitation. Any changes made to the solicitation will be made via an amendment which will be disseminated amongst all the interested offerors.

Initial Offer: The Government intends to award a contract on the basis of the initial offers received without further discussions or negotiations. Offers should contain the offeror's best terms from a cost and management standpoint.

- End of Section -

TEMPLATE FORMAT GUIDANCE ONLY

FACTOR 1

PAST EVALUATIONS/ PERFORMANCE

The following projects are to be the same projects submitted under Factor 2 Experience.

1. Project Name & Location:
2. Customer Point of Contact: (Note: the Government may contact this customer to verify the information provided on this form)  
Name:  
Address:  
Phone number:  
Email Address:
3. Problems encountered and corrective actions taken:
4. List Change Orders and their circumstances:
5. Project scheduled Completion date Actual Completion date:  
IF the above dates are different, explain reason for the change:
6. Initial Project Budget (US Dollars)  
Final Actual Project cost (US Dollars)  
IF the above dates are different, explain reason for the change:
7. Safety record and accident reports:
8. References: Submit the following, Customer Satisfaction letters, Letters of Appreciation, Performance Evaluations, Certification of Achievements, and Letters of Recommendations.

(Note: A neutral rating with unknown risk will be assigned IF no past performance is submitted)

TEMPLATE FORMAT GUIDANCE ONLY

FACTOR 2

EXPERIENCE

- a. Project Name & Location:
- b. Contract Number if applicable:
- c. Project type: Construction: (Y/N) Design: (Y/N) Design/Build: (Y/N)
- d. Project owner's name:  
Address:  
Telephone:  
Email:
- e. Prime Contractor: (Y/N) Sub-Contractor: (Y/N)
- f. Project completion Date:
- g. Construction Cost:
- h. Brief explanation that illustrates your design/build capabilities and relevant experiences:

## TEMPLATE FORMAT GUIDANCE ONLY

## FACTOR 3

PROJECT MANAGEMENT PLAN

1. Provide an Organizational Chart: (include key personnel Names and their titles)
  - a. Show the key design personnel
  - b. Show the key construction personnel
  - c. Show other firms involved such as partnerships and sub-contractors if applicable
  - d. Show the relationship between the quality control and health & safety personnel, project level management and corporate management
2. Explain the quality control process for design:
3. Explain quality control management throughout the construction process including;
  - a. Testing
  - b. Inspection
  - c. Safety
4. Explain how interactions with the Corps of Engineers and the roles that different team members will play when dealing with;
  - a. Resolving problems with modifications to the contract (design and/or construction)
  - b. Resolving potential design and/or construction delays
  - c. Reviewing and approving submittals
  - d. Attending progress meetings
  - e. Facilitating contract completion and closeouts
  - f. Explain process to control cost over runs while maintaining the project budget during design and construction.

This portion of the contractor's proposal shall be limited to no more than 10 pages. Pages beyond 10 pages may not be evaluated.

## TEMPLATE FORMAT GUIDANCE ONLY

## FACTOR 4

PERSONNEL & EQUIPMENT RESOURCES PLAN

SUB-FACTOR 1: PERSONNEL for the following:

- Project Manager for design and for construction
- Quality Control Manager
- Project Architect
- Senior Structural Engineer
- Senior Civil Engineer
- Senior Mechanical Engineer
- Senior Electrical Engineer
- Safety Officer
- Construction Superintendent or Manager
- Construction Foreman (if different from above)
- Safety Manager

All key personnel shall have a minimum of five years of professional experience. The following information is required for each of the key personnel below: Information to be provided for key personnel should be limited to no more than one page per person.

a. Name:

b. Project Title:

c. Project Responsibilities:

d. Years of Experience: with this Company: with other firms:

e. Education: Degree(s) Year: Specialization:

f. Active Registration: First year Registered:

g. Other relevant experiences & qualifications:

- How many or the percentage of the Afghan contractors & laborers who will be working on this project:

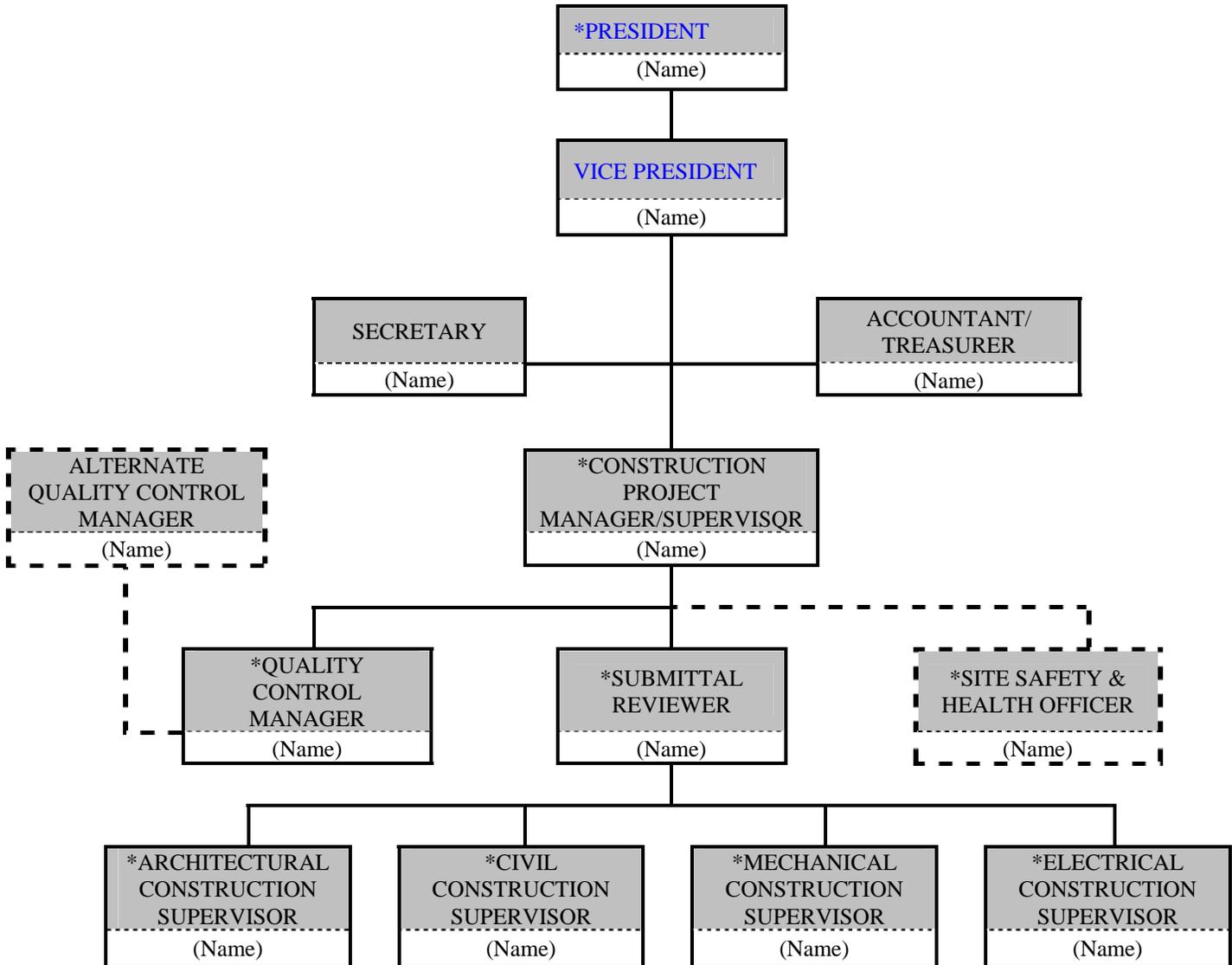
SUB-FACTOR 2: EQUIPMENT

List of equipment, facilities and other resources available for this project:

TEMPLATE FORMAT GUIDANCE ONLY

CONTRACTOR’S ORGANIZATIONAL CHART

Notes:



1. This is only a sample of Organizational Chart. Actual personnel, assignments, and flow chart shall be adapted and provided by the Offeror. As a minimum requirement, assignments with asterisk (\*) are considered as “Key Personnel”.

2. Additional Charts from Sub-Contractor(s), and/or Partnership or Joint Venture from other Contractor(s) may be submitted in separate sheet(s).

## PROPOSAL EVAL & CONTRACT AWARD

### SECTION 00120

#### PROPOSAL EVALUATION AND CONTRACT AWARD

##### PART 1 – GENERAL

**A. BASIS FOR AWARD:** Award will be made on the basis of the lowest evaluated price of proposals meeting or exceeding the acceptability standards for non-cost factors. Tradeoffs are not permitted. Proposals are evaluated for acceptability but not ranked using non-cost/price factors.

**B. EVALUATION OF FACTORS:** Evaluation will be performed on each proposal. The Evaluation Factors for Award are outlined below: The proposal that provides the lowest price that is considered to be fair and reasonable will be evaluated to determine if it is technically acceptable. To be considered technically acceptable, no technical factor in the proposal may be determined to be unacceptable.

**B.1 FACTORS: The Technical Factors are comprised of:**

**Past Performance; Construction Experience; Project Management, and Personnel and equipment Resources. The failure of a proposal to meet any of the factors will result in a technically unacceptable rating and preclude award to the offeror submitting the proposal.**

##### C. PROPOSAL EVALUATION.

###### VOLUME 1 – MANAGEMENT-TECHNICAL PROPOSAL.

**Factor 1 – Past Performance.** This factor may be evaluated by contacting references for **customer satisfaction** and review of **quality performance** evaluations or other information provided by the offeror or obtained by the Government. The evaluators will consider the **relevance** of the past performance information and the success achieved on past projects to determine the rating. In the event that an offeror does not have a record of past performance evaluations, a written explanation of the reasons why no record is available is requested. In the case of an offeror without a record of relevant past performance evaluations or for whom information on past performance is not available, a neutral rating will be assigned.

The information provided will be used to evaluate the relevancy of each offeror's construction experience. Qualifying project(s) shall have been awarded within the past three years. Relevancy for an incomplete project will depend upon the status of the physical completion of the project. Those closer to physical completion will be considered more relevant. Offerors are responsible for providing project descriptions in sufficient detail to permit evaluation of project relevancy. An English speaking representative and phone number must be included with every project listed.

**Factor 2 - Construction Experience.** The Government will evaluate the relevant work experience of the contractor's company and designer, including subcontractors, on projects similar to that described in this RFP. Contractor experience with similar relevant projects (type of construction, dollar value,

design-build method, complexity) will have a better chance to receive an acceptable rating than those with dissimilar or non-relevant projects.

**Factor 3 – Project Management Plan.** The Government will evaluate the Project Management Plan which will include the contractor's construction management process, the company's quality control and safety management procedures, its ability to control cost and schedule growth, its ability to resolve problems, a description of its interactions with the Corps of Engineers, and its logistics management capabilities. The less convincing the evidence, the more likely the Project Management Plan will be considered unacceptable. Deviations from RFP requirements or technical specifications may result in an unacceptable rating.

**Factor 4 – Personnel and Equipment Resources Plan.**

**Personnel.** The Government will evaluate the qualifications and experience of contractor's personnel for this project. Contractor personnel with experience that is associated with **similar and relevant** projects (type of construction, dollar value, design-build method, complexity) will have a better chance to receive an acceptable rating than those with dissimilar or non-relevant project experience. The contractor's utilization of Afghan personnel will also be evaluated.

**Equipment Resources.** The Government will evaluate the adequacy of the offeror's equipment resources to successfully complete the project.

**C.1** Each offeror's proposal shall receive a technical evaluation of the offeror's Past Performance; Construction Experience, Project Management and Personnel and Equipment Resources. Each factor (evaluation criteria) will receive an rating of either acceptable or unacceptable.

**D. VOLUME II - COST/PRICE PROPOSAL PREPARATION.** Price or cost to the Government will be evaluated and considered, but will not receive an actual rating or be combined with other aspects of the proposal evaluation. The proposed price will be analyzed for fairness and reasonableness. It may also be evaluated to determine whether it is realistic for the work to be performed; reflects the Contractor's clear understanding of the requirements; and is consistent with the offeror's technical proposal. Additionally, all offers with separately priced line items will be reviewed for unbalanced pricing.

**E. METHOD OF PROPOSAL EVALUATION**

**E.1** Proposals will be reviewed to determine if they contain the required minimum procurement and technical data.

Incomplete proposals may be eliminated. All forms shall be filled in and all requested data must be provided.

**E.2** The Government may reject any or all proposals and waive minor irregularities in proposals.

**E. 3 SELECTION and AWARD.** Award will be made to the offeror that, in the judgment of the Contracting Officer, is technically acceptable and provides the lowest price that is considered to be fair and reasonable.

-- End of Section --

## Section 00600 - Representations &amp; Certifications

## CLAUSES INCORPORATED BY REFERENCE

52.203-11	Certification And Disclosure Regarding Payments To Influence Certain Federal Transactions	SEP 2005
52.222-38	Compliance With Veterans' Employment Reporting Requirements	DEC 2001
252.209-7001	Disclosure of Ownership or Control by the Government of a Terrorist Country	OCT 2006
252.225-7031	Secondary Arab Boycott Of Israel	JUN 2005

## CLAUSES INCORPORATED BY FULL TEXT

## 52.203-2 CERTIFICATE OF INDEPENDENT PRICE DETERMINATION (APR 1985)

(a) The offeror certifies that --

(1) The prices in this offer have been arrived at independently, without, for the purpose of restricting competition, any consultation, communication, or agreement with any other offeror or competitor relating to –

(i) Those prices,

(ii) The intention to submit an offer, or

(iii) The methods of factors used to calculate the prices offered:

(2) The prices in this offer have not been and will not be knowingly disclosed by the offeror, directly or indirectly, to any other offeror or competitor before bid opening (in the case of a sealed bid solicitation) or contract award (in the case of a negotiated solicitation) unless otherwise required by law; and

(3) No attempt has been made or will be made by the offeror to induce any other concern to submit or not to submit an offer for the purpose of restricting competition.

(b) Each signature on the offer is considered to be a certification by the signatory that the signatory --

(1) Is the person in the offeror's organization responsible for determining the prices offered in this bid or proposal, and that the signatory has not participated and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) of this provision; or

(2) (i) Has been authorized, in writing, to act as agent for the following principals in certifying that those principals have not participated, and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) of this provision \_\_\_\_\_ (insert full name of person(s) in the offeror's organization responsible for determining the prices offered in this bid or proposal, and the title of his or her position in the offeror's organization);

(ii) As an authorized agent, does certify that the principals named in subdivision (b)(2)(i) above have not participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) above; and

(iii) As an agent, has not personally participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) of this provision.

(c) If the offeror deletes or modifies subparagraph (a)(2) of this provision, the offeror must furnish with its offer a signed statement setting forth in detail the circumstances of the disclosure.

(End of clause)

52.204-3 TAXPAYER IDENTIFICATION (OCT 1998)

(a) Definitions.

Common parent, as used in this provision, means that corporate entity that owns or controls an affiliated group of corporations that files its Federal income tax returns on a consolidated basis, and of which the offeror is a member.

Taxpayer Identification Number (TIN), as used in this provision, means the number required by the Internal Revenue Service (IRS) to be used by the offeror in reporting income tax and other returns. The TIN may be either a Social Security Number or an Employer Identification Number.

(b) All offerors must submit the information required in paragraphs (d) through (f) of this provision to comply with debt collection requirements of 31 U.S.C. 7701(c) and 3325(d), reporting requirements of 26 U.S.C. 6041, 6041A, and 6050M, and implementing regulations issued by the IRS. If the resulting contract is subject to the payment reporting requirements described in Federal Acquisition Regulation (FAR) 4.904, the failure or refusal by the offeror to furnish the information may result in a 31 percent reduction of payments otherwise due under the contract.

(c) The TIN may be used by the Government to collect and report on any delinquent amounts arising out of the offeror's relationship with the Government (31 U.S.C. 7701(c)(3)). If the resulting contract is subject to the payment reporting requirements described in FAR 4.904, the TIN provided hereunder may be matched with IRS records to verify the accuracy of the offeror's TIN.

(d) Taxpayer Identification Number (TIN).

\_\_\_ TIN:-----

\_\_\_ TIN has been applied for.

\_\_\_ TIN is not required because:

\_\_\_ Offeror is a nonresident alien, foreign corporation, or foreign partnership that does not have income effectively connected with the conduct of a trade or business in the United States and does not have an office or place of business or a fiscal paying agent in the United States;

\_\_\_ Offeror is an agency or instrumentality of a foreign government;

\_\_\_ Offeror is an agency or instrumentality of the Federal Government.

(e) Type of organization.

\_\_\_ Sole proprietorship;

- Partnership;
- Corporate entity (not tax-exempt);
- Corporate entity (tax-exempt);
- Government entity (Federal, State, or local);
- Foreign government;
- International organization per 26 CFR 1.6049-4;
- Other-----

(f) Common parent.

Offeror is not owned or controlled by a common parent as defined in paragraph (a) of this provision.

Name and TIN of common parent:

Name-----

TIN-----

(End of provision)

52.204-8 ANNUAL REPRESENTATIONS AND CERTIFICATIONS (JAN 2006)

(a)(1) The North American Industry Classification System (NAICS) code for this acquisition is 236220 or 237310.

(2) The small business size standard is \$31,000,000.00

(3) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

(b)(1) If the clause at 52.204-7, Central Contractor Registration, is included in this solicitation, paragraph (c) of this provision applies.

(2) If the clause at 52.204-7 is not included in this solicitation, and the offeror is currently registered in CCR, and has completed the ORCA electronically, the offeror may choose to use paragraph (b) of this provision instead of completing the corresponding individual representations and certifications in the solicitation. The offeror shall indicate which option applies by checking one of the following boxes:

(XX) Paragraph (c) applies.

( ) Paragraph (c) does not apply and the offeror has completed the individual representations and certifications in the solicitation.

(c) The offeror has completed the annual representations and certifications electronically via the Online Representations and Certifications Application (ORCA) website at <http://orca.bpn.gov>. After reviewing the ORCA database information, the offeror verifies by submission of the offer that the representations and certifications currently posted electronically have been entered or updated within the last 12 months, are current, accurate, complete, and applicable to this solicitation (including the business size standard applicable to the NAICS code referenced for this solicitation), as of the date of this offer and are incorporated in this offer by reference (see FAR 4.1201); except for the changes identified below [offeror to insert changes, identifying change by clause number, title, date]. These amended representation(s) and/or certification(s) are also incorporated in this offer and are current, accurate, and complete as of the date of this offer.

FAR Clause	Title	Date	Change
-----	-----	-----	-----

Any changes provided by the offeror are applicable to this solicitation only, and do not result in an update to the representations and certifications posted on ORCA.

(End of Provision)

52.209-5 CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS (DEC 2001)

(a)(1) The Offeror certifies, to the best of its knowledge and belief, that-

(i) The Offeror and/or any of its Principals-

(A) Are ( ) are not ( ) presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency;

(B) Have ( ) have not ( ), within a three-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, state, or local) contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, or receiving stolen property; and

(C) Are ( ) are not ( ) presently indicted for, or otherwise criminally or civilly charged by a governmental entity with, commission of any of the offenses enumerated in paragraph (a)(1)(i)(B) of this provision.

(ii) The Offeror has ( ) has not ( ), within a three-year period preceding this offer, had one or more contracts terminated for default by any Federal agency.

(2) "Principals," for the purposes of this certification, means officers; directors; owners; partners; and, persons having primary management or supervisory responsibilities within a business entity (e.g., general manager; plant manager; head of a subsidiary, division, or business segment, and similar positions).

This Certification Concerns a Matter Within the Jurisdiction of an Agency of the United States and the Making of a False, Fictitious, or Fraudulent Certification May Render the Maker Subject to Prosecution Under Section 1001, Title 18, United States Code.

(b) The Offeror shall provide immediate written notice to the Contracting Officer if, at any time prior to contract award, the Offeror learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

(c) A certification that any of the items in paragraph (a) of this provision exists will not necessarily result in withholding of an award under this solicitation. However, the certification will be considered in connection with a determination of the Offeror's responsibility. Failure of the Offeror to furnish a certification or provide such additional information as requested by the Contracting Officer may render the Offeror nonresponsible.

(d) Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by paragraph (a) of this provision. The knowledge and information of an Offeror is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

(e) The certification in paragraph (a) of this provision is a material representation of fact upon which reliance was placed when making award. If it is later determined that the Offeror knowingly rendered an erroneous certification, in addition to other remedies available to the Government, the Contracting Officer may terminate the contract resulting from this solicitation for default.

(End of provision)

#### 52.222-22 PREVIOUS CONTRACTS AND COMPLIANCE REPORTS (FEB 1999)

The offeror represents that --

(a) ( ) It has, ( ) has not participated in a previous contract or subcontract subject to the Equal Opportunity clause of this solicitation;

(b) ( ) It has, ( ) has not, filed all required compliance reports; and

(c) Representations indicating submission of required compliance reports, signed by proposed subcontractors, will be obtained before subcontract awards.

(End of provision)

#### 52.230-1 COST ACCOUNTING STANDARDS NOTICES AND CERTIFICATION (JUN 2000)

Note: This notice does not apply to small businesses or foreign governments. This notice is in three parts, identified by Roman numerals I through III.

Offerors shall examine each part and provide the requested information in order to determine Cost Accounting Standards (CAS) requirements applicable to any resultant contract.

If the offeror is an educational institution, Part II does not apply unless the contemplated contract will be subject to full or modified CAS coverage pursuant to 48 CFR 9903.201-2(c)(5) or 9903.201-2(c)(6), respectively.

I. DISCLOSURE STATEMENT--COST ACCOUNTING PRACTICES AND CERTIFICATION

(a) Any contract in excess of \$500,000 resulting from this solicitation will be subject to the requirements of the Cost Accounting Standards Board (48 CFR Chapter 99), except for those contracts which are exempt as specified in 48 CFR 9903.201-1.

(b) Any offeror submitting a proposal which, if accepted, will result in a contract subject to the requirements of 48 CFR Chapter 99 must, as a condition of contracting, submit a Disclosure Statement as required by 48 CFR 9903.202. When required, the Disclosure Statement must be submitted as a part of the offeror's proposal under this solicitation unless the offeror has already submitted a Disclosure Statement disclosing the practices used in connection with the pricing of this proposal. If an applicable Disclosure Statement has already been submitted, the offeror may satisfy the requirement for submission by providing the information requested in paragraph (c) of Part I of this provision.

CAUTION: In the absence of specific regulations or agreement, a practice disclosed in a Disclosure Statement shall not, by virtue of such disclosure, be deemed to be a proper, approved, or agreed-to practice for pricing proposals or accumulating and reporting contract performance cost data.

(c) Check the appropriate box below:

(1) Certificate of Concurrent Submission of Disclosure Statement.

The offeror hereby certifies that, as a part of the offer, copies of the Disclosure Statement have been submitted as follows: (i) original and one copy to the cognizant Administrative Contracting Officer (ACO) or cognizant Federal agency official authorized to act in that capacity (Federal official), as applicable, and (ii) one copy to the cognizant Federal auditor.

(Disclosure must be on Form No. CASB DS-1 or CASB DS-2, as applicable. Forms may be obtained from the cognizant ACO or Federal official and/or from the loose-leaf version of the Federal Acquisition Regulation.)

Date of Disclosure Statement: \_\_\_\_\_ Name and Address of Cognizant ACO or Federal Official Where Filed: \_\_\_\_\_

The offeror further certifies that the practices used in estimating costs in pricing this proposal are consistent with the cost accounting practices disclosed in the Disclosure Statement.

(2) Certificate of Previously Submitted Disclosure Statement.

The offeror hereby certifies that the required Disclosure Statement was filed as follows:

Date of Disclosure Statement: \_\_\_\_\_ Name and Address of Cognizant ACO or Federal Official Where Filed: \_\_\_\_\_

The offeror further certifies that the practices used in estimating costs in pricing this proposal are consistent with the cost accounting practices disclosed in the applicable Disclosure Statement.

(3) Certificate of Monetary Exemption.

The offeror hereby certifies that the offeror, together with all divisions, subsidiaries, and affiliates under common control, did not receive net awards of negotiated prime contracts and subcontracts subject to CAS totaling more than \$50 million (of which at least one award exceeded \$1 million) in the cost accounting period immediately preceding the period in which this proposal was submitted. The offeror further certifies that if such status changes before an award resulting from this proposal, the offeror will advise the Contracting Officer immediately.

## (4) Certificate of Interim Exemption.

The offeror hereby certifies that (i) the offeror first exceeded the monetary exemption for disclosure, as defined in (3) of this subsection, in the cost accounting period immediately preceding the period in which this offer was submitted and (ii) in accordance with 48 CFR 9903.202-1, the offeror is not yet required to submit a Disclosure Statement. The offeror further certifies that if an award resulting from this proposal has not been made within 90 days after the end of that period, the offeror will immediately submit a revised certificate to the Contracting Officer, in the form specified under subparagraph (c)(1) or (c)(2) of Part I of this provision, as appropriate, to verify submission of a completed Disclosure Statement.

CAUTION: Offerors currently required to disclose because they were awarded a CAS-covered prime contract or subcontract of \$50 million or more in the current cost accounting period may not claim this exemption (4). Further, the exemption applies only in connection with proposals submitted before expiration of the 90-day period following the cost accounting period in which the monetary exemption was exceeded.

## II. COST ACCOUNTING STANDARDS--ELIGIBILITY FOR MODIFIED CONTRACT COVERAGE

If the offeror is eligible to use the modified provisions of 48 CFR 9903.201-2(b) and elects to do so, the offeror shall indicate by checking the box below. Checking the box below shall mean that the resultant contract is subject to the Disclosure and Consistency of Cost Accounting Practices clause in lieu of the Cost Accounting Standards clause.

The offeror hereby claims an exemption from the Cost Accounting Standards clause under the provisions of 48 CFR 9903.201-2(b) and certifies that the offeror is eligible for use of the Disclosure and Consistency of Cost Accounting Practices clause because during the cost accounting period immediately preceding the period in which this proposal was submitted, the offeror received less than \$50 million in awards of CAS-covered prime contracts and subcontracts. The offeror further certifies that if such status changes before an award resulting from this proposal, the offeror will advise the Contracting Officer immediately.

CAUTION: An offeror may not claim the above eligibility for modified contract coverage if this proposal is expected to result in the award of a CAS-covered contract of \$50 million or more or if, during its current cost accounting period, the offeror has been awarded a single CAS-covered prime contract or subcontract of \$25 million or more.

## III. ADDITIONAL COST ACCOUNTING STANDARDS APPLICABLE TO EXISTING CONTRACTS

The offeror shall indicate below whether award of the contemplated contract would, in accordance with subparagraph (a)(3) of the Cost Accounting Standards clause, require a change in established cost accounting practices affecting existing contracts and subcontracts.

YES  NO

(End of clause)

## 252.247-7002 REVISION OF PRICES (DEC 1991)

(a) "Definition. Wage adjustment", as used in this clause, means a change in the wages, salaries, or other terms or conditions of employment which --

(1) Substantially affects the cost of performing this contract;

- (2) Is generally applicable to the port where work under this contract is performed; and
- (3) Applies to operations by the Contractor on non-Government work as well as to work under this contract.
- (b) "General." The prices fixed in this contract are based on wages and working conditions established by collective bargaining agreements, and on other conditions in effect on the date of this contract. The Contracting Officer and the Contractor may agree to increase or decrease such prices in accordance with this clause.
- (c) "Demand for negotiation." (1) At any time, subject to the limitations specified in this clause, either the Contracting Officer or the Contractor may deliver to the other a written demand that the parties negotiate to revise the prices under this contract.
- (2) No such demand shall be made before 90 days after the date of this contract, and thereafter neither party shall make a demand having an effective date within 90 days of the effective date of any prior demand. However, this limitation does not apply to a wage adjustment during the 90 day period.
- (3) Each demand shall specify a date (the same as or subsequent to the date of the delivery of the demand) as to when the revised prices shall be effective. This date is the effective date of the price revision.
- (i) If the Contractor makes a demand under this clause, the demand shall briefly state the basis of the demand and include the statements and data referred to in paragraph (d) of this clause.
- (ii) If the demand is made by the Contracting Officer, the Contractor shall furnish the statements and data within 30 days of the delivery of the demand.
- (d) "Submission of data." At the times specified in paragraphs (c)(3)(i) and (ii) of this clause, the Contractor shall submit --
- (1) A new estimate and breakdown of the unit cost and the proposed prices for the services the Contractor will perform under this contract after the effective date of the price revision, itemized to be consistent with the original negotiations of the contract;
- (2) An explanation of the difference between the original (or last preceding) estimate and the new estimate;
- (3) Such relevant operating data, cost records, overhead absorption reports, and accounting statements as may be of assistance in determining the accuracy and reliability of the new estimate;
- (4) A statement of the actual costs of performance under this contract to the extent that they are available at the time of the negotiation of the revision of prices under this clause; and
- (5) Any other relevant data usually furnished in the case of negotiations of prices under a new contract. The Government may examine and audit the Contractor's accounts, records, and books as the Contracting Officer considers necessary.
- (e) "Negotiations." (1) Upon the filing of the statements and data required by paragraph (d) of this clause, the Contractor and the Contracting Officer shall negotiate promptly in good faith to agree upon prices for services the Contractor will perform on and after the effective date of the price revision.
- (2) If the prices in this contract were established by competitive negotiation, they shall not be revised upward unless justified by changes in conditions occurring after the contract was awarded.
- (3) The agreement reached after each negotiation will be incorporated into the contract by supplemental agreement.

(f) "Disagreements." If, within 30 days after the date on which statements and data are required pursuant to paragraph (c) of this clause, the Contracting Officer and the Contractor fail to agree to revised prices, the failure to agree shall be resolved in accordance with the Disputes clause of this contract. The prices fixed by the Contracting Officer will remain in effect for the balance of the contract, and the Contractor shall continue performance.

(g) "Retroactive changes in wages or working conditions." (1) In the event of a retroactive wage adjustment, the Contractor or the Contracting Officer may request an equitable adjustment in the prices in this contract.

(2) The Contractor shall request a price adjustment within 30 days of any retroactive wage adjustment. The Contractor shall support its request with --

(i) An estimate of the changes in cost resulting from the retroactive wage adjustment;

(ii) Complete information upon which the estimate is based; and

(iii) A certified copy of the collective bargaining agreement, arbitration award, or other document evidencing the retroactive wage adjustment.

(3) Subject to the limitation in paragraph (g)(2) of this clause as to the time of making a request, completion or termination of this contract shall not affect the Contractor's right under paragraph (g) of this clause.

(4) In case of disagreement concerning any question of fact, including whether any adjustment should be made, or the amount of such adjustment, the disagreement will be resolved in accordance with the Disputes clause of this contract.

(5) The Contractor shall notify the Contracting Officer in writing of any request by or on behalf of the employees of the Contractor which may result in a retroactive wage adjustment. The notice shall be given within 20 days after the request, or if the request occurs before contract execution, at the time of execution.

## Section 00700 - Contract Clauses

## CLAUSES INCORPORATED BY REFERENCE

52.202-1	Definitions	JUL 2004
52.203-3	Gratuities	APR 1984
52.203-5	Covenant Against Contingent Fees	APR 1984
52.203-7	Anti-Kickback Procedures	JUL 1995
52.203-8	Cancellation, Rescission, and Recovery of Funds for Illegal or Improper Activity	JAN 1997
52.203-10	Price Or Fee Adjustment For Illegal Or Improper Activity	JAN 1997
52.203-12	Limitation On Payments To Influence Certain Federal Transactions	SEP 2005
52.204-4	Printed or Copied Double-Sided on Recycled Paper	AUG 2000
52.209-6	Protecting the Government's Interest When Subcontracting With Contractors Debarred, Suspended, or Proposed for Debarment	SEP 2006
52.215-2	Audit and Records--Negotiation	JUN 1999
52.215-11	Price Reduction for Defective Cost or Pricing Data--Modifications	OCT 1997
52.215-13	Subcontractor Cost or Pricing Data--Modifications	OCT 1997
52.215-15	Pension Adjustments and Asset Reversions	OCT 2004
52.215-18	Reversion or Adjustment of Plans for Postretirement Benefits (PRB) Other than Pensions	JUL 2005
52.215-21	Requirements for Cost or Pricing Data or Information Other Than Cost or Pricing Data--Modifications	OCT 1997
52.222-21	Prohibition Of Segregated Facilities	FEB 1999
52.222-26	Equal Opportunity	APR 2002
52.222-27	Affirmative Action Compliance Requirements for Construction	FEB 1999
52.222-35	Equal Opportunity For Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans	SEP 2006
52.222-36	Affirmative Action For Workers With Disabilities	JUN 1998
52.222-37	Employment Reports On Special Disabled Veterans, Veterans Of The Vietnam Era, and Other Eligible Veterans	SEP 2006
52.225-13	Restrictions on Certain Foreign Purchases	FEB 2006
52.225-14	Inconsistency Between English Version And Translation Of Contract	FEB 2000
52.227-4	Patent Indemnity-Construction Contracts	APR 1984
52.228-3	Worker's Compensation Insurance (Defense Base Act)	APR 1984
52.229-6	Taxes--Foreign Fixed-Price Contracts	JUN 2003
52.232-5	Payments under Fixed-Price Construction Contracts	SEP 2002
52.232-17	Interest	JUN 1996
52.232-27	Prompt Payment for Construction Contracts	SEP 2005
52.232-33	Payment by Electronic Funds Transfer--Central Contractor Registration	OCT 2003
52.232-38	Submission of Electronic Funds Transfer Information with Offer	MAY 1999
52.233-1	Disputes	JUL 2002
52.233-3	Protest After Award	AUG 1996
52.233-4	Applicable Law for Breach of Contract Claim	OCT 2004
52.236-2	Differing Site Conditions	APR 1984
52.236-3	Site Investigation and Conditions Affecting the Work	APR 1984

52.236-5	Material and Workmanship	APR 1984
52.236-6	Superintendence by the Contractor	APR 1984
52.236-7	Permits and Responsibilities	NOV 1991
52.236-8	Other Contracts	APR 1984
52.236-9	Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements	APR 1984
52.236-10	Operations and Storage Areas	APR 1984
52.236-11	Use and Possession Prior to Completion	APR 1984
52.236-12	Cleaning Up	APR 1984
52.236-13 Alt I	Accident Prevention (Nov 1991) - Alternate I	NOV 1991
52.236-15	Schedules for Construction Contracts	APR 1984
52.236-17	Layout of Work	APR 1984
52.236-21 Alt I	Specifications and Drawings for Construction (Feb 97) - Alternate I	APR 1984
52.236-23	Responsibility of the Architect-Engineer Contractor	APR 1984
52.236-24	Work Oversight in Architect-Engineer Contracts	APR 1984
52.236-25	Requirements for Registration of Designers	JUN 2003
52.236-26	Preconstruction Conference	FEB 1995
52.242-13	Bankruptcy	JUL 1995
52.242-14	Suspension of Work	APR 1984
52.243-4	Changes	AUG 1987
52.243-6	Change Order Accounting	APR 1984
52.244-4	Subcontractors and Outside Associates and Consultants (Architect-Engineer Services)	AUG 1998
52.244-5	Competition In Subcontracting	DEC 1996
52.246-21	Warranty of Construction	MAR 1994
52.247-34	F.O.B. Destination	NOV 1991
52.247-63	Preference For U.S. Flag Air Carriers	JUN 2003
52.248-3	Value Engineering-Construction	SEP 2006
52.249-2 Alt I	Termination for Convenience of the Government (Fixed- Price) (May 2004) - Alternate I	SEP 1996
52.249-10	Default (Fixed-Price Construction)	APR 1984
52.253-1	Computer Generated Forms	JAN 1991
252.201-7000	Contracting Officer's Representative	DEC 1991
252.203-7001	Prohibition On Persons Convicted of Fraud or Other Defense- Contract-Related Felonies	DEC 2004
252.204-7000	Disclosure Of Information	DEC 1991
252.204-7003	Control Of Government Personnel Work Product	APR 1992
252.209-7004	Subcontracting With Firms That Are Owned or Controlled By The Government of a Terrorist Country	DEC 2006
252.215-7000	Pricing Adjustments	DEC 1991
252.215-7002	Cost Estimating System Requirements	DEC 2006
252.222-7002	Compliance With Local Labor Laws (Overseas)	JUN 1997
252.223-7002	Safety Precautions For Ammunition And Explosives	MAY 1994
252.223-7003	Changes In Place Of Performance--Ammunition And Explosives	DEC 1991
252.223-7004	Drug Free Work Force	SEP 1988
252.225-7005	Identification Of Expenditures In The United States	JUN 2005
252.225-7041	Correspondence in English	JUN 1997
252.227-7013	Rights in Technical Data--Noncommercial Items	NOV 1995
252.227-7022	Government Rights (Unlimited)	MAR 1979
252.227-7023	Drawings and Other Data to become Property of Government	MAR 1979
252.227-7030	Technical Data--Withholding Of Payment	MAR 2000
252.227-7033	Rights in Shop Drawings	APR 1966

252.231-7000	Supplemental Cost Principles	DEC 1991
252.232-7003	Electronic Submission of Payment Requests	MAY 2006
252.232-7008	Assignment of Claims (Overseas)	JUN 1997
252.232-7010	Levies on Contract Payments	DEC 2006
252.233-7001	Choice of Law (Overseas)	JUN 1997
252.236-7000	Modification Proposals-Price Breakdown	DEC 1991
252.236-7008	Contract Prices-Bidding Schedules	DEC 1991
252.243-7001	Pricing Of Contract Modifications	DEC 1991
252.243-7002	Requests for Equitable Adjustment	MAR 1998
252.247-7023	Transportation of Supplies by Sea	MAY 2002
252.247-7024	Notification Of Transportation Of Supplies By Sea	MAR 2000

#### CLAUSES INCORPORATED BY FULL TEXT

##### 52.215-19 NOTIFICATION OF OWNERSHIP CHANGES (OCT 1997)

(a) The Contractor shall make the following notifications in writing:

(1) When the Contractor becomes aware that a change in its ownership has occurred, or is certain to occur, that could result in changes in the valuation of its capitalized assets in the accounting records, the Contractor shall notify the Administrative Contracting Officer (ACO) within 30 days.

(2) The Contractor shall also notify the ACO within 30 days whenever changes to asset valuations or any other cost changes have occurred or are certain to occur as a result of a change in ownership.

(b) The Contractor shall--

(1) Maintain current, accurate, and complete inventory records of assets and their costs;

(2) Provide the ACO or designated representative ready access to the records upon request;

(3) Ensure that all individual and grouped assets, their capitalized values, accumulated depreciation or amortization, and remaining useful lives are identified accurately before and after each of the Contractor's ownership changes; and

(4) Retain and continue to maintain depreciation and amortization schedules based on the asset records maintained before each Contractor ownership change.

The Contractor shall include the substance of this clause in all subcontracts under this contract that meet the applicability requirement of FAR 15.408(k).

(End of clause)

##### 52.222-29 NOTIFICATION OF VISA DENIAL (JIUN 2003)

It is a violation of Executive Order 11246 for a Contractor to refuse to employ any applicant or not to assign any person hired in the United States, Puerto Rico, the Northern Mariana Islands, American Samoa, Guam, the U.S. Virgin Islands, or Wake Island, on the basis that the individual's race, color, religion, sex, or national origin is not compatible with the policies of the country where or for whom the work will be performed (41 CFR 60-1.10). The Contractor shall notify the U.S. Department of State, Assistant Secretary, Bureau of Political-Military Affairs

(PM), 2201 C Street NW., Room 6212, Washington, DC 20520, and the U.S. Department of Labor, Deputy Assistant Secretary for Federal Contract Compliance, when it has knowledge of any employee or potential employee being denied an entry visa to a country where this contract will be performed, and it believes the denial is attributable to the race, color, religion, sex, or national origin of the employee or potential employee.

(End of clause)

#### 52.232-18 AVAILABILITY OF FUNDS (APR 1984)

Funds are not presently available for this contract. The Government's obligation under this contract is contingent upon the availability of appropriated funds from which payment for contract purposes can be made. No legal liability on the part of the Government for any payment may arise until funds are made available to the Contracting Officer for this contract and until the Contractor receives notice of such availability, to be confirmed in writing by the Contracting Officer.

(End of clause)

#### 52.232-34 PAYMENT BY ELECTRONIC FUNDS TRANSFER—OTHER THAN CENTRAL CONTRACTOR REGISTRATION (MAY 1999)

(a) Method of payment. (1) All payments by the Government under this contract shall be made by electronic funds transfer (EFT) except as provided in paragraph (a)(2) of this clause. As used in this clause, the term "EFT" refers to the funds transfer and may also include the payment information transfer.

(2) In the event the Government is unable to release one or more payments by EFT, the Contractor agrees to either--

(i) Accept payment by check or some other mutually agreeable method of payment; or

(ii) Request the Government to extend payment due dates until such time as the Government makes payment by EFT (but see paragraph (d) of this clause).

(b) Mandatory submission of Contractor's EFT information. (1) The Contractor is required to provide the Government with the information required to make payment by EFT (see paragraph (j) of this clause). The Contractor shall provide this information directly to the office designated in this contract to receive that information (hereafter: "designated office") no later than 15 days prior to submission of the first request for payment. If not otherwise specified in this contract, the payment office is the designated office for receipt of the Contractor's EFT information. If more than one designated office is named for the contract, the Contractor shall provide a separate notice to each office. In the event that the EFT information changes, the Contractor shall be responsible for providing the updated information to the designated office(s).

(2) If the Contractor provides EFT information applicable to multiple contracts, the Contractor shall specifically state the applicability of this EFT information in terms acceptable to the designated office. However, EFT information supplied to a designated office shall be applicable only to contracts that identify that designated office as the office to receive EFT information for that contract.

(c) Mechanisms for EFT payment. The Government may make payment by EFT through either the Automated Clearing House (ACH) network, subject to the rules of the National Automated Clearing House Association, or the Fedwire Transfer System. The rules governing Federal payments through the ACH are contained in 31 CFR part 210.

(d) Suspension of payment. (1) The Government is not required to make any payment under this contract until after receipt, by the designated office, of the correct EFT payment information from the Contractor. Until receipt of the correct EFT information, any invoice or contract financing request shall be deemed not to be a proper invoice for the purpose of prompt payment under this contract. The prompt payment terms of the contract regarding notice of an improper invoice and delays in accrual of interest penalties apply.

(2) If the EFT information changes after submission of correct EFT information, the Government shall begin using the changed EFT information no later than 30 days after its receipt by the designated office to the extent payment is made by EFT. However, the Contractor may request that no further payments be made until the updated EFT information is implemented by the payment office. If such suspension would result in a late payment under the prompt payment terms of this contract, the Contractor's request for suspension shall extend the due date for payment by the number of days of the suspension.

(e) Liability for uncompleted or erroneous transfers. (1) If an uncompleted or erroneous transfer occurs because the Government used the Contractor's EFT information incorrectly, the Government remains responsible for--

(i) Making a correct payment;

(ii) Paying any prompt payment penalty due; and

(iii) Recovering any erroneously directed funds.

(2) If an uncompleted or erroneous transfer occurs because the Contractor's EFT information was incorrect, or was revised within 30 days of Government release of the EFT payment transaction instruction to the Federal Reserve System, and--

(i) If the funds are no longer under the control of the payment office, the Government is deemed to have made payment and the Contractor is responsible for recovery of any erroneously directed funds; or

(ii) If the funds remain under the control of the payment office, the Government shall not make payment and the provisions of paragraph (d) shall apply.

(f) EFT and prompt payment. A payment shall be deemed to have been made in a timely manner in accordance with the prompt payment terms of this contract if, in the EFT payment transaction instruction released to the Federal Reserve System, the date specified for settlement of the payment is on or before the prompt payment due date, provided the specified payment date is a valid date under the rules of the Federal Reserve System.

(g) EFT and assignment of claims. If the Contractor assigns the proceeds of this contract as provided for in the assignment of claims terms of this contract, the Contractor shall require as a condition of any such assignment, that the assignee shall provide the EFT information required by paragraph (j) of this clause to the designated office, and shall be paid by EFT in accordance with the terms of this clause. In all respects, the requirements of this clause shall apply to the assignee as if it were the Contractor. EFT information that shows the ultimate recipient of the transfer to be other than the Contractor, in the absence of a proper assignment of claims acceptable to the Government, is incorrect EFT information within the meaning of paragraph (d) of this clause.

(h) Liability for change of EFT information by financial agent. The Government is not liable for errors resulting from changes to EFT information provided by the Contractor's financial agent.

(i) Payment information. The payment or disbursing office shall forward to the Contractor available payment information that is suitable for transmission as of the date of release of the EFT instruction to the Federal Reserve System. The Government may request the Contractor to designate a desired format and method(s) for delivery of payment information from a list of formats and methods the payment office is capable of executing. However, the Government does not guarantee that any particular format or method of delivery is available at any particular

payment office and retains the latitude to use the format and delivery method most convenient to the Government. If the Government makes payment by check in accordance with paragraph (a) of this clause, the Government shall mail the payment information to the remittance address in the contract.

(j) EFT information. The Contractor shall provide the following information to the designated office. The Contractor may supply this data for this or multiple contracts (see paragraph (b) of this clause). The Contractor shall designate a single financial agent per contract capable of receiving and processing the EFT information using the EFT methods described in paragraph (c) of this clause.

- (1) The contract number (or other procurement identification number).
- (2) The Contractor's name and remittance address, as stated in the contract(s).
- (3) The signature (manual or electronic, as appropriate), title, and telephone number of the Contractor official authorized to provide this information.
- (4) The name, address, and 9-digit Routing Transit Number of the Contractor's financial agent.
- (5) The Contractor's account number and the type of account (checking, saving, or lockbox).
- (6) If applicable, the Fedwire Transfer System telegraphic abbreviation of the Contractor's financial agent.
- (7) If applicable, the Contractor shall also provide the name, address, telegraphic abbreviation, and 9-digit Routing Transit Number of the correspondent financial institution receiving the wire transfer payment if the Contractor's financial agent is not directly on-line to the Fedwire Transfer System; and, therefore, not the receiver of the wire transfer payment.

(End of clause)

#### 52.236-1 PERFORMANCE OF WORK BY THE CONTRACTOR (APR 1984)

The Contractor shall perform on the site, and with its own organization, work equivalent to at least **twelve 12%** percent of the total amount of work to be performed under the contract. This percentage may be reduced by a supplemental agreement to this contract if, during performing the work, the Contractor requests a reduction and the Contracting Officer determines that the reduction would be to the advantage of the Government.

(End of clause)

#### 52.249-5000 BASIS FOR SETTLEMENT OF PROPOSALS

Actual costs will be used to determine equipment costs for a settlement proposal submitted on the total cost basis under FAR 49.206-2(b). In evaluating a terminations settlement proposal using the total cost basis, the following principles will be applied to determine allowable equipment costs:

- (1) Actual costs for each piece of equipment, or groups of similar serial or series equipment, need not be available in the contractor's accounting records to determine total actual equipment costs.
- (2) If equipment costs have been allocated to a contract using predetermined rates, those charges will be adjusted to actual costs.
- (3) Recorded job costs adjusted for unallowable expenses will be used to determine equipment operating expenses.

(4) Ownership costs (depreciation) will be determined using the contractor's depreciation schedule (subject to the provisions of FAR 31.205-11).

(5) License, taxes, storage and insurance costs are normally recovered as an indirect expense and unless the contractor charges these costs directly to contracts, they will be recovered through the indirect expense rate.

(End of Clause)

#### 52.252-2 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

<http://www.farsite.hill.af.mil>

<http://www.acq.osd.mil/dpap/dars/dfars/index.htm>

(End of clause)

#### 52.252-6 AUTHORIZED DEVIATIONS IN CLAUSES (APR 1984)

(a) The use in this solicitation or contract of any Federal Acquisition Regulation (48 CFR Chapter 1) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the date of the clause.

(b) The use in this solicitation or contract of any [Defense FAR Supplement \(48 CFR Chapter 2\)](#) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the name of the regulation.

(End of clause)

#### 252.204-7004 CENTRAL CONTRACTOR REGISTRATION (52.204-7) ALTERNATE A (NOV 2003)

(a) Definitions. As used in this clause--

“Central Contractor Registration (CCR) database” means the primary Government repository for contractor information required for the conduct of business with the Government.

“Commercial and Government Entity (CAGE) code” means--

(1) A code assigned by the Defense Logistics Information Service (DLIS) to identify a commercial or Government entity; or

(2) A code assigned by a member of the North Atlantic Treaty Organization that DLIS records and maintains in the CAGE master file. This type of code is known as an “NCAGE code.”

“Data Universal Numbering System (DUNS) number” means the 9-digit number assigned by Dun and Bradstreet, Inc. (D&B) to identify unique business entities.

“Data Universal Numbering System +4 (DUNS+4) number” means the DUNS number assigned by D&B plus a 4-character suffix that may be assigned by a business concern. (D&B has no affiliation with this 4-character suffix.) This 4-character suffix may be assigned at the discretion of the business concern to establish additional CCR records for identifying alternative Electronic Funds Transfer (EFT) accounts (see Subpart 32.11 of the Federal Acquisition Regulation) for the same parent concern.

“Registered in the CCR database” means that--

(1) The Contractor has entered all mandatory information, including the DUNS number or the DUNS+4 number, into the CCR database;

(2) The Contractor's CAGE code is in the CCR database; and

(3) The Government has validated all mandatory data fields and has marked the records “Active.”

(b)(1) By submission of an offer, the offeror acknowledges the requirement that a prospective awardee shall be registered in the CCR database prior to award, during performance, and through final payment of any contract, basic agreement, basic ordering agreement, or blanket purchasing agreement resulting from this solicitation.

(2) The offeror shall enter, in the block with its name and address on the cover page of its offer, the annotation "DUNS" or "DUNS +4" followed by the DUNS or DUNS +4 number that identifies the offeror's name and address exactly as stated in the offer. The DUNS number will be used by the Contracting Officer to verify that the offeror is registered in the CCR database.

(c) If the offeror does not have a DUNS number, it should contact Dun and Bradstreet directly to obtain one.

(1) An offeror may obtain a DUNS number-

(i) If located within the United States, by calling Dun and Bradstreet at 1-866-705-5711 or via the Internet at <http://www.dnb.com>; or

(ii) If located outside the United States, by contacting the local Dun and Bradstreet office.

(2) The offeror should be prepared to provide the following information:

(i) Company legal business.

(ii) Tradestyle, doing business, or other name by which your entity is commonly recognized.

(iii) Company Physical Street Address, City, State, and Zip Code.

(iv) Company Mailing Address, City, State and Zip Code (if separate from physical).

(v) Company Telephone Number.

(vi) Date the company was started.

(vii) Number of employees at your location.

- (viii) Chief executive officer/key manager.
- (ix) Line of business (industry).
- (x) Company Headquarters name and address (reporting relationship within your entity).
- (d) If the Offeror does not become registered in the CCR database in the time prescribed by the Contracting Officer, the Contracting Officer will proceed to award to the next otherwise successful registered Offeror.
- (e) Processing time, which normally takes 48 hours, should be taken into consideration when registering. Offerors who are not registered should consider applying for registration immediately upon receipt of this solicitation.
- (f) The Contractor is responsible for the accuracy and completeness of the data within the CCR database, and for any liability resulting from the Government's reliance on inaccurate or incomplete data. To remain registered in the CCR database after the initial registration, the Contractor is required to review and update on an annual basis from the date of initial registration or subsequent updates its information in the CCR database to ensure it is current, accurate and complete. Updating information in the CCR does not alter the terms and conditions of this contract and is not a substitute for a properly executed contractual document.
- (g)
- (1)
- (i) If a Contractor has legally changed its business name, "doing business as" name, or division name (whichever is shown on the contract), or has transferred the assets used in performing the contract, but has not completed the necessary requirements regarding novation and change-of-name agreements in Subpart 42.12, the Contractor shall provide the responsible Contracting Officer a minimum of one business day's written notification of its intention to (A) change the name in the CCR database; (B) comply with the requirements of Subpart 42.12 of the FAR; and (C) agree in writing to the timeline and procedures specified by the responsible Contracting Officer. The Contractor must provide with the notification sufficient documentation to support the legally changed name.
- (ii) If the Contractor fails to comply with the requirements of paragraph (g)(1)(i) of this clause, or fails to perform the agreement at paragraph (g)(1)(i)(C) of this clause, and, in the absence of a properly executed novation or change-of-name agreement, the CCR information that shows the Contractor to be other than the Contractor indicated in the contract will be considered to be incorrect information within the meaning of the "Suspension of Payment" paragraph of the electronic funds transfer (EFT) clause of this contract.
- (2) The Contractor shall not change the name or address for EFT payments or manual payments, as appropriate, in the CCR record to reflect an assignee for the purpose of assignment of claims (see FAR Subpart 32.8, Assignment of Claims). Assignees shall be separately registered in the CCR database. Information provided to the Contractor's CCR record that indicates payments, including those made by EFT, to an ultimate recipient other than that Contractor will be considered to be incorrect information within the meaning of the "Suspension of payment" paragraph of the EFT clause of this contract.
- (h) Offerors and Contractors may obtain information on registration and annual confirmation requirements via the internet at <http://www.ccr.gov> or by calling 1-888-227-2423, or 269-961-5757.

(End of clause)

252.222-7006 COMBATING TRAFFICKING IN PERSONS (OCT 2006)

- (a) Definitions. As used in this clause--

Coercion means--

- (1) Threats of serious harm to or physical restraint against any person;
- (2) Any scheme, plan, or pattern intended to cause a person to believe that failure to perform an act would result in serious harm to or physical restraint against any person; or
- (3) The abuse or threatened abuse of the legal process.

Commercial sex act means any sex act on account of which anything of value is given to or received by any person.

Construction means construction, alteration, or repair (including dredging, excavating, and painting) of buildings, structures, or other real property. For purposes of this definition, the terms "buildings, structures, or other real property" include, but are not limited to, improvements of all types, such as bridges, dams, plants, highways, parkways, streets, subways, tunnels, sewers, mains, power lines, cemeteries, pumping stations, railways, airport facilities, terminals, docks, piers, wharves, ways, lighthouses, buoys, jetties, breakwaters, levees, canals, and channels. Construction does not include the manufacture, production, furnishing, construction, alteration, repair, processing, or assembling of vessels, aircraft, or other kinds of personal property.

Debt bondage means the status or condition of a debtor arising from a pledge by the debtor of his or her personal services or of those of a person under his or her control as a security for debt, if the value of those services as reasonably assessed is not applied toward the liquidation of the debt or the length and nature of those services are not respectively limited and defined.

Employee means an employee of a contractor directly engaged in the performance of work under a Government contract, including all direct cost employees and any other contractor employee who has other than a minimal impact or involvement in contract performance.

Individual means a contractor that has no more than one employee including the contractor.

Involuntary servitude includes a condition of servitude induced by means of--

- (1) Any scheme, plan, or pattern intended to cause a person to believe that, if the person did not enter into or continue in such conditions, that person or another person would suffer serious harm or physical restraint; or
- (2) The abuse or threatened abuse of the legal process (22 U.S.C. 7102(5)).

Service contract means a contract that directly engages the time and effort of a contractor whose primary purpose is to perform an identifiable task rather than to furnish an end item of supply.

Service (other than commercial) means a service that does not meet the definition of commercial item in section 2.101 of the Federal Acquisition Regulation.

Severe forms of trafficking in persons means--

- (1) Sex trafficking in which a commercial sex act is induced by force, fraud, or coercion, or in which the person induced to perform such act has not attained 18 years of age; or
- (2) The recruitment, harboring, transportation, provision, or obtaining of a person for labor or services, through the use of force, fraud, or coercion for the purpose of subsection to involuntary servitude, peonage, debt bondage, or slavery.

Sex trafficking means the recruitment, harboring, transportation, provision, or obtaining of a person for the purpose of a commercial sex act.

United States means the 50 States, the District of Columbia, and outlying areas.

(b) Policy. It is the policy of the Department of Defense (DoD) that trafficking in persons will not be facilitated in any way by the activities of DoD contractors or contractor personnel. DoD will not tolerate severe forms of trafficking in persons or use of forced labor by DoD contractors, DoD subcontractors, or DoD contractor or subcontractor personnel during the period of contract performance. Furthermore, DoD will not tolerate the procurement of commercial sex acts by DoD contractors, DoD subcontractors, or DoD contractor or subcontractor personnel, during the period of performance of service or construction contracts. As delineated in National Security Presidential Directive 22, the United States has adopted a zero tolerance policy regarding contractor personnel who engage in or support trafficking in persons.

(c) Contractor compliance.

(1) During the performance of this contract, the Contractor shall comply with the policy of DoD and shall not engage in or support severe forms of trafficking in persons or use forced labor. The Contractor is responsible for knowing and adhering to United States Government zero-tolerance policy and all host nation laws and regulations relating to trafficking in persons and the use of forced labor.

(2) Additionally, if this contract is a service or construction contract, the Contractor shall not engage in or support the procurement of commercial sex acts during the performance of this contract and is responsible for knowing and adhering to United States Government policy and all host nation laws and regulations relating thereto.

(d) Contractor responsibilities for employee conduct--service or construction contracts. If this contract is a service or construction contract, the Contractor, if other than an individual, shall establish policies and procedures for ensuring that during the performance of this contract, its employees do not engage in or support severe forms of trafficking in persons, procure commercial sex acts, or use forced labor. At a minimum, the Contractor shall--

(1) Publish a statement notifying its employees of the United States Government policy described in paragraph (b) of this clause and specifying the actions that will be taken against employees for violations of this policy. Such actions may include, but are not limited to, removal from the contract, reduction in benefits, termination of employment, or removal from the host country;

(2) Establish an awareness program to inform employees regarding--

(i) The Contractor's policy of ensuring that employees do not engage in severe forms of trafficking in persons, procure commercial sex acts, or use forced labor;

(ii) The actions that will be taken against employees for violation of such policy; and

(iii) Laws, regulations, and directives that apply to conduct when performance of the contract is outside the United States, including--

(A) All host country Government laws and regulations relating to severe forms of trafficking in persons, procurement of commercial sex acts, and use of forced labor;

(B) All United States laws and regulations on severe forms of trafficking in persons, procurement of commercial sex acts, and use of forced labor that may apply to its employees' conduct in the host nation, including those laws for which jurisdiction is established by the Military Extraterritorial Jurisdiction Act of 2000 (18 U.S.C. 3261-3267) and 18 U.S.C. 3271, Trafficking in persons offenses committed by persons employed by or accompanying the Federal Government outside the United States; and

(C) Directives on trafficking in persons from the Combatant Commander, or the Combatant Commander's designated representative, that apply to contractor employees, such as general orders and military listings of "off-limits" local establishments; and

(3) Provide all employees directly engaged in performance of the contract with--

(i) Any necessary legal guidance and interpretations regarding combating trafficking in persons policies, laws, regulations, and directives applicable to performance in the host country; and

(ii) A copy of the statement required by paragraph (d)(1) of this clause. If this contract is for services (other than commercial), the Contractor shall obtain written agreement from the employee that the employee shall abide by the terms of the statement.

(e) Employee violations--notification and action. The Contractor shall--

(1) Inform the Contracting Officer immediately of any information it receives from any source (including host country law enforcement) that alleges a contractor or subcontractor employee has engaged in conduct that violates the policy in paragraph (b) of this clause. Notification to the Contracting Officer does not alleviate the Contractor's responsibility to comply with applicable host nation laws;

(2) In accordance with its own operating procedures and applicable policies, laws, regulations, and directives, take appropriate action, up to and including removal from the host nation or dismissal, against any of its employees who violate the policy in paragraph (b) of this clause; and

(3) Inform the Contracting Officer of any actions taken against employees pursuant to this clause.

(f) Remedies. In addition to other remedies available to the Government, the Contractor's failure to comply with the requirements of paragraphs (c), (d), (e), or (g) of this clause may render the Contractor subject to--

(1) Required removal of a Contractor employee or employees from the performance of the contract;

(2) Required subcontractor termination;

(3) Suspension of contract payments;

(4) Loss of award fee, consistent with the award fee plan, for the performance period in which the Government determined Contractor non-compliance;

(5) Termination of the contract for default, in accordance with the Termination clause of this contract; or

(6) Suspension or debarment.

(g) Subcontracts.

(1)(i) The Contractor shall include the substance of this clause, including this paragraph (g), in all subcontracts performed outside the United States; and

(ii) If this contract is for services (other than commercial), the Contractor shall include the substance of this clause, including this paragraph (g), in all subcontracts performed in the United States for the acquisition of services (other than commercial).

(2) If this contract is a service or construction contract, the Contractor shall conduct periodic reviews of its service and construction subcontractors to verify compliance with their obligations pursuant to paragraph (d) of this clause.

(3) The Contractor shall--

(i) Immediately inform the Contracting Officer of any information it receives from any source (including host country law enforcement) that alleges a subcontractor has engaged in conduct that violates the policy in paragraph (b) of this clause. Notification to the Contracting Officer does not alleviate the Contractor's responsibility to comply with applicable host nation laws;

(ii) Take appropriate action, including termination of the subcontract, when the Contractor obtains sufficient evidence to determine that the subcontractor is in non-compliance with its contractual obligations pursuant to this clause; and

(iii) Inform the Contracting Officer of any actions taken against subcontractors pursuant to this clause.

(End of Clause)

252.225-7043 ANTITERRORISM/FORCE PROTECTION POLICY FOR DEFENSE CONTRACTORS  
OUTSIDE THE UNITED STATES (MAR 2006)

(a) Definition. United States, as used in this clause, means, the 50 States, the District of Columbia, and outlying areas.

(b) Except as provided in paragraph (c) of this clause, the Contractor and its subcontractors, if performing or traveling outside the United States under this contract, shall--

(1) Affiliate with the Overseas Security Advisory Council, if the Contractor or subcontractor is a U.S. entity;

(2) Ensure that Contractor and subcontractor personnel who are U.S. nationals and are in-country on a non-transitory basis, register with the U.S. Embassy, and that Contractor and subcontractor personnel who are third country nationals comply with any security related requirements of the Embassy of their nationality;

(3) Provide, to Contractor and subcontractor personnel, antiterrorism/force protection awareness information commensurate with that which the Department of Defense (DoD) provides to its military and civilian personnel and their families, to the extent such information can be made available prior to travel outside the United States; and

(4) Obtain and comply with the most current antiterrorism/force protection guidance for Contractor and subcontractor personnel.

(c) The requirements of this clause do not apply to any subcontractor that is--

(1) A foreign government;

(2) A representative of a foreign government; or

(3) A foreign corporation wholly owned by a foreign government.

(d) Information and guidance pertaining to DoD antiterrorism/force protection can be obtained from Combined Forces Command – Afghanistan (CFC-A) Base Defense Operations Center (BDOC), Camp Eggers, Kabul, Afghanistan.

(End of clause)

252.229-7000 INVOICES EXCLUSIVE OF TAXES OR DUTIES (JUNE 1997)

Invoices submitted in accordance with the terms and conditions of this contract shall be exclusive of all taxes or duties for which relief is available.

(End of clause)

252.229-7001 TAX RELIEF (JUN 1997)

(a) Prices set forth in this contract are exclusive of all taxes and duties from which the United States Government is exempt by virtue of tax agreements between the United States Government and the Contractor's government. The following taxes or duties have been excluded from the contract price: "Reference the exchange of diplomatic notes between the USA and Afghanistan dated September 26, 2002, December 12, 2002 and May 28, 2003; and/or successor notes or agreements as applicable."

(b) The Contractor's invoice shall list separately the gross price, amount of tax deducted, and net price charged.

(c) When items manufactured to United States Government specifications are being acquired, the Contractor shall identify the materials or components intended to be imported in order to ensure that relief from import duties is obtained. If the Contractor intends to use imported products from inventories on hand, the price of which includes a factor for import duties, the Contractor shall ensure the United States Government's exemption from these taxes. The Contractor may obtain a refund of the import duties from its government or request the duty-free import of an amount of supplies or components corresponding to that used from inventory for this contract.

(End of clause)

252.236-7001 CONTRACT DRAWINGS AND SPECIFICATIONS (AUG 2000)

(a) The Government will provide to the Contractor, without charge, one set of contract drawings and specifications, except publications incorporated into the technical provisions by reference, in electronic or paper media as chosen by the Contracting Officer.

(b) The Contractor shall--

- (1) Check all drawings furnished immediately upon receipt;
- (2) Compare all drawings and verify the figures before laying out the work;
- (3) Promptly notify the Contracting Officer of any discrepancies;
- (4) Be responsible for any errors that might have been avoided by complying with this paragraph (b); and

(5) Reproduce and print contract drawings and specifications as needed.

(c) In general--

(1) Large-scale drawings shall govern small-scale drawings; and

(2) The Contractor shall follow figures marked on drawings in preference to scale measurements.

(d) Omissions from the drawings or specifications or the misdescription of details of work that are manifestly necessary to carry out the intent of the drawings and specifications, or that are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed details of the work. The Contractor shall perform such details as if fully and correctly set forth and described in the drawings and specifications.

(e) The work shall conform to the specifications and the contract drawings identified on the following index of drawings:

[See Appendixes](#)

(End of clause)

## Section 00800 - Special Contract Requirements

ECONOMIC SURVEILLANCESECTION 00800  
ECONOMIC SURVEILLANCE

Contractor shall report average pay rates and employment levels, for both domestic and international employees monthly. The information will be reported by labor category (as specified by USACE) and be specific to each active work site. In addition the contractor shall report monthly non-labor contract spending for domestic and international contract expenses. This information will be reported by category (as specified by USACE) and will be specific to each active work site.

DBA WORKERS COMP INS ACT(b) **WORKERS COMPENSATION INSURANCE (DEFENSE BASE ACT) -  
CONSTRUCTION (NOV 2005)**

52 This clause supplements FAR Clause 52.228-3

53 The contractor agrees to procure Defense Base Act (DBA) insurance pursuant to the terms of the contract between the U.S. Army Corps of Engineers (USACE) and the USACE DBA insurance carrier unless the contractor has a DBA self-insurance program approved by the Department of Labor. The contractor shall submit a copy of the Department of Labor's approval to the contracting officer upon contract award. The current rate under the USACE contract is \$8.50 per \$100 of compensation for construction.

54 The contractor agrees to insert a clause substantially the same as the one in all subcontracts to which DBA is applicable. Subcontractors shall be required to insert a similar clause in any of their subcontracts subject to the DBA.

55 Should the rates for DBA insurance coverage increase or decrease during the performance of this contract, USACE shall modify the contract accordingly.

End of clause

DBA INSURANCE RATES**52.000-4106 DEFENSE BASE ACT INSURANCE RATES – LIMITATION FIXED-PRICE (NOV  
2005)**

The U.S. Army Corps of Engineers (USACE) has entered into a contract with an insurance carrier to provide all Defense Base Act (DBA) insurance to USACE contractors at a contracted rate under the OSD/USACE Centrally-Managed Pilot DBA Insurance Program. The rates for this insurance are as follows:

01415 – Page 52

Services @ \$5.00 per \$100 of compensation; or

Construction @ \$8.50 per \$100 of compensation.

Bidders/Offerors should compute the total compensation (direct salary plus differential, but excluding per diem, housing allowance and other miscellaneous post allowances) to be paid to employees who will be covered by DBA insurance and the cost of DBA totals in the spaces provided for the base period and whatever extension there may be thereafter, if applicable

(1) Compensation of Covered Employees: \_\_\_\_\_

(2) Defense Base Act Insurance Costs: \_\_\_\_\_

(3) Total Cost: \_\_\_\_\_

Bidders/Offerors shall include a statement as to whether or not local nationals or third country nationals will be employed on the resultant contract

End of clause

• **CNA Insurance – Contractor – Insurance Carrier**

Roger Ellickson (312) 822-4395 [Roger.ellickson@cna.com](mailto:Roger.ellickson@cna.com)

The Continental Insurance Co.

Roger Ellickson

DBA CNA Insurance

333 S. Wabash Avenue

Chicago, IL 60685-1809

• **Rutherford International – Insurance Broker**

James Walczak (703) 813-6544 [jim.walczak@rutherford.com](mailto:jim.walczak@rutherford.com)

Rutherford International

James Walczak

5500 Cherokee Avenue, Suite 300

Alexandria, VA 22312

## CLAUSES INCORPORATED BY REFERENCE

52.211-13	Time Extensions	SEP 2000
52.246-12	Inspection of Construction	AUG 1996
252.232-7003	Electronic Submission of Payment Requests	MAY 2006

## CLAUSES INCORPORATED BY FULL TEXT

## 52.211-10 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (APR 1984)

The Contractor shall be required to (a) commence work under this contract within **seven (7)** calendar days after the date the Contractor receives the notice to proceed, (b) prosecute the work diligently, and (c) complete the entire work ready for use not later than 360 calendar days after the date the Contractor receives the notice to proceed. The time stated for completion shall include final cleanup of the premises.

(End of clause)

## 52.211-12 LIQUIDATED DAMAGES--CONSTRUCTION (SEP 2000)

(a) If the Contractor fails to complete the work within the time specified in the contract, the Contractor shall pay liquidated damages to the Government in the amount of \$2037.00 for each calendar day of delay until the work is completed or accepted.

(b) If the Government terminates the Contractor's right to proceed, liquidated damages will continue to accrue until the work is completed. These liquidated damages are in addition to excess costs of repurchase under the Termination clause.

(End of clause)

## 52.236-4 PHYSICAL DATA (APR 1984)

**Data and information furnished or referred to below is for the Contractor's information. The Government shall not be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor.**

(a) The indications of physical conditions on the drawings and in the specifications are the result of site investigations by either surveys core borings, and/or reconnaissance.

(b) Weather conditions. Information regarding weather conditions is available in Technical Specification Section 01060 for examination by the bidders. If additional information concerning weather is required prospective bidders should contact the U. S. Army Corps of Engineers, Afghanistan Engineer District, House 1 Street 1, West Wazir Akbar Khan, (behind Amani High School), Kabul, Afghanistan.

(c) Transportation facilities. It shall be the responsibility of the Contractor to make his own investigation of available roads for transportation, of load limits of bridges on the roads, and of other road conditions, which may effect transportation of materials, equipment, and personnel to the site of the work.

(End of clause)

## SCOPE OF WORK

### **SECTION 01010-A SCOPE OF WORK (Uthal Site)**

#### **1. GENERAL**

The project consists of the design and construction of a new **Cargo and Vehicle Inspection Compound** for the **Pakistan Coast Guard Battalion #1 in Uthal in Pakistan**. Site is located near the existing Pakistan Coast Guard Battalion #1 Headquarters, Uthal, Pakistan. Refer to appendices for approximate site location. The project is defined as the design, material, labor, and equipment to construct buildings, parking, utilities and other infrastructure for the entire inspection facility. 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:

IBC, International Building Codes 2003

#### **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 of the Basic Contract.

#### **1.3 COST ESTIMATE**

The contractor shall prepare a parametric construction cost estimate. The contractor shall prepare a thorough, well-supported, estimate reflecting the final design features, construction schedule and conditions, and any construction phasing requirements. The cost estimate shall be submitted as part of the 35%, 99% and Final design submittals are required for this contract.

#### **2. LOCATION**

The site is located in Uthal, Pakistan.

#### **3. UNEXPLODED ORDNANCE (UXO)**

##### **3.1 UXO REMOVAL AND CLEARANCE - *for Uthal inspection compound***

The contract limits of this project is believed to be clear of UXO, however, UXO may be discovered and/or uncovered within or around the construction work areas. If, during construction activities, UXO is unexpectedly discovered or uncovered, or suspected to be present, all operations shall cease immediately. The contractor shall safeguard the site pending notification and arrival of the UXO team. No further work shall be conducted in that location until the UXO team has assessed the situation to determine if disposal action is required. Once the UXO has been removed and the UXO team has issued an "All Clear" notice, construction work shall resume.

#### **4. SUMMARY OF WORK**

##### **4.1 CONTRACTOR REQUIREMENTS**

The contractor shall design and construct the facilities as a design-construct contract and shall be in accordance with the requirements stated HEREIN and in Section 01015: TECHNICAL REQUIREMENTS. Refer to attachment following this section for more specifics for required spaces. The design and construction work shall include but not be limited to that shown within attached table and described herein. The concept drawings

provided are only to be used as a starting point. **The contractor must incorporate all requirements stated in this section and in section 1015 above and beyond the basic concept site layout provided.**

#### 4.1.1 GENERAL REQUIREMENTS FOR FACILITIES

All requirements set forth in the Scope of Work, but not included in the Technical Requirements, shall be considered as set forth in both, and vice versa. Provide heating and cooling for all facilities unless otherwise stated in Section 1010 or 1015. All toilets shall be mixed eastern and western style. All eastern toilets shall face north or south.

All standard construction amenities and details such as heating, lighting, site drainage, utility connections, etc. shall be implied as a design and construction requirement. Drawings referenced are contained in Section 01015 or Appendix A. Concrete walkways are required to connect all buildings, facilities, and features such as parking lots, power plants, etc.

The design and construction work shall include but not be limited to the following sub-paragraphs.

Pakistan Coast Guard at Uthal Scanning Facility by Rank				
SENIOR	HIGH	MID	ORDINARY	Total
0	2	6	42	50

In general, this project consists of designing and constructing of the following:

#### 4.1.2 Base Bid

- 4.1.1.1 Demolition and grading
- 4.1.1.2 Roads with security measures
- 4.1.1.3 Perimeter Wall and Guard Towers
- 4.1.1.4 Entry Control Points
- 4.1.1.5 Initial Search Facility
- 4.1.1.6 Gantry Scanning Facility
- 4.1.1.7 Detail Search Office/Waiting Facility
- 4.1.1.8 Latrine Facility
- 4.1.1.9 Generator Power Plant and electrical system
- 4.1.1.10 Water System
- 4.1.1.11 Sanitary Sewer System
- 4.1.1.12 Storage Connex Containers

#### 4.1.3 Option #1

- 4.1.1.13 General Waiting and Vending Facility (Facility Area)
- 4.1.1.14 Barracks
- 4.1.1.15 K-9 Facility
- 4.1.1.16 Dining Facility (DFAC)
- 4.1.1.17 Office for Rapiscan Staff, 95 SM (1022 SF)- for 7 Person
- 4.1.1.18 Warehouse for Confiscated materials

#### 4.2 MASTER PLANNING

The Contractor shall prepare a site Master Plan based on information contained in the Request for Proposal. The development of the master plan will include participation in a design Charrette that will be conducted at the Corps of Engineers Headquarters Office in Kabul. Concept drawings provided are only concepts. The Contractor must

verify the space and functional requirements with the customer and code compliance in accordance of section 1010 and section 1015 of this contract.

#### **4.3 WATER SYSTEM**

Design a potable water system, to include a ground well water source, water well pump, and hydro-pneumatic water storage tank, and underground pipe distribution system. Assume that the well shall be constructed to deliver a minimum 345-414 kPa (50-60 psi) at a flow rate that is twice the required daily demand. The storage tanks shall provide capacity for a minimum of 100 percent of the required daily demand based on 155 L/capita/day (41 gal/capita/day). The storage tank and distribution system shall be designed to provide a minimum 276 kPa (40 psi) at ground level at all points in the systems. Minimum pressures of 207 kPa (30 psi), under peak domestic flow conditions, can be tolerated in small areas as long as all peak flow requirements can be satisfied. Maximum water pressures in distribution mains and service lines shall not exceed 517 kPa (75 psi) at ground elevation. Per customer, fire flow and irrigation systems shall not be included in design calculations. Provide an enclosed water well house.

#### **4.4 SANITARY SEWER SYSTEM**

Sanitary sewer collection and treatment system shall be designed and constructed by contractor. Sewer collection system shall consist of gravity sewer pipe and appurtenances such as manholes, cleanouts and building service connections. The gravity sewer collection system shall connect to the sewage treatment and effluent disposal system. Septic tank shall be underground and shall be located at proposed locations as shown. Sanitary sewer system shall be designed to accommodate future expansion. System capacity shall be calculated based on a hydraulic waste load that is equivalent to 80 percent of the Required Daily Demand for the water system as specified in these technical requirements, or as 33 gallons per capita per day (gpcd), whichever is greater. A 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. Sewage treatment system shall be a traditional septic tank absorption field effluent disposal system, facultative pond system or other low maintenance, cost effective system. The sewage collection system and wastewater treatment system and effluent disposal shall be designed to accommodate the total facility compound population as specified in the Scope of Work *plus* 25% and verified by the contractor.

#### **4.5 DEMOLITION AND GRADING**

The contractor shall demolish all existing structures and buildings at the site prior to commencement of new work. The Contractor shall remove and dispose of all debris, concrete, and foundations. The Contractor shall verify the location of debris disposal with the Contracting Officer. The Contractor shall perform complete final site grading after installation of all required drainage structures per the Drainage Plan that shall be prepared as part of this project and after installation of any other buried utilities or other project components. Contractor is to relocate (5) electrical poles on the site.

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. Concrete walkways shall be installed between buildings and parking areas.

#### **4.6 SITE ELECTRICAL DISTRIBUTION SYSTEM**

**POWER SYSTEM:** The contractor shall design a power system for supply and distribution to all buildings to include generators with fuel storage, and underground electrical distribution. All electrical design and installation shall meet NEC (NFPA 70) requirements. Electrical receptacles shall be provided as indicated in section in 01015, Technical Requirements. Conductors and circuits shall be sized for the specific loads. All wiring shall be run and pulled through conduits. The power plant shall include prime power generators, switchgear, and all appurtenances necessary to meet the electrical demand. Provide an enclosed a generator house.

**POWER:** Contractor shall connect to local power grid where available and use generators as backup system. Transformers shall be size at 120% of demand load. Transformers shall be fully enclosed, out-door rated, dead-front type, complete from a single manufacturer. Contractor shall provide one or more generators sized to provide backup power for 120% of the maximum calculated demand load. Single generator size shall not exceed 1 MW (1,000kW); in the event more than one generator is required to handle the entire load, the generators shall be provided with a synchronizer-switch, so that when total power demanded from one generator reaches 90% of the generators maximum, an additional generator shall automatically start and supplement the running generators, sharing the load between the generators equally.

**GENERATOR FUEL STORAGE:** The Contractor shall provide a design for low-profile fuel storage tanks that can accommodate a 30 day fuel supply based on the generators operating at 100% load. The design will provide capability for fuel delivery from two locations – one from outside the wall surrounding the compound and one directly into the fuel tanks. The delivery point outside the compound wall shall be lockable and securable from tampering or sabotage. A road shall be provided leading to the outside fuel delivery point with a place for trucks to turn around.

Contractor shall design and all interior electrical systems as described in section 01015 Technical Requirements and shall design and install any required exterior lighting, as described in section 01015.

#### **4.7 FORCE PROTECTION MEASURES**

The Contractor shall design and construct force protection measures to include masonry or stone walls, primary and secondary Entry Control Points (ECPs), guard towers, illumination system, and communication systems. The designer shall incorporate force protection 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 be in accordance with Joint Security Directorate Antiterrorism/Force Protection Guide, March 2002.

##### **4.7.1 PERIMETER WALL**

Masonry or native stone walls shall be constructed around the perimeter of the site. The height of the walls shall measure at least **7.5** meters (25 feet) from the inside and outside grades at the perimeter wall facing the road side and all other sides shall be at least **3.0** meters (9.8 feet) high. The wall shall be topped with barbed wire outriggers and single-coil concertina style razor wire.

##### **4.7.1.1 Boundary Gates**

The gates shall be sliding steel gate. Gates shall be large enough to allow trucks to pass through with excess space on both sides, 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 installed. Gates shall have a sufficient number of anchors mounted to the masonry walls, to support each gate leaf. 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.

##### **4.7.2 Primary Entry Control Point**

The Primary ECP shall include a paved entrance, manually operated, sliding steel gate or hinged steel gate; a guard house; vehicle drop arm barriers; and jersey barriers placed in serpentine pattern to prevent high speed vehicle entry into compound. The gate house shall be a 16 SM building consisting of a reinforced concrete foundation and floor slab, reinforced concrete masonry walls and a steel framed, sloping roof with a metal door and horizontal sliding windows with metal window frame, 800mm high x 1000mm wide. The floor finish shall be terrazzo. The exterior wall finish shall be stucco and the interior finish shall be plaster. The finished ceiling shall be either gypsum wallboard or plaster. Provide mineral fiber insulation in the ceiling space. Glazing for the windows shall be an 8mm thick laminated glass. The roof shall have a minimum of 2:12 slope with metal roofing. The building shall have 4 horizontal sliding windows, one located in each wall.

##### **4.7.3 Secondary Entry Control Point**

This ECP shall be for the exiting the compound after inspections. This secondary entry control point shall be separated and away from the Primary Entry Control Point. **Note this is not reflected on the drawings and the**

**contract shall revise the site layout as described in the Scope of Work section 1010 and Technical Requirement section 1015.** The Secondary ECP shall include a paved entrance, manually operated, sliding steel gate or hinged steel gate; a guard house; vehicle drop arm barriers; and passive anti-ram barriers. The gate house shall be a 16 SM building consisting of a reinforced concrete foundation and floor slab, reinforced concrete masonry walls and a steel framed, sloping roof with a metal door and horizontal sliding windows with metal window frame, 800mm high x 1000mm wide. The floor finish shall be sealed concrete. The exterior wall finish shall be stucco and the interior finish shall be plaster. The finished ceiling shall be either gypsum wallboard or plaster. Provide mineral fiber insulation in the ceiling space. Glazing for the windows shall be an 8mm thick laminated glass. The roof shall have a minimum of 2:12 slope with metal roofing. The building shall have 4 horizontal sliding windows, one located in each wall.

#### **4.7.4 Guard Towers**

The Contractor shall design and construct (4) guard towers **at each inside corner** of the force protection walls and (2) **additional towers** to be determined by the Contracting Officer Representation (COR). Guard tower shall be a minimum of 2m x 2m and not to exceed 3m x 3m in size. The floor height shall be elevated as to allow the window sill to be 0.5m above the top of the wall. The guard tower shall be constructed of reinforced CMU walls with a metal door and horizontal sliding windows with metal window frame, 800mm high x 1000mm wide. Glazing for the windows shall be an 8mm thick laminated glass. Windows shall be located on all 4 sides to provide a 360 degree viewing area. Windows shall not be screened. The guard tower must meet force protection requirements. The tower shall be supported on reinforced concrete footings. Footings shall be located below the frost line or a minimum of 800 mm, whichever is greater.

The roof shall have a gutter and downspout system to evacuate rain accumulation. The down spout shall run the entire height of the tower and drain at the finished ground level to a splash block. The stairs and platforms shall be constructed per OSHA Standards, with entry to the tower through a lockable security door. Guard Tower shall have heating and cooling with split pack unit and unit shall be able to maintain a minimum of 20 degrees C. Guard towers shall be provided with general lighting and shall be fitted with one 360-degree omni-directional searchlight. One weather-resistant duplex receptacle shall be provided as required for general use. The area in the immediate exterior vicinity of the guard tower shall be provided with an all weather non-slip surface and shall be graded to sufficiently drain away from structure. Guard Towers shall have a 360 degree walk around balcony with guard rails.

Illuminate the exterior of the compound. Position lights to provide overlapping coverage and to avoid illuminating guard positions. Do not use white lights inside guard towers. Use red, blue, or black lenses in interior guard tower lighting.

For communications, provide rigid metal conduit with pull strings in each guard tower and gate house. Wiring for communications system is not in the contract.

Force Protection measures also include maximizing standoff distances from the control perimeter for inhabited buildings, reinforced guard houses, guard towers, heavy duty steel exterior doors and frames, laminated glazing, and all other standards set forth herein.

#### **4.7.5 Loud Speaker and Alarm System**

Install Loud Speaker & Alarm System that can alert the entire compound via panic button from any tower or guard post station. 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.

#### **4.8 ROAD NETWORK, SIDEWALK, AND PARKING**

The Contractor shall design and construct the entire road and parking network. **The roads shall be designed to meet the MoPW standard for a standard single axle load of 8.2 metric tons.** Contractor shall revise and design the road system to allow stacking of trucks before initial search and before the detail search facility. Design and construct road system that will not permit entry traffic to have the potential to mix with exiting traffic. Provide parking area for (5) private staff vehicles and parking for (10) cargo trucks inside the compound.

Contractor shall provide one-way road spikes throughout the compound to prevent truck traffic in the reverse direction.

Road design shall be designed per Section 01015, Technical Requirements. Roadways and sidewalks are required as shown on attached drawings and shall be designed and constructed based upon recommendations from geotechnical analysis as required herein. A storm drainage system shall also be included. The road layout shall provide access to entry control points, parking lots, inspection facilities, fuel points, generator yard, sewage septic tank, and the trash collection point.

The Contractor shall design and provide landscaping for the compound. Design and provide a network of concrete sidewalks to connect the buildings. Sidewalks shall be wide enough to be used as fire-lane/ service roads. Provide outdoor benches, lighting, and gathering areas.

#### **4.9 TRASH POINT**

The Contractor shall design and construct, 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.

#### **4.10 INITIAL SEARCH FACILITY**

The contractor shall design and construct underground inspection pit for full length of cargo truck with trailer. Design and construct moveable barriers at entry and exit to contain the cargo truck while undergoing initial inspection. Provide concrete jersey barriers on both sides of the initial inspection area. Provide enough space on one side next to the inspection pit for scanning equipment truck. Contractor shall provide floor mounted drum type barriers to restrict movement of trucks undergoing inspection. Refer to drawings.

#### **4.11 GANTRY SCANNING FACILITY – DETAILED SCANNING**

The Contractor shall design and construct a **1300 SM** pre-engineered metal covered facility to house the **“Rapiscan Eagle Gantry possessing a 6 Mega-Electron Volt (MeV) X-Ray source”**. This facility shall be coordinated with the specifications of the Scanning equipment from manufacturer for the capability of scanning two cargo trucks. Provide large sliding metal doors to prevent visibility into the warehouse for entry and exit of this warehouse. Provide raised ramp up concrete drive way at full length of two cargo trucks for scanning under vehicles. Provide reinforced concrete wall barriers all around to protect the equipment from vehicular damage. Design and construct additional supporting facilities.

- a) Design and construct **70 SM Maintenance Staff Office**.
- b) Design and construct entry vehicle drop arm to control entry; and jersey barriers placed in serpentine pattern to prevent high speed vehicle entry into Gantry Scanning building.
- c) Design and construct exit vehicle drop arm to control entry; and jersey barriers placed in serpentine pattern to prevent high speed vehicle exiting Gantry Scanning building.
- d) Provide (3) meter high security fencing topped with barbed wire outriggers and single-coil concertina style razor wire all around the Scanning facility.
- e) Design and construct parking for cargo trucks after the scanning process building for secure long term parking. Secure the parking area with (3) meter high security fencing topped with barbed wire outriggers and single-coil concertina style razor wire.

#### **4.12 DETAILED SEARCH OFFICE / WAITING FACILITY**

The Contractor shall design and construct a single administrative facility for staff with waiting area for **(10) personnel awaiting inspection**. Provide two interview rooms, holding cell, two private offices, private staff bathroom with shower, and one share office space for 5 high officers with counter to waiting room. Space within the building shall be organized to provide functionally separate facilities for the truckers waiting area and the facility staff. Office space allocations shall be made according to the following table:

Net Area per Soldier with Break Down by Rank					
	Commander	Senior	High	Middle	Ordinary
Office Type	Private	Private	Semi-Private	Open Bay	None
NSM*/person	18.5	13.9	9.3	7	0

\*NSM = net square meters

- 1) Only one Commander Office per building. In cases where the High Officer is the Commander, then use the Commander Office for space calculations.
- 2) The figures above are guidelines and can be tailored as necessary to facilitate design efficiencies.
- 3) Electric hot water heaters shall be installed to provide hot water to the showers and sinks. Electric cabinet heaters or electric unit heaters suitable for wet areas shall be utilized to provide heat in the facility. Accessories shall include but not limited to; toilet paper holders, soap dishes, curtains and curtain rods, robe hooks, mirrors, paper towel dispenser, metal shelf, and grab bars. The building should have janitor/storage room with mop sinks.
- 4) Provide file rooms, storage areas, vending area, janitor closet with mop sink, and other special spaces in the building in addition to requirement listed above.
- 5) The bathroom in the Office Building shall have lockable doors.
- 6) Holding Cells. Provide one windowless room, 9.3 SM (100 square feet) in size. Each holding cell shall have solid walls and a sliding steel door. The door shall have a pass-through slot for passing of food trays with a hinged cover lockable from the outside. Built into the bottom of the door shall be a 0.3m wide by 0.5m tall door for passing a bucket in and out with a hinged cover lockable from the outside. Next to the holding cell install a 2.4m long bench securely bolted to the floor. Above the bench, install a steel bar for securing detainees by handcuffing them to the bar.

#### 4.13 GENERAL STORAGE CONEX CONTAINERS

The Contractor shall provide **(2) forty feet connex storage containers** to store confiscated goods and other materials. This facility should be located after the Detailed Search Area. Provide security locks for the main doors. Contractor shall provide concrete slab flooring for these connex containers. Concrete slab shall be at least 30 CM above the surrounding grade.

#### 4.14 LATRINE FACILITY

The Contractor shall design and construct a Latrine facility next to the Detailed Search Office/Waiting facility and near to the General Waiting and Vending Facility. Provide two private eastern toilets and two sinks for men. A separate latrine facility shall be constructed for females and shall be conjoined with the male latrine, but the doors shall be located on the opposite side of the building. Latrines for shall be eastern style units and be facing north and south.

The Contractor shall incorporate the following special features into the building:

All sinks shall be trough type constructed of block and concrete with ceramic tile exterior and lining capable of withstanding abuse.

Electric hot water heaters shall be installed to provide hot water to the sinks.

Electric cabinet heaters or electric unit heaters suitable for wet areas shall be utilized to provide heat in the facility.

The building shall be constructed with exhaust fans to ventilate steam to the outside environment and, where required, insulated piping to prevent freezing of water pipes in winter.

All water supply plumbing shall be exposed PVC pipes or galvanized metal.

Accessories shall include but not limited to; toilet paper holders, soap dishes, mirrors, paper towel dispenser, metal shelf, robe hooks and grab bars. The building should have janitor/storage room with mop sink.

**4.15 BARRACKS - Option facility**

The Contractor shall design and construct barracks facilities based on the total population of (50) personnel and the areas shown in the following table. Provide separate barracks to support a female population equal to 5 percent of the total population or 2 persons, whichever is greater. Barracks for ordinary and middle personnel shall be open bay. Barracks for high ranking, and senior personnel shall be individual rooms. Contractor shall also design and provide electrical room, janitor closet with mop sink, mechanical room, stairways, toilet rooms, showers, and break room.

Net Sleeping Area per Soldier with Breakdown by Rank (NSM)			
Senior	High	Middle	Ordinary
17	13	8.4	6.7

The Contractor shall incorporate the following special features into the barracks:

- 1) Ceiling fans shall be designed for summer ventilation.
- 2) Provide metal post with Clotheslines shall be installed behind each barracks, approximately 5m in length with 4 lines across spaced 410mm apart and of sufficient strength to prevent sagging when all of the lines are loaded.
- 3) Concrete stoops with metal grates for boot mud removal shall be provided at all exterior doors.
- 4) Contractor shall provide heating and cooling system for the barracks.
- 5) Each barracks shall have a dedicated storage area sized to 0.5 SM per person assigned to the barracks.

**4.16 DFAC, Dining Facility and Storage Yard (Option Facility)**

The Contractor shall design and construct a Dining Facility (DFAC) suitable for serving the 30 people at one seating. This facility shall provide cafeteria-style feeding of short order and regular style meals. Spaces include dining areas and kitchen facilities outfitted with **propane-burning**, built-in stoves in accordance with local practice. Provide four (4) weeks of propane gas operations assuming all stoves are in operation at the highest fuel consumption rate. The Contractor shall incorporate the following special features into the DFAC:

- 1) Install a canopy over the exterior area adjacent to the stoves to provide an area protected from the weather for storing propane tanks for the stoves. The canopy shall be sized to cover the area adjacent to all of the stoves.
- 2) The ventilation system shall be capable of preventing smoke generated by wood-burning stoves from migrating into the dining area.
- 3) Floor drains shall be incorporated into the dining area with the floor sloped to drain.
- 4) Trench type floor drains shall be installed in the kitchen cooking and dishwashing areas.
- 5) Hand wash stations in the entry vestibule shall be provided. Trough type sinks shall be used.
- 6) Install a stainless steel (s/s) large wash basin with a low rim height designed for washing very large pots. Provide all a grease interceptor to the s/s pot sink and a floor sink for the s/s prep sink. There shall be s/s shelvings, beverage counters, s/s self-serve counter and prep tables.

- 7) The Contractor shall provide walk-in refrigerators and freezers with electrical outlets for their installation. Provide loading dock to accommodate product deliveries and located close to the walk-in coolers and freezers.
- 8) Fire protection is to be provided by fire extinguishers throughout the facility at easily accessible locations.
- 9) Install overhead exhaust hoods to prevent smoke from go to the dining area, complete with exhaust stacks to ventilate smoke to the outside environment.
- 10) The Contractor shall design and construct a chain-link fenced storage yard for food and install facilities for the storage of both dry goods and refrigerated items.
- 11) The Contractor shall provide table and steel chairs for 30 people in the dining hall.
- 12) The Contractor shall provide toilet facility for the kitchen employees and a separate men's and women's toilet in the dining facility. There should also be janitor room with a mop sink and a general office.

#### **4.17 INITIAL SEARCH OFFICE AND WAITING BUILDING (*Option1 Facility*)**

The Contractor shall design and construct a single administrative facility for staff with waiting area for **(4) personnel awaiting initial search**. Provide one interview room, holding cell, two private office, and one share office space for 2 high officers with counter to waiting room. Space within the building shall be organized to provide functionally separate facilities for the truckers waiting area and the facility staff.

#### **4.18 K-9 FACILITY (*Option1 Facility*)**

The Contractor shall design and construct a K-9 housing facility. Provide insulated and well ventilated housing for all seasons to house **(4) dogs**. Provide fenced in yard for the K-9s to run around in and train.

#### **4.19 GENERAL WAITING AND VENDING FACILITY (*Option1 facility*)**

The Contractor shall design and construct a facility with waiting area for **(50) personnel**. Provide venting area, sitting for at least (25) person, janitor closet with mop sink, storage closet, prayer area, and toilet rooms for male and females. Space within the building shall be organized to provide functionally separate facilities for the truckers waiting area and the facility staff.

- 1) Electric hot water heaters shall be installed to provide hot water to the showers and sinks. Electric cabinet heaters or electric unit heaters suitable for wet areas shall be utilized to provide heat in the facility. Accessories shall include but not limited to; toilet paper holders, soap dishes, curtains and curtain rods, robe hooks, mirrors, paper towel dispenser, metal shelf, and grab bars. The building should have janitor/storage room with a mop sink.
- 2) Provide 3 toilets and 3 sinks for male toilet room. Provide 1 toilet and 2 sinks for female toilet room. The female toilet room shall have lockable doors.

#### **4.20 GENERAL WAREHOUSE STORAGE (*Optional, Option 1*)**

The Contractor shall design and construct a **400 SM** insulated warehouse facility to store confiscated goods and other materials. This facility should be located after the Detailed Search Area. Provide lockable fenced divider inside the warehouse. Each fenced area should be able to contain the goods of a full truck load. Provide (10) lockable fenced storage area. Provide insulation, loading docks, roll-up doors, heating, cooling by ceiling fans, ventilation, and exhaust fans.

#### **4.21 HVAC, Heating Ventilation Air-Conditioning**

Environmental control of the facilities shall be achieved by HVAC equipment proposed by the contractor and approved by the U.S. Government. See section 01015 for scope of work required.

#### **4.22 LIFE SAFETY**

Design and Construct circulation pathways and exit stairs in accordance with building code references herein. Fire sprinkler system is not required. However the facility shall comply with all other safety, life safety code requirements as required within references. Smoke detectors and fire alarm systems shall be installed in accordance with requirements herein.

#### 4.23 LIGHTING

General lighting shall be provided as indicated and shall meet recommendations from IESNA for each building type and function within each building. Design and installation shall meet NEC 70 requirements.

**Exterior lighting** shall be high intensity discharge luminaries on 10 meter high minimum spun aluminum or galvanized steel poles. If to be installed on an existing installation, type of luminaries shall match existing predominant type within installation.

- Guard Tower Searchlights shall be provided as indicated and shall be equivalent to the following:
- prison grade
- nickel reflectors (bullet resistant)
- 65 million candlepower (1000 watts)
- manual operation from below with one hand
- xenon lamp
- weatherproof design

#### 4.24 ELECTRICAL

Design and construct a power system for supply and distribution to all to include generation with fuel storage for 28 days, and underground electrical distribution.

All electrical design and installation shall meet NEC (NFPA 70) requirements. Electrical receptacles shall be provided as indicated. Conductors and circuits shall be sized for the specific loads. Primary voltage shall be [220/380 V, 50 hertz, 15kV, 50Hz. Secondary voltage shall be 220/380v 50Hz.

#### 4.25 BARRICADES

Barricades shall consist of the types shown or described herein. Barricades shall consist of concrete type barriers such as jersey barriers. Barricades shall be as shown and shall be provided as **described in this scope and in the 1015 technical requirement** even if not shown on drawings. **Drawings are only concepts layouts** and will need to be added upon to meet scope requirements. Barricades are not intended to resist a certain horizontal load and are not required to be permanently anchored to ground.

#### 4.26 FOUNDATION DESIGN

Foundations, including sub-grade, shall be designed and constructed based on recommendations from geotechnical investigation required herein.

### 5. PERIOD OF PERFORMANCE AND LIQUIDATED DAMAGES

**5.1** All work required under this contract shall be completed within **360** calendar days after Notice to Proceed.

All work under this contract shall be completed and buildings ready for beneficial occupancy in accordance with the following schedule:

The following Base Bid items to be completed within **120** calendar days after Notice to Proceed:

1. Gantry Scanning Facility (Pre-engineered building)
2. Perimeter wall and Guard Towers

#### 5.2 Liquidated Damages

Liquidated damages for the amount of **\$2,037** will be assessed will be assessed for each day of delay over and beyond the **360** calendar days after Notice to Proceed.

**6. SPARE PARTS**

Refer to other sections herein for requirements.

**7. REFERENCES**

Refer to Section 01015 for required references.

-- End of Section --

SECTION 01010-B  
SCOPE OF WORK  
(Coast Guard Outposts)

## 1. GENERAL

1.1 This project consists of design and construction of ten (10) Coast Guard Outposts along Makran Coast, Pakistan (refer to Appendix I for site location). The project includes the design and construction of a coast guard post (for operations and billeting use), aerated pit latrines, utilities, underground water storage tank, LP fuel tank, open pit septic system, solar power, kitchen with heating source for cooking and related works under optional bids as noted. These facilities shall be designed and constructed using the Summary of Work as a guide and incorporating all current international building codes, safety and security standards.

1.2 The work shall include the preparation of design documents and the subsequent construction of the facilities described within this Request for Proposal (RFP). The facilities shall include structures as indicated in the SOW, specifications or drawings and contain all necessary utilities for operation of such. These facilities shall be designed and constructed in accordance with current American and International Building Codes and standards and as described in these documents. A partial listing of references is included within the Request for Proposal.

1.3 Work shall be executed in accordance with the Technical Requirements in Section 01015. All requirements set forth in the Scope of Work, Section 01010, but not included in the Technical Requirements, shall be considered as set forth in both and vice versa. In case of question or ambiguity, the Contracting Officer (KO) shall make the final decision. The KO shall furnish the decision in writing if requested by the Contractor.

1.4 The site plan shall include a grading and drainage plan, prior to construction. All utilities shall be complete and operational prior to the occupancy of any buildings to eliminate the need for temporary utilities.

1.5 Warranty: The Contractor shall repair and/or replace all defective materials or workmanship, except for roofs, at his own cost for a warranty period of one (1) year commencing upon the date of final acceptance of the project. The Contractor shall repair and/or replace all defective materials or workmanship at his own cost for a warranty period of 20 years for all roofs commencing upon the date of final acceptance of the project.

## 2. LOCATION

2.1 Project sites are located along Makran Coast, Pakistan. There are total of ten (10) sites. The sites have been prioritized. General site photos are shown in Appendix II. The priority list is as following:

### Optional Items:

All options can be exercised up to 120 days after award.

<u>Site No</u>	<u>Option</u>	<u>Post</u>	<u>Ocean Sites</u>
(1)	Option #2	Kumb Defile	
(2)	Option #3	Kulky	YES
(3)	Option #4	Kantani	

(4)	Option #5	Old Marine	YES
(5)	Option #6	Shahabi	YES
(6)	Option #7	Passu	
(7)	Option #8	Jhanda	YES
(8)	Option #9	Hammer Head	
(9)	Option #10	Gatti Dor	YES
(10)	Option #11	Sur Bandar	

2.2 The size of each building shall be approximately 80 square meters. The contractor shall provide independent cost proposal for each site location.

### 3. PERIOD OF PERFORMANCE AND LIQUIDATED DAMAGES

The Government reserves the right to exercise one, all or none of the Optional Items shown on the Bidding Schedule. Liquidated damages for the amount of \$2,037 will be assessed for each site for each day of delay over and beyond the contract completion date.

### 4. WORK ITEMS

4.1 The following are the design-build buildings/facilities/features based on specific requirements for each item for each type of compound to be provided. All standard construction amenities and details such as lighting, site drainage, utility connections, etc. shall be implied as a design and construction requirement. The contractor shall accomplish required work in accordance with the requirements stated in Section 01015: Technical Requirements and other sections herein. Refer to Section 01015 for further direction. The design and construction work shall include but not limited to that described herein:

#### 4.2 Surveys and Site Planning

For each location, the contractor shall prepare site plans and site drainage plan with existing grades, proposed new grades, and finished floor elevations for existing and new buildings based on the new layout.

#### 4.3 Prepare Designs, Drawings, and Specifications

The Contractor shall completely design and construct all new buildings and structures on the base proposal and options if awarded as part of this project.

#### 4.4 Demolition and Removal

- As specifically noted per site, the contractor shall demolish the existing coast guard post buildings only after completing construction of the new post buildings. The contractor shall remove and dispose of all debris in future work areas. Contractor shall verify location of debris disposal with Contracting Officer. In the event that a new building will replace the existing building on the same foot print, an assessment should be made whether it is possible to build new buildings next to the existing building to be demolished so that occupants can utilize and perform their mission while their new building is being constructed. This would preclude the occupants from living in tents and even during the harsh seasons of monsoons and/or summer month construction. On sites that require demolition, ktr to notify the Contracting Officer what post and buildings and the time frames these buildings will be under construction, these issues can be addressed at the design Charatte. Ktr to make a structural assessment on the building's structural safety whether it should be demolished or

not, this will be handled on a case by case basis as the Gov't. does not want added cost to demolish buildings that are still in a satisfactory condition and usable albeit withstanding the asbestos issues that demolition would create.

## 5. SUMMARY OF WORK

5.1 For the following post: (1) Kumb Defile, (3) Kantani (2), Kulky, (4) Old Marine and (5) Shahab, (6) Passu, (7) Jhanda, (8) Hammer Head, (9) Gatti Dor, (10) Sur Bandar.

5.1.1 Operations and Billeting Building. Design and construct a building, approximately eighty (80) square meters, (refer to Appendix III-concept ground floor plan for one story buildings only) for operations and billeting use. The building shall include an operations room, communication room, and separate sleeping quarters for two (2) officers and six (6) enlisted personnel, dining room, kitchen, janitor room with service sink and storage room. Use either Reinforced CMU (concrete masonry unit) or using modular building construction material (i.e. modified connex box type designs).

5.1.2 New Facilities and equipment: Provide restrooms (toilet & shower), 5KW generator, solar panel with dry batteries, 15 day storage fuel tank, 30 day storage gas LPG cylinders, 2500 liter water storage tank with an electric pump to an overhead water tank, cooking stoves shall be able to use gas or wood.

5.2 Optional Item #3: Provide new toilets/washrooms and kitchen facility and all base bid items noted in Para. 5.1 (no new main building).

5.3 Optional Item #4: In addition to the general work items in this scope of work, provide a new access gravel road leading up to the Passu Post (new building with no existing building on site).

### 5.4 Utilities.

5.4.1 Prime Power System. Design and construct primary Solar Power and/or Wind power system with dry batteries to power the building. The contractor shall evaluate the size of the system and the number of dry batteries needed to meet the power demands of this facility 24 hrs/day. Also, provide a 5KW backup generator for emergency use.

5.4.2. Liquid Propane (LP) Fuel Storage. The Contractor shall provide liquid propane (LP) fuel for cooking and back up water heater to accommodate a 30 day supply of service. The tank shall be located on a concrete pad and containment. The contractor shall supply a full supply of fuel (i.e., completely filled tanks) at time of turnover to the Government. Note that fuel tanks on the ocean environment shall be protected against the salt air environment.

5.4.3 Electrical. All rooms shall be lighted with fluorescents and shall be provided with power duplex receptacles. All electrical receptacles no more than 3 meters apart on all walls for offices and common area, all other rooms have a minimum one duplex receptacle:

- a. Provide adequate lighting in each room.
- b. Computer wiring - Provide in Operation and communications room only.

5.4.4 Water. Provide an underground water storage tank with minimum capacity of 2500 gallons. Connect water line to the restrooms and dining facility. Provide hand pump option with a primary electric pump. Above ground storage tanks are acceptable IF warranted with construction restrictions at specific sites, justification shall be approved by the Contracting Officer.

5.4.5 Sewage. Provide mobile aerated pit latrine systems.

5.4.6 Heating/Cooling/Hot Water. Provide cooling by means of ceiling fans installed in each room (except for the lavatory). Size of the fan shall be based on room size. Use gas for water heater. Solar heat panels for water with backup passive solar tanks. Provide provisions for converting to gas heat when solar panels become inadequate for hot showers and general room heating.

## 5.5 General Requirements

### 5.5.1 Site Work

The contractor shall design and construct site grading and drainage required for new facilities and ties them into existing road and drainage. The contractor shall be required to perform site work for all facilities listed herein. All waste materials, fibrous trash, unusable/foreign metal items and objects not removed by the customer prior to contract award, and metallic debris currently onsite shall be collected by the contractor and shall be removed from the site and discarded by the contractor.

5.5.2 Sanitary Sewer System. Design and construct an aerated pit latrine. Grey water systems shall be dry pits usage.

5.5.3 Foundation Design. Design and construct slab-on-grade foundations based on recommendations from geotechnical investigation required herein.

5.5.4 Latrines, Lavatories and Plumbing. Latrines and lavatories shall be plumbed units and the latrines shall be Middle Eastern style units.

5.5.5 Hot Water and Plumbing. Provide a gas hot water system and associated piping as required, use passive solar water heating tank as a back-up system.

5.5.6 Lighting. General lighting shall be provided as indicated and shall meet NEC 70 requirements.

5.5.7 Electrical. The contractor shall design and install a Solar electrical power distribution system to support the new facility. The contractor shall perform a load calculation to determine the required capacity to support the increased load demands. The contractor will be responsible for completing all electrical connections from the existing site electrical system to the new facilities package. All electrical design and installation shall meet NEC 70 requirements. Electrical receptacles shall be provided as indicated or otherwise required. Conductors and circuits shall be sized for specific loads. A 5KW generator will be used for backup electrical needs.

5.5.8 Doors and Windows. Provide PVC or fiberglass doors with stainless steel hinges and hardware for the main entry and wood for interior doors. Provide PVC windows. Minimize metals on all ocean front environments, metal entry doors acceptable on in-land located buildings.

5.5.9 Telephone and Communication. Provide a minimum one telephone outlet and one data outlet for computer connections using RJ-45 adapters to support CAT 5e.

- END OF SECTION -

TECHNICAL REQUIREMENTS

## SECTION 01015-A

TECHNICAL REQUIREMENTS  
UTAHAL SITE**1. GENERAL**

**1.1** The Contractor's design and construction must comply with technical requirements contained herein. The Contractor shall provide design and construction using the best blend of cost, construction efficiency, system durability, ease of maintenance and environmental compatibility.

**1.2** These design and product requirements are minimum requirements. The Contractor is encouraged to propose alternate design or products (equipment and material) that are more commonly used in the region; will be equally or more cost effective or allow for more timely completion, but furnish the same system durability, ease of maintenance and environmental compatibility. The Contractor will be required to submit information as requested by the Contracting Officer to make a comparison of the proposed alternate. All variations 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)****1.4.1.1 UXO/mine Discovery During Project Construction**

It is the responsibility of the Contractor to be aware of the risk of encountering UXO and to take all actions necessary to assure a safe work area to perform the requirements of this contract. If after the entire site has been cleared of UXO/mines per the International Mine Action Standards (IMAS) and clearance is done to the anticipated foundation depth, the Contractor becomes aware of or encounters UXO or potential UXO during construction, the Contractor shall immediately stop work at the site of the encounter, move to a safe location, notify the COR, and mitigate any delays to scheduled or unscheduled contract work. The Contractor shall remove and dispose of UXO's per the International Mine Action Standards (IMAS). These standards can be found at <http://www.mineactionstandards.org>. The Contractor assumes the risk of any and all personal injury, property damage or other liability, arising out of and resulting from any Contractor action hereunder. In these cases the contractor shall be required to identify and dispose of the ordnance.

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.

NOTE: For previous demining information, the following points of contact from the UN Mine Action Center for Afghanistan are provided:

Reiko Kurihara, project manager, email [reiko@unmaca.org](mailto:reiko@unmaca.org)  
Cell phone: +93 070 284 686  
Sandy Powell, chief Operations Officer, [sandy@unmaca.org](mailto:sandy@unmaca.org)  
01415 – Page 70

Cell phone: +93 (0) 79 330 992

#### 1.4.1.2 Explosives Safety

##### 1.4.1.2.1 General Safety Considerations

General safety considerations applicable to personnel, both essential and non-essential, at project sites where UXO may be encountered include:

- a. Do not carry fire or spark-producing devices.
- b. Do not conduct explosive or explosive-related operations without approved procedures and proper supervision and UXO safety support.
- c. Do not become careless by reason of familiarity with UXO or the reported probability level of UXO contamination.
- d. Do not conduct explosive or potentially explosive operations during inclement weather.
- e. Avoid contact with UXO except during UXO clearance operations.
- f. Conduct UXO-related operations during daylight hours only.
- g. Employ the "buddy system" at all times.

##### 1.4.1.2.2 Activity Hazard Analysis (AHA) briefings

- a. Activity Hazard Analysis's shall be prepared in accordance with the Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1.
- b. Hazard analyses will be prepared and briefed by personnel that are knowledgeable in UXO and explosives safety standards and requirements. These personnel should understand the specific operational requirement and hazard analysis methodologies. A hazard analysis will be performed for each activity to determine the significance of any potential explosive-related hazards. Explosive residues may be discovered or exposed during UXO operations in the form of powder or various granular and powder based pellets. These contaminants can enter the body through the skin or by ingestion if proper personal hygiene practices are not followed. Explosive fillers such as white phosphorus are dangerously reactive in air and acute exposure can result in serious injury to the skin, eyes, and mucous membranes. They are also a fire hazard.

Safety requirements (or alternatives) that will either eliminate the identified hazards, mitigate or control them to reduce the associated risks to an acceptable level will be developed. The adequacy of the operational and support procedures that will be implemented to eliminate, control, or abate identified hazards or risks will then be evaluated and a second risk assessment completed to verify that a satisfactory safety level has been achieved.

##### 1.4.1.3 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. The Contractor shall make no part of the time lost due to such stop orders the subject of claim for extension of time or for excess costs or damages.

## 1.5 LIMITATION OF WORKING SPACE

The Contractor shall, except where required for service connections or other special reasons, 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. This list is not exhaustive and is not necessarily complete.

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

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

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

ARI - Air Conditioning and Refrigeration Institute

Army TM 5-853-1, Security Engineering, vols. 1 through 4, 12 May 1994

ASCE 7-02, Minimum Design Loads for Buildings and Other Structures, 2002

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

ASME - American Society for Mechanical Engineering

ASTM - American Society for Testing and Materials

AWS - American Welding Society

EIA ANSI/TIA/EIA-607: (1994) Commercial Building Grounding/Bonding Requirement Standard.

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

IBC - International Building Codes, 2003 (and its referenced codes including those inset below)

IFGC – International Fuel Gas Code

IMC – International Mechanical Code

IPC – International Plumbing Code

Lighting Handbook, IESNA, latest edition

Codes and Standards of the National Fire Protection Association (NFPA)

[as applicable and enacted in 2002 or later, unless otherwise noted].

NFPA 10, Portable Fire Extinguishers, 2002 edition

NFPA 54, National Fuel Gas Code, 2002

NFPA 58, Liquefied Petroleum Gas Code, 2004

NFPA 70, National Electrical Code, 2002 edition

NFPA 72, National Fire Alarm Code, 2002 edition

NFPA 90A, Air Conditioning and Ventilating Systems, 2002 edition

NFPA 101, Life Safety Code, 2003 edition

SMACNA - Sheet Metal and Air Conditioning Contractors' National Association

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

UFC 1-200-01, Design: General Building Requirements, 20 June 2005

UFC 3-230-03a, Water Supply, 16 Jan 2004  
UFC 3-230-04a, Water Distribution, 16 Jan 2004  
UFC 3-230-06a, Subsurface Drainage, 16 Jan 2004  
UFC 3-230-07a, Water Supply: Sources and General Considerations, 16 Jan 2004  
UFC 3-230-08a, Water Supply: Water Treatment, 16 Jan 2004  
UFC 3-230-09a, Water Supply: Water Storage, 16 Jan 2004  
UFC 3-230-10a, Water Supply: Water Distribution, 16 Jan 2004  
UFC 3-230-13a, Water Supply: Pumping Stations, 16 Jan 2004  
UFC 3-240-03N, Operation and Maintenance: Wastewater Treatment System Augmenting Handbook, 16 Jan 2004  
UFC 3-240-04a, Wastewater Collection, 16 Jan 2004  
UFC 3-260-01, Airfield and Heliport Planning and Design, 1 Nov 2001 with changes dated 19 May 2006  
UFC 3-260-02, Pavement Design for Airfields, 30 June 2001  
UFC 1-300-09N, Design Procedures, 25 May 2005  
UFC 3-400-01, Design: Energy Conservation, 5 July 2002  
UFC 3-600-01, Design: Fire Protection Engineering for Facilities, 26 Sept 2006  
UFC 4-010-01, Design: Minimum DoD Antiterrorism Standards for Buildings, 22 Jan 2007  
UFC 4-010-02, DoD Minimum Antiterrorism Standoff Distances for Buildings, 19 Jan 2007  
UFC 4-021-01, Design and O&M: Mass Notification Systems, draft 1 May 2006  
Underwriters' Laboratories (UL) Fire Protection Equipment Directory (2002)  
UL 710, Exhaust Hood for Commercial Cooking Equipment, latest edition  
UL 737, Fireplace Stoves, latest edition  
UL 752, Bullet Resisting Equipment, 2000 or later  
USCINCCENT OPORD 97-1

The publications to be taken into consideration shall be those of the most recent editions. 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.

## **2. SITE DEVELOPMENT:**

### **2.1 GENERAL**

The project includes furnishing all materials, equipment and labor for constructing water, sanitary sewer and storm sewer service lines, as applicable, and connecting to the existing sewer networks.

### **2.2 ENVIRONMENTAL PROTECTION**

#### **2.2.1 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.

#### **2.2.2 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.

### 2.2.3 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.

### 2.2.4 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.

## 2.3 CIVIL SITE DEVELOPMENT

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.

All site plans and master plans 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 42 N

### 2.3.1 GRADING AND DRAINAGE

The contractor will provide all necessary site grading to insure adequate drainage so that no areas will be flooded due to a rainfall of a 10-year frequency. Drainage of the area should be compatible with the existing terrain.

### 2.3.2 PAVING

#### 2.3.2.1 Roads

Paved roads are required within the base camp area. All pre-existing conditions are undeveloped land with gentle slopes, without substantial vegetation and with natural drainage channels of moderate size and spacing that are dry most of the time. All roads shall be of wearing surface 7.3 meters (24 feet) wide, unless otherwise noted, graded for proper drainage, provided with necessary drainage structures and completed with prescribed surfaces in accordance with applicable sections of TM 5-822-2 and TM 5-822-5 standards. The compound (cantonment area) roads sections shall have 200 mm (8 inch) compacted base course minimum and shall be surfaced with minimum 50 mm (2 inch) hot mix asphalt concrete, unless otherwise noted. 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 or preexisting conditions are determined to be substantially or materially different than the above-described conditions/estimates.

#### 2.3.2.2 Site Grading Plan

Preliminary investigation indicates no need for bridges or major drainage structures. The Contractor shall notify the Contracting Officer immediately if initial site survey determines that area hydrology requires major drainage structures or bridges. The contractor shall design a site grading plan that provides positive drainage and minimizes the requirement for major structures in a cost effective manner.

#### 2.3.2.3 Parking Areas and Motor Pools

Contractor shall construct parking and storage areas using aggregate surface. Subgrade shall be 150mm (6 inches) minimum in depth scarified and compacted to 95% proctor density. Aggregate base shall be 150mm (6 inches). Aggregate Base Course (ABC) material must be well graded, durable aggregate 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 presented in ASTM D 1557 or equivalent DIN, BS, or EN standards.

### 2.3.3 CIVIL UTILITIES

#### 2.3.3.1 General

The design of the water and sanitary systems shall be sized to provide flow and discharge based on a fixture unit basis. The design drawings shall show all utility lines, line sizes, valves, manholes, disinfection systems, and applicable details associated with water and sanitary system designs. Specifications covering water lines, valves, pumps, controls, sanitary sewers and storm sewers shall be submitted as part of the design and shall require standard materials that are available in-country. Contractor shall install and connect exterior sanitary sewer collection and water supply piping to service connection points of each facility requiring such.

#### 2.3.3.2 Water

##### 2.3.3.2.1 General Water

Infrastructure design and construction shall serve the demand. The Contractor shall install water distribution mains, branches, laterals, lines and service connections to include all pipe, valves, fittings and appurtenances. Exterior water line construction shall include service to all buildings as described in the Scope of Work Section 01010. The required Average Daily Demand (ADD) approximation is derived from 155 liters per capita per day (lpcd) or 41 gallons per capita per day (gpcd). 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 any building or facility for which a water supply is provided for landscaping purposes.

##### 2.3.3.2.2 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. Raw water quality criteria for Water Quality and Criteria Standards, and shall address the following: PH, turbidity, conductivity, oxidation reduction potential, total dissolved solids, color, odor, total coliform/fecal coliform (bacteria) an indicator of the presence of E. coli. These baseline parameters are a partial list as presented in TM5-813-3/AFM 88-10 APPENDIX A.

##### 2.3.3.2.3 Well House

At new wells or springs, construct a permanent well house with concrete slab floor. The floor of the well house shall slope away from the casing approximately 3 mm per 300 mm (1/8" per foot). Floor of well house shall be above flood plain. The well house design should be such that the well pump, motor and drop pipe could be removed readily by having an insulated hatch above on the roof which shall be lockable. The well house shall protect valves and pumping equipment plus provide freeze protection for the pump discharge piping beyond the check valve. The well house shall be insulated and a heating unit installed. The well shall be protected from unauthorized use by a security fence with lockable gate. Provide outriggers, barbed wire and concertina wire on fence and gate. Refer to drawings herein, as applicable.

#### 2.3.3.2.4 Raw Water Disinfection

Contractor shall perform disinfection of the well water in accordance with AWWA A 100 or equivalent. 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.

#### 2.3.3.2.5 Service Booster Pumps (Direct Pressure System Pending Engineering Site Investigation)

Contractor shall provide a booster pump station with end suction or split case double suction horizontal split case (frame mounted) centrifugal pumps arranged in parallel for pumping water storage into the main distribution system. The pumps and controls shall be designed to supply and maintain acceptable system pressure throughout the distribution network given the full range of flow conditions (low flow to peak). For conditions of low demand and to prevent short cycling of primary pumps, provide a low demand jockey pump with capacity of one-third (1/3) of the Average Daily Demand (ADD). Each booster pump, two (2), shall be capable of delivering 2 times (2x) the ADD. Provide suitable expansion tank. The suction side of the service booster pumps shall have an eccentric reducer and gate valve installed. The discharge side shall have a gate valve, check valve (between the pump and the gate valve and concentric reducer, pressure gage and air relief valve.

#### 2.3.3.2.6 Water Storage Tank

Contractor shall provide a circular steel or circular concrete ground storage reservoir (GST) to be located on the ground surface. Volume of the GST shall be a minimum storage volume of a full days demand. The Contractor shall verify storage volume requirements based on final design population. The storage facility shall be located above drainage areas and locations subject to flooding as approved by the Contracting Officer. The storage facility shall be located on the higher elevations of the site to promote gravity flow and reduce pumping requirements. Overflow and air vents shall be screened so that birds, rodents and debris cannot enter the reservoir.

#### 2.3.3.2.7 Disinfection & Chlorination System

Use hypochlorite compounds for disinfection. A hypo-chlorinator shall be used to feed a sodium hypochlorite solution of 5-15% available chlorine into the system. Hypochlorite compound may be a liquid or solid form. The hypo chlorination system shall consist of a chemical solution tank for hypochlorite, diaphragm-type pump, power supply, water pump, pressure switch and storage tank (optional hydro-pneumatic/storage). 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. 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 0.2-0.4mg/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.

#### 2.3.3.2.8 Chlorine Shelter

Contractor shall furnish a shelter as per chlorine manufacturer's installation requirements. The Contractor shall

provide manufacturers catalog information and shop drawing to the Contracting Officer for approval.

### 2.3.3.3 Water Distribution System

#### 2.3.3.3.1 General

The Contractor shall provide a water distribution system described as follows: Pipe diameters used in the network shall be 300mm (12 inch), 250mm (10 inch), 200mm (8 inch), 150mm (6 inch) and 100mm (4 inch), as calculated, using ductile iron (DI) conforming to AWWA C151, installed in accordance with C 600 or polyvinyl chloride (PVC) as per ASTM D 1784 and 1785. All pipes and joints shall be capable of at least 1.03 Mpa (150 psi) and 1.38 (200psi) hydrostatic test pressure unless otherwise specified. Pipes should be adequate to carry the maximum quantity of water at acceptable velocities 0.9 to 1.5m/sec (3 to 5 ft/sec) at maximum flows not to exceed 2.8m/sec (9.2ft/sec) with working pressures of 240kPa (35psi) to 350kPa (50psi). Minimum pressure is 140kPa (20psi) to all points of the distribution system and maximum pressure of 690kPa (75psi). If high pressures (greater than 690kPa) cannot be avoided, pressure-reducing valves shall be used. Water service connections to buildings shall vary from 19mm, 25mm or 38mm to 75mm, as calculated, depending on the usage requirement. 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. After choosing piping material type, use similar piping materials for all buildings for efficiency of future maintenance activities. The distribution network shall be laid out in a combination grid and looped pattern with dead ends not exceeding 30m (99 feet). Dead end sections shall not be less than 150mm (6 inch) 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 150mm (6 inch) in diameter. Water supply distribution shall connect to a building service at a point approximately 1.5m (5 feet) outside the building or structure to which the service is required. Adequate cover must be provided for frost protection. A minimum cover of 800mm (2'-8") is required to protect the water distribution system against freezing. Water lines less than 1.25 meters (4 feet) deep under road crossings shall have a reinforced concrete cover of at least 150 mm (6 inch) thickness around the pipe.

#### 2.3.3.3.2 Pipe

The Contractor shall provide pipe of adequate strength, durability and be corrosion resistant with no adverse effect on water quality. The exterior surface of the pipe must be corrosion resistant. If the pipe is installed underground pipe shall be encased with polyethylene in accordance with AWWA C105. Water distribution pipe material shall be PVC or Ductile Iron (DI). Ductile iron pipe shall conform to AWWA C104, etal. DI fittings shall be suitable for 1.03MPa (150psi) 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. Fittings and specials shall be cement mortar lined (standard thickness) in accordance with C104. 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, etal, Schedules 40, 80 and 120. PVC 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, All pipe and joints shall be capable of 1.03 Mpa (150psi) working pressure and 1.38 Mpa (200psi) hydrostatic test pressure.

#### 2.3.3.3.3 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 the concrete thrust blocking, unless otherwise approved.

#### 2.3.3.3.4 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 1.03 MPa (150 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.

#### 2.3.3.3.5 Leakage Test

Leakage test shall be conducted after the pressure tests have been satisfactorily completed. The duration of each leakage test shall be at least 2 hours and during the test the water line shall be subjected to not less than 1.03 MPa (150psi). 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 34.5kPa (5 psi) of the specified leakage test pressure after the pipe has been filled with water and the air expelled. Pipe installation will not be accepted if leakage exceeds the allowable leakage, which is determined by the following formula:

$L = 0.0001351ND (P \text{ raised to } 0.5 \text{ power})$  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.

#### 2.3.3.3.6 Bacteriological Disinfection

##### 2.3.3.3.6.1 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 1.0 ppm. During the flushing period, each fire hydrant on the line shall be opened and closed several times.

##### 2.3.3.3.6.2 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.

##### 2.3.3.3.6.3 Acceptance Requirements

The disinfection shall be repeated until tests indicate the absence of pollution for at least 2 full days. The unit will not be accepted until satisfactory bacteriological results have been obtained.

#### 2.3.3.3.7 Time for making Tests

Except for joint material setting or where concrete thrust blocks necessitate a 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.

#### 2.3.3.3.8 Concurrent 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. a. Pressure test and leakage test may be conducted concurrently, b. 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.

#### 2.3.3.3.9 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 3600 mm (12 feet). Gate valves shall be in accordance with AWWA C 500 and/or C509. Butterfly valves (rubber seated) shall be in accordance with C504 etal. 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, 1 meter (3'-4") square, for all valve boxes.

#### 2.3.3.3.10 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.

#### 2.3.3.3.11 Blow-Off Valves

The Contractor shall provide 40-50mm (1-5/8" – 2") 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.

#### 2.3.3.3.12 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.

### 2.3.3.4 Sanitary Sewer

#### 2.3.3.4.1 General

There are no functional or salvageable sanitary sewer collection, treatment or disposal facilities at this site. The Contractor shall obtain topographic information or other maps that show vegetation, drainage channels and other land surface features such as underground utilities and related structures that may influence the design and layout of the collection system. If maps are not available, or do not provide satisfactory information or sufficient detail of the site, field surveys shall be performed. Sanitary sewers less than 1.25 meters (4 feet) under road crossings shall have reinforced concrete cover at least 150 mm (6 inch) thick around the pipe.

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. 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. Construction required shall include appurtenant structures and building sewers to points of connection with building drains 1.5m (5 feet) outside the building to which the sewer collection system is to be connected.

The Contractor shall use the following criteria where possible to provide a layout which is practical, economical and meets hydraulic requirements: 1) Follow slopes of natural topography, 2) avoid routing sewers through areas which require extensive restoration or underground demolition, 3) Avoid areas of high groundwater and placement of sewer below the groundwater table, 4) locate manholes at change in direction, size or slope of gravity sewers, 5) use straight sections between manholes, curved alignment shall not be permitted, 6) locate manholes at intersections of streets where possible, 7) avoid placing manholes where the tops will be submerged or subject to surface water inflow, 8) evaluate alternative sewer routes where applicable, 9) verify that final routing selected is the most cost effective alternative that meets service requirements. In the event that facilities to be provided under the contract must be occupied prior to completion of permanent wastewater infrastructure, the Contractor will be responsible for providing temporary portable shower and bathroom facilities.

#### 2.3.3.4.2 Protection of Water Supplies

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

2.3.3.4.3 Sanitary sewers shall be located no closer than 15m (50 feet) horizontally to water wells or reservoirs to be used for potable water supply.

2.3.3.4.4 Sanitary sewers shall be no closer than 3m (10 feet) horizontally to potable water lines; where the bottom of the water pipe will be at least 300mm (12 inches) above the top of the sanitary sewer, horizontal spacing shall be a minimum of 1.8m (6 feet).

2.3.3.4.5 Sanitary sewers crossing above potable water lines shall be constructed of suitable pressure pipe or fully encased in concrete for a distance of 2.7m (9 feet) 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 meter (3 feet) horizontally to the crossing, unless the joint is encased in concrete.

#### 2.3.3.4.6 Quantity of Wastewater

The Contractor shall verify the average daily flow considering both resident (full occupancy) and non-resident (8hr per day) population. The average daily flow will represent the total waste volume generated over a 24-hour period, and shall be based on the total population of the facility and usage rate of 41 gallons per capita day (water usage). The wastewater flow rate shall be calculated as approximately 80% of water usage rate. Design criteria guideline shall be based on average influent wastewater characteristics as BOD of 400mg/l, SS of 400mg/l, BOD

load of 750ppd, and SS load of 750ppd.

#### 2.3.3.4.7 Gravity Sewer

Sanitary sewers shall be designed to flow at 90 to 95 percent full. Sanitary sewer velocities shall be designed to provide a minimum velocity of 0.6 meters per second (mps) or 2.0 feet per second (fps) at the ADD flow rate and a minimum velocity of 0.8 to 1.05 mps (2.5-3.5fps) at the peak diurnal flow rate. In no case shall the velocity drop below 0.3 mps, (1.0 fps) to prevent settlement of organic solids suspended in the wastewater. Pipe slopes shall be sufficient to provide the required minimum velocities and depths of cover on the pipe. 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 (2'-8") will be required to protect the sewer against freezing.

#### 2.3.3.4.8 Manholes

The Contractor shall provide standard depth manholes (MH), (depth may vary) an inside dimension of 1.2 meters (4 feet). Manholes shall be made of cast-in-place reinforced concrete with reinforced concrete cover. Alternate precast manhole option shall taper to a 750 mm (30-inch) cast iron frame that provides a minimum clear opening of 600 mm (24 inches). 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.

##### 2.3.3.4.8.1 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.

##### 2.3.3.4.8.2 Spacing

The distance between manholes must not exceed 120 m (400 ft) in sewers of less than 460 mm (18 inches) in diameter. For sewers 460 mm (18 inches) and larger, and for outfalls from wastewater treatment facilities, a spacing of up to 180 m (600 ft) is allowed provided the velocity is sufficient to prevent the sedimentation of solids.

##### 2.3.3.4.8.3 Pipe Connections

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

##### 2.3.3.4.8.4 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 (15inch) or less in diameter. PVC shall be certified as meeting the requirements of ASTM D 1784, cell Class 12454 B.

##### 2.3.3.4.8.5 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.

#### 2.3.3.4.8.6 Joints

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

#### 2.3.3.4.8.7 Branch Connections

Branch connections shall be made by use of regular fittings or solvent-cemented saddles as approved. Saddles for PVC pipe shall conform to Table 4 of ASTM D 3034.

#### 2.3.3.4.8.8 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.

#### 2.3.3.4.8.9 Steps for Manholes

Steps shall be cast iron, polyethylene coated, at least 15 mm (5/8 inch) thick, not less than 400mm (16 inches) in width, spaced 300 mm (12 inches) on center.

2.3.3.4.9 The minimum depth of the cover over the pipe crown shall be 0.8m (2'-8").

#### 2.3.3.4.10 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 31m from the building cleanout. Cleanouts shall be provided outside of the building. Service connection lines will be a minimum of 100 mm (4 inch) diameter and laid at a minimum 1% grade, but up to 2% as design parameters dictate. Service laterals shall be 150 mm (6 inch) and sloped to maintain the minimum velocity as described in paragraph "Gravity Sewer."

#### 2.3.3.4.11 Cleanouts

Cleanouts must be installed on all 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. Preferably the cleanout will be of the same diameter as the building sewer, and never be smaller than 100 mm (4 inch).

#### 2.3.3.4.12 Field Quality Control

##### 2.3.3.4.12.1 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, ASTM 969.

Low-pressure air tests: Perform tests as follows: 1) 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; 2) 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; 3) 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.

#### 2.3.3.4.13 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.

#### 2.3.3.4.14 Septic Systems

Septic systems shall be designed and installed in accordance with UFC 3-240-03, latest edition.

#### 2.3.3.5 Storm Sewer Systems

Oil/water separators shall be utilized for all drains from industrial sites. Separators shall be installed as close as possible from the drain location. Storm sewer system shall not be mixed with sanitary sewer system and shall be in accordance with UFC 3-240-03, latest edition.

### 3. ARCHITECTURAL REQUIREMENTS

#### 3.1 GENERAL

All material approved shall become standardized material to be used throughout the facilities under contract. 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 building 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. All building exterior walls shall be constructed with reinforced CMU, insulated concrete sandwich panels, reinforced concrete or approved equivalent.

#### 3.2 DESIGN CRITERIA

The Codes, Standards, and Regulations listed herein 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

NFPA-101- National Fire Protection Association, Life Safety Code.

### 3.3 LIFE SAFETY/ FIRE PROTECTION/ HANDICAPPED ACCESSIBILITY

To the extent possible, all facilities will be designed in accordance with recognized industry standards for life safety and building egress. An adequate fire alarm system, fire extinguishers, and smoke alarms shall all be included as required. If a sprinkler system is required by building code, a waiver will have to be obtained before construction notice to proceed is issued. However, due to the lack of adequate water volume and pressure, sprinkler systems may not be feasible. The facility shall comply with all other safety requirements of NFPA 101. In keeping with the intended function of these facilities, handicapped accessibility will not be incorporated into this project. Due to the war contingency requirement, it is assumed that only able-bodied military and civilian personnel will use the facilities listed herein.

### 3.4 ANTITERRORISM/ FORCE PROTECTION

Force protection/anti-terrorism measures for this location shall be followed and incorporated into this project in accordance with the referenced DoD Regulations. Information regarding force protection may be found at [www.tisp.org/files/pdf/dodstandards.pdf](http://www.tisp.org/files/pdf/dodstandards.pdf).

### 3.5 EXCAVATION

Trench excavation shall be made for concrete footings. Trenches shall be a minimum of .8 meter deep. Trenches deeper than 1.5 meters shall have protective shoring to protect workers or have the sides of the trench sloped back at a slope of 1.5:1. Care shall be taken when backfilling of foundation trenches to avoid damage to walls. Any excess dirt shall become the property of the Contractor and shall be removed from the site to a location approved by the Contracting Officer.

### 3.6 CONCRETE

Place 100 mm (4") of capillary water barrier below areas to receive a concrete slab on properly compacted soil free of organic material. A plastic vapor barrier (10 mils thick) shall be placed over the crushed stone prior to placing of concrete slabs. Concrete flooring in wet areas shall slope to the floor drain and not allow for water to puddle. Concrete slabs in all areas shall not be placed prior to inspection and approval of piping and sub-surface by the Contracting Officer. Foundation trenches shall be level and free of loose material. Trenches shall be inspected and approved by the Contracting Officer prior to placing of any concrete foundations. See paragraph 5 for structural characteristics of concrete and reinforcing steel for foundations and slabs.

#### 3.6.1 INSULATED CONCRETE SANDWICH WALL SYSTEM

As an option to standard masonry construction, the Contractor can construct walls of single storey buildings using an insulated concrete sandwich wall system. The insulated concrete sandwich wall system shall be field fabricated and composed of a 76 mm (3 inch) expanded polystyrene core that spans in a single piece from floor elevation to top of wall elevation. The polystyrene core shall have a welded wire fabric, 50 mm x 50 mm (2 inch x 2 inch) mesh, 2.52mm (12.5 gauge) wire, attached to both faces of the polystyrene core. The welded wire mesh shall be installed at 13mm from the face of the polystyrene core. The welded wire mesh on each face shall be attached to each other and the polystyrene core with diagonal truss wires. Apply sprayed on concrete (shotcrete) to a minimum thickness of 38mm (1-1/2 inch) or as structural calculations require, whichever is greater. Method of placing the shotcrete shall be in conformance with ACI 506R-85. Concrete finishing shall be done by appropriate hand tools (darby, trowel, etc.) to provide the desired finish effect.

### 3.7 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. Concrete masonry units (CMU) for exterior walls shall be either 200 mm or 300 mm wide x 400 mm x 200 mm high as shown on drawings. All cells shall be fully grouted in exterior walls. They shall be installed in running bond level and plumb. Mortar joints shall be 9 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.

### **3.8 METAL**

#### **3.8.1 STEEL ROOF JOISTS**

Steel roof joists shall be placed according to the roof design and roof manufacturer specifications. Steel “Z” 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” shall be installed on the bottom side of steel beams for the installation of gypsum board with screws. Provide all necessary metal framing for roof fascia and soffits. See structural paragraph for structural characteristics of steel joists.

#### **3.8.2 METAL WINDOW SILLS**

Galvanized metal window sills, 1 mm (20 gage), 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 windowsill 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 6mm to the exterior and not allow water to puddle.

#### **3.8.3 STEEL COOK TOP**

Provide steel cook top in kitchen minimum thickness of 10 mm. Provide circular cut outs. Consult with the Contracting Officer for the diameter of circular cutouts. Provide steel infill plates for all cut out openings. Cook top can be made of several pieces for ease of handling. Adjacent plates shall be tight fitting to each other.

#### **3.8.4 PASS-THROUGH COUNTER TOP**

Provide 1.6 mm (16 gauge) stainless steel, or 40 mm marble, pass through counter tops at openings between the kitchen and dining area. Edges shall be turned down 30 mm and corners shall be welded and ground smooth. Provide anchor angles welded to the bottom of the counters to anchor tops to masonry walls below. Provide six (6) anchors on the Dish Return Counter, three (3) on each side of the wall. Provide eight (8) anchors on the Serving Counter, four (4) on each side of the wall. Anchor angles to wall with masonry expansion sleeves and stainless steel screws. Counter tops are to be 600 mm wide x length of opening shown.

### **3.9 CARPENTRY**

#### **3.9.1 WOOD PURLINS**

If Contractor chooses to utilize wood purlins, provide and install roof purlins of natural wood, locally available material 1 meter on center securely wedged between steel H structural joists. Tightly fit 30 mm boards over roof structure and nail into wood purlins. New roofing shall extend a minimum of 300 mm past the exterior surface of the wall.

#### **3.9.2 Wood Fascia & Soffit**

If Contractor chooses to utilize wood fascia and soffit boards, provide and install 30 mm fascia and soffit boards.

Wood boards shall be planed and smooth ready for paint finish. Soffit shall extend 300 mm out from exterior wall surface. Extend fascia board down past bottom of soffit a minimum of 6 mm for water drip. Extend roof decking out over fascia a minimum of 20 mm. Provide a 40 mm drip flashing over edge of roof decking so that it extends past bottom of decking on all sides of the building. Provide continuous soffit venting of all overhangs at both bottom and top of roof slope.

### 3.9.3 Wood Battens

If Contractor chooses to utilize wood ceiling batten strips, wood ceiling batten strips, 20 mm x 60 mm, shall be nailed to the bottom of the wood purlins. Battens shall be spaced at 400 mm on center (or per UBC requirements if sheetrock is substituted for plaster). This is for the support of a plaster ceiling.

## 3.10 ROOFING AND WEATHERPROOFING

### 3.10.1 SLOPED ROOFS

On sloping roofs provide and install .70 mm (24 gauge) galvanized steel in either corrugated or standing seam design. Metal roofing shall be anchored to the steel "Z" purlins or wood deck sub-surface using exposed fasteners at 300 mm on center at all seams and at 600 mm on center in the panel field. Fasteners shall be placed at the top of the corrugation taking care not to dent panel. Roof sealant or adhesive shall be placed over each anchor head. Roofing system shall include all edge, ridge and penetration flashings necessary for a watertight installation and as described in this section. Roofing shall be galvanized mil finish. Panels shall be overlapped two corrugations side to side and be continuous sheets from ridge to eave. Provide continuous ridge vents on all gable roofs.

### 3.10.2 FLAT ROOFS

Provide and install 3 ply built up roofing over concrete deck. Contractor may propose to the Contracting Officer an alternate roofing system with justification for consideration and alternate pricing. Concrete roof deck shall slope 21mm per m.

#### 3.10.2.1 Built-up Roofing System

An Insulated-Deck, Coal Tar, Glass-Fiber, Aggregate Roofing (ICGA-BUR): Provide built-up, aggregate-surfaced roof system with coal tar bitumen and glass-fiber ply felts (roof manufacturer's separation layers) for layup as indicated.

1. Primer: ASTM D 41 primer as recommended by roofing manufacturer.
2. Coal Tar Bitumen: ASTM D 450, Type III, as an option to asphalt.
3. Bitumen Membrane which meets the following:
  - a. ASTM D312 or the equivalent EN 1849-1 for thickness and unit weight,
  - b. ASTM D312 or the equivalent EN-1426 for penetration,
  - c. ASTM D312 or the equivalent EN-1427 for softening point
  - d. ASTM D312 or the equivalent TS 11758-1 for flash point or heat stability
  - e. ASTM D4601 or the equivalent TS 11758-1 for width and area of roll
  - f. ASTM D4601 (moisture percentage) or the equivalent EN 1928 (water tightness)
  - g. ASTM D226 (pliability) or the equivalent EN 1109 (cold bending).
4. Glass Roofing Felt: ASTM D 2178, Type IV or VI, except felts for coal tar systems shall be impregnated with a bituminous resin coating which is compatible with coal tar bitumen.
5. Organic Felt Base: ASTM D 2626 for use with asphalt roofing system.

6. Organic Felt Base: ASTM D 226 for use with asphalt roofing system and ASTM D 227 for use with coal tar roofing system. Organic felts may be used for bitumen stops and edge envelopes.

7. Insulation: 5cm (2 inch) thick extruded polystyrene rigid thermal insulation boards, conforming DIN, EN 13164 BS, EN 13164,  $k=0.2$  @ 75 degrees F mean temperature, 2.82 kg/sq cm (40 lbs/sq in) compressive strength, hydrophobic, Type VI.

### 3.10.2.2 Roof Membrane Installation

A. Prime surface of concrete deck with asphalt primer per manufacturers recommended application rate.

B. Cant Strips/Tapered-Edge Strips: Wood, not less than 89 mm (3-1/2 inches) high, 45-degree insulation cant strips at juncture of membrane with vertical surface. Provide tapered-edge strips at perimeter edges of roof that do not terminate at vertical surfaces.

C. Base Layer: Install one lapped course of base sheet. Attach first layer of roofing membrane material to substrates and elsewhere as indicated. Mop to non-nailable substrate with hot bitumen or apply with torch method per manufacturer's specifications

D. Second Layer: Install second layer of roofing membrane material over the first course staggering joints and seams in both directions by at least 300 mm. Mop top layer of membrane to base layer, or attach via torch method per manufacturer's specifications.

### 3.10.2.3 Insulation Installation

Comply with insulation manufacturer's instructions and recommendations for handling, installing, and bonding or anchoring insulation to substrate. Insulation boards shall be installed loose, without glue, in staggered manner. Attention should be paid not to leave separation along edges. Where overall insulation thickness is 50 mm (2 inches) or greater, install required thickness in two layers with joints of second layer offset from joints of first layer a minimum of 300 mm (12 inches) each direction. Trim surface of insulation where necessary at roof drains so completed surface is flush with drain ring. Polyester felt or geotextile shall be installed over insulation layers as a filter layer to prevent the passage of fines in gravel layer to lower strata.

### 3.10.2.4 Composition Flashing And Stripping

A. Install composition flashing at cant strips, at other sloping and vertical surfaces, at roof edges, and at penetrations through roof. Install composition flashing in accordance with membrane manufacturers specifications. Nail or provide other forms of mechanical anchorage of composition flashing to vertical surfaces as recommended by manufacturer of primary roofing materials.

B. Install composition stripping where metal flanges are set on roofing. Provide not less than two plies of woven glass-fiber fabric, each set in a continuous coating of roofing cement and extended onto the deck 100 mm to 150 mm (4 inches and 6 inches), respectively. Except where concealed by aggregate surfacing or elastic flashing, apply a heavy coating of roofing cement over composition stripping.

C. Roof Drains: Fill clamping ring base with a heavy coating of roofing cement. Set built up roofing membrane in to the clamping ring base and fix the drain top on it.

D. Allow for expansion of running metal flashing and edge trim that adjoins roofing. Do not seal or bond built-up roof membrane or composition flashing and stripping to metal flanges that are over 914 mm (3 feet) in length.

E. Counterflashings: Counterflashings, cap flashings, expansion joints and similar work to be coordinated with built-up roofing work, are specified in other sections of these specifications.

F. Roof Accessories: Miscellaneous sheet metal accessory items, including insulation vents and other devices and major items of roof accessories to be coordinated with built-up roofing work.

#### 3.10.2.5 Gravel Layer

A gravel layer of 16 to 32 mm diameter stone will be laid in at least 5cm thick on top of the filter layer in non-trafficable flat roofs. The gravel layer will be applied as soon as possible to prevent UV damage and/or wind damage to insulation and filter layers.

### 3.10.3 FLASHING AND SHEET METAL

#### 3.10.3.1 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.

#### 3.10.3.2 Steel Sheet, Zinc-Coated (Galvanized)

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

#### 3.10.3.3 Aluminum wall capping and expansion joint profiles.

Aluminum wall capping conforming to ASTM B 209 M, DIN 18339, BS or EN Standards.

#### 3.10.3.4 General

Downspouts shall be designed and fabricated on site. Unless otherwise specified or indicated, exposed edges shall be folded back to form a 13 mm (1/2 inch) hem on the concealed side, and bottom edges of exposed vertical surfaces shall be angled to form drips. Bituminous cement shall not be placed in contact with roofing membranes other than built-up roofing.

#### 3.10.3.5 Wall, Floor, Ceiling Expansion Joints Over Plaster

Expansion joints shall be provided as specified in ASTM, DIN 18339, BS or EN Standards.

#### 3.10.3.6 Connections and Jointing

##### 3.10.3.6.1 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.

##### 3.10.3.6.2 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.

### 3.10.3.6.3 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.

### 3.10.3.7 Downspouts

Downspouts shall be installed as indicated. Downspouts shall be rigidly attached to the building. Supports for downspouts shall be spaced according to manufacturer's recommendations.

### 3.10.3.8 Flashing

Flashing shall be installed at locations indicated and as specified below. Sealing shall be according to the flashing manufacturer's recommendations. Flashings shall be installed at intersections of roof with vertical surfaces and at projections through roof, except that flashing for heating and plumbing, including piping, roof and floor drains, and for electrical conduit projections through roof or walls are specified in other sections. Except as otherwise indicated, counter flashings shall be provided over base flashings. Perforations in flashings made by masonry anchors shall be installed on top of joint reinforcement. Lashing shall be formed to direct water to the outside of the system.

#### 3.10.3.8.1 Through-wall Flashing

Through-wall flashing includes sill, lintel, and spandrel flashing. The flashing shall be laid with a layer of mortar above and below the flashing so that the total thickness of the two layers of the mortar and flashing are the same thickness as the regular mortar joints. Flashing shall not extend further in to the masonry backup wall than the first mortar joint. Joints in flashing shall be lapped and sealed. Flashing shall be one piece for lintels and sills.

#### 3.10.3.8.2 Lintel Flashing

Lintel flashing shall extend the full length of lintel. Flashing shall extend through the wall one masonry course above the lintels and shall be bent down over the vertical leg of the outer steel lintel angle not less than 50 mm, or shall be applied over top of masonry and pre-cast concrete lintels. Bed joints of lintels at joints shall be under laid with sheet metal bond breaker.

#### 3.10.3.8.3 Sill Flashing

Sill flashing shall extend the full width of the sill and not less than 100 mm beyond ends of sill except at joint where the flashing shall be terminated at the end of the sill.

### 3.10.3.9 Wall Capping

Wall Capping shall be installed according to the manufacturer's recommendations.

## 3.10.4 SEALANTS

### 3.10.4.1 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.

### 3.10.4.2 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.

#### 3.10.4.3 Floor Joint Sealant

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

#### 3.10.4.4 Primers

Provide a non-staining, quick-drying type and consistency recommended by the sealant manufacturer for the particular application.

#### 3.10.4.5 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.

#### 3.10.4.6 Backstops

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

#### 3.10.4.7 Cleaning Solvents

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

#### 3.10.4.8 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.

#### 3.10.4.9 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.

#### 3.10.4.10 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.

#### 3.10.4.11 Primer

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.

#### 3.10.4.12 Bond Breaker

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.

#### 3.10.4.13 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 can not 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 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.

#### 3.10.4.14 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.

#### 3.10.4.15 Final Cleaning

Upon completion of sealant application, remove remaining smears and stains and leave the work in a clean and neat condition.

a. Masonry and Other Porous Surfaces: Immediately scrape off fresh sealant that has been smeared on masonry and rub clean with a solvent as recommended by the sealant manufacturer. Allow excess sealant to cure for 24 hour then remove by wire brushing or sanding.

b. Metal and Other Non-Porous Surfaces: Remove excess sealant with a solvent-moistened cloth.

### 3.11 WINDOWS, DOORS & GLAZING

#### 3.11.1 WINDOWS

##### 3.11.1.1 Materials

A. 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/mm<sup>2</sup> ultimate tensile strength and not less than 1.5 mm thick at any location for main frame and sash members.

B. 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.

1. Reinforcement: Where fasteners screw-anchor into aluminum less than 0.125 inch thick, reinforce the interior with aluminum or nonmagnetic stainless steel to receive screw threads or provide standard non-corrosive pressed-in splined grommet nuts.

2. 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.

C. 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.

D. Compression-Type Glazing Strips and Weather-stripping: Unless otherwise indicated, and at the manufacturer's option, provide compressible stripping for glazing and weather-stripping such as molded EPDM or neoprene gaskets.

E. 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.

F. Wire Fabric Insect Screen shall be permanently fixed to the exterior, except for guard towers.

#### 3.11.1.2 Hardware

A. General: 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.

#### 3.11.1.3 Horizontal Sliding Windows

Provide window units with 5 mm single glazed. Provide cam action sweep sash lock and keeper at meeting rails.

#### 3.11.1.4 Fabrication

Provide horizontally sliding aluminum windows with factory finish in all buildings to fit the masonry openings. Window openings shall be provided with insect screening permanently fixed to the exterior. Provide a locking device on the interior of each window. Provide anchors on each side of the frame into the adjoining masonry, 3 on each side. Provide weather stripping system for all exterior windows and doors.

#### 3.11.1.5 Finishes

Apply baked enamel in compliance with paint manufacturer's specifications for cleaning, conversion coating, and painting.

1) Color: White meeting the requirements of DIN 50018

#### 3.11.1.6 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.

#### 3.11.1.7 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.

#### 3.11.1.8 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.

#### 3.11.1.9 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.

### 3.11.2 DOORS

All exterior doors (entry and exist doors) shall be metal doors with metal frames.

Interior wood doors shall be flush solid lumber core (no particle board allowed); 900 mm wide x 2030 mm high x 45 mm thick with wood frames to match new door masonry openings. All glazed doors shall have 5mm single glazing in the upper half of the door. Heavy gauge metal exterior doors are required for security of unmanned buildings, such as water treatment building, power station, warehouses, and other buildings requiring higher security. Commercial duty lock sets and hardware shall be used on all doors. Install required louvers, as called for in paragraph 6, in the lower portion of the door. Provide 3 hinges on all doors. 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 a 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. All glazing in or adjacent to doors shall be tempered per IBC. Provide weather stripping system for all exterior doors.

#### 3.11.2.1 Steel Doors

SDI 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.

##### 3.11.2.1.1 Accessories

##### 3.11.2.1.2 Louvers

##### 3.11.2.1.2.1 Interior Louvers

SDI 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 0.9 mm thick steel and louver blades of a minimum 0.6 mm. Louvers for lightproof doors shall have minimum of 20 percent net-free opening. Sight-proof louvers to be inverted "V" blade design with minimum 55 or inverted "Y" blade design with minimum 40 percent net-free opening.

##### 3.11.2.1.2.2 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.

##### 3.11.2.1.3 Astragals

For pairs of exterior steel doors which will not have aluminum astragals or removable mullions, provide

overlapping steel astragals with the doors. For interior pairs of fire rated and smoke control doors, provide stainless steel astragals complying with NFPA 80 for fire rated assemblies and NFPA 105 for smoke control assemblies.

#### 3.11.2.1.4 Moldings

Provide moldings around glass of interior and exterior doors of interior doors. Provide non-removable moldings on outside of exterior doors and on corridor side of interior doors. Other moldings may be stationary or removable. Secure inside moldings to stationary moldings, or provide snap-on moldings. Moldings shall interlock at intersections and shall be fitted and welded to stationary moldings.

#### 3.11.2.1.5 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.

#### 3.11.2.1.6 Welded Frames

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

#### 3.11.2.1.7 Mullions and Transom Bars

Mullions and transom bars shall be closed or tubular construction and shall member with heads and jambs butt-welded thereto or knock-down for field assembly. Bottom of door mullions shall have adjustable floor anchors and spreader connections.

#### 3.11.2.1.8 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 fasteners approximately 300 to 400 mm on centers. Miter molded shapes at corners. Butt or miter square or rectangular beads at corners.

#### 3.11.2.1.9 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.

#### 3.11.2.1.10 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.

a. Masonry: Provide anchors of corrugated or perforated steel straps or 5 mm diameter steel wire, adjustable or T-shaped;

b. Completed openings: Secure frames to previously placed concrete or masonry with expansion bolts

#### 3.11.2.1.10.1 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.

#### 3.11.2.1.11 Fire and Smoke Doors and Frames

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

#### 3.11.2.1.12 Weather-stripping, Integral Gasket

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. Insert gasket in groove after frame is finish painted.

#### 3.11.2.1.13 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 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 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.

#### 3.11.2.1.14 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 A250.8, or paintable A25 galvanized steel without primer. Where coating is removed by welding, apply touchup of factory primer.

#### 3.11.2.1.15 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 indicated. 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 calking compound.

#### 3.11.2.1.16 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.

#### 3.11.2.1.17 Installation

##### 3.11.2.1.17.1 Frames

Set frames in accordance with SDI 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.

#### 3.11.2.1.17.2 Doors

Hang doors in accordance with clearances specified in SDI A250.8. After erection and glazing, clean and adjust hardware.

#### 3.11.2.1.17.3 Fire and Smoke Doors and Frames

Install fire doors and frames, including hardware, in accordance with NFPA 80.

#### 3.11.2.1.18 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 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.

#### 3.11.2.2 Wood Doors

Provide doors that are wood, solid lumber core (no particle board allowed), 900/1000/1100/1200 mm. Wide x 2200 mm. High x 45 mm. Thick with steel frame to match new door masonry openings. All glazed doors shall have 5 mm. single tempered glazing. Wood doors are not to be used for exterior doors to any building.

#### 3.11.2.2.1 Accessories

##### 3.11.2.2.1.1 Door Louvers

Fabricate from wood and of sizes indicated. Louvers shall be of the manufacturer's standard design and shall transmit a minimum of 35 percent free air. Louvers shall be the slat type.

##### 3.11.2.2.1.2 Door Light Openings

Provide glazed openings with the manufacturer's standard wood moldings except that moldings for doors to receive natural finish shall be of the same species and color as the face veneers. Moldings for flush doors shall be lip type.

##### 3.11.2.2.1.3 Weather Stripping

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

##### 3.11.2.2.1.4 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.

##### 3.11.2.2.1.5 Finishes

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

##### 3.11.2.2.1.6 Water-Resistant Sealer

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

##### 3.11.2.2.1.7 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.

#### 3.11.2.2.1.8 Weather stripping

Install doors in strict accordance with the manufacturer's printed instructions and details. Weather strip 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.

#### 3.11.2.3 Overhead Coiling Doors

Doors shall be fabricated from interlocking cold-rolled slats, designed to withstand building wind loading and be installed with wind locks. Slats shall be continuous for the width of the door. For doors not exceeding 4.27 m, slats shall be flat-profile design, with a depth of not less than 15.9 mm, a center to center width not more than 69.9 mm, and not less than a 1.21 mm uncoated thickness. Provide weather stripping for door-head and door jamb guides, and a bottom astragal. Weather stripping and astragal shall be natural rubber or neoprene rubber. Curtain jamb guides shall be fabricated from a combination of steel angles of sufficient size to retain curtain against the specified wind. Guides shall be fabricated from structural quality steel angles. Door shall have manufacturer's standard five pin tumbler locks; keyed. Doors shall be counterbalanced by an adjustable, steel, helical torsion spring mounted around a steel shaft in a spring barrel and connected to the door curtain with the required barrel rings. Hoods shall be fabricated from steel sheets with a minimum yield strength of 227.5 Mpa.

Counterbalance-barrel components shall be as follows:

- Spring barrels shall be hot-formed structural-quality carbon steel, welded or seamless pipe. Pipe shall be of sufficient diameter and wall thickness to limit deflection to a maximum of 1/360 of the span.
- Counterbalance springs shall be oil-tempered helical steel springs designed with a safety factor of 4. Springs shall be sized to counterbalance the weight of the curtain at any point of its travel, and shall be capable of being adjusted to counterbalance not less than 125% of the normal curtain load. Spring adjustment shall be arranged in such a way that the curtain need not be raised or lowered to secure the adjustment.
- Counterbalance shafts shall be case-hardened steel of the proper size to hold the fixed ends of the spring and carry the torsion load of the spring.

Barrel plugs shall be fabricated from cast steel machined to fit the ends of the barrel. Plugs shall secure the ends of the spring to the barrel and the shaft.

Barrel rings shall be fabricated from malleable iron of the proper involute shape to coil the curtain in a uniformly increasing diameter.

Shaft bearings shall be factory sealed ball bearings of the proper size for load and shaft diameters.

Door operators shall consist of an endless steel hand chain, chain-pocket wheel and guard, and a geared reduction unit of at least a 3:1 ratio. Required pull for operation shall not exceed 16 kg. Chain hoists shall have a self-locking mechanism allowing the curtain to be stopped at any point in its upward/downward travel and to remain in that position until moved to the fully open or closed position. Hand chains shall be cadmium-plated alloy steel with a yield point of at least three times the required hand-chain pull. Pretreated zinc-coated steel sheets shall be given the manufacturer's standard prime coat and an enamel finish coat applied to the exterior face after forming.

After installation, doors, track, and operating equipment will be examined and tested for general operation and weather against the specified wind pressure, and weather resistance. Doors that fail the required tests shall be adjusted and retested. Doors that have been adjusted and fail subsequent tests shall be removed and replaced with

new doors at no additional cost.

### 3.11.3 GLAZING

ASTM C 1036, or ASTM C 1172 or equal.

#### 3.11.3.1 Tempered Glass

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.

#### 3.11.3.2 Glazing Accessories

##### 3.11.3.2.1 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.

##### 3.11.3.2.2 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.

##### 3.11.3.2.3 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.

##### 3.11.3.2.4 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.

##### 3.11.3.2.5 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.

##### 3.11.3.2.6 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.

##### 3.11.3.2.7 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.

#### 3.11.3.2.8 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.

#### 3.11.3.2.9 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.

#### 3.11.3.3 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.

### 3.12 FINISHES

All finishes, colors and materials in existing building and new buildings shall match. See Section 01335 for color submittals required. Provide color boards with all materials for COR approval prior to ordering materials.

3.12.1 The exterior of all buildings shall be stucco. 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 1 cm thick. Allow 7 days to cure. The second coat shall be finish stucco, smooth finish, approximately 1 cm 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 work in texture and color. All exterior color finish shall be integral with the stucco finish. No painted stucco shall be permitted due to minimize future maintenance. Color to be selected by the Contracting Officer from the color board provided by the Contractor.

3.12.2 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 .06% lead by weight color to be selected by the Contracting Officer from the color board provided by the Contractor.

3.12.3 Ceilings of Barracks, and Headquarters, shall be plaster applied in 2 coats over wire mesh, which is to be stapled to the 20 mm x 60 mm wood battens. Paint ceiling with 2 coats of flat white, with less than .06% lead by weight. Gypsum board may be used in lieu of plaster but framing supports for Gypsum board shall be as follows: For ½" thick gypsum board structural fastener supports shall be not further apart than 400 mm. If gypsum board is thicker follow guidelines in ASTM C 840 for supports and fastener frequency

3.12.4 Ceilings of Dining Facility shall be exposed concrete painted with 2 coats of flat white, with less than .06% lead by weight.

- 3.12.5 Paint all exposed wood fascia, soffit, and doors with 2 coats of gloss enamel, white.
- 3.12.6 Exposed exterior steel trim, frames, doors and pipe railings: 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.
- 3.12.7 Exposed wood trim, frames and doors: 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
- 3.12.8 Tile: 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.
- 3.12.8.1 Floors in wet areas shall be 300 mm x 300 mm terrazzo tile with thin set mortar. Joints shall be 2-3 mm. Waterproof gray grout shall be applied the full depth of the tile. Floors shall slope, minimum 1/50, to floor drains. Slope shall be obtained with sloping mortar bed of minimum 20 mm thickness. Provide continuous waterproofing membrane beneath sloping mortar bed, turn up wall 300 mm behind wall base. Membrane shall be fully sealed at joints and shall shed water into body of floor drain. Color of tile shall be selected by the Contracting Officer from samples provided by the Contractor.
- 3.12.8.2 Floors in administration areas/living quarters and corridors shall be 300 mm x 300 mm terrazzo tile with thin set mortar. Joints shall be 2-3 mm. Waterproof gray grout shall be applied the full depth of the tile. Color of tile shall be selected by the Contracting Officer from samples provided by the Contractor.
- 3.12.8.3 Walls in wet areas shall be tiled with 150 mm x 150 mm glazed ceramic tile up to 2 meters above the floor to include interior of toilet stalls, showers and behind sinks. Joints shall be 2-3 mm. Waterproof gray grout shall be applied full depth of the tile. Grout shall cure for 72 hours and then be sealed with a commercial grout sealant in two coats. Color of tile shall be selected by the Contracting Officer from samples provided by the Contractor.
- 3.12.8.4 The ablation drain areas shall be recessed below the floor level 200 mm and lined with ceramic tile. Ceramic tile shall extend up the wall past the water spigots to a height of 2 m above finished floor. Seats shall be formed concrete with terrazzo tile finish to match the floor, 300 mm x 300 mm x 300 mm high finished dimensions. Color of ceramic tile shall be selected by the Contracting Officer from samples provided by the Contractor. Spacing between tiles shall be similar to terrazzo tile.
- 3.12.8.5 All other floors are to be completely cleaned and painted with floor enamel. Color to be selected by the Contracting Officer from samples provided by the Contractor.
- 3.12.8.6 Kitchen in Dining Facility shall be covered with terrazzo flooring. Walls in kitchen shall be ceramic tile up to 2 m above finished floor. Floor in Dining area shall be painted concrete.

### **3.13 SPECIALTIES**

#### **3.13.1 Mirrors**

0.6 m x 0.9 m, 6 mm plate glass, shall be mounted above all lavatories. Mount bottom of mirrors 1.1m above finished floor.

### 3.13.2 Toilet Paper Holders

Toilet paper holders, stainless steel, shall be installed approximately 200 mm above floor in Eastern Toilets.

### 3.13.3 Shower Curtain Rods & Shower Curtain

Shower curtain rods, stainless steel, heavy duty, 18 gauge shall be mounted between the screen walls of each shower stall. Mount rod at 2.0 m above finished floor. Provide a shower curtain with support rings for each shower stall.

### 3.13.4 Grab Bars

Stainless steel grab bars, heavy duty, 18 gauge, two each 900 mm and 1050 mm long, 40 mm diameter. shall be mounted behind and beside all eastern toilets, and bathtubs as occur.

### 3.13.5 Paper Towel Dispensers

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

### 3.13.6 Light Duty Metal Shelf

Provide a 600 mm long, light duty stainless steel shelf and brackets over each lavatory.

3.13.7 Robe hooks on all toilet and shower stalls required.

### 3.13.8 COLD STORAGE ROOMS

3.13.8.1 Contractor shall provide the Contracting Officer shop drawings for approval of appropriately sized walk-in refrigerators and freezer to include proposed manufacturer, construction details, manufacturer's instructions, evacuation and charging procedures, operation and maintenance date, start-up and initial operational tests.

3.13.8.2 Walk-in coolers shall be panel type modular construction. Doors shall be swing type. Refrigeration equipment shall be remote located on the exterior of the building. Provide a temperature/ alarm system. Provide interior lighting with exterior switch. Floors of cool rooms shall be insulated panelized construction from the manufacturer of the cool rooms. The concrete floor will not be depressed.

3.13.8.3 Refrigeration piping shall be annealed or hard drawn seamless copper tubing in conformance with ASTM B280. Refrigeration systems shall be remote type.

3.13.8.4 Electrical characteristics shall match local power 400v/3ph/50Hz and 220v/1ph/50Hz.

3.13.8.5 Preservation and packing shall be commercial grade.

3.13.8.6 Provide a recording thermometer.

3.13.8.7 Provide temperature alarm with connector to remote temperature alarm.

3.13.8.8 Provide outdoor condensing unit cover and security fence or wall to protect outside units. Provide condensing unit outdoor controls for operation down to -18 degrees C ambient temperature.

3.13.8.9 Refrigeration Equipment

Refrigeration equipment shall be designed for remote installation. Design units for 16 to 18 hour operation at the indicated interior temperature in –18 degree C ambient temperature. Capacities, air delivery, and dimensions shall be as indicated. Remote condensing units shall be factory fabricated and rated in accordance with UL303 and ARI 365. Provide with motor, air cooled condenser, receiver, compressors, mounted on a common base. Compressors shall be hermetic type. Evaporators shall be factory fabricated and rated in accordance with UL 412 and ARI 420. Forced convection, unit cooler type, made to suspend from the ceiling panels, with forced air discharged parallel to the ceiling. Provide with air circulating motor, multi-fin tube type coil and grille assembled within a protective housing. Air circulation motors shall be lifetime sealed, and the entire unit-cooler assembly shall be accessible for cleaning. Provide a drip pan and drain connection. When the cold storage room is used for freezing, provide an automatic electric heat defrosting system. Provide a timer type defrost controllers.

3.13.8.9.1 Provide condensate drain lines and drains below freezer floors with electric heating cable, thermostatically controlled to maintain 10 degrees C at zero flow rate. Cable shall be sized in accordance with manufacturer's recommendations.

3.13.8.9.2 Submit a copy of installation instructions to the Contracting Officer covering both assembly and installation of the refrigeration equipment prior to start of work. Start up and initially operate the systems upon completion of the installation of the equipment and refrigerant piping. Adjust the safety and automatic controls to place them in operating sequence. Record manufacturer's recommended readings hourly. Operational test shall cover a period of not less than 24 hours. Upon completion of Operational test the systems shall be performance tested. Test duration shall not be less than 8 hours. Test shall include the following information to be in the report with conclusions regarding the adequacy of the systems:

Time, dates and duration of tests:

- Inside dry-bulb and wet-bulb temperatures maintained in each room during the tests employing recording instruments calibrated before the tests.
- Outside dry-bulb and wet-bulb temperatures obtained from recording instruments calibrated and checked hourly with a sling psychrometer.
- Evaporator and condenser entering and leaving temperatures taken hourly with the compressors in operation.
- The make, model, and capacity of each evaporator and condensing unit.
- Voltmeter and ammeter readings for condensing units and evaporators.

3.13.8.9.3 Provide chart showing the layout of the refrigeration systems, including piping, valves, wiring, and control mechanisms. Submit printed instructions covering the maintenance and operation of refrigeration equipment. Tag shutoff valves in accordance with the instructions. Provide any special tools necessary for repair and maintenance of the systems.

3.13.8.9.4 Remove any packing material. Wash and clean floors, walls, ceilings and equipment inside of cool rooms. Wash and clean exposed surfaces on outside.

3.13.8.9.5 Upon completion of the work and at a time designated by the Contracting Officer, provide instruction to designated personnel in the operation and maintenance of each refrigeration system. The period of instruction shall not be less than one 8-hour day.

### **3.14 STANDARDS**

The Contractor should use the following American standards to provide sound structural design if local standards

are not available, relevant, or applicable. The Contractor shall follow American Concrete Institute Standards for design and installation of all concrete structures.

Concrete	240.0 kg./sq.cm (f'c) cylinder strength @ 28 days (ASTM-. C 31M)
Steel Reinforcement	4218.0 kg./sq.cm (Fy= 60.0 ksi), yield strength.
Welded Wire Fabric	ASTM A185
Anchor Bolts	ASTM A307 using A36 steel.
Concrete Masonry Units	ASTM C90, Type I (normal wt, moisture Cntrl).
Mortar	ASTM C270, Type S (Ultimate compressive strength of 130.0 kg/sq. cm.)
Proportion	1 part cement, 0-1/2 part lime and 4-1/2 parts aggregate
Grout	ASTM C476 (Slump between 200 mm to 250 and Compressive Strength 14 MPa (2000 psi) at 28 days.
Joint Reinforcement	Standard 9 gage minimum, Ladder Type
Structural Steel	ASTM A36: 2530.0 kg./sq.cm (Fy = 36,000psi)
Welding	AWS (American Welding Society) D1.1-2002.

#### 4. STRUCTURAL

##### 4.1 GENERAL

The project consists of various structures. The new buildings shall be provided with a reinforced concrete slab foundation that is properly placed on suitable compacted ground area and shall be in accordance with the recommendations from the geotechnical investigation. The reinforced concrete foundation shall be designed by the Contractor. Building foundations shall be founded a minimum of 800 mm below grade.

##### 4.2 DESIGN

Design shall be performed and design documents signed by a registered professional architect and/or engineer. Calculations shall be in SI (metric) units of measurements. All components of the building shall be designed and constructed to support safely all loads without exceeding the allowable stress for the materials of construction in the structural members and connections. All building exterior walls shall be constructed with reinforced CMU, shotcrete 3-D panels, or reinforced Concrete unless otherwise stated in the 1010 or 1015.

##### 4.3 DEAD AND LIVE LOADS

Dead loads consist of the weight of all materials of construction incorporated in the buildings. Live loads used for design shall be in accordance with the American Society of Civil Engineers, ASCE STANDARD, and Minimum Design Loads for Buildings and Other Structures, ASCE 7, edition as referenced herein.

##### 4.4 WIND LOADS

Wind loads shall be calculated in accordance with ASCE 7 using a "3-second gust" wind speed of 125 km/hr.

##### 4.5 SEISMIC

The building and all parts thereof shall be designed for the seismic requirements as defined by the International Building Code referenced herein. Spectral ordinates shall be  $S_s = 1.65g$  and  $S_1 = 0.75g$ .

##### 4.6 STRUCTURAL CONCRETE

Concrete structural elements shall be designed and constructed in accordance with the provisions of the American Concrete Institute, Building Code Requirements for Structural Concrete, ACI 318, latest edition. A minimum cylinder 28 day compressive strength of 21 MPa (3000 psi) shall be used for design and construction of all concrete, except that 24 MPa (3500 psi) shall be used for shotcrete applications. Reinforcing steel shall be

deformed bars conforming to American Society for Testing and Materials (ASTM) publication ASTM a 615, Deformed and Plain Billet-Steel Bars for Concrete Reinforcement. Concrete at or below grade shall have maximum water-cement ration of 0.40. No concrete shall be placed when the ambient air temperature exceeds 32 degrees C (90 degrees F) unless an appropriate chemical retardant is used. In all cases when concrete is placed at 32 degrees C (90 degrees F) or hotter it shall be covered and kept continuously wet for a minimum of 48 hours. Concrete members at or below grade shall have a minimum concrete cover over reinforcement of 75 mm (3 inch).

#### **4.7 MASONRY**

Masonry shall be designed and constructed in accordance with the provisions of Building Code Requirements for Masonry Structures, ACI 530/ASCE 5/TMS 402, latest editions. Mortar shall be Type S and conform to ASTM C 270, latest edition. Masonry shall not be used below grade, unless for fully grouted and reinforced foundation stem walls. All cells of exterior CMU walls shall be fully grouted and reinforced.

#### **4.8 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, 9th Edition. 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.

#### **4.9 METAL DECK**

Deck units shall conform to SDI Pub. No. 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 inch) 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.

#### **4.10 OPEN WEB STEEL JOIST**

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.

#### **4.11 FOUNDATIONS**

Foundations shall be in accordance with the Geotechnical requirements of this RFP.

### **5. GEOTECHNICAL**

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.

### **6. MECHANICAL**

#### **6.1 GENERAL**

The work covered by this section consists of design, supply, fabrication and installation of new building heating, ventilation and air-conditioning (HVAC) 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 HVAC equipment including all necessary associated mechanical works.

## 6.2 SPECIALIST SUB-CONTRACTORS QUALIFICATIONS

The heating/ventilation and air-conditioning works shall be executed by an air-conditioning specialist sub-contractor experienced in the design and construction of these types of systems.

## 6.3 CODES, STANDARDS AND REGULATIONS

The equipment, materials and works covered under the heating, ventilation and air-conditioning services shall conform to the referenced standards, codes and regulations where applicable except where otherwise mentioned under each particular clause.

### 7.3.1 INDOOR DESIGN CONDITION

Summer – 23.9 deg C (75 deg F) & 50% RH

Winter – 21.1 deg C (70 deg F)

### 6.4.1 NOISE LEVEL

Noise levels inside occupied spaces generated by HVAC systems shall not exceed NC 40.

### 6.4.2 INTERNAL LOADS

- a. Occupancy: refer to Section 01010.
- b. Lighting (Fluor.): 21.5 W/m<sup>2</sup> (2 W/Ft<sup>2</sup>) maximum (however lighting levels shall meet minimum requirements)
- c. Outdoor Air: 34 CMH/Person (20 CFM) or “51 CMH/bedroom (30 CFM/bedroom)”; Latrine – 85 CMH/WC or Urinal (50 CFM) exhaust. Maintain negative pressure in latrine areas where mechanical HVAC is required.
- d. Building Pressurization: 1.3 mm W.G. (0.05 in W.G.)

### 6.4.3 THERMAL PERFORMANCE

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 2.288 (R 19)
ceilings/roof	RSI 6.688(R 38)
basement wall	RSI
floor (over unheated space)	RSI 5.28 (R 30)
exterior doors	RSI 0.25 (R 1.43)
exterior windows/ (glazing within doors)	RSI 0.308(R 1.75)
Skylights	RSI 0.18 (R 1.02)

## 6.5 NEW AIR CONDITIONING EQUIPMENT

Heating/Refrigeration Equipment:

Environmental control of the facilities shall be achieved by HVAC equipment proposed by the contractor and approved by the U.S. Government. Cooling in the housing module shall be achieved using ductless-type split direct-expansion air conditioning units. Cooling in the toilet/shower module (as required) may be accomplished using ductless type split direct-expansion air-conditioning units or packaged air conditioning units (roof or perimeter mounted) however, any specifics within Section 01010 or elsewhere herein regarding heating and cooling requirements shall be adhered to. Heating shall be achieved by electric heating as part of the air-conditioner and/or supplemented by electric baseboard type convactor heating. Unless otherwise noted, the Contractor may choose any combination of equipment to achieve the inside design conditions specified for the floor plans.

#### 6.5.1 Unitary (ductless split) DX Air Conditioning Units

Ductless split units shall be unitary in design and factory manufactured ready for installation. Provide two indoor units with a single condensing unit for each housing module. Evaporator unit shall consist of a DX evaporator cooling coil, blower, electric heater and washable filter all mounted in a housing finished for exposed installation. Cooling coil condensate piping shall route to and discharge to the sanitary sewer system. The condensing unit will contain compressor, condenser coil, and all internal controls/fittings complete to include a weatherized housing constructed and mounted on a 300 mm (12 inch) high steel stand on roof on the upper module. Copper refrigerant suction and liquid piping shall be sized, insulated and installed in accordance to unit manufacture recommendations. Unit temperature control shall include wall mounted adjustable thermostat, blower on-off-auto switch and heating-cooling change over control.

#### 6.5.2 Packaged Terminal Air Conditioners

Packaged Terminal Air Conditioners shall be self-contained thru-the-wall type unit consisting of a completely self-contained, electrically operated unit, equipped with a factory assembled refrigeration system. The units shall consist of compressor, condenser, evaporator fans, motors, evaporator, heating and condenser coils/sections and all necessary appurtenances. The unit shall be provided with a steel/metal sleeve or shall which can be permanently installed within the wall opening. The chassis of the unit shall be easily removable from the shell from inside the conditioned space. Adequate condenser air shall enter louvered openings. Provision of fresh air shall discharge through movable louvers. These units shall be mounted high on the wall to prevent infiltration of ground dust and in locations so as not to impede flow and function of the module.

#### 6.5.3 Wall Penetrations

Building wall penetrations shall be carefully made so as not to deteriorate the structural integrity of the wall system. The Contractor shall consult with the building manufacturer, if possible, to determine the best way to penetrate the wall. If the building manufacturer is not available, a structural engineer shall be consulted. In either case, the recommendations of the engineer shall be strictly adhered to.

#### 6.5.4 Control Wiring and Protection Devices

Control wiring and protection of the air conditioning units being offered must be the manufacturer's standard, pre-wired, installed in the unit at the factory or as recommended. Thermostats shall be located near the unit return. For units serving more than one area, the thermostat shall be located near the return of the space with the highest heat generation.

#### 6.5.5 Air Filtration

All supply air shall be filtered using manufacturer's standard washable filters mounted inside the unit. In addition, all outdoor air intakes where required shall be equipped with 50 mm (2 inch) thick washable filters.

#### 6.5.6 Submittals

The Contractor shall submit the following for the equipment to be provided under this section of the specification: manufacturer's data including performance characteristics at design conditions, dimensions, performance data, electrical requirements, and compliance with standards as stated in paragraph CODES, STANDARDS AND REGULATIONS; drawings indicating location of each piece of equipment, routing and size of refrigerant piping.

## **6.6 VENTILATION AND EXHAUST SYSTEMS**

All fans shall be used for building ventilation and pressurization with capacities to be selected for minimum noise level generated. Unit mounted fans either used for supply or exhaust 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 exhaust fan shall be provided with shut-off dampers which close automatically when the fan is not running. Also, each fan shall be complete with vibration isolator, external lubricators, and all accessories and sound attenuators as necessary.

### **6.6.1 Submittals**

The Contractor shall submit the following for the 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 standards as stated in paragraph CODES, STANDARDS AND REGULATIONS; drawings indicating location and installation details.

## **6.7 TEST ON COMPLETION**

6.7.1 After 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. Include tests for all interlocks, safety cutouts and other protective device to ensure correct functioning. All such tests shall be carried out and full records of the values obtained shall be prepared along with the final settings and submitted to the Contracting Officer in writing.

6.7.2 The following tests and readings shall be made by the Contractor in the presence of the Contracting Officer and all results shall be recorded and submitted in a tabulated form.

### **a. Room Inside Conditions:**

1. Inside room DB & WB temperatures
2. Air flow supply, return and/or exhaust

b. Air Handling Equipment: Air quantities shall be obtained by anemometer readings and all necessary adjustments shall be made to obtain the specified quantities of air indicated at each inlet and outlet.

Following readings shall be made:

1. Supply, return and outside air CMH (CFM) supplied by each air conditioning system.
2. Total CMH (CFM) exhausted by each exhaust fan
3. Motor speed, fan speed and input ampere reading for each fan
4. Supply, return and outside air temperature for each air-conditioning system.

### **c. Electric Motors:**

For each motor: (1) Speed in RPM  
(2) Amperes for each phase  
(3) Power input in KW

## **6.8 ELECTRICAL REQUIREMENTS FOR HVAC EQUIPMENT**

a. Note that electrical requirements for all HVAC systems shall be designed and installed to operate on the secondary power standard required herein.

b. All thermostats shall be wall mounted near the return grilles in the room with the highest heat load generation and mounted 1.5 meters (5 feet) above the floor. In lieu of a thermostat, a temperature sensor may be located in the same location and connected to a thermostat located near the unit return. Thermostat shall be mounted 1.5 meters (5 feet) above the finished floor and be easily accessible. Thermostats for the latrine facilities shall be located near the unit return and mounted 1.5 meters (5 feet) above the finished floor. Operation of the control system shall be at the manufacturer's standard voltage for the unit.

c. The following are the minimum requirements for motors regarding enclosure, insulation and protection:

1. Compressor Hermetic: Provide inherent (internal) overload protection.
2. Condenser: Provide internal thermal overload protection.
3. Evaporator (Open Class "A") fan motor type provides internal thermal overload protection.

## 7 PLUMBING

### 7.3 SYSTEM REQUIREMENTS

Domestic water and waste systems shall be provided to each area with fixtures requiring water and/or waste connections such as toilets, etc. The entire water system shall include cold water to each fixture as well as to a water heater. Hot water shall be distributed to all lavatories, sinks, showers, etc. normally requiring hot water. Design of the water distribution and waste systems shall be in complete accordance with the requirements of the National Standard Plumbing Code (NAPHCC-01, latest edition). Design and construct a sewage tank system that can be converted into a lift station in the future. The Contractor shall design, furnish, install and test a domestic water supply system for each showers/latrines module (three for male and one female) as indicated on the drawing. Each supply system shall comprise of a booster pump, booster tank and water heater. Mechanical equipment shall be housed inside an insulated enclosure designed for year around operation and suitably protected from weather elements. Contractor shall design and install a domestic water tank system that can be easily converted to a permanent system in the future.

### 7.4 PIPING MATERIALS

Domestic water shall be distributed by means of PVC (cold water only), CPVC (cold or hot water) or copper for the pressure to be utilized. PVC and CPVC shall not be used in areas where it will be exposed to outdoor sun.

### 7.5 FIXTURES

All plumbing fixtures shall be provided with p-traps and shall be vented to the roof per International Plumbing Code, latest edition.

#### 7.3.1 Water Closet

Unless noted otherwise, provide floor mounted, bottom discharge, white vitreous china elongated bowl with white seat and lid, flush tank type. Water supply shut-off valves shall be provided.

#### 7.3.1 Urinals

If required, provide wall hung, rear discharge white vitreous china with flush valve.

#### 7.3.2 Lavatories

Unless otherwise noted, lavatories shall be wall hung white vitreous china with hidden chair carriers, faucet and pop-up type drain. Faucets shall be chrome plated brass single lever mixing type.

### 7.3.3 Water Heater

Water heaters shall be electric storage type with either non-simultaneous dual element type. Water heaters shall be sized in accordance with the requirements of ASHRAE HVAC Applications Handbook, latest edition. Electrical service for water heaters shall be as required herein.

### 7.3.4 Insulation

All domestic water piping exposed to weather shall be insulated and covered with metal jacketing.

## 8 FIRE PROTECTION

### 8.3 GENERAL

Facility construction and fire protection systems shall be installed in accordance with the publications listed herein and the publications referenced therein. Where a conflict occurs among various criteria, the more stringent requirement shall take precedence.

### 8.4 BUILDING CONSTRUCTION

Building construction shall conform to fire resistance requirements, allowable floor area, building height limitations and building separation distance requirements of the building code.

### 8.5 LIFE SAFETY

Facilities features will be provided in accordance with NFPA 101, among other references, to assure protection of occupants from fire or similar emergencies.

### 8.6 FIRE PROTECTION EQUIPMENT

All fire protection equipment shall be listed by Underwriters' Laboratories (UL) or approved by Factory Mutual (FM) or equivalent and shall be listed in the current UL Fire Protection Equipment Directory or Factory Mutual Approval Guide or equivalent.

### 8.7 NOT USED

### 8.8 FIRE ALARM AND DETECTION

Smoke detection – see electrical section for more fire alarm and detection details. Smoke detectors are required for each building. Smoke detectors shall have back up battery power and be installed according to all applicable fire protection codes. Fire alarm evacuation systems shall be provided as required by NFPA 101 and UFC 3-600-01 and listed herein.

### 8.9 WATER SUPPLY FOR FIRE PROTECTION

A dedicated fire protection water supply is unavailable. Therefore, alternate methods of design and construction are being instituted.

### 8.10 PORTABLE FIRE EXTINGUISHERS

Portable fire extinguishers shall be provided inside all facilities and at exterior locations as required in accordance with NFPA 10. 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).

## 9 ELECTRICAL

### 9.3 GENERAL

Contractor shall design and construct all electrical systems for the modular housing structures, and shower and toilet buildings. This includes design, construction, all necessary labor, equipment, and material for a fully functional system. Secondary electrical distribution system shall be as required within Section 01010, 220/380 volt, 3-phase, 4 wire, 50 hertz. 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 systems shall be designed for the ultimate demand loads, plus 20% spare capacity.

#### 9.4 Design Criteria

##### 9.2.1 Applicable Standards

- a. Design shall be in the required units as stipulated herein.
- b. 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.
- c. All electrical systems and equipment shall be installed in accordance with NFPA code requirements.
- d. 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 NFPA 70 (NEC) and International Electrical Testing Association Inc. (NETA).
- e. Any other applicable references listed herein.

### 9.3 MATERIAL

#### 9.3.1 General:

Unless noted otherwise, all material used shall be in compliance with the requirements of IEC or DIN standards. In the event that IEC or DIN compliant materials are not available, contractor may then select applicable British Standards (BS), or Underwriters Laboratories Inc. (UL) listed material. Material and equipment installed under this contract shall be for the appropriate application.

#### 9.3.2 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.

9.3.3 Design Conditions: All equipment shall be rated and designed for 49 degrees Celsius (120 degrees Fahrenheit) and minimum elevation of 1524 meters (5000 feet) above sea level.

9.3.4 Restrictions: Aluminum conductors shall not be specified or used.

## 9.4 DESIGN REQUIREMENTS

### 9.4.1 Electrical Distribution System

Contractor shall perform a load calculation to determine the number of required transformers to feed all facilities in this project. In the event the existing transformer(s), if present, cannot support the load of the entire facilities package, the contractor shall notify the Contracting Officer. In such instances the contractor shall provide all the information regarding the required number of the new transformers to the Contracting Officer. Design and installation of any additional feeders required from any new ATS(s) will be the responsibility of the contractor.

Contractor shall coordinate power needs with the Contracting Officer relative to needs met by each transformer, and to limit power interruption to other services already connected.

Use the following paragraph when facility (ies) are connected to on-site generator power: Generators shall be provided for on site power. Generators shall be provided in a minimum of two (2) set configuration to enable backup of each other while still providing service for the total load. Generators shall be pad mounted within an enclosure rated for exterior use. An automatic transfer switch shall be provided for automatic transfer of power when switching from one generator to another. Transfer shall be fully automated with a time clock. Generators shall be fitted with load banks matched to the load. Generators shall be sized for total electrical load plus twenty percent (20 %) spare capacity minimum. Fuel storage capacity shall be based on usage at total electrical load for a minimum of 28 days at full load for the entire duration. Fuel storage shall either be in aboveground single wall steel tank(s) with containment pit or underground double wall with leak detection. The contractor shall provide and install properly sized service entrance feeder from the generator system to the service entrance equipment located inside of each facility. Service entrance equipment shall include a distribution panel board properly sized to feed each facility. Contractor shall coordinate with the Contracting Officer in locating the main distribution panel board(s) as close as possible to the corresponding ATS

Use the following paragraph when facility (ies) are connected to an existing or FUTURE electrical distribution grid (including prime power): Transformers shall will be provided with back-up generators and Automatic Transfer Switches (ATS) by the contractor. The scope of work covered by this proposal begins at each ATS. The contractor shall provide and install properly sized service entrance feeder from each ATS to the service entrance equipment located inside of each facility. Service entrance equipment shall include a distribution panel board properly sized to feed each facility. Contractor shall coordinate with the Contracting Officer in locating the main distribution panel board(s) as close as possible to the corresponding ATS.

All panel boards shall be circuit breaker 'bolt-on' type panels. Minimum size circuit breaker shall be rated at no less than 20-amperes. Circuit breakers shall be connected to bus bar(s) within the panel boards. 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 bridged to make a 3-pole breaker. All wiring shall be copper, minimum # 12 AWG (or equivalent mm sq wire) installed in metal conduit. Wiring shall be recessed in finished areas and surface mounted in unfinished areas. Flush mounted panels shall be provided with spare empty conduits from panel to unfinished area for future use. All panels shall be provided with a minimum of 20% spare capacity for future load growth. Power receptacles (outlets) shall be duplex type as required within Section 01010 220 V, 50 hertz and shall be compatible with the required secondary power. All splicing and terminations of wires shall be performed in a 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 NFPA 70 (National Electric Code). For large panels (225 Ampere and above) provide an ammeter, voltmeter and kilowatt-hour meter to monitor energy usage. Selector switch shall be provided for reading all 3 phases. Circuits shall be provided for all mechanical equipment and final connections made. Receptacle locations shall be coordinated with architectural requirements.

Contractor shall provide (design and install) circuits for all mechanical equipment and any other equipment that requires power and make the final connections.

#### 9.4.2 Lighting

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	35 FC (350 Lux)
Toilets, Showers, Latrines	20 FC (200 Lux)
Mechanical/Electrical rooms	30 FC (300 Lux)

Corridors and Stairways	20 FC (200 Lux)
Offices (private)	50 h/5 v FC (500 h/50 v Lux)
Offices (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	10 h/3 v FC (100 h/30 h Lux)
Conference	30 h/5 v FC (300 h/50 v Lux)
Video Conference	50 h/30 v FC (500 h/300 v Lux)
Corridors	10 v FC (100 v Lux)
Worship (congregational areas)	10 h/3 v FC (100 h/30 v Lux)
Worship (leader area)	30 h/30 v FC (300 h/300 v Lux)
Toilets and Washrooms	5 h/3 v FC (50 h/30 v Lux)
Egress path (incl. exterior)	10 Lux
Areas adjacent to egress path	0.5 Lux

FC = footcandle

H = horizontal component

V = vertical component

Indoor lighting for all areas shall consist of fluorescent surface mounted light fixtures. Exterior lighting will be installed as referenced. Moisture resistant/waterproof fluorescent light fixtures shall be provided in high humidity and wet areas such as latrines and showers. 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.

#### 9.4.3 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 magnetic 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.

#### 9.4.4 Emergency "EXIT" Light Fixtures

Emergency "EXIT" light fixture shall be provided in accordance with NFPA requirements. Fixtures shall be single side 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 and lamp failure indication buttons. Primary operating voltage shall be 120 volts. Lettering "EXIT" shall be color red and not less than 6 inches (150 mm) in height and on matte white background. Illuminations shall be with LEDs.

#### 9.4.5 Above Mirror Lights

Above mirror lights shall be provided in toilet rooms.

#### 9.4.6 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 and lamp failure indication buttons. Primary operating voltage shall be 220 volts.

#### 9.4.7 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. Three-way or Four-way lighting shall be provided in all rooms / areas with multiple entrances.

#### 9.4.8 Receptacles

General-purpose receptacles shall be as required herein. Receptacles shall be placed at 3-meter (10 feet) intervals in general. Sinks will have a receptacle above, with one dual receptacle serving two sinks that are side-by-side. Receptacles in wet/damp areas or within 1 meter (~3 feet) of sinks, lavatories, or wash-down areas shall be ground fault circuit interrupter (GFCI) type or Residual Current Disconnect (RCD) type, with the trip setting of 30 milliamperes or less. Total number of duplex receptacles shall be limited to six (6) per 20-ampere circuit breaker.

#### 9.4.9 Conductors

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

#### 9.4.10 Grounding and Bonding

Grounding and bonding shall comply with the requirements of NFPA 70. Underground connections shall be exothermal 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 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 less than 48 hours after rainfall.

#### 9.4.11 Enclosures

Enclosures for exterior and interior applications shall be IEC Classification IP54 and IEC Classification IP10, respectively.

#### 9.4.12 Fire Detection & Alarm System

A complete Fire Detection and Alarm System shall be provided throughout the buildings and installed in accordance with NFPA 72 requirements. System shall include, but not limited to, addressable Fire Alarm Control Panel (FACP), pull (or push button) stations, horns, strobes, and smoke and/or heat detectors (with alarm verification feature). The system shall be capable of automatically transmitting the alarm signal, via telephone lines, to the local fire department/fire station or other location designated by the Contracting Officer. Fire alarm system shall be complete and a standard product of one manufacturer and shall be compatible with the existing predominant standard system in place at the installation.

#### 9.4.13 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. It is recommended that Metal Oxide Varistors (MOV) technology be used for such application.

#### 9.4.14 Conduit Raceway System

Metal conduit system shall be complete, to include but not limited to, necessary junction and pull-boxes. Smallest conduit size shall be no less than 20mm (0.75 inch) in diameter. All empty conduits shall be furnished with

pullwire. System design and installation shall be per NFPA 70 requirements. Exterior conductors shall be installed in PVC conduit at a depth of 48-inches.

#### 9.4.15 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.

#### 9.4.16 Identification Nameplates

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

#### 9.4.17 Schedules

All panel boards and load centers shall be provided with a panel schedule. Schedule shall be typed written in English.

#### 9.4.18 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 rating. Single line diagrams for each system, installed in a clear plastic frame, shall be provided.

END OF SECTION

## SECTION 01015-B

TECHNICAL REQUIREMENTS  
OUTPOST SITES

## 1. GENERAL

1.1 The Contractor's design and construction must comply with technical requirements contained herein. The Contractor shall provide design and construction using the best combination of cost, construction efficiency, system durability, ease of maintenance and environmental compatibility. The Contractor is responsible for master planning and site design; site development, including grading and storm water management; water storage tank, water line, sanitary sewer construction; electric; communications systems and all facilities as described in this Request for Proposal (RFP).

1.2 These design and product requirements are minimum standards. The Contractor is encouraged to propose alternate design or products (equipment and material) that are more commonly used in the region; equipment and materials will be equally or more cost effective or allow for more timely completion, but furnish the same system durability, ease of maintenance and environmental compatibility. The Contractor will be required to submit information as requested by the Contracting Officer to make a comparison of the proposed alternate. All variations must be approved by the Contracting Officer. Life expectation for this facility is for twenty (20) years. Material and methods used for this project must meet this design requirement. All requirements set forth in the RFP, but not included in the Scope of Work (SOW) shall be considered as set forth in both, and vice versa. Any time two or more statements in the RFP, building codes, or standards are in conflict; the most stringent shall apply. This project consists of new construction of the infrastructure and building for a Counter Narcotics Coast Guard Outposts as defined in Section 01010 SCOPE OF WORK and shall be executed in accordance with the following requirements. All submittal and construction requirements are typical for each site. The sites for this contract are located along Makran Coast, Pakistan.

## 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 materials 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 ACTIVITY HAZARD ANALYSIS (AHA)

- a. Activity Hazard Analysis shall be prepared in accordance with the Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1.
- b. Safety requirements (or alternatives) that will either eliminate the identified hazards, mitigate or control them to reduce the associated risks to an acceptable level will be developed. The adequacy of the operational and support procedures that will be implemented to eliminate, control, or abate identified hazards or risks will then be evaluated and a second risk assessment completed to verify that a satisfactory safety level has been achieved.

## 1.5 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. The Contractor shall make no part of the time lost due to such stop orders the subject of claim for extension of time or for excess costs or damages.

## 1.6 WARRANTY

The Contractor shall repair and/or replace all defective materials or workmanship, except for roofs, at his own cost for a warranty period of one (1) year commencing upon the date of final acceptance of the project. See roof construction under RFP for warranty.

## 1.7 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.

## 1.8 MAN-HOUR EXPOSURE REPORTING REQUIREMENTS

Prime Contractors are required to maintain records for both prime and subcontractor employees to include exposure work hours, a log of occupational injuries and illness and local/international economic data. The Prime Contractor shall submit the information on CEAED Form 385-1-1 to the COR by the 25<sup>th</sup> of each month. The COR shall submit the information to the Chief, Safety, and the AED Economist by the end of the month. The COR shall assure that the form is properly filled out and that the complete contract number or task order number are clearly indicated. Section III of the form is the Economic Analysis Report and it must contain data itemized by location if the contract has more than one work location. It is extremely important that the economic data be broken out by work location. The contractor may develop their own spreadsheet for a contract with multiple work sites provided the spreadsheet includes the basic information detailed on the Economic Data Report. Accident exposure data does not need to be itemized by location and should be submitted as a total for the entire contract.

## 2. CIVIL 2.1 GENERAL OVERVIEW OF EXISTING AND PLANNED INFRASTRUCTURE

Assume survey mapping and topographical maps are not obtainable. Contractor is responsible for topographic survey. The sites contain existing Coast Guard Posts and infrastructure for water supply; however, there is no pumping or distribution water; no sanitary sewer collection system, no lift stations or sewage treatment facility. Additionally, solid waste management and/or collection facilities are non-existent. Generally, there is no potable water is available at this site. For the project site, it is anticipated that the sole source of water will be through water delivery trucks. The estimated water demand is 41 gallons per day per person, with the estimated total strength of six (6) guards. Hence new water supply, pumping and distribution infrastructure shall include: 1) A properly sized underground Water Storage Tank (minimum 1 week storage), 2) Water service booster pump, 3) Water transmission line to the building to supply water to kitchen sink and bathroom. An entirely new underground sanitary sewer septic holding tank shall be constructed and be connected to the building restroom and kitchen sink.

2.2 SURVEY AND MAPPING 2.2.1 Survey Requirements - Topographic survey is not required for this project.

2.2. 2 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. 2.2. 3 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.

### 2.3 WATER 2.3.1 Underground Water Storage Tank

Infrastructure design and construction shall be designed for a total population of six (6) personnel to last one week. The Contractor shall install an underground water storage tank, service water booster pump, gate valve, check valve (between the pump and the gate valve), concentric reducer, pressure gauge, air relief valve, water lines, valves, fittings and appurtenances to the above ground water storage reservoir. The required Average Daily Demand (ADD) is 155 liters (41 gallons) per capita per day.

### 2.3.2 Above Ground Water Storage Reservoir

Contractor shall provide a circular steel or circular concrete ground storage reservoir (GST) to be located on the ground surface. Volume of the GST shall be a minimum storage volume of a full days' demand. The Contractor shall verify storage volume requirements based on final design population. The storage facility shall be located above drainage areas and locations subject to flooding as approved by the Contracting Officer. The storage facility shall be located on the highest elevations of the site to promote gravity flow and reduce pumping requirements. Overflow and air vents shall be screened so that birds, rodents and debris cannot enter the reservoir. The contractor shall install piping and other fittings and valves to connect the storage reservoir to the main building kitchen and bathroom.

2.3.3 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 the concrete thrust blocking, unless otherwise approved. 2.3.4

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 1.03 MPa (150psi).

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. 2.3.5

Leakage Test Leakage test shall be conducted after the pressure tests have been satisfactorily completed. The duration of each leakage test shall be at least 2 hours and during the test the water line shall be subjected to not less than 1.03 MPa (150psi). 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 34.5kPa (5psi) of the specified leakage test pressure after the pipe has been filled with water and the air expelled. Pipe installation will not be accepted if leakage exceeds the allowable leakage, which is determined by the following formula:  $L = 0.0001351ND (P)^{0.5}$  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. 2.5

SANITARY SEWER 2.5.1 General: There are no functional or salvageable sanitary sewer collection, treatment or disposal facilities. The sites being remote outposts will require aerated pit latrines.

2.5.2 Aerated Pit Latrines: The pit maybe excavated, using a backhoe or hand labor. Usually the pit walls are supported by 2 x 4 lumber and lagging. The privy structure is best designed to allow easy transport to a new location. It may be uncoupled from the pit wall supports and carried to another location when the pit is filled with waste to within 0.6m of the ground surface. Once the structure has been removed, the remaining pit is buried with topsoil and seeded to grass. Use passive solar panels to produce a rising current of warm air, which passes out of the screened vent pipe. Screened openings are provided at he base of the privy structure to allow cool air to move laterally across the top of the pit, up, and then out of the vent. Latrines can be operated as composting toilets if leaves, wood chips and pine straw are added to the excreta.

2.5.4 Quantity of Wastewater The Contractor shall verify the average daily flow considering resident population. The average daily flow will represent the total waste volume generated over a 24-hour period, and shall be based on a population of eight (8) troops and usage rate of 41 gallons per capita day (water usage). The wastewater flow rate shall be calculated as 80% of average daily flow.

## 3.2 DESIGN PRODUCTS

### 3.2.1 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 Sub-Contractors, Vendors, Suppliers, etc.

### 3.2.2 Design Analysis

The design analysis should be written in the English Language for review by the Government for all buildings and to have indexes, table of contents and each page numbered. Each building shall be listed as indicated in Section 01010. 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 required, shall be submitted. Copies of all previous design phase review comments and the actions assigned to them shall be included with each submission of the design analysis. Specific requirements for the design analysis, listed by submittal phase, are contained hereinafter. Provide Code Analysis for each building based on the following items and code sections.

### 3.2.3 Code Analysis

The following analysis information is required for all buildings submitted in this proposal. List: Seismic Design Category, Wind Speed, and Snow Load.

Analysis Items	Code References – International Building Code (IBC) 2003
1. Type of Construction	IBC Chapter 6
2. Occupancy Classification	IBC Chapter 3 and Table 302.3.2
3. Actual Allowable Area	IBC 503, 505-508 & Table 503
4. Actual Allowable Height	IBC 504 & Table 503
5. Occupant Load (per use)	IBC 1004 & Table 1004.1.2
6. Exits Required/Provided	IBC 1004 & Table 1004.1.2 IBC 1014, 1018, and 1018.2
7. Required Opening Protection	IBC Table 602
8. Fire Resistive Construction	IBC Table 601

### 3.2.4 Design Calculations

When design calculations are voluminous, they shall be bound separately from the narrative part of the design analysis. The design calculations shall be presented in a clean and legible form incorporating a title page and index for each volume. A table of contents, which shall be an index of the indices, shall be furnished when there is more than one volume. The source of loading conditions, supplementary sketches, graphs, formulae, and references shall be identified. Assumptions and conclusions shall be explained. Calculation sheets shall carry the names or initials of the computer and the checker and the dates of calculations and checking. No portion of the calculations

shall be computed and checked by the same person. Either the designer or the checker shall be a licensed engineer.

### 3.2.5 Specifications

Specifications shall be prepared in accordance with the Construction Specifications Institute (CSI) format. The Design-Build Contractor prepared specifications shall include as a minimum, all applicable specifications sections referenced by the CSI. Where the CSI 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. All materials specified shall use CSI Standards and shall be listed in Section 1.1 References of each Specification Section. It shall be the Contractor's responsibility to show that equivalency requirements are met if the Standard is not per (CSI) format. Designer shall not edit out any references, standards, etc. relating to any materials used in the project. There shall be a Title page, index page and all sections clearly marked with pages associated within those CSI sections.

### 3.2.6 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. Any conflicts between sections 01010 and 01015 about RFP requirements, the more stringent criteria shall be used.

### 3.2.7 Colors

Designer of record shall provide one Color Board comprised of all finishes to be used on project and submit at 65% for approval. Upon approval two Color Boards shall be submitted for record. Color Boards shall be kept at job site for approval of materials used at jobsite.

## 3.3 DEMOLITION

3.3.1 Exterior site clearing and site preparation are required at some sites. There are a few structures on some sites requiring demolition. Refer to Appendix III (site photos) for more details.

3.3.2 As all buildings to be constructed under this Contract are new, there is no interior demolition required. All existing structures, that deem to be unsafe, to be demolished as noted in the survey report post Shahabi.

## 3.4 EXCAVATION AND FILL

3.4.1 Trench excavation shall be made for concrete slabs and footings (if necessary). Trenches shall be a minimum of .8 meter deep or below the frost depth, whichever is greater. Trenches deeper than 1.5 meters shall have protective shoring to protect workers or have the sides of the trench laid back at a slope of 1.5:1.

3.4.2 Care shall be taken when backfilling of foundation trenches to avoid damage to walls.

3.4.2.1 Fill in existing anti-vehicle trench that will be in the new compound area with clean, well draining gravel (no rocks larger than 50mm diameter) compacted to 95% proctor density.

3.4.3 Any excess gravel or excavated material shall become the property of the Contractor and shall be removed from the site to a location approved by the Contracting Officer.

## 3.5 CONCRETE

3.5.1 Place 150 mm (6") of crushed stone capillary water barrier below areas to receive a concrete slab on properly compacted soil free of organic material.

3.5.2 A plastic 6 mill vapor barrier shall be placed over the capillary water barrier prior to placing of concrete slabs.

3.5.3 Concrete flooring in wet areas shall slope to the floor drain and not allow for water to puddle. Concrete slabs in all areas shall not be placed prior to inspection and approval of piping and sub-surface by the Contracting Officer.

3.5.4 Foundation trenches shall be level and free of loose material. Trenches shall be inspected and approved by the Contracting Officer prior to placing of any concrete foundations.

3.5.5 See paragraph 4 for structural characteristics of concrete and reinforcing steel for foundations and slabs.

### 3.6 MASONRY

3.6.1 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.

3.6.2 Concrete masonry units (CMU) shall be 20cm x 40cm x 20cm high plastered on each side. They shall be installed in running bond level and plumb. Mortar joints shall be 9mm on all sides between CMU. Install only quality units. All materials of structural (bearing) masonry wall assemblies shall be rated at a minimum of 105 kg/cm<sup>2</sup> (1,500 psi) compressive strength. 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. Local building material can be used instead of CMU block; however, use of local building material still requires meeting seismic building code and mortar mix shall be in accordance with paragraph 4, Structural. For force protection, all masonry shall be fully grouted, and reinforced to resist the design loads. Note exterior wall insulation requirements of R-20 per paragraph 3.9.8 of this section.

3.7 METAL: Note many sites are on the ocean, salt-air is a design element that must be considered for the use of any kind of metals. The use of stainless steel is highly recommended.

3.7.1 Steel roof joists shall be placed according to the roof design and roof manufacturer specifications. Steel "Z" 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 details of how leaks will be avoided, and the Contracting Officer before application must approve the plan. Steel "hat channels" shall be installed on the bottom side of steel beams for the installation of gypsum board with screws. Provide all necessary metal framing for roof fascia, gable, and soffits.

3.7.2 See paragraph 4 for structural characteristics of steel joists.

3.7.3 Galvanized metal window sills, 1mm (20 gauge), shall be installed on the exterior of all windows. The metal window sills shall have a turn down of 5cm 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 2 cm 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 6mm to the exterior and not allow water to puddle.

3.7.4 Provide steel cook top in kitchen minimum thickness of 1cm. Provide circular cut outs as shown in Appendix A. Design the diameter of circular cut to fit propane gas stove rings. Provide steel infill plates for all cut out openings. Cook top can be made of several pieces for ease of handling. Adjacent plates shall be tight fitting to each other.

3.7.5 Provide steel cook top in kitchen for tea stations minimum thickness of 1cm. Provide circular cut outs as shown in Appendix A. Design the diameter of circular cut to fit propane gas stove rings and tea boilers. Provide steel infill plates for all cut out openings. Cook top can be made of several pieces for ease of handling

3.7.6 Provide 1.6mm (16 gauge) stainless steel pass through counter tops at the two openings between the kitchen areas. Edges shall be turned down 3 cm and corners shall be welded and ground smooth. Provide anchor angles welded to the bottom of the counters to anchor tops to masonry walls below. Provide six (6) anchors on the Dish Return Counter, three (3) on each side of the wall. Provide eight (8) anchors on the Serving Counter, four (4) on each side of the wall. Anchor angles to wall with masonry expansion sleeves and stainless steel screws. Counter tops are to be 60cm wide x length of opening shown.

3.7.7 Roof flashings and Fascia, see 3.9 Roof Construction.

3.8 PRE-ENGINEERED METAL BUILDING - NOTE: Metal buildings not recommended for post located in the ocean environment areas as noted in Section 01010 para. 2.1.

Pre-engineered Metal Building shall conform to all requirements in Uniform Facility Guide Specification (UFGS) SECTION 13120 PREENGINEERED METAL BUILDINGS

Steel Framing: Steel framing shall conform to American Iron and Steel Institute (AISI), Cold Formed Steel Design Manual, American Institute of Steel Construction (AISC) ASD, Manual of Steel Construction, Allowable Stress Design, and TI 809-07, Design of Cold-Formed Load Bearing Steel Systems and Masonry Veneer/Steel Stud Walls. Cold-formed framing shall consist of steel studs, top and bottom tracks, runners, horizontal bridging, and other cold-formed members and other accessories. All members and components made of sheet steel shall be hot-dip galvanized in accordance with ASTM A 653/A 653M with a minimum coating thickness of G 60. This framing shall be used only in framing the exterior steel stud wall system. Design metal siding and flashing to overhang CMU wall or concrete 50 cm.

3.9 ROOF CONSTRUCTION –design for local environment accordingly for a 20 year roof life.

3.9.1 Roofing shall be standing seam metal roofing. Roofing system shall include all edge, ridge and penetration flashings necessary for a watertight installation. Provide continuous soffit and ridge vents meeting the venting requirements of the IBC Code on all roofs. Roof slopes shall be continuous to the perimeter of the building, without interior valleys or depressions where ponds can form.

3.9.1.1 Overflow Scuppers shall be provided on all roofs that have interior roof drains designed into the roof plan.

3.9.2 Sloped roofs shall be standing seam metal roofing. Roof slopes shall be 3 in 12 minimum. Roof Panels: Panels shall be 22 – 24 gauge standing seam metal. Roof deck assemblies shall be Class 90 as defined in UL 580. Length of sheet shall be sufficient to cover the entire length of any unbroken roof slope when such slope is 9.000 mm or less. When length of run exceeds 9000 mm and panel splices are provided, each sheet in the run shall extend over three or more supports. Sheets longer than 9.000 mm may be furnished if approved by the Contracting Officer. Width of sheets shall provide not more than 450 mm of coverage in place. SSMRS with roofing panels greater than 300 mm in width shall have standing seams rolled during installation by an electrically driven seaming machine. Height of standing seams shall be not less than 60 mm. All sheets shall be cut in the shop to correspond to the roof slope and may have a horizontal joint at the eave line.

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

3.9.3 Performance Standards: The SSMRS shall be tested for wind uplift resistance in accordance with ASTM E 1592. The uplift resistance of the SSMRS shall be established as indicated in the “STANDARD TEST METHOD FOR STRUCTURAL PERFORMANCE OF SSMRS BY UNIFORM STATIC AIR PRESSURE DIFFERENCE”. The SSMRS design shall be adequate for uplift if the established allowable pressure from testing causes no failure

as defined in the Corps of Engineers' STANDARD TEST METHOD FOR STRUCTURAL PERFORMANCE OF SSMRS BY UNIFORM STATIC AIR PRESSURE DIFFERENCE. Testing to ultimate capacity is not required.

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

Fasteners: Concealed fasteners for steel roof panels shall be zinc-coated steel, aluminum, corrosion resisting steel, or nylon capped steel, type and size specified below or as otherwise approved for the applicable requirements. Concealed fasteners for aluminum roof panels shall be aluminum or corrosion resisting steel. Fasteners for structural connections shall provide both tensile and shear strength of not less than 350 kilograms per fastener. Fasteners for accessories shall be the manufacturer's standard.

Exposed roof fasteners shall not be used or welded to the metal roofing.

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

Bolts: Bolts shall be not less than 6 mm diameter, shouldered or plain shank as required, with locking washers and nuts.

Structural Blind Fasteners: Blind screw-type expandable fasteners shall be not less than 6 mm diameter. Blind rivets shall be .28 mm minimum diameter.

3.9.5 Thermal resistance of insulation shall be not less than the R-30. R-values shall be determined at 75 degrees F in accordance with ASTM C 518. Insulation shall have a flame spread not in excess of 25 and a smoke developed rating not in excess of 50 when tested in accordance with ASTM E 84. Insulation shall be a standard product of a manufacturer, factory-marked or identified with manufacturer's name or trademark and R-value. Identification shall be on individual pieces or individual packages. Facing shall be white, either of reinforced foil with a vinyl finish or sheet vinyl except unreinforced foil with a natural finish may be used in concealed locations. Insulation shall have a facing providing a permeability of 0.02 perm or less when tested in accordance with ASTM E 96. Facing shall be of 2 mil thick white vinyl backed with 150 mm by 150 mm glass scrim and 0.7 mil thick metal foil laminate. Reinforced foil with a natural finish may be used for facing in concealed locations. Facings and finishes shall be factory applied.

Rigid or Semi-rigid Board Insulation: Rigid board insulation shall conform to ASTM C 612, Form A, Class 1. All foam plastic insulation shall have a thermal barrier per IBC. Insulation shall not be exposed; any covering required shall meet the life expectation for this facility.

Blanket Insulation: Blanket insulation shall conform to FS HH-ISS8, Form B, Type I, Class 6. Insulation shall not be exposed; any covering required shall meet the life expectation for this facility.

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

Concealed Anchor Clips: Concealed anchor clips shall be as recommended by the manufacturer for the roofing system furnished. Clip bases shall have factory punched or drilled holes for attachment. Clips used with panel width greater than 300 mm shall be made from multiple pieces with the allowance for the total thermal movement required to take place within the clip.

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

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

**Sub-purlins:** Sub-purlins, when required by the system design, shall be formed from steel sheet as standard with the manufacturer. The uncoated thickness may be a minimum of 1.5 mm if bolts or structural blind fasteners are used for attachment of the concealed anchor clips to the sub purlins.

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

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

Provide roof coverings, roof gutters or roof water diverter's at all exterior door entry ways to keep rain water off of these walking surfaces.

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

**Ventilation:** A minimum of 25 mm of airspace shall be provided between the insulation and the roof sheathing. The net free ventilating area shall not be less than 1/300 of the area of the space ventilated, with 100 percent of the required ventilating area provided by ventilators located in the upper portion of the space.

**3.9.6 Contractor's Weather Tightness Warranty:** The SSSMR system shall be warranted by the Contractor on a no penal sum basis for a period of five years against material and workmanship deficiencies; system deterioration caused by exposure to the elements and/or inadequate resistance to specified service design loads, water leaks, and wind uplift damage. The SSSMR system covered under this warranty shall include the entire roofing system including, but not limited to, the standing seam metal roof panels, fasteners, connectors, roof securement components, and assemblies tested and approved in. In addition, the system shall consist of panel finishes, slip sheet, insulation, vapor retarder, all accessories, components, and trim and all connections with roof panels. This includes roof penetration items such as vents, curbs, and skylights; gutters and downspouts; eaves, ridge, hip, valley, rake, gable, wall, or other roof system flashings installed and any other components specified within the contract to provide a weather tight roof system; and items specified in other sections of the specifications that are part of the SSSMR system. All material and workmanship deficiencies, system deterioration caused by exposure to the elements and/or inadequate resistance to specified design loads, water leaks and wind uplift damage shall be repaired. This warranty shall warrant and cover the entire cost of repair or replacement, including all material, labor, and related markups. The Contractor shall supplement this warranty with written warranties from the installer and system manufacturer, which shall be submitted along with Contractor's warranty; however, the Contractor shall be ultimately responsible for this warranty. The Contractor's written warranty shall be as outlined in the Corps Of Engineers Guide Specifications for WARRANTY FOR STRUCTURAL STANDING SEAM METAL ROOF (SSSMR) SYSTEM, and shall start upon final acceptance of the facility. It shall be required that the Contractor provide a separate bond in an amount equal to the installed total roofing system cost in favor of the owner (Government) covering the Contractor's warranty responsibilities effective throughout the five-year Contractor's warranty period for the entire SSSMR system as outlined above.

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

A manufacturer's 2 year material warranty guaranteeing that the aluminum, zinc-coated steel, aluminum-zinc alloy coated steel or aluminum-coated steel as specified herein will not rupture, structurally fail, fracture, deteriorate, or become perforated under normal design atmospheric conditions and service design loads. Liability under this warranty shall be limited exclusively to the cost of either repairing or replacing nonconforming, ruptured, perforated, or structurally failed coil material.

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

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

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

3.9.8 Insulation Provide the minimum insulation values as follows:

Metal walls R Value of  $R = 20$

Roof R Value of  $R = 30$

### 3.10 DOORS and WINDOWS

3.10.1 Provide horizontally sliding PVC windows in all buildings to fit the masonry openings, with factory baked finish off-white to match doors. All windows shall be 6mm laminated glass. Windows openings shall be provided with insect screening permanently fixed to the exterior frame. Provide a locking device on the interior of each window. Provide anchors on each side of the frame into the adjoining masonry, 3 on each side, 2 top and bottom. Provide weather stripping system for all exterior windows and doors.

3.10.2 Insulation Provide the minimum insulation values as follows:

Exterior Doors R Value of  $R = 4$

Exterior Roll-up Doors R Value of  $R = 11$  Min.

#### 3.10.3 Spare

#### 3.10.4 Exterior Door

3.10.4.1 All exterior doors shall be 44 mm hollow metal 18 gauge steel with rigid foam core insulation. Hollow metal frames shall be 18 gauge steel and comply with ASTM A-366 cold rolled 3-piece knock down or equal Steel doors, frames, and steel glazing frames shall be painted to match factory finish off-white window frames. Doors shall be 900 mm wide X 2100 mm high.

#### 3.10.5 Interior Door

All interior doors to be solid wood lumber core (particle board not allowed), 90/100/120 cm. Wide x 220 cm. High x 45 mm. Thick with steel frames. Provide stainless steel kick plates in high traffic areas such as restrooms and DFAC facilities.

3.10.6 Weather Stripping: 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.

### 3.11 WEATHERPROOFING

3.11.1 Caulk all joints between masonry/stucco and metal window and doorframes and metal sills and metal window frames to prevent the passage of wind and water. Material shall be a 100% silicone, white or clear, applied with a caulking gun, if painting is not required. Where caulk is to be painted, siliconized acrylic or siliconized acrylic latex shall be used. Surfaces must be clean, dry, and free of dirt. Caulking bead should be 6mm. Smooth to produce a concave filet between the adjoining 90-degree angle surfaces. Allow to cure 2-4 days before painting.

3.12 HARDWARE. All finish hardware in this building shall be made of and shall be a brushed stainless steel #4 finish.

3.12.1 Hinges: Exterior hinges shall have non-removable pins and be 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 1200mm wide Hinges for labeled fire doors must be either steel or stainless steel. Hinges shall conform to ANSI/BHMA A156.1 and A156.7. Locksets, Latchets, Exit Devices, and Push and Pull Plates: Exterior doors shall have mortise locks conforming to ANSI/BHMA A156.13 for metal doors. Interior doors shall have mortise locksets conforming to ANSI/BHMA A156.13, Series 1000, 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.

3.12.2 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.

3.12.3 Thresholds: All exterior doors shall be provided with aluminum thresholds conforming to ANSI/BHMA A156.21. Doors at ceramic tile flooring shall be provided with marble thresholds and set marble threshold 13 mm above tile at all wet areas.

3.12.4 All hardware required for exiting, etc. shall be per Codes for exiting and shall comply with ANSI/BHMA and finishes shall match hardware specified above.

3.12.5 Door Stops: Doorstops shall be provided on all exterior and interior doors. Doorstops shall comply with ANSI/BHMA A156.16 and shall be stainless steel

#### 3.12.7 Master Keying

All submittals/shop drawings referring to keys and keying shall be submitted to engineering for evaluation. A key cabinet shall be provided with a capacity 50% greater than the number of key changes used for door locks. Location of Key cabinet shall as directed by Contracting Officer. Lock cylinder shall have not less than six (6) pins "Small Format Interchangeable Core (SFIC)" manufactured by Best Lock Company. A grand master keying system shall be provided from the factory. Locks shall be keyed in sets or subsets based on building groups as indicated in Section 01010 and submitted to for evaluation to engineering. Keys shall be supplied as follows:

Locks: 3 change keys each lock

Master keyed sets: 3 keys each set

Grand Master keys: 10 total

### 3.13 FINISHES

3.13.1 EXTERIOR of the building shall be plaster over CMU or plaster over concrete. Install new stucco in 2 coats which shall have color integral with the finish. The first coat shall be a scratch coat approximately 1 cm thick. Allow 7 days to cure. The second coat shall be finish stucco, smooth finish, approximately 1 cm thick. Exterior painting of stucco is discouraged for maintenance reasons.

### 3.13.2 INTERIOR WALLS

3.13.2.1 shall be plaster applied in a similar manner as exterior stucco but paint with 2 coats of semi-gloss off-white with less than .06% lead by weight.

3.13.2. 2 Walls in wet areas shall be tiled with 150mm x 150mm glazed ceramic tile up to 2 meters above the floor to include interior of toilet stalls, showers and behind sinks. Joints shall be 2-3mm. Waterproof gray grout shall be applied full depth of the tile. Grout shall cure for 72 hours and then be sealed with a commercial grout sealant in two coats. Color of tile shall be selected by the Contracting Officer from samples provided by the Contractor. Gypsum board backer boards shall NOT be used.

### 3.13.3 CEILINGS

3.13.3.1 Ceilings of all buildings shall be plaster applied in 2 coats over wire mesh, which is to be stapled to the 2cm x 6cm wood battens. Paint ceiling with 2 coats of flat white, with less than .06% lead by weight. Gypsum board may be used in lieu of plaster but framing supports for Gypsum board shall be as follows: For ½” thick gypsum board structural fastener supports shall be not further apart than 40 cm. If gypsum board is thicker, follow guidelines in ASTM C 840 for supports and fastener frequency.

3.13.4 Paint all doors and frames with 2 coats of semi-gloss enamel, off white.

### 3.13.6 FLOORS

3.13.6.1 Floors in all rooms shall be vinyl tile with glue. Walls in kitchen shall be ceramic tile up to 2 meters above finished floor. Color of vinyl shall be selected by the Contracting Officer from samples provided by the Contractor.

3.13.7 Provide and install propane burning cooking stoves and chimneys in the kitchen. Stove is to be site built of masonry. Provide 1cm steel cooking top.

3.13.8 Provide sink for washing pots and kitchen utensils.

3.13. 9 Provide tables and seating for 6 people in the dining room.

### 3.14 SPECIALTIES

3.14.1 Toilet paper holders, stainless steel, shall be installed in all Toilet stalls to be approximately 20 cm above the floor.

3.14.2.1 Robe Hooks shall be provided and installed in all toilet and shower stalls.

3.14.2.2 Showers

3.14.3 Other Accessories include soap dishes, curtain rods and curtains for showers.

## 4.0 STRUCTURAL

### 4.1 GENERAL

The single-story or two-story buildings will be constructed either using CMU (concrete masonry units) load bearing walls with steel beams supporting the roofing system, or 3D Panel construction. The ground floor slab shall be minimum 150 mm thick. Slab shall be placed on clean vapor barrier over 150 mm thick capillary water barrier on compacted soil.

#### 4.2 DESIGN LOADS

The facilities shall be designed by using service gravity loads and considering basic combinations of appropriate service loads, wind and seismic.

4.2.1 Basic wind speed, using 3-second gust, of 125 Kmph.

4.2.2 Seismic Loads

The computations of seismic loads shall be based on International Building Code using Spectral Ordinates  $S_S = 1.65g$  &  $S_1 = 0.75g$ .

#### 4.3 CRACK CONTROL

The work shall include crack control measures to minimize cracks in slab-on-grade, concrete construction, such as crack control joints, expansion joints and isolation joints, as necessary. Expansion joints shall be determined and shown on the drawings.

#### 4.5 DESIGN CRITERIA

The Contractor shall be familiar with codes/standards. the use of American codes/standards, etc., to include but not be limited to:

Minimum Design loads	ANSI/ASCE 7-1995.
Concrete	American Conc. Institute (ACI) 318-99
Structural Steel	AISC MANUAL, 9 <sup>th</sup> Edition
Masonry	Technical Manual, TM5-809-3 (working stress)
Seismic	IBC-2000, Seismic Design for Buildings.

#### 4.6 MATERIALS

The followings are few typical American Standards. The Contractor should use these standards to provide sound structural. The Contractor shall follow American Concrete Institute Standards for design and installation of all concrete structures.

Concrete	210 kg./sq.cm cylinder strength @ 28 days.
Steel Reinforcing	4218.0 kg. /sq.cm (Fy= 60.0 ksi), yield strength.
Welded Wire Fabric	ASTM A185
Anchor Bolts	ASTM A307 using A36 steel.
Concrete Masonry Units	ASTM C90, Type I (normal wt, moisture Cntrl). Mortar - ASTM C270, Type S (Ultimate compressive strength of 130.0 kg/sq. cm.) Proportion 1 part cement, 0-1/2 part lime, and 4-1/2 parts aggregate) Grout - ASTM C476 (Slump between 200 mm to 250 and Compressive Strength 14 MPa (2000 psi) at 28 days). Joint Reinforcements: Standard 9 gauge minimum Ladder Type

Structural Steel.           ASTM A36: 2530.0 kg./sq.cm (Fy = 36,000psi)  
                                          Welding: AWS (American Welding Society)  
                                          D1.1-2002.

#### 4.7 FOUNDATIONS

The foundations, and stem walls shall be constructed by using reinforced concrete materials. The foundations shall be strip-footing type for continuous walls and spread type for individual column footings and shall be reinforced as required per design. Minimum strip footing width shall be 80cm and minimum depth shall be 80cm to meet frost requirement. The allowable bearing pressure shall be determined by the Contractor and be put in accordance with the Contractor's Geotechnical Investigation.

### 5. GEOTECHNICAL

#### 5.1 Site Specific Information.

Site specific geotechnical information necessary to design and construct the foundations, pavements and other geotechnically related items contained in this project shall be the Contractor's responsibility. The Contractor shall determine all necessary geotechnical conditions by appropriate field and laboratory investigations and supporting calculations.

#### 5.2 Geotechnical Report.

The Contractor shall produce a detailed geotechnical report containing field exploration and testing results, laboratory testing results, evaluations, recommendations, calculations and descriptive supporting text. Information in the report shall include, but not limited to: existing geotechnical (e.g. surface and subsurface) conditions, location of subsurface exploration logs, exploration point, foundations selected, bearing capacity, pavement design criteria (e.g. CBR values, K values), ground-water levels, and construction materials (e.g. concrete cement, asphalt, and aggregates). Two copies of the detailed geotechnical report shall be submitted to the Contracting Officer.

#### 5.3 Geotechnical Qualifications.

A geotechnical engineer or geotechnical firm responsible to the Contractor shall develop all geotechnical engineering design parameters. The geotechnical engineer or geotechnical firm shall be qualified by: education in geotechnical engineering; professional registration; and a minimum of ten (10) years of experience in geotechnical engineering design.

#### 5.4 Design Certification.

The Contractor shall certify in writing that the design of the project has been developed consistent with the site-specific geotechnical conditions. The certification shall be stamped by the geotechnical engineer of the geotechnical firm and shall be submitted with the final design.

### 6. MECHANICAL

#### 6.1 SCOPE OF WORK

##### 6.1.1 General

The Contractor shall design, supply, fabricate and install mechanical systems in the facilities identified in Section 1010 Scope of Work and as described herein. Heating, Ventilation, and Air-Conditioning (HVAC) requirements for typical facilities are described hereinafter in paragraph 6.4. The contractor shall be responsible for complete design and construction of all HVAC and special mechanical systems required for Generators, Water & fuel Storage and other facility or structures required as part of this contract.

The work also includes the delivery to site, erection, setting to work, adjusting, testing and balancing, and handing over in full operating conditions all of the ventilation equipment and associated mechanical works. All mechanical/electrical controls accessible by the general public shall be lockable and tamper proof.

#### 6.1.2 Sub-Contractors Qualifications

The ventilating and heating works shall be executed by a specialist sub-contractor experienced in the design and construction of these types of systems.

#### 6.1.3 Standard Products

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.

### 6.2 CODES, STANDARDS AND REGULATIONS

The design and installation of equipment, materials and works covered under the mechanical, heating, ventilation, and air-conditioning services shall conform to the following standards, codes and regulations as applicable except where otherwise indicated under particular clause. The publications to be taken into consideration shall be those of the most recent editions. Standards other than those mentioned-above 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 to the Contracting Officer for approval.

IBC – International Building Code

IMC – International Mechanical Code

NFPA - National Fire Protection Association Including the following:

NFPA 31 – Standard for the Installation of Oil Burning Equipment (see annex D for diesel-fuel adaptation)

NFPA 54 – National Fuel Gas Code

NFPA 58 – Liquefied Petroleum Gas Code

NFPA 86 – Standard for Ovens and Furnaces

NFPA 92A – Recommended Practice for Smoke-Control Systems.

NFPA 96 – Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations

NFPA 97 – Standard Glossary of Terms Relating to Chimneys, Vents, and Heat Producing Appliances

NFPA 204 – Standard for Smoke and Heat Venting

NFPA 211 – Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances

ASHRAE – American Society of Heating, Refrigeration and Air-Conditioning Engineers Including the following:  
ASHRAE 62, ASHRAE 154

AABC – Associated Air Balance Council (National Standards for Total System Balance)

ARI – Air-Conditioning and Refrigeration Institute

ASME – American Society of Mechanical Engineers

ASTM – American Society for Testing and Materials

AWS – American Welding Society

SMACNA – Sheet Metal and Air Conditioning Contractors' National Association

ACGIH – American Conference of Governmental Industrial Hygienists

6.2.1 Site Location- reference the site map for the project location.

6.2. 2 Noise Levels

6.3 EQUIPMENT

6.3.5 Heating

Heating for personnel comfort shall be accomplished using mostly split-pac heating/cooling units. Contractor shall determine the size and number of these units in each area based on building heat loss and shall provide and route vent ducts or flue through exterior wall or roof to terminate at minimum 1 meter above roof.

Oil-fired, Fuel-Oil fired, or Diesel-fired stoves shall be in compliance with NFPA 31, NFPA 86, NFPA 92A, and NFPA 204.

6.3.10 Wall Penetrations

Building wall penetrations shall be carefully made so as not to deteriorate the structural integrity of the wall system.

6.3.11 Control Wiring and Protection Devices

Control wiring and protection devices shall be the manufacturer's standard, pre-wired, and installed at the factory. Operation of the control system shall be manufacturer's standard configured for 220V/50Hz or 24V operation.

6.3.12 Thermostats

All thermostats shall be located near the return grills and mounted 1.5 meters above the floor and shall be easily accessible. In lieu of a thermostat, a temperature sensor may be located in the room and connected to the control thermostat near the unit. Thermostats located inside occupied areas shall be provided with lockable covers.

6.3.13 Electric Motors

All HVAC motors shall be Totally Enclosed Fan Cooled (TEFC) type and rated for minimum 40 C ambient.

6.3.14 Outdoor Equipment

Screen walls or elevated platforms shall be provided for protection of outdoor HVAC equipment from wind-blown sand and debris.

6.4 Air-conditioning HVAC

Air-conditioning HVAC shall be provided for personnel comfort where noted.

#### 6.4.1 Exhaust Systems

Exhaust systems shall be provided to remove excess heat and noxious fumes and to maintain indoor temperature within equipment operational parameters. All toilet rooms shall be provided exhaust ventilation using wall or roof-mounted centrifugal fans and ductwork. Make-up air for small exhaust shall be pulled in from adjacent rooms through door grills or provided by air-handling systems. Provide toilet exhaust fans with Hand-OFF-AUTO switch. In Hand setting the fan shall operate continuously. In Auto setting, the operation of the exhaust fan shall be interlocked to the operation of the central AHU.

#### 6.4.2 Kitchen Fuel Storage/Distribution.

Propane Storage and Distribution shall be provided to support operation of the propane stoves for cooking and boiling tea. The bulk storage of fuels shall consist of above-ground horizontal steel tanks sized to store a 28-day supply of fuel, with earth berms (earth beams shall be designed to prevent gas from accumulating at low points). These tanks shall be complete with fill fittings, 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. Fuel shall be transferred from the bulk storage tanks by duplex transfer pumps into individual day tanks. Fuel piping shall be fiberglass for underground and steel for piping located above grade. Bulk storage capacity shall be based on minimum four-week full load operation of the plant. Metal fuel tank saddles should not be placed directly on fuel containment area slabs. They should be elevated on piers to avoid moisture corrosion. Fuel containment area should have a sump or manually controlled water release valves for water removal.

Provide fuel filling system for unloading fuel from fuel tanker into individual bulk storage tanks comprising of truck pad(s), duplex fuel transfer pumps, piping manifold and valves. The system shall provide remote fuel level monitoring panels at the pad(s) and to the generators.

### 6.5 TESTING AND COMMISSIONING

#### 6.5.1 General

After completing the work, but prior to building acceptance, the Contractor shall demonstrate that the ventilation systems are adjusted and operate correctly 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 cut-outs and other protective devices to demonstrate safe operation. A description of all equipment or systems to be tested and balanced including the test procedures must be submitted prior to the scheduled testing that will be witnessed by the Government. All such tests shall be carried out in the presence of the Contracting Officer or representative and full written records of the test data and final settings shall be submitted to the Contracting Officer.

### 7. PLUMBING

#### 7.1 SCOPE OF WORK.

##### 7.1.1 General

The Contractor shall design and build domestic cold and hot water systems, waste, drain and vent systems, waste-oil collection and storage and fuel-oil storage and distribution systems required in the facilities identified in Section 1010 Scope of Work and as described herein. The Contractor shall be also 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, setting to work, adjusting, testing and

balancing and handing over in full operating condition all of the plumbing equipment and associated plumbing works.

#### 7.1.2 Sub-Contractors Qualifications

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

#### 7.1.3 Standard Products

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.

### 7.2 CODES, STANDARDS AND REGULATIONS

The design and installation of equipment, materials and work covered under the plumbing services shall conform to the following standards, codes and regulations 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. Standards other than those mentioned herein 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.

IPC – International Plumbing Code

NFPA - National Fire Protection Association

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

ASME – American Society of Mechanical Engineers

ASTM – American Society for Testing and Materials

AWS – American Welding Society

### 7.3 PLUMBING SYSTEMS REQUIREMENTS

#### 7.3.1 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. 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.

#### 7.3.2 Piping Materials

Domestic water shall be distributed by means of standard weight (schedule 40) galvanized steel pipe. Waste and vent piping can be made of either galvanized steel pipe (schedule 40), or Polyvinyl Vinyl Chloride (PVC) conforming to ASTM D 2665. Corrosion protection shall be provided if galvanized piping comes in contact with earth or masonry floors, walls or ceilings.

#### 7.3.3 Plumbing Fixtures

The following typical plumbing fixtures shall be provided:

- a. Shower (P-5). Showerhead and faucet handles shall be copper alloy. Provide for manual mixing with hot and cold water valves. In addition to a shower head, provide each shower stall with a threaded faucet approximately 1.2 m AFF 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. Provide each lower faucet with a 1.5 m long flexible, reinforced vinyl hose with nozzle and hangar to hold the nozzle end off floor.
- b. Kitchen Sink (P-9). Single Bowl corrosion resisting formed 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.
- c. Floor or Shower Drain (FD-A). 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.
- d. Provide P-Traps per International Plumbing Code IPC to include all sinks, floor and trench & shower drains, sewer piping, etc. any water entering the drainage system.

#### 7.3.4 Hot Water

Electric Hot water shall be provided for the facility to supply 49°C (120°F) hot water to fixtures and outlets requiring hot water. Hot water of a higher temperature shall be provided only where required for special use or process. Hot water piping shall be routed parallel to the building lines and concealed within finished rooms. All hot water piping shall be insulated.

#### 7.3.5 Hot Water Heaters

The hot water shall be generated primarily from solar water panels with electric water heaters backups. The unit shall be typically located inside a mechanical room, storage room, toilet/janitor room or similar type space. The unit shall be of the commercially available tank type having low or medium watt density electric heating elements. Gas (natural or liquid propane) powered hot water generators shall be provided to satisfy large hot water requirements when economically justifiable and practical. In cases where the pressure of the water coming into the tank will violate manufacturer recommendations, and pressure reducer shall be installed in the line before the water heater. Also, all water heaters shall be equipped with a blow-off valve that will empty into a nearby floor drain.

#### 7.4 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.

8. Not Used.

## 9. ELECTRICAL

### 9.1 SCOPE OF WORK

9.1.1 General. Contractor shall design and construct: (a) Solar System Prime Power (b) Power Distribution System, (c) Interior Secondary Distribution System (d) Lighting and power branch circuitry, (e) Premise telephone and network/data wiring. All of the systems shall be designed for the ultimate demand loads plus 20% spare capacity.

9.1.2 All equipment shall be tested, commissioned, and operational at time of turn-over to the government. Contractor shall provide all necessary operating instructions, commissioning reports, and related items at time of turn-over.

### 9.2 DESIGN CRITERIA

#### 9.2.1 Applicable Standards

ANSI/TIA/EIA-568 Commercial Building Telecommunications Cabling Standard

ANSI/TIA/EIA-569 Commercial Building Standard for Telecommunication Pathways and Spaces

EIA ANSI/TIA/EIA-607: (1994) Commercial Building Grounding/Bonding Requirement Standard.

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

IBC - International Building Code

IMC – International Mechanical Code

IPC – International Plumbing Code

IESNA Lighting Handbook

International Electrical Testing Association Inc. (NETA) Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems

MIL-HDBK-1003/11 Diesel-Electric Generating Plants

MIL-HDBK-1004/21 Power Distribution Systems

MIL-HDBK-1012/3

NFPA 10, Portable Fire Extinguishers

NFPA 70, National Electrical Code

NFPA 72, National Fire Alarm Code, 2002 edition

NFPA 101, Life Safety Code, 2003 edition

NFPA 110, Emergency and Stand-by Power Systems, 2005

NFPA 780, Lightning Protection

TM 5-688 Foreign Voltages and Frequencies Guide

TM 5-811-1 Design: Electrical Power Supply and Distribution

TM 5-811-3 Electrical Design: Lightning and Static Electricity Protection

UFC 3-520-01 Interior Electrical Systems, 10 June 2002

UFC 3-530-01AN Design: Interior and Exterior Lighting and Controls 19 Aug 2005

UFC 3-540-04N Design: Diesel Electric Generating Plants 16 Jan 2004

UFC 3-550-03FA Electrical Power Supply and Distribution

UFC 3-550-03N Power Distribution Systems

9.2.2 Design shall be in metric units.

### 9.3 MATERIAL

#### 9.3.1 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, or DIN listed material, but the contractor must prove equivalence and must provide the government with a full copy of the relevant specification(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.

Material and equipment installed under this contract shall be for the appropriate application. Materials and equipment shall be installed in accordance with recommendations of the manufacturer. 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.

9.3.2 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.

9.3.3 Design Conditions: All equipment shall be rated and designed for 50 Degree Centigrade and elevation of 2,000 meters above sea level. All generators and other equipment shall be de-rated for temperature and elevation in accordance with manufacturer's recommendations.

9.3.4 Restrictions: Aluminum conductors shall not be used. Aluminum windings shall NOT be used in transformers.

Any references to 120/208/220/277/480 volt, 60Hz systems in any code or standard shall be interpreted as 220/380 volt, 50Hz systems, unless otherwise modified or directed in this RFP. References in the National Electrical Code to 120 or 125 volt receptacles shall be taken to mean 220v receptacles.

## 9.4 DESIGN REQUIREMENTS

9.4.1 Fuel Storage / Distribution System: Refer to mechanical section for generator fuel storage/distribution system requirements.

### 9.4.1.1 Operating Instructions

Contractor shall provide, mounted in a frame, a complete electrical one-line diagram of the power generation system with detail operating instruction. Instruction shall be mounted on a wall. Similarly, complete fuel and cooling system schematic diagrams shall also be provided. Brief operating instructions shall be posted on major components. These instructions shall be written in English and Afghanistan languages.

### 9.4.1.2 Miscellaneous

Contractor shall be responsible for providing all relaying, metering and power plant grounding equipment necessary for safe and efficient operation of the power plant. Relaying shall include, but not be limited to, differential, locking-out, over current, directional, reverse power

## 9.4.2 Site Power Distribution System

Primary (15kV 'Delta') and secondary power distribution shall be underground. Design and installation of primary and secondary power distribution systems shall be complete and in compliance with the requirements of the National Electrical Safety Code (ANSI/IEEE C2), UFC 3-550-03FA (also called Army TM 5-811-1), National Electrical Code (NFPA 70), and other electrical references listed in this RFP. Site-wide primary power distribution system shall be designed (laid-out) to be serviced by a minimum of three (3) high voltage feeders. All feeders shall be provided with feeder-to-feeder tie capabilities to transfer loads between feeders. Feeder tie points shall be located in the field and away from the Power Plant. Primary power distribution shall be complete, to include but not be limited to, fused cut-outs, arresters, terminals, cable guards, circuit breakers, transformers, and related items. All primary feeder taps shall be protected with fused cutouts. Long feeder runs shall be provided with sectionalizing devices, such as, in-line fuses, sectionalizer or recloser, as necessary. Minimum of 3 fuses, with appropriate rating, shall be provided as spares at each fused cut-out location.

Primary Distribution shall be installed in accordance with the NESC, UFC 3-550-03FA, and other applicable standards listed in this RFP.

### 9.4.2.1 Raceways

Exterior raceways (conduits) shall be installed at a slope towards a manhole or hand-hole to avoid collection of water in the raceway. Conduit shall be PVC, thin-wall for concrete encasement and hard-wall (Schedule 40) for direct burial. Direct buried conduit shall only be installed for street lighting circuits. Direct buried conduits shall be encased in concrete, when under paved areas or under road crossings. High voltage cables shall be installed in conduit no less than 100mm (4 inch) in diameter. Secondary cable shall be installed in conduit no less than 50mm (2 inch). Direct buried conduit shall be installed 800mm (32 inch) below grade.

9.4.2.2 All underground conduits shall use long-sweeping elbows. All communications conduits shall use long-sweeping elbows.

9.4.3 Provide telephone lines to the Operations and Communications room.

9.4.4 Underground Conductors: All underground conductors shall meet the requirements of the codes and standards listed in this RFP, including but not limited to: NEC, UFC 3-550-03FA, and related.

#### 9.4.6 Secondary Power Distribution System

Secondary Power shall be 380/220 volts, 3 phase, 4 wire, 50 Hz. Building secondary power distribution system shall include main distribution, lighting and power panels as required. All panel boards shall be circuit breaker 'bolt-on' type panels. In large buildings separate lighting and power panels shall be provided. It is recommended that minimum size circuit breaker be rated at 16 or 20 amperes. Circuit breakers shall be connected to bus bar(s) within the panel boards. Daisy chain (breaker-to-breaker) connection(s) shall not be acceptable. Indoor distribution panels and load centers shall be flush mounted in finished 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 bridged to make a 3-pole breaker. All wiring shall be copper, minimum # 12 AWG (4mm sq), recessed in finished areas and surface mounted in metal conduits in unfinished areas. All panels shall be provided with a minimum of 20% spare capacity for future load growth. Power receptacles (outlets) shall be duplex, 240 volts, 50 HZ, German (DIN) Standard. All splicing and terminations of wires shall be performed in a 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 the requirements of NFPA 70 (National Electric Code).

Main Distribution Panel shall be provided with an ammeter, voltmeter and kilowatt-hour meter. Selector switch shall be provided for reading all 3 phases. All service entrance cables and equipment, such as main distribution panels etc., to the facilities shall be sized for the ultimate facility loads, to include any heating loads (infrared heating), initial and future provided by others.

##### 9.4.6.1 Receptacles

General purpose receptacles shall be duplex, grounding (earthed) type, "flush" or "semi-flush" wall mounted type, color ivory and installed 500 mm above finished floor (AFF). In office or similar areas receptacles shall be provided at every 1.8 M intervals. In maintenance buildings 3-duplex receptacles shall be provided at each vehicle maintenance bay. In storage buildings, receptacles shall be provided in 5 m intervals. In communications rooms, receptacles shall be provided at 1 m intervals or closer. CEE Type receptacles with plugs 2P+E (240v) or 3P+E (380v) and with appropriate rating, shall be provided for, but not be limited to, washers, dryers, kitchen equipment and any other type of large plug-able equipment. Receptacle shall be complete to include box, cover plate and necessary screws/connectors and of the type most commonly used in Afghanistan. Receptacles near sinks or lavatories shall be switch operated and Ground Fault Circuit Interrupter (GFCI), or Residual Current Disconnect (RCD) type, with the trip setting of 30 milliampere or less.

Sinks will have a receptacle above, with one dual receptacle serving two sinks that are side-by-side. Receptacles in wet/damp areas or within 1 meter (~3 feet) of sinks, lavatories, or wash-down areas shall be ground fault circuit interrupter (GFCI) type or Residual Current Disconnect (RCD) type, with the trip setting of 30 milliamperes or less.

Total number of duplex receptacles shall be limited to six (6) per 16- or 20-ampere circuit breaker.

##### 9.4.6.2 Lighting

Light Fixtures: Lighting fixtures shall be a standard manufacturer's product. Fluorescent light fixtures shall be power factor corrected and equipped with standard magnetic ballast(s). All light fixtures shall be capable of receiving standard lamps used locally. Light fixtures shall be mounted at 2.7M, minimum, AFF. Fixtures may be pendant or ceiling mounted, depending on the ceiling height. Lighting levels for the areas for which no design has been provided shall be calculated for the values given below. All fixtures shall be fully factory wired.

General Office Space / Computer Rooms	40 FC (400 Lux)
Conference Rooms	30 FC (300 Lux)
Dinning Rooms	70 FC (700 Lux)
Laundry Rooms	30 FC (300 Lux)

Bed Rooms	30 FC (300 Lux)
Kitchen	70 FC (700 Lux)
Lobbies	15 FC (150 Lux)
Lounges	15 FC (150 Lux)
Mechanical & Electrical Equipment Rooms	20 FC (200 Lux)
Stairways	20 FC (200 Lux)
Toilets	20 FC (200 L)

#### 9.4.6.2.1 Light Switch

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. Lighting contactors may be used to operate lighting in open or large bay areas.

### 9.5 CONDUCTORS

All cable and wire conductors shall be copper conductor jacket or insulation shall be color coded to satisfy NEC and local requirements. Conductors shall be sized in accordance with this RFP and the listed codes and standards.

### 9.6 GROUNDING AND BONDING

In general, grounding and bonding shall comply with the requirements of NFPA 70 and NFPA 780. Underground connections shall be exothermal 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 copper-clad steel. Ground resistance shall not exceed 25 ohms when measured more than 48 hours after rainfall using the fall of potential method outlined in IEEE 81.

#### 9.6.1 Lightning Protection

Communications Building, Medical Clinic, and Power Plant shall have a lightning protection system installed per the NEC and NFPA 780, as well as other applicable standards listed in this document. Medical clinic lightning protection requirements shall also meet the requirements in UFC 4-510-01.

### 9.7 ENCLOSURES

Enclosures for exterior and interior applications shall be NEMA Type 4X (IEC Classification IP56) and NEMA Type 1 (IEC Classification IP10), respectively.

### 9.9 TELEPHONE/COMPUTER NETWORK SYSTEM

Operations room and Communication room shall have telephone and computer data outlets. Telephone/data System shall include cross-connect boxes, duplex RJ-45 telephone outlets with a minimum of 4 pair Category 5 Enhanced (CAT 5e) cable terminating at each outlet (jack). Telephone wiring shall be recessed in finished areas and surface mounted in metal conduits in unfinished areas. Two (2) appropriately sized empty conduits shall be provided from the cross connect box to the outside communication hand-hole.

### 9.10 IDENTIFICATION NAMEPLATES

Major items of electrical equipment, such as the transformers, manholes, hand holes, panel boards and load centers, shall be provided with a permanently installed engraved identification nameplate.

### 9.11 SCHEDULES

All panel boards and load centers shall be provided with a panel schedule. Schedule shall be typed written in English and Pakistani language.

#### 9.12 SINGLE LINE DIAGRAM

Complete single line diagram shall be provided in every transformer distribution panel and in Main Distribution Panel in each building. Single line diagram shall show all panels serviced from the transformer distribution panel and the MDP respectively.

#### 10.0 Installation Communication Systems

This facility will serve as the installation's center for telecommunications, switching, and automation networking (including internet service).

##### 10.1 Communication Room

A communication room (telephone and Computer Room) shall be constructed within the main building to service one (1) or two (2) people. A communication room is a special-purpose room that provides space and maintains a suitable operating environment for large communications and/or computer equipment.

All voice telephone, data and emergency wiring will originate and/or terminate in the equipment room.

Typical voice active equipments are Private Branch Exchange (PBX/telephone switch), attendant/maintenance consoles, call accounting systems, and voice mail systems.

Other active equipment includes HF/RF radio systems, microwave systems, VSAT equipment, etc.

Do not locate the equipment room in a location that is subject to water infiltration, steam infiltration, humidity from nearby water/steam, heat, and any other corrosive atmospheric or adverse environmental conditions.

Locate the equipment room far enough away from sources of Electrical Magnetic Interference (EMI) to reduce interference with the telecommunications cabling. EMI sources are power supply transformers, motors, generators, radio transmitters, radar transmitters.

##### 10.1.1 Power

The main power source will come from the Prime Power Plant. The Communication Building will be provided with the Prime Power Plant and will be supported by standby power generator, Uninterruptible Power Supply with Voltage Stabilizer System to secure graded and reliable power source for all types of communication and computer equipment.

The main communication building will be provided with Electrical Distribution Panel along with branch circuits for the connectivity of UPS, Voltage Stabilizer, Air Conditioner, and other related electrical machineries.

##### 10.1.2 Grounding System

A grounding grid tested to 5 ohms or less shall be distributed throughout the UPS and Equipment Room. A ground ring shall be installed around the communications room building.

##### 10.1.3 HVAC

The communication room will be provided with sufficient Heating, Ventilation, and Air Conditioning System capable to provide cooling temperature of 20 – 25 degree centigrade. The HVAC system is designed for the thermal management of computer, network server and telecommunication rooms. They typically incorporate good

filtration performance. The units will be provided with a minimum rating for outdoor shelters or enclosures

-- End of Section --

### SPECIAL CLAUSES

#### SECTION 01060 SPECIAL CLAUSES

##### PART 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 Contractor's 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 Contractor's CQC System Manager to prepare detailed minutes of the Preconstruction Conference meeting and submit same to the Contracting Officer for approval within three (3) work days. 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 AREA USE PLAN

The Contractor shall submit to the Contracting Officer, within ten (10) calendar days after Notice to Proceed (NTP), 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, plans, 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 which 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.

##### 1.3 CONTRACTOR'S MOBILIZATION AREAS

###### 1.3.1 General

###### 1.3.1.1 Facilities Within the Mobilization Site

All facilities within the Contractor's mobilization site shall be of substantial construction suitable for the local weather conditions. Housing, messing and sanitary facilities shall meet the requirements of Corps of Engineers

Safety and Health Requirements Manual EM 385-1-1. The Contractor shall provide all utilities required to make the site self-sufficient.

1.3.1.2. Trash Disposal: The Contractor shall be responsible for collection and disposal of trash from the work areas and from the mobilization areas. All trash shall be disposed of off base in accordance with Host Nation requirements. 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 which is tracked onto paved or surfaced roadways shall be cleaned daily. Materials resulting from demolition activities, which 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.

### 1.3.2 CONTRACTOR'S MOBILIZATION AREA (ON-BASE)

The Contractor will be permitted to use the area designated by the Contracting Officer within the contract limits for operation of his construction equipment and plants, shops, warehouses, and offices. The Contractor may provide living accommodations for his work force on the site. The Contractor is responsible for obtaining any required additional mobilization area above that designated. On completion of the contract, all facilities shall be removed from the mobilization area by the Contractor and shall be disposed of in accordance with applicable Host Government Laws and Regulations. The site shall be cleared of construction debris and other materials and the area restored to its final grade.

#### 1.3.2.1 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.

#### 1.3.2.2 Storage Area

The Contractor shall construct a temporary 1.8 meter 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.

#### 1.3.2.3 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. The devices shall be made available for use by Government personnel.

1.3.2.4 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.

#### 1.3.2.5 Maintenance of Storage Area

Fencing shall be kept in a state of good repair and proper alignment. Should the Contractor elect to traverse with construction equipment or other vehicles unpaved areas which are not established roadways, 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.

#### 1.3.2.6 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 personnel, facilities and equipment.

#### 1.3.2.7 Sanitation

Sanitary Facilities: The Contractor shall provide and maintain within the construction area minimum field-type sanitary facilities in accordance with the requirements of EM 385-1-1 Safety and Health Requirements Manual and approved by the Contracting Officer. Government toilet facilities will not be available to Contractor's personnel.

#### 1.3.2.8 Telephone

The Contractor shall make arrangements to install and pay all costs for telephone facilities desired.

#### 1.3.2.9 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.

#### 1.3.2.10 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/or 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 Host Nation and/or 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.

#### 1.3.2.11 Haul Roads

The Contractor shall, at its own expense, construct access and haul roads necessary for proper prosecution of the work under this contract. Haul roads shall be constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided. The Contractor shall provide necessary lighting, signs, barricades, and distinctive markings for the safe movement of traffic. The method of dust control shall be in accordance with the Special Clause entitled DUST CONTROL. Location, grade, width, and alignment of construction and hauling roads shall be subject to approval by the Contracting Officer. Lighting shall be adequate to assure full and clear visibility for full width of haul road and work areas during any night work operations. Upon completion of the work, haul roads designated by the Contracting Officer shall be removed.

#### 1.3.2.12 Use of Existing Roads as Haul Routes

The Contractor shall be responsible for coordinating with the Host Nation Government and 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 Host Nation and Base authorities and is the sole responsibility of the Contractor.

#### 1.3.2.13 Employee Parking

Contractor employees shall park vehicles in an area approved by the Contracting Officer. Contractor employee parking shall not interfere with existing and established parking requirements of the military installation.

#### 1.3.2.14 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.

#### 1.3.2.15 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 RESPONSIBILITY FOR PHYSICAL SECURITY

Prior to mobilization, the Contractor shall submit his proposed means of providing project security to prevent unauthorized access to equipment, facilities, materials and documents, and to safeguard them against sabotage, damage, and theft. The Contractor shall provide perimeter force protection security for the developing site. Security may include but is not limited to fence and private security guards. Perimeter security shall prevent unauthorized site access and provide safety protection to the Contractor work force and government personnel for the duration of the project. The Contractor is solely responsible for security however local police shall be coordinated with regarding security. 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.

### 1.5 DUST CONTROL

The Contractor shall be required to control objectional 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.

### 1.6 CONNECTIONS TO EXISTING UTILITIES

#### 1.6.1 General

Any outage of any utility service shall be requested in writing at least fifteen (15) 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 Contractor's 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.

#### 1.6.1.1 Performance of Work During Non-Standard Hours

To minimize outage impact to the mission of the Base, all outages shall be scheduled on weekends or from 2100 - 0530 hours on duty days. 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 work week.

#### 1.6.1.2 Exterior Night Lighting

Exterior night lighting shall be provided in conformance with EM-385-1-1 entitled Safety and Health Requirements Manual.

### 1.6.2 Existing Underground Utilities

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.

#### 1.6.2.1 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.

#### 1.6.2.2 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.

### 1.6.3 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.

### 1.7 WATER (CONTRACTOR PROVIDED)

The Contractor shall provide and maintain water at his own expense for his use for construction and domestic consumption, and 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. 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.

### 1.8 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. 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.

### 1.9 USE OF EXPLOSIVES

The Contractor shall make necessary arrangements as may be required by applicable codes, rules, regulations and laws and shall be responsible for compliance therewith for all phases of blasting operations. When blasting is required for removal of rock or other material, the Contractor shall notify the Contracting Officer prior to application for any use of explosives and take all necessary precautions for the protection of individuals and property exposed to his operation.

#### 1.9.1 Handling, Storage, and Use of Explosives

The handling, storage, and use of explosives shall be governed by the applicable provisions of the following: the "BLASTING" section of the Corps of Engineers Manual EM 385-1-1, entitled Safety and Health Requirements Manual, a copy of which may be obtained from the Contracting Officer's Representative at the jobsite, and Technical Section 02201 entitled BLASTING

### 1.9.2 Blasting Permits

The Government assumes no liability for changes that may be imposed by the Afghanistan Government.

### 1.10 WORK OUTSIDE REGULAR HOURS

If the Contractor desires to carry on work outside regular Base duty hours, or on holidays, he shall submit an application to the Contracting Officer. 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".

### 1.11 SCHEDULING OF WORK IN EXISTING FACILITIES

As soon as practicable, but in any event not later than fifteen (15) calendar days after receipt of Notice to Proceed, 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.

### 1.12 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER

#### 1.12.1 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 task order 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.

#### MONTHLY ANTICIPATED UNUSUALLY SEVERE WEATHER CALENDAR DAYS

January	4 Days
February	2 Days
March	2 Days
April thru December	0 Days

#### 1.12.2 Time Extensions

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.

### 1.13 NOT USED.

### 1.14 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, internal parts, performance characteristics, finish, 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.

#### 1.15 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.

#### 1.16 PREPARATION OF AS-BUILT DRAWINGS (BY CONTRACTOR)

##### 1.16.1 General

Upon completion of each facility under this contract, the Contractor shall prepare and furnish as-built drawings to the Contracting Officer. The as-built drawings shall be a record of the construction as installed and completed by the Contractor. They shall include all the information shown on the contract set of drawings, and all deviations, modifications, or changes from those drawings, however minor, which were incorporated in the work, including all additional work not appearing on the contract drawings, and all changes which are made after any final inspection of the contract work. In the event the Contractor accomplished additional work which changes the as-built conditions of the facility after submission of the final as-built drawings, the Contractor shall furnish revised and/or additional drawings and drawing files as required depicting final as-built conditions. The requirements for these additional drawings shall be the same as for the as-built drawings specified in this paragraph.

##### 1.16.2 Preliminary As-Built Drawings

The Contractor shall maintain a full-size set of contract drawings for depicting a daily record of as-built conditions. These drawings shall be maintained in a current, reproducible condition at all times during the entire contract period and shall be readily available for review by the Contracting Officer's Representative at all times. The as-built drawings shall be updated daily by the Contractor showing all changes from the contract plans which are made in the work, or additional information which might be uncovered in the course of construction. This information shall be recorded on the prints accurately and neatly by means of details and notes. Changes and additional information marked on the contract plans should be made in red or green color for highlighting purposes. The drawings shall show the following information, but not be limited thereto:

- a. The location and description of any utility lines or other installations of any kind or description known to exist within the construction area. The location includes dimensions to permanent features.
- b. The location and dimensions of any changes within the building or structure, and the accurate location and dimension of all underground utilities and facilities.
- c. Correct grade or alignment of roads, structures, or utilities if any changes were made from contract plans.
- d. Correct elevations if changes were made in site grading.
- 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 and grades of all drainage installed or affected as part of the project construction.
- g. All changes or modifications of the original design including those which result from the final inspection.
- h. Where contract drawings or specifications allow options, only the option actually used in the construction shall be shown on the as-built drawings. The option not used shall be deleted.
- i. In development of as-built drawings, the Contractor shall not substitute shop drawings for original contract drawings. All necessary information for as-built conditions shall be incorporated into contract drawings.
- j. One (1) copy of the preliminary as-built marked prints shall be delivered to the Contracting Officer at the time of final inspection of each facility for review and approval. Changes and additional information marked on the contract plans should be made in red or green color for highlighting purposes. If upon review of the preliminary as-built drawings, errors or omissions are found, the drawings will be returned to the Contractor for corrections.

The Contractor shall complete the corrections in red or green color, and return the as-built marked prints to the Contracting Officer within ten (10) calendar days.

#### 1.16.3 Final As-Built Drawings

The Contractor shall update the digital contract drawing files to reflect the approved final as-built conditions and shall furnish those updated drawing files and plots of the final as-built drawings to the Contracting Officer.

- a. Only personnel proficient in the use of Computer Assisted Design and Drafting (CADD) for the preparation of drawings shall be employed to modify the contract drawing files or prepare new drawing files.
- b. Existing digital drawing files shall be updated to reflect as-built conditions. Independent drawing files containing only as-built information are not acceptable. The modifications shall be made by additions and deletions to the original drawing files, and where additional drawings are necessary, they shall be developed in individual digital files for each new drawing. All additions and corrections to the contract drawing files shall be clear and legible, and shall match the adjacent existing line work and text in type, size, weight, and style. New or revised information placed into the design files shall be placed on the levels and in the colors used for placement of the corresponding initial data. Similarly, the drawing size, title block, and general format of new drawings shall be consistent with the format established by the original drawings.
- c. In the preparation of as-built drawings, the Contractor shall remove "Bubbles" used by the Government to highlight drawing changes made during design/construction. Triangles associated with those earlier drawing changes shall be left on the drawings and the Contractor shall not add triangles to designate modifications associated with representation of the as-built condition. The revision block identification of the drawing modifications shall be left intact and the date of completion and the words "REVISED AS-BUILT" shall be placed in the revision block above the latest existing notation. Each drawing shall have the words "DRAWING OF WORK AS-BUILT" in letters 4.5 mm (3/16") high placed below the drawing title portion of the drawing title block; between the border and the trim line.
- d. The Contractor shall check all final as-built drawing files for accuracy, conformance to the initial drawing scheme and the above instructions. The Contracting Officer will review the drawings and drawing files for conformance to these standards.
- e. The Contractor shall furnish the digital as-built drawing files in the format to the 2005 or latest version in common use of Autodesk, AUTOCADD. The Government will only accept the final product for full operation, without conversion or reformatting, in this format.
- f. Digital drawing files shall be furnished to the Contracting Officer on CDROM or other media and format as approved by the Contracting Officer. A transmittal sheet containing the name of the files, the date of creation, the CD-ROM number, and a short description of the contents, shall accompany the CD-ROM. Provide an index in each disk cover of contents.
- g. A sample drawing shall be furnished to the Contracting Officer before delivery of final as-built drawings as a test to demonstrate compliance with the above instructions and file format compatibility with the described CADD software.
- h. One (1) complete set of the updated final Record Copy digital drawing files and one (1) paper plot or copy of the final Record drawings shall be delivered to the Contracting Officer within 30 calendar days of approval of the preliminary as-built drawings. If upon review of the final as-built drawings, errors or omissions are found, the drawings and drawing files will be returned to the Contractor for corrections. The Contractor shall complete the corrections and return both the digital files and the as-built prints to the Contracting Officer within ten (10) calendar days.

#### 1.17 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 PROJECT. 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.

#### 1.18 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 (NOV 1991)-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's Representative at the jobsite or from the Transatlantic Programs Center at Winchester, Virginia.

##### 1.18.1 Accident Prevention Program

Within fifteen (15) days after receipt of Notice to Proceed, 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 or his authorized representative. 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. Provide a copy of company policy statement of Accident Prevention and any other guidance as required by EM 385-1-1, Appendix A.

##### 1.18.2 Ground Fault Circuit Interrupter (GFCI) Requirement – Overseas Construction

The Corps of Engineers Health and Safety Manual, EM 385-1-1, section 11. C.05.a. 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.

##### 1.18.3 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.

### 1.19 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.

### 1.20 OPERATION AND MAINTENANCE (O&M) DATA FOR EQUIPMENT AND SYSTEMS

#### 1.20.1 General

The requirements contained herein are in addition to all shop drawing submission requirements (e.g., SD-19) stated in other sections of the specification. The Contractor shall include provisions for obtaining the data required below in all purchase orders and sub-contract agreements issued under this contract. The Contractor shall obtain that data which is required to operate and maintain all items of equipment and all systems/subsystems under either normal or emergency operating conditions. See items listed under paragraph EQUIPMENT FOR WHICH O&M DATA MUST BE SUBMITTED for example.

#### 1.20.2 O&M Data for Equipment

##### 1.20.2.1 Equipment for Which O&M Data Must be Submitted

The Contractor shall provide all data necessary to operate and maintain all equipment purchased and/or installed under this contract. The data will consist of any O&M instructions not normally the common knowledge of a Journeyman Level Technician in the applicable trade. Provided below are examples of the general types of equipment for which the Contractor is required to submit O&M data. The examples provided are not definitive for this contract, but are provided to indicate the general types of equipment for which O&M data is required.

Control Devices Chillers

Lighting Fixtures Motor Generator Sets

Valves Cooling Towers

Motors Kitchen Equipment

Water Heaters Exhaust Fans

Compressors Plumbing Fixtures

Boilers Appliances (e.g. washing machines, food disposers, coffee urns, etc.)

##### 1.20.2.2 Data to be Provided for Each Equipment Item

For each equipment item O&M data shall be submitted as described below. For identical pieces of equipment installed within any one system, only one (1) file of O&M data for that equipment item will be required for maintenance purposes. Deviation from these requirements will require approval of the Contracting Officer. The data as a minimum will include for each equipment item, the following:

- a. Equipment O&M Data Sheet: Equipment O&M data sheet shall include the equipment name, manufacturer's name and address, model number, (including characteristics and any special remarks), and the serial number(s), tag number(s) or any user assigned identification number(s), and installed location(s) of the equipment. This sheet shall be the first page of each item of equipment O&M data package and shall contain a checklist covering paragraphs 1.32.2.2.b thru 1.32.2.2.j hereinafter.
- b. Equipment Description: Equipment description shall include item name, model number, serial number, equipment price (FOB Manufacturer), electrical and/or mechanical characteristics, manufacturer's name and address, order number and all other data found on the equipment name plates. Include local/regional representative of manufacturer, name, address, telephone number, and telex number.
- c. Component and Assembly Drawings/Master Parts List: Component and

assembly drawings/master parts list shall contain exploded views and a master parts list clearly identifying all parts and subassemblies by manufacturer's part number. Master Part's list shall also include the price for each part (FOB Manufacturer) and effective date.

d. Control Diagrams and Sequences of Operations: Control diagrams and sequences of operations shall include operating instructions (including normal start-up, normal shut-down and emergency shut-down as applicable).

e. Performance Characteristics: Performance characteristics shall include performance curves for full range of operation, and data pertinent to characteristics of equipment provided.

f. Installation Instructions: Installation instructions shall include adjustment and alignment procedures, checkout procedures and test procedures.

g. Preventive Maintenance Procedures: Preventive maintenance procedures shall include inspection, cleaning, adjustment, service and lubrication instructions. A schedule shall be furnished for each piece of equipment listing manufacturer's recommended maintenance routine of specific tasks to be performed at specific intervals such as daily, weekly, monthly, quarterly, or based on the number of operating hours. Preventive maintenance schedules shall take into account operating conditions in Afghanistan.

h. Corrective Maintenance Procedures: Corrective maintenance procedures shall include instructions for troubleshooting, repair, overhaul and calibration.

i. Special Items: The Contractor shall prepare a list of special tools, test equipment, and safety precautions when specified in the Technical Provisions and special items that are normally provided by the manufacturer with the equipment. The list shall also include the current unit price and date for each item (FOB MANUFACTURER).

j. Recommended Spare Parts List: List shall contain the manufacturer's recommendation 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.

#### 1.20.2.3 Preparation of O&M Data for Each Equipment

At least two (2) sets of the final approved O&M Data shall be composed of original copies. No other form of printed and prepared data shall be acceptable unless approved in writing by the Contracting Officer. All data shall be prepared in the English language covering data described in paragraph **EQUIPMENT FOR WHICH O&M DATA MUST BE SUBMITTED**, and shall be furnished in the number of submittals (number of sets of volumes) specified in Section 01335 SUBMITTAL PROCEDURES FOR DESIGN/BUILD PROJECT of the Technical Provisions. Each item of equipment shall be cross-referenced in the equipment O&M Data and Systems Manuals, to include installation location using the Contractor's system of identification as approved by the Contracting Officer. All data shall be presented on 8-1/2 x 11 inch sheets to the greatest possible extent. Foldouts will normally be limited to 11 x 17 inch sheets. For other sets of data, reproductions shall be clear, legible, re-reproducible, and not subject to fade. Extraneous information on inapplicable models or components shall be removed or suitably marked through. O&M data shall be contained in a volume consisting of multi-ring binders of good commercial quality. Each volume shall be identified by the equipment name as shown on the Equipment O&M Data Sheet, and sequentially numbered. Each volume shall include an index of items included in the binder and the index shall be the first sheet in the binder, and all remaining data shall be taped accordingly. Volume binders shall be packed (maximum) 2/3 full to allow easy access to contents.

#### 1.20.2.4 O&M Data Submittal Procedure for Each Equipment Item

The initial submittal of O&M Data for each item of equipment shall include all data required in paragraph **DATA TO BE PROVIDED FOR EACH EQUIPMENT ITEM** above, and as required by the technical specifications.

Each O&M Data Package shall be submitted in two (2) copies to the Contracting Officer for approval of format and content, not later than ninety (90) calendar days following equipment item selection approval. After approval the two (2) copies will be returned to the Contractor to maintain for incorporation into the final submittal of the full set of O&M Manuals. The Contractor shall allow a minimum period of forty-five (45) calendar days from receipt by the Government (exclusive of mailing time) for the Government review and approval/disapproval of O&M data.

#### 1.20.2.5 Payment for Preparation and Submittal of O&M Data for Individual

Equipment Items For payment purposes, preparation and submittal of required O&M data shall be considered as part of the price for the individual item of equipment.

### 1.20.3 O&M Data for Systems

The Contractor shall develop and provide the data beyond separate equipment items necessary to operate and maintain all civil, mechanical and electrical systems for each building, each central plant, and/or each distribution or collection system. A system is defined as a group of equipment items related in purpose and which share electrical power or communication circuits as in a fire alarm system or which share mechanical piping or ductwork as in an HVAC system. O&M data for systems shall be submitted as described below.

#### 1.20.3.1 Preparation and Organization of Systems O&M Manuals

At least two (2) sets of the final approved systems O&M manuals shall be composed of original copies. For each location and for each system installed, the Contractor shall prepare and provide the required number of sets of separate complete system O&M Manuals, bound in loose leaf three ring binders. These manuals will provide the basic information and direction needed by journeymen operators to effectively operate each system and by journeymen maintenance technicians to perform Preventive Maintenance (PM) and Corrective Maintenance (CM) routines on systems components. The following identification shall be printed on the cover and spine of each binder, the words "OPERATING AND MAINTENANCE INSTRUCTIONS", plus name of the system, the location of the building(s). When two or more binders are required for the data, for an individual system, the binder shall be marked 1 of n, 2 of n, 3 of n, etc. (where n equals the total number of binders). Each manual shall have a complete index page(s), which shall be inserted after the title page of the first volume of that system. Title page shall include name of project and project number. Each binder shall have a complete index that lists all the information and data contained in the binder(s).

All systems O&M Manuals shall include the following:

- a. Each piece of equipment will have a divider and tab properly identified.
- b. Each section for each piece of equipment will have a divider and tab properly identified.
- c. Narrative description of principles of operation.
- d. Systems flow diagrams showing point-to-point connections, sequence of operation, control diagrams and identification of each system component.
- e. Electrical single line and three (3) line diagrams in sufficient detail to define the system and operation of related parts.
- f. Final balancing reports for air, water and other systems as applicable. (These may be added to the manual after installation testing is completed and accepted.)
- g. Systems test reports and certification.
- h. Operating procedures including pre-start, start-up, and normal operation, emergency operation, normal and emergency shut-down.
- i. Schedules including valve schedules, circuit breakers schedules, equipment schedules, etc.
- j. List of special tools and test and calibration equipment.
- k. List of systems components cross referenced to the O&M equipment data volume number.
- l. System preventive maintenance procedures and schedules.
- m. System troubleshooting guides.
- n. System corrective maintenance procedures.
- o. Folded-up copy of the system's wall charts (Training instructions).

#### 1.20.3.2 Submittal of Systems O&M Manuals

Submittal of Systems O&M Manuals for each system installed shall include all data required in paragraphs 1.32.2.2.a thru 1.32.2.2.j hereinbefore. Two (2) copies shall be submitted to the Contracting Officer for approval not later than 30 calendar days prior to the construction completion date. If

disapproved, the two (2) copies will be returned to the Contractor for correction and re-submittal. Final submittals of all Systems O&M Manuals must include and be simultaneous with all O&M Data Manuals for equipment associated with that system, and must be in Pashto, English and Dari. Upon completion of systems check out and acceptance tests, the Contractor shall submit a supplemental submittal containing any addition, deletion or correction found appropriate due to these tests performed in the field or during training.

#### 1.20.4 Framed Instructions for Systems

For each system, the Contractor shall provide framed instructions mounted on the wall of each mechanical and electrical equipment room, which contains a portion of the system. The size of the framed instructions will be governed by the content to be framed plus room for a minimum of two (2) inch border. The framed instructions shall include drawings and typed narrative descriptions as required to provide the following information:

##### 1.20.4.1 Drawings

Drawings containing flow, piping, instrumentation and control diagrams of mechanical systems and wiring and control schematics of electrical systems contained within or controlled from that equipment room.

##### 1.20.4.2 Equipment and System Narrative

Narrative containing equipment and system normal pre-start, start-up, operating and shut-down procedures.

##### 1.20.4.3 Emergency Shut-Down Narrative

Narrative of emergency shut-down instructions and safety precautions.

##### 1.20.4.4 Preparation and Installation of Framed Instructions

All material prepared for use as framed instructions to meet the requirements of paragraph EQUIPMENT AND SYSTEM NARRATIVE above shall be prepared in the English language. All material prepared for use as framed instructions to meet the requirement of paragraph EMERGENCY SHUT-DOWN NARRATIVE above shall be prepared in Pashto, Dari and English. Drawings and narratives prepared for use as framed instructions shall be submitted to the Contracting Officer for approval prior to posting. Framed instructions shall be mounted using frames with glass or rigid plastic covers as approved by the Contracting Officer.

All framed instructions must be posted before final acceptance testing of the equipment and systems.

#### 1.20.5 Contractor Responsibility for Updating O&M Information

The Contractor shall be responsible for the accuracy of all information furnished in accordance with the above requirements. The Contractor shall be responsible for updating or supplementing all O&M data, including data which has been previously submitted, to reflect changes in the contract or to correct errors discovered by any other means. The O&M data for separate equipment items, the systems O&M Manuals, and the framed instructions prepared by the Contractor shall be utilized and verified during installation and testing of the equipment and/or systems and shall be updated and corrected as required. Errors found during systems testing and validation shall be corrected within fourteen (14) calendar days of completion of each test and validation.

Drawings, pages of text, etc. of systems O&M Manuals shall be complete in final form. Marked-up drawings or pages are not acceptable.

### 1.21 INSTRUCTIONS AND TRAINING FOR OPERATION AND MAINTENANCE

#### 1.21.1 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

Water System: Provide 40 Hours Training.

Power System: Provide 40 Hours Training.

Sewer System: Provide 40 Hours Training.

#### 1.21.2 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 periods 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. The Contractor shall be prepared to offer training in Pashto, Dari and English.

#### 1.21.3 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 video taped 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 video tapes 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.

#### 1.21.4 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 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 training outline sufficient in detail to provide a broad indication and 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.

#### 1.21.5 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 45 calendar days after Notice to Proceed. The plan will be reviewed and coordinated with the content of the O&M manuals.

#### 1.21.6 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 O&M Manuals required by the Contractor per Section 01335 SUBMITTAL PROCEDURES 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. Re-submittals shall be made within twenty (20) days of notice from the Contracting Officer.

#### 1.21.7 Attendance Roster/TAC Form 356

The Contractor shall develop an attendance roster or a similar documents indicating each students 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 can not 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.

#### 1.22 LOCALLY AVAILABLE SERVICE FOR EQUIPMENT

All equipment furnished under this contract, regardless of country of manufacture or purchase, must have in-country service availability. In the event that the Contractor proposed to provide equipment for which in-country service is not available, the Contractor must provide written justification for the Contracting Officer's approval. This justification shall be submitted for each product or material for which a waiver is sought concurrently with the submittal required by the Technical Provisions. Submission of group or "blanket" waivers is unacceptable.

#### 1.23 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, computers, 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 or his representative at all times. Prior to acceptance, the Contractor shall submit the complete register to the Contracting Officer.

#### 1.24 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER

##### 1.24.1 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 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 weather time evaluations. Upon acknowledgment of the Notice to Proceed (NTP) and continuing throughout the contract period, actual unusually severe weather

days will be recorded on a calendar day basis (including weekends and holidays) and compared to the 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. Note: there are monsoon seasons within these project sites, allowances shall be made by the contractor to anticipate these weather conditions.

#### 1.24.2 Time Extensions

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 work day 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.

#### 1.25 STANDARDIZATION

Where two or more items of the same type or class of 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, which normally require repair or replacement during the life of the equipment.

#### 1.26 RESIDUAL CONSTRUCTION MATERIAL

All Contractor purchased materials and equipment intended for incorporation into the completed facilities and which are later determined excess to the actual construction requirements, will become the property of the Government. The residual materials and equipment shall be tagged (giving the area where like type material and equipment were installed), and stored in an orderly manner in a designated area as directed and approved by the Contracting Officer.

#### 1.27 MILITARY BASE RULES AND REGULATIONS

The Contractor and his employees and subcontractors shall become familiar with and obey all Base rules and regulations including fire, traffic and security regulations. All personnel employed on the Base shall keep within the limits of the work (and avenues of ingress and egress), and shall not enter any Restricted Areas unless required to do so and prior clearance for such entry is obtained. The Contractor's equipment shall be conspicuously marked for identification.

#### 1.28 IDENTIFICATION OF EMPLOYEE'S PERSONNEL AND VEHICULAR ACCESS TO THE PROJECT SITES

The Base Security maintains the ultimate authority for establishing, monitoring, and enforcing security requirements for the Base Security Office. All contractors, subcontractors, or vendor personnel and vehicles at any tier working at any location on the Base are subject to a thorough search upon entering, departing, or at any time deemed necessary by the Base Security Personnel. The Contractor shall be responsible for compliance with all the Base Security requirements. The Government reserves the right to deny access or to require the Contractor to remove any personnel or equipment deemed to be a threat to the security of the Base Security Office or the Base personnel. The Contractor shall work through the Contracting Officer to ensure that the Base Security Regulations are followed.

##### 1.28.1 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.

#### 1.28.2 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 and shall be insured.

#### 1.28.3 Security Plan

The Contractor shall submit to the Contracting Officer, within fifteen (15) calendar days after Notice to Proceed, his proposed personnel and vehicular access plan. This plan shall cover all elements for issuance of the access passes, safeguarding of unissued passes, construction security operations, lost passes, temporary vehicle passes, and collection of passes for employee's and vehicles on 1) - temporary absence; 2) - termination or release; and 3) - termination or completion of contract. The plan shall address in detail the Contractor's proposed procedures, and organization necessary to produce and maintain effective security within the contract limits twenty four (24) hours a day seven (7) days a week.

#### 1.29 ON-BASE PHOTOGRAPHY PROHIBITION

The Contractor shall not engage in any form of photography without prior written approval from the Contracting Officer.

#### 1.30 PUBLIC RELEASE OF INFORMATION

##### 1.30.1 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.

##### 1.30.2 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.

#### 1.31 ATTACHMENTS

TAC FORM 61 - Accident Prevention Program Hazard Analysis

TAC FORM 356 - Operation and Maintenance Training Validation Certificate

-- End of Section --

QUALITY CONTROL SYSTEM (QCS)SECTION 01312  
QUALITY CONTROL SYSTEM (QCS)

## PART 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
- Finances
- Quality Control
- Submittal Monitoring
- Scheduling
- 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 -

PROJECT SCHEDULE

## SECTION 01321

## PROJECT SCHEDULE

## PART 1 GENERAL

## 1.1 SUBMITTALS

The following shall be submitted for Government approval in accordance with Section 01335 SUBMITTAL PROCEDURES: SD-07 Schedules Project Schedule. Horizontal Bar Chart and Periodic Payment Request Updates. Projected Earnings Curve and Periodic Payment Request Updates. Revisions to the Project Schedule and Projected Earnings Curve for Modifications Issued to this Contract shall be coordinated with the Contracting Officer.

## PART 2 PRODUCTS (Not Applicable)

## PART 3 EXECUTION

## 3.1 GENERAL

The Contractor shall furnish a Project Schedule as described below. The scheduling of construction shall be the responsibility of the Contractor. Contractor management personnel shall actively participate in its development. Subcontractors and suppliers working on the project should also contribute in developing and maintaining an accurate Project Schedule. 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 shall result in an inability of the Contracting Officer to evaluate Contractor 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, then the Contracting Officer may hold retainage up to the maximum allowed by contract, each payment period, until revisions to the Project Schedule have been made.

## 3.3 PROJECT SCHEDULE

## 3.3.1 Schedule of Construction

Within seven (7) calendar days after award of the task order, the Contractor shall prepare and submit a Construction Schedule to the Contracting Officer for approval. This schedule shall address each payment line item and/or sub-line item listed in the Proposal Schedule separately.

## 3.3.2 Non-Compliance

Failure of the Contractor to comply with the requirements of the Contracting Officer shall be grounds for determination by the Contracting Officer that the Contractor is not prosecuting the work with sufficient diligence to ensure completion within the time specified in the contract. Upon making this determination, the Contracting Officer may terminate the Contractor's right to proceed with the work, or any separable part of it, in accordance with the default terms of this contract.

### 3.3.3 Horizontal Bar Chart

The required schedule shall utilize an automated scheduling program and shall be in the form of a horizontal bar chart. The line or sub-line item schedule of activities shall be listed down the left side of the page. A time scale shall run across the bottom of the page. Each work item shall be represented by a bar starting with the schedule start date and running continuously to the completion date.

### 3.3.4 Cost

Listed with each work item shall be a corresponding cost representing the total cost, such as material, labor, equipment, and overhead associated with that item. The total cost of the work items shall be equal to the Bid Price for that sub-line item of the Proposal Schedule.

### 3.3.5 Scheduled Project Completion

The schedule interval shall extend from Notice-To-Proceed to the contract completion date.

### 3.3.6 Projected Earning Curve

Submitted with the Construction Schedule shall be a Projected Earning Curve. The Projected Earning Curve is a plot of the Contractor's earnings on the vertical axis and the contract duration on the horizontal axis. The earnings figure shall relate to the complete value of the contract and need not reflect each facility separately.

### 3.3.7 Construction Schedule

The Construction Schedule shall be on one page with a maximum dimension of 90 cm by 120 cm. The Contractor shall submit the Projected Earnings Curve on the same page. The initial submittal shall include one (1) reproducible and four (4) copies, one (1) copy of which will be returned to the Contractor when approved.

### 3.3.8 Submission With Partial Payment Estimate

Each time the Contractor submits a payment request under this contract he shall also submit three (3) copies of the Bar Chart. The Bar Chart shall be annotated by indicating the percent complete for each activity directly on the bar. The Projected Earnings Curve shall be annotated by plotting actual earnings versus time on the same graph. Those work items reflecting performance which is behind schedule by fifteen (15) calendar days or more shall be fully explained in detail giving the reason for delay and the Contractor's plan for timely completion within the schedule.

### 3.3.9 Modifications

The Construction Schedule and Projected Earning Curve shall be revised to reflect any and all modifications issued to this contract as they are issued. Format and numbers of copies as defined in paragraph CONSTRUCTION SCHEDULE shall be submitted for approval by the Contracting Officer.

## 3.4 PERIODIC PROGRESS MEETINGS

Progress meetings to discuss payment shall include a monthly on-site meeting or shall be conducted at 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.

#### 3.4.1 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 four (4) working days after the monthly progress meeting.

#### 3.4.2 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.

#### 3.4.3 Earnings Report

A compilation of the Contractor's Total Earnings on the project from the Notice-to-Proceed 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 the 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. This report shall: sum all activities and provide a percent complete by individual activity and total project percent complete. The report shall contain, for each activity: activity identification, activity description, original budgeted amount, total quantity, quantity to date, percent complete (based on cost), and earnings to date.

#### 3.4.4 Cost Completion

The earnings for each activity started shall be reviewed. Payment shall be based on earnings for each in-progress or completed activity. Payment for individual activities shall not be made for work that contains quality defects. A portion of the overall project amount may be retained based on delays of activities.

#### 3.4.5 Network Analysis System

The Contractor may, as an option, submit to the Contracting Officer for approval, a time related network analysis in lieu of the previously specified bar chart.

-- End of Section --

SUBMITTAL PROCEDURES FOR D/B

## SECTION 01335

## SUBMITTAL PROCEDURES FOR DESIGN-BUILD PROJECTS

## PART 1 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](http://www.csinet.org/s_csi/index.asp)  
601 Madison Street  
Alexandria, Virginia  
22314-1791

## AFGHANISTAN ENGINEER DISTRICT

AFGHANISTAN ENGINEER DISTRICT  
<http://www.aed.usace.army.mil>  
U.S. Army Corps of Engineers  
Attn.: Qalaa House  
APO AE 09356

## 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 specifications, drawings and design analysis and calculations. The Design-Build Contractor shall not begin construction work until the Government has reviewed the Design-Build Contractor's final design and has cleared it 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 Design-Build Contractor.

## 1.2.2 CONSTRUCTION SUBMITTALS

## 1.2.3 Contractor Furnished Government Approved Construction Submittals

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. They may also include proposed variations to approved design documents in accordance with the paragraph entitled "VARIATIONS".

## 1.2.4 For Information Only Construction Submittals (FIO)

All submittals not requiring Designer of Record or Government approval will be for information only.

### 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 Design-Build 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 specification 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 Design-Build 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 Design-Build 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 Design-Build 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

After design submittals have been reviewed and cleared for construction by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered unless justified as indicated in the paragraph entitled VARIATIONS.

#### 1.3.4 Additional Submittals

The Contracting Officer may request additional submittals in conjunction with Contract Clause 52.236-5 MATERIAL AND WORKMANSHIP, In addition to those specified when deemed necessary to adequately describe the work.

### 1.3.5 Untimely and Unacceptable Submittals

If the Design-Build 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 Design-Build Contractor.

### 1.3.6 Stamps

Stamps shall be used by the Design-Build Contractor on all design and post design construction submittals to certify that the submittal meets contract requirements and shall be similar to the following:

Design-Build 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 All site layout data shall be dimensioned in meters or coordinates, as appropriate. All details and pipe sizes shall be dimensioned in millimeters.

1.5.1.2 All site plans shall be georeferenced using the WGS 1984 coordinate system, specifically the following: WGS 1984 UTM one 42 N. 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 AED 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 Design-Build Contractor is allowed partial or total invoice payment for materials shipped from the Continental United States (CONUS), and/or stored at the site, the Design-Build 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.

## PART 2 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 DESIGN ANALYSIS

2.2.1 A design analysis, written in the English Language with SI units of measure shall be submitted for review by the Government. 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. Provide sufficient information to permit manual checks of the results. 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, hardware, and items, shall be submitted. Copies of all previous design phase review comments and the actions assigned to them shall be included with each submission of the design analysis. Specific requirements for the design analysis, listed by submittal phase, are contained herein.

#### 2.2.2 Architectural Code Analysis

Provide Code Analysis for each building based on the following items and code sections. The following analysis information is required for all buildings submitted in this proposal.

Analysis Items	Code References
1. Occupancy Classification	IBC Chapter 3 and Table 302.3.2
2. Type of Construction	IBC Chapter 6
3. Actual Allowable Area	IBC 503, 505-508 & Table 503
4. Actual Allowable Height	IBC 504 & Table 503
5 Occupant Load (per use)	IBC 1004 & Table 1004.1.2
6. Exits Required/Provided	IBC 1004 & Table 1004.1.2 IBC 1014, 1018, and 1018.2
7. Required Opening Protection	IBC Table 602
8. Fire Resistive Construction	IBC Table 601

### 2.3 DESIGN CALCULATIONS

When they are voluminous, they shall be bound separately from the narrative part of the design analysis. The design calculations shall be presented in a clean and legible form incorporating a title page and index for each volume. A table of contents, which shall be an index of the indices, shall be furnished when there is more than one volume. The source of loading conditions, supplementary sketches, graphs, formulae, and references shall be identified. Assumptions and conclusions shall be explained. Calculation sheets shall carry the names or initials of the computer and the checker and the dates of calculations and checking. No portion of the calculations shall be computed and checked by the same person.

#### 2.3.1 Automatic Data Processing Systems (ADPS)

When ADPS are used to perform design calculations, the design analysis shall include descriptions of the computer programs used and copies of the ADPS input data and output summaries. When the computer output is large, it may be divided into volumes at logical division points.

##### 2.3.1.1 Computer Printouts

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.

##### 2.3.1.2 Preparation of the Description

Preparation of the description which must accompany each set of ADPS printouts shall include the following.

- a. Explain the design method, including assumptions, theories and formulae.
- b. Include applicable diagrams, adequately identified.
- c. State exactly the computation performed by the computer.

- d. Provide all necessary explanations of the computer printout format, symbols, and abbreviations.
- e. Use adequate and consistent notation.

## 2.4 SPECIFICATIONS

Specifications shall be prepared in accordance with the Construction Specifications Institute (CSI) format. The Design-Build Contractor prepared specifications shall include as a minimum, all applicable specification sections referenced by the CSI for each product supplied and used for project. Where the CSI 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.

Construction Specifications Institute  
[http://www.csinet.org/s\\_csi/index.asp](http://www.csinet.org/s_csi/index.asp)  
601 Madison Street  
Alexandria, Virginia  
22314-1791

### 2.4.1 Preparation of Proprietary Non-Generic Design Documents

During the course of design, the designer shall specify specific proprietary materials, equipment, systems, and patented processes by trade name, make, or catalog number. The subsequent use of construction submittals to supplant and/or supplement incomplete design effort is unacceptable. Design submittals containing non-proprietary and/or generic design criteria where proprietary items are available, will be returned for resubmission.

### 2.4.2 Use of Unified Facilities Guide Specifications (UFGS)

If UFGS are used, it is the sole responsibility of the Design-Build Contractor to prepare these specifications in strict conformance with the paragraph entitled PREPARATION OF PROPRIETARY NON-GENERIC DESIGN DOCUMENTS. UFGS containing non-proprietary and/or generic design criteria, where proprietary items are available, will be returned for resubmission. If the UFGS contains a "SUBMITTALS" paragraph, the Design-Build Contractor shall delete it and incorporate all required information directly into the design documents. Under no circumstances will the Design-Build Contractor be permitted to use submittals and shop drawings to finalize an incomplete design. UFGS (Uniform Federal Guide Specifications) are required for this project when U.S. products and systems are required or used. Current UFGS information may be obtained at the following location: [http://www.wbdg.org/ccb/browse\\_org.php?o=70](http://www.wbdg.org/ccb/browse_org.php?o=70).

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>.

### 2.4.3 Quality Control and Testing

Specifications shall include required quality control and further indicate all testing to be conducted by the Design-Build Contractor, its subcontractors, vendors and/or suppliers.

### 2.4.4 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.

### 2.4.5 Binding

All volumes of specifications shall be 8.5 inches X 11 inches, and firmly bound, covers shall be of a heavier bond than the drawing sheets. All specifications shall be bound in sets with Chicago Screws to fasten sheets together, the drilled holes on the bond edges of the sheets shall be on 100 mm centers maximum, and 40 mm maximum from edges.

#### 2.4.5 Industry Standards

##### 2.4.5.1 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 (AFCEA), 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 Design-Build Contractor shall be by specific issue; the revision letter, date or other specific identification shall be included.

##### 2.4.5.2 Non U.S. Industry Standards

The Codes, Standards, and Regulations listed below shall be used in the construction of this project. The publications shall be the most recent editions. Standards specified shall be ASTM or equivalent DIN, BS, or EN. 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. It shall be the contractor’s responsibility to show equivalency requirements are met if the Standard is not per specified format. Any time two or more Codes or standards conflict, the most stringent shall apply.

#### 2.4.6 Incorporation of Government review comments

Subsequent to submission to the Government, the specifications shall be finalized by the incorporation of Government review comments.

### 2.5 DRAWINGS

Drawings, prepared in the English language with SI units of measure, are a part of each submittal. The working drawings shall be adequately labeled and cross-referenced for review. Complete, thoroughly checked and coordinated contract drawings shall be submitted. The contract drawings submitted for final review shall include the drawings previously submitted which have been revised and completed as necessary. The Design-Build Contractor shall have incorporated any design review comments generated by previous design review(s), have completed all of his constructability and coordination checks, 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.

### 2.5.1 Drawing Size

If project is required to be in (SI) Metric units, all drawings shall be prepared in size "A1" sheets (594mm by 841mm). If project is required to be in English units, all drawings shall be modified Architectural D size (24 inches by 36 inches) sheets. Design submissions may be prepared in half size (11 inches by 17 inches) to save paper and for ease of review. All final contract drawing sets shall be prepared with full size sheets. Drawings shall be trimmed to size if necessary.

### 2.5.2 Computer Assisted Design and Drafting (CADD)

Computer Assisted Design and Drafting (CADD) is required for all work related to this contract. The CADD deliverables shall meet the requirements of the AEC CAD Standard Release 2.0. Emphasis is on drawings meeting sheet layout standards, level/layer naming standards and sheet naming conventions. CAD standards may be found at the following link: <https://tsc.wes.army.mil/products/standards/aec/aecstdweb.asp>. Transatlantic Programs Center Design Instructions Manual, Chapter 22 entitled COMPUTER ASSISTED DESIGN AND DRAFTING. The Contractor shall furnish the digital as-built drawing files in .DWG file format utilizing AutoDesk AutoCAD revision 2005 or later. Drawings shall not be prepared in another Cad format and converted into AutoCAD.

### 2.5.3 Plotter Prepared Original Drawings

Plotter prepared original drawings shall be prepared on 20 pound bond paper, unless otherwise approved and shall be plotted on the matte side. Raster plotters must provide a minimum resolution of 400 dpi while vector plotters shall provide a minimum resolution of 0.0010 inch with an accuracy of +0.1% of the move and a repeatability error of not more than 0.005 inch. Drawings produced from dot matrix plotters are not acceptable. Plots accompanied by the digital design file may be prepared on vellum: translucent bond is not acceptable. Line density shall be equivalent to that produced by black India ink: half-tones and gray scale plots are not acceptable unless otherwise approved. Manual changes to plotted originals are not acceptable.

### 2.5.4 Half-Size Reduction

Preparation of all work shall accommodate half size reduction unless project is required to meet SI units or shall be instructed otherwise by the Contracting Officer.

### 2.5.5 Symbols and Abbreviations

Symbols and abbreviations shall be in accordance with AEC CAD Standard Release 2.0 or later /or conform to the symbols used with a CADD program such AutoDesk AutoCAD release 2000 or greater.

### 2.5.6 Design Discipline Designation Format

Referencing AEC CAD Standard Release 2.0, the drawing package shall be divided into the following proposed divisions:

#### Discipline

#### Designation      Discipline

Use the following for AEC CAD Standard Release 2.0:

CCivil

S	Structural
A	Architectural
F	Fire Protection

P	Plumbing
M	Mechanical
E	Electrical

Each drawing for the particular facility shall be designated by the discipline designation and sheet number and shall be consecutive within each discipline. AEC CAD Standard, referenced herein, shall be adhered to, especially with regard to sheet naming, numbering and level/layer naming standards. Copies of level/layer naming standards are available at the following locations (in comma delimited format - .CSV) and may be imported into Microstation and/or AutoCAD release 2000 or later:

Public FTP site:

[ftp://anonymous:anonymous@ftp.usace.army.mil/pub/aed/Standards/AEC\\_Nat\\_CAD\\_Std/level\\_libs/](ftp://anonymous:anonymous@ftp.usace.army.mil/pub/aed/Standards/AEC_Nat_CAD_Std/level_libs/)

Share Point site:

[https://aedsharepoint.tac.usace.army.mil/C16/Drawings/Document%20Library/AEC\\_CAD\\_level\\_templates.ZIP](https://aedsharepoint.tac.usace.army.mil/C16/Drawings/Document%20Library/AEC_CAD_level_templates.ZIP)

### 2.5.7 Grouping Drawings

A building or individual facility design shall, except for site development drawings, be grouped in the design drawing package so that a single building may be withdrawn by deleting or removing a consecutive block of sheets.

### 2.5.8 Title and Revision Block

Title and revision block shall match FIGURES 1 through 5 furnished in the paragraph entitled ATTACHMENTS.

### 2.5.9 Drawing Scales

The scales indicated on the following list shall, in general, be used for all drawings. The Contractor may, at its option, make exceptions to scales indicated, if approved in writing by the Contracting Officer.

Site, Grading and Utility Plans - 1:500, if in SI units

Key Plans as large as practical

Cross Sections/elevations (as large scale as possible to adequately show required detail) - 1:100, if in SI units

Details - 1:10 minimum, if in SI units

### 2.5.10 Binding

All volumes of drawing prints shall be firmly bound and shall have covers of heavier bond than the drawing sheets. All drawings shall be bound in sets with Chicago Screws to fasten sheets together, the drilled holes on the bond edges of the sheets shall be on 200 mm centers maximum, and 50 mm maximum from edges. Maximum thickness of each set of drawings shall be 40 mm.

### 2.5.11 Typical Sheets

Typical sheets of standard details uniformly used on all buildings are authorized and encouraged. Sheets of standard details may be prepared so that they can be reused if the design package must be divided into separate construction packages. Each typical detail drawing sheet may be limited to a particular design discipline. Standard detail sheets shall be organized by discipline as are the other drawing sheets. Details peculiar to one facility shall not be shown in the standard details but with the group of drawings for the facility to which it pertains.

#### 2.5.12 Index Sheet(s)

The first sheet of each volume in a project shall be a cover sheet. In general, the second sheet shall be the first index. The third sheet shall be a legend with all symbols and abbreviations used in drawings listed. Multiple index sheets may be required, depending on the project size. All index sheets shall be included with each volume of drawings and shall be an index of all the individual drawings in all volumes. The index shall list sequentially the site development drawings, each facility's drawings, and the standard details drawings (if any), and shall locate them by volume and file number. Each index sheet shall be signed and stamped by a principal of the Design-Build Contractor.

#### 2.5.13 Drawing File Number

The File Number is unique to each drawing and is a combination of a project location code, project number, facility designator and the CADD file name. Unassigned numbers or skipped sheets shall be labeled as "Not Used" on the index sheets. Cover sheets are not numbered.

#### 2.5.14 Specifications Placed on the Drawings

Details of standard products or items which are adequately covered by specifications shall not be included on the drawings.

#### 2.5.15 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 third drawing.

#### 2.5.16 Location 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.

#### 2.5.17 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 total plan shall be placed on one sheet at a smaller scale. Appropriate key plans and match lines shall appear on segmented drawings. Key plans shall be used not only to relate large scale plans to total floor plans but also to relate individual buildings to complexes of buildings. Key plans shall be drawn in a convenient location and shall indicate the relative location of the represented plan area by crosshatching.

#### 2.5.18 Revisions

Drawing revisions shall be prepared only on the original CADD files. A revision area is required on all sheets.

### PART 3 EXECUTION

#### 3.1 GENERAL

##### 3.1.1 Design Concept Coordination Meeting

In addition to regular meetings with the Government the Contractor shall conduct formal status briefings on a bi-weekly basis, as a minimum, to provide a management overview of design development. Shortly after contract award the Government may choose to conduct meetings with the Design-Build Contractor to refine proposal concept features. The purpose of the meeting is to assure attention to project requirements and to suggest ways of improving the design prior to tentative level submissions.

### 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 REGISTERS

### 3.2.1 Contractor-Furnished Design Documents Submittal Register (TAC Form 122-E)

#### 3.2.1.1 General

The Contractor shall submit as part of his Project Schedule, information regarding the submittal and clearance for construction of Contractor furnished design documents. In addition, the Contractor shall provide a complete submittal register in the sample format (TAC Form 122-E - Contractor Furnished Design Documents Submittal Register) which is attached to this section. The Contractor shall, within fifteen (15) calendar days after approval of the Project Schedule, submit 3 copies of his finalized Contractor Furnished Design Document Submittal Register to the Contracting Officer for approval. The submittal register shall consist of a tabulation of all the Contractor furnished design documents with the indicated dates integrated into the Design Progress Schedule. The Contractor shall post all actual dates of submittal actions (including clearance for construction) as they occur. Revisions shall be made at minimum on a monthly basis to keep the submittal register in agreement with the scheduled dates shown in the network mathematical analysis.

#### 3.2.1.2 Additions or Revisions

Any additions or changes required to be made to the TAC Form 122-E as a result of the Contracting Officer's review shall be incorporated into the TAC Form 122-E by the Contractor and (3) copies shall be affected within five (5) calendar days after receipt of the Contracting Officer's review comments.

#### 3.2.1.3 Submission Requirements

A copy of the initial TAC Form 122-E and each monthly update prepared by the Contractor, shall be submitted to

#### AFGHANISTAN ENGINEER DISTRICT

(1) DHL, FEDEX, UPS or any other courier service:

U.S. Army Corps of Engineers  
Afghanistan Engineer District  
House # 1, St. #1 West  
West Wazir Akbar High School  
Behind Amani High School  
Kabul, Afghanistan

(2) U.S. Postal Service:  
USACE AED

ATTN: QALAA House  
APO AE 09356

### 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 construction submittals shall be shown on this register. The submittal register shall be the controlling document and will be used to control all construction 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 shall deliver Submittal section AED (3) copies 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

Note: all design submittal phases shall consist of Designs, Specifications, Design analysis, 2 Half size sets of drawings bound with a CD-ROM electronic files of all the listed here in.

Adequate time a minimum of fifteen (15) calendar days exclusive of mailing time shall be allowed for review and clearance for construction. 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 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 fifteen (15) 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.

### 3.5.3 Incorporation of Government Review Comments

The Contractor shall use DrChecks<sub>SM</sub>, as the communication mechanism for the Government's review comments. The review will be for conformance with the technical requirements and parameters of the contract documents. The Contractor shall either incorporate each comment or, if the Contractor disagrees technically and does not intend to comply with the comment(s), the Contractor shall clearly outline, with ample justification, its reasons for its noncompliance within five (5) days after receipt of the comment(s) in DrChecks<sub>SM</sub>. Additionally, the Contractor is cautioned in that if it believes the action required by any comment exceeds the requirements of this contract, that he should take no action and notify the Contracting Officer in writing immediately. The DR Checks review comments and the submittal material for each design review will become the basis for any ensuing design work. Copies of the DrChecks<sub>SM</sub>, design review comments with the action taken on each comment noted shall be bound in all succeeding volumes of the design analysis.

## 3.6 SUBMITTAL PROCEDURE

### 3.6.1 Design Submittals

#### 3.6.1.1 Afghanistan Engineer District (AED)

Two (2) hard copies and one soft copy (1) copies of all design submittals shall be transmitted to the Government at the following address by means of ENG Form 4025:

AFGHANISTAN ENGINEER DISTRICT

(1) DHL, FEDEX, UPS or any other courier service:

U.S. Army Corps of Engineers  
Afghanistan Engineer District  
House # 1, St. #1 West  
West Wazir Akbar High School  
Behind Amani High School  
Kabul, Afghanistan

(2) U.S. Postal Service:

USACE AED  
ATTN: QALAA House  
APO AE 09356

One (1) set of designs (3) copies of all design submittals shall be transmitted to the Government at the following address by means of ENG Form 4025:

The drawings shall be submitted in full size and half size formats unless otherwise noted.

For the Afghanistan Engineer District and/or field office, the Contractor shall submit two (1) full size and one (2) half size sets of drawings and a complete set of specification, design analysis and a soft copy on CD-ROM of all of the listed herein.

#### 3.6.1.2 Resident/Area Engineer Office

Two (2) half size copies and one (1) full size additional copy of each design submittal shall be transmitted to the overseas field office administering the construction portion of the contract at the following address:

#### 3.6.1.3 Deliverables "Cleared for Construction"

Once the Design Documents have been "Cleared for Construction" by the Contracting Officer, the Design-Build Contractor shall clearly identify each document by annotating it as "Cleared for Construction". One (1) complete hardcopy and CD set of all finalized design documents shall be submitted to the Government as follows:

#### AFGHANISTAN ENGINEER DISTRICT

(1) DHL, FEDEX, UPS or any other courier service:

U.S. Army Corps of Engineers  
Afghanistan Engineer District  
House # 1, St. #1 West  
West Wazir Akbar High School  
Behind Amani High School  
Kabul, Afghanistan

(2) U.S. Postal Service:

USACE AED  
ATTN: QALAA House  
APO AE 09356

Resident Area Engineer Office AED

Field office or site location of design project.

This is a Design-Build project and 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.

#### 3.6.1.4 Editable CADD Format As-Builts

One (1) set of the Government approved As-Builts shall be submitted to the following address in an editable CADD format:

#### AFGHANISTAN ENGINEER DISTRICT

(1)

DHL, FEDEX, UPS or any other courier service:  
U.S. Army Corps of Engineers  
Afghanistan Engineer District  
House # 1, St. #1 West  
West Wazir Akbar High School  
Behind Amani High School  
Kabul, Afghanistan

(2) U.S. Postal Service:

USACE AED  
ATTN: QALAA House  
APO AE 09356

This requirement is in addition to all other submission requirements stated elsewhere in the contract.

#### 3.6.1.5 Digital Transmission of Design Submittals

The Design-Build Contractor shall submit design deliverables addressed by this specification in digital format. The following procedure shall be followed:

a. **USE OF FILE TRANSFER PROTOCOL (FTP) SERVER.** The Design-Build contractor will download all design files on either its own File Transfer Protocol (FTP) Server, the Corps FTP Server or as otherwise directed. Afghanistan Engineer District (AED) prefers that the contractor provide the soft copy of design submittals be burned to CD-ROM and submitted as such. Files shall be arranged on a CD with each facility clearly identified as a separate subdirectory, with all files for that facility contained in that subdirectory. Each disk shall have an adhered printed label listing contents. Hand writing unacceptable. The procedure to be followed will be established at the Pre-Construction Conference and the appropriate log-in and password information will be exchanged between the Government and the Design-Build Contractor.

NOTE: AED accepts AutoCAD release 2005 or higher drawing file format as the standard due to the fact that the local region does not support Microstation

b. **TRANSLATED OR CONVERTED FILES DRAWING FILES.** Digital drawing files shall be prepared as indicated in the paragraph entitled COMPUTER ASSISTED DESIGN AND DRAFTING (CADD). Under NO circumstances shall the Design-Build Contractor translate (or convert) the files from Bentley Microstation to AutoDesk AutoCAD.

c. **NOTIFICATION.** The Design-Build Contractor shall notify all recipients by email that the Design submittal has been downloaded to the designated FTP server or electronically provided on a CD and is ready for Government review. This email shall include a scanned copy of the ENG Form 4025 signed by the Design-Build Contractor's Contractor Quality Control (CQC) Organization. It shall also include an updated digital copy of TAC Form 122-E. The Government will use the digital submittal as an advance copy pending receipt of an official hardcopy version in accordance with the paragraph entitled SUBMITTAL PROCEDURE. Subsequent to a period of demonstrated successful performance, the Government may elect to eliminate the requirement to submit an official hardcopy version.

The TAC Form 122-E shall be prepared in a spread sheet software that readily allows the file to be saved as a \*.CSV file that can subsequently be imported into the Corps of Engineers Resident Management System (RMS) software.

d. **RETURN OF GOVERNMENT REVIEWED SUBMITTALS.** Subsequent to the Government review, the Eng Form 4025 with comments (if applicable) will be returned to the Design-build Contractor digitally by email. Hardcopies of these documents will subsequently be submitted to the Design-Build Contractor via the United States Postal Service (USPS). The Government may elect to stop sending hardcopies if it deems that digital transmission of design submittals is progressing satisfactorily.

e. **SUPPLEMENTAL ACTIONS.** All supplemental actions, resubmittals, and subsequently scheduled submissions shall be performed by the Design-Build contractor as indicated within this paragraph.

AED: As-builts shall be prepared and submitted in .DWG format utilizing AutoDesk AutoCAD release 2000 or higher format.

### 3.6.2 Post Design Construction Submittals

Three (3) copies of all post design construction submittals shall be transmitted to the overseas district office administering the construction portion of the contract at the following address:

AFGHANISTAN ENGINEER DISTRICT

(1) DHL, FEDEX, UPS or any other courier service:  
U.S. Army Corps of Engineers

Afghanistan Engineer District  
House # 1, St. #1 West  
West Wazir Akbar High School  
Behind Amani High School  
Kabul, Afghanistan

(2) U.S. Postal Service:  
USACE AED  
ATTN: QALAA House  
APO AE 09356

Submittal area of the AED engineering section

One (1) additional copy of each Post Design Construction submittal shall be transmitted to the Government at the following stateside address by means of ENG Form 4025:

Submittals of Operations and Maintenance (O & M) Manuals in sets of (3) three copies shall be as follows:

#### AFGHANISTAN ENGINEER DISTRICT

(1) DHL, FEDEX, UPS or any other courier service:  
U.S. Army Corps of Engineers  
Afghanistan Engineer District  
House # 1, St. #1 West  
West Wazir Akbar High School  
Behind Amani High School  
Kabul, Afghanistan

(2) U.S. Postal Service:  
USACE AED  
ATTN: QALAA House  
APO AE 09356

### 3.6.3 Submittal Numbering System

An instruction 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:

- a. List is prepared according to contract specifications and drawings, picking up all items involved in the project.
- b. This list is divided into sections as indicated in the specifications for example:

Sec 01015	"Technical Requirements"
Sec. 02831	"Chain-Link Fence"
Sec. 02710	"Sub drainage System"
Sec 03300	"Concrete For Building Construction"
Sec. 04200	"Masonry"

### 3.6.3.2 Numbering procedures for transmittal on ENG FORM 4025

a. Each section, may include a list of items. All these items will then be listed with a progressive number within the sections they belong to, for example:

Sec. 01015 will have 01015.00 (Basic number)

Item x " " 01015.01

Item y " " 01015.02

Item z " " 01015.03

Sec. 02710 will have 02710.00 (Basic number)

Item x " " 02710.01

Item y " " 02710.02

Item z " " 02710.03

Sec. 02600 will have 02600.00 (Basic number)

Item x " " 02600.01

Item y " " 02600.02

Sec. 03300 will have 03300.00 (Basic number)

Item x " " 03300.01

Item y " " 03300.02

etc.

b. It is evident a transmittal will never show a Section number i.e., 02831.00, 03300.00, etc., since these are only the basic numbers of the system. Numbers on transmittals will be the item numbers, i.e., 01015.01, 02710.01, 02710.02, 02710.03, 03300.01, 03300.02, etc. All items, as listed on the Submittal Register, will be submitted via a separate transmittal form ENG FORM 4025 thus avoiding getting together more than one item (as listed) and more than one number. There are items, on the other hand, which may be submitted all together on the same transmittal form. This must be established before submission is made.

c. Sec. 10800 "Toilet Accessories" - this section will have basic number 10800.00 - all items relative to it will be listed one by one on separate lines. ONLY one transmittal number will then be given for all of these "10800.01" which will include i.e., robe hook, toilet paper holder, mirror, soap holder, cabinet for paper towels, etc. Each one of these items will be listed on the same Transmittal Number 10800.01 as item 1, item 2, item 3, etc.

For design reviews the standard Corps of Engineers method of review is through DrChecks<sub>SSM</sub>, through Projnet <https://www.projnet.org/projnet/bin/KornHome/index.cfm> All of AED design submittal reviews shall be done through DrChecks.

### 3.6.3.3 Resubmittals

Should the Contractor be required to resubmit any transmittal, it will be accomplished by utilizing the same transmittal number followed by the number "-1" for the first resubmittal, "-2" for the second resubmittal, "-3" for the third resubmittal, etc. For example, a first resubmittal would be "SUBMITTAL PROCEDURES FOR DESIGN BUILD PROJECT" 01335.01-1, a second resubmittal 01335.01-2, etc. The purpose of this system is to avoid deviations from Submittal Register and, to avoid confusion arising from the use of more than one number on transmittal when more than one item is submitted on the same form. This system will also facilitate the use, wherever required, on machine printouts.

### 3.6.4 Variations

If design documents or construction submittals show variations from the contract parameters and/or requirements, 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 will be considered unless accompanied by the following:

- a. Reason or purpose for proposed variation, substitution, or revision.
- b. How does quality of variation compare with quality of the specified item? This shall be in the form of a technical evaluation tabulating differences between the item(s) originally specified and what is proposed.
- c. Provide a cost comparison. This shall include an acquisition and life cycle cost comparison.
- d. For proprietary materials, products, systems, and patented processes a certification signed by an official authorized to certify in behalf of the manufacturing company that the proposed substitution meets or exceeds what was originally specified.
- e. For all other actions, a certification signed by a licensed professional engineer or architect certifying that the proposed variation or revision meets or exceeds what was originally specified.
- f. Advantage to the Government, if variation is approved, i.e. Operation and Maintenance considerations, better product, etc.
- g. Ramifications and impact, if not approved.

If the Government review detects any items not in compliance with contract requirements or items requiring further clarification, the Contractor will be so advised. Lack of notification by the Contracting Officer of any non-complying item does not relieve the Contractor of any contractual obligation.

### 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 Design-Build 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 Design-Build Contractor or may be directed by the Contracting Officer as necessary to progress the work. The Design-Build Contractor shall prepare minutes of all conferences and shall furnish two copies to the Contracting Officer within seven (7) days after the conference.

Note: All design submittal reviews shall be reviewed and comments entered in DrChecks<sub>SM</sub>, located on the web at: <https://www.projnet.org/projnet/binKornHome/index.cfm>

### 3.7.2 Independent Design Review

The Design-Build Contractor shall have someone other than the Designer or Design Team perform an independent review of all specifications, drawings, design analysis, calculations, and other required data prior to submission to the Government. Upon completion of this review, the Design-Build 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

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. Design submittals submitted to the Contracting officer without evidence of 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.

Action Code on Eng Form 4025 the "G – Other (specify)" Code must be used. ENG Forms 4025 and 4026 will be annotated as follows:

- A – Cleared for Construction
- B – Cleared for Construction, except as noted in attached comments
- D – 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.

NOTE: Cleared for construction does not relieve the Design-Build Contractor from the responsibility for any errors or omissions in the design, nor from responsibility for complying with the requirements of this contract.

### 3.7.4 Government Review

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 bi-weekly. After receipt, the Government will be allowed fifteen (15) days to review and comment on each 35%, and 65% design submittal and fifteen (15) days to review and comment on each 99% design and 100% submittal, except as noted below. For each design review submittal, comments from the various design sections and from other concerned agencies involved in the review process will be made in the on-line review management system DrChecks<sub>SM</sub>, (<https://www.projnet.org/projnet/binKornHome/index.cfm>). Contractor shall coordinate with the Contracting Officer and/or Representative(s) to register for DrChecks<sub>SM</sub>, use. Contractor shall be responsible for accessing DrChecks<sub>SM</sub> on a daily basis during Government Review period for comments pertaining to package submitted. The review will be for conformance with the technical requirements of the solicitation and the Successful Offeror's (Contractor's) RFP proposal.

If a design submittal is deficient, it will be returned for correction and resubmission. The review time will begin when the corrected submittal is received.

See table of submittals and meetings at the end of this section..

The contractor shall not begin construction work until the Government has reviewed the contractor's design and

has 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. Upon completion of the review, all comments will be forwarded to the Contractor. The Contracting Officer will indicate whether the design submittal 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 Design-Build Contractor. Design-Build Contractor's Quality Control Organization will annotate Block "g" entitled "FOR CONTRACTOR USE CODE" of Eng Form 4025-R using the action codes listed on the reverse side of the form.

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

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. The Contractor shall furnish disposition of all comments in DrChecks<sub>SM</sub>, 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. The Contractor is cautioned that if he believes the action required by any comment exceeds the requirements of this contract, that he should flag the comment in DrChecks<sub>SM</sub> as a scope change, and notify the COR in writing immediately. 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. Submittals date revisions must be made in writing at least five (5) days prior to the submittal. 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 design-build process.

The Contractor will be furnished comments from the various design sections of the Corps of Engineers, Afghanistan Engineer District (AED) as well as from other concerned agencies involved in the review process. The review will be for conformance with the technical requirements and parameters of the contract documents. The Contractor shall either incorporate each comment or, if the Contractor disagrees technically and does not intend to comply with the comment(s), the contractor shall clearly outline, with ample justification, its reasons for its noncompliance within five (5) days after receipt of the comment(s). Additionally, the Contractor is cautioned in that if it believes the action required by any comment exceeds the requirements of this contract, that he should take no action and notify the Contracting Officer in writing immediately. The disposition of all comments shall be furnished in writing with the next scheduled submittal. The review comments and the submittal material for each

design review will become the basis for any ensuing design work. Copies of the design review comments with the action taken on each comment noted, shall be bound in all succeeding volumes of the design analysis.

#### 3.7.4.2 Conferences

As necessary, conferences will be conducted between the Design-Build contractor and the Government to resolve review comments.

One review conference will be held for each design submittal as necessary. The review conference will be held at the will be held at the Corps District Office in Kabul, Afghanistan. The Contractor shall bring the personnel that developed the design submittal to the review conference. These conferences when required will take place the week after the fifteen (15) day review periods respectively.

#### 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 Design-Build Contractor shall be responsible for the correction of incomplete design data, omissions, and design discrepancies which become apparent during construction. The Design-Build 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 Design-Build Contractor of any detected noncompliance with the foregoing requirements. The Design-Build Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Design-Build Contractor at the worksite, shall be deemed sufficient for the purpose of notification. If the Design-Build 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 Design-Build 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.

##### 3.8.1.1 Design Phases

Complete or partial design phasing may or may not have been specified by the Government elsewhere in this contract. For construction sequencing or phasing that the Government has not specifically mandated, the Design-Build Contractor may submit a proposed phasing plan. Design phasing proposed by the Design-Build Contractor shall be submitted to the Government for approval in accordance with TAC Form 122-E CONTRACTOR FURNISHED DESIGN DOCUMENTS.

##### 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 DESIGN STAGES

The Contractor shall schedule the number and composition of the design submittal phases. Design submittals are required at the Concept (35%), Preliminary (65%) and Final (99%) design stages and at the "Cleared for Construction" (100%) phase. The requirements of each design stage are listed hereinafter. The number and contents of the design submittals phases shall be reflected in TAC Form 122-E as well as in the Contractor's design progress schedule.

### 3.9.1 DESIGN SUBMITTAL (35%)

The review of this submittal is primarily to ensure that the Contractor has taken an inventory of the existing conditions at proposed site, has incorporated all requirements from the Design Charette, has established the most desirable functional relationships between the various project elements, has provided the technical solution to how the functional and technical requirements will be met, and to show Contractor compliance (or justify noncompliance) with the design parameters and/or requirements. Refer to requirements herein for specific submittal requirements.

The following documents shall be submitted:

- a. 35% Design Analysis. The Design Analysis shall be in outline form Listing Executive Summary, Building Types, complete Code Analysis, all codes and standards to be incorporated in design. It shall include all backup material previously submitted and revised as necessary; 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.
- b. 35% Construction Specifications. A Draft Outline of all Specifications to be used in project.

c. 35% Construction Drawings. The Contract Drawings submitted for 35% Review shall include Site Plan, Building Plans, and one each of Section thru each Building, and Exterior Elevations of building. The Contractor is expected to have completed all of his coordination checks and have the drawings at a 35% design level.

### 3.9.2 PRELIMINARY (65%)

a. Design Analysis, developed to a 65% design stage. The Design Analysis shall be near final form. It shall include all backup material previously submitted and revised as necessary. Half of the design calculations shall be included. The Design Analysis shall contain all explanatory material giving the design rationale for any design decisions which would not be obvious to an engineer.

b. 65% Complete Construction Specifications. The Draft Specifications on all items of work submitted for 65% Review shall consist of marked-up proprietary specifications with 65% of specification edited.

c. 65% Complete Construction Drawings. The Contract Drawings submitted for Final Review shall include the drawings previously submitted which have been revised and completed as necessary. 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 the Preliminary design review.

d. The Contractor shall incorporate Government's 35% Design Review Comments with the Contractor's annotation to each comment.

e. The Contractor may at this time submit for approval the following drawings 1. thru 3. for approval to begin 3.8 PHASED OR "FAST-TRACK" DESIGN.

1. 100% drawings for site plan, grading, utilities, roads, and foundation
2. Geotechnical report
3. Site topographic survey

### 3.9.3 FINAL DESIGN REVIEW SUBMITTAL 99%

b. 99% Complete Construction Specifications. The Specifications on all items of work submitted for Final Review shall consist of a complete 99 % edited set of specifications.

c. 99% Complete Construction Drawings. The Contract Drawings submitted for Final Review shall include the drawings previously submitted which have been revised and completed as necessary. 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 the Preliminary design review. The drawings shall contain all the details necessary to assure a clear understanding of the work throughout construction.

d. The Contractor shall incorporate Government's 35% and, 65% Design Review Comments with the Contractor's annotation to each comment.

### 3.9.4 "Cleared for Construction" Design Review Submittal (100%)

After the FINAL DESIGN REVIEW SUBMITTAL review, the Contractor shall revise the Contract Documents by incorporating any comments generated during the FINAL DESIGN REVIEW SUBMITTAL and shall prepare final hard copy Construction Specifications. The Contractor shall submit the following documents for the design complete submittal:

- a. Complete Design Analysis

b. Construction Specifications

c. Construction Drawings

d. A soft copy (CD) of the design drawings, specifications, and design analysis shall be submitted at this stage and all other subsequent stages of the design process. Files shall be arranged on a CD with each facility clearly identified as a separate subdirectory, with all files for that facility contained in that subdirectory. Each disk shall have an adhered printed label listing contents. Hand writing unacceptable.

e. The Contractor shall incorporate Government's 99% Design Review Comments with the Contractor's annotation to each comment.

f. Once the design documents have been "Cleared for Construction" by the Contracting Officer, the Design-Build Contractor shall clearly identify each document by annotating it as "Cleared for Construction."

### 3.9.5 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.

### 3.9.6 Design Submittals not in compliance with the contract documents

The Contractor shall, without additional compensation, correct or revise any errors or deficiencies in its design analysis, specifications, and drawings, and promptly furnish a corrected submittal in the form and number of copies as specified for the initial submittal. 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. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, a notice shall be given promptly to the Contracting Officer.

## 3.10 GENERAL DESIGN INSTRUCTIONS

### 3.10.1 Responsibility of the Design-Build Contractor

#### 3.10.1.1 Professional Quality, Technical Accuracy, and Coordination

The Design-Build Contractor shall be responsible for the professional quality, technical accuracy, and the coordination of all design specifications, drawings, and other services furnished under this contract. 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 Design-Build 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.

#### 3.10.1.2 Deviating From the "Cleared-For-Construction" Design

(a.) 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.

(b.) 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.

(c.) 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.

(d.) 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.

(e.) 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. The Designer of Record shall document its professional concurrence on the As-Built for any revisions by affixing its stamp and seal on the drawings and specifications.

#### 3.10.1.3 Government Oversight

The extent and character of the work to be done by the Design-Build Contractor shall be subject to the general oversight, supervision, direction, control, and review by the Contracting Officer.

#### 3.10.1.4 Unlimited Drawing Rights

The Government shall have unlimited rights in all drawings, designs, specifications, notes and all other works developed in the performance of this contract, including the right to use same on any other Government design or construction without additional compensation to the Design-Build Contractor. The Design-Build Contractor hereby grants to the Government a paid-up license throughout the world to all such works to which he may assert or establish any claim under design patent or copyright laws.

#### 3.10.1.5 Conflicts

Any conflicts, ambiguities, questions or problems encountered by the Design-Build Contractor in following the criteria shall be immediately submitted in writing to the Contracting Officer with the Design-Build Contractor's recommendations. Prior to submission to the Government the Design-Build 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.

#### 3.10.1.6 Design Specialists

Whenever a design specialist is required, the Design-Build Contractor shall submit for the approval by Contracting Officer, the name of the designated specialist along with the individual's educational background, experience, and licenses or registrations held, before design work commences. The design specialists shall be registered architects, registered professional engineers, or recognized consultants with a background of at least five (5) years design experience in the appropriate specialty. Services of design specialists may be required for the following specialties:

- Landscape Design
- Fire Protection
- Medical Design
- Acoustical Design
- Security
- Telecommunications
- Geotechnical Design
- Audio Visual, PA, TV, etc.

#### 3.10.2 Conduct of Work

In the performance of contract the Design-Build contractor shall:

#### 3.10.2.1 Performance

Perform the work diligently and aggressively, and promptly advise the Contracting Officer of all significant developments.

#### 3.10.2.2 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.

#### 3.10.2.3 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.

#### 3.10.2.4 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 Design-Build 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 Design-Build Contractor will be required to conform his design to the same at his own time and expense.

#### 3.10.3 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:

##### 3.10.3.1 CONSTRUCTION LIFE-SPAN LEVEL

Permanent Construction. 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.

##### 3.10.3.2 Operability

Systems including but not necessarily limited to mechanical, electrical, communications, etc., must be simple to operate and easy to maintain.

##### 3.10.3.3 Standardization

Use of standardized materials, products, equipment, and systems is necessary to minimize the requirements for replacement parts, storage facilities, and service requirements.

##### 3.10.3.4 Overseas Work

Use of construction materials or techniques shall be utilized which are suitable for overseas work in harsh climates and environments.

#### 3.10.4 Topographic Surveys, Easements, and Utilities

Unless otherwise stated in the contract, the Design-Build Contractor will be responsible for detailed topographic mapping, available easements, and utility information for the project.

##### 3.10.4.1 Not Used

##### 3.10.4.2 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.

#### 3.10.5 Geotechnical Investigation

Design-Build Contractor will be responsible for Geotechnical investigation, including subsurface explorations, sampling, field and laboratory testing.

#### 3.10.6 Cathodic Protection and Earth Resistance

Unless otherwise stated in the contract, the Design-Build Contractor will be responsible for determining whether cathodic protection on buried structures and underground utility systems are needed for special electrical grounding and counterpoise systems, and for gathering the field data necessary for design.

#### 3.10.7 Not Used

#### 3.10.8 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.

#### 3.10.9 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 CETAC.

#### 3.10.9.1 Not Used

#### 3.10.9.2 Not Used

### 3.11 VALUE METHODOLOGY/VALUE ENGINEERING

The Design-Build Contractor during the course of his design shall be alert for and shall identify those high-cost low-value items or areas which he considers may be accomplished in different ways that will increase the value of the project at the same or less cost. Potential value engineering study items shall be reported to the Value Engineer through the Contracting Officer.

#### 3.11.1 Performance Oriented Value Engineering Change Proposal (VECP)

In reference to Contract Clause 52.248-3, "Value Engineering - Construction", the Government may refuse to entertain a "Value Engineering Change Proposal" (VECP) for those "performance oriented" aspects of the Contract Documents which were addressed in the Design-Build Contractor's accepted contract proposal and which were evaluated in competition with other Proposers for award of this contract. For purposes of this clause, the term "performance oriented" refers to those aspects of the design criteria or other contract requirements which allow the Proposer or the Design-Build Contractor certain latitude, choice of and flexibility to propose in its accepted contract offer a choice of design, technical approach, design solution, construction approach or other approach to fulfill the contract requirements. Such requirements generally tend to be expressed in terms of functions to be performed, performance required or essential physical characteristics, without dictating a specific process or specific design solution for achieving the desired result.

#### 3.11.2 Prescriptive Oriented Value Engineering Change Proposal (VECP)

The Government may consider a VECP for those "prescriptive" aspects of the Solicitation documents, not addressed in the Design-Build Contractor's accepted contract proposal or addressed but evaluated only for minimum conformance with the Solicitation requirements. For purposes of this clause, the term "prescriptive" refers to those aspects of the design criteria or other Solicitation requirements wherein the Government expressed the design solution or other requirements in terms of specific materials, approaches, systems and/or processes to be used. Prescriptive aspects typically allow the Proposers little or no freedom in the choice of design approach, materials, fabrication techniques, methods of installation or other approach to fulfill the contract requirements.

### 3.12 SUBMITTAL OF CONTRACTOR FURNISHED DESIGN DOCUMENTS

The requirements of this paragraph pertain to the submittal of design documents, specifications, design calculations, surveys, testing reports and other documents prepared by the Design-Build Contractor to meet the design requirements of this project.

#### 3.12.1 Geo-technical

##### 3.12.1.1 Design Analysis

The Design-Build Contractor shall submit in the design analysis catalog cuts, manufacturer's data for the following:

##### 3.12.1.2 Specifications

Specifications for all civil utilities shall include:

3.12.1.3 Design Drawings

1 ea. 2 ea. Half-Size Design drawings shall be submitted for the following:

Afghanistan Engineer District (AED)

3.12.1.4 Manufacturer's recommendations, instructions, and certifications

Shall be submitted for the following:

Afghanistan Engineer District (AED)

3.12.1.5 Samples

Samples shall be submitted for the following:

Afghanistan Engineer District (AED)

3.12.1.6 Schedules

Schedules shall be submitted for the following:

Afghanistan Engineer District (AED)

3.12.1.7 Reports

Reports shall be submitted for the following:

Afghanistan Engineer District (AED)

3.12.1.8 Records

Records shall be submitted for the following:

Afghanistan Engineer District (AED)

Engineering Studies. Occasionally, in addition to the items previously mentioned, engineering studies that relate to specific problems or surveys may be required. The necessary instructions regarding the preparation of such reports must be added by the Specification Writer as appropriate.

3.12.2 Civil, Site Planning and Layout

3.12.3 Wastewater and Solid Waste Systems

3.12.4 Architectural/Interior Design

3.12.5 Structural

3.12.6 Force Protection Design Procedures for the Protection of  
United States Forces

3.12.7 Fire Protection and Life Safety

3.12.8 Heating, Ventilating, and Air Conditioning

3.12.9 Plumbing

3.12.10 Special Mechanical Systems and Equipment

3.12.11 Electrical

3.12.12 Power Generation

3.12.13 Power Transmission and Distribution

3.12.14 Communications

3.12.15 Corrosion Prevention and Control

### 3.13 SUBMITTAL OF CONTRACTOR FURNISHED DESIGN DRAWINGS

3.13.1 Geo-technical

3.13.2 Civil, Site Planning and Layout

3.13.3 Wastewater and Waste Systems

3.13.4 Architectural/Interior Design

3.13.5 Structural

3.13.6 Force Protection Design Procedures for the Protection of  
United States Forces

3.13.7 Fire Protection and Life Safety

3.13.8 Heating, Ventilating, and Air Conditioning

3.13.9 Plumbing

3.13.10 Special Mechanical Systems and Equipment

3.13.11 Electrical

3.13.12 Power Generation

3.13.13 Power Transmission and Distribution

3.13.14 Communications

3.13.15 Accident Prevention and Safety

### 3.14 GOVERNMENT APPROVED CONSTRUCTION SUBMITTALS (Required During Construction)

3.14.1 General

Since this contract requires that the drawings and specifications specify specific proprietary materials, equipment, systems, and patented processes by trade name, make, or catalog number, it is anticipated that construction shop drawings will primarily be limited to testing, construction plans (e.g., Contractor Quality Control, Accident Prevention, Resident Management System, Area Use etc), schedules (Project Schedule/Network Analysis), certificates of compliance, reports, records/statements and variations.

#### 3.14.1.1 Variations

After design submittals have been reviewed and cleared for construction by the Contracting Officer, no submittal for the purpose of substituting materials, equipment, systems, and patented processes will be considered by the Government unless submitted in accordance with the paragraph entitled VARIATIONS.

#### 3.14.1.2 Additional Shop Drawings and Submittals

In accordance with the paragraph entitled DESIGN DISCREPANCIES, the Government may request the Design-Build Contractor to provide additional shop drawing and submittal type data subsequent to completion of the design.

#### 3.14.2 Incomplete Design

The Design-Build Contractor shall not use construction submittals as a means to supplant and/or supplement an incomplete design effort.

#### 3.14.3 Government Approval of Construction Submittals

The approval of construction submittals by the Contracting Officer shall not be construed as a complete check, but will indicate only that the general method of design construction, materials, detailing and other information are satisfactory. Approval will not relieve the Design-Build Contractor of the responsibility for any error which may exist, as it is the sole responsibility of the Design-Build Contractor to certify that each submittal has been reviewed in detail and is in strict conformance with all the contract documents and design criteria referenced therein.

Virtually all design related construction submittals can and must be incorporated directly into the design specifications and drawings prepared by the Design-Build Contractor. Since the Design-Build Contractor has sole responsibility for the design, procurement, and construction, impediments do not exist which would impair his ability to specifically identify what is being furnished to the Government prior to the start of construction. Generic/non-proprietary specifications are indicative of an incomplete design effort and as such must be rejected as unacceptable

#### 3.14.4 Submittals

Submittals (other than shop drawings) shall be limited to items such as Plans (e.g., Quality Control Plan, Accident Prevention Plan, Area Use Plan etc.), Certificates of Compliance, Installation Instructions, Manufacturer's Catalog Data, Descriptive Literature/Illustrations, Factory and Field Test Reports, Performance and Operational Test Data Reports, Records, Operation and Maintenance Manuals, and required variations.

#### 3.14.5 Government Review

Upon completion of review of construction submittals requiring Government approval, the submittals will be identified as having received approval by being so stamped and dated. Two (2) copies of the submittal will be retained by the Contracting Officer and one (1) copy of the submittal will be returned to the Design-Build Contractor.

### 3.15 FOR INFORMATION ONLY SUBMITTALS

These submittals shall be checked, stamped, signed and dated by the Design-Build 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 information only submittals. These submittals will be used for information purposes. The Government reserves the right to require the Design-Build Contractor to resubmit any item found not to comply with the contract. This does not relieve the Design-Build 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.

### 3.16 ATTACHMENTS

The following attachments form an integral part of this specification:

ENG FORM 4025 - Transmittal of Shop Drawings, Equipment Data, Material Samples, or Manufacturer's Certificate of Compliance (2 pages)

TAC FORM 122-E - Contractor Furnished Design Documents Submittal Register

ENG FORM 4288 - Submittal Register

Select one of the following:

AED projects:

Figure 1 - sheet/number description; AED title block per AEC CADD standards

Figure 2 - A-E logo/designed by/submitted my; AED title block per AEC CADD standards

Figure 3 - revision block; AED title block per AEC CADD standards

Figure 4 - Finished Format Size per AEC CADD standards

-- End of Section -

<b>TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE</b> <i>(Read instructions on the reverse side prior to initiating this form)</i>	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: <input type="checkbox"/> THIS IS A NEW TRANSMITTAL <input type="checkbox"/> THIS IS A RESUBMITTAL OF TRANSMITTAL _____
-----	-------	--------------	-----------------------------------------------------------------------------------------------------------------------------------------

SPECIFICATION SEC. NO. <i>(Cover only one section with each transmittal)</i>	PROJECT TITLE AND LOCATION	CHECK ONE: THIS TRANSMITTAL IS FOR <input type="checkbox"/> FIO <input type="checkbox"/> GOV'T. APPROVAL
------------------------------------------------------------------------------	----------------------------	-------------------------------------------------------------------------------------------------------------

ITEM NO.	DESCRIPTION OF ITEM SUBMITTED <i>(Type size, model number/etc.)</i>	MFG OR CONTR. CAT., CURVE DRAWING OR BROCHURE NO. <i>(See instruction no. 8)</i>	NO. OF COPIES	CONTRACT REFERENCE DOCUMENT		FOR CONTRACTOR USE CODE	VARIATION <i>(See instruction No. 6)</i>	FOR CE USE CODE
				SPEC. PARA. NO.	DRAWING SHEET NO.			
a.	b.	c.	d.	e.	f.	g.	h.	i.

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 <i>(List by Item No.)</i>	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.<br>Refer to attached sheet resubmission required. | FX -- Receipt acknowledged, does not comply<br>as noted with contract requirements. |
| D -- Will be returned by separate correspondence.                                             | G -- Other ( <i>Specify</i> )                                                       |

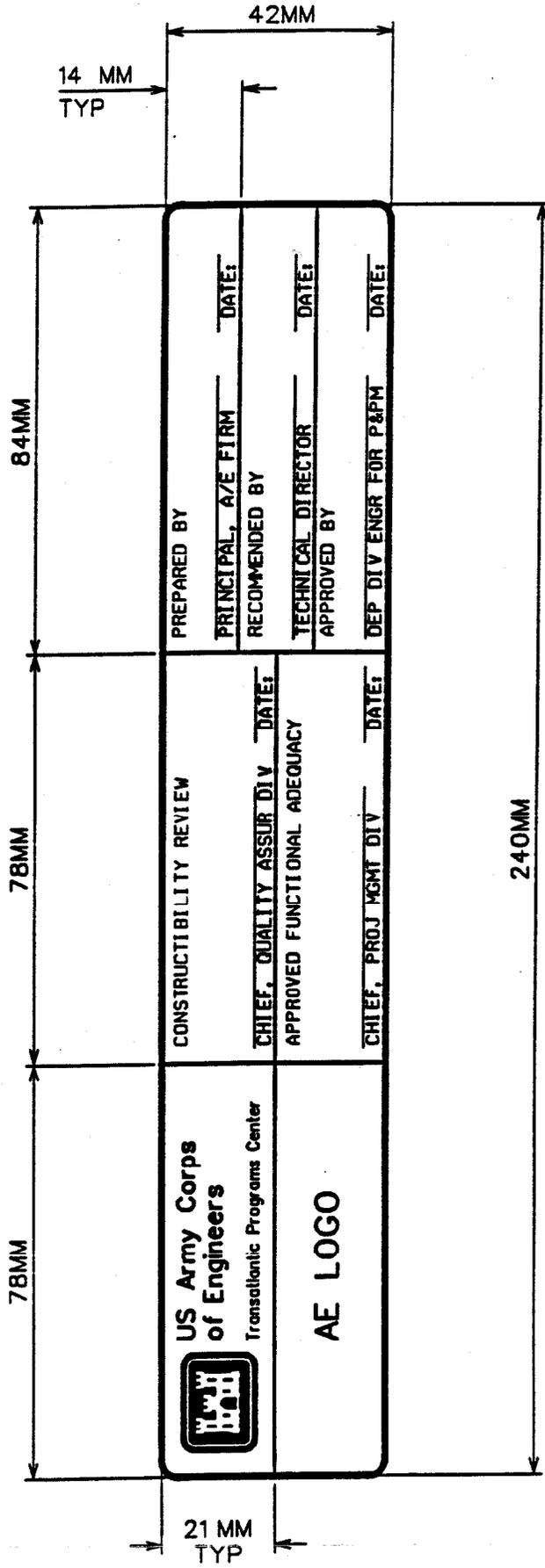
10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

*(Reverse of ENG Form 4025-R)*

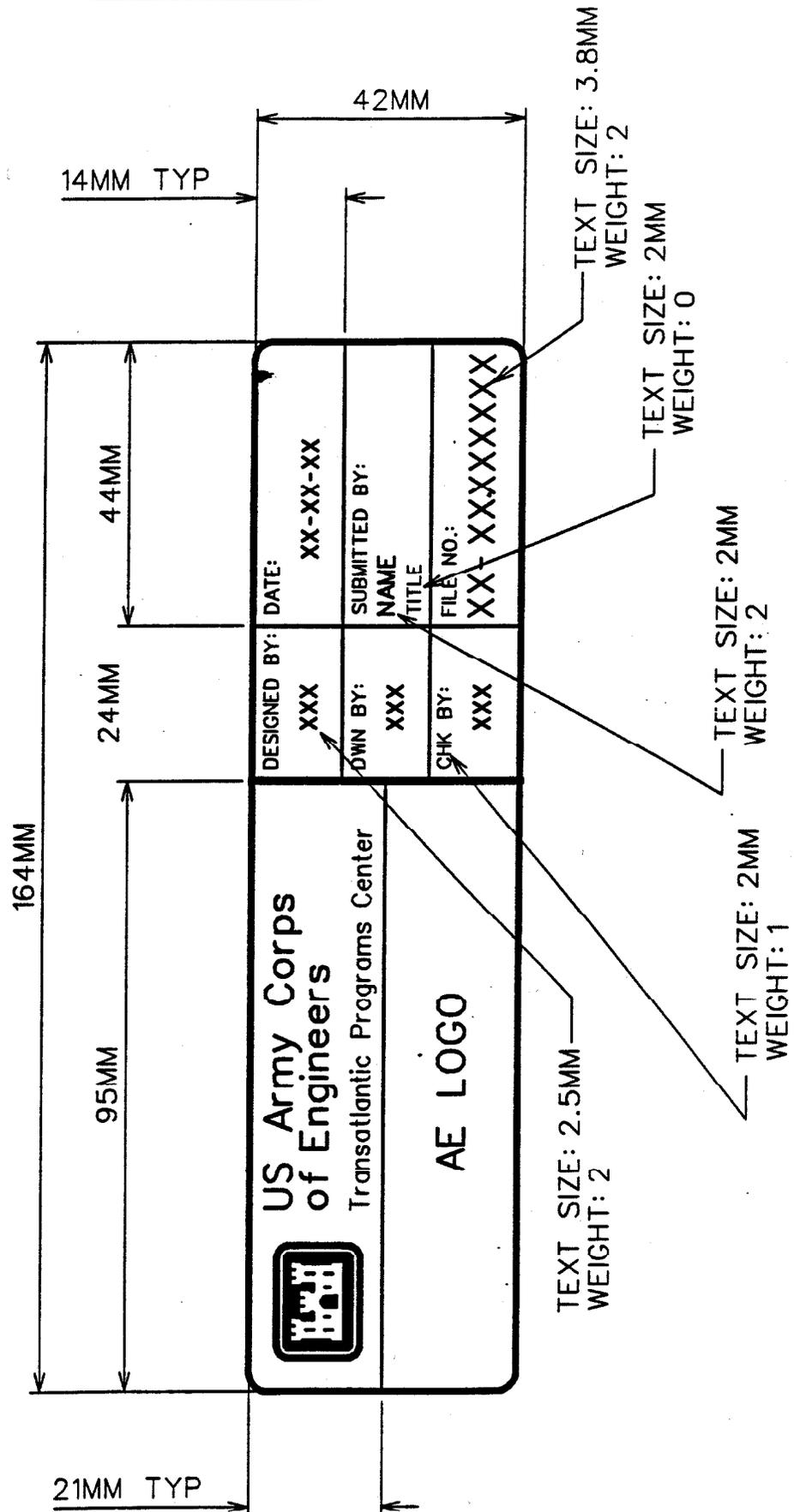
Contractor - Furnished Design Documents Submittal Register		Contract Title & Location:			
		Contractor:		Contract m.:	
Submittal Identification N <sup>o</sup> .	NAS Activity Code	Description of Document (s)	Contractor Submittal Date	Government Action	
				Receipt Date	Construction Clearance Date



# INDEX SHEET LOGO/SIGNATURE BLOCK (A-E)

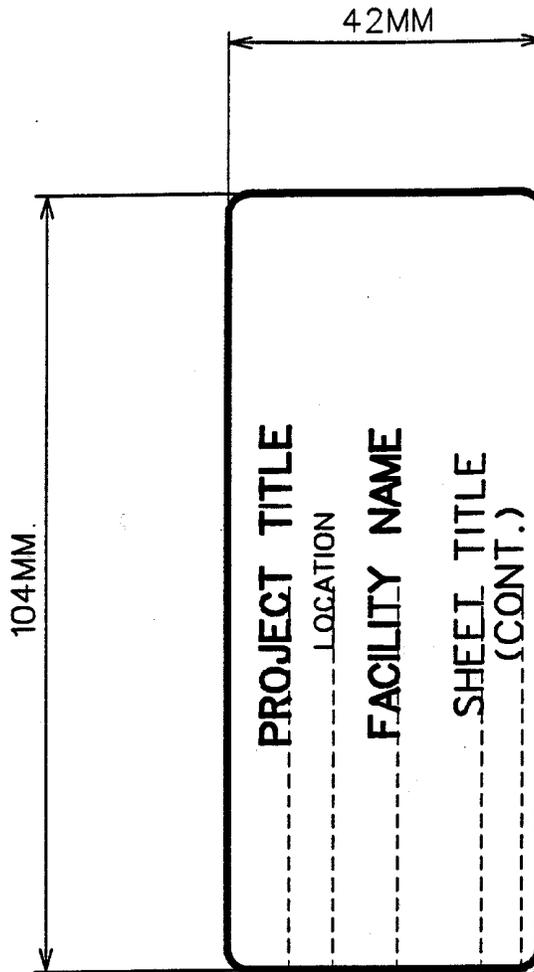


# CONTINUATION SHEET LOGO/SIGNATURE BLOCK (A-E)

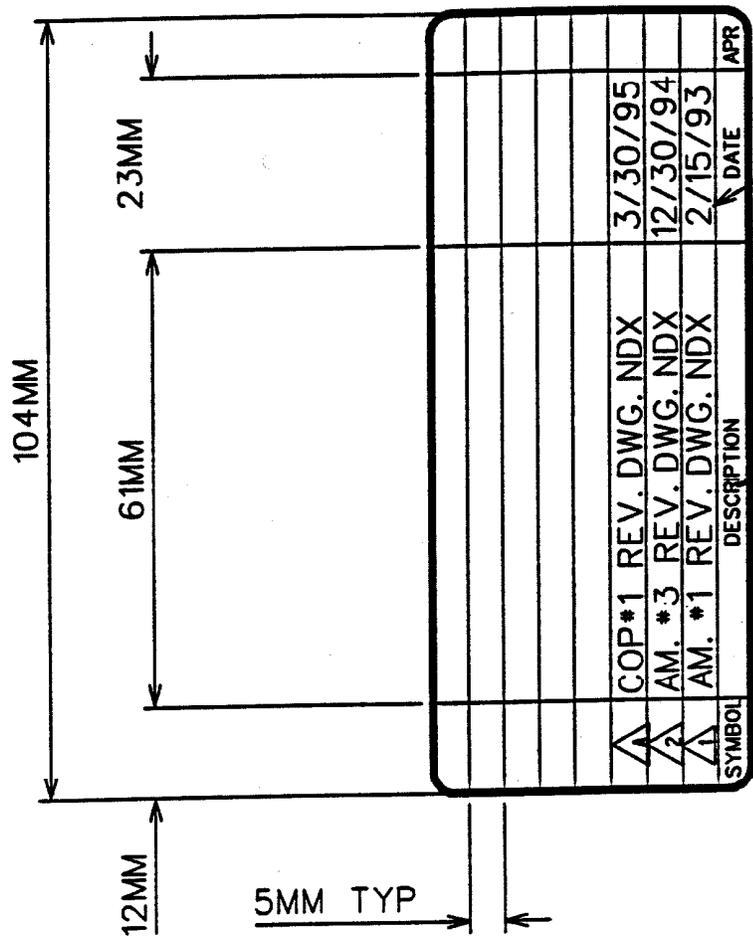


# TITLE BLOCK FOR CONTINUATION SHEETS

TEXT SIZE	WEIGHT
36MM	4
25MM	1
36MM	4
36MM	2
36MM	2



# REVISION BLOCK



TEXT SIZE:  
3MM  
WEIGHT: 1

TEXT SIZE:  
1.75MM  
WEIGHT: 1



FIGURE 6

TRANSATLANTIC PROGRAMS CENTER  
U.S. ARMY CORPS OF ENGINEERS  
AFGHANISTAN ENGINEER DISTRICT  
(CEAED)

SCOPE OF WORK TO DEVELOP WORK PLAN

FOR

DESIGN/CONSTRUCT ANA BRIGADE  
AFGHANISTAN

**PROJECT NAME:** DESIGN/CONSTRUCT ANA BRIGADE

1. **LOCATION:** Afghanistan

2. **PROJECT NUMBER:** Not applicable

3. **POC for Design:** TBD **PHONE:** Fax:

**E-MAIL:**

**POC for Construction:** TBD **PHONE:**

**E-MAIL:**

**PROJECT Manager :** Gary Headley

**PHONE:** 540-665-3466

**E-MAIL:** [gary.headley@tac01.usace.army.mil](mailto:gary.headley@tac01.usace.army.mil)

4. **DESIGN EFFORT** (Related to preparation of plans and specs):

4.1 The Design-Build Contractor shall review the provided preliminary drawings and layout of the area with requirements of Army Corps of Engineer publications, ADA, NFPA, API and other listed requirements and documents in the attachments of this scope. Design-Build Contractor shall verify measurements and information on all drawings provided by the Government. The Design-Build Contractor shall provide a design based on compliance with these standards. The design shall contain the site layout based on, but not limited to the following:

4.1.1 A demolition plan.

4.1.2 The design shall provide for a complete set of plans and drawings to construct the Brigade footprint.

4.1.3 The work plan shall contain the site layout.

4.1.4 All buildings to be constructed will be shown on the plan.

4.1.5 All electrical and mechanical work will be shown on plans.

4.1.6 All major construction, including site work, shall be shown.

4.1.7 tabulate all major life safety requirements to be incorporated into the project. Include these requirements on separate life safety plan.

4.2 The Design-Build Contractor is responsible for field verifying all drawings during the design phase.

4.3 The Design-Build Contractor will provide full design specifications for material and equipment.

4.5 The Design-Build Contractor shall provide a construction sequence of work that is in accordance with the required completion dates for the buildings included in the footprint.

4.6 Plan-In-Hand Inspection held at 99% Submittal Review Phase: Make a "Plan-in-Hand" field inspection during the final design review phase to determine that the project plans and specifications reflect true site conditions and

the needed requirements for construction. Any corrections needed to the project plans or specifications shall be incorporated in the Certified Final Submittal. Notify the Corps of Engineers field office at Kandahar, Afghanistan when the inspection will be made.

4.7 The Design-Build Contractor is responsible for preparing "Meeting Minutes for all design review meetings." The final version of the minutes will be provided to attendees within 5 days of the meeting and recorded in the design analysis.

5 **Quality Control Plan (QCP):** The Design-Build Contractor will submit a draft QCP for the design portion of the project within 14 calendar days after Notice To Proceed. The completed QCP that contains as a minimum the following features:

- Purpose
- Identification and discussion of all organizational and technical interfaces.
- Design/Study Team to include assignment of all areas of responsibility.
- Identification Designer of Record and team members responsible for checking the design
- Plans, specifications, and calculations shall be signed by designer and checker
- Project Schedule showing key milestones and review periods.
- Identification of the methods to be used for management of review comments
- QC procedures for assuring end product native CADD Files are acceptable for use by the customer.

The contractor is responsible for the product development, internal Quality Control, and technical review for all products provided under this contract. The QCP may be developed while work commences on other portions of the contract. However, the plan must be submitted and approved in final form within 30 days after award of the task order.ust

## 6 ANALYSES AND OTHER SUBMITTALS

6.1 Design Analyses: Prepare a Design Analysis for each discipline. This shall include all meeting minutes, structural, mechanical, and electrical calculations for the project.

6.2 Designer Instructions to Field: Put in writing any aspect of the design intent, the drawings and specifications or the construction which may require special awareness or attention by U.S. Government field personnel during supervision and inspection of construction. If none, a negative response is required.

6.3 Design Support During Project Construction: (Compensation for this effort is to be included in the price proposal.)

"Extension of Design" Shop Drawing Review: Review for approval all shop drawings that are "extensions of design" by the contractor. Such shop drawing extensions of design, for which the Design/Build Contractor must remain the Engineer of Record, shall include structural details, reinforcing details, and supports or hangers for mechanical and electrical equipment.

6.4 Responding to Review Comments: The Government will review submittals and make comments. Notify the Project Engineer immediately of any comments that are not understood or are disputed. Respond to all comments verbally at any review meetings, and then in writing in the next submittal. Include all comments and annotations in the design analysis. Provide a certification signed by the project principal, certifying that all pertinent review comments have been incorporated into the Certified Final documents.

## 7.0 DRAWINGS :

7.1 Drawings; Prepare in accordance with specification section 01335. Drawings in English with Metric units of measure are required for each submittal.

7.2 AUTOCAD Files: AUTOCAD designs shall be developed to provide complete project information that will enable the end users to utilize AUTOCAD to its fullest. To accommodate this, it is required that the following will be done:

7.2.1 The software used to be used shall be Autocad 2000 version.

**8.0 SPECIFICATIONS:**

8.1 Prepare technical specifications as needed. Specifications shall be prepared in accordance with the Construction Specifications Institute (CSI) format. The Design-Build Contractor prepared specifications shall include as a minimum, all applicable specifications referenced by the CSI. Where the CSI 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.

8.2 During the course of design, the designer, shall specify specific proprietary materials, equipment, systems, and patented processes by trade name, make, or catalog number. The subsequent use of construction submittals to supplant and/or supplement incomplete design effort is unacceptable. Design submittals containing non-proprietary and/or generic design criteria where proprietary items are available, will be returned for resubmission.

8.3 If the Corps of Engineers Unified Facility Guide Specifications (UFGS) are used, it is the sole responsibility of the Design-Build Contractor to prepare these specifications in strict conformance with the paragraph regarding preparation of proprietary non-generic design documents. UFGS containing non-proprietary and/or generic design criteria where proprietary items are available, will be returned for resubmission. If the UFGS contains a "SUBMITTALS" paragraph, the Design-Build Contractor shall delete it and incorporate all required information directly into the design documents. Under no circumstances will the Design-Build Contractor be permitted to use submittals and shop drawings to finalize an incomplete design. UFGS are available for direct download via the internet <http://www.hnd.usace.army.mil/techinfo/cegs/cegstoc.htm>.

**9. ATTACHMENTS:**

- |               |                                             |
|---------------|---------------------------------------------|
| Attachment #1 | General Design Guidance and Criteria        |
| Attachment #2 | Submittal Matrix – 35% Work Plan Submittal  |
| Attachment #3 | Submittal Matrix - 99% Work Plan Submittal  |
| Attachment #4 | Submittal Matrix - Certified 100% Submittal |
| Attachment #5 | Address List                                |

Attachment #1:

General Design Guidance and Criteria

Design and construction of this project shall adhere to the following:

ER 1110-2-1200 Plans and Specifications

ARMS User Manual "A/E Response Package".

Index of Corps of Engineers Unified Facility Guide Specs (UFGS), current listing.

Fire Protection for Facilities, UFC 3-600-01, 17 April 2003

International Building Code, 2000

NFPA 101, Life Safety Code, 2003

NFPA 70, National Electric Code, latest edition.

OCE Std. Dwg. Booklet No. 40-06-04, Lighting Fixtures.

TM 402-02, Masonry structural design for buildings.

TI 800-03, Technical Requirements for Design Build, July 98.

Systems Operation and Maintenance Documentation, ER 25-345-1, dated 31 January 1991.

EM 1110-1-1807, Corps CADD Standards Manual, with diskettes.

PAM 420-11, Project Definition and Work Classification.

**TI 800-03 Technical Requirements for Design-Build located at url:**

<http://www.hnd.usace.army.mil/techinfo/ti/800-03.pdf>

**Design-Build Instructions (DBI) for Military Construction at url:**

<http://www.hnd.usace.army.mil/techinfo/misc/dbi.pdf>

Applicable references listed in specification section 01420 SOURCES FOR REFERENCE PUBLICATIONS

Attachment #2  
 Submittal Matrix – 35% Work Plan Submittal

Addressee	(1)	(2)	(3)	(4)	(5)
Afghanistan Engineer District*	3	3	3	2	
Resident (Field) Office	2	2	2	2	
Transatlantic Program Center	0	1	1	1	1
<b>Total Copies</b>	<b>5</b>	<b>6</b>	<b>6</b>	<b>5</b>	<b>1</b>

**35% Work Plan Items**  
 I

- (1) Drawing prints, full size
  - (2) Design Analysis
  - (3) Specifications
  - (4) Drawing prints, half size
  - (5) CD containing electronic version of drawings, specifications and design analysis
- \* Add 2 CDs for electronic submittals to the Afghanistan Engineer Office, Kabul

Attachment #3

Submittal Matrix – 99% Work Plan Submittal

Addressee	(1)	(2)	(3)	(4)	(5)
Afghanistan Engineer District*	3	3	3	2	
Resident (Field) Office	2	2	2	2	
Transatlantic Programs Center	0	1	1	1	1
<b>Total Copies</b>	<b>5</b>	<b>6</b>	<b>6</b>	<b>5</b>	<b>1</b>

**99% Work Plan Items**  
I

- (1) Drawing prints, full size
  - (2) Design Analysis, updated from 35%
  - (3) Specifications, updated from 35%, including submittal register
  - (4) Drawing prints, half size
  - (5) CD containing electronic version of drawings, specifications and design analysis
- \*Add 2 CDs for electronic submittals to the Afghanistan Engineer Office, Kabul

Attachment #4:  
100%(Certified) Final Design

Addressee	(1)	(2)	(3)	(4)	(5)	(6)
Afghanistan Engineer District*	3	3	3	3	3	
Resident (Field) Office	2	2	2	2	2	
Transatlantic Programs Center	0	0	1	1	1	1
<b>Total Copies</b>	<b>5</b>	<b>5</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>1</b>

**100% Submittal Items**

- (1) Set of prints and specs on disk.
  - (2) Full size drawing prints
  - (3) 1/2 size drawings prints
  - (4) Specifications, updated from 99%, including submittal register
  - (5) Design Analyses Book, updated from 99%.  
Narrative design analyses and calculations
  - (6) CD containing electronic version of drawings, specifications and design analysis
- \*Add 2 CDs for electronic submittals to the Afghanistan Engineer Office, Kabul

Attachment #5:

Address List

Office Symbol/Phone

Address

CETAC  
(CETAC-EC-TT)  
540-665-3980

U.S. Army Corps of Engineers  
Transatlantic Programs Center  
Attn: H. Spaulding  
201 Prince Frederick Drive  
Winchester, VA 22602 (for DHL, FEDEX or UPS)

Afghanistan Area Office  
540-665-3475

U.S. Army Corps of Engineers  
Afghanistan Engineer District  
TAC-House, Chara-E-Shirpar  
Next to the former UNAMA Compound A  
Kabul, Afghanistan

Resident (Field) Office

Address to be Provided after Award

METRIC MEASUREMENTSSECTION 01415  
METRIC MEASUREMENTS

## 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.

## 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

## 1.2 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 the 11th 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.

### 1.3 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.

#### 1.3.1 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.

#### 1.3.2 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 15-5/8 inches)).

#### 1.3.3 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).

### 1.4 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.

### 1.5 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 -

CONTRACTOR QUALITY CONTROLSECTION 01451  
CONTRACTOR QUALITY CONTROL

## PART 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.

## PART 2 PRODUCTS (Not Applicable)

## PART 3 EXECUTIONS

## 3.1 GENERAL REQUIREMENTS

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract 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.

## 3.2 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.

## 3.2.1 Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all construction operations, both on site 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.

### 3.2.2 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 a 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.

### 3.2.3 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.

### 3.2.4 Notification of Changes

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.

## 3.3 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.

## 3.4 QUALITY CONTROL ORGANIZATION

### 3.4.1 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.

### 3.4.2 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.

### 3.4.3 Not Used.

### 3.4.4 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.

### 3.4.5 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.

## 3.5 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.

## 3.6 CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control shall be conducted by the CQC System Manager for each definable feature of the construction work as follows:

### 3.6.1 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.

### 3.6.2 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.

### 3.6.3 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.

### 3.6.4 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.

## 3.7 TESTS

### 3.7.1 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.

## 3.8 COMPLETION INSPECTION

### 3.8.1 Punch-Out Inspection

Near the end of the work, or any increment of the work established by a time stated in the SPECIAL CONTRACT REQUIREMENTS Clause, "Commencement, Prosecution, and Completion of Work", or by the specifications, the CQC Manager shall conduct an inspection of the work. 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.

### 3.8.2 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.

### 3.8.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative shall 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".

## 3.9 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.

### 3.10 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.

### 3.11 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 --

SAFETY & OC HEALTH REQUIREMENT

## SPECIFICATION SECTION 01525

## SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS

## PART 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.

This specification consists of two parts:

- 1) Sections 1.1 through 3.12.1, which are the standard safety specifications for work in Europe District and;
- 2) Appendix A, Phasing approach for safety in emerging countries where there is little or no national safety standards.

## 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.

## AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A10.32	Personal Fall Protection - Safety Requirements for Construction and Demolition Operations
ANSI Z359.1 (1992; R 1999)	Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components
ANSI/ASSE A10.34 (2001)	Protection of the Public on or Adjacent to Construction Sites
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(2005)	National Electrical Code

NFPA 70E (2004)	Electrical Safety in the Workplace
U.S. ARMY CORPS OF ENGINEERS (USACE)	
EM 385-1-1(2003) Safety	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

## 1.2 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 SR SUBMITTAL PROCEDURES:

### SD-01 Preconstruction Submittals

Accident Prevention Plan (APP); G, ACC

Activity Hazard Analysis (AHA); G, ACC

Crane Critical Lift Plan; G, ACC

Proof of qualification for Crane Operators; G, ACC

### 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, ACC

Submit one copy of each permit/certificate attached to each Daily Quality Control Report.

### 1.3 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 though 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.

### 1.4 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.

### 1.5 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, and in particular, the requirements of the European Union Council Directive 92/57/EEC of 24 June 1992 on the implementation of minimum safety and health requirements at temporary or mobile construction sites. Submit matters of interpretation of standards to the appropriate administrative

agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements shall apply.

## 1.6 SITE QUALIFICATIONS, DUTIES AND MEETINGS

### 1.6.1 Personnel Qualifications

#### 1.6.1.1 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 can only be the SSHO on this project if approved by the Contracting Officer. Any project exceeding 1 Million US dollars in value shall have a full time SSHO. The SSHO shall meet the following requirements: A minimum of 5 years safety work on similar projects; 30-hour OSHA construction safety class or European Union equivalent within the last 5 years; an average of at least 24 hours of formal safety training each year for the past 5 years. Competent person training as needed.

#### 1.6.1.2 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. Perform all required tests and inspections specified in Section 06.I of EM 385-1-1;
- d. Assess hazardous conditions including atmospheric hazards in confined space and adjacent spaces and specify the necessary protection and precautions to be taken;
- e. Determine ventilation requirements for confined space entries and operations;
- f. Assess hazards associated with hot work in confined and adjacent space and determine fire watch requirements; and,
- g. Maintain records required.

#### 1.6.1.3 Crane Operators

Crane operators shall meet the requirements in USACE EM 385-1-1, Section 16 and Appendix G. In addition, crane operators shall be designated as qualified by a source that qualifies crane operators (i.e., union, a government agency, or and organization that tests and qualifies crane operators). Proof of current qualification shall be provided.

### 1.6.2 Personnel Duties

#### 1.6.2.1 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. Maintain applicable safety reference material on the job site.
- 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.

### 1.6.3 Meetings

#### 1.6.3.1 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 Design Build Contracts.

#### 1.6.3.2 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.

### 1.7 TRAINING

#### 1.7.1 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.

#### 1.7.2 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.

#### 1.7.3 Training on Activity Hazard Analysis (AHA)

Prior to beginning a new phase, training will be provided to all affected

### 1.8 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. 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.

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.

#### 1.8.1 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 06.I, 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.C.18. and the following:
    - (1) For lifts of personnel, the plan shall demonstrate compliance with the requirements of EM 385-1-1, Section 22.F.
    - (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).

#### 1.9 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. 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.

#### 1.10 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.

#### 1.11 SITE SAFETY REFERENCE MATERIALS

Maintain safety-related references applicable to the project. Maintain applicable equipment manufacturer's manuals.

#### 1.12 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.

#### 1.13 REPORTS

##### 1.13.1 Accident Reports

For recordable injuries and 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, 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.

##### 1.13.2 Accident Notification

Notify the Contracting Officer as soon as practical, but not later than four 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.). Preserve the conditions and evidence on the accident site until the Government investigation team arrives on-site and Government investigation is conducted.

##### 1.13.3 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.

##### 1.13.4 Crane Reports

Submit crane inspection reports required in accordance with USACE EM 385-1-1, Appendix H and as specified herein with Daily Reports of Inspections.

#### 1.14 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.**

## PART 2 PRODUCTS

Not used.

## PART 3 EXECUTION

### 3.1 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.09 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.

#### 3.1.1 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.

### 3.1.2 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.

### 3.1.3 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-isocyanates, 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.

### 3.1.4 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."

## 3.2 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.

### 3.2.1 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.A.16.

### 3.2.2 Fall Protection Equipment and Systems

The Contractor shall enforce use of the fall protection equipment and systems designated for each specific work activity in the Fall Protection and Prevention Plan and/or AHA at all times when an employee is exposed to a fall hazard. Employees shall be protected from fall hazards as specified in EM 385-1-1, section 21. In addition to the required fall protection systems, safety skiff, personal floatation devices, life rings etc., are required when working above or next to water in accordance with USACE EM 385-1-1, paragraphs 05.H. and 05.I. Personal fall arrest systems are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition, personal fall arrest systems are required when operating other equipment such as scissor lifts if the work platform is capable of being positioned outside the wheelbase. The need for tying-off in such equipment is to prevent ejection of the employee from the equipment during raising, lowering, or travel.

Fall protection must comply with USACE EM 385-1-1 and host nation requirements, whichever is more stringent.

### 3.2.2.1 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.

### 3.2.3 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.

### 3.2.4 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. Existing horizontal lifeline anchorages shall be certified (or re-certified) by a registered professional engineer with experience in designing horizontal lifeline systems.

### 3.2.5 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.

### 3.2.6 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.

### 3.2.7 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).

### 3.3 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 is 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.

### 3.4 EQUIPMENT

#### 3.4.1 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.

#### 3.4.2 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.

### 3.5 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.

#### 3.5.1 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.

#### 3.5.2 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.

### 3.5.3 Shoring Systems

Trench and shoring systems must be identified in the accepted safety plan and AHA. Manufacturer 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.

### 3.5.4 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.

## 3.6 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.

## 3.7 ELECTRICAL

### 3.7.1 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. 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.

### 3.7.2 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.

### 3.8 WORK IN CONFINED SPACES

The Contractor shall comply with the requirements in Section 06.I 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. (See Section 06.I.06 of USACE EM 385-1-1 for entry procedures). 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.
- c. Ensure the use of rescue and retrieval devices in confined spaces greater than 1.5 m (5 feet) in depth. Conform to Sections 06.I.08, 06.I.09 and 06.I.10 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 06.I.07 of USACE EM 385-1-1.
- f. Daily Entry Permit. Post the permit in a conspicuous place close to the confined space entrance.

### 3.9 CRYSTALLINE SILICA

Grinding, abrasive blasting, and foundry operations of construction materials containing crystalline silica, shall comply with USACE EM 385-1-1, Appendix C. 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.

### 3.10 DEMOLITION

#### 3.101.1 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.

#### 3.12.1 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.

#### 3.10.1 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

### 3.11 HOUSEKEEPING

#### 3.11.1 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.

### ATTACHMENT

#### STR 015250 – SAFETY AND OCCUPATIONAL HEALTH PHASING PLAN

- End of Section -

A. PURPOSE AND RESPONSIBILITIES:

1. The purpose of this SOH Phasing Plan is to establish controls and procedures to reduce the safety and occupational health risks on associated projects to an acceptable level. This SOH Phasing Plan is not intended to address all program SOH requirements, but provides general emphasis to certain procedures and requirements addressed in: EM 385-1-1, U.S. Army Corps of Engineers Safety and Health Requirements Manual

2. 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.

a. The exact timeline and methods of compliance, based generally on the Phase plan below will be determined by in-theater Project Delivery Team (PDT) partners responsible for safety, to include USACE Field Engineering/Construction/ Safety personnel, Prime Contractors and Local Subcontractors. The Prime Contractor, in partnership with the USACE and subcontractors, will develop a Safety and occupational Health Plan (SOHP) consisting of a specific Accident Prevention Plan (APP) and Activity Hazard Analysis for each project.

b. Each project SOHP will evolve as a living document, starting by dividing into phases to provide a goal with a timeline. Focus for the project safety program areas will be based on the following time-based phases.

Phase I: "Saving Lives". Establish achievable compliance methods and basic worker safety education to eliminate or reduce to an acceptable level the life-threatening conditions associated with high hazard construction activities.

- The initial high-hazard focus areas shall include:
  - Excavations
  - Fall Hazards
  - Electrical Work
  - Mobile Construction Equipment
  - Machinery
  - Confined Spaces
- Develop a basic worker safety and health practices manual/ guide and associated mandatory training for each Focus area listed above. These will be in English and local language, based on local conditions and practices and targeted at high-hazard activities.
- On all contract sites, the basic life-support will include First Aid Kits, and emergency communication.
- Contractor Accident Prevention Plans, Activity Hazard Analyses, and other safety-related systems under development with assistance by PDT

Phase II: "Building A Safety Culture" (Approximately one year, beginning at end of Phase I) Advanced safety education of local contractors and LN work force. Full contractor compliance with USACE safety standards related to high-hazard situations, increased application of standards on all work.

- Workforce education and training to include all applicable requirements of EM 385-1-1 and International Safety Standards
- All required Personal Protective Equipment (PPE) available and used by workers in applicable work practices, as outlined in the EM 385-1-1.
- Contractor Accident Prevention Plans, Activity Hazard Analyses, and other safety-related systems refined to meet standard USACE expectations with assistance by PDT
- Standard Contractor Safety administrative responsibilities required, i.e.: Accident reporting, man-hour tracking, training documentation, First Aid personnel certification, fire protection, etc.

Phase III, “Full Performance” (beginning at end of Phase II) Full performance in compliance with EM 385-1-1 and other applicable laws, regulations, design codes and standards.

Where standard compliance is not possible, local methods may be used in accordance with implementing letter of EM 385-1-1 or through formal waiver process.

3. The PDT shall employ the “Plan, Do, Check, Act” process for implementing this SOHP as a living document. Each PDT member is responsible for planning for safety and health management within their area of responsibility, implementing agreed-on mitigation, checking to assure that the SOHP is being implemented and acting to adjust plans and implementation with a goal of continuous improvement. This plan will be reviewed and revised as needed at the initiation of each Phase listed above.

4. The PDT members shall cooperate in developing a listing of potential hazards associated with each project.

#### B. GOALS AND OBJECTIVES:

1. Goals. The safety and health goals of all projects are:
  - a. Be accident free
  - b. Detect and address safety and health problems early in the life of each project
  - c. Do not accept unnecessary risk
  - d. Every team member, to include contractors shall contribute to the safety and health of their fellow team members and assure that the product is free of inherent hazards to the user.
  - e. Educate the workforce and promote Safety as a new way of doing business, show how the project and the employee benefit from Safety.
2. Objectives. The safety and health objectives of this program are:
  - a. Managers, supervisors, and workers shall be held accountable, based on the current Phase, for safety and health.
  - b. Safety and health expectations shall be communicated with the work force in their native language through the use of banners, flyers, and periodic safety meetings
  - c. The work force shall have the safety and health training needed to perform the work at hand, based on the Phase.
  - d. Injury and property damage shall be avoided through early detection and management of hazards

#### Phase I Interim Safety and Occupational Health Work Practices for USACE Contractor Projects

##### Phase I Safety Program

1. Contractors shall strive to maintain full compliance with the USACE Safety Requirements Manual, EM 385-1-1. This may not be easily achieved during this Phase, due to a number of factors. The focus for safety and health efforts during this Phase is Saving Lives – the prevention of deaths, permanently disabling injuries, and major property loss. The goal during this period is to provide the equipment and methods needed to save lives and to train the workforce in working safely and using the correct personal Protective Equipment (PPE).
2. In order to assist in achieving this goal immediately, the following interim standards shall be used (as a minimum acceptable standard) when full compliance with the EM 385-1-1 is not possible. Contractors shall provide these standards in to their workforce in the local language and shall provide training as needed to ensure worker awareness.

---

#### Basic Safety and Health Standards for Construction

- A. USACE and the contractors must form a team to assure safety on every job site and prevent serious accidents. All unsafe conditions must be reported and the hazard reduced before work may proceed.

- B. Personal Protective Equipment (PPE) may not always be available to every worker during this Phase. Where the equipment required by the USACE Safety Manual, EM 385-1-1, cannot be provided in a timely manner, the contractor shall develop methods that will provide a similar degree of safety (as accepted by USACE) and not expose the workers to serious risk. The mandatory minimum standards for all PPE are:
- Footwear: Closed-toe durable shoes or boots shall be worn by all workers on the project site. No sandals or sports shoes will be allowed, at no time will workers be allowed on the project site with bare feet. Safety footwear (steel-toe or other protection) should be worn by workers using steel rollers, tampers, jack hammers or carrying heavy objects (metal, concrete, stone)
  - Head Protection: When they are available, hard hats should be worn by all construction workers when they are at the project. Hard Hats must be worn in overhead hazard areas including material hoisting/ lifting operations, areas below scaffolds and other elevated work, in excavations, and low ceiling areas that have sharp or hazardous projections. If they are not available, then workers must be kept away from these and other overhead hazard areas.
  - Respirators: Workers exposed to toxic chemicals, vapors, gases and dusts must wear proper respiratory protection. Such exposure is expected in asbestos removal/ repair work, working with paints and solvents in rooms or enclosed spaces, and fuel production facilities. The employer must train the workers in the uses of the respirator and how to properly wear it. The minimum acceptable respirator is a negative pressure filter or cartridge half-face respirator that is correctly equipped for the hazard. Contractors shall consult and follow the ACGIH guidance for length of allowable exposure to the contaminant and workers shall not exceed the recommended time for exposure. Dust Masks will be worn when the work is producing visible dust.
  - Eye Protection: Workers shall wear protective glasses, goggles, or visors when exposed to eye hazards. These hazards include concrete dust, stone and concrete chips from hammering, sandblasting, and power tool cutting or milling. Workers performing welding and cutting with torches or arc-welding equipment shall wear the proper shaded lenses in face shields and/ or goggles.
  - Hearing Protection: Protective ear plugs shall be worn when workers are exposed to potentially damaging noise including jack hammers, flight line operations, power saws and grinders, and combustion engines without mufflers.
  - Gloves: All workers shall have protective gloves appropriate to the task.
  - Clothing: Workers shall wear clothing that protects their skin from damage – shirts and long pants at a minimum. Workers exposed to welding operations, chemicals, abrasive blasting, wet concrete, asbestos, and other hazardous contaminants will wear appropriate clothing for the hazard. Workers using power tools or operating equipment shall not wear very loose or flowing clothing that may get caught in the equipment.
- C. Work Methods for Highly Hazardous Work: The following types of work and hazards are recognized as the leading cause of serious injuries and deaths in construction work. Each type of work has specific PPE and safety equipment that is required to do the work and also specific procedures that must be followed every time the work is done. These interim measures are the minimum acceptable precautions. For each project, an Activity Hazard Analysis (AHA) shall be completed and, when possible, compliance with more restrictive methods of the EM 385-1-1 shall be achieved.

Workers shall be trained on the following safety precautions, the nature of the hazards involved, and any additional work methods used before performing each type of work

- Excavations
  - The Site Safety and Health Officer will be contacted for inspection of the work prior to digging. The SSHO will assist in any safety equipment or techniques that are required to avoid injury. They will also provide a safety check on the location to assure there are no underground hazards at the site.

- All excavations or unsafe areas will be marked with barricades or warning tape. These warnings must be maintained and visible until the area is restored to a safe condition.
  - When workers will enter trenches, the walls shall be sloped according to the type of soil or shoring, trench boxes, or other structures will be used to protect workers from collapsing walls
  - Soil removed from trenches will not be placed at the edge of the trench – it must be placed back at least 1 meter from the edge.
  - Vehicles and construction equipment must not be parked closer than 2 meters from the edge of an excavation.
  - Excavation walls shall be inspected regularly during each day to check for cracks, bulges, large stones, sandy areas, and failure of the wall. If these conditions are found, nobody may enter the excavation and the damaged area must be dug out or braced.
- 
- Fall Hazards
    - When working above 2 meters from the ground or another level, all workers shall be protected from falling. The SSHO will inspect prior to beginning work to be sure the work methods are safe. Inspection will include work on ladders, scaffolds, and other elevated work areas.
    - Protection systems shall be sturdy railings, walls, or other structures
    - If there are no structures to protect workers, body belts or harnesses shall be used along with lanyards.
    - Body belts should be mainly be used only to prevent a worker from falling over an edge or off a structure.
    - Body belts and harnesses can both be used as fall protection (stopping a falling worker). The lanyard shall be rope strong enough to withstand the shock of stopping the worker's weight, and they shall be as short as possible, to limit the shock force. Lanyards shall never allow a worker to fall more than 2 meters. It is recommended that lanyards without shock absorber devices be no longer than 1 meter.
  - Electrical Work
    - All circuits, wires, and electrical devices shall be tested with a volt meter and found to be de-energized before workers touch the energized parts
    - Controls, switches, and other means for energizing the circuit or equipment shall be tagged "do not operate"
    - Workers shall not work closer to energized systems than the distances listed in the USACE manual.
    - Temporary electrical systems shall be grounded and tested for good ground resistance before use.
    - Power tools shall be protected from water and damage, and their cords must be insulated. Cords must be factory installed or equivalent replacements, including safety grip plug and cord boot.
    - Extension cords will be in safe, good working order.
  - Mobile Construction Equipment
    - If equipment, particularly cranes, are damaged the repairs shall be done by a competent repair person and verified by the SSHO prior to being brought back into service.
    - Nobody may ride outside the cab of construction equipment. Specifically, no riders may ever be in loader buckets, bulldozer blades, on forklift forks, or suspended by a crane.
    - When workers are nearby, construction equipment must have reverse signal alarms or shall use a spotter standing away from the equipment. The spotter must be visible by the driver and positioned to see the area behind the equipment.

- Construction equipment must work a safe distance from electrical systems, based on the voltage.
  - Cranes must be used according to the manufacturer. If no manufacturer data is available, a load chart shall be developed by a qualified engineer.
  - Workers should stay out of the radius of the crane boom during a lift.
  - Lifting ropes shall be inspected daily for breaks and failure of hardware and fittings.
  - Nobody shall ever ride the hook or load of a crane.
- Machinery
    - Rotating shafts, wheels, blades, and other hazardous parts shall have guards to prevent workers from being injured.
    - Fuel-powered machinery must not be operated indoors or near enclosed areas without using powered ventilation to prevent toxic CO build-up.
    - Metal housings of electrically powered equipment must be grounded
  - Confined Spaces
    - The SSHO will pre-approve any work in a confined space, such as in a tank, sewer, manhole or any other enclosed area. The SSHO will inspect the work and assist with any safety equipment or techniques that are required.
    - All permit-required confined spaces (PRCS) on a project shall have signs prohibiting entry.
    - Entrants, supervisors, and attendants for PRCS shall be properly trained.
    - When available, oxygen/flammable/toxic gas meters shall be used for all PRCS. This equipment must be used to evaluate the air in all spaces known or suspected to have contained flammable or toxic chemicals or contain sewage, rotting vegetation or other organic matter.
    - For spaces not meeting the above criteria, mechanical ventilation fans shall be used to clear the air in the space when meters are not available. Based on the air flow of the fan, it shall exhaust the total volume of the space a minimum of seven times prior to entry.
    - All entrants shall wear a harness, body belt, or other device attached to a rope sufficient to retrieve the worker in an emergency.
    - Permits should be used during PRCS entry. If not possible, then some visible means, such as flags or tags outside the entrance, shall be used so supervisors can see when workers are in the space.
  - Gas Cylinders
    - Pressurized gas cylinders, such as Oxygen and Acetylene tanks will be stored in a holding stand/ cart to prevent them from falling over. Cylinders will not be placed free on the ground or standing free. If the bottle is not in use the valve will be removed.
- D. Child Labor. Minors under the age of 18 may not perform any of the above hazardous work. Additionally, these minors can not perform any hazardous work such as operating dangerous power tools (circular saws, jack hammers, lathes, etc), driving vehicles, be exterior assistants for vehicle operators or operating mobile construction equipment, explosives work, work at heights over 2 meters without standard railings, electrical work, entering excavations, and work with toxic substances.

-- End of Section --

CLOSEOUT PROCEDURES

SPECIFICATION SECTION 01770

CLOSEOUT PROCEDURES

PART 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 01015 SPECIAL CONDITIONS

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.

#### PART 2 PRODUCTS

Not used.

#### PART 3 EXECUTION

Not used.

- End of Section -

CLOSEOUT SUBMITTALS

## SECTION 01780

## CLOSEOUT SUBMITTALS

## PART 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

Drawings showing final as-built conditions of the project. The final CADD as-built drawings shall consist of one set of electronic CADD drawing files in the specified format, one set of Mylar drawings, 2 sets of blue-line prints of the Mylar's, and one set of the approved working as-built drawings.

## SD-03 Product Data

## As-Built Record of Equipment and Materials

Two copies of the record listing the as-built materials and equipment incorporated into the construction of the project.

## Warranty Management Plan

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

Two record copies of the warranty tags showing the layout and design.

## Final Cleaning

Two copies of the listing of completed final clean-up items.

## 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

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:

- a. 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.
- b. The location and dimensions of any changes within the building structure.
- c. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.
- d. 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.
- e. The topography, invert elevations and grades of drainage installed or affected as part of the project construction.
- f. Changes or modifications which result from the final inspection.
- g. Where contract drawings or specifications present options, only the option selected for construction shall be shown on the final as-built prints.
- h. 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.
- i. Systems designed or enhanced by the Contractor, such as HVAC controls, fire alarm, fire sprinkler, and irrigation systems.

j. 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

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 2005. 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. The Contracting Officer will review final as-built drawings for accuracy and the Contractor shall make required corrections, changes, additions, and deletions.

- a. CADD colors shall be the "base" colors of red, green, and blue. Color code for changes shall be as follows:
  - (1) Deletions (red) - Deleted graphic items (lines) shall be colored red with red lettering in notes and leaders.
  - (2) Additions (Green) - Added items shall be drawn in green with green lettering in notes and leaders.
  - (3) Special (Blue) - Items requiring special information, coordination, or special detailing or detailing

notes shall be in blue.

- b. The Contract drawing files shall be renamed in a manner related to the contract number (i.e., 98-C-10.DGN) as instructed in the Pre-Construction conference. Marked-up changes shall be made only to those renamed files. All changes shall be made on the layer/level as the original item. There shall be no deletions of existing lines; existing lines shall be over struck in red. Additions shall be in green with line weights the same as the drawing. Special notes shall be in blue on layer#63.
- 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 3/16 inch 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. Within 20days for contracts \$5 million and above 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 blue-lined prints of these drawings for Government review and approval. The Government will promptly return one set of prints annotated with any necessary corrections. Within 10 days for contracts \$5 million and above the Contractor shall revise the CADD files accordingly at no additional cost and submit one set of final prints for the completed phase of work to the Government. Within 20 days for contracts \$5 million and above 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 mylars, two sets of blue-line 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 customer's CADD system. 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:

RECORD OF DESIGNATED EQUIPMENT AND MATERIALS DATA

Description	Specification Section	Manufacturer and Catalog, Model, and Serial Number	Composition and Size Used	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, sub-Contractors, 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 back charge 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.

1.3.5 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 in applicable technical specification sections.

1.5 OPERATION AND MAINTENANCE MANUALS

Operation manuals and maintenance manuals shall be submitted as specified. Operation manuals and maintenance manuals provided in a common volume shall be clearly differentiated and shall be separately indexed.

## 1.6 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.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

- End of Section -

OPERATION & MAINT DATA

## SPECIFICATION SECTION 01781

## OPERATION AND MAINTENANCE DATA

## PART 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&amp;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

Include 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 requires 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, and 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 and telephone number of the manufacturer's representative and service organization most convenient to the project site. Provide the name, address, and telephone number of the product, equipment, and system manufacturers.

## PART 2 PRODUCTS

Not used.

## PART 3 EXECUTION

### 3.1 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.

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 videotape the training session on VHS tapes and provide the tapes to the Government.

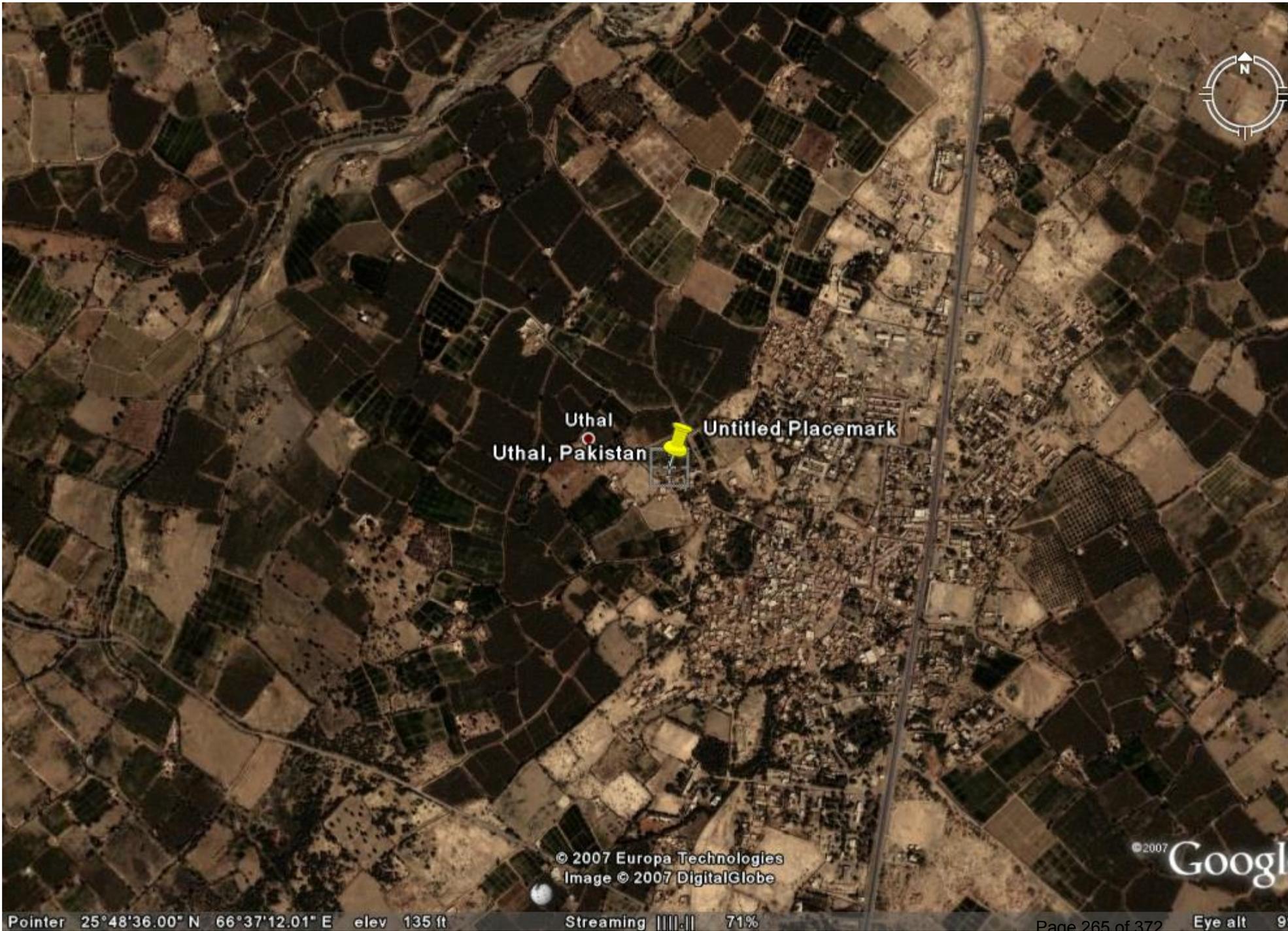
-- End of Section --

# **APPENDIX I**

## GENERAL AREA MAP



General Area  
Map.doc

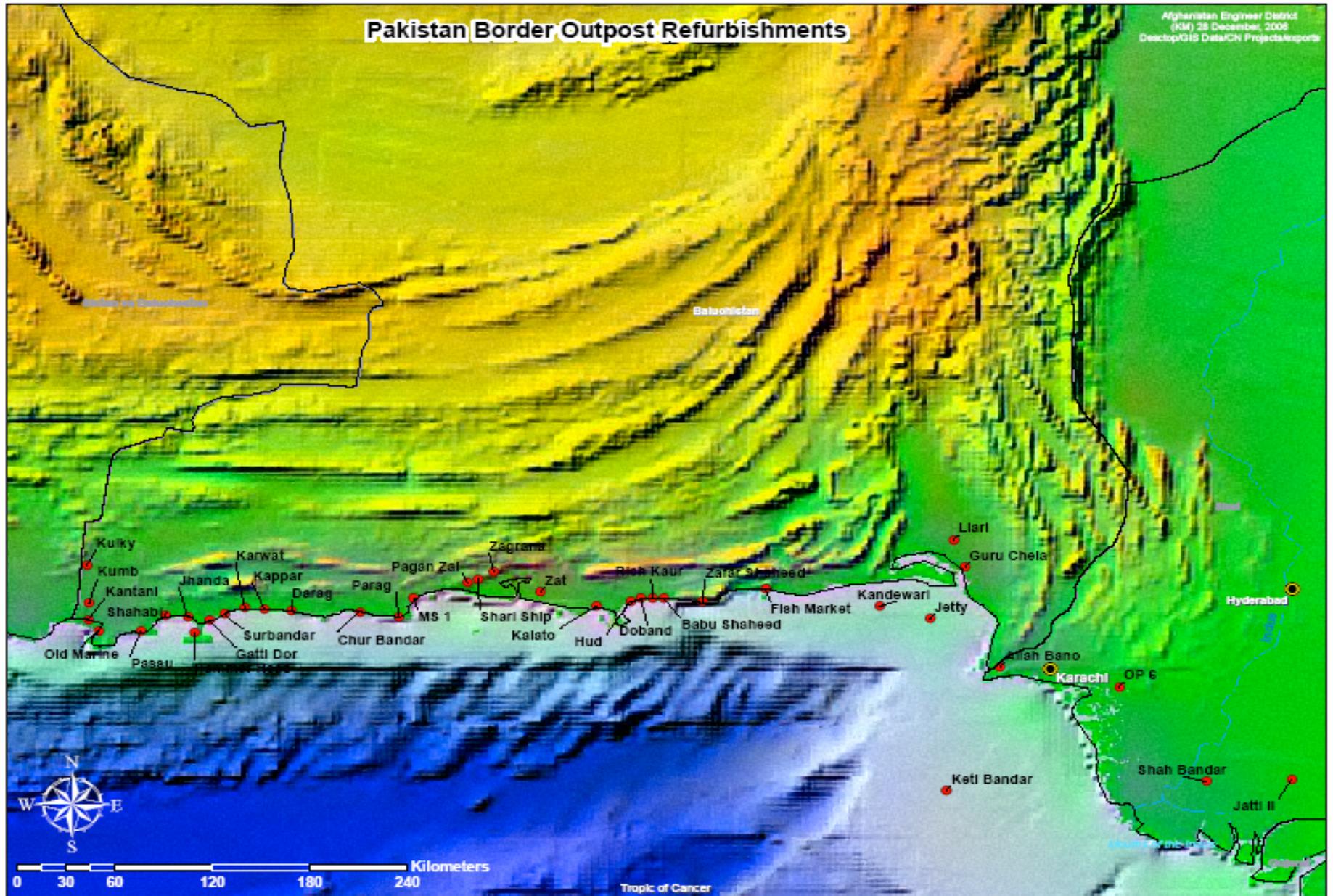




General Area  
Map.doc

# **APPENDIX I**

## **General Site Plan**



Existing Coast Guard Outpost Locations – Makran Coast, Pakistan

# **APPENDIX II**

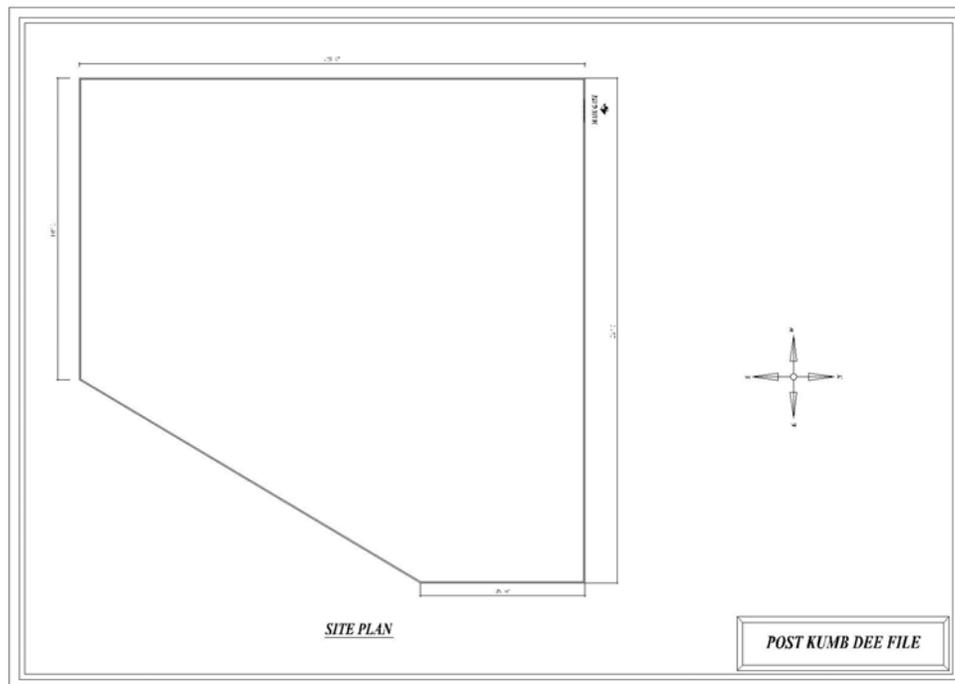
# Site Photos

## PCG Post Kumb Defile Site Survey

### **Location:**

Post Kumb Defile (3 Bn Sector) is located 75 Km NW of Gawadar and 25 Km from Jiwani and is situated in close proximity of Pak Iran Border which is about 5 Km from the post. There is virtually no road link and the approach tracks are of soft mud, therefore a 4x4 vehicle is required to reach the post. The terrain of the location is hilly with hard rocks. The ground is levelled and has rocky surface. There are no amenities as well as utilities in proximity of site. Water is brought in water tanker. The hot weather has makes it further inhospitable place.

### **Site Sketch:**



#### **Buildings Structure:**

There is no building structure at the site. The troops are accommodated in tents. These are not proper tents. There are no fans or lights in the tents. No construction work has been undertaken on this site. A fibreglass water storage tank of about 400 litres is available at the site and water is replenished through water tankers from Coy HQs on fortnightly or as required basis. Similarly, cookhouse and toilets are also a make shift arrangement. There is no kitchenette and cooking is done utilizing firewood for which the personnel have to travel long distances to collect. Being hilly and rocky terrain, it is extremely hot during day in summers.

#### **Amenities /utilities:**

**Electricity** is not available on site Two batteries are connected to UPS primarily to operate HF / VHF communication sets. Batteries are recharged utilizing solar panels. There are 2 energy saver bulbs of 18 watts each and are operated at night for a short duration. The nearest electricity is available about 25 km from the site i.e. at the coy HQs located at Kumb.

**Water** is not available on site. There is no underground tank. Water is stored in fibreglass tank. The company HQs through water tankers on weekly basis provides water. As it is on hilly terrain, the water table is quite deep, therefore, subsoil water cannot be fetched.

**Cooking arrangements** are laborious. Presently cooking is done in a make shift cookhouse and utilizing firewood. Firewood is collected by the troops from the vicinity, cut to suitable size for burning in locally made mud stoves.



This arrangement is not only laborious for the troops but also unhygienic as well as safety hazard.

**Amenities** are non-existent. There is no telephone available and as such troops have to go to Gawadar for talking to their family members. Similarly there is no recreational facility available on the site. The site is an isolated place and some sort of recreational facility is considered essential. The beds are of very low quality and not enough bedding was present. There were no closets for the staff to place their personal effects.

**Additional Equipment:**

The posts are not equipped with any fire fighting equipment. The staff has few search lights with low power.

**1. Kumb Defile Post Site Photos**



## 2. Kulky Post Site Photos



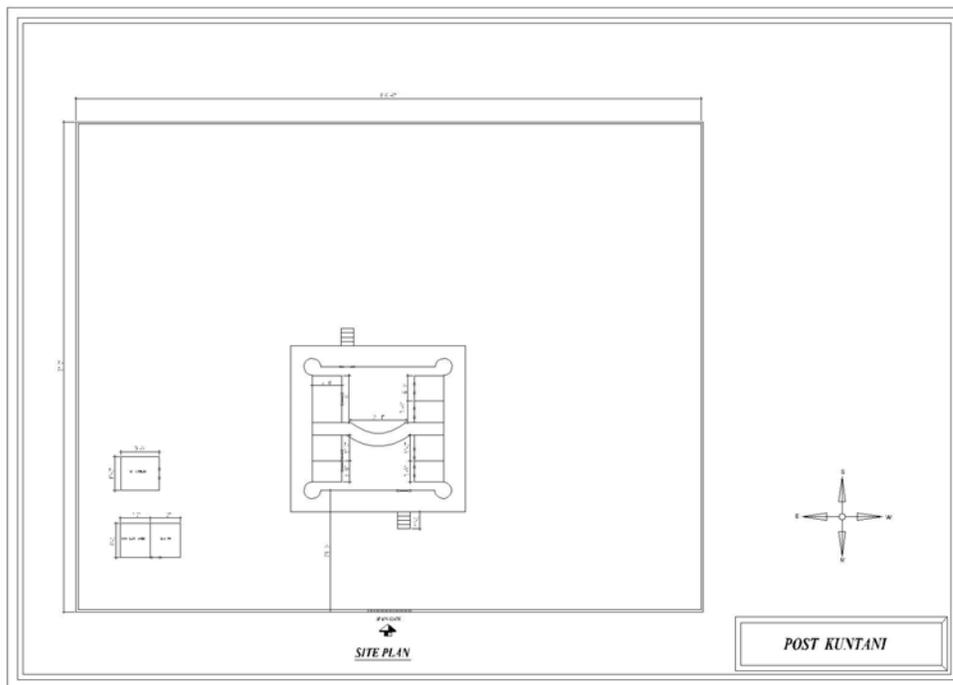


## PCG Post Kantani Site Survey

### Location:

Post Kantani (3 Bn Sector) is located about 7 Km NW of Jiwani and 65 Kms west of Gawadar. The site area is about 44 m by 34 m. The road from Jiwani to the post is a jeep track which is mostly muddy. Only 4x4 vehicles can reach the post. There are no amenities as well as utilities in proximity of site. Water is brought in a water tanker from Jiwani. In the summertime the area becomes very hot and inhospitable.

### Site Sketch:



### Buildings Structure:

The post has recently been built with RCC roof. It has a hall which is being utilized as sleeping quarters. This hall which lies in the centre of the main building can accommodate 6-8 beds. The floor is hardened with concrete. The hall has two windows and two doors. There are four small rooms on the four corners of the main building. These are being utilized for armoury, signal centre, JCO room and store. The four corners of the building have been converted in to observation posts. A small make shift room about 30-40 feet from the main building is being utilized as a cookhouse. Similarly a makeshift toilet has been built about 30-40 feet from the main building. The essential amenities like electricity, water supply, proper cooking arrangement, telephone and recreational facilities are non-existent at the post. This is the



only post which has RCC roof over the main building. However asbestos sheets have used as roofing material in some of the smaller rooms, cookhouse and toilets.

**Amenities /utilities:**

**Electricity** is not available on site. Two batteries are connected to UPS primarily to operate HF / VHF communication sets. Batteries are recharged utilizing solar panels. The nearest place electricity is available at Jiwani, about 7-8 Km from the post.

**Water** is not available on site. There is one underground tank. Water is stored in fibreglass tank. The company HQs through water tankers on weekly basis provides water. As it is proximity of sea, therefore subsoil water cannot be fetched as it is very salty.

**Cooking arrangements** are laborious. Presently cooking is done in a make shift cookhouse utilizing firewood. Firewood is collected by the troops from the vicinity, cut to suitable size for burning in locally made mud stoves. This arrangement is not only laborious for the troops but also unhygienic as well as a safety hazard.

**Amenities** are non-existent. There is no telephone available and as such troops have to go to Jiwani for talking to their family members. Similarly there is no recreational facility available on the site. The site is an isolated place and some sort of recreational facility is considered essential

**Additional Equipment:**

The posts are not equipped with any fire fighting equipment. The staff have a few search lights with low power.

### 3. Kantani Post Site Photos





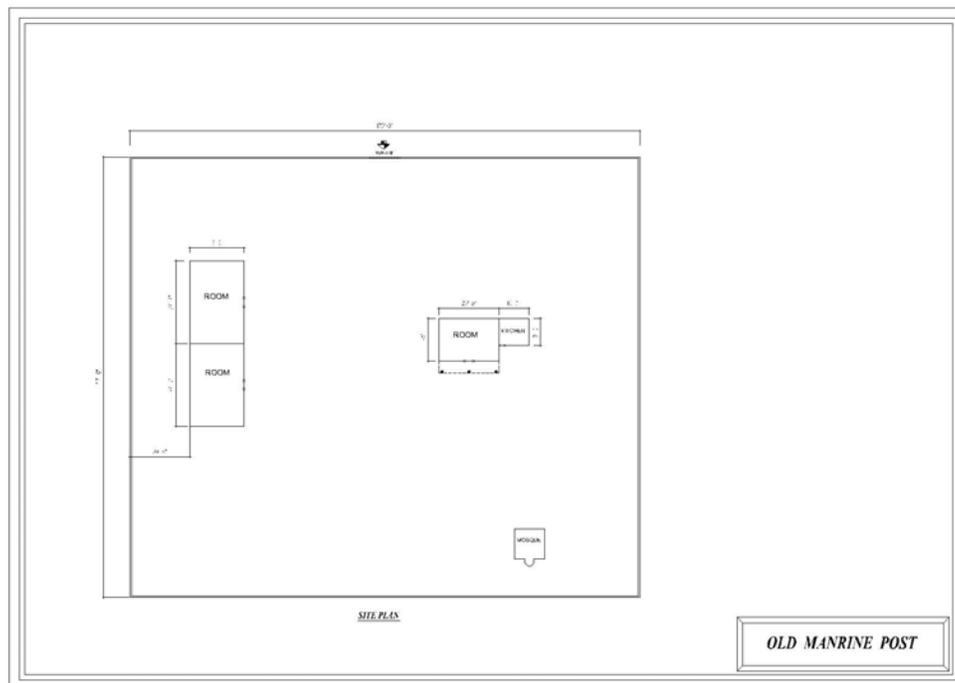


## PCG Post Old Marine Site Survey

### Location:

Post Old Marine (3 Bn Sector) is located 4 Km NW from the town of Jiwani. This site was previously used by marine company and is located close to the Arabian Sea coastline. The site has an approximate area of 44 m by 51 m. The approach to the post is a sand/mud track and 4x4 vehicles are required to reach the post. There are no amenities as well as utilities in proximity of site. The closest place where electricity and fresh water is available is in Jiwani. Wireless telephone services are also present in Jiwani. Water is brought to the post in water tankers from Jiwani. The hot weather makes it an inhospitable place.

### Site Sketch:



### Buildings Structure:

The site has an old building structure in vicinity of colonial era but it is very bad and in dangerous condition and therefore is not presently in use. The post has a dilapidated building which is being used for accommodation of the personnel. The living quarter is a small building with no RCC roof where present troops are being accommodated. The floor is hardened with concrete but in poor condition. The walls are also in rundown condition with cracks visible at some places. The room can accommodate maximum of 4-6 beds with no wardrobes or closets to be utilized by individuals for keeping their

belongings. The room has two windows and a door. It is an old construction with no columns or beams. The roof consists of steel guarders and asbestos sheets. There is a small make shift room in very poor condition that is being utilized as cookhouse. Cooking is done by utilising firewood fetched from far distances. Similarly toilet is also made on a makeshift arrangement. The most essential amenities like electricity, water supply, proper cooking arrangement, telephone and recreational facilities are non-existent.

**Amenities/utilities:**

**Electricity** is not available on site Two batteries are connected to UPS primarily to operate HF / VHF communication sets. Batteries are recharged utilizing solar panels There are 2 energy saver bulbs of 18 watts each and are operated at night for a short duration. The nearest electricity is available about 25 km from the site i.e. at the coy HQs located at Jiwani

**Water** is not available on site. There is one underground tank. Water is stored in fibreglass tank The company HQs through water tankers on weekly basis provides water. As it is on hilly terrain, the water table is quite deep; therefore, subsoil water cannot be fetched and most likely it will be salty.

**Cooking arrangements** are laborious. Presently cooking is done in a make shift cookhouse and utilizing firewood. Firewood is collected by the troops from the vicinity, cut to suitable size for burning in locally made mud stoves. This arrangement is not only laborious for the troops but also unhygienic as well as safety hazard.

**Amenities** are non-existent. There is no telephone available and as such troops have to go to Jiwani for talking to their family members. Similarly there is no recreational facility available on the site. The site is an isolated place and some sort of recreational facility is considered essential. The beds are of very low quality and not enough bedding was present. There were no closets for the staff to place their personal effects.

**Additional Equipment:**

The posts are not equipped with any fire fighting equipment. The staff have a few search lights with low power.

#### 4. Old Marine Post Site Photos





## PCG Shahabi Post Site Survey

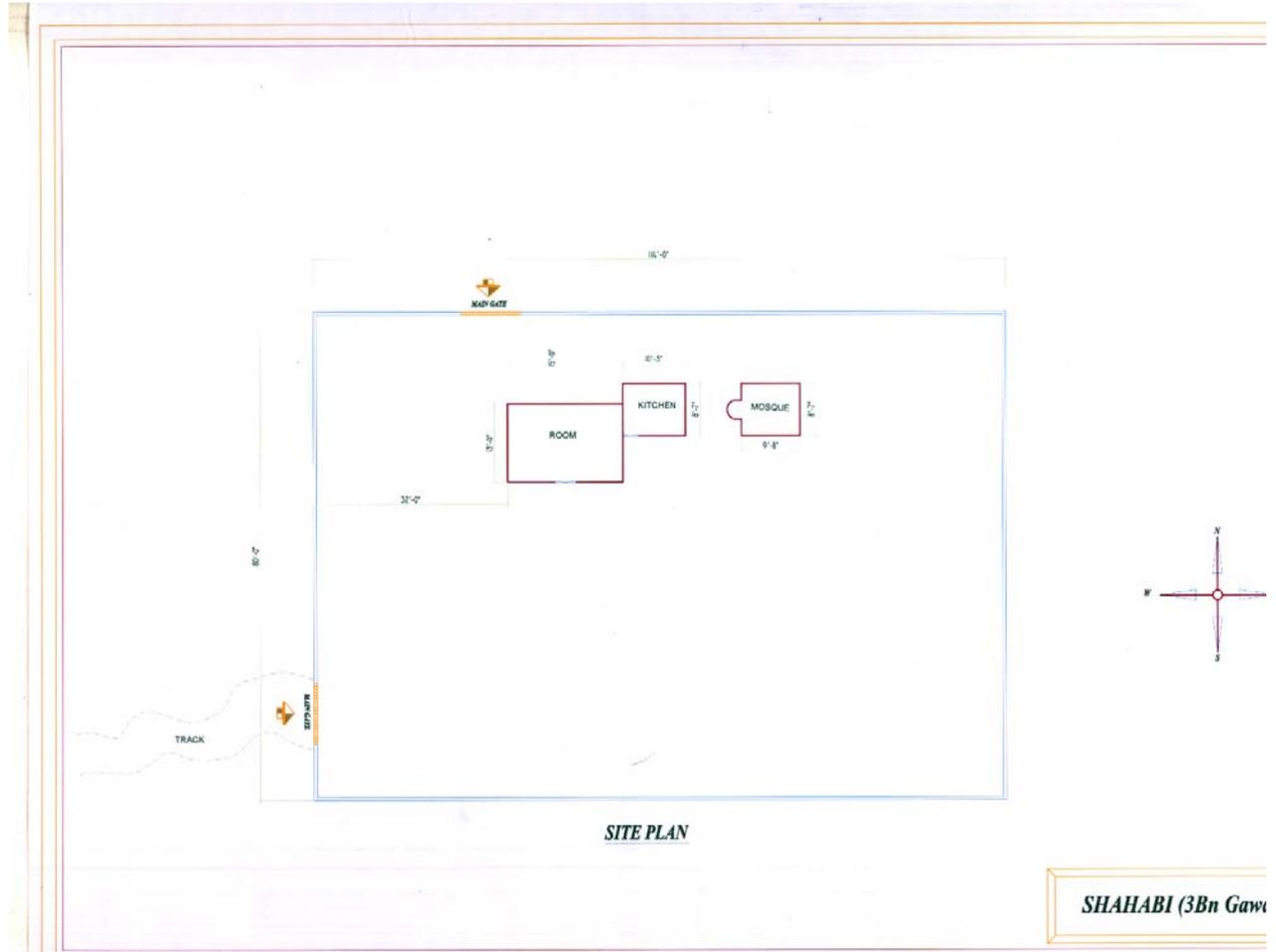
A survey of the Pakistan Coastguard's Shahabi Post site along the Makran coast was conducted on September 16, 2006.

### **Location:**

The Shahabi Post is located 40 km west of the city of Gawadar and situated on the coastline of Gawadar Bay. The first 32 km segment of the journey is on a single lane mettle road and the last leg of 8 km is through a rough and difficult dirt track. Alternately there is a much shorter route if one moves along the sea side, but the route is open during the non-monsoon season only. At such time the vehicular traffic can use this route during the low tide hours. Similar to the other sites in order to reach Shahabi, 4X4 vehicle is a must accompanied with a local guide who is familiar with the area.

Shahabi post is located off the beach at a higher ground with dimensions of 34m X 24m. The adjoining area around the site is mainly consistent of sand dunes and thus unlevelled. There are no amenities present at the Post and the closest station / city with electrification is Gawadar. Potable water is supplied to the post through tankers from Pakistan Coastguard (3 Bn) HQs located at Gawadar.

## Site Plan



**Note: the perimeter shown in the drawing is an approximate representation of the boundary of the site and is not necessarily an indication of the presence of any physical structure there**

### **Buildings Structure:**

Shahabi post's main building structure is no different from the rest of posts and is constructed without a suitable design methodology appropriating to the area of operation. There are no columns or beams to support the structure and the walls do not have proper cement plastering. The roof comprises of asbestos sheets supported by steel girders and fastened with iron T's. The walls are also deteriorating fast. However, the floor is hardened with cement plastered but because of poor quality of material used it is tearing away from some places.

Considering the area of operation and the poor state of repair of the structure, it can be surmised that it is both weak and hazardous to the life of the troops living in it.

Bearing in mind the harsh conditions of the area these arrangements are not at all weather resistant or even up to normal living standards and thus adding to the agony of the troops living there. Wardrobes and lockers are not available therefore the individuals are keeping their belongings in suit cases/trunks.

The room can only accommodate 4-6 beds with hardly any spare walking space. Doors and windows are wooden and in poor worn out condition, however, the windows have fly-proofing accomplished using a wire mesh. The room has a ceiling fan, an energy saver of 18 W and a tube light fitted in the main room.

There is no separate room for the in-charge (JCO). Latrines and toilets are again makeshift soft structures located close to the main residential building structure with no arrangement of water supply and septic tank.

An underground water tank is located in the proximity of the latrines. A small room adjacent to the living area is a cookhouse. Cooking is done utilizing firewood fetched by the troops from nearby area. The wood is cut to size for burning in a mud stove. Invariably, this cooking arrangement remains the main concern of the day. There is neither separate signals communication room nor separate armoury. The most essential amenities like electricity, water supply, gas, telephone and recreational facilities are non-existent. Presently there are 5 staff members stationed at the post. However, ideally section strength should be stationed at all time on this Post.

#### **Amenities/utilities:**

**Electricity** is not available on site. As standard arrangements on the posts, two dry batteries with UPS are available to mainly operate communication sets. For limited durations this electric power supply from batteries is utilized for domestic lighting. A solar panel is also available as standard kit for recharging the dry batteries during the day.

**Water** is not available on site and presently fresh water is supplied through Pakistan Coastguard (3 Bn HQ) water tankers on weekly basis. Since the site is in the proximity of the sea, usable subsoil water cannot be extracted by boring a well. The underground water tank at site has a storage capacity of about 2000 gallons.

**Cooking arrangements** are laborious as well as hazardous. Cooking is done utilizing firewood fetched by the troops from the vicinity as well as far flung areas. This consumes a lot of time of the troops that otherwise may be used for operational activities.

**Amenities** are non-existent. There is no telephone facility on the post and the troops have to travel all the way to Gawadar for inquiring about their loved ones. Similarly there is no TV or cable connection either.

#### **Additional Equipment**

**The post is not equipped with any fire fighting equipment. The staff has a few search lights with low power which are not at all suitable for effective night time use.**

## 5. Shahabi Post Site Photos



## PCG Passu Post Site Survey



A survey of the Pakistan Coastguard's Passu Post site along the Makran coast was conducted on September 15, 2006.

**Location:**

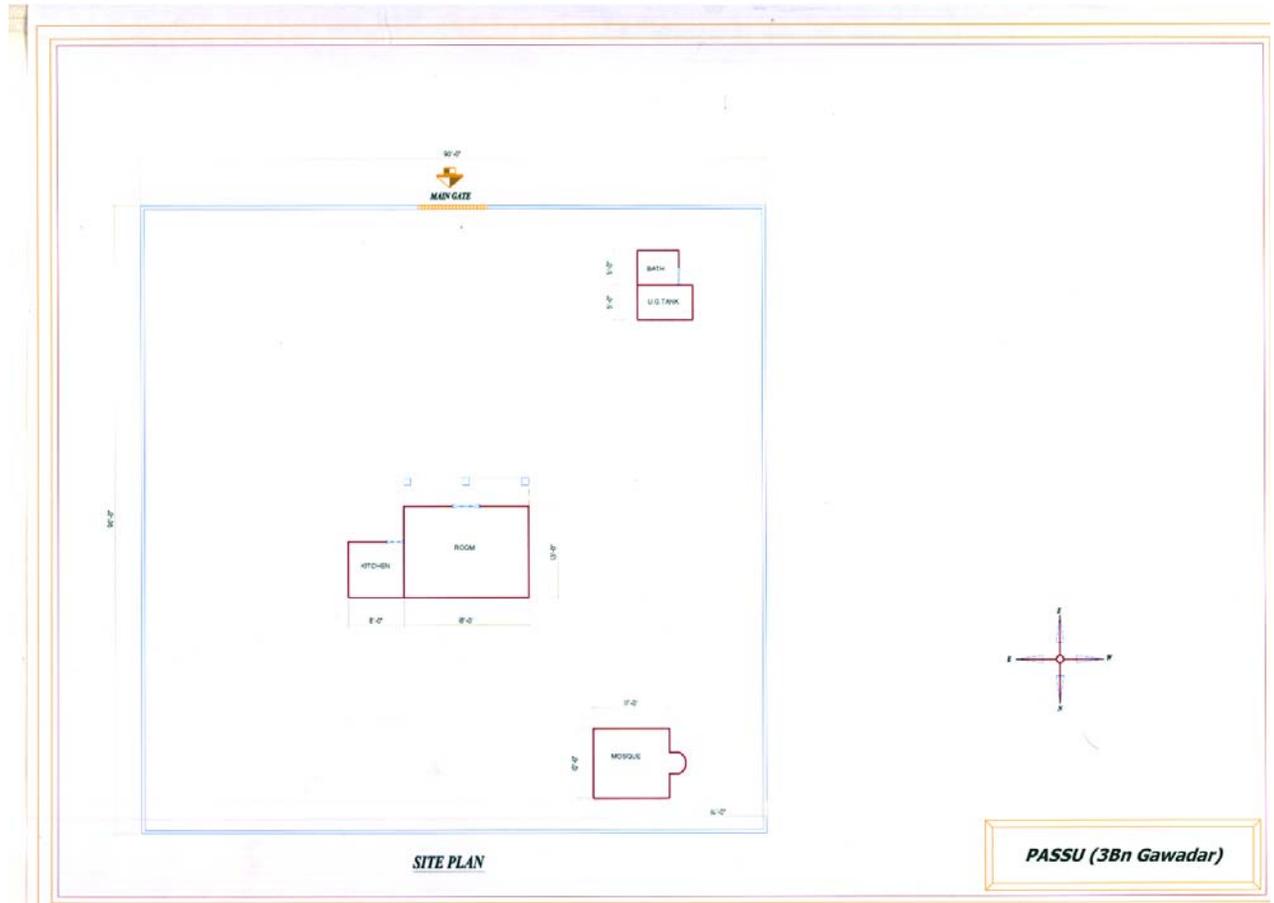
The Passu Post is located 25 Km East from the main town of Jiwani. Further East from the site is the main city of Gawadar and the road originating from Gawadar to Jiwani is a continuous dirt track. The Passu post falls roughly in the centre of the two towns but is relatively closer to Jiwani. The journey to the site is on a continuous 25 km stretch of dirt track originating from Jawani.

This site is located on a hilltop at an approximate elevation of 70 ft. There is no road leading up to the site and the only approach available is through a narrowly carved dirt pathway. Therefore the vehicles have to be parked at the bottom of the hill and the rest of the distance has to be covered by foot.

The site is located close to the coastline and has approximate dimensions of 27m x 27m. The land is flat at some places and can be utilized for construction; however the terrain is hard rock and mud at some places and thus would require some levelling. As a foremost requirement a road has to be carved around the hill so that vehicles laden with water and supplies are able to reach the site with ease.

There are no amenities present at the Post and the closest station/ city with fresh water and electrification is Jiwani. Portable water is supplied to the post through tankers from Jiwani.

## Site Plan



**Note: The perimeter shown in the drawing is an approximate representation of the boundary of the site and is not necessarily an indication of the presence of any physical structure there**

### **Buildings Structure:**

At a glance it is surmised judging through the dilapidated condition of the post that it is by no means fit for accommodation and considering the harsh climatic conditions of the area incapable of providing adequate shelter to the inhabitants. Unfortunately the structure is still operational and being used as the primary means of accommodation for the Pakistan Coastguard troops.

Bearing in mind the harsh conditions of the area these arrangements are not at all weather resistant or even up to normal living standards and thus adding to the agony of the troops living there.

There are no columns or beams to support the structure and the walls do not have proper cement plastering. The roof is of asbestos sheets supported by steel girders and fastened with iron T's. The walls are also deteriorating fast.

However, the floor is hardened with cement plastered but because of poor quality of material used it is tearing away from some places.

The structure comprises one main room and a small room which are being utilized for accommodation of the troops and for cooking respectively. The room can only accommodate 4-6 beds with hardly any spare walking area. Doors (1 no) and windows (4 no) are wooden and in poor worn out condition, however the windows do have fly-proofing accomplished using a wire mesh. The room has a ceiling fan, two 18 W energy saver bulbs and a fluorescent tube light. Wardrobes and lockers are not available therefore the individuals have to keep their belongings in their personal suit cases/trunks. The beds are of very low quality and not enough bedding was present for all the troops.

There is no separate room for the in-charge (JCO). Latrine again is a makeshift soft structure located close to the main residential building structure with no arrangement for water supply or septic tank for proper waste disposal. There is only a soak pit present where all the waste eventually ends up.

An underground water tank is also located next to the latrines which need to be replenished manually from time to time.

A makeshift mosque is also present at the site, which too is in a poor state of repair.

The small room next to the main room is the cookhouse. Cooking is done utilizing firewood fetched by the troops from nearby areas, which is later cut to size for burning in a mud stove.

There is neither separate signal communication room nor separate armoury. The most essential amenities like electricity, water supply, gas, telephone and recreational facilities are non-existent. Presently 5 troops including the in-charge JCO are stationed at the post. However, ideally section strength should be stationed at all time on this post.

#### **Amenities/utilities:**

**Electricity** is not available at the site. As standard arrangement two batteries are connected to a UPS primarily to operate HF / VHF communication sets. Batteries are recharged during the day with the help of solar panels. The site has two energy saver bulbs of 18 watts each and is operated after dark for short duration only. Due to the low capacity of the batteries and the solar panels extended operations after dark are not possible. The nearest station with electricity is roughly 30 km from the site i.e., at the Coy HQs located at Jiwani.

**Water** is not available at the site. There is one underground water tank at the top of the hill in the vicinity of the site and water is replenished manually. Closest water is supplied from Company HQs in Jiwani through water tankers on weekly basis.



**Cooking arrangements** are laborious as well as hazardous. Cooking is done utilizing firewood fetched by the troops from the vicinity as well as far flung areas. This consumes a lot of time of the troops that otherwise may be used for operational activities.

**Amenities** are non-existent. There is no telephone facility on the post and the troops have to travel all the way to Jiwani for inquiring about their loved ones. Recreation facilities such as TV and cable connection or any other means of recreations such as indoor and outdoor games are also not available.

### **Additional Equipment**

The post is not equipped with any fire fighting equipment. The staff has a few search lights with low power which are not at all suitable for effective night time use.

## Passu Post Photographs



**Approach road from Pasni to the site – view from site – Passu Post –  
15 Sep 06**



**Approach road from Gawadar to the site – view from site – Passu Post –  
15 Sep 06**



**Passage to the post on hill top – Passu Post – 15 Sep 06**



**Arriving at the top of hill – Passu Post – 15 Sep 06**



**View of main building from south – Passu Post – 15 Sep 06**



**View of the main building from west – Passu Post – 15 Sep 06**



**Main building along with kitchenette are visible – Passu Post –  
15 Sep 06**



**Exterior view of wall in poor condition – Passu Post – 15 Sep 06**



**View from the north, water reservoir is seen – Passu Post – 15 Sep 06**



**Front of the building having uneven ground – Passu Post – 15 Sep 06**



**Guard post made of stones located 30 M from building – Passu Post –  
15 Sep 06**



**View of low land toward west from the post – Passu Post – 15 Sep 06**



**View of building from the west – 15 Sep 06**



**Inside view of sleep**

**PCG Jhanda Post Site Survey**



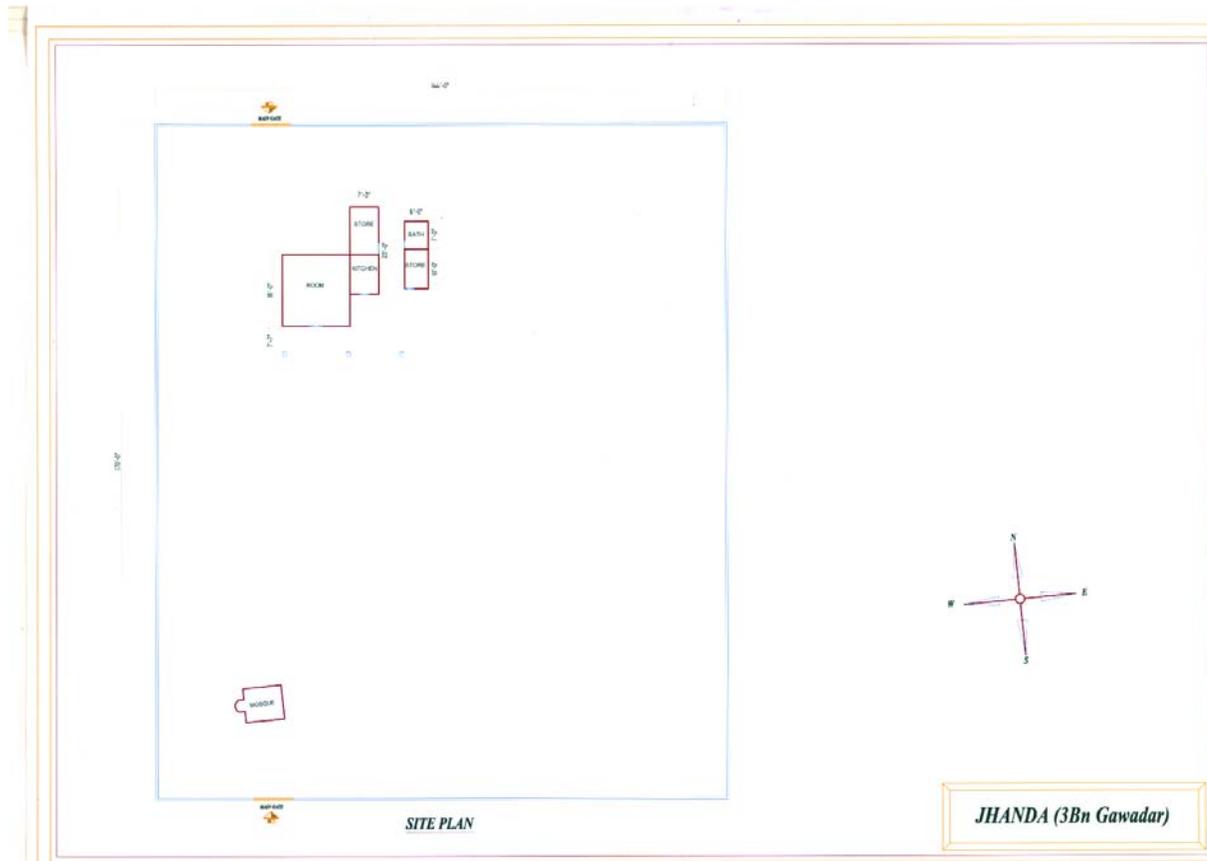
A survey of the Pakistan Coastguard's Jhanda Post site along the Makran coast was conducted on September 16, 2006.

**Location:**

The Jhanda Post is located approximately 31km West from the main city of Gawadar. The first part of the journey is a 27 km stretch following the main coastal highway and the remaining 4 km are covered travelling on a dirt track and takes approximately 45 min. After getting off the main Coastal Highway one has to travel on an unmarked track of soft mud terrain extending all the way to the post. The direction to the site is primarily sought from a local guide and is only accessible via 4X4 vehicles.

An alternate route to the post is via the coastline and is a much shorter route but unfortunately is only open from November to March when the tide is low. The adjoining area around the site mainly consists of sand dunes and requires leveling and compaction for future use. The post has dimension of 51m X 43m.

## Site Plan



**Note: the perimeter shown in the drawing is an approximate representation of the boundary of the site and is not necessarily an indication of the presence of any physical structure there.**

## **Buildings Structure:**

Jhanda post's main building structure is no different from the rest of the posts and is constructed without a suitable design methodology appropriating to the area of operation.

There are no columns or beams to support the structure and the walls do not have proper cement plastering and thus are deteriorating fast. The roof is of asbestos sheets supported by steel girders and fastened with iron T's. The floor is hardened and cement plastered but because of poor quality of material used it is waning away from some places. It is therefore a makeshift structure with poor material state and unfit to provide proper shelter.

The main building consists of one room primarily utilized to accommodate the troops and can house up to 4-5 troops with no spare room for lockers for keeping the clothes and other belongings of the staff. There is no separate accommodation for the in-charge (JCO) or existence of an armoury room or communication room. Additionally all doors and windows are in a worn out state and the windows are covered with a wire mesh to protect against mosquitoes and flies. The main room consists of one fan, two 18 W energy saver bulbs and a fluorescent tube light.

Cookhouse is located adjacent to the main room with a small storeroom mainly utilized for storage purposes. Cooking is done utilizing firewood fetched by the troops from near by areas, which is later cut to size for burning in a mud stove. Invariably, this cooking arrangement remains the main concern of the day.

The latrines is also a make shift structure with no waste disposal facilities by means of a septic tank or otherwise. There is no washing closet or wash basin or showering facility available for troops ablution needs. There is only a soak pit present and the walls of the bathroom have developed serious cracks through time.

A small water reservoir is present with an approximate capacity of 2000 gallons.

There is also a makeshift mosque present at the site.

The most essential amenities like electricity, water supply, gas, telephone and recreational facilities are non-existent. Presently there are 5 troops stationed at the post. However, ideally section strength should be stationed at all time on this Post for an effective operational capability.

## **Amenities/utilities:**

**Electricity** is not available on site and the closest station/ city with electricity is Gawadar. As standard arrangements for all posts, two dry batteries with UPS are available to mainly operate communication sets. For limited durations this electric power supply from batteries is utilized for domestic lighting. A solar panel is also available as standard kit for recharging the dry batteries during the day.



**Water** is not available on site and presently fresh water is supplied through Pakistan Coastguard (3 Bn HQ) water tankers on weekly basis. Since the site is in the proximity of the sea, usable subsoil water cannot be extracted by boring a well. The underground water tank at site has a storage capacity of about 2000 gallons.

**Cooking arrangements** are laborious. Presently cooking is done in a small cook house utilizing firewood gathered from the environs, cut to suitable size for burning in locally made mud stoves. This arrangement is not only laborious for the troops but also unhygienic as well as a safety hazard. Since there are not many trees in the area, the staff will at some point run out of firewood.

**Amenities** are non-existent. There is no telephone facility on the post and the troops have to travel all the way to Gawadar for inquiring about their loved ones. Similarly there is no TV or cable connection either.

### **Additional Equipment**

The post is not equipped with any fire fighting equipment. The staff has a few search lights with low power which are not at all suitable for effective night time use.

## Jhanda Post Photographs



**Approach from beach – Jhanda Post – 16 Sep 06**



**Main building, solar panel is visible – Jhanda Post – 16 Sep 06**



**Front area of post view from west – Jhanda Post – 16 Sep 06**



**Dirt track from the post leading to Gawadar main road – Jhanda Post –  
16 Sep 06**



**Side view of building from west – Jhanda Post – 16 S3p 06**



**Kitchen, water reservoir & latrine – Jhanda Post – 16 Sep 06**



**View from north – latrine & kitchen are visible – Jhanda Post – 16 Sep 06**



**View from north eastern corner of site – Jhanda Post – 16 Sep 06**



**Side view of building and water reservoir – Jhanda Post – 16 Sep 06**



**Depleted condition of kitchen wall – Jhanda Post – 16 Sep 06**



**Sleeping quarters – poor condition of roof is seen – Jhanda Post – 16 Sep 06**



**Poor condition of walls of sleeping quarters – Jhanda Post – 16 Sep 06**



**Bamboo is used in ceiling supported by steel girders – Jhanda Post – 16 Sep 06**



**Front of the main building – Jhanda Post – 16 Sep 06**



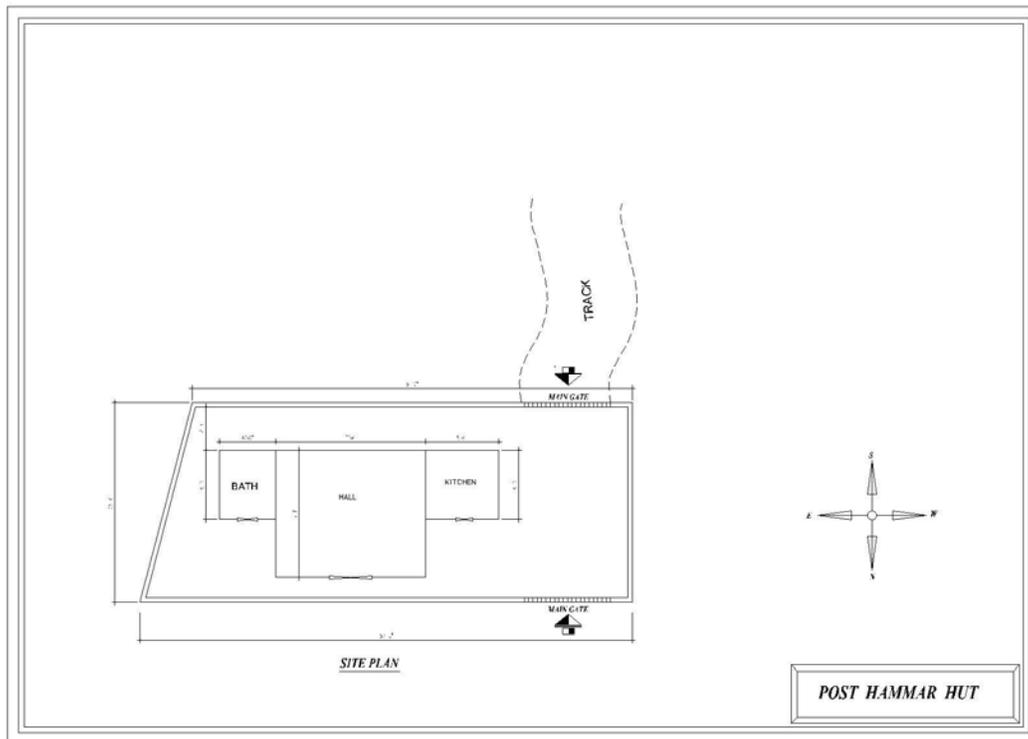
**Main building viewed from south west corner - Jhanda Post – 16 Sep 06**

## **Hammer Head Post Site Survey**

### **Location:**

Hammer Head Post (3 Bn Sector) is located on the hills of Gawardar Hammer Head. The site is located 5 km from the Gawardar Main Road and about 8 km from the Coastal Highway. Approximately 3 km of the 5 km road leading from Gawadar Main Road to the post is metalled and the remaining 2 km is a dirt track. The post is located at the foot of Ras Noah hill and the site is flat area of approximately 517 square meters (11m by 14 m) primarily consisting of mud and rock. Centre and corner co-ordinates of the post are as follows:

### **Site Sketch:**



### Buildings Structure:

The building accommodating the staff is a makeshift structure consisting of 2 rooms which are used as sleeping quarters by the troops. The size of the rooms is small and can accommodate four beds each in a very tight arrangement. The two rooms have plastered floor but in depilated condition. There are no wardrobes or lockers for keeping the clothes and other belongings of the staff. There are no fans or lights in the 2 rooms. There is no separate room for in-charge of the personnel who is a senior ranking soldier (JCO). The toilet consists of one W/C, however there is no peptic tank and sewage line connected to the W/C. With no over head water tank, this W/C is not being utilized. The staff has dug a pit and used it instead as a toilet. The cookhouse is a small room and cooking is done utilizing firewood for which the personnel have to travel long distances to collect. The building doesn't have a RCC roof and is covered by asbestos sheets. There is no protection against mosquitoes/flyes inside of the building. Although the building structure had a whitewash job done on it, the structure looked week and over time with the highly salty humid air in the area, the structure may not last very long. Worse the highly salty humid air is a dangerous combination with the asbestos roof. The walls of the building are thin and it gets very cold inside during winters. The doors and windows are of the lowest quality wood and are already quite deteriorated.

The adjacent land can also be utilized but as it is hilly terrain, ground will need to be cleared/flattened prior to construction.

### **Amenities/utilities:**

**Electricity** is not available on site and presently one solar panel is present that charges 2 dry batteries. These batteries are connected to UPS primarily to operate HF / VHF communication sets. There are 2 energy saver bulbs of 18 watts each and are operated at night for a short duration. This arrangement does not permit to use refrigerators or deep freezers, as such even cold water is not available for drinking during sizzling heat in the summer months which lasts more than 8 months in a year. The nearest electricity available is 5 km from the site i.e. at the main road in Gawadar main city.

**Water** is not available on site. There is one underground tank of about 600 Litres capacity. Water is provided by the company HQs through water tankers on weekly basis. As it is on hilly terrain, the water table is quite deep and the under ground water has strong salty taste. This is due to the site being close to the sea, which is about 1 km from the site due south. Therefore water cannot be obtained from well in this area.

**Cooking arrangements** are laborious. Presently cooking is done in kitchen and utilizing firewood. Firewood is collected by the troops from the vicinity, cut to suitable size for burning in locally made mud stoves. This arrangement is not only laborious for the troops but also unhygienic as well as a safety hazard. Since there are not many trees in the area, the staff will at some point run out of firewood.

**Amenities** are non-existent. There is no telephone available and as such troops have to go to Gawadar for talking to their family members. Similarly there is no recreational facility available on the site. The site is an isolated place and some sort of recreational facility is considered essential. The beds are of very low quality and not enough bedding was present. There were no closets for the staff to place their personal effects.

### **Additional Equipment:**

The posts are not equipped with any fire fighting equipment. The staff have a few search lights with low power.

## **Hammer Head Post Photographs**



**Approach to the Post – Hammer Head Post – September 13, 2006**



**Side view of building showing total area that could be utilised for construction – Hammer Head Post – September 13, 2006**



**View of Building from Rear – Hammer Head Post – September 13, 2006**



**View of Site from South-eastern Corner – Hammer Head Post – September 13, 2006**



**Asbestos Sheets Used as Roofing – Hammer Head Post – September 13, 2006**



**Full View of the Post – Hammer Head Post – September 13, 2006**



**Roof of Sleeping Quarters Showing Ceiling (Asbestos Sheets) – Hammer Head Post – September 13, 2006**



**Inside view of Sleeping Quarters – Hammer Head Post – September 13, 2006**



**Inside view of Sleeping Quarters – Hammer Head Post – September 13, 2006**



**Inside view of Sleeping Quarters– Hammer Head Post – September 13, 2006**



Inside view of Sleeping Quarters – Hammer Head Post – September 13, 2006





**Clothes of Staff Hanging from Wall and Showing No Lighting in the Room – Hammer  
Head Post – September 13, 2006**



**Non-operational Toilet – Hammer Head Post – September 13, 2006**





**Another View of the Asbestos Roof Using Steel Guarders – Hammer Head Post –  
September 13, 2006**

## **PCG Gatti Dor Post Site Survey**

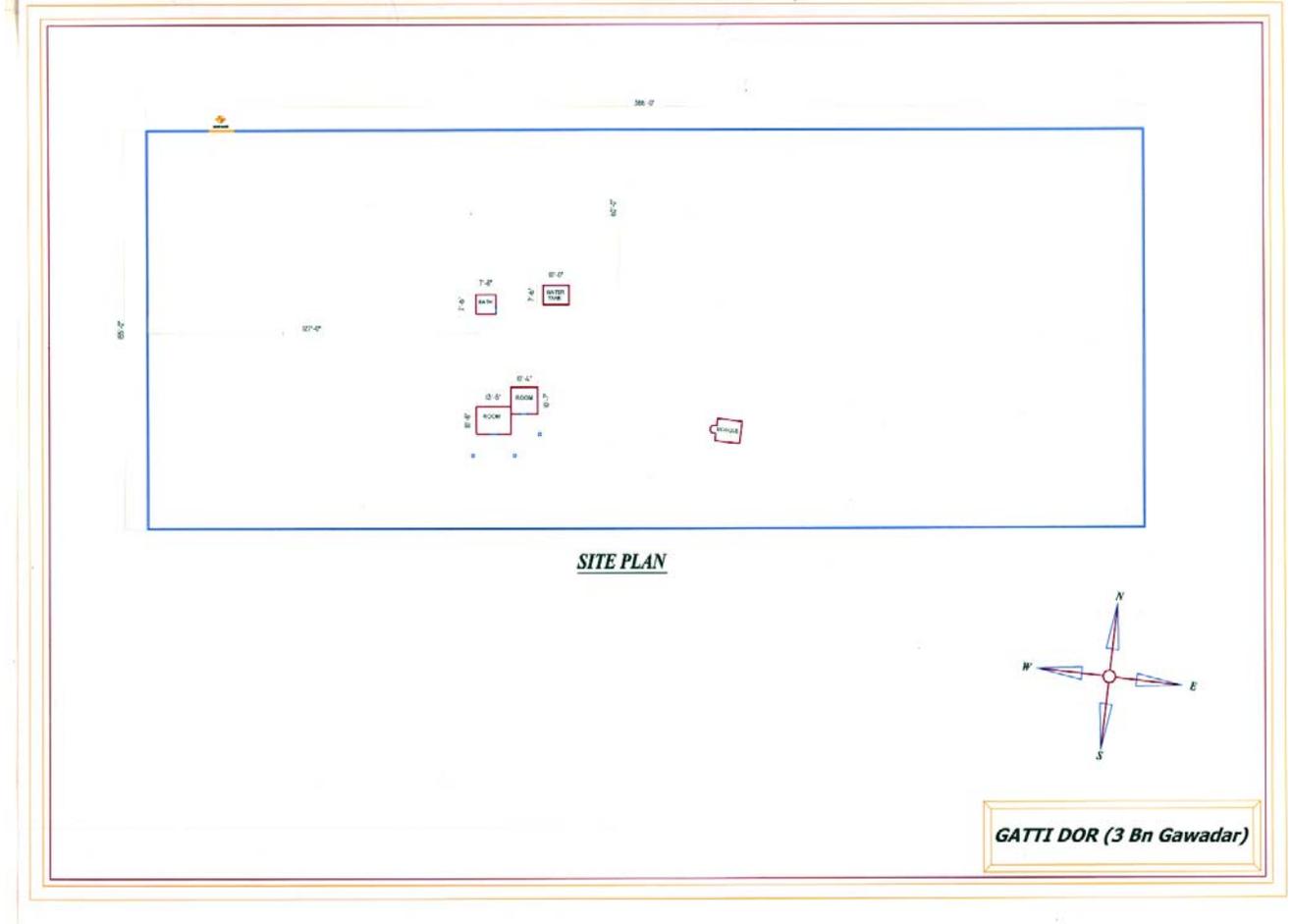
A survey of the Pakistan Coastguards' Gatti Dor Post site along the Makran coast was conducted on September 18, 2006.

### **Location**

The Gatti Dor post site is located approximately 8.5 km west of the main city of Gawadar following main Coastal Highway with a 4.5 km track from the Coastal Highway towards the site. One has to travel on unmarked tracks on soft mud terrain from main road to the site with the help of local guides. The 4.5 km dirt track takes more than 15 minutes to reach the site following the tracks.

The site is situated on the Eastern edge of "Jabal-e-Mehdi" The site has an area 115m by 47m and is levelled ground located off the beach. The sea is fast eroding the site at which the post is presently located. The edges of land towards sea will require strengthening to preserve the facility from being eroded by the sea.

## Site Plan



Note: the perimeter shown in the drawing is an approximate representation of the boundary of the site and is not necessarily an indication of the presence of any physical structure there

## Buildings Structure

The main building is constructed using a temporary structure construction methodology whereby there are no columns or beams to support the structure and the walls do not have proper cement plastering. The roof is of asbestos sheets supported by steel girders and fastened with iron T's. The walls are also deteriorating fast. However the floor is hardened with plastered cement.

The main building consists of only one room utilized primarily to accommodate the troops. The room can house up to 5-6 with no spare room for lockers for keeping the clothes and other belongings of the staff. Doors and windows are wooden and are in poor condition. However, the windows do have fly-proofing mesh.

One makeshift latrine is available. Cooking is also done in a makeshift arrangement which adjoins the building used as living quarters. The state of the latrine and cookhouse is in very poor condition. There is no septic tank or any provision for proper waste disposal. The latrine does not have a proper washing closet, a wash basin for ablution purposes or any other bathroom accessories.

There is an underground water reservoir made of concrete large enough to store 1500 gallons of water supplied through water tankers brought in by the Coastguard staff from Pasni.

Although there are 5 staff persons stationed at the post, it is understood that this post should ideally have a section strength (which is 13 staff persons).

### **Amenities /utilities**

**Electricity** is not available on the site and presently power is generated using a solar panel for daytime operations and a pair of dry batteries connected to a UPS for evening power consumption. The power generated by the solar panels is limited and is utilized mainly to operate HF/VHF communication equipment. The post does, however, have a ceiling fan, an 18w energy saver bulb and a standard fluorescent tube light all in the main room. The nearest place electricity is available is at Gawadar, about 8-9 km from the post.

**Water** is not available on site and presently fresh water is supplied through water tankers on weekly basis. Since the site is in the proximity of the sea, usable subsoil water cannot be extracted by boring a well.

**Cooking arrangements** are laborious. Presently cooking is done in a small cookhouse utilizing firewood gathered from the environs, cut to suitable size for burning in locally made mud stoves. This arrangement is not only laborious for the troops but also unhygienic as well as a safety hazard. Since there are not many trees in the area, the staff will at some point run out of firewood.

**Amenities** are virtually non-existent in the area with no telephone link or TV/ cable connectivity, making the life of troops even more difficult.

### **Additional Equipment**

The post is not equipped with any fire fighting equipment. The staff has a few search lights with low power which are not at all suitable for effective night time use.

## Gatti Dor Post Photographs



**Approaches to the post – Gatti Dor Post – 18 Sep 06**



**Dirt Track leading to post – Gatti Dor Post – 18 Sep 06**



**Water reservoir and main building – Gatti Dor Post – 18 Sep 06**



**Latrine with main building in the background – Gatti Dor Post – 18 Sep 06**



**Main building viewed from west – Gatti Dor Post – 18 Sep 06**



**Another view from west – Gatti Dor Post – 18 Sep 06**



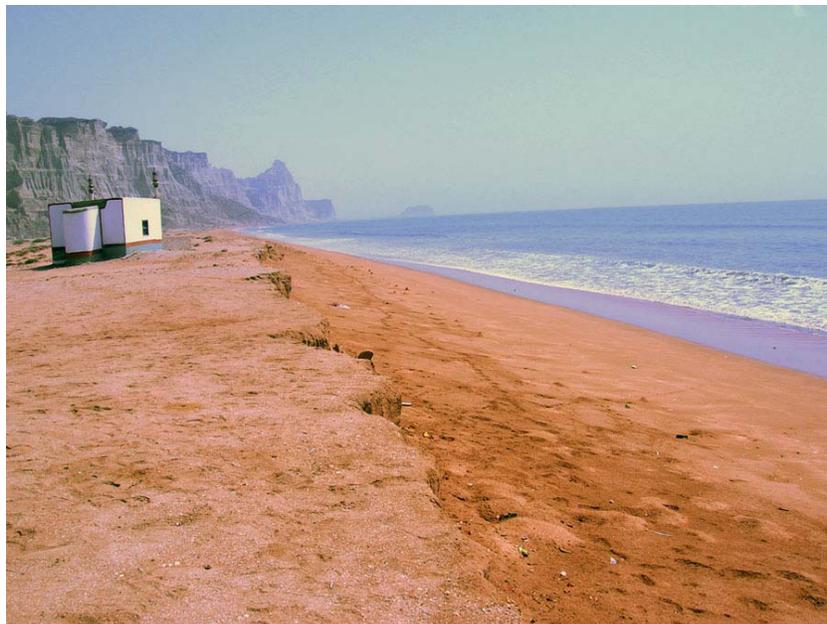
**View from South – Gatti Dor Post – 18 Sep 06**



**Rear of the main building viewed from north – Gatti Dor Post – 18 Sep 06**



**Front of the post – Gatti Dor Post – 18 Sep 06**



**View from the West – Gatti Dor Post – 18 Sep 06**



**Edge of the land of post being eroded by sea – Gatti Dor Post –  
18 Sep 06**



**View from the East of Post – Gatti Dor Post – 18 Sep 06**



**Side view of the building – Gatti Dor Post – 18 Sep 06**



**Inside sleeping quarters – Gatti Dor Post – 18 Sep 06**



**Another view of sleeping quarters – Gatti Dor Post – 18 Sep 06**



**Asbestos sheets**

## PCG Surbandar Post Site Survey

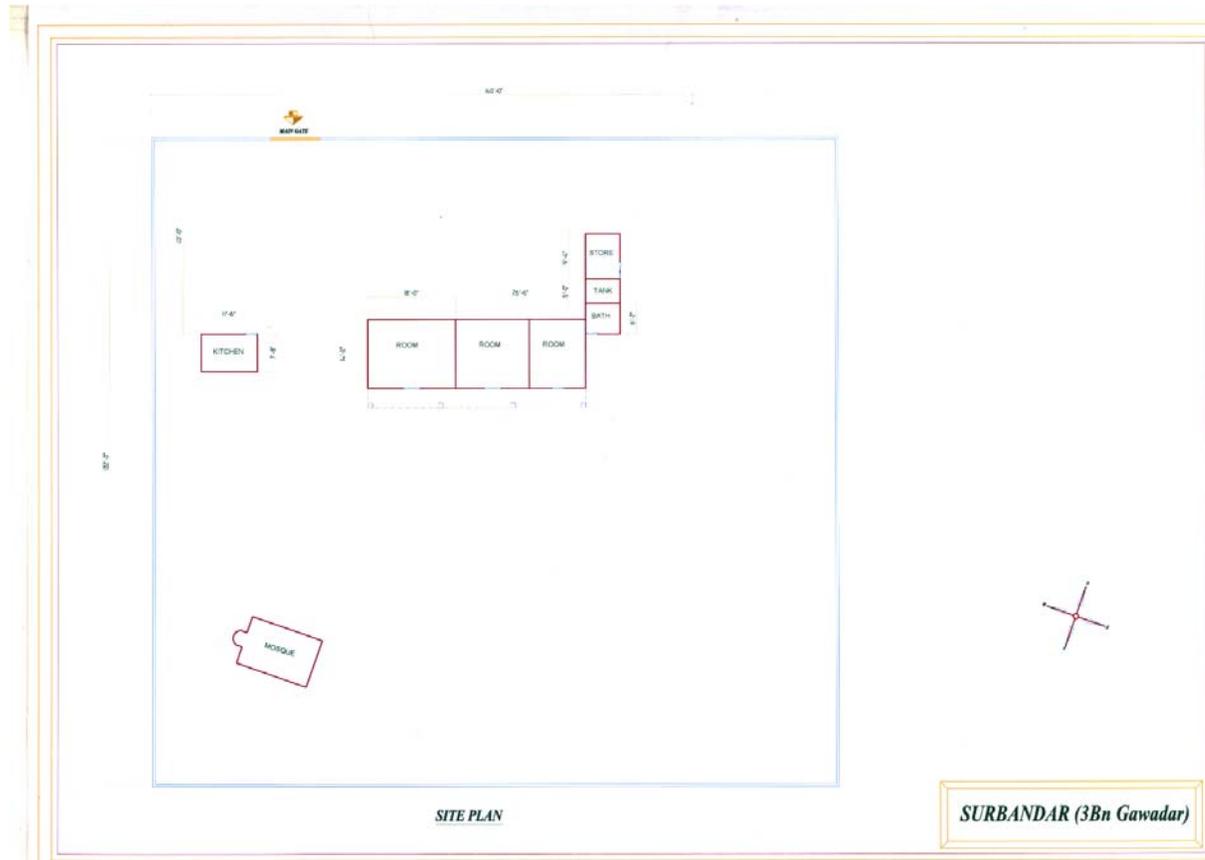
A survey of the Pakistan Coastguard's Surbandar Post site along the Makran coast was conducted on September 16, 2006.

### **Location:**

The Surbandar Post is located 22 km east from the main city of Gawadar. The initial 20 km of the journey is on the main coastal highway and the remaining 2 km is on a different mettle road running due south towards the sea.

The dimensions of the site are 42m X40m and the adjoining area is mainly composed of mud and sand, nevertheless the ground is levelled and ripe for construction.

### Site Plan



**Note: The perimeter shown in the drawing is an approximate representation of the boundary of the site and is not necessarily an indication of the presence of any physical structure there**

## **Buildings Structure:**

The structure comprises of three main rooms, one adjacent to the other of which two rooms serve primarily as accommodation for the troops and the third room is for the in-charge JCO. The two rooms can accommodate 8-10 beds with hardly any spare walking space. Each room has one wooden door and two windows which are in poor worn out condition; however the windows do have fly-proofing accomplished using a wire mesh. There is one fan and one fluorescent tube light in each room. Wardrobes and lockers are not available therefore the individuals have to keep their belongings in their personal suit cases/trunks. The same room utilized for accommodation of the troops is also used for housing the communication equipment.

There are no columns or beams to support the structure and the walls do not have proper cement plastering. The roof is of asbestos sheets supported by steel girders and bamboos. The walls are deteriorating fast. The floor is hardened concrete with cement-plastered surface

The kitchen is located approximately 20 feet away from the main structure and is yet another makeshift construction which is deteriorating fast as large cracks on the walls are visible from a distance. Cooking is done utilizing firewood fetched by the troops from nearby areas, which is later cut to size for burning in a mud stove.

The bathroom is located adjacent to the main building and again is a makeshift soft structure with no arrangement for water supply or septic tank for proper waste disposal. However there is a washing closet in the bathroom but without a proper flushing mechanism, water has to be poured manually to dispose of the waste, which ultimately ends up in the sea.

Since electricity is available in the Surbandar village, electric connection has been provided at the post.

Water reservoir is constructed on ground, it is a concrete structure and has top covered with prefabricated sheets.

A mosque is also present at the site, constructed out of cement blocks with no plaster on the walls. The roof is made out of prefabricated sheets and has one wooden door and two windows.

Presently 8 troops including the in-charge JCO are stationed at the post. However, ideally section strength should be stationed at all time on this Post.

## **Amenities/utilities:**



**Electricity** is available at the site by virtue of being in close proximity to the Surbandar village. However backup arrangements are required as there are frequent power breakdowns.

**Water** is not available at the site. Fresh water is replenished in the water reservoir through water tankers brought in from Coy HQs. Being in the vicinity of the sea, there is no subsoil fresh water available, and therefore boring a well for fresh water is not advisable. The current water tank capacity is roughly 2000 gallons.

**Cooking arrangements** are laborious as well as hazardous. Cooking is done utilizing firewood fetched by the troops from the vicinity as well as far flung areas. This consumes a lot of time of the troops that otherwise may be used for operational activities.

**Amenities** are non-existent. There is no telephone facility on the post and the troops have to travel all the way to Gawadar for inquiring about their loved ones. Recreation facilities such as TV and cable connection or any other means of recreations such as indoor and outdoor games are also not available.

### **Additional Equipment**

The post is not equipped with any fire fighting equipment. The troops are in possession of a few search lights but with relatively low power which are not at all suitable for effective night time use.

## Surbandar Post Photographs



**Approaches to the post with Surbandar village in the background –  
Surbandar Post – 16 Sep 06**



**Front of the post viewed from southeast – Surbandar Post – 16 Sep 06**



**View of the post from East – Surbandar Post – 16 Sep 06**



**Water reservoir on left and cookhouse on right of main building –  
Surbandar Post – 16 Sep 06**



**View from north, fish factory in background – Surbandar Post –  
16 Sep 06**



**Rear of main building view from northwest – Surbandar Post – 16 Sep 06**



**View of main building from west – Surbandar Post – 16 Sep 06**



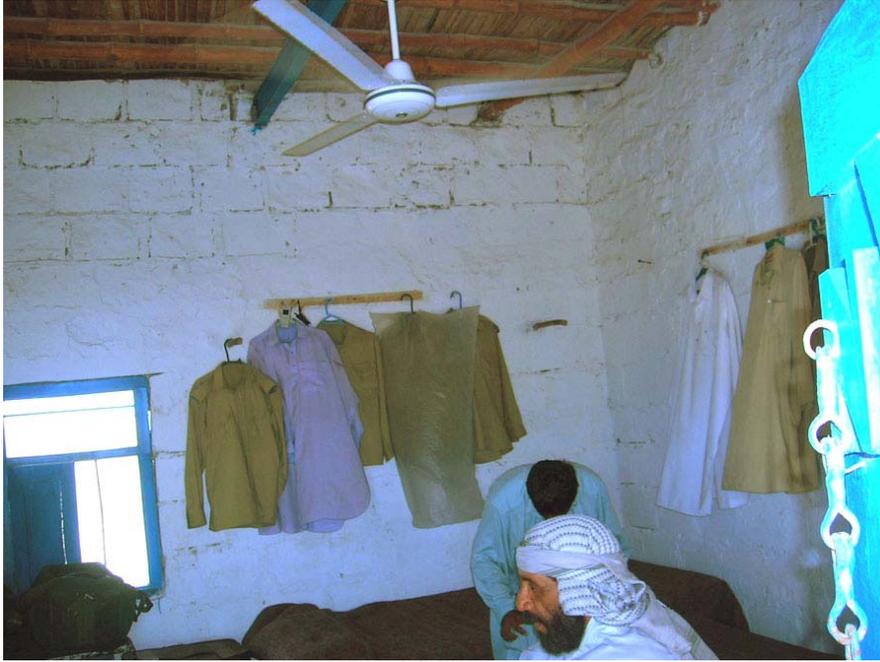
**Make shift cook house with damaged wall – Surbandar Post – 16 Sep 06**



**Sitting area in front of sleeping quarters view from west –  
Surbandar Post – 16 Sep 06**



**Sleeping quarters walls in deteriorated condition – Surbandar Post –  
16 Sep 06**



**Another view of sleeping quarters – no wardrobes – Surbandar Post –  
16 Sep 06**



**Ceiling made of Bamboos supported by steel girder – Surbandar Post – 16 Sep 06**



**Sleeping quarters with limited space and no wardrobes – Surbandar Post – 16 Sep 06**



**Another room, roof of asbestos sheets – Surbandar Post – 16 Sep 06**



**Latrine with out flushing tank – Surbandar Post – 16 Sep 06**



**Water reservoir – Surbandar Post – 16 Sep 06**



**South-eastern corner of the site, bench mark is visible in the middle  
– Surbandar Post – 16 Sep 06**



# **APPENDIX III**

## PORT OF KARACHI—CARGO SCREENING APPLICATION AND MOBILE SCREENING

CNTPO wishes to improve the cargo inspection capabilities deployed at the Port of Karachi. Last year, CNTPO deployed two (2) Rapiscan GaRDS Mobile cargo and vehicle inspection systems to the port. These systems, while operating at peak performance, are limited by the fundamental limitations of gamma-based inspection systems. The Rapiscan GaRDS Mobiles provide the best penetration (190mm of steel) and image quality (5.5mm resolution) in the industry. However, over the past year, CNTPO has learned that much of the cargo passing through the port is comprised of exceedingly dense material (produce, animal pelts, liquids). The GaRDS units have not provided sufficient inspection capability to inspect all cargo.

Rapiscan, therefore, proposes that CNTPO augment the existing GaRDS Mobile units with a Eagle Gantry with a 6 Megaelectron Volt (MeV) x-ray source. The Eagle Gantry will provide enhance penetration (380mm of steel) and dramatically better image quality (1mm resolution) to fully inspect these dense cargos.

The Rapiscan Eagle Gantry ("Eagle Gantry") incorporates proven high-energy x-ray imaging technology in a rail-mounted inspection system capable of rapid, automated scanning of vehicles and cargo. The linear accelerator x-ray source and x-ray detector array are mounted on an electric-powered gantry that runs on rails. The system automatically scans unoccupied vehicles parked between the rails. The gantry is remotely controlled from a nearby or remote facility, where the x-ray images are sent for examination and evaluation.

The Eagle Gantry employs the same 6-MV x-ray imaging system as the Rapiscan Eagle cargo inspection system. The Eagle achieves up to 375 mm of equivalent steel penetration and has proven its ability to inspect nearly all cargo during operation at US seaports and border crossings. The Eagle Gantry deploys this proven technology in a relocatable gantry system that supports high throughput by continuously scanning several vehicles.

**OPTION**—Rapiscan is also providing its Eagle Gantry (4.5 MeV) as an option to the 6 MeV Gantry requested in the RFQ. The Eagle Gantry (4.5 MeV) has all the same operating characteristics as the Eagle Gantry (6MeV) will a slightly reduced penetration (300mm of penetration vs. 375mm of penetration). All other performance, design, safety and operating characteristics are identical between the two models.

The Eagle Gantry facility consists of the gantry, which supports the x-ray source and detector array, the rails, the radiation shielding and the Control Room. The entire facility is enclosed in a security fence, which also demarks the radiation safety exclusion zone. The Eagle Gantry can be designed to be easily relocatable. The gantry, source and detector and the Control room are loaded on to trucks or rail cars for shipment to a new site. Prior to arrival, the site is prepared by laying rails, building the concrete shield walls and erecting the fence. If necessary, the shield walls can be constructed from concrete

blocks, which are also removed and relocated to the new site. The control room will allow for remote operation up to 150 meters from the inspection system.

The Eagle Gantry is designed for automated operation by a minimum number of personnel. Therefore, it is well-suited to cargo screening at entrances to critical facilities, border crossings and seaports. For entry point inspection, the Eagle Gantry will be installed at a roadway entrance to a building, base, or critical facility. It can be located at a roadway bypass, where selected vehicles are diverted for inspection. If necessary, the Eagle Gantry can be incorporated within an architecturally appropriate enclosure, so that the inspection equipment is inconspicuous and compatible with the surrounding structures. The enclosure could be designed to provide blast protection. This approach may be attractive for embassies or other facilities. At a seaport, an easily-relocatable, prefabricated enclosure may be added for security and weather protection.

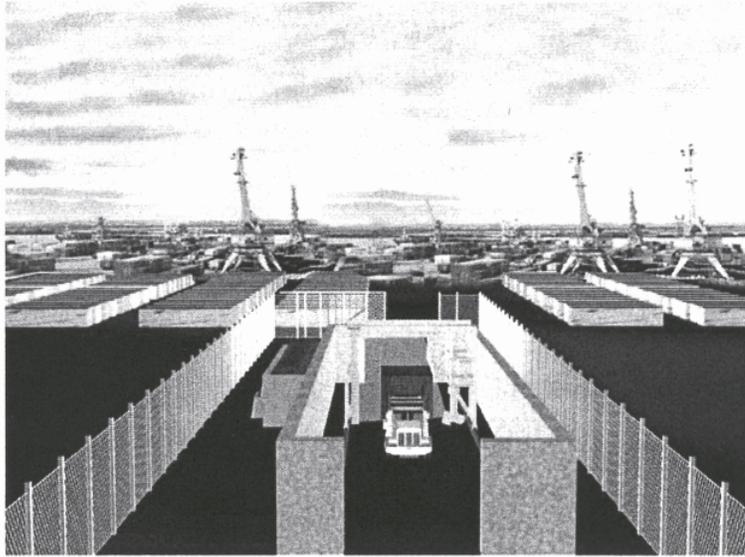
The Eagle Gantry has a unique combination of features:

- Automatically scans densely loaded containers and vehicles
- Rapid scanning supports high throughput
- Proven high-energy x-ray imaging technology
- High-energy linear accelerator x-ray source
- High penetration to inspect even dense cargo
- High-quality x-ray images
- Operated by as few as one crew person
- Radiation safe for operators, observers and stowaways

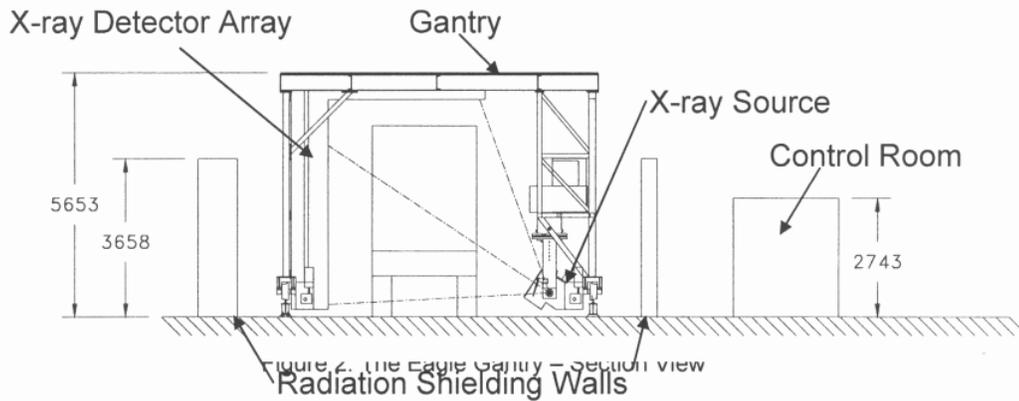
### **Features and Benefits**

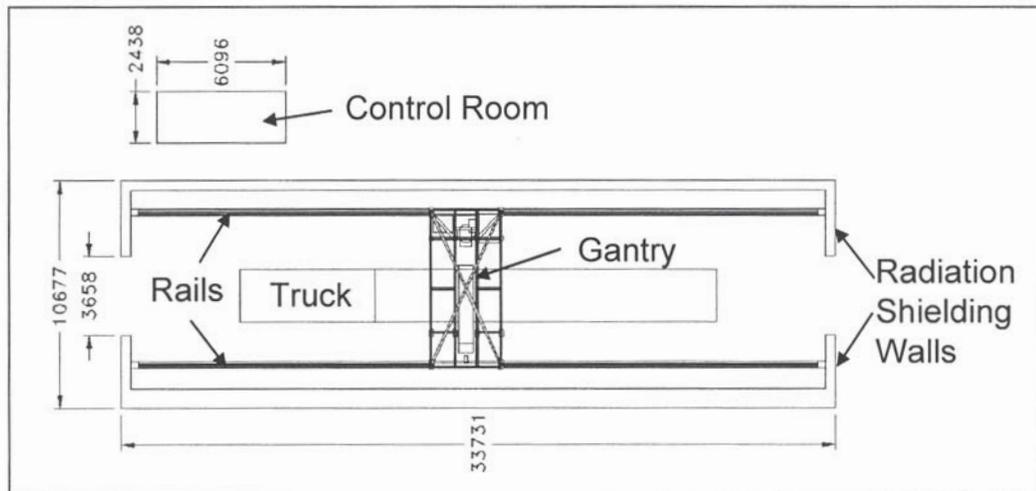
The Eagle Gantry (Figure 11) is a stationary cargo inspection system consisting of An Eagle high-energy x-ray imaging system configured as a rail-mounted gantry with the following principal elements:

- A high-energy x-ray imaging system, including the 6 MV x-ray source, x-ray detector array and computer hardware and software. The gantry supports the x-ray source and detector array and moves them along the rails past the object(s) being inspected.
- The rails, which define the length and width of the inspection zone, can be sized to enable one or more than one vehicle to be inspected at a time.
- A Control Room that houses the operators, inspectors and the workstations used to display and evaluate the x-ray images. To make this facility easily relocatable, a construction trailer is used, which can be moved by truck to another inspection site.
- A concrete wall surrounding the rails and gantry, which provides radiation shielding.
- A security fence surrounding the entire facility, which prevents personnel access and demarks the radiation safety exclusion zone.



The components and typical layout of the Eagle Gantry system are shown in the schematic drawings presented in Figures 12 and 13. (All dimensions are in millimeters.) The system layout is optimized for the specific site and inspection requirements. For example, the length of the system will increase if multiple trucks are to be inspected.





Rails for the Eagle Gantry are installed at the inspection site. The length of the rails defines the length of the inspection zone and the number of vehicles that can be inspected at one time. The site also includes a nearby control room for the inspection facility. The x-ray images are sent to the control room for review by the inspector using the Eagle Gantry's imaging computer and software. From there, images can be wirelessly transmitted to a more remote facility for further evaluation by other inspectors or supervisors.

**Control Room.** The Eagle Gantry's control room accommodates the inspectors and operators and houses some of the system equipment. It is designed to meet specific user requirements, including facilities for multiple inspectors, in order to increase inspection throughput. A design for a rather spacious control room with three inspector stations is shown in Figure 14. This design includes a separate electrical equipment room and space for the x-ray source modulator and the scan control racks. By using a 40 foot trailer, such as a construction trailer, the control room can be lifted by a crane onto a truck and relocated to a new site.

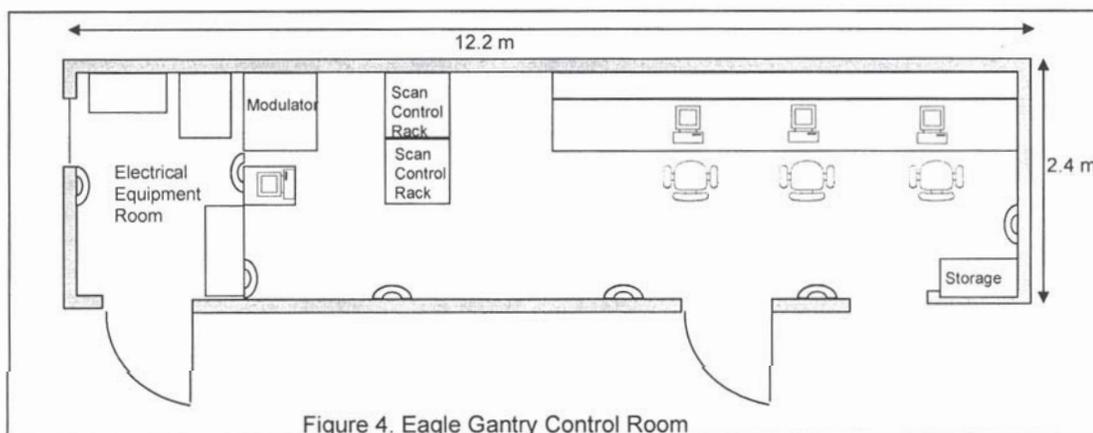


Figure 4. Eagle Gantry Control Room

**Operation.** The Eagle Gantry inspects unoccupied vehicles parked between the rails. At the operator's command, the gantry scans the vehicles as it moves along the length of the rails in either direction (Figure 15). The resulting x-ray image of the vehicles and their cargo is sent to the nearby Control Room, where inspectors review and evaluate the image. The results are used to determine if a vehicle is approved or requires further inspection, including devanning and manual inspection of its cargo.

At its nominal inspection speed of 1 km/hr (55 ft/min), the Eagle Gantry can scan a 60 foot truck in less than 70 seconds. Inspection throughput can be increased by scanning more than one truck at a time and sending the x-ray images to multiple inspectors in the Control Room. For example, three inspectors review the image from one of three trucks.

The Eagle Gantry is designed for highly automated operation, which reduces the size of the crew required to operate the system. One approach is to divide the duties between a crew of two, an operator and inspector. At locations where traffic is light, it is conceivable that an Eagle Gantry inspection site can be manned by one person, who directs the trucks, operates the system and reviews the x-ray images.

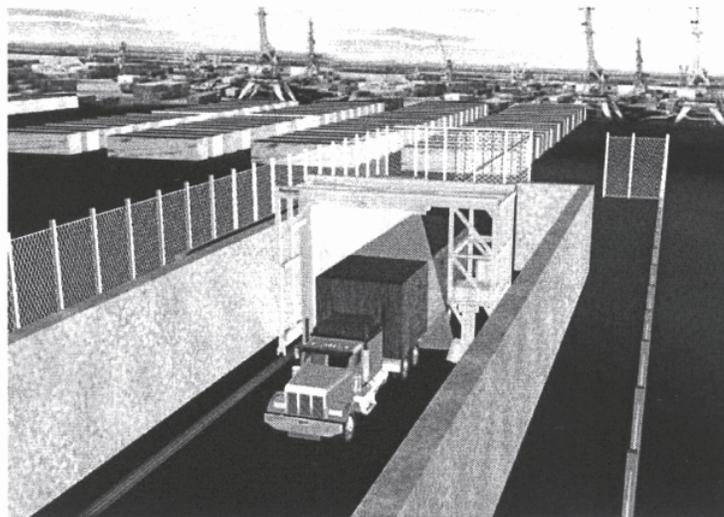


Figure 15: Eagle Gantry in operation

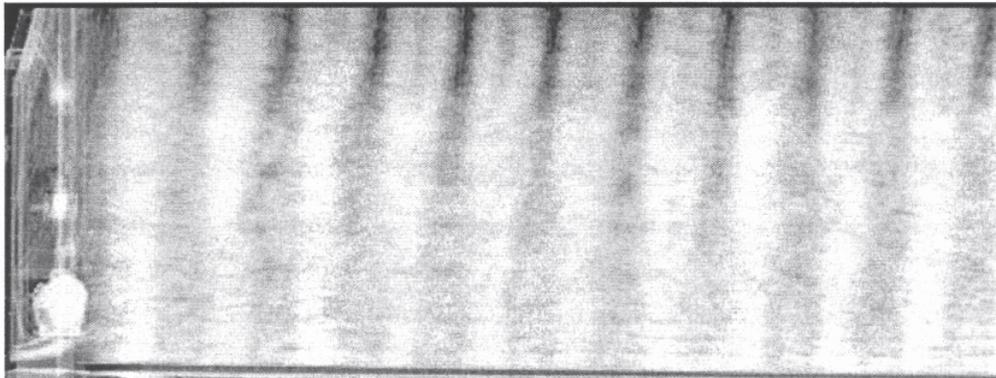
**Radiation Safety.** The Eagle Gantry is designed to be radiation safe for the crew, nearby observers and even stowaways, in accordance with international and local standards.

- Crew - The crew for the system typically includes an operator and inspector. During an inspection, they will be located inside a nearby control room that is shielded to maintain the average dose rate below the allowable level.
- Observers - To protect nearby observers and prevent unauthorized access, the Eagle Portal facility includes radiation shielding, warning lights and alarms, barriers and fences, as appropriate. The dose at the controlled area boundary will meet applicable standards.
- Stowaways - Measurements performed by US Customs and Border Protection have shown that the radiation dose to a stowaway present during an Eagle inspection is approximately 3 to 5% of the limit for the general public and thus poses no health issue. The Eagle Gantry will be even safer and result in lower dose to a stowaway, since it inspects faster than the Eagle.

**Images.** During an Eagle Gantry inspection, the x-ray image is sent to the inspector in the nearby control room. The inspector uses the Image Analysis Workstation, a Windows PC computer system, to view, process, evaluate and store the image. The Rapiscan CargoViewer software includes a comprehensive suite of image processing functions, including contrast and brightness adjustment, magnify/demagnify, edge enhancement, filters, histogram equalization and statistical analysis. The images can be displayed on the flat panel color monitor, saved as a computer file on a disk or a CD-ROM, or printed on a color printer.

The Eagle Gantry employs a 6 MeV x-ray imaging system, like the Eagle. Therefore, estimates of the Eagle Gantry's images can be obtained by examining Eagle images. Examples of Eagle x-ray images are presented in Figures 16-21.

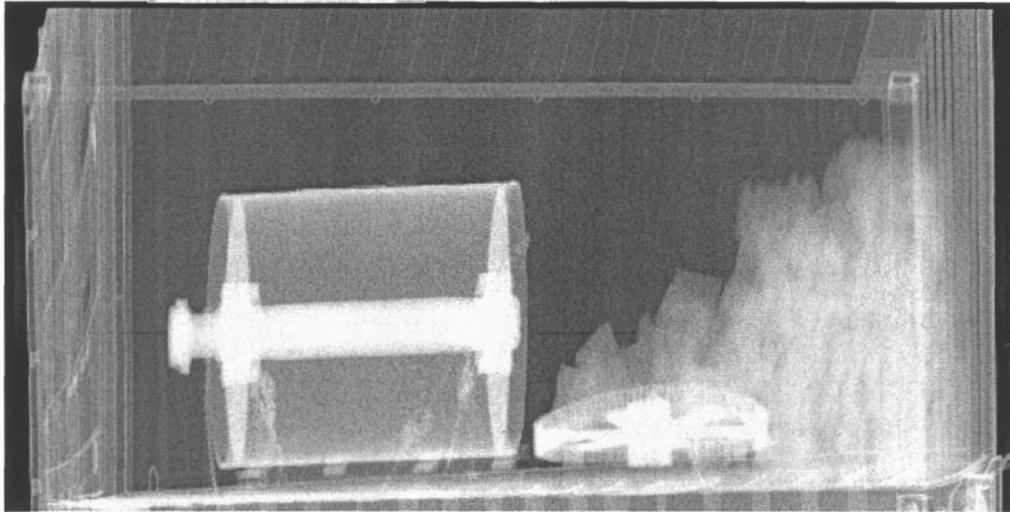
**Frozen Seafood.** Inspection of refrigerated and frozen products, such as seafood, is challenging. However, during service at the Port of Miami, the Eagle demonstrated its capabilities to inspect containers of fish and frozen shrimp. Figure 6 presents an image of a container of fish. Notice that the cargo appears uniform and there are no areas that the Eagle cannot inspect. The Port Authority of Jamaica selected the Eagle, in part, to inspect refrigerated cargo, which could not be inspected with its lower energy, gamma-ray systems.



**Figure 16. A Container of Fish**

**Low and High Density Cargo.** The Eagle has proven its capability to dispel the myth that a high-energy inspection system cannot inspect low density cargo. The container in Figure 17 is transporting two large high-density steel structures. The container is also being used to smuggle a large quantity of marijuana, a low-density "agricultural" product. The Eagle is powerful enough to fully penetrate the steel structures and also reveal the presence of the marijuana. Notice that the Eagle's offset x-ray beam enables the end and floor of the container to be inspected.

**Inspection of Scrap Steel.** The Eagle's 6 MeV x-ray source is powerful enough to penetrate and inspect a container filled with scrap steel. Notice that individual pieces of steel wire are visible in the resulting x-ray image (Figure 18).

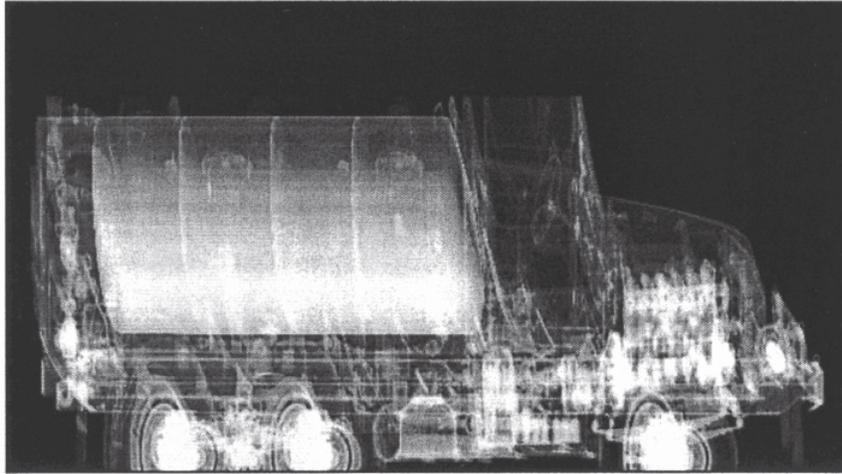


Steel Wire



**Figure 18. Eagle Image of Scrap Steel in a Container**

**Fluid-Filled Tanker Trucks.** Fluid-filled tanker trucks are of particular concern since they have been used to conceal large quantities of explosives in major terrorist events. X-ray inspection of a tanker truck is challenging because it requires penetration of the thick-walled tank and the fluid. However, the Eagle has successfully inspected water and fuel trucks and located objects on the floor of the tank and suspended in the water. In fact, the Technical Support Working Group, a major U.S. antiterrorism agency, has determined that the Eagle is the only mobile system capable of inspecting fluid-filled trucks. An example x-ray image of a water truck is shown in Figure 9.



**Figure 19. Water Truck**

**Contraband Hidden in a Cement Truck.** Weapons and explosives may easily be hidden in a cement truck, which is difficult to inspect manually. However, a pistol, explosive simulants and drug simulants are clearly visible in the Eagle x-ray images of a cement truck shown in Figure 20.

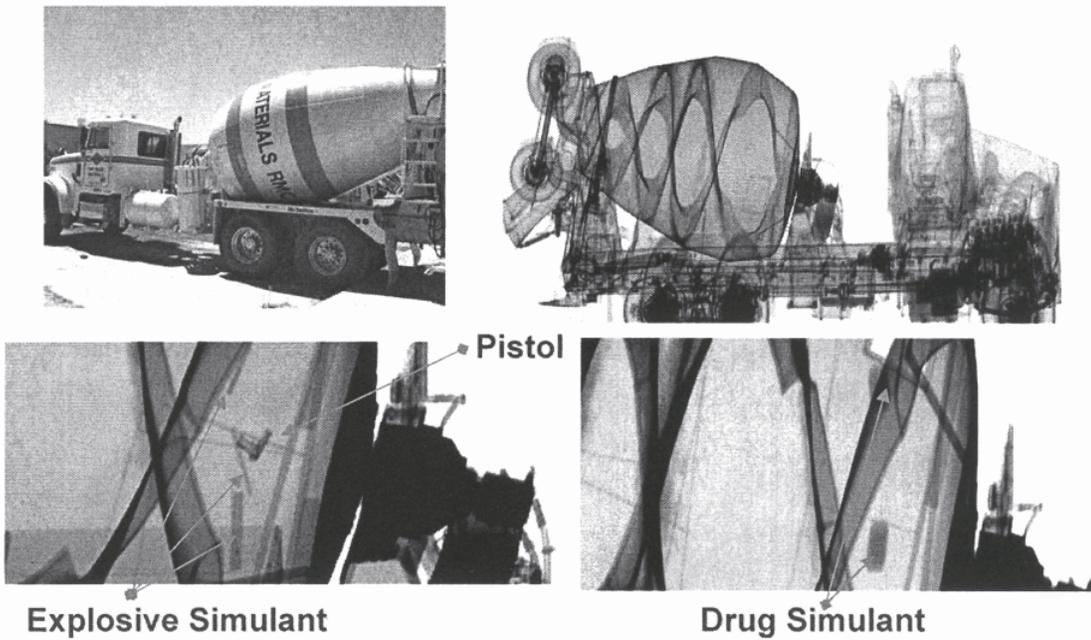
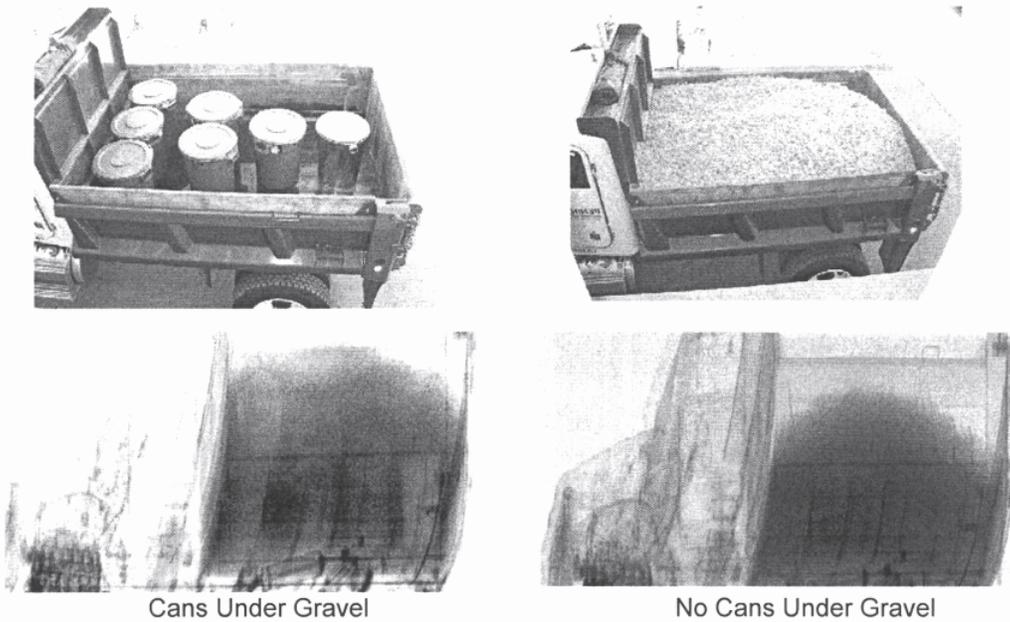


Figure 20. Contraband Hidden in a Cement Truck

**Explosives Hidden in a Gravel Truck.** Trash cans filled with water were used to simulate explosives hidden in a gravel truck. Figure 21 presents x-ray images of the gravel truck with and without the cans hidden under the gravel. Notice that the cans are clearly visible in the x-ray image on the lower left.



**Figure 21. Simulated Explosives Hidden in a Gravel Truck**

**Performance Specifications.** Specific features of the Eagle Gantry are listed in Table 1. In its standard mode of operation, the Eagle Gantry achieves 300 mm of equivalent steel penetration. For applications requiring maximum penetration, the x-ray source output can be increased to obtain up to 375 mm of penetration.

The nominal inspection speed of the Eagle Gantry is 1 km/hr (55 ft/min), which enables a 20 foot container to be scanned in less than 30 seconds or a 60 foot truck in less than 70 seconds. Because the system runs on rails, which define the path of travel, the speed can easily be increased up to 4 km/hr, which decreases the scan time by 80%. However, the impact on overall throughput will depend on other factors, including the time to review the x-ray images and the number of inspectors available to evaluate them.

**Table 3. Eagle Gantry Features**

<b>Inspection</b>	
Inspection Envelope	4.1 m wide x 4.8 m high x length of rails
Single Pass Coverage	0.4 m to 4.5 m above ground
Inspection Speed	0.8 km/hr (nominal); 4 km/hr (optional)
Inspection Direction	Inspects in both directions
<b>X-ray Imaging Performance</b>	
X-ray Source	6 MV linear accelerator; other energies (optional)
Penetration	300 – 375 mm
Resolution	1 - 3 mm
Contrast Sensitivity	2%
Image Depth	16 bits
<b>Operation</b>	
Operators	Minimum of 1
Utilities	Shore or fully self-contained (optional)
Data Transmission	Cable or wireless (optional)
Relocatable	Optional
<b>Radiation Safety</b>	
Dose to Observers	Per US and international standards
Dose to Cargo	< 5 mR

#### **Mobile Baggage and Parcel Screening—Rapiscan 536SV Box Van**

CNTPO wants to provide Pakistan Coast Guard with the ability to establish mobile and/or temporary checkpoints to inspect people and their baggage/parcels. Rapiscan proposes to provide its 536 Single View Box Van which is a Mercedes Chassis with an operator cabin in the box along with a Rapiscan 527 system attached directly to the chassis frame for stability. The systems will be right-hand drive to comply with Pakistan road standards.

The Rapiscan Mobile 536SV (Single View) provides a completely self-contained mobile X-ray screening facility. Mobile systems reduce costs by enabling X-ray screening at many locations with one investment. Security is improved with the ability to rapidly deploy screening without prior notice.

The dual energy Rapiscan Mobile 536SV provides automatic color coding of materials with different atomic numbers so that screeners can easily identify objects within the parcel.

The Rapiscan Mobile 536SV has a large tunnel opening of 1,016mm (40 inches) x 1,016mm (40 inches).

For inspection performance, please review the description of the 500 series systems presented earlier.

### **Mobile People Screening—Rapiscan Metor 160**

To facilitate the spot screening of people at temporary or mobile checkpoints, Rapiscan proposes to supply Metro 160 Walk-through metal detectors to be carried in the Rapiscan 536 Box Vans. The Metor 160s are easily disassembled in three parts with single allen wrench (supplied) and can be carried in the Rapiscan 536 box van to each mobile or temporary checkpoint.

#### **Uniform Detection Field**

The METOR 160 utilizes a patented pulse induction, cross-magnetic field for a more uniform detection. The detection will not vary significantly due to changes in object orientation because of the dual-channel sequentially pulsed magnetic field.

#### **High Discrimination**

The Metor 160 Walk-Through Metal Detector (WTMD) utilizes the pulse induction cross-magnetic field to increase discrimination between threat and non-threat objects. Its digital signal processing and specially designed detection programs allow for a false alarm rate of <5% in favorable conditions.

#### **Walking Speed Compensation**

The Metor 160 maintains a consistent sensitivity over a wide range of walking speeds. Weapons can be reliably detected over a range of walking speeds from 0.2 to 28 feet/second.

#### **Continuously Active**

The Metor 160 is continuously active. At no time is it possible to toss, pass, or slide a weapon through undetected. No photoelectric, infrared, or other sensor device is used to enable and disable the detection circuitry, and thus mask the impact of external interference.

#### **Multiple Unit Operation**

The Metor 160 has several operating frequencies, allowing two or more detectors to operate in close proximity.

#### **Throughput Rate**

The Metor 160 is capable of a maximum throughput rate of over 50 persons per minute. The throughput rate is not limited by the performance of the detector but the human factor during the screening process (walking speed of people, and additional time spent to resolve items on people that caused an alarm, etc.)

### **Relay Outputs**

Alarm relay contacts provide outputs that activate when the WTMD goes into alarm. The relay contacts can handle up to 24VDC or 120VAC at 2A to control external devices.

### **Control Panel**

The Control Panel regulates all of the programming functions of the gate. The Control Panel requires an access code to be entered before the operator can make programming changes. It has a buzzer to signify any alarm state, error messages, or incorrect keypad entries. The display uses LED's to show status (ready or alarm state), signal strength (in a horizontal LED bar graph) and all parameter and error states. It can be placed on all four sides of the detector or be used remotely up to 200 feet away.

### **Access Code Protection**

Parameter adjustments are access code protected. Access code protection eliminates any unauthorized tampering with parameters. Only authorized personnel can change the access code.

### **Programs**

The Metor 160 has 21 detection programs. They are designed to meet a wide assortment of different detection criteria including many International Security Standards. They also include programs designed to detect specific metals and alloys.

### **Sensitivity**

There are 100 sensitivity steps in each program and each of the eight (8) detection zones are individually adjustable in relation to the overall sensitivity from 0% to 255%.

### **Automatic Sensitivity Calibration**

An Automatic Sensitivity Calibration Function enables the detector's sensitivity to be automatically selected for a specific weapon or test object. The user can choose the amount of passes with the test object(s) on which the automatic sensitivity setting is based.

### **Self-Diagnostics**

A comprehensive self-diagnostics system continuously monitors the unit's operation. If a fault condition occurs, an alphanumeric readout shall display the exact nature of the problem. Operating personnel cannot override a fault condition prior to it being corrected.

### **Noise Level Measurement**

The Noise Level Measurement is a special function designed to assist in set-up and troubleshooting in an area where strong electromagnetic interference is present. This function will determine the numerical value of this electromagnetic interference without any special test equipment or computers.

### **Interference Rejection**

The Metor 160 has excellent immunity to outside interference. It will not false alarm due to x-ray units, computer or CCTV monitors, or other electromagnetic interference. It utilizes its five operating frequencies and thirty-six filter combinations to inhibit false alarms created by external interference.

#### **Parameter Memory**

Non-volatile memory is used to store all of the parameters regardless of the power connection. At no time is a battery system required to maintain the parameters when the main power is disconnected.

#### **Power Supply**

Mains, nominal: 100-240 VAC  
Mains, maximum: 90-264 VAC  
Mains frequency (nominal): 45-65Hz  
Battery (optional): 24 VDC

The Metor 160 has the ability to adjust automatically to variations in line voltage from 95 to 250 VAC or 24 VDC without operator intervention. In an installation site where line voltage regulation is a problem, there will be no degradation in WTMD performance.

#### **Operating Temperature**

Ambient operating temperature range: -10°C to 55°C (14°F to 131°F)

#### **Operating Humidity**

Ambient operating humidity range: 0% to 95%, no condensation

#### **Weight & Dimensions**

Weight: 40 kg (88.2 lbs)  
Width: Interior: 760 mm (30") Exterior: 870 mm (34.3")  
Height: Interior: 2010 mm (79.1") Exterior: 2180 mm (85.6")  
Depth: 510 mm (19.9")

#### **Network Connection**

The Metor 160 is able to connect to MetorNet 3 Pro, a remote security monitoring system through ETHERNET.

#### **Standards and Directives**

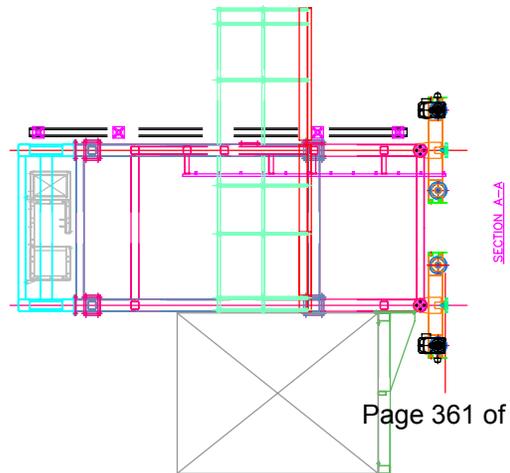
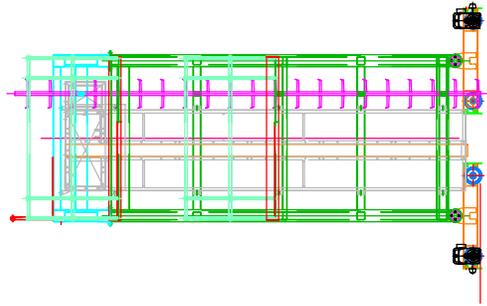
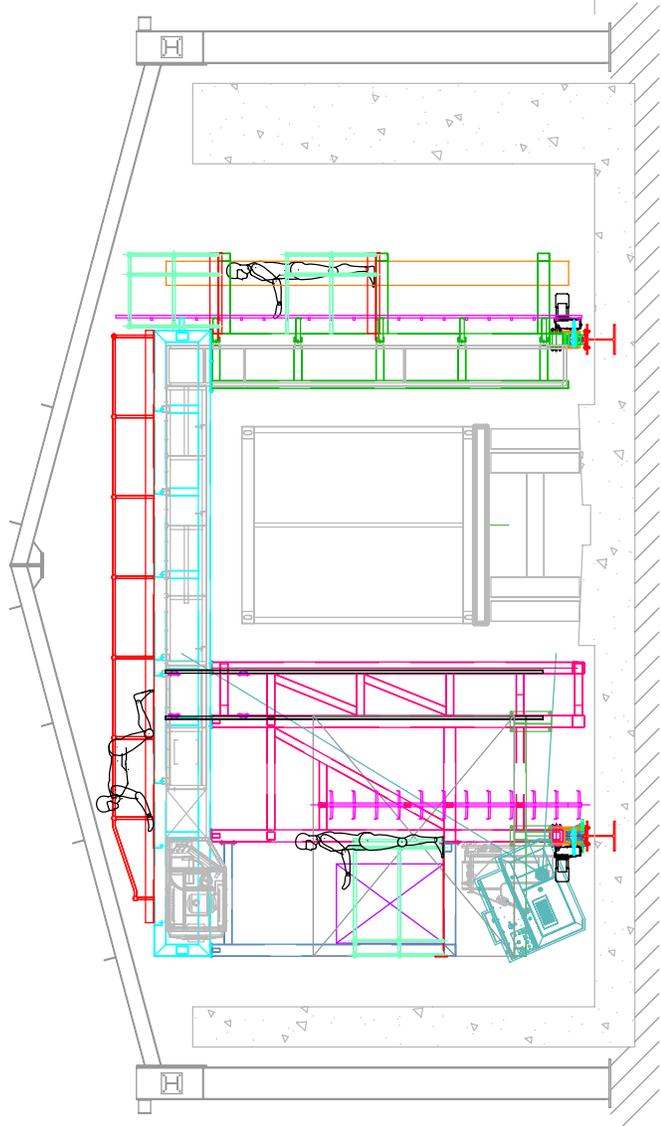
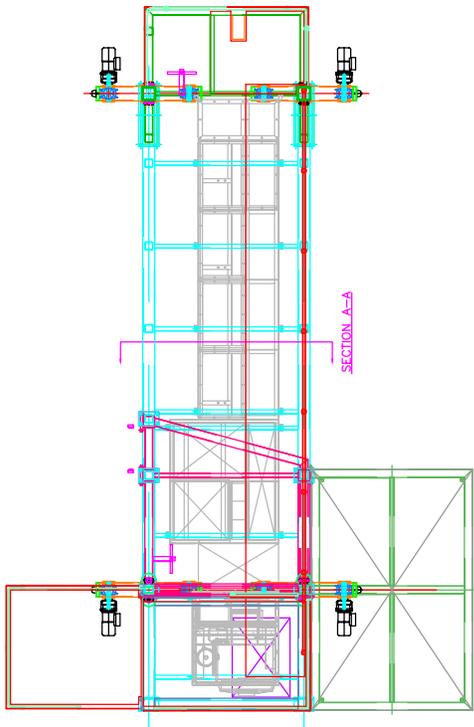
European Electromagnetic Compatibility Directive 89/336/EEC  
EU EMC Standard – EN 61000-6-3:2001 (Emission)  
EU EMC Standard – EN 61000-6-1:2001 (Immunity)  
European Low Voltage Directive 73/23/EEC, 93/68/EEC  
EU Safety Standard - EN 60950 (Electrical Safety)

#### **Compliance**

IEC Standards for Safety Requirements for Electromagnetic Measuring Apparatus  
Federal Communications Commission Class B Standards for noise emission from electrical equipment

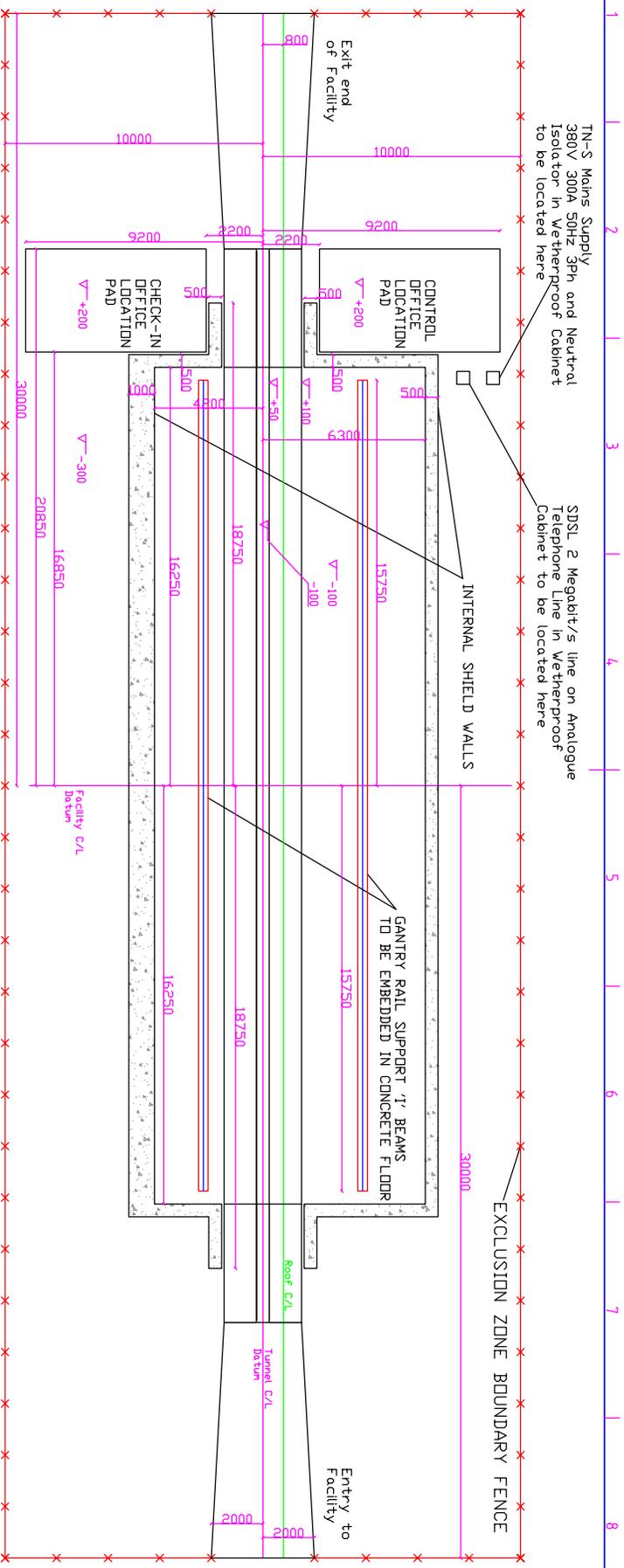
#### **Personal Safety**

Safe for people with pacemakers and pregnant women

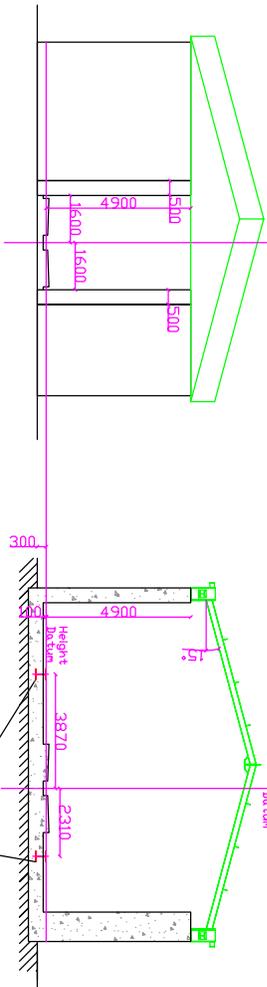


TN-S Mains Supply 300V 50Hz 3Ph and Neutral Isolator in Weatherproof Cabinet to be located here

SDSL 2 Megabit/s line on Analogue Telephone Line in Weatherproof Cabinet to be located here



ENTRANCE/EXIT OF BUILDING



TYPICAL SECTION THROUGH BUILDING

2 number '1' beams to be supplied and cast in to floor by Building Contractor. See Sheet 2 for Beam details

- Notes
- 1 All dimensions are in mm and measured from datum lines identified, except wall thickness and are minimum dimensions for radiation shielding requirements.
  - 2 Final dimensions for Structural strength, building regulations compliance etc are to be determined by Building Contractor.
  - 3 Concrete for shield walls must have finished dry density of not less than 2350 kg/m<sup>3</sup>.
  - 4 Building to be designed to protect the Gantry from direct solar gain and incident weather conditions, e.g. snow, dust storms etc.
  - 5 Entrance/Exit shows minimum door portal required. If any 'Roller/shutter' door is fitted for weather protection etc it must not obstruct Tunnel access.
  - 6 Suitable foundations to be determined by Building Contractor

**Rapiscan**  
systems  
An OSI Systems Company

ISS	DESCRIPTION	DATE
1	Issue 1	11/06
	AI	

Scale :  
NOT TO SCALE

Sheet Size :  
A1  
Dimensional Tolerances  
All dimensions are in mm  
0.0  
0.00  
0.01  
0.02  
0.05  
0.10  
0.15  
0.20  
0.25  
0.30  
0.40  
0.50  
0.60  
0.70  
0.80  
1.00  
1.50  
2.00  
3.00  
4.00  
5.00  
6.00  
8.00  
10.00  
15.00  
20.00  
25.00  
30.00  
40.00  
50.00  
60.00  
80.00  
100.00

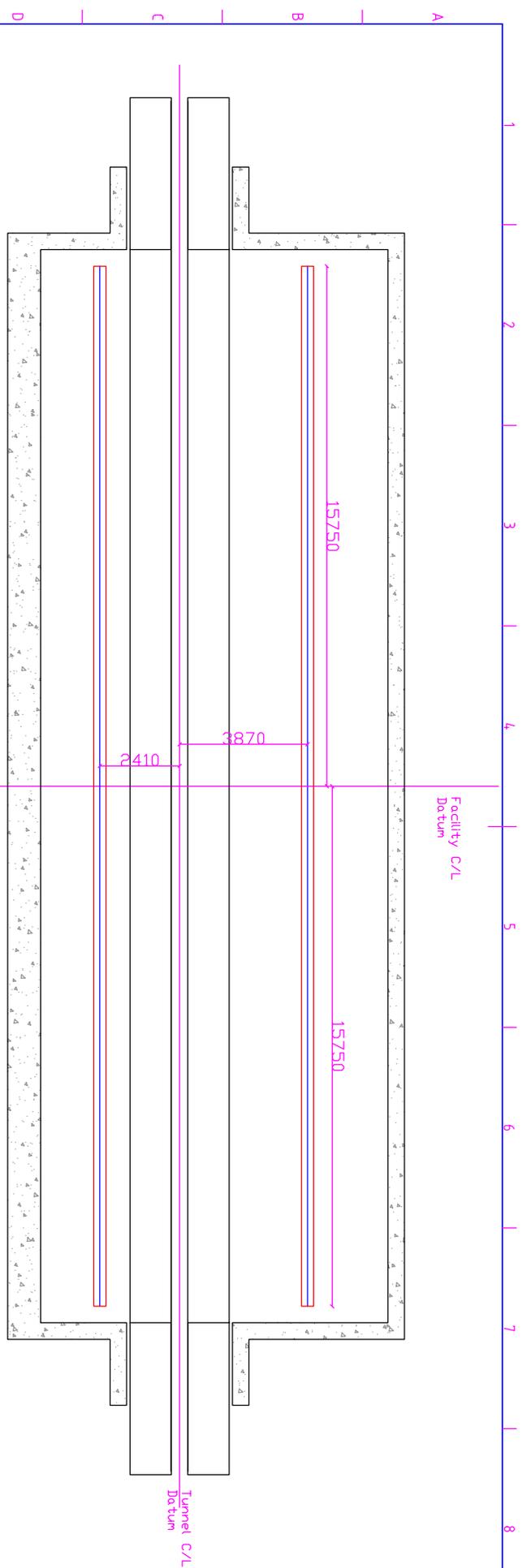
This drawing (including the copyright therein) is owned by Rapiscan Systems, the drawing and contents are confidential and used solely for the purposes specified by the owner. This drawing must not be copied or reproduced, nor divulged in whole or part without the owners prior written consent.

Projection  
Can be used for location  
1:100  
AKA

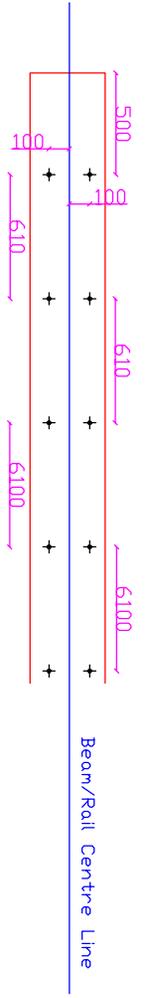
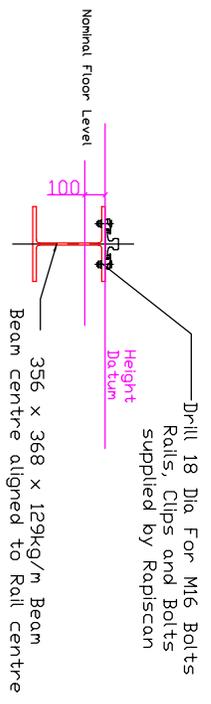
Title  
General Layout sheet 1 of 2  
Site Infrastructure  
To be Supplied by Others  
Project 1  
Position 6 Main Gantry

DRN	APPD	ENG	DATE
AA	AA	AA	11/06

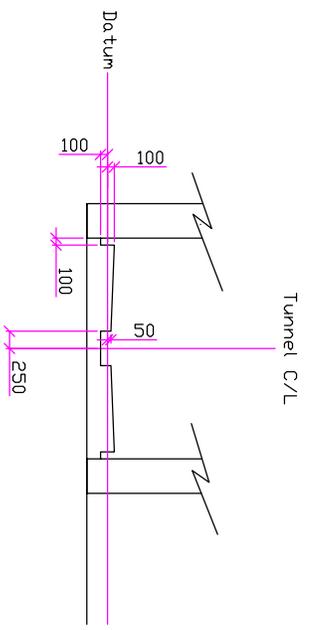
Drawing No.  
GA/76999



Quantity 2 'I' Beams cast into floor, Contractor, to be supplied and fitted by Building Contractor. Beams to be 356 x 368 x129 Kg/m. Beams to be predrilled as shown prior to installation. Beams to be flat and level to Height Datum to +/- 1 mm, along full length and must be parallel to each other within +/- 2 mm from nominal rail centres.



Beam Drilling Detail, 18 mm diameter holes at 610 mm centres, starting at 500 mm from Beam end, Pair of holes at each location at +/- 100 mm from Beam Centre Line



An OSI Systems Company

ISS	DESCRIPTION	DATE
1	Issue 1	11/06

Scale : NOT TO SCALE  
 Sheet Size : A1

Dimensional Tolerances	Dimensional Tolerances
All dimensions are in mm	All dimensions are in mm
0.0	±0.2 mm
0.00	±0.1 mm
0.05	±0.3 mm
0.1	±0.5 mm

This drawing (including the copyright therein) is owned by Rapiscan Systems, the drawing and content is confidential and used solely for the purposes specified by the owner. This drawing must not be copied or reproduced, nor divulged in whole or part without the owner's prior written consent.

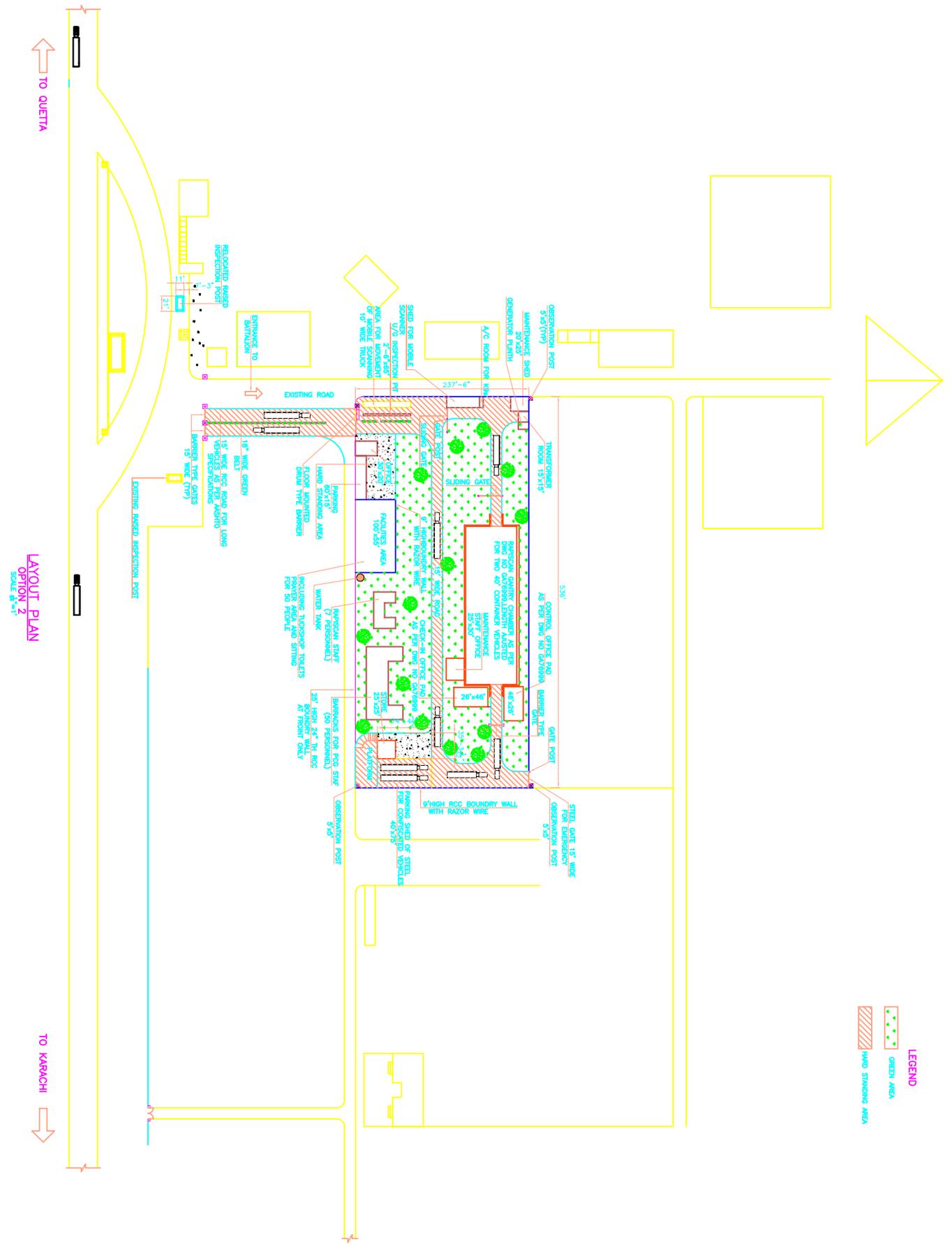
The drawing (including the copyright therein) is owned by Rapiscan Systems, the drawing and content is confidential and used solely for the purposes specified by the owner. This drawing must not be copied or reproduced, nor divulged in whole or part without the owner's prior written consent.

DRAWN	APPD	ENG	DATE
AA	AA	AA	11/06

Title: General Layout sheet 2 of 2  
 Site Infrastructure  
 To be Supplied by Others  
 Project: Podkaton 6 Melb Gentry

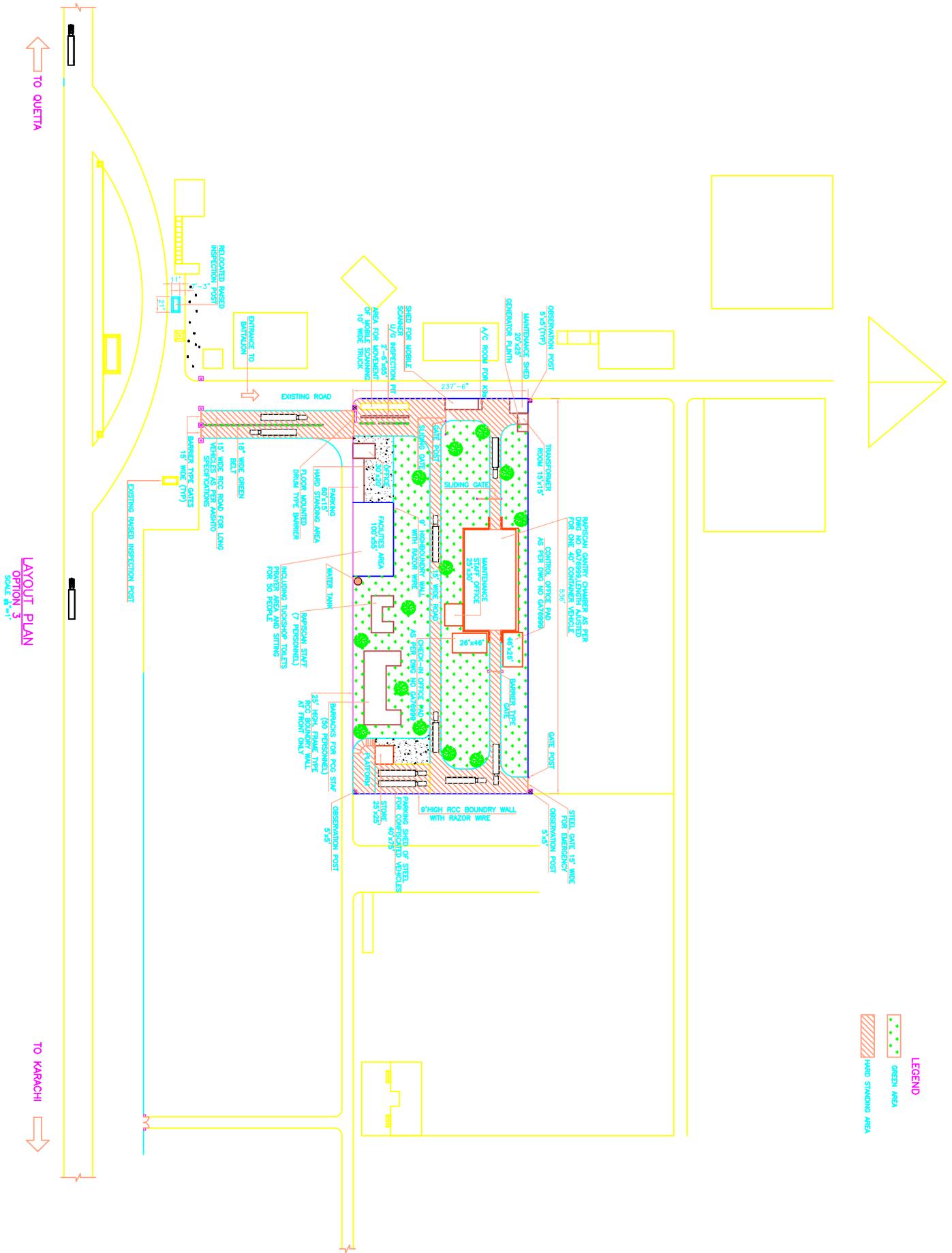
Drawing No. GA/76999





LAYOUT PLAN  
OPTION 2  
SCALE 1/4"=1'



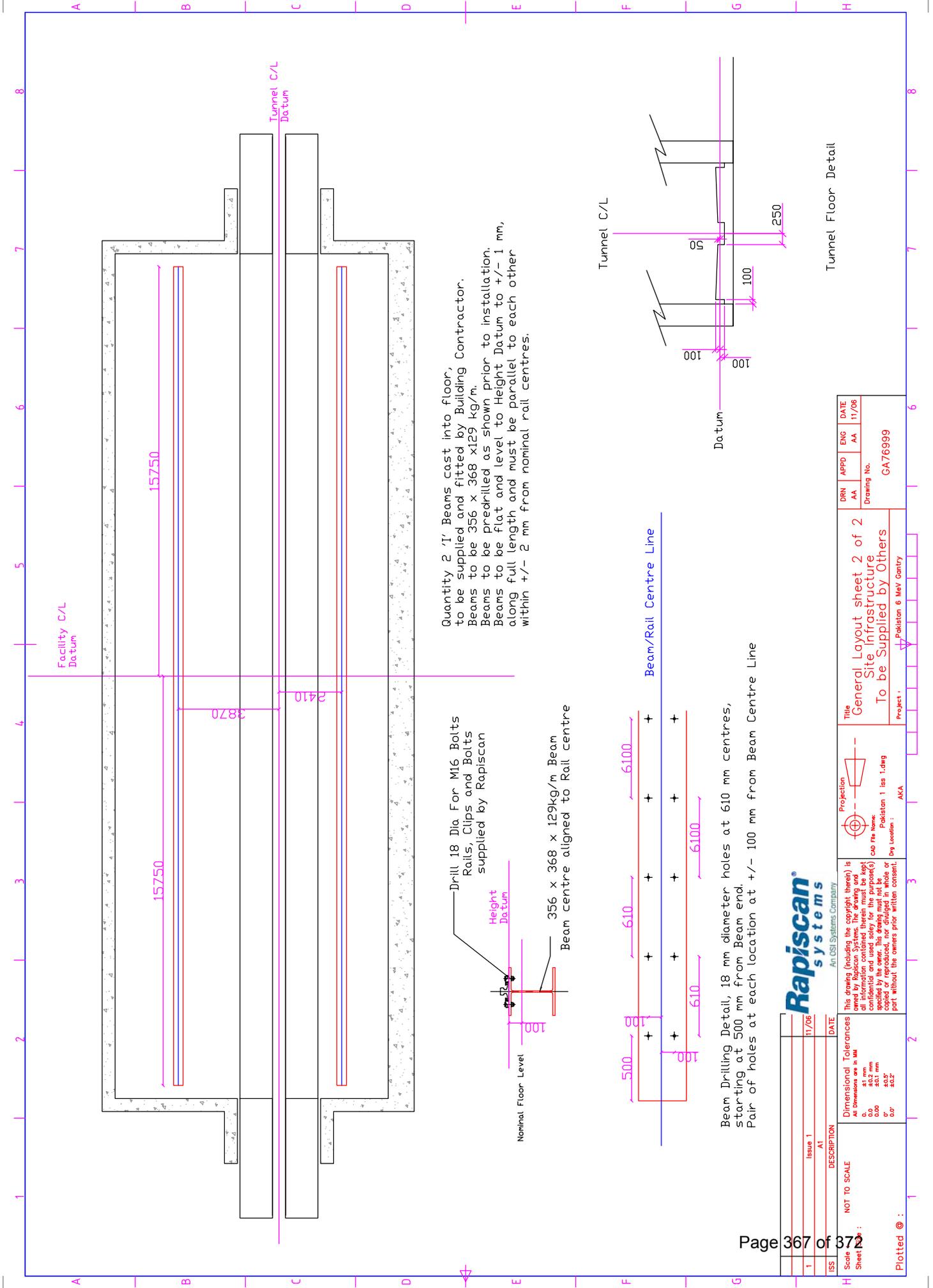


LAYOUT PLAN  
OPTION 3  
SCALE 1/4"=1'

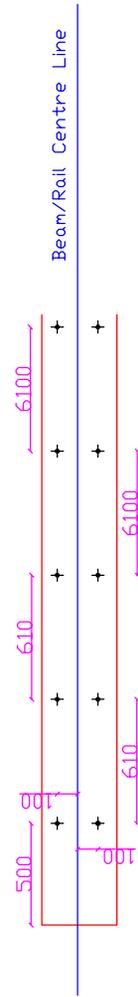
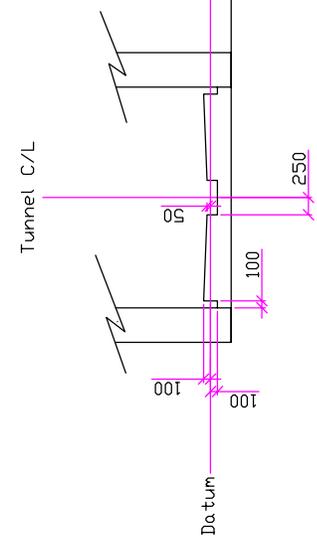
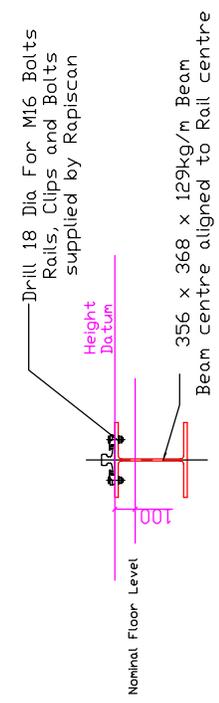
TO QUETTA

TO KARACHI





Quantity 2 'I' Beams cast into floor, to be supplied and fitted by Building Contractor. Beams to be 356 x 368 x129 kg/m. Beams to be predrilled as shown prior to installation. Beams to be flat and level to Height Datum to +/- 1 mm, along full length and must be parallel to each other within +/- 2 mm from nominal rail centres.



Beam Drilling Detail, 18 mm diameter holes at 610 mm centres, starting at 500 mm from Beam end. Pair of holes at each location at +/- 100 mm from Beam Centre Line

ISS	NOT TO SCALE	DATE	11/06
Scale	Dimensional Tolerances	DESCRIPTION	Issue 1
Sheet	All dimensions are in MM	A1	
Plotted	±0.2 mm		
	0.00		
	±0.1 mm		
	±0.2'		
	0.0'		

**Rapiscan**  
systems  
An OSI Systems Company

This drawing (including the copyright therein) is owned by Rapiscan Systems, the drawing and its contents are confidential and used solely for the purpose(s) specified by the owner. This drawing must not be copied or reproduced, nor divulged in whole or part, without the owners prior written consent.

Projection:

Use File Number: Pakistan 1 Iss 1.dwg  
Proj Location: AKA

DRN	APPD	ENG	DATE
AA	AA	AA	11/06
Drawing No.		GA76999	
Title		Project	
General Layout sheet 2 of 2		Pakistan 6 May Gantry	
Site Infrastructure		To be Supplied by Others	

Tunnel Floor Detail

# **APPENDIX IV**

# Rapiscan Eagle® Gantry

**Rapiscan**  
systems

An OSI Systems Company

## CARGO AND VEHICLE INSPECTION

Automated

Rapid Scanning

High-Energy

Relocatable



The **Rapiscan Eagle® Gantry** incorporates proven high energy X-ray imaging technology in a rail-mounted inspection system capable of rapid, automated scanning of dense cargo and vehicles. The linear accelerator X-ray source and X-ray detectors are mounted on an electric-powered gantry that runs on rails. The system automatically scans unoccupied vehicles parked between the rails as the gantry moves over them. The length of the rails determines the number of vehicles that can be scanned in a single pass. The gantry is remotely controlled from a nearby or remote facility, where the X-ray images are sent for examination and evaluation. The **Rapiscan Eagle Gantry** is designed for automated operation by a minimum number of personnel. Therefore, it is well-suited to cargo screening at entrances to critical facilities and border crossings, as well as seaports. The unit can also be readily disassembled and shipped to another location, requiring only that a set of rails be laid at the new site.

- Automatically scans densely loaded containers and vehicles
- Scans a 20-foot container in less than 10 seconds
- Rapid scanning supports high throughput
- 6 MV linear accelerator X-ray source
- Proven high-energy X-ray imaging technology
- Easy-to-use Cargo Viewer software for image evaluation
- Operated by as few as one crew person
- Radiation safe for operators, observers and stowaways
- Available in relocatable model

### CUSTOMER SUPPORT SERVICES

Our team is dedicated to providing a prompt, effective and personalized response that exceeds your expectations. With spare parts inventory and skilled technicians all over the world, you can be certain Rapiscan Systems will always be prepared with a solution to address your requirements. By measuring response time, parts delivery and support status, our team embraces a customer centric philosophy to ensure continual improvement of our products and services.



### EAGLE PRODUCT FAMILY

Rapiscan Systems offers Eagle high energy X-ray systems designed to meet the full range of cargo inspection applications. Their linear accelerator X-ray sources penetrate even the densest cargo. The resulting high quality images enable inspectors to detect hidden contraband, including weapons, explosives, weapons of mass destruction, drugs, and undeclared goods. All Eagle systems meet applicable USA and international radiation safety standards.

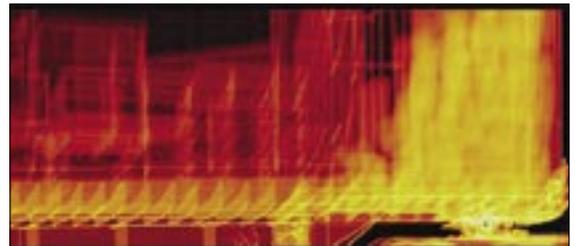
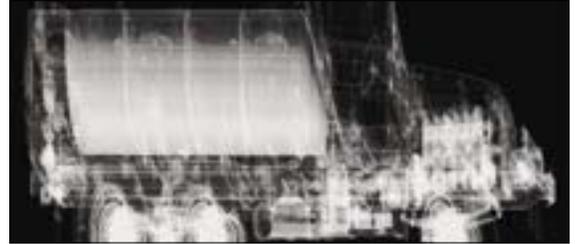
**MOBILE SYSTEMS:** The truck-mounted, road mobile Eagle Mobile and the easily relocatable, locally mobile Eagle provide operational flexibility in a variety of demanding screening environments.

**GANTRY AND PORTAL SYSTEMS:** High inspection throughput is achieved with the Eagle Gantry system, the drive-thru Eagle Portal system for trucks and Eagle Railcar system for trains.

**CARGO INSPECTION FACILITIES:** With their 6 or 9 MV linear accelerators, the Eagle Fixed and Eagle Relocatable systems have the highest X-ray imaging performance of all the Eagle products.

Page 369 of 372

## CARGO AND VEHICLE INSPECTION



SPECIFICATIONS	
X-ray Energy	6 MV
Inspection Envelope	4.1 m wide x 4.8 m high x length of rails
Single Pass Coverage	0.4 m - 4.5 m above ground
Inspection Speed	0.8 - 4 km/hr
Inspection Direction	Inspects in both directions
Penetration	300 - 380 mm of steel
Resolution	1 mm in air
Contrast Sensitivity	2%
Image Depth	16 bits
Crew	Minimum of 1
Utilities	Shore or fully self-contained (optional)
Data Transmission	Cable or wireless (optional)
Relocatable	Optional
Dose to Observers	Per USA and international standards
Dose to Cargo	30 µSV

9150097-1

### ISO 9001:2000 Certified

With continual development of our products Rapiscan Systems reserves the right to amend specifications without notice.

[www.rapiscansystems.com](http://www.rapiscansystems.com)

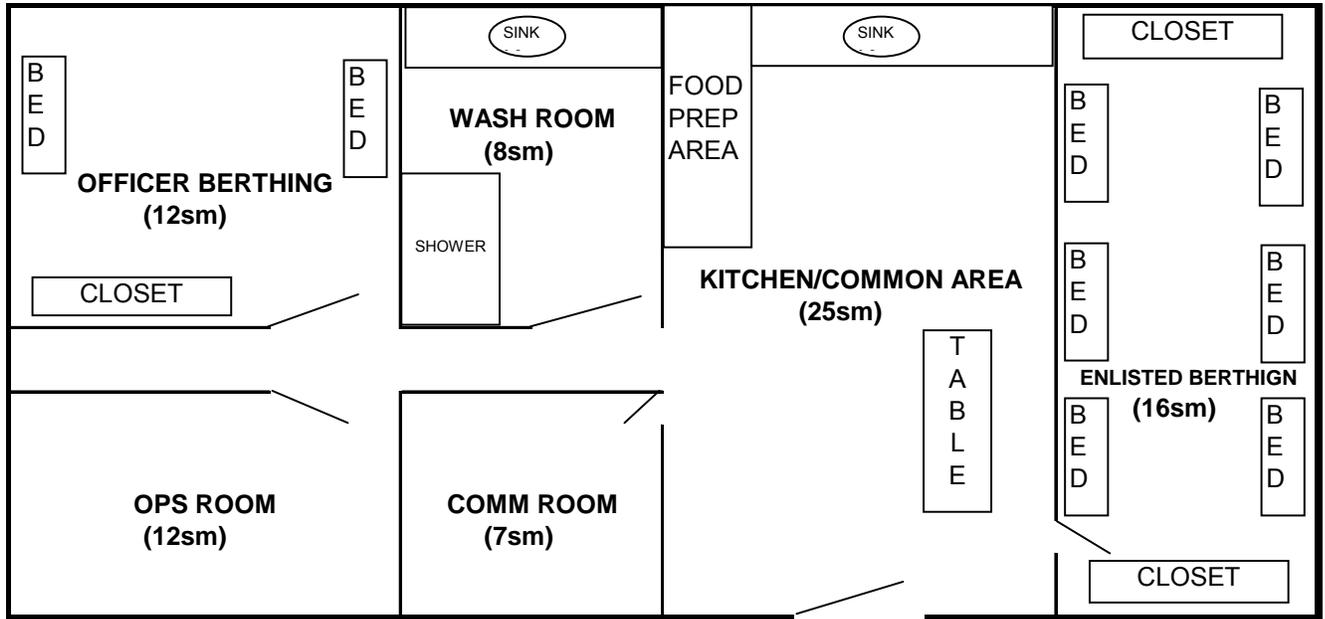
**UNITED STATES OF AMERICA**  
3232 W. El Segundo Blvd.  
Hawthorne, California 90250  
UNITED STATES OF AMERICA  
Tel: +1 310-978-1457  
Fax: +1 310-349-2491  
**E-MAIL**  
sales@rapiscansystems.com

**UNITED KINGDOM**  
X-Ray House  
Bonehurst Road  
Salfords  
Surrey RH1 5GG  
UNITED KINGDOM  
Tel: +44 (0) 870-7774301  
Fax: +44 (0) 870-7774302

**ASIA PACIFIC**  
240 Macpherson Road  
#06-04 Pines Industrial Building  
Singapore 348574  
SINGAPORE  
Tel: +65-6743-9892  
Fax: +65-6743-9885 / 6743-9915

# **APPENDIX V**

### GENERAL FLOOR PLAN LAY OUT



**General Floor Plan Layout**  
**(Square footages specified within each room are approximate)**