Solicitation No. W5J9LE-13-R-0002

US Army Corps of Engineers
Afghanistan Engineer District South

Kajaki Dam – Irrigation Tunnel Works

Helmand Province, Afghanistan

Project Specifications And Drawings

October 2012

TABLE OF CONTENTS

Section	Title
00 00 10	Bid Schedule
00 07 00	General Clauses
00 08 00	Design Build Clauses
00 55 50	Design Concept Documents
01 01 40	Summary of Work
01 01 50	Technical Requirements
01 06 00	Special Clauses
01 10 00.25	Contract Administration Data
01 22 00	Measurement and Payment
01 32 01	Project Schedule
01 33 15	Submittal Procedures for Design Build Projects
01 33 15A	Attachments AES
01 33 15B	E-Submittal Format
01 33 15-2	Project Identification
01 33 16	Design Build After Award
01 35 26	Safety and Occupational Health Requirements
01 35 50	Environmental Protection
01 40 00	Security Plan
01 41 50	Metric Measurements
01 45 00	Contractor Quality Control
01 45 00.10	Quality Control System
01 58 00	Project Identification (with attachment TAS Signage)
01 64 00	Start Up Testing and Commissioning
01 66 40	Training
01 78 00	Closeout Submittals
01 78 10	Operation and Maintenance Data
35 20 16.29 25	Cone Valve Operating Mechanism (Roto)
35 20 19.23 25	A1 Fixed Cone Valve Configuration
35 20 19.23 25	Fixed Cone Valve (Regulating)
41 24 26.00 25	Hydraulic Power System and Cylinders (Roto)
APPENDIX A	Photos and Drawings
APPENDIX B	List of Applicable Design Guide and Codes
APPENDIX C	Historical Documents
APPENDIX D	Government Design Reviews

SECTION TABLE OF CONTENTS

DIVISION 00 – GENERAL REQUIREMENTS

SECTION 00 55 50

DESIGN CONCEPT DOCUMENTS

PART 1 GENERAL 3

1.1 ENGINEERING AND DESIGN CRITERIA 3

1.2 BASIS FOR DESIGN 3

1.2.1 ADDITIONAL DOCUMENTS FOR BASIS OF DESIGN 3

1.3 SPECIFICATIONS 4

1.4 ORDER OF PRECEDENCE 4

1.5 ADDITIONAL DOCUMENTS/CRITERIA FURNISHED BY THE GOVERNMENT 4

PART 2 PRODUCTS 4

PART 3 EXECUTION 4

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 00 55 50
DESIGN CONCEPT DOCUMENTS

PART 1 GENERAL

This section establishes the concept, basis for the project design and/or the basis of construction. These requirements are minimum standards and may be exceeded by the Offeror. Deviations from these concepts, standards and design drawings may be approved if considered by the Government to be in its best interests.

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

1.1 ENGINEERING AND DESIGN CRITERIA

General design requirements are set forth in this document herein. The Contractor shall use the list of applicable guides, industry standards, codes, and USACE Corps of Engineers publications provided in Appendix B for design. The publications in Appendix B shall be used for design and incorporated by reference into the appropriate contract specifications. The Specifications Divisions 02 thru 48 are the primary specifications criteria for the project. No design criteria will be furnished by the Afghanistan Engineer District South except that which may be required for design and IS NOT available from commercial sources or from the Construction Criteria Base (CCB) or 'Techinfo' website located at http://www.wbdg.org/ccb/ . The references within CCB must be obtained by the A/E if the criteria are required or desired. All design, unless otherwise specified, shall be based on nationally recognized UFGS industry standard, criteria, and practice.

1.2 BASIS FOR DESIGN

All known original design drawings are included in Appendix A. Many of these are not redline drawings certified "as-built" by the designer of record. These are the only drawings known to still exist (as-built or otherwise).

Relevant historical documents supporting the basis for design are provided in Appendix C. This includes the original design report (1956), subsequent inspections of the irrigation conduits (1964), and original manuals and catalogue sheets for the valves.

1.2.1 ADDITIONAL DOCUMENTS FOR BASIS OF DESIGN

A copy of the relevant documents prepared by the government for defining the scope of work in this invitation to bid is attached. Appendix C contains historical documentation such as O&M manuals and previous assessments of the tunnel works that indirectly support design. Appendix D contains recent documentation that directly supports design including:

- USACE Value Engineering Alternative for the Irrigation Intake Structure (2011)
- Government Review of existing and historical conditions for mechanical features in downstream tunnel
- Government Topographic Survey Report
- Layout Drawings for Tunnel Access
- Photos illustrated with access to the intake tower
- Photos illustrated with access to the jet valves
- Photos illustrated with access to the roto valves
- Government review of tail water elevations
- Concept for Modified Bulkhead

- Kajaki Spillways Report Rev February 2012
- Diving Inspection Report for Intake Tower and Apron at outlet works

1.3 SPECIFICATIONS

Specifications shall utilize the design criteria herein and follow the format for Specifications Divisions 02 through 46 of the UFGS. The successful Offeror shall develop complete construction specifications using the criteria included in these specifications.

The Government will provide Division 1 specifications sections (this solicitation) as required, to the successful Offeror; and these sections shall be included in the final construction specifications without change. The Contractor shall furnish these specifications on electronic media for the production of construction specifications when requested. These specifications shall be submitted together with other required contractor prepared project construction documents according to Section 01 33 16 DESIGN BUILD AFETR AWARD and Section 01 33 15 SUBMITTAL PROCEDURES FOR DESIGN-BUILD PROJECTS.

1.4 ORDER OF PRECEDENCE

In case of conflict, duplication, or overlap of design criteria specified in the documents referenced in this section the contractor shall submit a Request for Clarification to the Contracting Officer's Representative for resolution.

1.5 ADDITIONAL DOCUMENTS/CRITERIA FURNISHED BY THE GOVERNMENT

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

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

b. Commercial design criteria and prescriptive specifications will be furnished by the Government where required for two main features of the Contract, i.e. specifications for the new Fixed Cone Valves, specifications for the refurbishment of actuators for the RotoValves and specifications for the new Hydraulic Power Units (HPU's) to power the RotoValve actuators. Commercial specifications for other items in the contract will not be provided.

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

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- END OF SECTION --

SECTION TABLE OF CONTENTS

DIVISION 01 – GENERAL REQUIREMENTS

SECTION 01 01 40

SUMMARY OF WORK

TABLE OF CONTENTS

PART 1 GENERAL 3

1.1 SUMMARY 3

1.1.1 Project Background 3

1.1.2 Coordination 7

1.1.3 English Language Requirement 7

1.1.4 CQM Training Requirement 7

1.2 SUBMITTALS 7

1.3 UNEXPLODED ORDINANCE (UXO)/MINES 7

1.4 WORK COVERED BY CONTRACT DOCUMENTS 8

1.5 MANDATORY WORK 8

1.5.1 General Work Items 8

1.5.2 Intake Structure 9

1.5.3 Tunnel Works 9

1.5.4 Dam Safety Instrumentation - Design and Construction 11

1.6 OPTIONAL ITEMS 11

1.7 Contract Drawings 11

1.8 Photos and Recent Inspections 12

1.9 Design Guidance 12

1.10 Occupancy of Premises 12

1.11 Existing Work 12

PART 2 PRODUCTS 12

PART 3 EXECUTION 12

THIS PAGE INTENTIONALLY LEFT BLANK

PART 1 GENERAL

1.1 SUMMARY

This section provides a summary of the various Contract work elements and their relationship to each other. This section shall be used in conjunction with all the other sections and the drawings to establish the total work requirements.

1.1.1 Project Background

Kajaki Dam serves a multi-purpose role in supplying hydropower, irrigation storage and, to a lesser extent flood control. Kajaki Dam is the primary source of sustainable power for the Kandahar City and Lashkar Gah regions. Kajaki Dam is an integral part of a larger irrigation scheme in Helmand and Kandahar Provinces and is regulated by the Helmand Arghandab Valley Authority under Ministry of Energy and Water (MEW). The project location and a plan of the reservoir are shown on Figures 1 and 2 respectively.

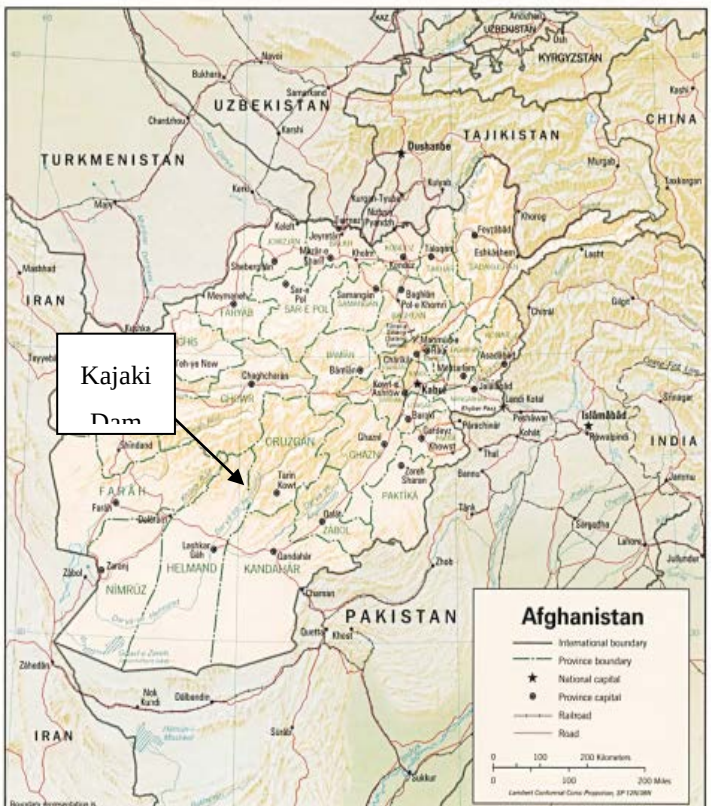


Figure 1. Location Map of Kajaki Dam

The dam site is accessible by road from Kandahar, travelling west through Marwand to Girishk, then turning north up the Helmand River Valley on the east side.

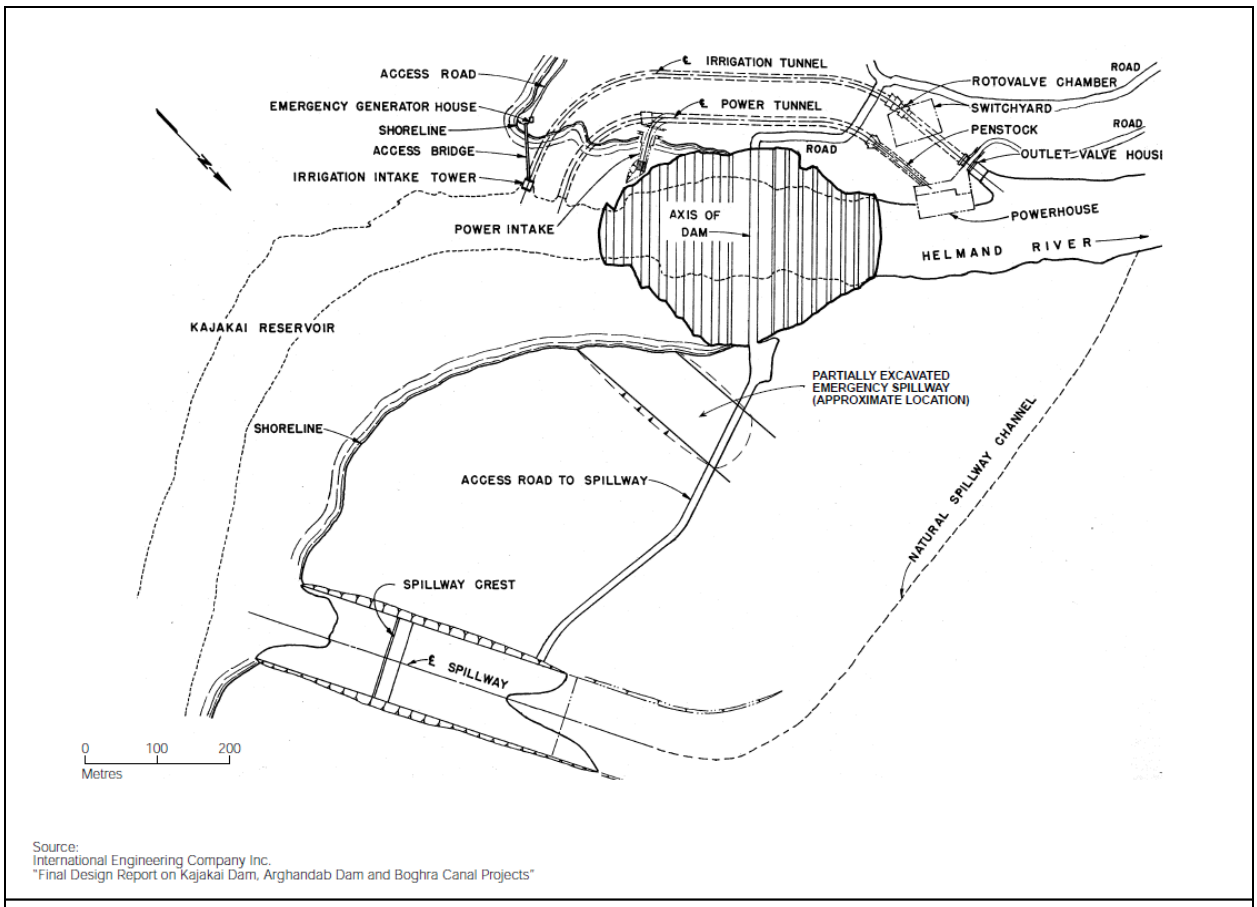


Figure 2. General Layout of Kajaki Dam Site.

Kajaki Dam was constructed in the early 1950s. A 33MW Power House project was added in 1975 and two of three turbines were installed and commissioned. However, during the Russian occupation, all work on the spillways stopped and maintenance has since been inconsistent. Many components have become inoperable or their condition is unknown as described below. Work to install Unit 2 in the powerhouse is ongoing under separate contract.

The service and emergency spillways for the dam were never completed. As a result, the reservoir has been operating at a pool elevation that is significantly lower than intended. The emergency spillway has not been excavated below the dam crest, and therefore is entirely unusable. The service spillway was partially completed, with some concrete foundation. When the reservoir reaches this elevation, water flows freely over the partial structure and into the river below the dam. Completion of the service and emergency spillways is not a part of this contract.

The Kajaki Irrigation Intake Structure system consists of an intake structure in the reservoir with two bulkheads (i.e. concrete STOP-LOG and steel WHEEL-GATE), unlined tunnel, emergency closure valves (a.k.a. ROTO-VALVES), and outlet service valves (a.k.a HOLLOW JET VALVES). The jet valves are the service control for regulation of flow and dissipation of energy, and the roto valves are for emergency closure. The intake structure is shown in Figure 3, Roto Valves and auxiliary equipment are shown in Figure 4, Jet Valves in Figure 5, and the Spillways are shown in Figure 6.

Reservoir water enters the system at the intake tower, which is located at the portal to one of the project diversion tunnels. A concrete bulkhead and a wheeled gate are suspended in slots which may be lowered with a hoist to close openings at the intake portal. Trash racks are located in slots upstream of the intake portals. Water flows through the diversion tunnel to a concrete plug where the water is distributed to the entrance of three large steel pipe lines (conduits). Each conduit is equipped with a Roto Valve just downstream of the concrete plug and a Hollow Jet

valve located at the end of the line. Water is also distributed to a 12-inch diameter penstock with valve feeding the micro-hydro-electric turbine that provides power service to the tunnel works.

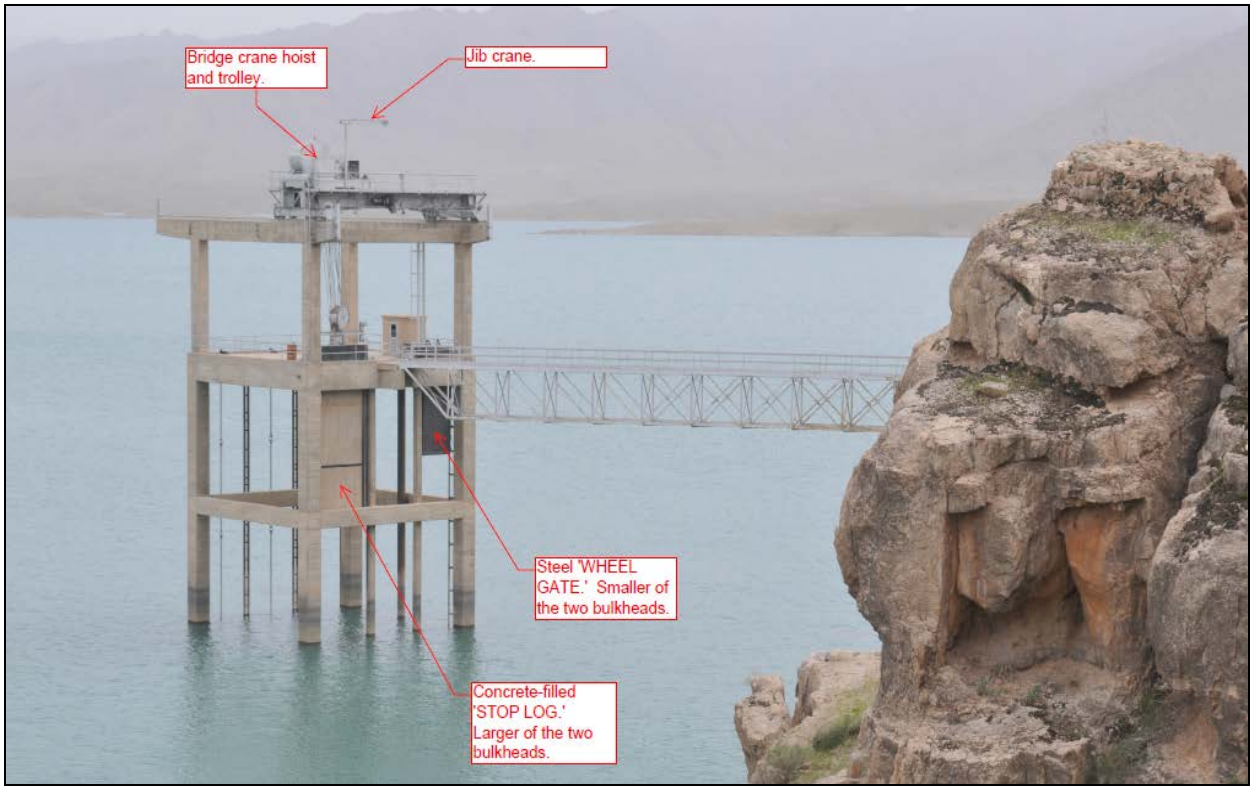


Figure 3. View of Irrigation Intake Structure from shore.

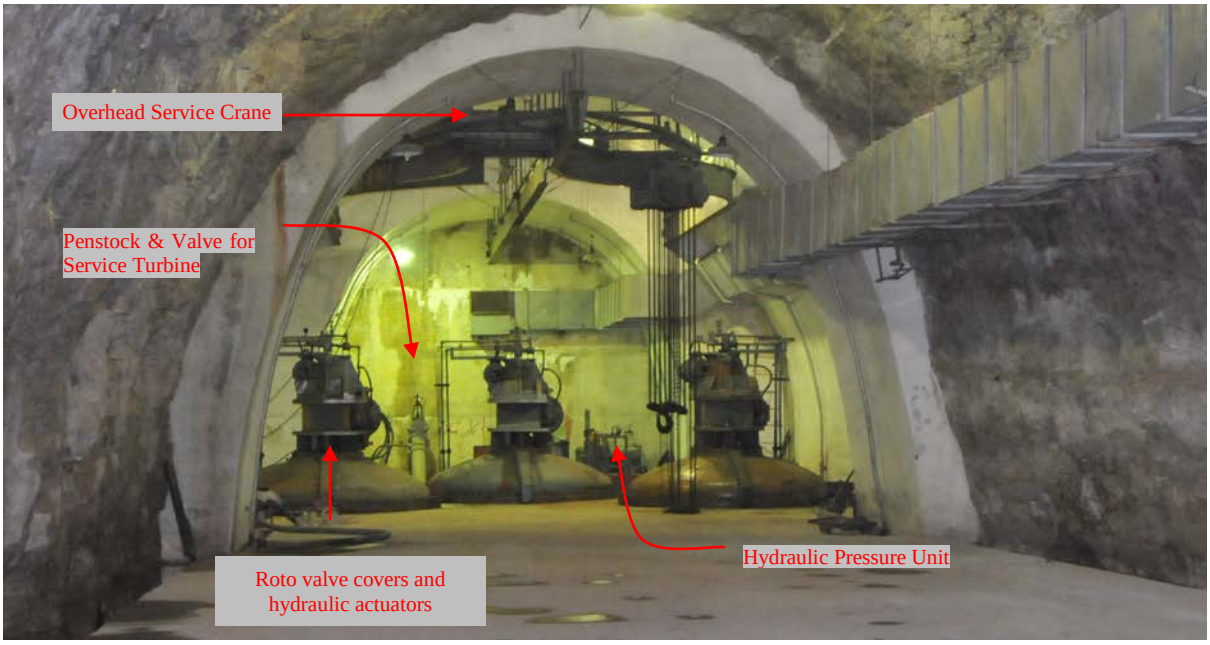


Figure 4. View of roto valves and auxiliary equipment.

Jet Valve (1of 3) | Valve Actuator | Outlet structure with pipe to local water supply thrust into flowing jet valve

Figure 5. Jet valve

Un-gated Service Spillway | Spillway Overflowing

Figure 6. Service Spillway

The existing Intake Structure Hoist is not functioning and does not have the rated capacity to lift the concrete bulkhead. Construction documentation indicates that the capacity was insufficient and today's design standards are more stringent (See Government Review in Appendix D). Rehabilitation of the intake structure hoist is required for future maintenance operations that will require dewatering the tunnel. This summary of work covers items intended to rehabilitate the irrigation intake structure. This Contract does not include any dewatering operations for the tunnel.

The existing instrumentation for dam safety has fallen into disrepair or ceased functioning. The existing piezometers have failed in spite of recent attempts to rehabilitate them. This summary of work covers the installation of new dam safety instrumentation. No attempt to rehabilitate the existing piezometers shall be made.

1.1.2 Coordination

The Contractor may be required to coordinate the efforts required under this contract with at least one other contractor at the site. Coordination may include such tasks as the exchange of information with other contractors such as design data, drawings, calculations, and technical information. Additionally, it may be necessary for the contractor to conduct meetings, hold teleconferences, and prepare the submittal of additional information to the Contracting Officer (KO) that demonstrates the coordination and integration of new work with existing and future work of other contractors. All coordination shall be in agreement with the KO and approved prior to the commencement of any work.

1.1.3 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 KO or the Contracting Officer's Representative (COR) at all times when work is in progress.

1.1.4 CQM Training Requirement

The Contractor shall provide quality control for all design and construction activities as specified in Section 01 45 00 Contractor Quality Control. This includes a designated Quality Control (QC) manager, certification course for the QC Manager, and submittal of the Contractor Quality Control (CQC) Plan and Design Quality Control (DQC) Plan.

1.2 SUBMITTALS

Submittals and a Submittal Register are required as specified in Section 01 33 15 SUBMITTAL PROCEDURES.

1.3 UNEXPLODED ORDINANCE (UXO)/MINES

The Contractor **IS NOT** responsible for the clearance or removal of mines and unexploded ordnance (UXO) from the site prior to the commencement of construction. The existing site has had numerous construction projects including underground utilities and foundations etc., and has been occupied and under security for an extended period of time. This site is therefore classified as "LOW PROBABILITY" for existence of UXO/Mines, but the contractor shall be aware that this site does not have demining certificates.

If a UXO/mine is encountered during project construction, the Contractor shall immediately stop work in the affected area, mark the area of the UXO/Mine and immediately notify the Contracting Officer, COR or the Government Construction Representative.

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

NOTE 1: For UXO/mine information, the following points of contact from the UN Mine Action Center of Afghanistan are provided:

Mohammad Sediq, Chief of Operations,
mohammad.sediq@macca.org.af
+93 (0)705 966 400 and +93 (0) 700 295 207
Mr. Mullah Jan
MACCA Senior Operations Manager
Mullah.jan@macca.org.af
+93 (0) 700 295 207

UXO Safety/ Mine clearance COR, USACE
tas.uxo-deminingsafety@usace.army.mil

Jeffrey Helmick USACE OESS/COR Mine Clearance AES
jeffrey.a.helmick2@usace.army.mil
Roshan: 079-403-1452
Comm: 540-723-6129

1.4 WORK COVERED BY CONTRACT DOCUMENTS

The work covered by this contract involves both mandatory items as well as optional items identified in the stated items below. Payment for the work items is covered in Section 01 22 00, "Measurement and Payment" of this contract Task Order.

1.5 MANDATORY WORK

Mandatory work includes general work items, Intake Structure, Tunnel Works, and Dam Safety Instrumentation to be completed in accordance with provisions of this contract and paid for under the Bid Schedule CLINS listed in Section 00010 of this contract Task Order. The general sequence of work is described in detail in Table 1 - General Sequencing for Design and Build by Phase in Section 01 33 16 Design Build After Award.

1.5.1 General Work Items

1.5.1.1 Mobilization/Demobilization

The work shall be located at the Kajaki Dam site and is located on the Helmand River approximately 90 kilometers northwest of Kandahar City, Afghanistan (32.323N, 65.119E). Based on recent construction activities near the subject site, the Contractor shall assume access to the site by air transport for all items except heavy equipment (e.g., trucks and drill rigs) and supplies (e.g., jet valves). The anticipated release point will likely be Bastion Air field. For scheduling the period of performance, the Government assumes airfreight transportation to the release point. Contractor will be required to coordinate with USACE and Marine Expeditionary Forces for security status and traffic-ability of roads. There is no commitment of military assistance at this time.

Mobilization and Demobilization shall consist of all labor, equipment, supplies and facilities required to stage all equipment and facilities needed for construction of this project. All mobilization and staging areas shall be located within the limit of work or shall be coordinated with the Contracting Officer. See Contract Clauses for further information.

The Contractor shall install and maintain temporary access points, roads, temporary parking, construction lay-down areas, and foot paths that are appropriately graded for drainage and capable of withstanding the anticipated construction traffic.

Portable latrines: During construction, the Contractor shall furnish, install, and maintain portable latrine units in locations as required. Portable latrines shall be a mix of western and eastern style units. Mix shall be determined by Contracting Officer.

Portable lavatories: During construction, the Contractor shall furnish, install, and maintain hand wash units in locations as required. Hand wash units shall each include four (4) wash units. Each wash unit shall consist of a basin, foot controlled wash water dispenser, hand soap dispenser, and towel dispenser.

No separate allowance for contract management, tracking, reporting, subcontract management, quality control, safety, environmental controls, independent testing, operating and maintenance manuals, nor as-builts will be made under a separate CLIN within this contract Task Order.

CLIN amount for Mobilization/Demobilization shall not exceed 10% of the total base bid for the project.

1.5.1.2 Security

Security is critical to construction in Afghanistan, especially on roads and remote areas away from Coalition Force bases. The Contractor must have an appropriate amount of security/protection to match the threat in the project area, outside of the perimeter fence, and along the supply routes. A detailed security plan in accordance with Section 01 40 00 SECURITY shall be approved by the Government before construction notice to proceed.

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.

1.5.1.3 DBA Insurance

Note 1 of the Bid Schedule defines the basis for this work item and further identifies how the costs are to be paid.

1.5.1.4 Performance and Payment Bonds

The Contractor shall provide performance and payment bonds in the proper amounts described in Contract Clause 52.228-15 entitled "Performance and Payment Bonds – Construction," stated in Section 0700 of the Contract Clauses. Bond assignment shall be made in accordance with instructions from the Contracting Officer or his designated representative.

1.5.1.5 Warranty Inspections

The Contractor shall perform warranty inspections on all work as described in Section 01 77 00 Closeout Procedures.

1.5.2 Intake Structure

The Contractor shall design and construct (or install) the work specified from the approved 'cleared for construction' plans and specifications in accordance with the stated standards and quality requirements therein. The standards and general requirements to be used for design are defined in Section 00 55 50 Design Concept Documents, and Section 01 01 50 Technical Requirements. The plans and specifications will be in accordance with Section 01 33 15 Submittal Procedures.

1.5.2.1 Intake Structure Modifications

The goal is to restore functionality of the intake tower for future maintenance purposes. The Contractor shall design all features of the project as described in this Invitation to Bid according to the requirements of the documents including all mechanical, electrical and structural aspects of the following items:

a. **Bridge Crane:** Rehabilitation of the crane to include replacement of the existing hoist and trolley to meet new load rating (i.e. 75 ton to 100 ton)

b. **Stop Log and Wheel Gates:** Repair corroded steel surface, and replace seals and wire ropes.

c. **Lifting Beam:** Rehabilitate the existing lifting beam.

Designs shall include detailed inspections, design reports, design analysis, calculations, and completed plans and specifications. Designs shall also include an updated Commissioning Plan submitted at each design submittal as described in Section 01 64 00 START UP TESTING AND COMMISSIONING.

The tunnel will not be dewatered as part of this Contract.

1.5.2.2 Diesel Generator for Intake Structure

The Contractor shall design all electrical features for the required stand by generator at the intake tower. The Contractor shall provide a complete operational diesel generator to meet power requirements for operation and maintenance of the intake structure water control components in the event of power outages.

The Contractor shall construct and/or install the work specified from the approved 'issue for construction' plans and specifications in accordance with the stated standards and quality requirements therein. The standards and requirements to be used for final designs are defined in 00 55 50 Design Concept Documents and 001 01 50.00 Technical Requirements. The Cleared for Construction issued plans and specifications will be in accordance with Section 01 33 15 Submittal Procedures as stated in this contract Task Order.

1.5.3 Tunnel Works

The goal is to regain positive control over the outlet works by replacing the jet valves and control systems. Further, there is some maintenance required of auxiliary equipment required to promote safe operations in the tunnel. The service turbine providing power to the control systems must also be replaced to ensure future operations in the absence of power from the main powerhouse. The Contractor shall design and construct (or install) the work specified from the approved 'Cleared for Construction' plans and specifications in accordance with the stated standards and quality requirements therein. The standards and general requirements to be used for design are defined in Section 00 55 50 Design Concept Documents, and Section 01 01 50 Technical Requirements. The plans and specifications will be in accordance with Section 01 33 15 Submittal Procedures.

1.5.3.1 Outlet Valves- Design

The Contractor shall design all mechanical and electrical aspects of the outlet valves including the following:

a. Design for the demolition of existing jet valves and installation of new fixed cone valves and actuators as specified herein. The Contractor shall design all features required to adapt the valves to the existing conduit as may be required. Contractor shall also design the new electrical systems for power and control including a new control cabinet.
b. Design for one new modified bulkhead to be placed in the outlet valve chamber during dewatering operations. Contractor shall address the fact that a new fixed cone will probably not fit the length of the existing chamber.

1.5.3.2 Auxiliary Tunnel Equipment- Design

The Contractor shall design all mechanical and electrical aspects of the auxiliary equipment including the following:

a. **Sump Pumps.** The Contractor shall design all features associated with the sumps in the valve house (i.e., sanitary waste pumps, and sump in valve pit).

b. **Flap Gate**: Contractor shall locate and replacing a flap gate on sump discharge line that exits near the bottom of outlet valve chamber.

c. **HVAC Repair:** Contractor shall replace the electric motors and repair the HVAC systems for the tunnel works.

Designs shall include detailed inspections, design reports, design analysis, calculations, and completed plans and specifications. Designs shall also include an updated Commissioning Plan submitted at each design submittal as described in Section 01 64 00 START UP TESTING AND COMMISSIONING.

The Contractor shall construct and/or install the work specified from the approved 'issue for construction' plans and specifications in accordance with the stated standards and quality requirements therein. The standards and requirements to be used for final designs are defined in 00 55 50 Design Concept Documents, 01 01 50.00 Technical Requirements, and approved for construction issued plans and specifications will be in accordance with Section 01 33 15 Submittal Procedures as stated in this contract Task Order.

1.5.3.3 Conduit, and Chamber- Evaluate and Report

The Contractor shall perform an inspection of the three conduits extending from the jet valve outlet to the roto valve. Dewatering of the conduit will be performed under a separate mandatory item (See paragraph Outlet Valve – Construction). The contractor shall also provide a mechanical and structural engineering evaluation and report on the condition of the inspected items, and make recommendations for repair as specified herein.

1.5.3.4 Local Water Supply Evaluate and Report

The Contractor shall perform an inspection of the existing local water supply line and provide an engineering evaluation and report on the mechanical aspects of modifying the connection. The intent is to provide a service connection that does not interfere with the operation of the tunnel works. Optional items under this contract exist for the repair of the water supply system.. The Government has assumed a repair plan, however the final repair designs may depend on the evaluation and report. The report shall also include a plan to provided uninterrupted water supply during other mandatory work (See Paragraph on Outlet Valve-Construction)

1.5.3.5 Roto Valve Evaluate and Report

The Contractor shall perform a complete function check of the three roto valves including the topside of all three of the existing roto valves including of the hydraulic actuators, pressure units, electrical power, and controls as specified herein. The outcome of the report may inform an option in this contract to refurbish the hydraulic systems.

1.5.3.6 Outlet Valve Construction

The Contractor shall repair or replace all mechanical and electrical aspects covered under the paragraph on Outlet Valve Design, including the demolition and removal of existing jet valves, electrical systems and fabrication of a modified bulkhead for the Chamber. Construction includes dewatering of the 84-inch conduits and chamber downstream of the rotovalves. Contractor shall also provide uninterrupted public water supply to the existing

connection at the chamber. Construction activities shall include any coordination to maintain the tunnel flow requirements (See Section 010150 Technical Requirements).

1.5.3.7 Auxiliary Tunnel Equipment Construction

The Contractor shall repair or replace as specified under Section 010150 Technical Requirements, all aspects of the HVAC system, flap gate and sump pumps.

1.5.3.8 Replace Valve House Hydro-electric Generating Unit

Contractor shall perform all activities required to replace the existing hydro-electric unit with a new unit including all auxiliary equipment and new electrical systems. Work also includes replacing in-kind the 12-inch control valve. Work also includes replacing the packing and backing bar of the 12-inch isolation valve located upstream near the tunnel plug.

1.5.4 Dam Safety Instrumentation - Design and Construction

The Contractor shall design and install a piezometer on the left abutment of the dam. Contractor shall also design and install other dam safety instrumentation including staff gages, and water level meter The standards and general requirements to be used for design and installation are defined in Section 00 55 50 Design Concept Documents, and Section 01 01 50 Technical Requirements.

1.6 OPTIONAL ITEMS

The Contractor shall provide all the required services for options below. The Contractor shall design and build or install the work specified from the approved 'cleared for construction' plans and specifications in accordance with the stated standards and quality requirements therein. The standards and requirements to be used for final designs on the option items are defined in 00 55 50 Design Concept Documents, 001 01 50.00 Technical Requirements. Similar to the mandatory items, the construction issued plans and specifications will be in accordance with Section 01 33 15 Submittal Procedures as stated in this contract Task Order.

The options depend on the outcome of some inspections and evaluations performed under mandatory CLNs. The services are further described in this Invitation to Bid and in Section 01 01 50 Technical Requirements, and or Section 01 22 00 Measurement and Payment. If exercised, the Contractor shall provide the following items:

a. **Refurbish Rotovalves.** The Contractor shall design and construct all mechanical and electrical features for refurbishment of the rotovalves including design reports, design analyses, and completed plans and specifications. The major design features includes refurbishing the topside of all three of the existing roto valves including of the hydraulic actuators, pressure units, electrical power, and controls as specified herein. The refurbishment of the roto valves has been separated into two CLN items

b. **Modify Local Water Supply.** Contractor shall provide a replacement for the water supply to the downstream camp and village as specified. Modification may include a tap into the existing line that feeds the hydro-electric generating unit. The specifications provided assume that this connection is the most effective method, however other methods may prove more effective pending other evaluations and design work executed under separate mandatory CLNs.

1.7 CONTRACT DRAWINGS

The drawings that accompany these specifications are a part thereof. The contract drawings include but are not limited to the dam safety instrumentation.

Electronic copies of the contract drawings will be provided to the contractor. A schedule of all available design drawings is attached in Appendix A. Several useful record drawings have been lost to history and were not recovered for this project. Contractor will be required to prepare informational drawings where the existing set is incomplete but necessary to the project.

Contractor shall check furnished drawings and notify the Government of any discrepancies. Further, Contractor shall verify field conditions and informational drawings provided.

Reference publications will not be furnished unless already provide with the appendices herein.

1.8 PHOTOS AND RECENT INSPECTIONS

Select photos of the project are included in Appendix A. Electronic copies of the photos will be provided to the contractor. A report on the results of a recent underwater inspection of the irrigation intake trash racks and the apron outside the jet valves is also included.

1.9 DESIGN GUIDANCE

Contract drawings are in Appendix A. A list of applicable guidelines is provided in Appendix B. Historical documents for reference are in Appendix C. Section 00 55 00 DESIGN CONCEPT DOCUMENTS specifies a basis for design with additional details in Appendix D.

1.10 OCCUPANCY OF PREMISES

Building(s) will be occupied during performance of work under this Contract. Occupancy notifications will be posted in a prominent location in the work area.

Before work is started, the Contractor shall arrange with the Contracting Officer a sequence of procedure, means of access, space for storage of materials and equipment, and use of approaches, corridors, and stairways. The sequencing should correlate directly to the Area Use Plan specified in Section 01 06 00 Special Clauses (p 1.5).

1.11 EXISTING WORK

In addition to Section 00700, Contract Clause 52.236-9, “Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements”, the Contractor shall not remove or alter existing work in such a manner that injures or damages any portion of the existing work to remain.

Upon completion of the work, the Contractor shall repair or replace portions of existing work, which have been damaged by Contractor's operations, to preconstruction conditions at the expense of the Contractor.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

– END OF SECTION –

SECTION TABLE OF CONTENTS

DIVISION 01 – GENERAL REQUIREMENTS

SECTION 01 01 50

TECHNICAL REQUIREMENTS

TABLE OF CONTENTS

PART 1. GENERAL 5

1.1 GENERAL 5

1.1.1 REFERENCES 5

1.1.2 SUBMITTALS 7

1.1.3 COMPLIANCE 8

1.1.4 DESIGN PACKAGE 8

1.1.5 ASBESTOS-CONTAINING MATERIALS 8

1.1.6 SAFETY 8

1.1.7 MANDATORY AND OPTIONAL ITEMS 8

1.1.8 SITE SPECIFIC LIMITATIONS 8

1.1.8.1 Pool Elevations 9

1.1.8.2 Valve Room 9

1.1.8.3 Irrigation Tunnel Flows 9

1.1.8.4 Intake Structure 11

1.1.8.5 Piezometers and Instrumentation Installation 11

1.1.8.6 Valves for Service Turbine 11

1.1.8.7 Tail Water Elevations 11

1.1.8.8 Outlet Valve Chamber 11

1.1.9 TEMPORARY STRUCTURES 12

1.1.10 SUBCONTRACTORS 12

1.1.11 APPLICABLE CODES AND TECHNICAL CRITERIA 12

1.1.12 SITE DEVELOPMENT 12

1.1.12.1 Environmental Protection 12

1.1.12.2 Notification 12

1.1.12.3 Spillages 12

1.1.12.4 Demolition and Disposal 12

1.1.12.5 Project Identification 13

1.2 PROJECT: IRRIGATION TUNNEL WORKS 14

1.2.1 Robustness of Components 14

1.2.2 Mechanical Work 14

1.2.2.1 General 14
1.2.2.2 Site Inspection 14
1.2.2.3 Conduit and Chamber - Evaluation and Report 14
1.2.2.4 Emergency Closure Valves (ROTOVALVES)Evaluate and Report 14
1.2.2.5 Refurbish Emergency Closure Valve Operators (ROTOVALVES) (Optional) 15
1.2.2.6 Hydraulic System for Emergency Closure Valves (ROTO-VALVES) (Optional) 16
1.2.2.7 Outlet Valve (HOLLOW JET VALVE) Replacement 17
1.2.2.8 Valve Actuators for Flow Regulating Valves (FIXED CONE VALVES) 18
1.2.2.9 Design/Manufacture for Outlet (FIXED CONE VALVES) 19
1.2.2.10 Sump Pumps 19
1.2.2.11 Flap Gate 20
1.2.2.12 Generator 20
1.2.2.13 Local Water Supply – Evaluate and Report 20
1.2.2.14 Modify Local Water Supply (Optional) 20
1.2.2.15 Refurbish HVAC 21
1.2.2.16 Testing 21
1.2.2.17 Operations and Maintenance 21
1.2.3 Electrical Work 21
1.2.3.1 General 21
1.2.3.2 Electrical Site Inspection – Tunnel Works 21
1.2.3.3 Design 22
1.2.3.4 Valve House Sump Pumps 22
1.2.3.5 Flow Regulating Valves 22
1.2.3.6 Emergency Closure Valves (ROTO VALVES) - OPTIONAL 22
1.2.3.7 Products 22
1.2.3.8 Specifications 22
1.2.3.9 Installation 22
1.2.3.10 Testing 22
1.2.3.11 Operations and Maintenance 23
1.2.4 Valve House Hydro-electric Generating Unit 23
1.2.4.1 General 23
1.2.4.2 Site Inspection 23
1.2.4.3 Design 23
1.2.4.4 General Design Requirements 23
1.2.4.5 Generator 24
1.2.4.6 Commissioning 25
1.2.4.7 Alignment 28
1.2.4.8 Training 28
1.2.4.9 Operation and Maintenance 28

1.2.5 Structural/Geotechnical Work 28
1.2.5.1 General....28
1.2.5.2 Modified Bulkhead for Outlet Valve Chamber....28
1.2.6 Spare Parts 29
1.2.6.1 Roto Valve Operators and ancillary equipment. 29
1.2.6.2 Outlet Valves (Fixed Cone) 29
1.2.6.3 Outlet Valve Actuators 29
1.2.6.4 Valve House Hydroelectric Generating Unit 29
1.2.6.5 Electrical Controls 30
1.3 PROJECT: IRRIGATION INTAKE STRUCTURE....31
1.3.1 Mechanical Work....31
1.3.1.1 General....31
1.3.1.2 Site Inspection....31
1.3.1.3 Bridge Crane and Hoist....31
1.3.1.4 Jib Crane 32
1.3.1.5 Lifting Beams....33
1.3.1.6 Design/Manufacture 33
1.3.1.7 Installation and Site Work 33
1.3.1.8 Testing....34
1.3.1.9 Operation & Maintenance 34
1.3.2 Electrical Work....34
1.3.2.1 General....34
1.3.2.2 Site Inspection....34
1.3.2.3 Design 34
1.3.2.4 Studies 35
1.3.2.5 Irrigation Intake Structure....35
1.3.2.6 Products 35
1.3.2.7 Installation 35
1.3.2.8 Testing....35
1.3.2.9 Operation & Maintenance 35
1.3.2.10 Diesel Generator for Intake structure....36
1.3.3 Structural Work 36
1.3.3.1 Access Bridge (Optional to Contractor) 36
1.3.3.2 Irrigation Tunnel Closure Wheeled Bulkhead 36
1.3.3.3 Irrigation Tunnel Closure Concrete Bulkhead....37
1.3.4 SPARE PARTS 37
1.3.4.1 Bridge Crane 37
1.3.4.2 Electrical Controls 37
1.4 DAM SAFETY INSTRUMENTATION 38

1.4.1 Civil/Geotechnical Work 38
1.4.1.1 General 38
1.4.1.2 Geotechnical Requirements 38
1.4.1.3 Geotechnical Qualifications 38
1.4.1.4 Installation and Site Work 38
1.4.1.5 Piezometers 38
1.4.1.6 Water Level Meter 38
1.4.1.7 Staff Gages 39
1.4.1.8 Project Identifications 39
1.5 OPERATIONS AND MAINTENANCE (O&M) - 39
PART 2. PRODUCTS 39
PART 3. EXECUTION 39

PART 1. GENERAL

1.1 GENERAL

1.1.1 REFERENCES

This paragraph is used to list the sections and publications cited in the text. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title. Appendix B contains a complete list of a manuals and regulations for the entire RFP

CROSS REFERENCED SECTIONS

SECTION 00 12 00, PROPOSAL EVALUATION AND BASIS OF AWARD

SECTION 01 45 00, CONTRACTOR QUALITY CONTROL

SECTION 00 15 00, PROJECT PHASES

SECTION 01 33 16, DESIGN-BUILD AFTER AWARD

SECTION 016400 START UP TESTING AND COMMISSIONING

SECTION 017810 OPERATIONS AND MAINTENANCE DATA

SECTION 016640 TRAINING

SECTION 013315 SUBMITTAL PROCEDURES FOR DESIGN-BUILD PROJECTS

SECTION 010140 SUMMARY OF WORK

USACE ENGINEERING MANUALS AND REGULATIONS

EM 385-1-1 (2008) Safety and Health Requirements Manual, including Changes in effect at the time of advertisement

EM 1110-2-1602 (1980) Engineering and Design - Hydraulic Design of Reservoir Outlet Works

EM 1110-1-1804 Geotechnical Investigations, ENG 1836, ENG 1836A

EM 1110-2-2105 (1994) Design of Hydraulic Steel Structures Change 1

EM 1110-2-2701 (1997) Vertical Lift Gates

EM 1110-2-1908 (1995) Engineering and Design - Instrumentation of Embankment Dams and Levees

EM 1110-2-2105 (1994) Design of Hydraulic Steel Structures Change 1

ER 1110-2-110 (1985) Instrumentation for Safety - Evaluations of Civil Works Projects

ASTM STANDARDS

ASTM D5092 Standard Practice for Design and Installation of Ground Water Monitoring Wells

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION STANDARDS

NEMA 250 (2008) Enclosures for Electrical Equipment (1000 Volts maximum)

NEMA ICS 1 (2000, R 2008) Industrial Control and Systems General Requirements

NEMA ICS 2 (2000, R 2005) Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts

NEMA ICS 5 (2000, R 2010) Industrial Control and Systems Control-Circuit and Pilot Devices

NEMA ICS 8 (2000, R 2005) Industrial Control and Systems Crane and Hoist Controllers

NEMA RN 1 (2005) Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit

NEMA WC 70 (2009) Non-Shielded Power Cable 2000V or Less for the Distribution of Electrical Energy

MISCELLANEOUS

AMSE B30.2 (2005) Overhead and Gantry Cranes

UFC 3-320-07N (2004; R 2007) Weight Handling Equipment

TM 5-811-1 (1995) Electrical Power Supply and Distribution

NFPA 70 (2011) National Electrical Code

IES Lighting Handbook, 9th edition

IEEE C2 (2007, Errata 2007; INT 2008) National Electrical Safety Code

UNITED STATES GEOLOGICAL SURVEY (USGS)

Open-File Report 2007-1137: Preliminary Earthquake Hazard Map of Afghanistan (Version1, Posted May 2007), available at: http://pubs.usgs.gov/of/2007/1137/.

The publications utilized shall be those of the most recent editions.

UFGS GUIDES

26 00 00.00 20	BASIC ELECTRICAL MATERIALS AND METHODS
26 05 00.00 40	COMMON WORK RESULTS FOR ELECTRICAL
26 05 19.00 10	INSULATED WIRE AND CABLE
26 28 00.00 10	MOTOR CONTROL CENTERS, SWITCHBOARDS AND PANELBOARDS
26 32 14.00 10	DIESEL-GENERATOR SET, STATIONARY 15-300 KW, STANDBY APPS.
26 51 00	INTERIOR LIGHTING
33 70 01.00	ELECTRICAL DISTRIBUTION SYSTEM, AERIAL
33 70 02.00	ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND
01 74 19	CONST & DEMO WASTE MANAGEMENT; 33
01 50 00	TEMPORARY CONSTRUCTION FACILITIES AND CONTROL
05 05 23	WELDING, STRUCTURAL
05 59 13	FABRICATION OF HYDRAULIC STEEL STRUCTURES
09 97 02	PAINTING: HYDRAULIC STEEL STRUCTURES

U.S. BUREAU OF RECLAMATION GUIDE

(1996) Inspection of Steel Penstocks and Pressure Conduits

1.1.2 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 SECTION 01 33 15 SUBMITTAL PROCEDURES FOR DESIGN-BUILD PROJECTS.

ITEMS	PARAGRAPH
TUNNEL WORKS	
Conduit and Chamber – Evaluation and Report; FIO (including report on leakage through Roto Valve seals)	1.2.3.2
Emergency Closure Valves (ROTOVALVES) Evaluate and Report, FIO	1.2.2.3
Design Package for Refurbishment of Roto Valves (Optional); Including design for electrical power and control, and hydraulic operating system 65% G, 99% G, and 100% DA	1.2.2.5
Auxiliary Tunnel Equipment Design Package including submittals for Sump Pumps, flap gates and HVAC 65% G, 99% G, and 100% DA	1.2.2.10, 1.2.2.11,1.2.2.15
Outlet Valve – Design Package for Replacement; Including design for electrical power and control, and taillog for Chamber 65% G, 99% G, and 100% DA	1.2.2.7
Local Water Supply – Evaluate and Report**;** FIO	1.2.2.13
Local Water Supply – Design Package for Modified Connection (Optional); 65% G, 99% G, and 100% DA	1.2.2.14
Report on Condition of Electrical Components and Drawings for Electrical Work; • Single-Line Diagram (17-F-8) • Irrigation Tunnel – Valve Chamber and Tunnel - Power and Lighting (17-F-2) • Valve House - Power and Lighting Plans (17-F-3) • Valve House - Power and Lighting – Sections and Details (17-F-4) 65% G, 99% G, and 100% DA	1.2.3.2
Report on Service Turbine and Drawings for Hydro-Electric Work; • Valve House - Power and Lighting Plans (17-F-3) • Valve House Switchboard Elementary Wiring (17-F-5R2) • Valve House Switchboard 3 & 4 Wire 400 Volt 50 Cycle (D-18555F-1) • Wiring Diagram Panels 1 & 2 Valve House Switchboard (D-18555F-2) 65% G, 99% G, and 100% DA	1.2.4.2
Commissioning Plan for Hydro-Electric Service, 65%G	1.2.4.6
Operation and Maintenance Manual for Valve House Hydro-electric Generating Unit, 99%G	1.2.4.9
Spare Parts Manual, FIO	1.2.7
INTAKE TOWER	
Report on Crane Inspection, FIO	1.3.1.2
Design Package for Bridge Crane including Hoist, Lifting Beam, and Jib Crane 65% G, 99% G, and 100% DA	1.3.1.3, 1.3.1.4, 1.3.1.5
Electrical Inspection and Load Study 35% G	1.3.2.2, 1.3.2.4
Electrical Design Package for the Intake Tower	1.3.2.3

65% G, 99% G, and 100%DA	
Design Package for Diesel Generator at Intake Tower 65% G, 99% G, and 100%G	1.3.2.10
Structural Analysis and Report on Access Bridge to Intake Tower (Optional to Contractor depending on use of bridge), DA	1.3.3.1
Commissioning Plan for Bridge Crane, 65%G	1.3.1.8
Manual for Spare Parts at Intake Tower, 99%G	1.3.4
DAM SAFETY INSTRUMENTATION	
Dam Safety Instrumentation Report; 65%G, 99%G, 100%DA	1.4.1.2
Project Identification, G, Pre Build Activity	1.4.1.8

1.1.3 COMPLIANCE

The Contractor's design and construction shall 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. Criteria for proposal evaluation is in Section 00 12 00 PROPOSAL EVALUATION AND BASIS OF AWARD. Qualifications for site inspection personnel shall be in accordance with Section 01 45 00, CONTRACTOR QUALITY CONTROL.

1.1.4 DESIGN PACKAGE

a. Technical requirements within this section shall be used to prepare Plans & Specifications in accordance with SECTION 01 33 16, DESIGN-BUILD AFTER AWARD.
b. Design Submittals identified within this section shall be submitted under the Interim Design submittal requirements of SECTION 01 33 16, DESIGN-BUILD AFTER AWARD.
c. These design and product requirements are minimum requirements.

1.1.5 ASBESTOS-CONTAINING MATERIALS

Asbestos-containing material (ACM) shall not be used in the design and construction of this project. ACM is defined as a material composed of 1% or more asbestos by weight.

1.1.6 SAFETY

Designs and finished products shall conform to EM 385-1-1.

Hearing protection shall be issued and used in the area of work in the presence of grinding, operating equipment or other loud processes. Additional hearing protection equipment will be readily available at the work site in the vicinity of the work

1.1.7 MANDATORY AND OPTIONAL ITEMS

All items in this section are considered mandatory work items to be performed by the Contractor, unless the paragraph title is indicated to be (OPTIONAL). For those items listed as optional, only the portion of work under that specific paragraph title and related subparagraphs shall be considered as optional.

1.1.8 SITE SPECIFIC LIMITATIONS

The Contractor shall become familiar with the nature of the work to be done and identify constraints which must be considered for design and construction. A list of notable items is included below. This list is not comprehensive, and failure to identify additional site constraints does not relieve the Contractor from the responsibility to become familiar with all aspects of work.

1.1.8.1 Pool Elevations

The maximum reservoir pool elevation for design purposes is 1045m. The uncompleted spillway crest is at 1033.5m. The maximum reservoir pool elevation of 1045m will only be seen if the spillway work is completed and will not happen before this contract is executed. Therefore there will be an uncontrolled spillway during the period of performance for this contract. The centerline of the outlet valves are at elevation 965m.

1.1.8.2 Valve Room

a. Existing HVAC system may not be fully functional. Repair of the system is a part of the contract as specified in the mechanical work sections below.

b. The emergency closure valves are located at the end of a tunnel. The Contractor shall supply forced ventilation as required to ensure adequate working conditions **(**See EM 385-1-1 0.6.G.01 Portable and Temporary Ventilation Systems required under the Safety and Health Requirements of this Contract**).** The contractor shall provide mechanically delivered fresh air to the furthest point in the tunnel (approximately 450ft) at a rate of no less than 80% of the exhaust quantity or as specified in 29 CFR 1910.94 and 29 CFR 1926.57, whichever requirement is more stringent. For historical reference, see paragraph 11. Tunnel Ventilation, Section III- page 30 of Appendix C – 1956 Final Design Report.

c. HVAC Equipment shall fit through existing access doorways and hatches.

d. The pumps in the valve sump pit may not be fully functional. The flap gate over the sump discharge line is missing and water backs up into the sump from the tailwater.

1.1.8.3 Irrigation Tunnel Flows

As of September 2012, the operating records for the tunnel indicate the following conditions:

Reservoir = 1019.55 m - Decreasing

Discharge = 82.1 m3/s - Decreasing

Irrigation Jet Valves:

#1 30% Open

#2 15% Open

#3 0% Closed

Note: Jet Valve #3 located on the far right looking downstream has a limited operability. There is a 2005 Report from Combine Forces Command that indicates the Jet Valve is jammed Open and cannot be further opened or closed (See Appendix D – MS-1-2-5). The Government assumes that this is still the case. Operational records indicate that the flows in Jet Valve#3 drop to 0%, therefore the Government assumes the Project is stopping the flow with the roto valve upstream. However, the 0% flow though conduit #3 as indicated by the operational records is probably not an accurate assessment of the seals and potential leakage of the roto valve. A leakage measurement is a part of this contract for the rotovalves. Jet Valve #1 and #2 see regular operation through a range of 0 to 90% open. Jet valve operations records are available upon request from TAS.

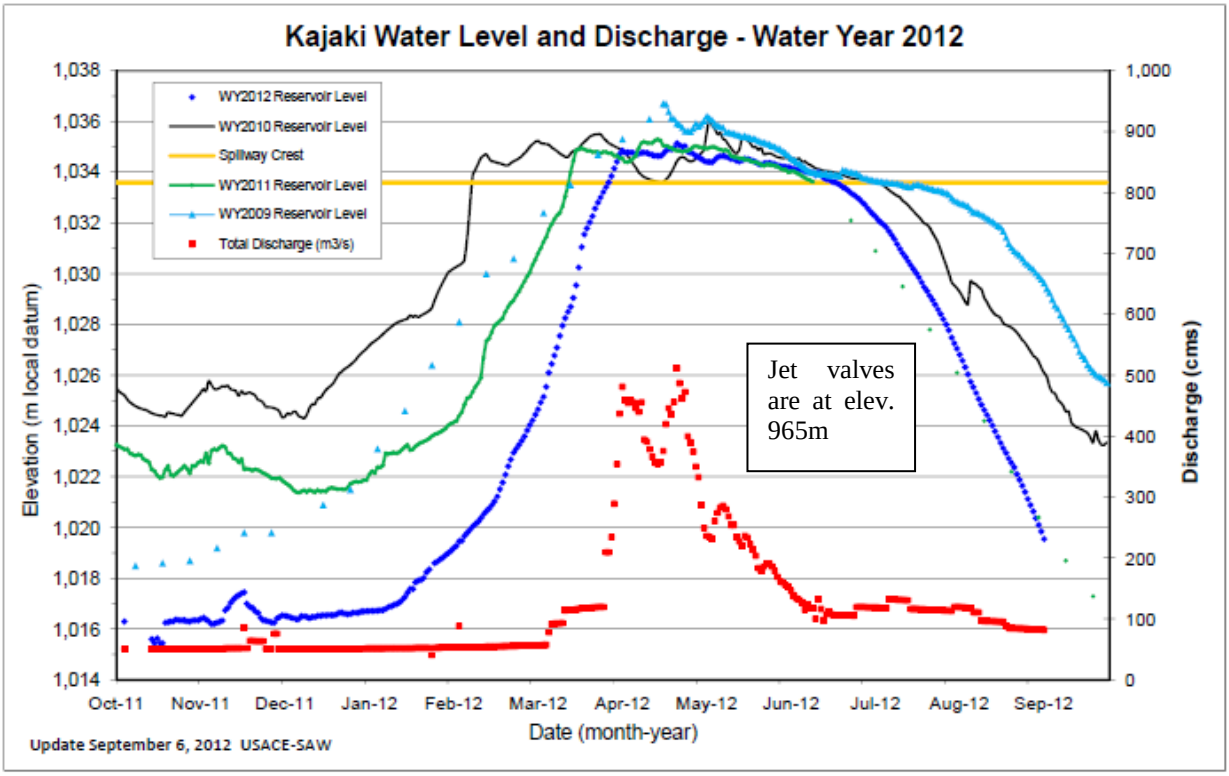
Total Jet Valve Discharge = 28.6 m3/s

Powerhouse Units #1 online, #3 online

Powerhouse Discharge = 53.5 m3/s

Spillway Head = 0 m

Spillway Discharge = 0 m3/s



The minimum allowable flow, combined, over the spillway (uncontrolled), through the powerhouse turbines and the irrigation tunnel must be maintained at a minimum of 80 cubic meters per second. Note, the power house currently has 2 turbines with a flow capacity of about 20-30 cubic meters per seconds, therefore given no flow over the spillway, the irrigation tunnel would have to convey a minimum of 40-60 cubic meters per second. One (1) jet valve flowing full under 30m of head can convey about 60 cubic meters per second.

Contractor shall maintain a minimum flow of 80 cubic meters per second in the river by coordinating with powerhouse flows and spillway observations. It follows that for about 8 months of the year with no flow over the spillway, at least one jet valve will have to be full and open. Given that the powerhouse rarely operates at 100%, then there is a strong likelyhood that at least 2 jet valves will need to remain open to some degree.

In the event that there is a planned shut down or reduction of flows through the powerhouse and the spillway is not flowing, then the Government will coordinate with the Contractor for the Irrigation tunnel to minimize impacts to the construction schedule.

In the event that more than 2 jet valves in the full and open position are required to meet the minimum flow requirement, then the resulting flow in the 2 open jet valves will be the new minimum flow requirement. This could only happen in an extreme dry year with a very low reservoir, therefore the Contracor is not responsible for a drought.

In the event that Jet Valve #2 and #3 cannot be opened to the degree necessary to meet the minimum flow requirement, then the resulting flow in the 2 open jet valves will be the new minimum flow requirement. Based on the jet valve records on past operation, this is an unlikely event, therefore the Contrcator is nor responisble if the equipment fails while trying to work on it.

Based on operational records, it appears Jet Valve #3 has the most problems and should be replaced first along with ensuring the local water supply is maintained.

For comssioning of the intake tower, the Contractor shall shut down all flow in the tunnel for a period not to exceed an estimated time of 4 hours. The actual time and schedule for tunnel shutdown must be cocordinated with the COR. Contractor should be prepared to perform the shutdown any time during a 24-hr period.

1.1.8.4 Intake Structure

a. The intake structure bridge crane hoist is currently inoperable. The design drawings conservatively rate the existing hoist at 75 tons which is for the center of the bridge, not the lift points at the columns.

b. Access to the intake structure is via a pedestrian footbridge. The original O&M Manual specified a weight restriction limited to "hand carry only". The design documents indicate 93 psf. The footbridge loading shall be limited to hand transport or small cart not to exceed 1,000 lbs total. Deviation from this weight limitation is not acceptable unless the Contractor performs an inspection of the condition of the bridge and submits a report along with a structural analysis by a licensed structural engineer showing the structural system is adequate to support the proposed loading.

c. The concrete bulkhead is supported at its current elevation and cannot be moved with the existing hoist.

d. Under normal operations all jet valves must be closed prior to closing the bulkheads on the tower. During emergency closure operations, the bulk head gates must not be closed if more than one jet valve is open.

e. The pressure diagram for the wheel gate design is on drawing 15-F-11 (R1).

f. Contractor is not required to perform a structural analysis of the intake structure or the crane bridge. The government has performed a review of the design documents and O&M manual to facilitate developing this request for proposal. A copy of this government review is attached – See Engineering Alternative MS1-2-5 and determined that the static loading of the up-rated crane to be installed as part of this contract will not constitute a change in the original design function of the tower. The dynamics of the up-rated crane are considered negligible.

1.1.8.5 Piezometers and Instrumentation Installation

The Contractor shall determine detailed access requirements for installation of all instrumentation during a site inspection and submit a report.

The reservoir pool is currently limited to a lower elevation than originally designed, due to the incomplete service and emergency spillways. The current reservoir has never been impounded to a level higher than about Elevation 1037m. All new designs and equipment shall be based on the potential maximum pool at Elevation 1045m as if these spillways were complete.

1.1.8.6 Valves for Service Turbine

There are two 12 inch valves upstream on the penstock of the existing service turbine, one isolation valve and one control valve. The isolation valve is located in the RotoValve chamber near the tunnel plug. This valve will remain under pressure unless the Irrigation tunnel is in a dewatered state. The control valve is located in the Valve House near the service turbine.

1.1.8.7 Tail Water Elevations

The tail water elevations depend on the flow through the powerhouse, spillway and the irrigation tunnel itself. The Contractor will not be able to control the tail race elevations and therefore should assume minimum values as shown in Appendix D – "Assumed Tail Water Elevations".

1.1.8.8 Outlet Valve Chamber

The new fixed cone valves that are specified herein are generally longer than the existing jet valves and do not fit within the exiting chamber, therefore a modified bulkhead is required for the installation. Commercially available Jet valves are constructed to very tight tolerances and aftermarket modifications to the valves are not allowed.

1.1.9 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.

1.1.10 SUBCONTRACTORS

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

1.1.11 APPLICABLE CODES AND TECHNICAL CRITERIA

The codes and guide specifications found in Appendix B shall be required for this project. This list is not comprehensive. Additional required codes and specific technical standards are referenced in other sections and paragraphs. The publications utilized shall be those of the most recent editions.

Any Code or Reference that can be determined to be substantially equivalent to those specified in this document may be used, but it is the Contractor's responsibility to show the equivalency of the alternate Code or Reference and the Contracting Officer must approve its use prior to implementation. A partial listing of references is included within the Request for Proposal.

1.1.12 SITE DEVELOPMENT

1.1.12.1 Environmental Protection

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 regulations with the contracting officer prior to design and discharge of any liquid wastes into natural streams or manmade channels.

1.1.12.2 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 he (she) is satisfied 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.

1.1.12.3 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.

1.1.12.4 Demolition and Disposal

Demolition and proper disposal needs to occur anywhere systems are being replaced or abandoned. At the end of the project all unused equipment, wiring, controls, conduit, pads, mounting structures should be removed and disposed of safely according to Host Nation Laws and Regulations.

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

1.1.12.5 Project Identification

The Contractor shall provide project identification in accordance with Section 01 58 00 PROEJCT IDENTIFCATION and as specified in the paragraph for Dam Safety Instrumentation below.

INTENTIONAL PAGE BREAK

1.2 PROJECT: IRRIGATION TUNNEL WORKS

1.2.1 Robustness of Components

The installation is occurring in an area of political instability and there may be extended periods of time, perhaps years, where the plant will not receive scheduled maintenance. The contractor is encouraged to select equipment and materials with this in mind, choosing simplicity of maintenance and robust construction where feasible.

1.2.2 Mechanical Work

1.2.2.1 General

Prepare construction plans & specifications, as well as perform construction, testing and commissioning for: the valve house sump pumps and flap gate on discharge line, flow regulating valves (HOLLOW JET-VALVES), emergency closure valves (ROTO-VALVES), and overhead service crane and hoist, and local water supply connection.

1.2.2.2 Site Inspection

Become familiar with all aspects of the site, including size, weight, and environmental constraints. All inspections shall be performed by a qualified engineer of a relevant discipline. Perform visual inspection of equipment and structures not intended for demolition. Submit reports described below on the condition of existing equipment and structures, including recommendations for correcting deficiencies.

1.2.2.3 Conduit and Chamber - Evaluation and Report

Contractor shall inspect the entire length of conduit downstream of the centerline of the existing roto valves. Submit a report on the condition of existing equipment and structures, including recommendations for correcting deficiencies. Use U.S. Department of the Interior Bureau of Reclamation, *Facilities Instructions, Standards, and Techniques Volume 2-8*, "Inspection of Steel Penstocks and Pressure Conduits" as an inspection guide (document available in Appendix B). Conduit inspections shall include but are not limited to:

a. videography, coating condition, non-destructive examination (NDE) assessment of wall thicknesses, weld defects, voids in concrete encasement and signs of erosion, corrosion and cavitations.
b. A grouping of NDE measurements, of the shell thickness, shall be taken approximately every 5 feet for the length of the conduits. A grouping of measurements shall consist of 4 readings taken equidistant around the ring of the conduit. A similar grouping of measurements is to be taken of the welds at each joint.
c. Inspection is also required for elements of the Chamber that may have been subject to cavitations damage (below normal high water and jet spray) downstream of the Jet valves. The Chamber shall be inspected visually after dewatering as part of the Outlet Valve Construction work.
d. Contractor shall submit both a plan and a report to determine the amount of leakage in gallons per minute passing through the seals of the rotovalves. The results shall be contained in a single report.

1.2.2.4 Emergency Closure Valves (ROTOVALVES)Evaluate and Report

Perform a top-side inspection of the emergency closure valves and evaluate their operating mechanisms. The evaluation shall include but not be limited to:

a. Apparent and/or recorded service history from Project personnel
b. Condition of hydraulic cylinders
c. Condition of trunnion greasing system
d. Condition of the exterior surface coating
e. Condition of seals
f. Condition of the Hydraulic Power Units
g. Contrast the design pressures with actual pressures to operate the valves
h. Provide a written report on the inspection and evaluation

The COR may use this evaluation to inform the option for refurbishment of the emergency closure valves. This report may be combined with the inspection of the Conduit and Chamber evaluation that includes but is not limited to leakage past the valves, and an assessment of the interior of the conduit.

1.2.2.5 Refurbish Emergency Closure Valve Operators (ROTOVALVES) (Optional)

These valves are described as ROTOVALVES on informational drawings. These three valves were manufactured by S. Morgan Smith Company, which is now owned by Rodney Hunt. The valves were purchased by Morrison-Knudsen Afghanistan Incorporated under purchase order number 11.5031. The Operations and Maintenance Instructions list the three (3) – 84" diameter Rotovalve of steel construction, 125# standard A.S.A flanges, 115 psi working pressure, for water service. Special assembly required for multi-components. No controls or special equipment. Serial nos. VB-1844, VB-1845, VB-1846. See Appendix C- Rotovalve Operation & Maintenance.

For a brief description of the installation procedure of the valves during irrigation releases, see Appendix C -1956 Final Design Report.pdf, Section III, page 37, paragraph 5. Irrigation Outlets.

Refurbish the three 84-inch irrigation emergency closure valve operators, and ancillary equipment. Refurbished valves shall meet the following requirements:

a. The operating mechanism components shall be replaced with new components. The guide rods for the crosshead shall be replaced with new stainless steel rods.

b. The trunnion greasing system shall be replaced with new.

c. The valve exterior and interior of the valve operator mechanism and components shall be painted with two coats of high solids epoxy.

d. Valves shall operate under full flow when the reservoir is at maximum pool.

e. Valves shall have a maximum operating time of five minutes from the fully open to fully closed position.

f. Valves shall have a minimum operating time sufficient to prevent detrimental fluid transients within the irrigation tunnel system. Contractor shall provide design calculations and submit a report for approval or provide some original documentation if it can be located.

g. All seals shall be resistant to dirt and debris.

h. Each valve shall have a means to visually indicate valve position.

i. Each valve shall have a means to positively lock the valve in position and prevent undesired or un-commanded operation during the refurbishment. The existing valves have no known locking mechanism in their design, therefore something will need to be fabricated for an external fit.

j. Submit an Operations and Maintenance Manual for the Roto Valves, valve operators and ancillary equipment.

   Note: The replacement of the hydraulic cylinders for lifting and turning the valve plug will be covered under *Hydraulic System for Emergency Closure Valves.*

The Contractor shall conduct site inspections to gather the required information for preparation of as-constructed drawings for the Rotovalve Actuators. It may be possible to obtain reissued drawings from Rodney Hunt Co. All inspections shall be performed by a qualified mechanical engineer. Submit drawings which show the demolition of the old actuators, hydraulic power system, associated piping and controls. Submit drawings which show the installation of the new valve operators and ancillary equipment including piping not associated directly with the Hydraulic System mentioned below.

In the effort to decrease the amount of time between Notice to Proceed and the ordering of the 3 Valve Operators from a manufacturer, Specification Section 35 20 16.29 25 (Cone Valve Operating Mechanism) has been prepared to about a 90% level of completion.

1.2.2.6 Hydraulic System for Emergency Closure Valves (ROTO-VALVES) (Optional)

Replace existing hydraulic system with a new hydraulic system designed for and capable of operating the three Emergency Closure Valves (ROTO-VALVES). Replacement of the hydraulic system shall be inclusive of the hydraulic cylinders for lifting and rotating the valve. The intent is to replace components and ancillary items of the pressurized system. The system shall meet the following requirements:

a. The hydraulic cylinders shall be replaced with new (6 total: 3 lifting cylinders and 3 lifting cylinders).

b. The hydraulic system overall shall be capable of delivering the volume and pressure of hydraulic fluid required to operate all three emergency closure valves at once.

c. The electrical supply shall be sized to operate all three valves at once.

d. Each valve shall be equipped with its own hydraulic power unit (HPU). Each HPU shall be capable of providing the pressure required to close and open the emergency closure valves at maximum reservoir pool.

e. Each HPU shall be attached to the hydraulic circuit using quick-connect fittings. Fittings shall be liquid-tight, such that disconnecting a hose does not introduce air into or allow fluid to leak out of the system.

f. HPUs shall be interchangeable between valves.

g. The valve room shall be outfitted with at least one portable manually powered hydraulic unit. The manual unit shall be easily connected to any individual valve, and capable of developing the full operating pressure required to open and close the valves at maximum reservoir pool.

h. Each hydraulic unit shall be push-button operated, for CLOSE, OPEN, and STOP operations.

i. Hydraulic units shall be protected from overpressure by means of a mechanical device.

j. Each HPU shall be provided with a pressure gage, indicating pressure in Pascals (MPa, kPa, or Pa as appropriate to the application).

k. Each HPU shall have provisions (disconnect switch) to individually isolate it from electrical energy.

l. Each HPU shall have a means to safely depressurize the system.

m. Hydraulic fluid shall be filtered. Filters shall be of an automotive type, readily available on the regional market. Filter shall be mounted in an easily accessible location for maintenance purposes.

n. Hydraulic fluid shall be desiccated by means of replaceable-media desiccant breathers.

o. Pipe or hard-lines and fittings for the hydraulic system shall be corrosion-resistant.

p. Each HPU shall be skid-mounted, with all operating components less hoses and input power supply contained therein. Skids shall be provided with features that allow the unit to be moved with a standard lift truck or forklift.

q. Skids shall be leveled and anchored after final placement.

r. Individual skids shall be grounded.

s. Each skid shall be provided with a seven-pound ABC-type dry chemical fire extinguisher.

t. Demolish existing HPU system and appropriately dispose of hydraulic oils according to Afghan environmental regulations.

Submit drawings which show the demolition of the old hydraulic power system, associated piping and controls. Submit drawings which show the location and installation of the new HPUs, the associated piping, controls and appurtenances. Submit drawings which show the location and installation of the new manually operated hydraulic unit as well as the quick connect fitting locations to which the unit may connect to.

In the effort to decrease the amount of time between Notice to Proceed and the ordering of the 3 Valve Operators from a manufacturer, Specification Section 41 24 26.00 25 (Hydraulic Power System and Cylinders) has been prepared to a 90% level of completion.

1.2.2.7 Outlet Valve (HOLLOW JET VALVE) Replacement

These specifications cover the three existing 84-inch diameter valves located at the irrigation tunnel discharge to the tailrace. These valves are described as HOLLOW JET VALVES on informational drawings.

Flow Regulating Valves

Remove and replace the three existing 84-inch irrigation flow-regulating discharge valves. New valves shall meet the following requirements:

a. Valves shall be of a size, shape, and weight to interface with the existing discharge piping. Valve inlet diameter shall be 84 inches. The valve shall be complete with flanges to mate with adjacent equipment. Alternate size valves (e.g. smaller valves with reducer) may be acceptable if the Contractor provides a hydraulic system analysis (i.e. Intake Tower to Valve Outlet) supporting the use of the proposed valve and consistency with intended original design (i.e. energy dissipation for flows in the range of 58 to 77 cubic meters per sec and up to 80 meters of head.).

b. Valves shall be able to completely stop the flow of water. Acceptable leakage is 35 ounces per minute at maximum reservoir pool during the warranty period.

c. Seals or valve seats shall be resistant to dirt and debris. Valves shall be able to pass dirt and debris that pass through the intake trash racks.

d. Allowable stresses in valve components shall not exceed one-half of the yield stress for the material.

e. Valve design shall exhibit a design life expectancy of at least 50 years.

f. Valves shall be designed with corrosion-resistant features. Where galvanic corrosion may take place, components shall be protected by a sacrificial galvanic cell.

g. Valves shall operate throughout the entire range of flow at any possible head condition of the reservoir.

h. Valves shall be able to fully open and close when no flow is present.

i. Valves shall be free of cavitations or vibration through the full range of operation and at any possible head condition of the reservoir.

j. The valve discharge pattern shall not contact structures. Depending on manufacturer a steel jet deflector hood may be required to reduce the discharge spray by confining the exiting water jet.

k. The valve discharge shall be such, that erosion in the tailrace does not occur.

l. Valves shall be outfitted with a mechanical device to indicate valve position. The device shall be readable from the local operator station, and indicate from fully-opened to fully-closed in increments of 10 percent or less.

m. Valves shall be mechanically actuated.

n. Valves shall have a minimum operating time sufficient to prevent detrimental fluid transients within the irrigation tunnel system. Contractor shall provide design calculations and submit a report for approval unless some original documentation can be located.

o. Install a pressure tap just upstream of the outlet valves to aid in the hydraulic analysis of flow conditions through the range of valve operation and head conditions. The system discharge curve will be developed from this analysis (by Other).

p. Demolish existing HPU system and appropriately dispose of hydraulic oils according to Afghan environmental regulations.

q. Design and install a modified bulkhead using the existing slots. The modified bulkhead shall be capable of dewatering the chamber for the jet valves. Contractor shall assume dewatering is required to a depth of 2m. The actual tail water elevation will depend on dam operations and work must be coordinated with the powerhouse manager and the COR. The modified bulkhead shall become the property of the government after construction is completed.

The Contractor shall conduct site inspections to gather the required information for preparation of as-constructed drawings for the Outlet valve chambers. As-constructed drawings shall also include the stop log slot and the flange details for the 84" conduit. All inspections shall be performed by a qualified mechanical engineer. Submit drawings which show the demolition of the old hollow jet vavles, hydraulic power system, associated piping and controls. Submit drawings which show the installation of the new outlet valves.

Submit the service manuals for the fixed-cone valves, motor-actuators, and accessories. Submit a manufacturer's prepared table of valve discharge coefficients with one axis showing the discharge coefficient and the other axis showing the percent open or (sleeve travel/diameter)

1.2.2.8 Valve Actuators for Flow Regulating Valves (FIXED CONE VALVES)

New actuating mechanisms for each Outlet valve. Actuators shall meet the following requirements:

a. Each valve shall be actuated independently of the others.

b. Each actuator shall be capable of fully opening and closing the valve at any possible head condition of the reservoir.

c. Actuators shall be powered by an electric motor. A manual backup shall be provided that may be engaged via a clutch. Force required to actuate the valve manually shall not exceed 40 pounds-force (lbf).

d. Actuators shall be mounted on new pedestals located on the deck (EL. 973.10) above the valves.

e. Each actuator unit shall be push-button operated, for CLOSE, OPEN, and STOP operations.

f. Absolute limit switches shall be installed to prevent over travel of valves and to protect equipment from damage.

g. Each actuator shall have provisions (disconnect switch) to individually isolate it from electrical energy.

h. All actuation system components shall be capable of forgoing maintenance for five years with no adverse affects on operation. This does not mean that regular, routine maintenance should not be scheduled and accomplished as recommended by the equipment manufacturer.

i. Actuator design shall exhibit a design life expectancy of 50 years.

j. Actuators shall be designed with corrosion-resistant features.

k. All grease fittings for each actuator shall be plumbed to a single manifold.

l. Actuators shall be provided with a cover that prevents damage from dirt, debris, and the environment.

m. Actuators shall be provided with provisions for rigging or lifting with a crane or hoist.

The Contractor shall submit drawings which show the installation and components of the Outlet valve actuator and linkages and linkage details. The Contractor shall submit drawings which show the installation and placement of the hand actuator on the deck of the Outlet valve chamber.

1.2.2.9 Design/Manufacture for Outlet (FIXED CONE VALVES)

Use U.S. Army Corps of Engineers Engineering Manual EM 1110-2-1602 as a guide in developing technical specifications for the design and purchase of valves. In the effort to decrease the amount of time between Notice to Proceed and the ordering of the fixed cone valves from a manufacturer, Specification Section 35 20 19.23 25 (Fixed Cone Valves) has been prepared to a 90% level of completion. Installation instructions are as follows:

a. Shop-fit and assemble components and assemblies to the fullest extent possible prior to transportation to the site, to ensure proper fit. Match mark individual components for ease of field assembly. Perform a factory test on at least one of the three Flow Regulating Valves, to be witnessed by the Government. Testing shall include a full cycle of open and close operations using a power HPU, and an open-to-close cycle using the manual hydraulic unit.

b. After ensuring that components are acceptable, disassemble to a degree required for shipping.

c. Remove three existing (old) valves, valve actuators, and ancillary equipment. Old equipment becomes property of the Contractor. Transport old equipment off-site.

d. Install three new valves, valve actuators, and ancillary equipment.

e. Perform operational testing of valves in a no-flow condition. Make adjustments or rectify defects as necessary to meet manufacturer's specifications. Testing shall be performed in accordance with SECTION 016400 START UP TESTING AND COMMISSIONING.

f. Perform operational testing of valves under flow, from fully closed to fully open position. Make adjustments or rectify defects as necessary to meet manufacturer's specifications. Testing shall be performed in accordance with SECTION 016400 START UP TESTING AND COMMISSIONING.

1.2.2.10 Sump Pumps

Locate and replace the two valve house sump pumps that serve the powerhouse waste system. Contractor shall also locate and replace the sump to the Roto Valve pit. New pumps shall be similar in design, capacity, and horsepower as the existing. A photo of the sump pumps is listed in the 'Sump Pumps' folder of Appendix A. See drawings 17-F-1-R1, and 13-F-46 for some information. Contractor shall provide catalogue cuts on the new sump pumps for Government approval as well as photo documentation of completed installation work.

The Contractor shall conduct site inspections to gather the required information for preparation of as-constructed drawings of drawings 17-F-1-R1, and 13-F-46. All inspections shall be performed by a qualified mechanical engineer. Submit drawings which show the installation of the two valve house sump pumps and the installation of the sump pump in Roto Valve pit located in the Irrigation tunnel. Include routing details of the piping, paying special attention to showing the exit of the outlet piping.

1.2.2.11 Flap Gate

Locate and replace the flap gate for small diameter discharge line that exits near the jet valves. That pipe allows water to backup into tunnel when tail water is high. Drawings (15-F-61, and 13-F-46 Section C-C) indicate there is small diameter (about 4 inches) flap valve at elevation 961.5 meters (Also see Appendix D – "Assumed tail Race Elevations"). The pipe exits at the bottom of the exterior of the outlet valve chamber. Note that the minimum tailrace elevation is 961.5 meters. Installation of the flap valve may require the use of a caisson or a small coffer dam. Contractor shall provide catalogue cuts on the new flap gate for Government approval as well as photo documentation of completed installation work.

The Contractor shall conduct site inspections to gather the required information for preparation of as-constructed drawings of drawings 15-F-61. All inspections shall be performed by a qualified mechanical engineer. Submit drawings which show the installation of the new flap gate near the outlet valve chambers.

1.2.2.12 Generator

See Valve House Hydro-electric Generating Unit work under section 1.2.5 for Generator electrical requirements.

The mechanical requirements for the Penstock are as follows:

a. Replace the 12 inch control valve in kind. The control valve is located in the valve house adjacent to the generator.
b. Replace the valve stem packing, backing plate, and hardware on the 12 inch isolation valve. The isolation valve is located near the wall of the tunnel plug in the Rotovalve chamber. The backing plate for the packing gland on the isolation valve is corroded. The valve is currently in the open or partially open position, see Appendix A photos
c. Contractor shall assume that the Penstock will be under pressure unless the Irrigation tunnel has been drained.

1.2.2.13 Local Water Supply – Evaluate and Report

The water supply for the adjoining camp and village across the river is obtained at the discharge of one of the jet valves. A 6-inch pipe from the camp has been mounted to the outer frame of a jet valve so that as high velocity water is discharged from the jet valve it enters the open end of the pipe, ramming water into the pipe. During valve replacement this pipe will be removed and the local population will lose their source of piped water. Replacement of this source of water is part of this project, however, there is some concern that the current methodology may be unsafe to maintain, and may affect jet valve operation or warranty. The current system is also dependent on having the particular jet valve open. As a result the water supply is not consistently reliable.

The contractor shall investigate and report on the existing conditions concerning the water system and recommend options that are consistent with the ability of an impoverished village to operate and maintain its source of water. The report should present several options, with different levels of costs and benefits. One of the options shall be an in-kind replacement of the method currently being used (assuming the method does not affect operation or warranty of the new jet valve). Another option to be considered shall be a tap into the existing 12-inch line that feeds the service turbine (See optional bid items). The report shall include information as to the extent of the water system and how the water is being used. Due to the sensitive nature of the subject to the local population as well as the potential for an open-ended investigation, the contractor shall coordinate his efforts with the COR and exercise care not to create unrealistic expectations among the local population.

Appendix A includes two pictures of the existing conditions.

1.2.2.14 Modify Local Water Supply (Optional)

Provide a replacement for the water supply to the downstream camp and village. The new system shall be similar in capacity as the existing, and shall be plumbed independent of the irrigation outlet works. Contractor shall provide and install one, 6-inch tap into the existing line that feeds the service turbine, a 6-inch valve, and 450 lineal feet of

6-inch diameter Schedule 80 steel pipe that extends to the end of the tunnel works. A pressurized connection to the existing water supply line shall be made to restore the flow of water once the valve is opened.

The Contractor shall conduct site inspections to gather the required information for preparation of as-constructed drawings required to complete design. All inspections shall be performed by a qualified mechanical engineer. Submit drawings which show the connection details of the tap, the pipe routing, and the connection to the existing village water supply pipe located near outlet valve chambers.

1.2.2.15 Refurbish HVAC

Refurbish the existing ventilation systems in the tunnel and valve house. Replace in-kind the electric motors (See Drawing 19-F-59, and 19-F-60). Submit a report on the condition of the existing and refurbished equipment and controls. Contractor shall provide catalogue cuts on the new HVAC equipment for Government approval as well as photo documentation of completed installation work.

The Contractor shall conduct site inspections to gather the required information for preparation of as-constructed drawings of the ventilation systems. All inspections shall be performed by a qualified mechanical engineer. Submit drawings which show the demolition of the old electric motors and the installation of the two new electric motors.

1.2.2.16 Testing

Field and operating testing shall be conducted in accordance with SECTION 016400 START UP TESTING AND COMMISSIONING**.**

1.2.2.17 Operations and Maintenance

O&M Manual covering all equipment shall be prepared in accordance with SECTION 017810 OPERATIONS AND MAINTENANCE DATA.

1.2.3 Electrical Work

1.2.3.1 General

Prepare construction plans & specifications, as well as perform construction, testing and commissioning for the valve house sump pumps, flow regulating valves, emergency closure valves and associated power distribution system. Design and installation shall conform to requirements of NFPA 70 and IEEE C2.

The designs will be complicated by a lack of available information, pending Load Study and design-build work by others on the Irrigation Intake Structure Therefore, the Contractor is directed to assume an in-kind replacement of existing components if not items are not otherwise specified herein.

1.2.3.2 Electrical Site Inspection – Tunnel Works

Original As-constructed drawings required to facilitate design under this contract are not available. The available drawings are considered “Informational” since they are not certified “As-Constructed”. Therefore, the Contractor shall conduct site inspections to gather the required information for preparation of as-constructed drawings required to complete design. All inspections shall be performed by a qualified electrical engineer. Submit a report on the condition of existing equipment, including recommendations for correcting deficiencies. A list of drawings required to be certified “as-constructed” is provided below:

Single-Line Diagram (17-F-8)
Irrigation Tunnel – Valve Chamber and Tunnel - Power and Lighting (17-F-2)
Valve House - Power and Lighting Plans (17-F-3)
Valve House - Power and Lighting – Sections and Details (17-F-4)

Drawings can be found in Appendix A.

1.2.3.3 Design

Design shall utilize guide specifications and industry standards referenced within this Section. Controls shall not use any solid-state devices unless similar electro-mechanical type devices are not available or will not provide the required function. Electrical materials shall be dust-tight, corrosion-resistant and have an operating temperature suitable for the harsh conditions found at this site. Existing electrical distribution system characteristics can be found on the Informational Drawings. See Appendix A for list of Informational Drawings.

1.2.3.4 Valve House Sump Pumps

a. Replace power conductors for valve house lift pump(s). Reference Dwgs 17-F-3, 17-F-4, and 17-F-8.
b. Replace control system and control conductors for valve house lift pumps. Controls shall conform to the requirements of NEMA ICS 1, ICS 2 and ICS 5.

1.2.3.5 Flow Regulating Valves

a. Provide new power conductors and conduits (as necessary) to the new flow regulating valve actuators.
b. Provide new control cabinet and all control components, conduits and conductors for each regulating valve actuator. Controls shall conform to the requirements of NEMA ICS 1, ICS 2 and ICS 5.

1.2.3.6 Emergency Closure Valves (ROTO VALVES) - OPTIONAL

a. Replace power conductors and conduits (as necessary) for each emergency closure valve hydraulic pump unit.
b. Replace control system and control conductors for each emergency closure valve hydraulic pump unit. Controls shall conform to the requirements of NEMA ICS 1, ICS 2 and ICS 5.

1.2.3.7 Products

Power and control conductors shall be stranded copper with cross-linked thermosetting polyethylene insulation and non-PVC jacket conforming to NEMA WC 70. Switchboard conductors shall be type SIS. Enclosures shall constructed of steel and conform to NEMA 250. Enclosures indoors shall be Type 12 and enclosures outdoors or in damp locations shall be Type 4X. Indicating (pilot) lights shall be push-to-test type. All exposed conduit shall be rigid galvanized steel conform to UL 6. All buried conduit shall be PVC-coated rigid galvanized steel conforming to NEMA RN 1**.**

1.2.3.8 Specifications

See Appendix B for a list of guide specifications to be tailored (by the contractor) to fit the required design.

1.2.3.9 Installation

Remove all unused electrical equipment & materials (control panels, conduit, wire, etc.) prior to installation of new equipment. Removed equipment and materials are the property of the Contractor and shall be removed from site. Installation of new equipment shall conform to applicable codes and standards, as well as manufacturer's recommendations.

1.2.3.10 Testing

Field and operating testing shall be conducted in accordance with SECTION 016400 START UP TESTING AND COMMISSIONING**.** As well, all new wire shall be given insulation resistance (Meggar) and continuity tests.

1.2.3.11 Operations and Maintenance

O&M Manual covering all equipment shall be prepared in accordance with SECTION 017810 OPERATIONS AND MAINTENANCE DATA.

1.2.4 Valve House Hydro-electric Generating Unit

1.2.4.1 General

The contractor shall replace the Valve House generating unit consisting of turbine, generator, exciter, controls and protection with a new hydro-electric generating unit that meets the requirements listed below. This generating unit is shown on pictures in Appendix A. The contractor shall furnish and install the new generating unit and commission it. The contractor shall replace the control equipment and the power and control cables to the generator and to the governor and exciter.

The contractor shall either provide a new governor or rehabilitate the existing governor.

The contractor shall also replace in kind the service supply line valve. The Contractor shall coordinate work on the supply valve with any evaluations for local water supply connections. Alternate valve configurations are permissible if it meets the requirements of feeding the service turbine and the local water supply.

1.2.4.2 Site Inspection

Original As-constructed drawings required to facilitate design under this contract are not available. The available drawings are considered "Informational" since they are not certified "As-Constructed". Therefore, the Contractor shall conduct site inspections to gather the required information for preparation of as-constructed drawings required to complete design. All inspection shall be performed by a qualified electrical engineer. Submit a report on the condition of existing equipment, including recommendations for correcting deficiencies. A list of drawings required to be as-constructed is provided below:

Valve House Power and Lighting Plans (17-F-3)
Valve House Switchboard Elementary Wiring (17-F-5R2)
Valve House Switchboard 3 & 4 Wire 400 Volt 50 Cycle (D-18555F-1)
Wiring Diagram Panels 1 & 2 Valve House Switchboard (D-18555F-2)

The as-constructed drawings shall include all electrical characteristics of the electrical equipment.

1.2.4.3 Design

Design shall utilize guide specifications and industry standards referenced within this section. Controls shall be electro-mechanical and shall not use any solid-state type devices. Electrical equipment shall be dust-tight and corrosion –resistant suitable for the harsh environment found at this site. Existing generator and control design and characteristics can be found on the Informational Drawings. See Appendix A for a list of the Informational Drawings.

1.2.4.4 General Design Requirements

All new equipment shall be air cooled.

Equipment and performance conditions shall conform to the requirements of IEC 60193, IEC 60041, and IEC 60609.

The available hydraulic head at the site shall be determined as part of the design.

The turbine and generator shall be able to withstand operation at full runaway speed for an unlimited amount of time with no damage to the equipment.

The maximum efficiency of the turbine generator unit, at the design hydraulic head, shall not be less than 80%. Input energy will be calculated as the difference between the total energy in the water at the turbine intake minus the

total energy in the water one runner diameter downstream of the runner discharge. Output energy shall be calculated at the generator terminals, under the conditions of equalized phase load and unity power factor.

All equipment shall have a two year warranty. In the event that a component or piece of equipment requires service or repair under the terms of the warranty, the warranty for that piece of equipment shall be restarted for an additional two years at the completion of the repair.

a. The generating unit including all auxiliary equipment shall be supplied by a manufacturer that has manufactured similar equipment for a minimum of 5 years. The manufacturer must have manufactured a minimum of 5 generating units that are 50kW or larger each year for the past 5 years.
b. All Equipment shall be tested per manufacturer's recommended testing before shipment from the factory. Factory testing shall meet the requirements of SECTION 016400 STARTUP TESTING AND COMMISSIONING.

1.2.4.5 Generator

Generator shall produce 75 kW output at the generator terminals at 0.8 power factor.

Generator shall be a synchronous three phase, four wire, resistor grounded, 50Hz, 240/416V, at 0.8 power factor.

Generator insulation shall be class 155 insulation as defined in NEMA MG-1, and shall be insulated for 600 Volts AC or higher.

The generator shall conform to NEMA MG-1

Turbine

a. The contractor shall determine the operating ranges (head and flow) that the turbine will encounter in service.
b. The Turbine shall be designed such that at the worst case combination of load rejection, head and flow, the maximum stress in any turbine component shall not exceed 67% of the material yield strength.
c. The turbine shall operate smoothly, without water passageway pressure pulsation, torque fluctuation or load swing at all power outputs between 5% and 100% of maximum power;
d. The turbine runner, wicket gates, and stay vanes shall be made of stainless steel, either austenitic or martinsitic.
e. No 'greaseless' or self lubricating bushings or bearing pads shall be used.
f. All wicket gate mechanism bushings, wicket gate stem bushings and bearing pads shall be greased bronze.
g. Standard manual zerk grease fittings shall be fitted to the equipment at each grease point.
h. Cloth type packing shall be used at shaft sealing points—no 'O' rings or elastomer type seals shall be allowed where mating pieces have relative motion with respect to each other.
i. Main shaft bearings shall be either grease lubricated, sealed anti-friction roller bearings or they shall be babbited journal bearings immersed in an oil bath. Anti-friction rollers bearings shall be grease-able and shall have a pressure relief fitting. Oil baths shall not require external cooling.
j. The wicket gate actuator shall be hydraulically driven.
k. All consumables (such as filter elements) shall be readily available on the local market. As an example, in the case of filters—use an automotive engine filter, and make the filter fitting / connection adaptable to accommodate future filter design changes.
l. The turbine shall have a torque limiting mechanism that prevents overstressing of the wicket gate stems.
m. The turbine shall have a Wicket Gate operating ring. Individual wicket gate actuators shall not be allowed.
n. The turbine power shaft shall have a replaceable shaft sleeve at the turbine shaft packing area. The shaft sleeve shall have a wall thickness not less than 9 millimeters.
o. The Generator rotor / shaft assembly shall be supported by at least two shaft bearings. If a flexible coupling between the turbine and generator shaft is used, then the turbine shaft shall be supported by two bearings. If there is a rigid coupling between the turbine and generator shafts, then the turbine shaft need only have one bearing. If the turbine runner is mounted directly on the generator shaft, then a two bearing system is acceptable. Main shaft bearings shall have an infinite bearing life and loads shall be calculated based on coupled turbine and generator shafts.

Governor

a. If the contractor chooses to supply a new governor, the frequency tolerance shall be not more than +/- 1HZ over a range of 5% to 100% of the maximum turbine power output. The new governor shall include a Hydraulic Pumping Unit.
b. At his option the contractor may choose to rehabilitate the existing governor rather than supply a new governor. If the governor is rehabilitated, the work shall be performed by a firm that specializes in the rehabilitation and repair of mechanical governors. In this case, the specialty firm shall have rehabilitated a minimum of five (5) generating units that are 50kW or larger each year for the past five (5) years. Qualifications shall be submitted to the Contracting Officer's Representative (COR) to substantiate that the specialty firm meets this requirement.
c. All components comprising the governor system, including but not limited to Hydraulic Pumping Unit, Servo-motor, ball head and ball head motor shall be restored to 'as new' fits and tolerances.

Exciter

The exciter shall be a brushless, rotating exciter that is sized to meet the requirements of the generator.

Control Equipment

All equipment and control wiring located in Panel no. 1 of the Valve House Switchboard shown in drawings 17-F-5R2, D-18555F-1, and D-18555F-2 shall be replaced in kind with equal equipment. Where the equipment cannot be replaced in kind with new equipment, it shall be replaced with new equipment that is functionally equal to the original equipment. The new equipment shall not use integrated circuits, digital controls, solid state components or computers.

Power and Control Cables

Remove and replace the power and control cables that run between Panel no. 1 of the Valve House Switchboard and the station service generator. Perform cable size and voltage drop calculations. Size the new cables to meet the current carrying capacity allowed by NFPA 70 when the generator is running at full load, per the requirements of Section 1.12.2.

1.2.4.6 Commissioning

After completing installation of all components, testing to confirm the unit operates and functions per design specifications, and per contract requirements, shall be conducted. The contractor shall create a test program that identifies the tests to be performed and the detailed procedures for conducting the tests. The test program shall be submitted to the Contracting Officer for approval. In addition to the testing identified here, the testing and commissioning program shall comply with the requirements of SECTION 016400 START UP TESTING AND COMMISSIONING. In the event of conflicting requirements, the requirements stated in this section shall apply.

At a minimum, the test program shall include, and conform to, the following requirements as stated in IEEE Standard 1248-1998.

Turbine/Generator/Governor System
Visual Inspection (9.1.82)
Clearance Measurement (9.1.14)
Vibration Check (9.1.81)
Calibration (9.1.11)
Lubrication Check (9.1.54)
Function Check (9.1.37)
Leak Testing (9.1.49)
Shaft Runout (9.1.69)
Bearing Heat Run (9.1.6)
Overspeed (9.1.61)
Load Rejection, including a load rejection at 100% power output (9.1.51)
Initial Rotation (9.1.45)
Initial Operation (9.1.44)

Turbine
Runner
Visual Inspection (9.1.82)
Clearance Measurement (9.1.14)
Calibration (9.1.11)

Wicket Gates
Visual Inspection (9.1.82)
Clearance Measurement (9.1.14)
Vibration Check (9.1.81)
Calibration (9.1.11)
Lubrication Check (9.1.54)
Function Check (9.1.37)
Leak Testing (9.1.49)

Shaft
Visual Inspection (9.1.82)
Clearance Measurement (9.1.14)
Vibration Check (9.1.81)
Shaft Runout (9.1.69)
Guide Bearing
Visual Inspection (9.1.82)
Clearance Measurement (9.1.14)
Vibration Check (9.1.81)
Calibration (9.1.11)
Lubrication Check (9.1.54)
Shaft Runout (9.1.69)
Bearing Heat Run (9.1.6)
Bearing Insulation (9.1.7)
Flushing (9.1.35)
Leak Testing (9.1.49)

Head Cover and bottom ring
Leak Testing (9.1.49)
Pressure Test (9.1.66)

Shaft Seal
Visual Inspection (9.1.82)
Clearance Measurement (9.1.14)
Flushing (9.1.35)
Leak Testing (9.1.49)
Lubrication Check (9.1.54)

Servomotors
Visual Inspection (9.1.82)
Clearance Measurement (9.1.14)
Lubrication Check (9.1.54)
Function Check (9.1.37)
Pressure Test (9.1.66)
Flushing (9.1.35)

Spiral Case
Visual Inspection (9.1.82)
Clearance Measurement (9.1.14)
Pressure Test (9.1.66)
Flushing (9.1.35)

Bolted Joint Torque (9.1.8)

Turbine Generator Shaft Coupling
Visual Inspection (9.1.82)
Clearance Measurement (9.1.14)
Bolted Joint Torque (9.1.8)
Initial Rotation (9.1.45)

---Generator---

Stator Testing
- DC winding resistance test (9.1.21)
- Insulation resistance (9.1.48)
- High potential (9.1.42)
- Insulation Power Factor (9.1.47)

Rotor Field Windings
- DC Winding resistance (9.1.21)
- Insulation resistance (9.1.48)
- High potential (9.1.42)
- Turn insulation (9.1.80)

Exciter
- Insulation resistance test (9.1.48)

Potential Transformers
- Insulation resistance (9.1.48)
- Phase relation (9.1.62)
- Ground connection (9.1.39)
- Ratios (9.1.67)
- Polarity (ac) (9.1.64)
- Instrument transformer burden (9.1.46)
- Accuracy test (9.1.2)

Current Transformers
- Phase Relation (9.1.62)
- Ratios (9.1.67)
- Polarity (ac) (9.1.64)
- Instrument transformers burden (9.1.46)
- CT saturation (9.1.19)
- Accuracy test (9.1.2)

Power Cables
- Insulation Resistance (9.1.48)
- High potential (9.1.42)
- Phase relation (9.1.62)
- DC winding resistance (9.1.21)

Meters
- Polarity (dc) (9.1.65)
- Calibration (9.1.11)
- Continuity checks (9.1.16)

Switches
- Functional checks (9.1.37)

Relays
- Polarity (dc) (9.1.65)
- Calibration (9.1.11)
- Continuity checks (9.1.16)
- Functional checks (9.1.37)

1.2.4.7 Alignment

The Turbine-Generator shafts shall be aligned per the equipment manufacturer's tolerances and instructions.

1.2.4.8 Training

The contractor shall provide training to indigenous staff, providing information on how to operate and maintain the equipment supplied for the Valve House Hydroelectric Power System. Training shall conform to SECTION 016640 TRAINING.

1.2.4.9 Operation and Maintenance

An operation and maintenance (O&M) manual for the equipment shall be provided. The O&M Manual shall comply with the requirements of SECTION 017810 OPERATION AND MAINTENANCE DATA and at a minimum shall contain:

Detail drawings of each component of the equipment

Specific instructions for the operation of the equipment, including but not limited to:
- Start-up sequences
- Steady State Operation
- Normal operating ranges for temperatures and pressures of bearings, oil and water.
- Shut down sequences
- Trouble shooting and repair instructions.
- Procedures for replacing wear parts
- Adjustment procedures for movable parts, including wicket gate closure and fit.
- Packing box and seal maintenance, adjustment and repair
- Gate Closure Timing settings
- Maintenance Intervals and schedule for each maintenance activity.
- Recommended types of oil and grease for each lubrication point.

1.2.5 Structural/Geotechnical Work

1.2.5.1 General

Perform all evaluations and reports as specified below. Perform construction and prepare plans & specifications perform construction, testing and commissioning for the chamber repair, and apron repair.

1.2.5.2 Modified Bulkhead for Outlet Valve Chamber

Contractor shall design, fabricate and place a single modified bulkhead for the downstream Chamber to facilitate the inspections in the conduits and replacement of outlet valves. The Contractor shall fabricate a single bulk head for placement in the slots for any three of the chambers. Designs for the modified bulkhead shall be a part of the Outlet Valve Design Package.

Use the as-constructed drawings for the Outlet valve chambers prepared under work of Paragraph 1.2.3.7 (Outlet Valve Replacement) as a reference to the design. Submit drawings which show plan, elevation, and details of the

new bulkhead. Include on the drawings any details need for proper installation, seating and sealing. Contractor shall address the fact that the new fixed cone valves are generally longer than the existing jet valves and probably do not fit within the guide slots of the existing chamber. Structural changes to the geometry of the existing chamber will not be allowed. Appurtenances (temporary or permanent) that fasten to the existing chamber will be allowed.

1.2.6 Spare Parts

Provide a spare parts list with associated annotated photographs for all parts actually delivered written in English and Pashto for all sub items listed below.

1.2.6.1 Roto Valve Operators and ancillary equipment.

a. Furnish a new set of nuts, bolts, gaskets (if any) to be shipped with valve operators and ancillary equipment. as the original might get damaged during assembly and disassembly process. This is to avoid costly delays that may result from damage and the extreme transportation distances required.

b. Furnish four (4) complete sets of valve seals.

c. Furnish one (1) complete set of special tools specific to valve components.

d. Furnish five (5) years worth of consumables for servicing, based on the manufacturer's recommended service intervals.

e. Furnish three (3) replacement sets of hoses and fittings for hydraulic units.

f. Furnish three (3) complete sets of standard replacement parts and wear items for the HPUs.

g. Furnish one (1) set of hoses and fittings long enough to reach from any one HPU to any other HPU.

h. Furnish one (1) complete set of special tools specific to HPU components.

1.2.6.2 Outlet Valves (Fixed Cone)

a. Furnish four (4) complete sets of valve seals.

b. Furnish one (1) complete set of special tools specific to valve components.

c. Furnish five (5) years worth of consumables for servicing, based on the manufacturer's recommended service intervals.

1.2.6.3 Outlet Valve Actuators

a. Furnish one (1) complete spare Valve Actutator.

b. Furnish one (1) complete set of special tools specific to valve components.

c. Furnish five (5) years worth of consumables for servicing, based on the manufacturer's recommended service intervals.

1.2.6.4 Valve House Hydroelectric Generating Unit

a. Furnish one (1) complete set of brushes for the exciter and for the generator

b. Furnish three (3) spare fuses for each fuse used in the control circuit for the generators

c. Provide two complete sets of packing for each location that packing is used. For the wicket gate packing this means two spare sets for each wicket gate.

d. If the wicket gate torque limiting device uses a breakable or consumable device (for example a shear pin or breaking link), two complete sets of consumable devices shall be supplied as spares.

1.2.6.5 Electrical Controls

a. Furnish four (4) indicating light assemblies of each type used

b. Furnish four (4) indicating light lens of each color used

c. Furnish two (2) control relays of each type used

d. Furnish five (5) fuses of each type and rating used

e. Furnish two (2) control transformers of each type and rating used

f. Furnish two (2) control (selector) switches of each type used

g. Furnish two (2) pushbutton assemblies of each type used

h. Furnish a minimum of two (2) for any other replaceable control component used.

INTENTIONAL PAGE BREAK

1.3 PROJECT: IRRIGATION INTAKE STRUCTURE

1.3.1 Mechanical Work

1.3.1.1 General

Prepare construction plans & specifications, as well as perform inspections, construction, testing and commissioning for the sub items listed below.

1.3.1.2 Site Inspection

All inspections should be performed by a qualified mechanical engineer. Perform visual inspection of crane structure, welds, rails, and paint system. Submit a report on the condition of existing equipment and structures, including recommendations for correcting deficiencies.

1.3.1.3 Bridge Crane and Hoist

Rehabilitate the irrigation intake structure bridge crane. The new hoist and trolley are estimated to weigh approximately 10,000 lbs. The actual weight of the hoist and trolley shall be determined prior to installation. All weights shall be coordinated with the COR to ensure that it is within the capacity of the proposed hoisting method. The rehabilitated bridge crane shall meet the following requirements: Clarify or confirm trolley requirements, keep or replace?.

a. The Contractor shall remove all of the old equipment above the bridge supporting the crane and place it on site at a location determined by the Contracting Office Representative.

b. The new crane shall be able to be operated by one individual.

c. The crane shall be up-rated from the current capacity of 75 tons up to 100 tons (200,000 pounds-force, lbf). The Contractor shall perform a full analysis of the existing bridge and determine if any modifications are required. Contractor may assume an alternate method of watering the tunnel thus reducing the maximum load on the gate that would otherwise be required (See Paragraph “Alternate Tunnel Watering System”. The Contractor shall prepare new lifting diagrams. The intake tower structure, crane structure, and hoist components shall have a capacity adequate for all live and dead loads resulting from the rated load.(See Appendix D MS-1-2-5 by the Government).

d. The crane shall be able to completely lower and raise each of the two closure bulkheads (i.e., both WHEEL GATE and STOP LOG).

e. The hoist block shall travel at least four feet per minute up or down at rated load. The hoist shall be electrically powered and push-button operated.

f. Replace all wire rope. The designers shall determine if stainless steel or galvanized wire rope is required for withstanding the environmental conditions, and provide design criteria accordingly.

g. The trolley traverse mechanism shall be able to traverse the trolley at rated load.

h. The trolley traverse may either be electrically powered and push-button operated, or manually operated with a maximum of 20 lbf manual input at rated load. If electrically powered, the trolley traverse shall operate at five to ten feet per minute.

i. The bridge traverse mechanism shall be able to traverse the bridge at a rate of twenty to thirty feet per minute with a 50 kip load.

j. All hoist and bridge traverse components shall be rated for and capable of continuous operation. The bridge traverse shall be electrically powered and push-button operated.

k. Crane hoist, trolley, and bridge traverse mechanisms each shall be equipped with a brake capable of preventing movement that is not commanded.

l. All crane components shall be protected from damage due to corrosion, dust and debris, sun, weather, and lightning.

m. All crane components shall be capable of forgoing maintenance for five years with no adverse affects on operation.

n. The crane shall be outfitted with a pendant control to allow operation from the intake structure deck.

o. Motor starters shall be rated for plugging duty.

p. Motor functions shall be protected from over travel by limit switches or other means. The crane shall be outfitted with an anti-blocking device in addition to the upper limit switches.

q. The bulkheads (i.e., both WHEEL GATE and STOP LOG) shall be protected from gate skew by slack cable switches or other means.

Original As-constructed drawings required to facilitate design under this contract are not available. The available drawings are considered "Informational" since they are not certified "As-Constructed". Therefore, the Contractor shall conduct site inspections to gather the required information for preparation of as-constructed drawings required to complete design. All inspections shall be performed by a qualified mechanical engineer. As-Constructed drawings should include the tower structure as it relates to the crane and the crane loads. As-Constructed drawings should include the crane bridge as it relates to the trolley and hoist. Submit drawings which show the demolition of the old trolley. Submit drawings which show plan, elevation, and detail views of the installation of the new trolley and hoist and appurtenances including but not limited to the hoist block and trolley mounted jib crane.

1.3.1.4 Jib Crane

Replace the jib crane located on the bridge crane trolley. The jib crane is intended solely for crane service items, such as lubricants, hand tools, and smaller main hoist components. The jib crane shall meet the following requirements:

a. The jib crane shall be able to lift objects between the bridge crane deck and the intake structure deck.

b. The jib crane boom shall be high enough off the deck that normal service items will be fully suspended in the air over the crane deck at the upper limit of travel.

c. The jib crane shall be able to be operated by one individual.

d. The jib crane shall have a rated capacity of ¼ ton (500 lbf). If outfitted with a manual hoist, the operator shall be able to lift the rated load with a maximum of 20 lbf effort.

e. The jib crane hoist shall be outfitted with a brake capable of holding the rated load. The brake shall be operated from the operator station.

f. The jib crane shall be able to smoothly swing 360 degrees about the upright member at rated load. The crane shall have a provision to swing the boom from the operator station. All crane components shall be protected from damage due to corrosion, dust and debris, sun, weather, and lightning.

g. The jib crane may be upsized to assist with lifting components required for rehabilitation of the Bridge Crane.

1.3.1.5 Lifting Beams

Rehabilitate the two lifting beams for the intake bulkheads (i.e., both WHEEL GATE and STOP LOG). The lifting beams shall meet the following requirements for their respective bulkheads:

a. Each lifting beam shall be able to interface with the bulkhead.

b. Each lifting beam shall be able to fully lower the bulkhead, disengage, and be hoisted back to the intake structure deck with operation by a single person and without fouling or binding in the guide slots.

c. Each lifting beam shall be able to travel to the bottom of the guide slot, engage a bulkhead, and fully raise the bulkhead to the dogging position at the intake structure deck.

d. The lifting beam shall engage and disengage the bulkhead with the pull of a rope, at no more than 40 lbf.

e. The lifting beam shall have a mechanism or design that prevents the beam from being oriented in a manner which would prevent engagement or disengagement from the bulkhead.

f. The lifting beam shall have a mechanism that prevents inadvertent release of the bulkhead.

g. All lifting beam components shall be protected from damage due to corrosion, dust and debris, sun, and weather.

1.3.1.6 Design/Manufacture

Use ASME B30.2-2005 and Unified Facilities Criteria UFC 3-320-07N for the development of technical specifications for the design, construction, and installation of all crane components. In the event of a conflict or an overlap in governance between the two standards, the most stringent requirements shall apply.

1.3.1.7 Installation and Site Work

a. Shop-fit and assemble components to the fullest extent possible prior to transportation to the site, to ensure proper fit. Match mark individual components for ease of field assembly. Disassemble as required for shipping.

b. Replace end truck wheel bearings on the bridge crane.

c. Replace all bridge crane drive components.

d. Replace entire jib crane.

e. Replace entire bridge crane trolley, hoist, and all hoisting equipment.

f. Replace all power/control wire and equipment. See paragraph 1.11.2. ELECTRICAL WORK.

g. Remove any existing rust, corrosion, or failed paint system. Repaint exposed surfaces.

h. Install grease distribution system.

i. Lubricate all components requiring lubrication.

j. Test bridge drive mechanism at no load. Correct any deficiencies. Test at rated load. Correct any deficiencies.

k. Test hoist and trolley mechanisms at no load. Correct any deficiencies. Test at rated load. Correct any deficiencies.

1.3.1.8 Testing

Field and operating testing shall be conducted in accordance with SECTION 016400 START UP TESTING AND COMMISSIONING**.** After completing installation of all components, testing to confirm the hoist and trolley operates and functions per design specifications, and per contract requirements, shall be conducted. The contractor shall create a test program that identifies the tests to be performed and the detailed procedures for conducting the tests. The test program shall be submitted to the Contracting Officer for approval. Tests to be preformed, including but not limited to:

a. Crane Performance Testing Requirements – No Load testing
b. Crane Performance Testing Requirements - At Load tests
c. Lifting Beams functional testing –Engage/Disengage 3cycles
d. Lifting Beam operation testing – Raise/Lower bulkhead and wheel gate

1.3.1.9 Operation & Maintenance

O&M Manual covering all equipment shall be prepared in accordance with SECTION 017810 OPERATIONS AND MAINTENANCE DATA.

1.3.2 Electrical Work

1.3.2.1 General

Prepare construction plans & specifications, as well as perform construction, testing and commissioning for the irrigation intake crane, emergency diesel generator and associated power distribution system. Design and installation shall conform to requirements of NFPA 70 and IEEE C2.

1.3.2.2 Site Inspection

All inspections should be performed by a qualified electrical engineer. Original As-constructed drawings required to facilitate design under this contract are not available. The available drawings are considered “Informational” since they are not certified “As-Constructed”. Therefore, the Contractor shall conduct site inspections to gather the required information for preparation of as-constructed drawings required to complete design. Site inspections will also be necessary to determine condition of existing electrical systems where indicated below. All inspections shall be performed by a qualified electrical engineer. A list of drawings required to be as-constructed is provided below:

Single-Line Diagram (17-F-8)
Aerial Distribution Line – Plan and Details (17-F-6)
Intake Tower Access Bridge – Bent and Girder (15-F-65)

These drawings can be found in Appendix A**.**

1.3.2.3 Design

Design shall utilize guide specifications and industry standards referenced within this Section. Controls shall not use any solid-state devices unless similar electro-mechanical type devices are not available or will not provide the required function. Electrical materials shall be dust-tight, corrosion-resistant and have an operating temperature suitable for the harsh conditions found at this site. Existing electrical distribution system characteristics can be found on the Informational Drawings. See Appendix A for list of Informational Drawings.

1.3.2.4 Studies

Conduct load study and voltage drop study on the aerial distribution line to verify it has adequate capacity to service the existing connected loads plus the intake crane structure loads. Contractor shall notify the Contracting Officer Representative of any unauthorized connections to the aerial distribution line. Conduct a fault study to determine the required interrupting ratings of the new power distribution equipment.

1.3.2.5 Irrigation Intake Structure

a. Replacement of electrical equipment for irrigation intake crane. Equipment includes, but not limited to: lighting fixtures/switches, crane control devices, motor starters, transformers, power distribution panels. Motor starters shall be reduced voltage, non-solid state type; wye-delta, primary impedance, partial-winding, or primary resistive Use Technical Specification 412213.13, BRIDGE CRANES for guidance. Controls shall conform to the requirements of NEMA ICS 1, ICS 2, ICS 5 and ICS 8. Lighting shall utilize HID fixtures capable of producing a minimum level of illumination at the structure's main platform in accordance with IES Lighting Handbook guidance.
b. Replacement of power/control conductors for the irrigation intake crane (existing conduits may be used if undamaged, adequately sized, and conform to applicable standards).
c. Inspect crane rail electrification system for damage. Perform continuity tests on runway conductors and current collectors (see informational drawings 9698D20 and 9798D8). Replace electrification system if it fails continuity tests.
d. Restore power to the Intake Structure by replacement of conductors between irrigation intake structure and overhead line. Design of aerial distribution components shall conform to requirements of TM 5-811-1.

1.3.2.6 Products

Power and control conductors shall be stranded copper with cross-linked thermosetting polyethylene insulation and non-PVC jacket conforming to NEMA WC 70. Enclosures shall constructed of steel and conform to NEMA 250. Enclosures indoors shall be Type 12 and enclosures outdoors or in damp locations shall be Type 4X. Indicating (pilot) lights shall be push-to-test type. All exposed conduit shall be rigid galvanized steel conform to UL 6. All buried conduit shall be PVC-coated rigid galvanized steel conforming to NEMA RN 1**.**

1.3.2.7 Installation

Remove all unused electrical equipment & materials (control panels, conduit, wire, etc.) prior to installation of new equipment. Removed equipment and materials are the property of the Contractor and shall be removed from site. Installation of new equipment shall conform to applicable codes and standards, as well as manufacturer's recommendations.

1.3.2.8 Testing

Field and operating testing shall be conducted in accordance with SECTION 016400 START UP TESTING AND COMMISSIONING**.** The emergency diesel generator shall be tested in accordance with Technical Specification 263214.00. As well, all new and reused wire shall be given insulation resistance (Meggar) and continuity tests.

1.3.2.9 Operation & Maintenance

O&M Manual covering all equipment shall be prepared in accordance with SECTION 017810 OPERATIONS AND MAINTENANCE DATA. O&M data for the emergency diesel generator shall include instructions on manual exercising in accordance with manufacturer's recommendations.

1.3.2.10 Diesel Generator for Intake structure

Provide a new emergency diesel generator to serve as standby power for the intake structure crane. Controls and instrumentation shall not use any solid-state devices unless similar electro-mechanical type devices are not available or will not provide the required function. Electrical control cabinets shall be dust-tight, corrosion-resistant and have an operating temperature suitable for the harsh conditions found at this site. Provide manufacturer's weatherproof enclosure mounted on a concrete pad or, at contractor's option, provide a generator building similar to that originally provided, with power receptacles and lighting. Power distribution configuration shall be similar to that originally designed (see Informational Drawings 17-F-7 and 17-F-8). Power panels shall be dust-tight and have an operating temperature suitable for the harsh conditions found at this site. Should power panels be exposed to the environment, then they must also be corrosion-resistant. Generator shall be sized to carry the full load of the irrigation intake structure. See Informational Drawing 17-F-8 for electrical characteristics of original emergency generator. Provide electrical plans and specifications for the power service to the intake tower.

The generator set shall meet the following requirements:

a. The generator set shall provide power to the intake structure through a manual transfer switch.

b. The generator set shall be sized such that it is capable of providing power to all equipment and lighting on the intake structure simultaneously.

c. The generator set shall be provided with a fuel tank supply (i.e. a "belly tank") adequate for 24 hours of continuous use under load. Fuel tanks shall have secondary containment integral to the generator.

d. The generator set shall be designed for outdoor and extreme-duty use. . The cooling system shall be designed for both 50 degrees C ambient temperature, and the altitude at the location.

There will be no load on the generator set when started. Provide an Operation and Maintenance manual for the diesel generator.

1.3.3 Structural Work

Provide all inspection reports, plans and inspections for all sub items below.

1.3.3.1 Access Bridge (Optional to Contractor)

The access bridge will require an inspection and structural analysis by a qualified engineer IF used for moving heavy loads beyond the Site Specific Limitations in paragraph 1.6.

1.3.3.2 Irrigation Tunnel Closure Wheeled Bulkhead

This paragraph covers the smaller of the two intake tunnel closure bulkheads. It is listed on drawings as the WHEEL GATE. Analyze the design of the existing wheeled bulkhead to ensure an adequate design and capacity. Rehabilitate the wheeled bulkhead. Rehabilitation shall include:

a. 100% visual inspection of welds and structural steel. Repair of defects or cracks discovered.

b. Complete replacement of wheels, bearings, and shafts.

c. Complete replacement of seals.

d. Modification of lifting points or rigging as necessary to interface with new lifting equipment.

e. Repainting with an approved vinyl-based paint system. The system shall include primer, intermediate, and top coats and in thicknesses as specified by the paint manufacturer for the application.

The wheeled bulkhead shall meet the following performance requirements:

a. The bulkhead shall be inspected for conformance with current design in accordance with EM 1110-2-2105 and EM 1110-2-2701 for the reservoir at maximum pool.

b. If the bulkhead does not meet current design standard, then the Contractor shall prepare designs and upgrade the bulkhead to bring it into conformance.

c. The bulkhead shall interface with existing dogs.

d. Bulkhead travel shall be smooth throughout the entire range of travel up and down, without hesitation or binding on guide slots.

e. The bulkhead shall fully seat against the irrigation tunnel intake and prevent leakage, permitting the tunnel to be dewatered. Acceptable leakage is fifteen gallons per minute.

f. Depending on Contractor design, install valve in the face of the bulkhead to provide an alternate method of watering the tunnel. See Paragraph on Mechanical Work.

1.3.3.3 Irrigation Tunnel Closure Concrete Bulkhead

This paragraph covers the larger of the two intake tunnel closure bulkheads. It is listed on the informational drawings as the STOP LOG.

The existing concrete bulkhead shall be rehabilitated by lifting the bulkhead up clear of the structural elements and replacing the seals. The contractor shall provide the necessary scaffolding, and other temporary features. The contractor shall provide protection as necessary to assure that the existing intake tower and inlet structure is not damaged during the repair. The contractor shall repair any damage at no cost to the government.

The refurbished bulkhead shall meet the following requirements:

a. The bulkhead seals shall be replaced according to the original design.

b. Bulkhead travel shall be smooth throughout the entire range of travel up and down, without hesitation or binding on guide slots.

c. The bulkhead shall fully seat against the irrigation tunnel intake portal and prevent leakage, permitting the tunnel to be dewatered. Acceptable leakage is fifteen gallons per minute.

d. Remove corrosion, inspect welds and metal components for cracking (e.g., lifting eyes). Repair by welding and paint the steel surface.

1.3.4 SPARE PARTS

1.3.4.1 Bridge Crane

a. Furnish two (2) replacement bearings and couplings of each size for the bridge drive, trolley drive, and hoist.
b. Furnish one (1) complete set of standard replacement parts and wear items for all motors, speed reducers, bearings, and couplings.
c. Furnish one (1) complete set of special tools specific to crane components.
d. Furnish five (5) years worth of consumables for servicing, based on the manufacturer's recommended service intervals.

1.3.4.2 Electrical Controls

a. Furnish four (4) indicating light assemblies of each type used
b. Furnish four (4) indicating light lens of each color used
c. Furnish two (2) control relays of each type used
d. Furnish five (5) fuses of each type and rating used
e. Furnish two (2) control transformers of each type and rating used
f. Furnish two (2) control (selector) switches of each type used
g. Furnish two (2) pushbutton assemblies of each type used
h. Furnish a minimum of two (2) for any other replaceable control component used.

1.4 DAM SAFETY INSTRUMENTATION

1.4.1 Civil/Geotechnical Work

1.4.1.1 General

Instrumentation type, location, depth (as applies), installation, and completion details (finish details) shall be in accordance with the Instrumentation Plan and applicable USACE and ASTM standards for embankment dam instrumentation for design, monitoring, and operation. The Instrumentation Plan and Elevation View (Embankment only, tunnel section not available at prescribed location) are included Appendix A and should be used as a guide to required type and locations. Contractor shall provide a design package including the results of all site inspections, plans and specifications, equipment installed, equipment provided with operational procedures.

1.4.1.2 Geotechnical Requirements

The Contractor shall develop all pertinent Dam Safety Instrumentation using appropriate ASTM and USACE Standards. The Contractor shall submit a Dam Safety Instrumentation report containing field exploration results, existing geotechnical (e.g. surface and subsurface) conditions, location of piezometers on site plan, ground-water levels, and construction materials (e.g. concrete cement, asphalt, and aggregates). For rock coring, perform core logging following the methodology in Section 5-10, Core Logging, in EM 1110-1-1804, Geotechnical Investigations.

The contractor shall submit a dam safety instrumentation plan prior to commencing any field investigation to the USACE-AED Engineering Branch through the COR for review and approval. Once the plan is reviewed and approved, the Contractor can start the field investigation. The dam safety instrumentation shall be submitted with all the design review submittals. Dam safety instrumentation Plan shall be submitted promptly in accordance with SECTION 013316 DESIGN BUILD AFETR AWARD.

1.4.1.3 Geotechnical Qualifications

A geologist or geotechnical engineer that is a member of a geotechnical firm responsible to the Contractor shall oversee all geotechnical design parameters. The geologist or geotechnical engineer shall be qualified by: education in geology or geotechnical engineering; professional registration; and a minimum of ten (10) years of experience in geology or geotechnical engineering design. The geotechnical firm conducting the field investigation and laboratory work shall be certified by the Chief, Quality Assurance Branch USACE-AED. Certification document shall be submitted as part of the Dam Safety Instrumentation Report.

1.4.1.4 Installation and Site Work

Locks for all instruments shall be keyed alike where possible. Provide approved locks and keys.

1.4.1.5 Piezometers

Install two piezometers in the left abutment as illustrated in the Base Instrumentation - Plan View, and Instrumentation - Elevation View drawings in Appendix A. Drawing 13-F-53 (Appendix A) shows the inlet invert of the tunnel at elevation 963.1 meters and a sketch in the USBR Report (Appendix C) shows the outlet invert at elevation 961 meters. Design the sensing zone (at least 3 meters long) starting at the same elevation as the bottom of the irrigation tunnel. Contractor shall install the piezometers according to ASTM D5092 and USACE guidance (ER 1110-1-1807, and EM 1110-2-1908), as applicable, shall be used to design the piezometers, including locking cover or caps mounted flush to the ground surface over each piezometer. Take initial water level readings, then before and after tunnel dewatering operations (Option in Contract) at a sufficient interval to evaluate any changes.

1.4.1.6 Water Level Meter

Provide one portable battery operated water level meter sensing units with light and sounding buzzer to indicate water with markings in meters and millimeters. Unit shall have 100 meter length of cable. Sensing units shall be

Stevens Water Monitoring Systems, Inc. Contact Meter or the Durham Geo Slope Indicator Water Level Indicator (230 mm reel – 100 m cable and 180 mm reel – 50 m cable), or equivalent.

1.4.1.7 Staff Gages

Install staff gages for visual reference of pool elevation and tailrace elevation. Porcelain enameled staff gages similar to Stevens Water Monitoring Systems Style M metric measurement staff gages shall be installed with figure plates to denote pool elevation from elevation 1007 m to 1050 m and for tailrace elevation from elevation 962 m to 974 m. Staff gages panel or board and mounting to be Contractor designed. Equipment to be supplied shall include an optical spotting scope or binocular of sufficient magnification to read the pool elevation staff gage from a distance of 200m, or the distance from the Power Intake to the Irrigation Intake Structure where the pool staff gage will be mounted on the northwest leg of the intake structure. The tailrace staff gage shall be mounted on the upstream wall of the Powerhouse facility near the elevation reference point. Documentation and photographs of the staff gage shall be included in a report on Dam, Safety Instrumentation. Documentation shall include a specific reference to the datum used for setting the gage see topographic survey report in Appendix D for details on the available datum.

1.4.1.8 Project Identifications

Design and install signs identifying major features of the site according to Section 01 58 00 PROJECT IDENTIFICATION. The project identification shall include the following;

a. Construction Project Signage; one for project identification and one for on-the-job safety performance of the contractor.

Signage for all major features will be provided along all vehicle and pedestrian ways where construction site workers and project facility workers are required to travel.

1.5 OPERATIONS AND MAINTENANCE (O&M) -

See SECTION 017810 OPERATION AND MAINTENANCE DATA for shop, assembly, and operations and maintenance drawing and data requirements.

PART 2. PRODUCTS

Not used.

PART 3. EXECUTION

Not used.

-- END OF SECTION --

SECTION TABLE OF CONTENTS

DIVISION 01 – GENERAL REQUIREMENTS

SECTION 01 06 00

SPECIAL CLAUSES

PART 1 GENERAL 4

1.1.1 PRECONSTRUCTION CONFERENCE 4

1.1.2 Schedule of Meeting 4

1.1.3 Meeting Minutes 4

1.1.4 AREA USE PLAN 5

1.1.5 CONTRACTOR'S MOBILIZATION AREA 5

1.1.6 Contractor's Temporary Facilities 5

1.1.6.1 General 5

1.1.6.2 Administrative Field Offices 5

1.1.6.3 Contractor provided Government facilities 5

1.1.6.4 Storage Area 6

1.1.6.5 Plant Communication 6

1.1.6.6 Appearance of Mobilization Site Facilities and/or Trailers 6

1.1.6.7 Maintenance of Storage Area 6

1.1.6.8 Security Provisions 6

1.1.6.9 Sanitation 6

1.1.6.10 Telephone 6

1.1.6.11 Restoration of Storage Area 7

1.1.7 Protection and Maintenance of Traffic 7

1.1.7.1 Use of Existing Roads as Haul Routes 7

1.1.7.2 Employee Parking 7

1.1.8 Temporary Project Safety Fencing and Barricades 7

1.1.8.1 Barricades 7

1.1.9 Host Nation Authorizations, Permits and Licenses 7

1.1.10 RESPONSIBILITY FOR PHYSICAL SECURITY 8

1.2 DUST CONTROL 8

1.3 CONNECTIONS TO EXISTING UTILITIES 8

1.3.1 General 8

1.3.2 Existing Underground Utilities 8

1.3.3 Use of Underground Utility Detecting Device 8

1.3.4 Hand Excavation 8

1.3.5 Repair of Damaged Utilities 8

1.4 TEMPORARY OUTAGES OF EXISTING SERVICES 8

1.5 WATER 9

1.6 electricity 9
1.7 WORK OUTSIDE REGULAR HOURS 9
1.7.1 Exterior Night Lighting 9
1.8 SCHEDULING OF WORK IN EXISTING FACILITIES 9
1.9 SPECIAL FACILITIES AND SERVICES TO BE FURNISHED BY THE CONTRACTOR 9
1.10 CERTIFICATES OF COMPLIANCE 10
1.11 ACCIDENT PREVENTION 10
1.11.1 Accident Prevention Program 10
1.11.2 Ground Fault Circuit Interrupter (GFCI) Requirement – Overseas Construction 10
1.11.3 Temporary Power - Electrical Distribution Boxes 10
1.12 HAZARDOUS MATERIALS 11
1.13 SPARE PARTS 11
1.13.1 General 11
1.13.2 Procurement and Delivery of Spare Parts 11
1.13.2.1 Shipment and Delivery 11
1.13.2.2 Turnover of Spare Parts 11
1.13.2.3 Parts and Package Identification 11
1.13.2.4 Preservation and Packaging Instruction 11
1.13.3 Warranty 12
1.13.4 Payments for Spare Parts 12
1.14 OPERATION AND MAINTENANCE (O&M) DATA 12
1.14.1 General 12
1.14.2 Submittals 12
1.14.3 Operation and Maintenance (O&M) Data 13
1.14.4 Recommended Spare Parts List 13
1.14.5 Supplemental Submittals of Data 13
1.14.6 Framed Instructions for Systems 13
1.14.7 Additional Submittals/Re-submittals 13
1.15 CONTRACTOR FURNISHED EQUIPMENT LISTS 13
1.16 TIME EXTENSIONS 14
1.16.1 General 14
1.16.2 WEATHER DELAYs 14
1.16.3 Other Delays 14
1.17 STANDARDIZATION 14
1.18 COMPLIANCE WITH HOST COUNTRY RULES AND CUSTOMS 14
1.18.1 Contractor's Responsibilities 15
1.19 EMPLOYEE ACCESS TO PROJECT SITE 15
1.19.1 Employee Identification 15
1.19.1.1 Preparation of Identification Badges 15

1.19.1.2 Employee Background and Historical Information 15
1.19.2 Identification of Contractor Vehicles 16
1.20 RADIO TRANSMITTER RESTRICTIONS 16
1.21 PUBLIC RELEASE OF INFORMATION 16
1.21.1 Prohibition 16
1.21.2 Subcontract and Purchase Orders 16
1.22 LOCAL CLAUSES ..... **Error! Bookmark not defined.**
1.23 APPLICATION OF US CRIMINAL JURISDICTION 16
1.24 ATTACKS FROM HOSTILE ENTITIES 16
PART 2 PRODUCTS 17
PART 3 EXECUTION 17

SECTION 01 06 00
SPECIAL CLAUSES

REVISED 30 DEC 2011

PART 1 GENERAL

1.1 SUMMARY

This section was prepared for work performed under supervision of the Afghan Engineer District South and represents special clauses that have become customary for work in that region.

1.1.1 Related Sections and Clauses

Section 01 40 00 SECURITY

Section 01 33 15 SUBMITTAL PROCEDURES

01 01 50 TECHNICAL REQUIREMENTS

CONTRACT CLAUSE 52.236-13 entitled “ACCIDENT PREVENTION (NOV1991)-ALTERNATE 1

Contract Clause 52.249-10 entitled “DEFAULT (FIXED-PRICE CONSTRUCTION) APR 1984”; see 52.249-10(b)(1)(i) and (2)

1.1.2 Submittals

Area Use Plan, G

1.2 PRECONSTRUCTION CONFERENCE

1.3 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:

a. The Contractor's Quality Control (CQC) Program,
b. The Contractors Accident Prevention Program,
c. Submittals,
d. Correspondence,
e. Schedule,
f. Access to the work site,
g. Security requirements,
h. Interface requirements,
i. Temporary facilities and services,
j. Hazards and risks,
k. Working after normal hours or on weekends or holidays,
l. Assignment of inspectors,
m. Representations,
n. Special requirements,
o. Phasing,
p. Other aspects of this project that warrant clarification and understanding.

1.4 MEETING MINUTES

It shall be the responsibility of the Contractors CQC System Manager to prepare detailed minutes of this meeting

and submit those minutes to the Contracting Officer for approval within three (3) workdays. Any corrections deemed necessary by the Contracting Officer shall be incorporated and resubmitted within two (2) calendar days after receipt. Upon approval of the minutes by the Contracting Officer, the Contractor shall distribute the minutes to all parties present or concerned.

1.5 AREA USE PLAN

The Contractor shall submit to the Contracting Officer, within thirty (30) calendar days after notice to proceed of this contract, an Area Use Plan designating intended use of all areas within the project boundaries. This plan shall include, but not necessarily be limited to the following:

a. The proposed location and dimensions of any area to be fenced and used by the Contractor;
b. Construction plant and building installations/the number of trailers and facilities to be used;
c. Avenues of ingress/egress to the fenced areas and details of the fence installation;
d. Drawings showing temporary electrical installations;
e. Temporary water and sewage disposal installations;
f. Material storage areas;
g. Hazardous storage areas.
h. Any areas that may have to be graveled shall also be identified.
i. The plan shall also include a narrative description of the building structural system, the site utility system and the office or administration facilities.
j. 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.

1.6 CONTRACTOR'S MOBILIZATION AREA

The Contractor will be permitted to use an area approved by the Contracting Officer within the contract limits for operation of his construction equipment and plants, shops, warehouses, and offices. Utilities will be provided for the Contractor as described below. The Contractor is responsible for obtaining any required additional mobilization area above that designated. The construction site shall be cleared of construction debris and other materials and the area restored to its final grade.

1.7 CONTRACTOR'S TEMPORARY FACILITIES

1.7.1 General

All facilities within the Contractor's mobilization area shall be of substantial construction suitable for the local weather conditions. Sanitary facilities shall meet the requirements of Corps of Engineers, Safety and Health Requirements Manual EM 385-1-1. Local nationals will not be granted any privileges under this contract. Government provided services are for American and Foreign national contractors only.

1.7.2 Administrative Field Offices

The Contractor may provide and maintain administrative field office facilities within the mobilization area at the designated site. Government office and warehouse facilities will not be available to the Contractor's personnel.

1.7.3 Contractor provided Government facilities

The Contractor shall provide office area for Government personnel within the project site, near the Contractor’s field offices. The office area shall consist of two (2) 8 ft. x 40 ft. CONEX containers or equivalent. One CONEX shall contain two rooms and one toilet room. The toilet room shall consist of one shower, one western style toilet and one sink. The offices shall be heated/cooled using split pac ductless heating/cooling units. The Contractor shall provide each office with two desks, two chairs, one drawing table, telephone, and two computer connections with internet access. The second CONEX shall be heated/cooled using ductless split pack units. The second CONEX shall be used for Government storage. The contractor shall provide four aggregate paved parking spaces for Government use. The Contractor shall provide water, sewer and electrical utilities for the Government office space. The

Contractor shall be responsible for all utilities, trash disposal and security for Government office area. No separate measurement and payment shall be provided for the Contractor Provided Government Facilities and all costs associated shall be distributed throughout the other bid items.

1.7.4 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.

1.7.5 Plant Communication

Whenever the Contractor has the individual elements of its plant so located that operation by normal voice between these elements is not satisfactory, the Contractor shall install a satisfactory means of communication, such as telephone or other suitable devices. If radio communication is approved by Contracting Officer / installation security office, frequency selection shall be approved by Contracting Officer to prevent interference with installation operations. Such devices shall be provided by the Contractor and made available for use by Government personnel as requested.

1.7.6 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.

1.7.7 Maintenance of Storage Area

Fencing shall be kept in a state of good repair and proper alignment. Should the Contractor elect to traverse unpaved areas which are not established roadways with construction equipment or other vehicles, such areas shall be covered with a layer of gravel as necessary to prevent rutting and the tracking of soil onto paved or established roadways. The gravel gradation shall be at the Contractor's discretion.

1.7.8 Security Provisions

Adequate outside security lighting shall be provided at the Contractor's temporary facilities. The Contractor shall be responsible for the security of its own facilities and equipment in accordance with Section 01 40 00 Security.

1.7.9 Sanitation

a. Sanitary Facilities: The Contractor shall be responsible for maintaining such facilities at no expense to the Government.
b. Trash Disposal: The Contractor shall be responsible for collection and disposal of trash from the work areas and from the mobilization area. General construction debris and demolition debris shall be collected and transported by the Contractor to a location designated by the Government. Construction debris, waste materials, packaging material and the like shall be removed from the work site daily. Loose debris capable of being windblown, shall be immediately placed in sealed or covered containers to prevent it from being blown onto taxiways or runways. Any dirt or soil that is tracked onto paved or surfaced roadways shall be cleaned daily. Materials resulting from demolition activities that are salvageable shall be stored within the fenced area described above. Stored material not indoors, whether new or salvaged, shall be neatly stacked when stored.

1.7.10 Telephone

The Contractor shall make arrangements to install and pay all costs for telephone facilities desired.

1.7.11 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.

1.8 PROTECTION AND MAINTENANCE OF TRAFFIC

During construction the Contractor shall provide access and temporary relocated roads as necessary to maintain traffic. The Contractor shall maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the Contracting Officer. Measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, erection of barricades, placing of lights around and in front of equipment and the work, and the erection and maintenance of adequate warning, danger, and direction signs, shall be as required by the Host Nation and base authorities having jurisdiction. The traveling public shall be protected from damage to person and property. The Contractor's traffic on roads selected for hauling material to and from the site shall interfere as little as possible with base traffic. The Contractor shall investigate the adequacy of existing roads and the allowable load limit on these roads. The Contractor shall be responsible for the repair of any damage to roads caused by construction operations.

1.8.1 Use of Existing Roads as Haul Routes

The Contractor shall be responsible for coordinating with any applicable 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 any applicable authorities and is the sole responsibility of the Contractor.

1.8.2 Employee Parking

The Contractor’s employees may be allowed parking on the project site as determined by the COR. The Contractor is responsible for transporting workers (local nationals) from off post to the worksite, coordinating security identification screening, and cooperating in gate searches with the base authorities. The Government reserves the right to terminate any and all Contractor parking at any time.

1.9 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**.** Contractor shall be responsible for fencing off individual project sites within the total contract limits to control safe access to individual project areas and to control movement of personnel and materials.

1.9.1 Barricades

Barricades shall be required whenever safe public access to paved areas such as roads, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic. Barricades shall be securely placed, clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night. Travel to and from the project site shall be restricted to a route approved by the Contracting Officer.

1.10 HOST NATION AUTHORIZATIONS, PERMITS AND LICENSES

It shall be the Contractor's responsibility to obtain such local authorizations, permits and licenses necessary to establish his quarry/borrow pit operations, batching operations and haul routes (See Special Clause entitled: “COMPLIANCE WITH HOST COUNTRY RULES AND CUSTOMS”).

1.11 RESPONSIBILITY FOR PHYSICAL SECURITY

Prior to mobilization, the Contractor shall submit his proposed means of providing project security to meet the requirements of Contract Section 01 40 00 SECURITY and prevent unauthorized access to equipment, facilities, materials and documents, and to safeguard them against sabotage, damage, and theft. The Contractor shall be responsible for physical security of all materials, supplies, and equipment of every description, including property which may be Government-furnished or owned, for all areas occupied jointly by the Contractor and the Government, as well as for all work performed.

1.12 DUST CONTROL

The Contractor shall be required to control objectionable dust in the work areas, access roadways, and haul roads by means of controlled vehicle speeds or dust palliatives. Vehicles transporting sand, cement, gravel or other materials creating a dust problem shall be covered, as directed by the Contracting Officer, or in accordance with local Laws, codes, and regulations.

1.13 CONNECTIONS TO EXISTING UTILITIES

1.14 GENERAL

Any outage involving disruption of electrical service beyond the site area shall be requested in writing at least ten (10) days in advance of the date requested for the commencement of the outage. The Contractor shall provide a request, detailing the type of outage needed (water, sewer, electrical, steam, etc.), the time needed to perform the work, the reason for the outage, and the known affected facilities. The Contracting Officer shall be contacted prior to the outage to confirm the time and date. If the Contractor fails to initiate work at the approved time, the Contracting Officer may cancel the approved outage and may direct the Contractor to resubmit a new request. No part of the time lost due to the Contractors failure to properly schedule an outage shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

1.15 EXISTING UNDERGROUND UTILITIES

The Contractor is provided notice that existing utilities may be present in the construction area. The Contractor shall exercise the utmost care in researching locations of existing utility lines by implementing control measures to eliminate, or reduce to a level acceptable to the Contracting Officer, the chance of damaging or destroying existing utilities.

1.16 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.

1.17 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.

1.18 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.

1.19 TEMPORARY OUTAGES OF EXISTING SERVICES

To minimize outage impact to the mission of the installation, all outages shall be scheduled on weekends or from

2100 – 0530 hours on duty days and/or as directed by Contracting Officer Representative (COR). The period proposed for performance of the outage shall include sufficient contingencies to preclude impact to the peak working hours 0530 – 1800 hours during the workweek.

1.20 WATER

The Contractor shall install and maintain necessary supply connections and piping for same, but only at such locations and in such manner as may be approved by the Contracting Officer. 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.

1.21 ELECTRICITY

Electrical service is not available for use under this contract; therefore all electric current required by the Contractor shall be the responsibility of the Contractor, furnished at his own expense. The Contractor shall provide diesel generators to meet his demand requirements. The means of doing so, such as by temporary distribution systems, shall be the responsibility of the Contractor. All temporary connections for electricity shall be subject to the approval of the Contracting Officer and shall comply with Corps of Engineers manual EM 385-1-1 entitled Safety and Health Requirements Manual. All temporary lines shall be furnished, installed, connected and maintained by the Contractor in a workmanlike manner satisfactory to the Contracting Officer. Before final acceptance of systems, or facilities, all temporary connections installed by the Contractor shall be removed at his expense in a manner satisfactory to the Contracting Officer.

1.22 WORK OUTSIDE REGULAR HOURS

If the Contractor desires to carry on work outside regular base duty hours, or on holidays, including the following U.S. holidays: New Year's Day, Independence Day, Thanksgiving and Christmas. The Contractor shall submit an application to the Contracting Officer. Due to reliance upon local national laborers and time off due to local observances, there may be disruptions. Potentials dates are the following local observances: National Islamic Holiday of Ashura, Ramadan (actual date varies – check with local authorities). The Contractor shall allow ample time to enable satisfactory arrangements to be made by the Government for inspecting the work in progress. At night, exterior lighting shall be provided in conformance with EM-385-1-1 entitled "Safety and Health Requirements Manual".

1.23 EXTERIOR NIGHT LIGHTING

Exterior night lighting shall be provided in conformance with EM-385-1-1 entitled Safety and Health Requirements Manual.

1.24 SCHEDULING OF WORK IN EXISTING FACILITIES

As soon as practicable, but in any event not later than thirty (30) calendar days after award of this contract, the Contractor shall meet in conference with the Contracting Officer, or his duly authorized representatives, to discuss and develop mutual understanding relative to the scheduling of work in and access to the existing facilities where work has to be performed under this contract, so that the Contractor's proposed construction schedule is coordinated with the operating and security requirements of the installation.

1.25 SPECIAL FACILITIES AND SERVICES TO BE FURNISHED BY THE CONTRACTOR

The Contractor shall furnish the facilities and services listed in this clause for Corps of Engineers personnel and other persons as designated by the Contracting Officer. All facilities, furnishings, materials, and equipment shall be new when furnished at the site. The Contractor shall fully maintain and repair all facilities, furnishings and equipment listed below. All facilities, furnishings, materials, and equipment furnished and/or installed by the Contractor under this clause shall remain the property of the Contractor at the completion of the contract. Facility structures shall be modular or containerized, suitable for easy movement at a later date.

1.26 CERTIFICATES OF COMPLIANCE

Any certificates required for demonstrating proof of compliance of materials with specification requirements shall be executed in accordance with Section 01 33 15 SUBMITTAL PROCEDURES. 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.

1.27 ACCIDENT PREVENTION

The Contractor shall comply with all applicable Host Country laws and with such additional measures as the Contracting Officer may find necessary in accordance with CONTRACT CLAUSE 52.236-13 entitled “ACCIDENT PREVENTION (NOV1991)-ALTERNATE 1”. Applicable provisions of the Corps of Engineers manual entitled Safety and Health Requirements Manual EM 385-1-1 will be applied to all work under this contract. The referenced manual may be obtained from the Contracting Officer at the jobsite or from the Afghanistan Engineer District South at Kandahar, Afghanistan.

1.28 ACCIDENT PREVENTION PROGRAM

Within fifteen (15) days after award of this contract, and at least ten (10) days prior to the accident prevention pre-work conference, four (4) copies of the Accident Prevention Plan required by the CONTRACT CLAUSE 52.236-13 entitled “ACCIDENT PREVENTION (NOV 1991)- ALTERNATE I”, shall be submitted for review by the Contracting Officer. The Contractor shall not commence physical work at the site until the Accident Prevention Plan (APP) has been reviewed and accepted by the Contracting Officer. The APP shall meet the requirements listed in Appendix "A" of EM385-1-1. The program shall include the following: TAC Form 61 “Accident Prevention Program Hazard Analysis (Activity Hazard Analysis)" fully completed and signed by an executive officer of the company in block No. 13. The Activity Hazard Analysis is a method in which those hazards likely to cause a serious injury or fatality are analyzed for each phase of operations. Corrective action is planned in advance, which will eliminate the hazards. An analysis is required for each new phase of work. On large or complex jobs the first phase may be presented in detail with the submittal of the Accident Prevention Plan rather than presenting the complete analysis. If the plan is to be presented in phases, a proposed outline for future phases must be submitted as a part of the initial Accident Prevention Plan submittal. Accident Prevention Plans will be reviewed for timeliness and adequacy at least monthly with a signature sheet signed and dated documenting that these reviews took place. The Contractor shall provide a copy of company policy statement of Accident Prevention and any other guidance as required by EM 385-1-1, Appendix A.

1.29 GROUND FAULT CIRCUIT INTERRUPTER (GFCI) REQUIREMENT – OVERSEAS CONSTRUCTION

The Corps of Engineers Health and Safety Manual, EM 385-1-1, section 11.D.05.b. states: "The GFCI device shall be calibrated to trip within the threshold values of 5 ma +/- 1 ma as specified in Underwriters Laboratory (UL) Standard 943." A variance from USACE has been granted allowing 10 ma, in lieu of 5 ma, for overseas activities that use 220 Volts (V)/50 hertz (Hz) electrical power.

1.30 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.

1.31 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.

1.32 SPARE PARTS

1.33 GENERAL

The requirements of this clause are in addition to any requirements for the provision of specific spare parts to be provided by the Contractor included in 01 01 50 TECHNICAL REQUIREMENTS. The Contractor shall furnish spare parts under the provisions of this clause for all equipment for which O&M data is to be provided under Clause OPERATION AND MAINTENANCE (O&M) DATA of this contract. The term "spare parts" as used herein shall include spare parts, special tools and test equipment.

1.34 PROCUREMENT AND DELIVERY OF SPARE PARTS

The Contractor shall procure and be responsible for delivery, receipt, handling, placing in storage, inventory, and turnover to the Contracting Officer all spare parts selected by the Contracting Officer.

1.34.1 Shipment and Delivery

The Contractor shall be responsible for the shipment and delivery of spare parts to the location on or near the site in Afghanistan as selected by the Contracting Officer. The Contractor shall provide all manpower and equipment required to receive and place into designated storage areas all spare parts purchased under this clause. The Contractor shall give the Contracting Officer thirty (30) calendar days notice of arrival at the site of the first shipment.

1.34.2 Turnover of Spare Parts

The Contractor shall notify the Contracting Officer seventy-two (72) hours prior to delivery of spare parts to the designated storage area. The Contractor and the Contracting Officer will perform a joint inventory of the spare parts and the spare parts will be turned over to the Contracting Officer. Spare parts purchased under this clause shall not be used by the Contractor.

1.34.3 Parts and Package Identification

Prior to shipment from point of purchase, each spare part shall be tagged or otherwise marked or labeled. Such labeling may be placed or affixed to the container, box or packaging in which spare parts are located when it is not feasible to place or affix such labeling directly on each spare part. Tags or labels shall include, but not necessarily be limited to; part number, description, parent equipment name and number location, project and/or other data as directed by the Contracting Officer.

1.34.4 Preservation and Packaging Instruction

a. Items ordered under this contract shall be preserved and packed for a minimum of three (3) years shelf life storage. All items shall be individually packaged except when the manufacturer specifies that the items are to be used in sets. Appropriate identification labels must be affixed to the items protective box or package. After the

spare parts are packaged, the manufacturer shall weigh the spare parts and packaging and place the weight and size of the packaged container on the label with other information as outlined herein. Each item, not normally identified with manufacturer's name and part number, shall have an appropriate label affixed to it with manufacturer's name and part number.

b. Machined spare parts shall be lubricated or coated in order to withstand extensive periods of storage in a highly corrosive atmosphere.

c. Large items (greater than 22.7 kg (50 lbs.), or larger than 0.03 CM (one cubic foot) shall be packaged in waterproof wooden boxes and properly braced. Cushioning shall be used to prevent damage to the item and to the packaging material.

d. Solid state components, such as diodes, transistors, integrated circuits or equipment consisting of such parts that can be damaged as a result of static electricity and other stray electro-magnetic fields shall be packaged in heat-sealed, aluminum foil, laminated, flexible packages.

e. All other spare parts shall be packaged in heat sealed plastic bags or wrap. Delicate and more fragile items such as test equipment shall be cushioned or wrapped with transparent bubble wrap material prior to being inserted into the plastic package.

1.35 WARRANTY

All spare parts provided by the Contractor under this clause are subject to the general warranty clauses of this contract.

1.36 PAYMENTS FOR SPARE PARTS

Payments for spare parts specifically required in this contract shall be considered as part of those equipment costs and shall be included in bid items as appropriate. Payment for handling, delivery, inventory, turnover, customs, overhead or profit shall not be paid or allowed under this Contract Provision, and shall be included in the cost for installation of this equipment under the other appropriate bid items of this contract. Payment for the spare parts portion of the appropriate bid items will be made after the spare parts have been accepted at the site by the Contracting Officer. Payments for equipment costs under this clause shall constitute full payment for all cost of the spare parts and associated cost of preservation and packaging, and cost of surface shipment to the site. Other ancillary costs shall be included by the Contractor under the other appropriate bid items of this contract and no additional cost except as provided herein will be allowed.

1.37 OPERATION AND MAINTENANCE (O&M) DATA

1.38 GENERAL

The requirements contained herein are in addition to all shop drawings submission requirements stated in other sections of the specifications. The Contractor shall include the provisions for all items required under this clause in all purchase orders and sub-contract agreements. Submittals required hereinafter will not relieve the Contractor of any responsibilities under the Warranty of Construction Provisions of this contract or under the various Guarantee Clauses of the Technical Provisions.

1.39 SUBMITTALS

The Contractor shall submit all items requiring submission of O&M data under this and other sections of these specifications in accordance with Section 01 33 15 SUBMITTAL PROCEDURES of the specifications. 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.

1.40 OPERATION AND MAINTENANCE (O&M) DATA

The Contractor shall furnish operation and maintenance manuals for all facilities constructed under this contract. The manuals shall be “tri-lingual” in Dari, Pashto and English. The manuals shall be loose leaf, indexed and shall consist of manufacturer's brochures, manufacturer's operation and maintenance manuals, service and repair manuals, catalogs, service bulletins, instruction charts, diagrams, other information as necessary to support the operation and maintenance of the end items of equipment, assemblies and systems. Each type of facility (housing, barracks, mosque, etc.) shall be covered by a separate manual (or manuals) consisting of all data pertaining to the equipment and/or systems within that facility. Identical equipment within a single major system shall require only one submittal of data. The Contractor shall furnish all O&M manuals to the Contracting Officer not less than thirty (30) calendar days prior to contract completion. Required number of submittals (number of sets) shall be as specified in Section 01 33 15 SUBMITTAL PROCEDURES.

1.41 RECOMMENDED SPARE PARTS LIST

The Contractor shall furnish a recommended spare parts list containing equipment manufacturers' recommendations for five (5) years; two (2) years and one (1) year spare parts stock levels in Afghanistan. Current unit price and effective date, lead time, shelf life for each individual part, and total cost of all recommended parts shall be furnished.

1.42 SUPPLEMENTAL SUBMITTALS OF DATA

After initial submittal of O&M manuals and until final acceptance of all equipment, the Contractor shall prepare and deliver to the Contracting Officer supplemental technical data as previously described for all changes, modifications, revisions and substitutions to equipment and components. For equipment or systems introduced into the contract under change order, or modified by change order, supplemental data shall be furnished within forty-five (45) calendar days after issuance of the change order. The supplemental data furnished shall be properly prepared and identified for insertion into the O&M manuals.

1.43 FRAMED INSTRUCTIONS FOR SYSTEMS

Approved wiring and control diagrams showing the complete layout of the entire system, including equipment, piping, valves and control sequence, framed under glass or in approved laminated plastic, shall be posted, where applicable, in all mechanical equipment rooms. In addition, detailed operating instructions explaining safe starting and stopping procedures for all systems shall be prepared in typed form along with the inspections required to insure normal safe operations. The instructions shall be framed as specified above for the wiring and control diagrams and posted beside the diagram. Proposed diagrams, instructions, and other sheets shall be submitted for approval prior to posting. Operating instructions shall be posted before acceptance testing of the systems and verified during acceptance testing.

1.44 ADDITIONAL SUBMITTALS/RE-SUBMITTALS

The Contracting Officer reserves the right to determine whether the above specified information, as furnished by the Contractor, is adequate and complete and to require such additional submittals by the Contractor as necessary to insure that adequate information has been furnished to provide the satisfactory operation and maintenance of the various items of equipment and to fulfill the intent of the specifications. Additional submittals or re-submittals supplementing incorrect or incomplete data shall be made within thirty (30) calendar days after receiving notice by the Contracting Officer. All costs arising from these resubmissions shall be borne by the Contractor.

1.45 CONTRACTOR FURNISHED EQUIPMENT LISTS

The Contractor shall furnish a list of all items, other than integral construction type items, furnished under the contract. Items such as furniture, drapes, rugs, vehicles, office machines, appliances, etc., shall fall under this category. The Contractor's list shall describe the item; give the unit price and total quantities of each. Model and serial numbers for equipment shall be provided when applicable. The Contractor shall keep an up-to-date register of all covered items and make this information available to the Contracting Officer at all times. Prior to acceptance, the Contractor shall submit the complete register to the Contracting Officer.

1.46 TIME EXTENSIONS

1.47 GENERAL

This provision specifies the procedure for determination of time extensions for unusually severe weather in accordance with the Contract " 52.249-10 entitled “DEFAULT (FIXED-PRICE CONSTRUCTION) APR 1984”. The listing below defines the anticipated monthly unusually severe weather for the contract period and is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the geographic location of the project. The schedule of anticipated unusually severe weather will constitute the baseline for determining monthly weather time evaluations. Upon award of this contract and continuing throughout the contract each month, actual unusually severe weather days will be recorded on a calendar day basis (including weekends and holidays) and compared to the monthly anticipated unusually severe weather in the schedule below. The term "actual unusually severe weather days" shall include days actually impacted by unusually severe weather. The Contractor's schedule must reflect the anticipated unusually severe weather days on all weather dependent activities.

Helmand Province

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
14	7	4	6	1	0	1	1	0	1	6	12	53

1.48 WEATHER DELAYS

The number of actual unusually severe weather days shall be calculated chronologically from the first to the last day in each month. Unusually severe weather days must prevent work for fifty percent (50%) or more of the Contractor's workday and delay work critical to the timely completion of the project. If the number of actual unusually severe weather days exceeds the number of days anticipated in the paragraph above, the Contracting Officer will determine whether the Contractor is entitled to a time extension. The Contracting Officer will convert any qualifying delays to calendar days and issue a modification in accordance with the Contract Clause 52.249-10 entitled “DEFAULT (FIXED-PRICE CONSTRUCTION) APR 1984”.

1.49 OTHER DELAYS

Construction delays due to full or partial base closures due to incidents such as demonstrations, civil unrest and outright attacks will be examined on an individual basis for consideration of time extensions.

1.50 STANDARDIZATION

Where two or more items of the same type or class of product, system or equipment furnished in this project are required, the units shall be products of the same manufacturer and shall be interchangeable when of the same size, capacity, performance characteristics, and rating. The only exception to this requirement is where the items are interchangeable due to conformance with industry standards (valves, fittings, etc.); they need not be by the same manufacturer. This requirement applies to all manufactured items in the project that normally require repair or replacement during the life of the equipment.

1.51 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.

1.52 CONTRACTOR'S RESPONSIBILITIES

The following items are the sole responsibility of the Contractor to investigate, estimate as to cost, and assume the risk, as normally encountered by Contractors. The Contractor shall be responsible for determining the effect of the following on his own cost of performance of the contract and for including sufficient amount in the contract price:

a. Official language and type of accounts required to satisfy the officials of the Local Government.
b. Entry and exit visas, residence permits, and residence laws applicable to aliens. This includes any special requirements of the Host Government, including those required by local Labor Offices, which the Contractor may have to fulfill before an application for a regular block of visas will be accepted.
c. Passports, health and immunization certificates, and quarantine clearance.
d. Compliance with local labor and insurance laws, including payment of employer's share of contribution, collecting balance from employee and paying into insurance funds.
e. Strikes, demonstrations and work stoppage.
f. Collection through withholding and payment to local Government, of any Host Country income tax on employees subject to tax.
g. Arranging to perform work in the Host Country, to import personnel, to employ non-indigenous labor, to receive payments and to remove such funds from the country.
h. Operating under local laws, practices, customs and controls, and with local unions, in connection with hiring and firing, mandatory wage scales, vacation pay, severance pay, overtime, holiday pay, 7th day of rest, legal notice or pay in lieu thereof for dismissal of employees, slowdown and curtailed schedules during religious holidays and ratio of local labor employed in comparison to others.
i. Possibility of claims in local bureaus, litigation in local courts, or attachment of local bank accounts.
j. Compliance with workmen's compensation laws and contributions into funds. Provisions of necessary medical service for Contractor employees.
k. Special license required by the local Government for setting up and operating any manufacturing plant in the Host Country, e.g. concrete batching, precast concrete, concrete blocks, etc.
l. Sales within the host country of Contractor-owned materials, and equipment.
m. Special licenses for physicians, mechanics, tradesmen, drivers, etc.
n. Identification and/or registration with local police of imported personnel.
o. Stamp tax on documents, payments and payrolls.
p. Base passes for permanent staff, day laborers, motor vehicles, etc.
q. Compliance with all customs and import rules, regulations and restrictions, including, but not limited to, local purchase requirements.

1.53 EMPLOYEE ACCESS TO PROJECT SITE

1.54 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.

1.54.1 Preparation of Identification Badges

The Contractor shall prepare an identification badge, laminated in plastic, containing the employee's name, badge number, color photo, height and weight, the name of the Contractor's organization for each employee. Each employee engaged on the work shall display this identification as directed by the Contracting Officer.

1.54.2 Employee Background and Historical Information

The Contractor shall be required to prepare and maintain personal background and historical information forms on each employee. The required information shall include but not necessarily be limited to the following:

a. Full name.

b. Place and date of birth.
c. Three (3) current color photographs.
d. Copy of Citizenship/Nationality identification.
e. Copy of Passport.
f. Copy of drivers license.
g. Police Background Check.
h. Work History.
i. Personal background information.
j. Copy of Work Permit and/or Visa.
k. Permanent home of record and in-country address.
l. Other information mandated by local law or that may be required to coordinate and process the necessary documentation with the government offices responsible for the approval.
m. Registration, insurance company, policy number and expiration date for each vehicle.

1.55 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 approved by the Contracting Officer, the Contractor may institute a system of non-permanent temporary identification for one-time delivery and transit vehicles. Each Contractor vehicle, machine, piece of equipment, or towed trailers, shall show the Contractor's name such that it is clearly visible on both front doors of the vehicle and both sides of a towed trailer. A valid license plate shall be displayed at all times. Contractor vehicles operated on Government property shall be maintained in a good state of repair, shall be insured, and shall be registered in accordance with Afghan Law.

1.56 RADIO TRANSMITTER RESTRICTIONS

To preclude accidental actuation of sensitive electronic equipment, the Contractor shall not use radio-transmitting equipment without prior approval of the Contracting Officer.

1.57 PUBLIC RELEASE OF INFORMATION

1.58 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.

1.59 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.

1.60 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.

1.61 ATTACKS FROM HOSTILE ENTITIES

This contract is firm fixed-price. Costs incurred in the performance of project execution that arise from the attacks of hostile entities, such as costs arising from damage to or destruction of contractor equipment and facilities, and damage to or destruction of the project prior to Government acceptance, are the sole responsibility of the Contractor.

The Government makes no guarantee to provide the Contractor with security, and bears no obligation to reimburse the Contractor for costs arising from the attacks of hostile entities. When appropriate, the Contracting Officer may provide the Contractor with an equitable adjustment with respect to time – but not cost – in accordance with Contract Clause 52.249-10 entitled "DEFAULT (FIXED-PRICE CONSTRUCTION) APR 1984"; see 52.249-10(b)(1)(i) and (2).

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- END OF SECTION --

SECTION 01 10 00.00 25

CONTRACT ADMINISTRATION DATA

PART 1 GENERAL

1.1. CONTRACT ADMINISTRATION

This Contract will be administered by the Office or Person(s) listed in Section 00800, Contract Clause 52.000-4006, CONTRACT ADMINISTRATOR.

1.2. CONTRACTING OFFICER

The Contracting Officer who signed this Contract is the primary Contracting Officer for the Contract. Nevertheless, any Contracting Officer assigned to the Portland District and acting within his/her authority may take formal action on this Contract when a Contract action needs to be taken and the primary Contracting Officer is unavailable.

1.3. SERIAL LETTER CORRESPONDENCE

1.3.1.General

The original and three copies of all correspondence pertaining to this Contract shall be sent to the Vancouver Resident Office, 4480 SE Columbia Way, Vancouver, WA 98661. Letters shall be signed by the Project Manager or by assistants designated to act for the Project Manager. A list of personnel so designated shall be furnished.

1.3.2.Numbering

All letter correspondence shall be independently numbered serially with no numbers missing or duplicated, and in sequence, commencing with number one (1). Each letter shall show the Contract number, description, and subject matter. Only one subject should be covered in the same letter.

1.3.3.Subcontractors

Subcontractors shall not correspond with either the Resident or District offices; the prime Contractor shall handle all correspondence.

1.3.4.Transmittals

Transmittals of signed pay estimates, payrolls, submittals, and other similar correspondence will not require a Serial Letter; use of a commercial transmittal form or speed letter is encouraged.

1.4. PROJECT-SPECIFIC MANAGEMENT PLAN

Particular Submittals identified as SD-01, Pre-Construction Submittals (Section 01 33 00, SUBMITTAL PROCEDURES FOR DESIGN BUILD PROJECTS), shall be submitted via the Project-Specific Management Plan. The Project-Specific Management Plan shall be submitted as a single document and address job-specific accident prevention program, environmental protection plan, construction quality control program, and project work plan. The current version of the SAFETY AND HEALTH REQUIREMENTS MANUAL, EM 385-1-1, including all errata and changes, shall be used for this Contract and is obtainable at http://140.194.76.129/publications/eng-manuals/. This manual is also available in hard copy (paper) version. All changes that are dated prior to the date of the Solicitation for this Contract (Reference paragraph 4.b (1) and 4.c introductory letter EM 385-1-1), will be contractually binding as part of any Contract issued. Changes can be obtained from http://www.usace.army.mil/CESO/Pages/EM385-1-1.aspx. Acceptance of the Project-Specific Management Plan is required prior to commencement of site work. It shall be organized as follows:

a. Section I - Accident Prevention Program.

(1) Accident prevention plan (EM 385-1-1 and Section 01 35 26.00 25, GOVERNMENT SAFETY REQUIREMENTS).

(2) Drug-free workplace policy.

(3) Hazard communication program.

(4) Activity hazard analysis (EM 385-1-1).

(5) Equipment certification.

b. Section II - Environmental Protection Plan (Section 01 57 20.00 25, ENVIRONMENTAL PROTECTION).

c. Section III - Construction Quality Management Program (Section 01 45 00.00 25, QUALITY CONTROL).

(1) Contractor's quality control (CQC) plan.

(2) CQC Daily Report form.

d. Project Work Plan. (The following are examples:)

(1) Roadway Access Agreement

(2) Temporary electrical systems

(3) Welder qualifications

(4) Welding procedures

(5) Bolt pre-tensioning procedure

e. Schedule for Construction.

f. Submittal Register.

1.5. LETTERS OF AUTHORITY

a. To authenticate actions required under terms of this Contract, a letter of authority shall be furnished to the Resident Engineer that indicates the names of individual or individuals who will be authorized to perform the following functions on behalf of the company:

(1) Sign progress payment estimates.

(2) Accept Government furnished property (if applicable).

(3) Sign Contract modifications, supplemental agreements and consent of surety.

(4) Monitor and report on the environmental protection plan, management plan, quality control plan, and safety plan.

(5) Supervise the field activities.

b. This letter of authority shall bear the typewritten names and the handwritten signatures of each individual and be signed by the person whose signature appears on the final Contract.

1.6. CONTRACTOR PERFORMANCE EVALUATIONS

In accordance with the provisions of Subpart 36.201 (Evaluation of Contractor Performance) of the Federal Acquisition Regulation (FAR), construction Contractor’s performance shall be evaluated throughout the performance of the Contract. For construction Contracts awarded at or above $650,000.00, the USACE will evaluate Contractor’s performance and prepare a performance report using the Construction Contractor Appraisal Support System (CCASS), which is now a web-based system. After an evaluation (interim or final) is completed by the USACE, the Contractor will have the ability to access, review and comment on the evaluation for a period of 30

days. Accessing and using CCASS requires specific software, called PKI certification, which is installed on the user's computer. The certification is a Department of Defense requirement and was implemented to provide security in electronic transactions. The certification software could cost approximately $110 - $125 per certificate per year and is purchased from an External Certificate Authorities (ECA) vendor. Current information about the PKI certification process and for contacting vendors can be found on the web site: http://www.cpars.csd.disa.mil/pki_info.htm. If the Contractor wishes to participate in the performance evaluation process, access to CCASS and PKI certification is the sole responsibility of the Contractor.

1.7. LABOR STANDARDS

1.7.1.General

The Contractor and all subcontractors are required to comply with the following labor standards, statutes, and regulations: Davis-Bacon Act; Contract Work Hours and Safety Standards Act; Secretary of Labor's regulations (Parts 3 and 5, Subtitle A, Title 29, Code of Federal Regulations).

1.7.2.Coverage

The Contract provisions relating to wages, overtime, payroll deductions, and other labor standards requirements cover foremen, laborers, and mechanics, including owner-operators of other than hauling equipment and other individual enterprises performing the duties of a laborer or mechanic. Bona fide owner-operators of hauling equipment, such as trucks, who are independent Contractors, are not covered, and the certified payrolls, including the names of such owner-operators, need not show hours worked nor rates paid, but only the notation "owner-operator."

1.7.3.Wages

Wages shall be paid at least once a week and shall be computed at hourly rates not less than those set forth in the Contract wage schedule, as set by the Davis-Bacon Act wage determinations, for the particular classifications of work performed. (Instructions regarding wage determination obligations are available on request.)

1.7.4.Overtime

Overtime for work in excess of 40 hours in any workweek shall be paid at not less than 1-1/2 times the basic rate of pay. Rates paid for fringe benefits are excluded in the computations of overtime.

1.7.5.Deductions

Deductions from wages earned may be only those that are permitted by the Copeland Act (Anti-Kickback) regulations. An instruction sheet entitled "Payroll Deductions" is available upon request.

1.7.6.Apprentices

Apprentices shall be individually registered in a program of a State apprenticeship and training agency approved and recognized by the U.S. Bureau of Apprenticeship and Training. Written evidence of such registration shall accompany the first payroll on which apprentices appear.

1.7.7.Equal Opportunity

Affirmative action shall be taken to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, creed, color, religion, sex, or national origin. Section 00700, Contract Clause 52.222-26, EQUAL OPPORTUNITY, requires the posting of notices and sending of a notice to each labor union or representative of workers with which you have an agreement. Posting of the notice available from the Resident Engineer's office satisfies both requirements.

1.7.8.Reporting

In accordance with Section 00700, Contract Clause 52.222-27, AFFIRMATIVE ACTION COMPLIANCE REQUIREMENTS FOR CONSTRUCTION, a Form CC-257, Monthly Employment Utilization Report, shall be submitted on a monthly basis. A sample copy of the report form is available upon request.

1.7.9.Subcontracts

Subcontracts (first tier or otherwise) shall physically contain the labor standards provisions of the prime Contract. Subcontracts of any tier in excess of $10,000 must also contain Section 00700, Contract Clause 52.222-26, EQUAL OPPORTUNITY.

1.7.10. Payrolls

Correct Weekly Payrolls, including those of subcontractors, shall be prepared and submitted. An instruction sheet is available upon request. Incorrect and delinquent payrolls will delay processing of partial payment estimates.

1.7.11. Records

Payroll and Employment Records shall be maintained during the course of work and for three years thereafter. They are subject to inspection by authorized representative of the Contracting Officer and the U.S. Department of Labor.

1.7.12. Job Interviews

A Government representative will interview Contractor and Subcontractor employees from time to time during working hours on the job.

1.7.13. Work Stoppage

Work stoppages resulting, or, likely to result from actual or potential labor disputes, shall be promptly reported, with all relevant information, to the Government Quality Assurance Representative (GQAR).

1.7.14. Other

The Contractor's attention is called to the following Section 00600, Contract Clauses: 52.219-1, SMALL BUSINESS PROGRAM REPRESENTATIONS, 52.219-22, SMALL DISADVANTAGED BUSINESS STATUS; and 52.204-5, WOMEN-OWNED BUSINESS (OTHER THAN SMALL BUSINESS). The Contractor assumes affirmative obligations with respect to subcontracting with such enterprises. The prime Contractor shall send a copy of the clauses to each subcontractor.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

SECTION TABLE OF CONTENTS

DIVISION 01 – GENERAL REQUIREMENTS

SECTION 01 22 00

MEASUREMENT AND PAYMENT

TABLE OF CONTENTS

PART 1 GENERAL....2
1.1. GENERAL INFORMATION....2
1.2. MEASUREMENT....2
1.2.1.1. Lump Sum Price Payment Items....2
1.2.1.2. Optional Items....2
1.2.1.3. Schedule of CLINS....3
1.3. PAYMENT....5
1.3.1.1. General....5
1.3.1.2. INTAKE STRUCTURE (SCHEDULE A)....6
1.3.1.3. TUNNEL WORKS (SCHEDULE B)....6
1.3.1.4. DAM SAFETY INSTRUMENTATION (SCHEDULE C)....8
1.4. OPTION ITEMS....8
1.5. TRAINING AND COMMISSIONING....8
PART 2 PRODUCTS....8
PART 3 EXECUTION....8

THIS PAGE INTENTIONALLY LEFT BLANK

PART 1 GENERAL

1.1. GENERAL INFORMATION

The price and payment shall constitute full compensation for all work relating to each contract line item number (CLIN) as herein specified, as shown, or as otherwise approved. The contract price and payment will also constitute completion of the item, unless such work is otherwise specifically mentioned for separate payment under another item. In the event any work is required by the specification sections or by the drawings and not specifically mentioned in the measurement and payment paragraphs, separate or direct payment shall not be made, and all costs thereof are incidental to, and included in, the prices and payment for all items listed in the Bid Schedule (also referred to as a price proposal schedule).

There are three (3) bid schedules for this project. The 3 schedules are:

SCHEDULE A: INTAKE STRUCTURE
SCHEDULE B: TUNNEL WORKS
SCHEDULE C: DAM SAFETY INSTRUMENTATION

1.2. MEASUREMENT

1.2.1.1. Lump Sum Price Payment Items

Payment items for the work of this contract for which contract payments shall be made lump sum are listed in the BID SCHEDULE and described below. General items for each schedule include mobilization/demobilization, security, Reimbursement for Actual Performance and Payment Bond, and DBA Insurance. The lump sum price and payment made for each subsequent base item listed shall constitute full compensation for the specific details that are stated in each item to include furnishing all plant, labor, materials, and equipment, and performing any associated or incidental Contractor quality control, environmental protection, meeting safety requirements, tests, analyses, computer files and reports, submittals and for performing all work required for which separate payment is not otherwise specified herein. The costs for mobilization/demobilization, and security are incidental to the option items.

1.2.1.2. Optional Items

The Government may require the performance of the line item(s) identified in the Bid Schedule as an "(OPTIONAL)" item. The Government may exercise the optional items by written notice to the Contractor as specified in the solicitation.

1.2.1.3. Schedule of CLINS

A schedule of individual CLIN #s is provided below.

	SCHEDULE A
0001	**INTAKE STRUCTURE**
0001AA	Mobilization/Demobilization
0001AB	Security
0001AC	Design Intake Structure Modifications
0001AD	Build Intake Structure Modifications
0001AE	Diesel Generator for Intake Structure
0001AF	DBA INSURANCE
0001AG	REIMBURSEMENT FOR ACTUAL PERFORMANCE AND PAYMENT BONDS

	SCHEDULE B
0002	**TUNNEL WORKS**
0002AA	Mobilization/Demobilization
0002AB	Security
0002AC	Outlet Valve Design
0002AD	Auxiliary Tunnel Equipment Design
0002AE	Conduit and Chamber - Evaluate and Report
0002AF	Local Water Supply – Evaluate and Report
0002AG	Outlet Valve Construction
0002AH	Auxiliary Tunnel Equipment Construction
0002AI	Replace hydro-electric Generating Unit
0002AJ	Rotovalve – Evaluate and Report
0002AK	DBA INSURANCE
0002AI	REIMBURSEMENT FOR ACTUAL PERFORMANCE AND PAYMENT BONDS

0003	**HYDRAULIC SYSTEM FOR EMERGENCY CLOSURE VALVES (OPTIONAL)**
0003AA	Hydraulic System for Emergency Closure Valves
0003AB	DBA for SUBCLIN 0003AA
0004	**REFURBISH EMERGENCY CLOSURE VALVE OPERATORS (OPTIONAL)**
0004AA	Refurbish Emergency Closure Valve Operators
0004AB	DBA for SUBCLIN 0004AA
0005	**MODIFY LOCAL WATER SUPPLY CONNECTION (OPTIONAL)**
005AA	Modify Local Water Supply Connection
005AB	DBA for SUBCLIN 0005AA

	SCHEDULE C
0006	**DAM SAFETY INSTRUMENTATION**
0006AA	Mobilization/Demobilization
0006AB	Security
0006AC	Design and Install Dam Safety Instrumentation
0006AD	DBA INSURANCE
0006AE	REIMBURSEMENT FOR ACTUAL PERFORMANCE AND PAYMENT BONDS

1.3. PAYMENT

1.3.1.1. General

Contractor shall perform all base activities as described in the Section 01 01 40 Summary of Work, and Section 01 01 50 Technical Requirements and throughout the Solicitation. Work is listed under various CLINs in the Section 00010 Bid Schedule as stated below.

a. Mobilization and Demobilization

Moving of all equipment and final demobilization will be measured for payment as a lump sum pay item (LS). Payment will be for work described in the summary of work and related provisions found throughout the Invitation. Price and payment shall be full compensation for all work required to transport all necessary plant, equipment, instrumentation, supplies, and personnel materials to and from the project as specified. This bid item also contains all costs associated with a documented comprehensive quality control plan submittal. The Mobilization and Demobilization item shall have a unit of measure of lump sum and paid for under bid items 0001AA, 0002AA, 0006AA of Section 00010 Bid Schedule. Mobilization and demobilization costs for optional items for SCHEDULES A and B are not included.

b. Security

Security is critical to construction in Afghanistan, especially on roads and remote areas away from Coalition Force bases. The Contractor must have an appropriate amount of security/protection to match the threat in the project area, outside of the perimeter fence, and along the supply routes. 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. The Security item shall have a unit of measure lump sum (LS) and paid for under bid items 0001AB, 0002AB, 0006AB of Section 00010 Bid Schedule. Security costs for optional items in SCHEDULES A and B are not included.

c. Reimbursement for Actual Performance and Payment Bond

The Reimbursement for Actual Performance and Payment Bond item shall have a unit of measure lump sum (LS) and paid for under bid items 0001AG, 0002AI, 0006AE of Section 00010 Bid Schedule. Note that each CLIN is a Not to Exceed (NTE) amount.

d. DBA Insurance

The DBA Insurance item shall have a unit of measure of lump sum (LS) and paid for under bid items 0001AF, 0002AK, and 0004AB, 0005AB, and 006AD of Section 00010 Bid Schedule.

1.3.1.2. INTAKE STRUCTURE (SCHEDULE A)

Contractor shall perform all required activities for the intake structure as described in the Section 01 01 40 Summary of Work, and Section 01 01 50 Technical Requirements and throughout the Solicitation. Work is listed under SCHEDULE A of the Section 00010 Bid Schedule. For all design items, Contractor shall provide an updated Commissioning Plan submitted as described in Section 016400 Start Up Testing and Commissioning. For all construction items, Contractor shall include all training activities according to Section 01 66 40 Training, and perform all commissioning activities according to Section 01 64 00 Start Up Testing and Commissioning. Work is listed under SCHEDULE A of the Section 00010 Bid Schedule.

a. Design Intake Structure Modifications

The Contractor shall design all features of the intake structure including detailed site inspections, design reports, design analyses, and completed plans and specifications. Field activities and testing described in that section will be included in the Intake Structure CLIN. The design work shall have a unit measure of lump sum and paid for under bid items 0001AC of Section 00010 Bid Schedule.

b. Build Intake Structure Modifications

Contractor shall perform all construction activities required to rehabilitate the intake tower. The described scope will be measured for payment as a lump sum pay item (LS). Payment will be made at the lump sum price for Bid Item No. 0001AD of Section 00010 Bid Schedule.

c. Diesel Generator for Intake Structure

Contractor shall provide and install a diesel generator for the intake structure including all electrical work required for power delivery to the intake tower. Contractor shall include work for coordination with the intake structure Construction and downstream operations. The described scope will be measured for payment as a lump sum pay item (LS). Payment will be made at the lump sum price for Bid Item No.0001AE of Section 00010 Bid Schedule.

1.3.1.3. TUNNEL WORKS (SCHEDULE B)

Contractor shall perform all mandatory activities for the intake structure as described in the Section 01 01 40 Summary of Work, and Section 01 01 50 Technical Requirements and throughout the Invitation to Bid. Work is listed under SCHEDULE B of the Section 00010 Bid Schedule. For all design items, Contractor shall provide an updated Commissioning Plan submitted as described in Section 016400 Start Up Testing and Commissioning. For all construction items, Contractor shall include all training activities according to Section 01 66 40 Training, and perform all commissioning activities according to Section 01 64 00 Start Up Testing and Commissioning. Work is listed under **SCHEDULE B** of the Section 00010 Bid Schedule.

a. Outlet Valve Designs

Contractor shall be paid for all specified aspects of the regulating outlet valve designs including the demolition and replacement of jet valves, removing the existing hydraulic actuators and replacing with electric actuators, and replace existing power and controls. Contractor shall also design one new modified bulkhead for the chamber surrounding the outlet valves to be placed during dewatering. Work shall also include all inspection costs that may be incurred for design. Field activities and testing will be included in the Tunnel Works CLIN. The design work shall have a unit measure of lump sum (LS) and paid for under bid items 0002AC of Section 00010 Bid Schedule.

b. Auxiliary Tunnel Equipment Designs

Contractor shall be paid for all specified aspects of the design for auxiliary tunnel equipment including repair of existing service HVAC system in the tunnel, replacement of the flap gate that discharges from the sump line to the bottom of the outlet valve chamber, and specification of new sump pumps in the valve house. The design work shall have a unit measure of lump sum (LS) and paid for under bid items 0002AD of Section 00010 Bid Schedule.

c. Conduit and Chamber – Evaluate and Report

The contractor shall perform the specified inspections of the steel conduits downstream of the roto valves and inside

the concrete chambers. The inspection activities shall be coordinated with work for the outlet valves, and if necessary, coordinate with the work performed on roto valves and the intake tower. Work also includes a dewatering and ventilation plan for the Conduit and Chamber features. The Contractor shall provide the specified engineering evaluation and report with recommendations. Dewatering operations are covered under Outlet Valve Construction (separate CLIN). The work shall have a unit measure of lump sum (LS) and paid for under bid items 0002AE of Section 00010 Bid Schedule. Based on the report recommendations, the COR may exercise their right to execute options (or negotiated contract modification) as appropriate under separate CLINs.

d. Local Water Supply – Evaluate and Report

The Contractor shall inspect the existing water supply located at the outlet of the jet valves. The inspections shall be used for an engineering evaluation and report to inform the CORs right to execute options for repair or replacement. The report shall include a plan to provided uninterrupted water supply during work on other mandatory CLIN (See Valve-Construction). The inspection activities shall be coordinated with rehabilitation of the rotovalves. The work shall have a unit measure of lump sum (LS) and paid for under bid items 0002AF of Section 00010 Bid Schedule.

e. Outlet Valve Construction

Contractor shall perform all activities required to construct the items designed under Valve Design. This includes replacing all three flow regulating valves and related controls. Work shall also include providing and installing the new electric powered actuators and electrical control systems. Work shall also include the fabrication of a modified bulkhead for dewatering the chambers surrounding the jet valves. Work shall also include dewatering each chamber and conduit. Work shall also include providing uninterrupted water supply to the public line thrust into the jet valve. The described scope will be measured for payment as a lump sum pay item (LS). Payment will be made at the lump sum price for Bid Item No. 0002AG of Section 00010 Bid Schedule.

f. Auxiliary Tunnel Equipment Construction

Contractor shall perform all activities required to locate and replace the flap gate for small diameter discharge line that exits near the jet valves. Contractor shall also replace the electric motor and perform repairs on the HVAC system for the tunnel works. Work shall also include replacing all sump pumps in the valve house. Contractor shall include any work for coordination with upstream operations and inspections. The described scope will be measured for payment as a lump sum pay item (LS). Payment will be made at the lump sum price for Bid Item No. 0002AH of Section 00010 Bid Schedule.

g. Replace Valve House Hydro-electric Generating Unit

Contractor shall perform all activities required to replace the existing hydro-electric unit with a new unit including all auxiliary equipment and new electrical systems. Work also includes replacing in-kind the 12-ich valve controlling the penstock upstream of the service turbine and the repacking of the 12-inch isolation valve located in the RotoValve chamber. Contractor shall include work for coordination with upstream operations and inspections. Contractor shall also coordinate with the work performed on the local water supply if executed by the COR. The described scope will be measured for payment as a lump sum pay item (LS). Payment will be made at the lump sum price for Bid Item No. 0002AI of Section 00010 Bid Schedule.

h. Roto Valve Evaluate and Report

The Contractor shall perform a complete function check of the three existing roto valves including the hydraulic actuators, pressure units, electrical power, and controls as specified herein. The inspection activities shall be coordinated with replacement of the outlet valves. The work shall have a unit measure of lump sum (LS) and paid for under bid items 0002AJ of Section 00010 Bid Schedule.

1.3.1.4. DAM SAFETY INSTRUMENTATION (SCHEDULE C)

Contractor shall perform all required activities for the dam safety instrumentation as described in the Section 01 01 40 Summary of Work, and Section 01 01 50 Technical Requirements and throughout the Invitation to Bid. Work is listed under general item **0006** of the Section 00010 Bid Schedule. The Contractor shall design and install all dam safety items including Dam Safety Report, two piezometers in the left abutment of the dam, water level meter, and staff gauge, and project identification (i.e., signage). The contractor shall also record the initial water level readings as specified. This work item also generally includes the commissioning, initial readings, and training of project personnel as specified. The work will be measured for payment as a lump sum pay item (LS) and will be paid for under bid item 0006AC.

1.4. OPTION ITEMS

If exercised, the Contractor shall perform all required activities for the various optional items as described in the Section 01 01 40 Summary of Work, and Section 01 01 50 Technical Requirements and throughout the Solicitation. The optional work will be paid for the primary items lump sums (LS) or as an individual item (EA). The additional sub-items for DBA insurance associated with each primary item will be paid as lump sum (LS).

a. Emergency Closure Valves – Refurbish Hydraulic System

As part of Schedule B, Contractor shall replace the hydraulic system and all specified parts on the top side of the existing roto valves. Work also includes replacing the electrical systems, replacing the hydraulic cylinders and replacing the hydraulic power units (HPU's). The work shall have a unit measure of lump sum (LS) and paid for under bid item 0003AA of Section 00010 Bid Schedule.

b. Emergency Closure Valve - Refurbish Operators

As part of Schedule B, Contractor shall refurbish the operating mechanism on the top side of the existing roto valves. The components include, but are not limited to the roller, rotator lever, operator rod, lift lever, lifter link, lift nut, crosshead, guide rods, and seating adjuster. 5. The trunnion greasing system shall also be replaced. The work shall have a unit measure of lump sum (LS) and paid for under bid item 0004AA of Section 00010 Bid Schedule.

c. Modify Local Water Supply

As part of Schedule B, Contractor shall replace the water supply to the downstream camp and village as specified. Modification will include a tap into the existing 12-inch line that feeds the hydro-electric generating unit. The specifications provided assume that this connection is the most effective method. Payment will be made all items under bid item, 0005AA of Section 00010 Bid Schedule.

1.5. TRAINING AND COMMISSIONING

All training and commissioning shall be paid for under the bid item in which the training and commissioning is associated. The final 10% of all Construction/Rehabilitation/Repair/Replace CLINs will not be paid until Testing and Commissioning has been performed and the Government has accepted the various reports that process entails. The proper execution of Commissioning and Training will be considered in any contractor performance rating.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

- END OF SECTION –

SECTION 01 32 01

PROJECT SCHEDULE

PART 1. GENERAL....3
1.1 REFERENCES....3
1.2 SUBMITTALS....3
1.3 QUALIFICATIONS....3
PART 2. PART 2 PRODUCTS....3
PART 3. PART 3 EXECUTION....3
3.1 GENERAL REQUIREMENTS....3
3.2 BASIS FOR PAYMENT....3
3.3 PROJECT SCHEDULE....4
3.3.1 Use of the Critical Path Method....4
3.3.2 Level of Detail Required....4
3.3.3 Scheduled Project Completion....6
3.3.4 Interim Completion Dates....6
3.4 PROJECT SCHEDULE SUBMISSIONS....7
3.4.1 Initial Project Schedule Submission....7
3.4.2 Periodic Schedule Updates....7
3.4.3 Standard Activity Coding Dictionary....7
3.5 SUBMISSION REQUIREMENTS....8
3.5.1 Data Disks....8
3.5.2 Narrative Report....8
3.5.3 Approved Changes Verification....9
3.5.4 Schedule Reports....9
3.5.5 Network Diagram....9
3.6 PERIODIC PROGRESS MEETINGS....10
3.6.1 Meeting Attendance....10
3.6.2 Update Submission Following Progress Meeting....11
3.6.3 Progress Meeting Contents....11
3.7 REQUESTS FOR TIME EXTENSIONS....11
3.7.1 Justification of Delay....11
3.7.2 Submission Requirements....12
3.7.3 Additional Submission Requirements....12
3.8 DIRECTED CHANGES....12
3.9 OWNERSHIP OF FLOAT....12
ADDENDUM Exporting and Importing Project Information

THIS PAGE INTENTIONALLY LEFT BLANK.

PART 1. GENERAL

1.1 REFERENCES

The publications listed below form a part of the specification to the extent referenced. The publications are referenced in the text by basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE) ER 1-1-11 (1995) Progress, Schedules, and Network Analysis Systems

1.2 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.

Submittals	Paragraph
Initial Project Schedule Submission; G	3.4.1
Periodic Schedule Updates; G	3.4.2

1.3 QUALIFICATIONS

The Contractor shall designate an authorized representative who shall be responsible for the preparation of all required project schedule reports.

PART 2. PART 2 PRODUCTS

Not used.

PART 3. PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Pursuant to the Contract Clause, SCHEDULE FOR CONSTRUCTION CONTRACTS, a Project Schedule as described below shall be prepared. The scheduling of Construction design and construction shall be the responsibility of the Contractor. Contractor management personnel shall actively participate in its development. Designers, Subcontractors and suppliers working on the project shall also contribute in developing and maintaining an accurate Project Schedule. The Contractor is responsible for scheduling the construction contract work to include procurement of critical materials and equipment, Contractor quality control and construction, acceptance testing and training. The approved Project Schedule shall be used to measure the progress of the work, to aid in evaluating time extensions, and to provide the basis of all progress payments.

3.2 BASIS FOR PAYMENT

The schedule shall be the basis for measuring Contractor progress. Lack of an approved schedule or scheduling personnel will result in an inability of the Contracting Officer to evaluate Contractor's progress for the purposes of payment. Failure of the Contractor to provide all information, as specified below, shall result in the disapproval of the entire Project Schedule submission and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes. In the case where Project Schedule revisions have been directed by the Contracting Officer and those revisions have not been included in the Project Schedule, the Contracting Officer may hold, retain up to the maximum allowed by contract, each payment period, until revisions to the Project Schedule have been made. Resource loading of cost is required and will be used as the cost breakdown for progress payments.

3.3 PROJECT SCHEDULE

The computer software system utilized by the Contractor to produce the Project Schedule shall be capable of providing all requirements of this specification. Failure of the Contractor to meet the requirements of this specification shall result in the disapproval of the schedule. Manual methods used to produce any required information shall require approval by the Contracting Officer. Project schedules must be prepared and maintained in a software compatible with current versions of the government's systems RMS and Primavera Project Manager. Contracts with price value over $500,000 will use Primavera SureTrak, Primavera Project Manager P6, or current version of government's systems. The Licensed copy of scheduling software shall be submitted for acceptance to the Contracting Officer within two weeks after Contract Award.

3.3.1 Use of the Critical Path Method

The Critical Path Method (CPM) of network calculation shall be used to generate the Project Schedule. The Contractor shall provide the Project Schedule in the Precedence Diagram Method (PDM).

3.3.2 Level of Detail Required

The Project Schedule shall include an appropriate level of detail. Failure to develop or update the Project Schedule or provide data to the Contracting Officer at the appropriate level of detail, as specified by the Contracting Officer, shall result in the disapproval of the schedule.

The Network Analysis System (NAS) shall identify all Government, Construction Quality Management (CQM) Construction activities planned for the project and all other activities that could impact project completion if delayed. Refer to 3.5.5.4 Banding for further detail in grouping activities.

With the exception of the Contract Award and Contract Completion Date (CCD) milestone activities, no activity shall be open-ended; each activity shall have predecessor and successor ties. Once an activity exists on the schedule it may not be deleted or renamed to change the scope of the activity and shall not be removed from the schedule logic without approval from the Contracting Officer. The ID number for a deleted activity shall not be re-used for another activity. No more than 20 percent of the activities shall be critical or near critical. Critical is defined as having zero days of Total Float. "Near Critical" is defined as having Total Float of 1 to 14 days. Contractor activities shall be driven by calendars that reflect Saturdays, Sundays and all Federal Holidays as non-work days.

The Contracting Officer will use, but is not limited to, the following conditions to determine the appropriate level of detail to be used in the Project Schedule:

3.3.2.1 Activity Durations

Contractor submissions shall follow the direction of the Contracting Officer regarding reasonable activity durations. Reasonable durations are those that allow the progress of activities to be accurately determined between payment periods (usually less than 2 percent of all non-procurement activities' Original Durations are greater than 20 days).

3.3.2.2 Design and Permit Activities

Design and permitting activities, including necessary conferences and follow up actions and design package submission dates, shall be integrated into the schedule.

3.3.2.3 Procurement Activities

Tasks related to the procurement of long lead materials or equipment shall be included as separate activities in the project schedule. Long lead materials and equipment are those materials that have a procurement cycle of over 90 days. Examples of procurement process activities include, but are not limited to: submittals, approvals, procurement, fabrication, and delivery. The Contractor shall show each delivery with relationship tie to the Construction Activity specifically for the delivery. For rejected material/equipment not in compliance with approved submittals a new procurement activity shall be inserted in the schedule.

3.3.2.4 Critical Activities

The following activities, as applicable, shall be listed as separate line activities on the Contractor's project schedule:

a. Submission and approval of mechanical/electrical layout drawings
b. Submission and approval of O & M manuals
c. Submission and approval of as-built drawings
d. Submission and approval of 1354 data and installed equipment lists
e. Submission and approval of testing and air balance (TAB)
f. Submission of TAB specialist design review report
g. Submission and approval of fire protection specialist
h. Submission and approval of testing and balancing of HVAC plus commissioning plans and data
i. Air and water balance dates
j. HVAC commissioning dates
k. Controls testing plan
l. Controls testing
m. Performance Verification testing
n. Other systems testing, if required
o. Pre-final inspection
p. Correction of punch list from pre-final inspection
q. Final inspection

3.3.2.5 Government Activities

Government and other agency activities germane to the contract shall be shown. These activities include, but are not limited to: design reviews, environmental permit approvals by State regulators, inspections, proposals and pay estimates reviews, and utility tie in.

3.3.2.6 Responsibility

All activities shall be identified in the project schedule by the party responsible to perform the work. Responsibility includes, but is not limited to, the subcontracting firm, contractor work force, or government agency performing a given task. Activities shall not belong to more than one responsible party. The responsible party for each activity shall be identified by the Responsibility Code.

3.3.2.7 Work Areas

All activities shall be identified in the project schedule by the work area in which the activity occurs. Activities shall not be allowed to cover more than one work area. The work area of each activity shall be identified by the Work Area Code.

3.3.2.8 Modification or Claim Number

Any activity that is added or changed by contract modification or used to justify claimed time shall be identified by a mod or claim code that changed the activity. Activities shall not belong to more than one modification or claim item. The modification or claim number of each activity shall be identified by the Mod or Claim Number. Whenever possible, changes shall be added to the schedule by adding new activities. Existing activities shall not normally be changed to reflect modifications. A new current approved baseline shall be created to reflect the changes to the previous approved baseline (see item 3.5.5.6 Baseline Network Analysis Schedule.)

3.3.2.9 Work Item

All activities shall be identified in the project schedule by the Work Item to which the activity belongs. An activity shall not contain work in more than one work item. The work item for each appropriate activity shall be identified by the Work Item Code.

3.3.2.10 Phase of Work

All activities shall be identified in the project schedule by the phases of work in which the activity occurs. Activities shall not contain work in more than one phase of work. The project phase of each activity shall be by the unique Phase of Work Code.

3.3.2.11 Category of Work

All Activities shall be identified in the project schedule according to the category of work which best describes the activity. Category of work refers, but is not limited, to the procurement chain of activities including such items as designs, design package submissions design reviews, review conferences, permits, submittals, approvals, procurement, fabrication, delivery, installation, start-up, and testing. The category of work for each activity shall be identified by the Category of Work Code.

3.3.2.12 Feature of Work

All activities shall be identified in the project schedule according to the feature of work to which the activity belongs. Feature of work refers, but is not limited to, a work breakdown structure for the project. The feature of work for each activity shall be identified by the Feature of Work Code.

3.3.3 Scheduled Project Completion

The schedule interval shall extend from award of contract to the contract completion date.

3.3.3.1 Project Start Date

The schedule shall start no earlier than the date on which award of contract was acknowledged. The Contractor shall include as the first activity in the project schedule an activity called "Start Project". The "Start Project" activity shall have an "ES" constraint date equal to the date that the award of task order was acknowledged, and a zero day duration.

3.3.3.2 Constraint of Last Activity

Completion of the last activity in the schedule shall be constrained by the contract completion date. Calculation on project updates shall be such that if the early finish of the last activity falls after the contract completion date, then the float calculation shall reflect a negative float on the critical path. The Contractor shall include as the last activity in the project schedule an activity called "End Project". The "End Project" activity shall have an "LF" constraint date equal to the completion date for the project, and a zero day duration.

3.3.3.3 Early Project Completion

In the event the project schedule shows completion of the project prior to the contract completion date, the Contractor shall identify those activities that have been accelerated and/or those activities that are scheduled in parallel to support the Contractor's "early" completion. Contractor shall specifically address each of the activities noted in the narrative report at every project schedule update period to assist the Contracting Officer in evaluating the Contractor's ability to actually complete prior to the contract period.

3.3.4 Interim Completion Dates

Contractually specified interim completion dates shall also be constrained to show negative float if the early finish date of the last activity in that phase falls after the interim completion date.

3.3.4.1 Start Phase

The Contractor shall include as the first activity for a project phase an activity called "Start Phase X" where "X" refers to the phase of work. The "Start Phase X" activity shall have an "ES" constraint date equal to the date on which the award of task order was acknowledged, and a zero day duration.

3.3.4.2 End Phase

The Contractor shall include as the last activity in a project phase an activity called "End Phase X" where "X" refers to the phase of work. The "End Phase X" activity shall have an "LF" constraint date equal to the completion date for the project, and a zero day duration.

3.3.4.3 Phase X

The Contractor shall include a hammock type activity for each project phase called "Phase X" where "X" refers to the phase of work. The "Phase X" activity shall be logically tied to the earliest and latest activities in the phase.

3.3.4.4 Default Progress Data Disallowed

Actual Start and Finish dates shall not be automatically updated by default mechanisms that may be included in CPM scheduling software systems. Actual Start and Finish dates on the CPM schedule shall match those dates provided from Contractor Quality Control Reports. Failure of the Contractor to document the Actual Start and Finish dates on the Daily Quality Control report for every in-progress or completed activity, and failure to ensure that the data contained on the Daily Quality Control reports is the sole basis for schedule updating shall result in the disapproval of the Contractor's schedule and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes. Updating of the percent complete and the remaining duration of any activity shall be independent functions. Program features which calculate one of these parameters from the other shall be disabled.

3.3.4.5 Out-of-Sequence Progress

Activities that have posted progress without all preceding logic being satisfied (Out-of-Sequence Progress) will be allowed only on a case-by-case approval of the Contracting Officer. The Contractor shall propose logic corrections to eliminate all out of sequence progress or justify not changing the sequencing for approval prior to submitting an updated project schedule.

3.3.4.6 Negative Lags

Lag durations contained in the project schedule shall not have a negative value.

3.4 PROJECT SCHEDULE SUBMISSIONS

The Contractor shall provide the submissions as described below. The data disk, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS.

3.4.1 Initial Project Schedule Submission

The Initial Project Schedule shall be submitted for approval within 30 calendar days after award of contract. The schedule shall provide a reasonable sequence of activities which represent work through the entire project and shall be at a reasonable level of detail. The baseline schedule shall be reviewed and deemed acceptable prior to the contractor entering (manually or electronically via SDEF file) in QCS.

3.4.2 Periodic Schedule Updates

Based on the result of progress meetings, specified in "Periodic Progress Meetings," the Contractor shall submit periodic schedule updates. These submissions shall enable the Contracting Officer to assess Contractor's progress. If the Contractor fails or refuses to furnish the information and project schedule data, which in the judgment of the Contracting Officer or authorized representative is necessary for verifying the Contractor's progress, the Contractor shall be deemed not to have provided an estimate upon which progress payment may be made.

3.4.3 Standard Activity Coding Dictionary

The Contractor shall use the activity coding structure defined in the Standard Data Exchange Format (SDEF) in ER 1-1-11, Appendix A. This exact structure is mandatory, even if some fields are not used. The contractor shall assure

the schedule contains the holidays, fiscal year starting month, work day start and finish shift and preferences for units of time, observed by the government.

3.5 SUBMISSION REQUIREMENTS

The following items shall be submitted by the Contractor for the preliminary submission, initial submission, and every periodic project schedule update throughout the life of the project:

3.5.1 Data Disks

Two (2) Data Compact Disks containing the project schedule shall be provided. Data on the disks shall adhere to the SDEF format specified in ER 1-1-11, Appendix A.

3.5.1.1 File Medium

Required data shall be submitted on Compact Disk, formatted to hold 700 MB of data, under the MS-DOS Version 5. or 6.x, unless otherwise approved by the Contracting Officer.

3.5.1.2 Disk Label

A permanent exterior label shall be affixed to each disk submitted. The label shall indicate the type of schedule (Preliminary, Initial, Update, or Change), full contract number, project name, project location, data date, name and telephone number of person responsible for the schedule, and the MSDOS version used to format the disk.

a. Two (2) Data Compact Disks containing the project schedule shall be provided. Data on the disks shall adhere to the SDEF format specified in ER 1-1-11, Appendix A.

b. File Medium - Required data shall be submitted on Compact Disk, formatted to hold 700 MB of data, under the MS-DOS Version 5. or 6.x, unless otherwise approved by the Contracting Officer.

c. Disk Label - A permanent exterior label shall be affixed to each disk submitted. The label shall indicate the type of schedule (Preliminary, Initial, Update, or Change), full contract number, project name, project location, data date, name and telephone number of person responsible for the schedule, and the MSDOS version used to format the disk.

d. File Name - Each file submitted shall have a name related to either the schedule data date, project name, or contract number. The Contractor shall develop a naming convention that will ensure that the names of the files submitted are unique. The Contractor shall submit the file naming convention to the Contracting Officer for approval.

3.5.1.3 File Name

Each file submitted shall have a name related to the schedule data date, project name, or contract number. The Contractor shall develop a naming convention that will ensure that the names of the files submitted are unique. The Contractor shall submit the file naming convention to the Contracting Officer for approval.

3.5.2 Narrative Report

A Narrative Report shall be provided with the preliminary, initial, and each update of the project schedule. This report shall be provided as the basis of the Contractor's progress payment request. The Narrative Report shall include: a description of activities along the 2 most critical paths, a description of current and anticipated problem areas or delaying factors and their impact, and an explanation of corrective actions taken or required to be taken. The narrative report is expected to relay to the Government, the Contractor's thorough analysis of the schedule output and its plans to compensate for any problems, either current or potential, which are revealed through that analysis.

3.5.3 Approved Changes Verification

Only project schedule changes that have been previously approved by the Contracting Officer shall be included in the schedule submission. The Narrative Report shall specifically reference, on an activity by activity basis, all changes made since the previous period and relate each change to documented, approved schedule changes.

3.5.4 Schedule Reports

The format for each activity for the schedule reports listed below shall contain: Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date, and Total Float. Actual Start and Actual Finish Dates shall be printed for those activities in progress or completed.

3.5.4.1 Activity Report

A list of all activities sorted according to activity number.

3.5.4.2 Logic Report

A Logic Report is a list of Preceding and Succeeding activities for every activity in ascending order by activity number. Preceding and succeeding activities shall include all information listed above in paragraph Schedule Reports. A blank line shall be left between each activity grouping.

3.5.4.3 Total Float Report

A list of all incomplete activities sorted in ascending order of total float. Activities which have the same amount of total float shall be listed in ascending order of Early Start Dates. Completed activities shall not be shown on this report.

3.5.4.4 Earnings Report

An Earnings Report is a compilation of the Contractor's Total Earnings on the project from award of contract until the most recent Monthly Progress Meeting. This report shall reflect the Earnings of specific activities based on the agreements made in the field and approved between the Contractor and Contracting Officer at the most recent Monthly Progress Meeting. Provided that the Contractor has provided a complete schedule update, this report shall serve as the basis of determining Contractor Payment. Activities shall be grouped by work item and sorted by activity numbers. This report shall: sum all activities in a work item and provide a work item percent; and complete and sum all work items to provide a total project percent complete. The printed report shall contain, for each activity: the Activity Number, Activity Description, Original Budgeted Amount, Total Quantity, Quantity to Date, Percent Complete (based on cost), and Earnings to Date.

3.5.5 Network Diagram

The network diagram shall be required on the initial schedule submission and on monthly schedule update submissions. The network diagram shall depict and display the order and interdependence of activities and the sequence in which the work is to be accomplished. The Contracting Officer will use, but is not limited to, the following conditions to review compliance with this paragraph:

3.5.5.1 Continuous Flow

Diagrams shall show a continuous flow from left to right with no arrows from right to left. The activity number, description, duration, and estimated earned value shall be shown on the diagram.

3.5.5.2 Project Milestone Dates

Dates shall be shown on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

3.5.5.3 Critical Path

The critical path shall be clearly shown.

3.5.5.4 Banding

Activities shall be grouped to assist in the understanding of the activity sequence. Typically, this flow will group activities by category of work, work area and/or responsibility. Separate activities shall be created for each Phase, Area, Floor Level and Location in which the activity is occurring. Each set of activities identified as a separate group shall be included in a Work Breakdown Structure to avoid confusion with similar activities repeated in other phases, floors, or locations.

3.5.5.5 S-Curves

Earnings curves showing projected early and late earnings and earnings to date.

3.5.5.6 Baseline Network Analysis Schedule

The original approved baseline shall not change through the duration of the contract. The original baseline naming convention is B/L – Contract Name – (Date created). A second revised baseline shall be maintained to reflect approved time extensions, and/or changes to the contract; this could be named as Current Approved Baseline and follow the naming convention: C/A - Contract Name – (Date changed). A third monthly baseline shall be maintained to reflect the monthly updates submitted by the contractor for payment. Naming convention is Mmm-Contract Name-(Date created). Submittal of the Baseline Network Analysis Schedule, and subsequent schedule updates, shall be understood to be the Contractor's certification that the submitted schedule meets all of the requirements of the Contract Documents, represents the Contractor's plan on how the work shall be accomplished, and accurately reflects the work that has been accomplished and how it was sequenced (as-built logic).

Samples of baselines naming conventions:

Field Description in Primavera	Baseline Type	Naming Convention
Project Baseline	Current Approved Baseline	CA – Cerrillos Dam – (12-Jan-1992)
Primary	Monthly Baseline	M02 – Cerillos Dam – (1-Feb-1992)
Secondary	Original Baseline	BL – Cerrillos Dam – (12-Jan-1992)

3.6 PERIODIC PROGRESS MEETINGS

Progress meetings to discuss payment shall include a monthly onsite meeting or other regular intervals mutually agreed to at the preconstruction conference. During this meeting the Contractor shall describe, on an activity by activity basis, all proposed revisions and adjustments to the project schedule required to reflect the current status of the project. The Contracting Officer will approve activity progress, proposed revisions, and adjustments as appropriate.

3.6.1 Meeting Attendance

The Contractor's Project Manager and Scheduler shall attend the regular progress meeting.

3.6.2 Update Submission Following Progress Meeting

A complete update of the project schedule containing all approved progress, revisions, and adjustments, based on the regular progress meeting, shall be submitted not later than 4 working days after the monthly progress meeting.

3.6.3 Progress Meeting Contents

Update information, including Actual Start Dates, Actual Finish Dates, Remaining Durations, and Cost-to-Date shall be subject to the approval of the Contracting Officer. As a minimum, the Contractor shall address the following items on an activity by activity basis during each progress meeting.

3.6.3.1 Start and Finish Dates

The Actual Start and Actual Finish date for each activity currently in progress or completed.

3.6.3.2 Time Completion

The estimated Remaining Duration for each activity in-progress. Time-based progress calculations shall be based on Remaining Duration for each activity.

3.6.3.3 Cost Completion

The earnings for each activity started. Payment will be based on earnings for each in-progress or completed activity. Payment for individual activities will not be made for work that contains quality defects. A portion of the overall project amount may be retained based on delays of activities.

3.6.3.4 Logic Changes

All logic changes pertaining to change orders, change orders to be incorporated into the schedule, contractor proposed changes in work sequence, corrections to schedule logic for out-of-sequence progress, lag durations, and other changes that have been made pursuant to contract provisions shall be specifically identified and discussed.

3.6.3.5 Other Changes

Other changes required due to delays in completion of any activity or group of activities include:

a. Delays beyond the Contractor's control, such as strikes and unusual weather.

b. Delays encountered due to submittals, Government Activities, deliveries or work stoppages which make re-planning the work necessary.

c. Changes required in order to correct a schedule which does not represent the actual or planned prosecution and progress of the work.

3.7 REQUESTS FOR TIME EXTENSIONS

In the event the Contractor requests an extension of the contract completion date, or any interim milestone date, the Contractor shall furnish the following for a determination as to whether or not the Contractor is entitled to an extension of time under the provisions of the contract: justification, project schedule data, and supporting evidence as the Contracting Officer may deem necessary. Submission of proof of delay, based on revised activity logic, duration, and costs (updated to the specific date that the delay occurred) is obligatory to any approvals.

3.7.1 Justification of Delay

The project schedule shall clearly display that the Contractor has used, in full, all the float time available for the work involved with this request. The Contracting Officer's determination as to the number of allowable days of contract extension shall be based upon the project schedule updates in effect for the time period in question, and

other factual information. Actual delays that are found to be caused by the Contractor's own actions, which result in the extension of the schedule, will not be a cause for a time extension to the contract completion date.

3.7.2 Submission Requirements

The Contractor shall submit a justification for each request for a change in the contract completion date of less than 2 weeks based upon the most recent schedule update at the time of the constructive direction issued for the change. Such a request shall be in accordance with the requirements of other appropriate Contract Clauses and shall include, as a minimum:

a. A list of affected activities, with their associated project schedule activity number.

b. A brief explanation of the causes of the change.

c. An analysis of the overall impact of the changes proposed.

d. A sub-network of the affected area.

Activities impacted in each justification for change shall be identified by a unique activity code contained in the required data file.

3.7.3 Additional Submission Requirements

For any requested time extension greater than 2 weeks, the Contracting Officer may request an interim update with revised activities for a specific change request. The Contractor shall provide this disk within 4 days of the Contracting Officer's request.

3.8 DIRECTED CHANGES

If changes are issued prior to settlement of price and/or time, the Contractor shall submit proposed schedule revisions to the Contracting Officer within 2 weeks of this task order being issued. The proposed revisions to the schedule will be approved by the Contracting Officer prior to inclusion of those changes within the project schedule. If the Contractor fails to submit the proposed revisions, the Contracting Officer may furnish the Contractor with suggested revisions to the project schedule. The Contractor shall include these revisions in the project schedule until revisions are submitted, and final changes and impacts have been negotiated. If the Contractor has any objections to the revisions furnished by the Contracting Officer, the Contractor shall advise the Contracting Officer within 2 weeks of receipt of the revisions. Regardless of the objections, the Contractor shall continue to update the schedule with the Contracting Officer's revisions until a mutual agreement in the revisions is reached. If the Contractor fails to submit alternative revisions within 2 weeks of receipt of the Contracting Officer's proposed revisions, the Contractor will be deemed to have concurred with the Contracting Officer's proposed revisions. The proposed revisions will then be the basis for an equitable adjustment for performance of the work.

3.9 OWNERSHIP OF FLOAT

Float available in the schedule, at any time, shall not be considered for the exclusive use of either the Government or the Contractor.

-- End of Section --

ADDENDUM

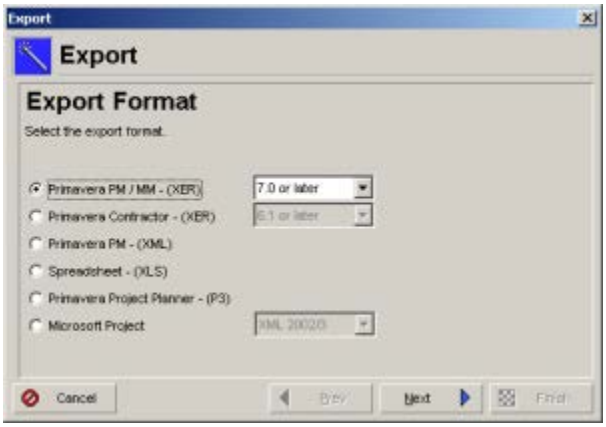
Exporting and Importing Project Information
October 25th, 2009 Activities, EPS primaverarena

As you know Primavera P6 is not a File based system, you need to export Project files if you wish to share your project with someone not in your network via email or other electronic delivery system. Export a Project file is simple and the exported file is a compressed file of all you project

As you know Primavera P6 is not a *File based system*, you need to export Project files if you wish to share your project with someone not in your network via email or other electronic delivery system. Export a Project file is simple and the exported file is a compressed file of all you project information which the other party needs to import in order to see it.

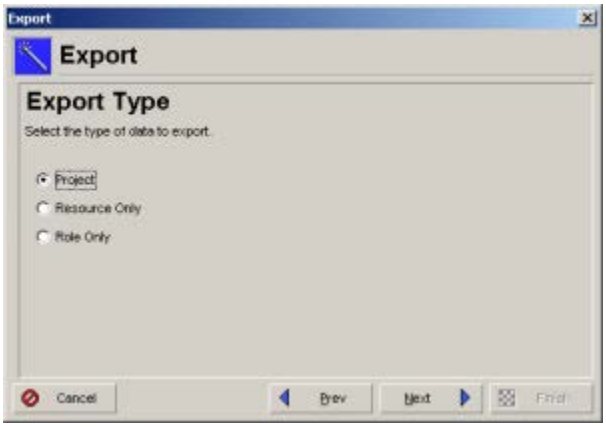
Export

To export a project file, you can go to File menu and click on Export.

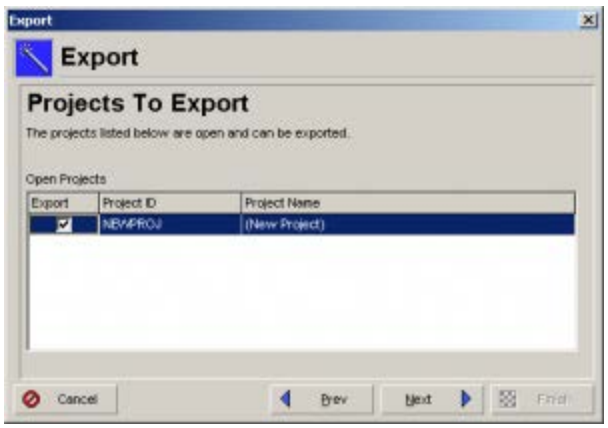


Select Primavera PM/MM format.

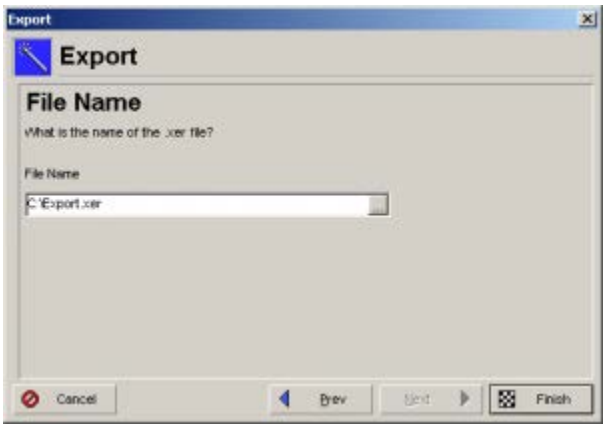
Choose which type of data you wish to export.



Select the Project.



Select the location of the exported file to be placed in.



Click Finish and Ta'daa

And you will find the*.XER file on your desktop (or the location you chose).

Import

To Import the file just double clicking the *.xer file would take you through the same steps and help you successfully update or create a new Project in your EPS.

Key definitions

1. Earned value is a technique for measuring project performance according to both project cost and schedule. This technique compares the budgeted or planned cost of the work to the actual cost. While earned value analyses are typically performed for WBS elements, you can also perform an earned value analysis for activities and groups of activities.

    a. In order to perform an earned value analysis, you must specify two calculation techniques. These techniques apply to activities that are currently in progress. The first technique is used to calculate an activity's percent complete. The second technique is used to calculate an activity's Estimate To Complete (ETC). A set of options is provided for both of these techniques, and you can set these options for each WBS element.

    b. The fundamental earned value parameters used to calculate an activity's Estimate to Complete are: Earned Value Cost; Budget at Completion; Planned Value Cost; and, Actual Cost. You can derive an activity's Estimate to Complete and other earned value indexes from these parameters.

    c. If you are the administrator for your organization, you can specify default earned value techniques for WBS elements.

2. Critical path: The critical path is a series of activities that determines a project's completion time. The duration of the activities on the critical path controls the duration of the entire project; a delay to any of these activities will delay the finish date of the entire project. Critical activities are defined by either the total float or the longest path in the project network.

3. Critical Path Method (CPM) scheduling: The method by which activity durations and the relationships between activities are used to mathematically calculate a schedule for the entire project. CPM focuses your attention on the critical path of activities that affect the completion date for the project or an intermediate deadline.

    Early dates, the earliest possible dates each activity can start and finish, and late dates, the latest possible dates each activity can start and finish without delaying the project finish or an intermediate deadline (constraint) are also calculated.

SECTION 01 33 15
SUBMITTAL PROCEDURES FOR DESIGN BUILD PROJECTS

PART 1. GENERAL....4
1.1 REFERENCE....4
1.2 SUBMITTALS....4
1.2.1 Submittal Descriptions (SD)....4
1.3 Construction Submittals....5
1.3.1 Review Classification....5
1.3.2 Submittal Descriptions....5
1.3.3 Submittal package quantity....7
1.3.4 Processing of "G" Submittals....7
1.3.5 For Information Only Construction Submittals (FIO)....8
1.3.6 Variations....9
1.3.7 Additional Shop Drawings and Submittals....9
1.3.8 Incomplete Design....9
1.4 SUBMITTAL CERTIFICATION....9
1.4.1 Effective Quality Control System....9
1.4.2 Responsibility for Errors or Omissions....9
1.4.3 Substitutions....10
1.4.4 Additional Submittals....10
1.4.5 Untimely and Unacceptable Submittals....10
1.4.6 Stamps....10
1.5 ENGLISH LANGUAGE....11
1.6 UNITS OF MEASUREMENT....11
1.6.1 Drawings....11
1.6.2 Design Calculations....11
1.6.3 Specifications....11
1.7 WITHHOLDING OF PAYMENT FOR SUBMITTALS....11
1.7.1 Design Submittals....11
1.7.2 Construction Submittals....11
PART 2. PRODUCTS....12
2.1 GENERAL....12
2.2 PROJECT NARRATIVE....12
2.3 DESIGN ANALYSIS....12
2.3.1 Submittal....12
2.3.2 Format....12
2.4 DESIGN CALCULATIONS....12
2.4.1 Submittal....12

2.4.2 Computer Analysis 13
2.5 CONSTRUCTION SPECIFICATIONS 13
2.5.1 Use of Unified Facilities Guide Specifications (UFGS) 14
2.5.2 Quality Control and Testing....14
2.5.3 Ambiguities and indefinite specifications....14
2.5.4 Industry Standards 14
2.6 DRAWINGS 14
2.6.1 Computer Assisted Design and Drafting (CAD) 14
2.6.2 Drawings....16
2.6.3 Drawing Size Border Sheets 16
2.6.4 Sequence of Design Drawings 16
2.6.5 Drawing Folder Structure 17
2.6.6 Drawing Sheet Assembly....17
2.6.7 Model Files 17
2.6.8 Border Sheet Files....17
2.6.9 Layer/Level names....17
2.6.10 Drawing File Naming Convention 18
2.6.11 Sheet Identification Block 18
2.6.12 Drawing Scales....18
2.6.13 Symbols, Line styles, & Patterns....19
2.6.14 Plotter Prepared Original Drawings AND PDF FILES 19
2.6.15 Title and Revision Block 19
2.6.16 Legends 19
2.6.17 Location/column Grid 19
2.6.18 Composite and Key Plans....19
2.6.19 Specifications Placed on the Drawings 19
2.6.20 Revisions 20
2.6.21 Binding....20
2.6.22 Government Provided files....20
PART 3. EXECUTION 20
3.1 GENERAL 20
3.1.1 Design Concept Coordination Meeting....20
3.1.2 Government Design Changes 20
3.2 SUBMITTAL REGISTER....20
3.2.1 Design Submittals....20
3.2.2 Construction Submittal Register (ENG Form 4288)....21
3.3 TRANSMITTAL FORM (ENG Form 4025)....21
3.4 PROGRESS SCHEDULE....21
3.5 SCHEDULING 21

3.5.1 Design Submittals 21
3.5.2 Construction Submittals 21
3.5.3 Post Design Construction Submittals 21
3.6 SUBMITTAL PROCEDURE 22
3.6.1 Design Submittals 22
3.6.2 Post Design Construction Submittals 22
3.6.3 Submittal Numbering System 23
3.6.4 Variations 24
3.6.5 Non-Compliance 24
3.7 REVIEW OF CONTRACTOR PREPARED DESIGN DOCUMENTS 24
3.7.1 general 24
3.7.2 Contractor's Quality Control Organization Review 25
3.7.3 Government Review 25
3.7.4 Design Discrepancies 26
3.8 Phased or "Fast-Track" Design 27
3.8.1 General 27
3.8.2 Sequence of Design-Construction (Fast-Track) 27
3.8.3 Notice-to-Proceed for Limited Construction 27
3.8.4 In-Place Construction Payment 27
3.8.5 Commencement of Construction 27
3.9 Conduct of Work 27
3.9.1 Performance 27
3.9.2 Telephone Conversations 27
3.9.3 Cooperation with Others 27
3.9.4 Technical Criteria 28
3.9.5 Conflicts 28
3.9.6 Design Priorities 28
3.9.7 Occupational Safety and Health Act 29
3.9.8 Asbestos Containing Materials 29
3.10 ATTACHMENTS 29

SECTION 01 33 15
SUBMITTAL PROCEDURES

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.

NATIONAL INSTITUTE OF BUILDING SCIENCES (NIBS)

Unified Master Reference List (UMRL)

National Institute of Building Sciences
1090 Vermont Avenue, NW, Suite 700
Washington, DC 20005-4905
Email: nibs@nibs.org
FAX: (202) 289-1092
Tele: (202) 289-7800

1.2 SUBMITTALS

Construction Submittals are classified by design stage and fast-track sequence as specified in 01 33 16 DESIGN BUILD AFETR WARD and restated below. 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.

Submittal	Paragraph
General Design (35%); FIO	1.2.1.1
General Design (65%); G	1.2.12
Final Design (99%); G	1.2.1.3
Complete Design Package (100%); G	1.2.1.4

The submittals listed above are not unique items and do not show up as such on the submittal register. The submittals listed above generally represent the requirements for a range of mandatory and optional items listed in Section 01 05 50 TECHNICAL REQUIREMENTS.

1.2.1 Submittal Descriptions (SD)

SD-01 Preconstruction Submittals

SD-02 Shop Drawings

SD-03 Product Data

SD-04 Samples

SD-05 Design Data

SD-06 Test Reports

SD-07 Certificates

SD-08 Manufacturer’s Instructions

SD-09 Manufacturer's Field Reports

SD-10 Operation and Maintenance Data

SD-11 Closeout Submittals

1.3 Construction Submittals

1.3.1 Review Classification

Construction Submittals are classified as follows:

a) Government Approved (G). Government approval is required for critical materials, variations, deviations, an "or equal" decision, equipment whose compatibility with the entire system must be checked, and other items as designated by the COR. Within the terms of Section 00700, Contract Clause 52.236-21, SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, these submittals are considered to be "shop drawings."
b) Information Only. Submittals not requiring Government approval will be for information only. Within the terms of the Section 00700, Contract Clause 52.236-21, SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, these submittals are not considered to be "shop drawings."

1.3.2 Submittal Descriptions

Construction Submittals are described according to various aspects of construction as described in the following paragraphs.

SD-01 Preconstruction Submittals

Particular Submittals identified as SD-01, Pre-Construction Submittals shall be submitted via the Project-Specific Management Plan. The Project-Specific Management Plan shall be submitted as a single document and address job-specific accident prevention program, environmental protection plan, construction quality control program, and project work plan. The current version of the SAFETY AND HEALTH REQUIREMENTS MANUAL, EM 385-1-1, including all errata and changes, shall be used for this Contract and is obtainable at http://140.194.76.129/publications/eng-manuals/. This manual is also available in hard copy (paper) version. All changes that are dated prior to the date of the Solicitation for this Contract (Reference paragraph 4.b (1) and 4.c introductory letter EM 385-1-1), will be contractually binding as part of any Contract issued. Changes can be obtained from http://www.usace.army.mil/CESO/Pages/EM385-1-1.aspx. Acceptance of the Project-Specific Management Plan is required prior to commencement of site work.

It shall be organized as follows:

a. Section I - Accident Prevention Program.

1) Accident prevention plan (EM 385-1-1 and Section 01 35 26.00 25, GOVERNMENT SAFETY REQUIREMENTS).
2) Drug-free workplace policy.
3) Hazard communication program.
4) Activity hazard analysis (EM 385-1-1).
5) Equipment certification.
6) Critical Lift Plan

b. Section II - Environmental Protection Plan

1) Spill Prevention/Cleanup Plan
2) Waste Management Plan

c. Section III - Construction Quality Management Program (Section 01 45 00.00 25, QUALITY CONTROL).

1) Contractor's quality control (CQC) plan.

2) CQC Daily Report form.
3) Progress construction photos

d. Project Work Plan. (The following are examples:)

1) Security Plan
2) Communication Plan
3) Mobilization/site laydown plan
4) Temporary electrical systems
5) Welder qualifications
6) Welding procedures
7) List of proposed products

e. Schedule for Construction/Network Analysis.

f. Submittal Register.

g. Certificates of Insurance

h. Surety Bonds

i. List of proposed subcontractors.

SD-02 Shop Drawings

- Drawings, diagrams, and schedules specifically prepared to illustrate some portion of the work.
- Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the product or system into the project.
- Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work will be coordinated.

SD-03 Product Data

- Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other characteristics of materials, systems or equipment for some portion of the work.
- Samples of warranty language when the Contract requires extended product warranties.

SD-04 Samples

- Fabricated or unfabricated physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged.
- Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project.
- Field samples and mock-ups constructed on the project site establish standards by which the ensuing work can be judged. Includes assemblies or portions of assemblies which are to be incorporated into the project and those which will be removed at conclusion of the work.

SD-05 Design Data

- Design calculations, mix designs, analyses or other data pertaining to a part of work.

SD-06 Test Reports

- Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. (Testing must have been within three years of date of Contract award for the project.)
- Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work or prototype prepared for the project before shipment to job site.

- Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.
- Investigation reports.
- Daily logs and checklists.
- Final acceptance test and operational test procedure.
- Any reports required by the Contracting Officer or designated representative to assure successful completion of tasks during the life of the Contract.

SD-07 Certificates

- Statements printed on the manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements. Must be dated after award of project Contract and clearly name the project.
- Document required of Contractor, or of a manufacturer, supplier, installer or subcontractor through Contractor, the purpose of which is to further quality of orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel qualifications.
- Confined space entry permits.
- Text of posted operating instructions.

SD-08 Manufacturer's Instructions

- Preprinted material describing installation of a product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.

SD-09 Manufacturer's Field Reports

- Documentation of the testing and verification actions taken by manufacturer's representative at the job site, in the vicinity of the job site, or on a sample taken from the job site, on a portion of the work, during or after installation, to confirm compliance with manufacturer's standards or instructions. The documentation must be signed by an authorized official of a testing laboratory or agency and must state the test results; and indicate whether the material, product, or system has passed or failed the test.
- Factory test reports.

SD-10 Operation and Maintenance Data

- Data that is furnished by the manufacturer, or the system provider, to the equipment operating and maintenance personnel, including manufacturer's help and product line documentation necessary to maintain and install equipment. This data is needed by operating and maintenance personnel for the safe and efficient operation, maintenance, and repair of the item.
- This Data is intended to be incorporated in an operations and maintenance manual or control system.

SD-11 Closeout Submittals

- Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.
- Special requirements necessary to properly close out a construction Contract. For example, Record Drawings and as-built drawings.

1.3.3 Submittal package quantity

The Contractor shall submit five copies of "G" submittals with five corresponding 4025 forms. Upon completion of "G" submittal review, copies as specified below will be marked with an action code, dated, and returned to the Contractor:

1.3.4 Processing of "G" Submittals.

a. Submittals will be reviewed and processed as follows:

- **Approved as Submitted** (Action Code "A"): Shop drawings which can be approved without correction will be stamped "Approved" and one copy will be returned to the Contractor.

- **Approved, Except as Noted on Drawings** (Action Code "B"): Shop drawings which have only minor discrepancies will be annotated in red to indicate necessary corrections. Marked material will be stamped "Approved Except as Noted" and one copy returned to the Contractor for correction.

- **Approved, Except as Noted on Drawings, Resubmission Required** (Action Code "C"): Shop drawings which are incomplete or require more than minor corrections will be annotated in red to indicate necessary corrections. Marked material will be stamped "Approved Except as Noted - Resubmission Required" and one copy returned to the Contractor for correction. Resubmittal of only those items needing correction required.
- **Will be Returned by Separate Correspondence** (Action Code "D"): Shop drawings will be addressed by Serial Letter and the Contractor shall respond according to instructions in the letter.
- **Disapproved** (Action Code "E"): Shop drawings which are fundamentally in error, cover wrong equipment or construction, or require extensive corrections, will be returned to the Contractor stamped "Disapproved." One copy will be returned to the Contractor and an explanation will be furnished on the submitted material or on ENG Form 4025 indicating reason for disapproval. Complete resubmittal required.
- **Receipt Acknowledged** (Action Code "F"): Shop drawings stamped "Receipt Acknowledged" are complete and one copy will be returned to the Contractor.
- **Receipt Acknowledged, Does Not Comply** (Action Code "FX"): Shop drawings which have been received but do not comply with Contract requirements. One copy will be returned to the Contractor stamped "Receipt Acknowledged, Does Not Comply" and an explanation will be furnished. Resubmittal required.
- **Other (Specify)** (Action Code "G"): Shop drawings requiring other specific action will be stamped "Other (Specify)" and returned with a description in the Remarks section. One copy will be returned to the Contractor. Resubmittal of only those items needing correction required.

b. Resubmittal will not be required for approved shop drawings unless subsequent changes are made by Contractor or by Contract modification. For shop drawings required to be resubmitted, Contractor shall make corrections required, note any changes by dating the revisions to correspond with the change request date, and promptly resubmit the corrected material. Resubmittals shall be associated with the "parent" by use of sequential alpha characters (for example, resubmittal of transmittal 8 will be 8A, 8B, etc). Government costs incurred after the first resubmittal may be charged to the Contractor.

c. Construction submittals resulting from investigative studies, reports, and analysis, that lead to designs that involve various engineering disciplines shall be identified within the submittal paragraph of the desiginated CSI spec section.

d. The Contractor shall provide construction submittals for **G**overnment review and **A**pproval (**GA**) for any other construction materials, equipment, or systems required by the Contracting Officer's Representative throughout the construction performance period of this contract.

1.3.5 <u>For Information Only Construction Submittals (FIO)</u>

All submittals not requiring Designer of Record or Government approval will be for information only. These construction submittals shall be checked, stamped, signed and dated by the Contractor's Quality Control Engineer, certifying that such submittal complies with the contract requirements. All Contractor submittals shall be subject to review by the Government at any time during the course of the contract. Any Contractor submittal found to contain errors or omissions shall be resubmitted as one requiring "approval". No adjustment for time or money will be allowed for corrections required as a result of noncompliance with plans or specifications. Normally submittals For Information Only will not be returned. Approval of the Contracting Officer is not required on FIO submittals. These submittals will be used for information purposes. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from

the obligation to furnish material conforming to the plans and specifications and will not prevent the Contracting Officer from requiring removal and replacement if nonconforming material is incorporated in the work.

1.3.6 Variations

After design submittals have been reviewed and cleared for construction by the Contracting Officer, no submittal for variation shall be considered by the Government.

1.3.7 Additional Shop Drawings and Submittals

In accordance with the paragraph entitled DESIGN DISCREPANCIES, the Government may request the Contractor to provide additional shop drawing and submittal type data subsequent to completion of the design.

1.3.8 Incomplete Design

The Contractor shall not use construction submittals as a means to supplant and/or supplement an incomplete design effort.

1.4 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.

1.4.1 Effective Quality Control System

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with Contract Clause 52.236-21 entitled "SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION - ALTERNATE I", and SECTION 01451 CONTRACTOR QUALITY CONTROL.

1.4.1.1 Organizational Responsibility

The quality control system shall cover all design, construction, subcontractor, manufacturer, vendor, and supplier operations at any tier, both onsite and offsite.

1.4.1.2 CQC System Manager Review and Approval

Prior to submittal, all items shall be checked and approved by the Contractor's Quality Control (CQC) System Manager. If found to be in strict conformance with the contract requirement, each item shall be stamped, signed, and dated by the CQC System Manager. Copies of the CQC organizations review comments indicating action taken shall be included within each submittal.

1.4.1.3 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.

1.4.2 Responsibility for Errors or Omissions

It is the sole responsibility of the Contractor to ensure that submittals do or do not comply with the contract documents. Government review, clearance for construction, or approval by the Contracting Officer shall not relieve the Contractor from responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this contract.

1.4.2.1 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.

1.4.3 Substitutions

No submittals for the purpose of substituting materials or equipment specified in the contract drawings, specifications, and reference documents shall be considered by the Government.

1.4.4 Additional Submittals

In conjunction with Contract Clause 52.236-5 entitled "MATERIAL AND WORKMANSHIP", the Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work.

1.4.5 Untimely and Unacceptable Submittals

Submittals covering component items forming a system or items that are interrelated shall be scheduled and submitted concurrently. Adequate time (a minimum of 18 calendar days exclusive of mailing time) shall be allowed and shown on the register for review and approval. No delay damages or time extensions will be allowed for time lost in late submittals.

a. Coordinate scheduling, sequencing, preparing and processing of submittals with performance of work so that work will not be delayed by submittal processing. Allow for potential resubmittal of requirements.

b. Submittals called for by the Contract documents will be listed on the register. Approval by the Contracting Officer does not relieve the Contractor of supplying submittals required by the Contract documents but which have been omitted from the register.

c. Re-submit register and annotate monthly with actual submission and approval dates. When all items on the register have been fully approved, no further re-submittal is required.

d. Carefully control procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

If the Contractor fails to submit submittals in a timely fashion, or repetitively submits submittals that are incomplete or not in strict conformance with the contract documents, no part of the time lost due to such actions shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

1.4.6 Stamps

Stamps shall be used by the Contractor on all design and post design construction submittals to certify that the submittal meets contract requirements and shall be similar to the following:

Contractor (Firm Name)
Contract Number
Contract Name

I certify that this submittal accurate, is in strict conformance with all contract requirements, has been thoroughly coordinated and cross checked against all other applicable disciplines to prevent the omission of vital information, that all conflicts have been resolved, and that repetition has been avoided and, it is complete and in sufficient detail to allow ready determination of compliance with contract requirements by the Contracting Officer.

Name of CQC System Manager: _____
Signature of CQC System Manager: _____
Date: _____

1.5 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.

1.6 UNITS OF MEASUREMENT

Design documents shall be prepared in accordance with the guidance offered in SECTION 01 41 50 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.

1.6.1 Drawings

1.6.1.1 Site Layout

All site layout data shall be dimensioned in meters or coordinates, as appropriate. All details and pipe sizes shall be dimensioned in millimeters.

EXAMPLE: Masonry openings shall be a U.S. module to suit a standard U.S. door. The dimensions of the opening shall be given in SI units. Metric dimensions for site plans shall be in meters and fraction thereof. Dimensions for all other drawings shall be in millimeters using hard metric designations (example: 12 meters = 12 000). Hard metric is defined as utilizing standard metric products and the use of measurements in increments of fifty (50) and one hundred (100) millimeters.

1.6.1.2 Geo-reference

All site plans shall be geo-referenced using the WGS 1984 coordinate system, specifically the following: WGS 1984 UTM one 41 North. 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 TAS to incorporate the plans into GIS for storage, map production, and possible geospatial analysis of the different work sites.

1.6.2 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.

1.6.3 Specifications

All equipment and products shall be specified according to U.S. standards and described by appropriate units as required herein.

1.7 WITHHOLDING OF PAYMENT FOR SUBMITTALS

1.7.1 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.

1.7.2 Construction Submittals

Payment for materials incorporated in the work will not be made if required approvals have not been obtained. In event under separate clause of the contract, the Contractor is allowed partial or total invoice payment for materials

shipped from the Continental United States (CONUS), and/or stored at the site, the Contractor shall with his request for such payment, submit copies of approvals (ENG Form 4025) certifying that the materials that are being shipped and/or stored have been approved and are in full compliance with the contract technical specifications.

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 PROJECT NARRATIVE

The Project Narrative shall be a bound set and shall contain the contract Sections 01 01 00 and 01 01 50 (and any additional sections that are appropriate). The Section 01 01 00 and 01 01 50 shall be the latest version. Any subsequent changes to the contract shall be clearly marked and highlighted with explanation for the changes. The Project Narrative shall also contain the general description of the project and a discussion of the design approach and design features for the project.

2.3 DESIGN ANALYSIS

2.3.1 Submittal

It shall be written in the English language with SI units of measure. The design analysis is a written explanation of the project design which is expanded and revised (updated) as the design progresses. The design analysis shall contain all explanatory material giving the design rationale for any design decisions which would not be obvious to an engineer reviewing the final drawings and specifications. The design analysis contains the criteria for, and the history of, the project design, including criteria furnished by the Government, letters, codes, references, conference minutes, and pertinent research. Design calculations, computerized and manual, are included in the design analysis. Narrative descriptions of design solutions are also included. Written material may be illustrated by diagrams and sketches to convey design concepts. Catalog cuts and manufacturer's data for all equipment items, shall be submitted.

2.3.2 Format

Format of design analysis shall closely match the standard format referenced within this document.

2.4 DESIGN CALCULATIONS

All design calculations shall be presented such that they are easily understood, correlated with the requirements (Section 01 01 00 and 01 01 50 criteria; codes; all other applicable or pertinent criteria) and all final conclusions clearly documented and summarized. The Design Submittal must include complete information (concrete design strengths, steel material properties, electrical loads, heat gain/loss assumptions, etc.) necessary to support all design calculations in order to easily and efficiently verify the accuracy of this information and the resulting project components shown in plans and specifications.

2.4.1 Submittal

When design calculations are voluminous, they shall be bound separately from the narrative part of the design analysis. Design calculations will include a title page, table of contents, and be indexed (tabbed) to separate distinct parts of the various analysis and design actions being accomplished to support plan drawings submitted. They shall

be presented in a clear, consistent and legible format in order to quickly understand the analysis and design accomplished. Presentation shall be such that a person unfamiliar with the project features and associated analysis and design can quickly understand the overall design process and procedures, review the information in conjunction with the given set of plans and specifications, and verify the suitability of all information submitted.

All design calculations shall explain the source of loading conditions with assumptions and conclusions explained. The analysis and design methods shall also be explained, including assumptions, theories and formulae. Include applicable diagrams that are clearly explained and correlated with related computations, whether computer or hand generated. The design calculations shall include a complete and comprehensive list of the criteria (and date or version of the criteria) that the design/analysis will be compared to (codes, Corps of Engineers Engineering Regulations, Engineering Manuals, etc.). Within the separable elements of design calculations, the engineer shall cite the specific code or reference paragraph or section as appropriate to indicate conformance to requirements.

At the beginning of each project component design section, present a summary of all load conditions and combinations required per applicable code or Corps of Engineers manual or regulation. Then clearly identify the particular load case governing the design and clearly show how the particular analysis, construction materials to be used, and the specific design meet the governing load combination.

Calculation sheets shall carry the names or initials of the engineer and the checker and the dates of calculations and checking. No portion of the calculations shall be computed and checked by the same person.

2.4.2 Computer Analysis

Provide a clear summary of all computer outputs and highlight in the outputs information used in the analysis and design accomplished elsewhere in the calculations.

If a computerized analysis or design program is used (either commercial software packages or unique, designer-written computer analysis/design tools), the computations shall provide clear reference to the software program and version being used and an explanation of the validity of the particular program to the given application (where has the program been used before, what input and output does the program provide, is the program a recognized Corps of Engineers or industry standard). If the program is proprietary to the Contractor (not recognized by the Corps of Engineers or industry), the Contractor shall provide a sample hand calculation to verify the results of one set of data generated by the computer program.

State exactly the computation performed by the computer. Include applicable diagrams, adequately identified. Provide all necessary explanations of the computer printout format, symbols, and abbreviations. Use adequate and consistent notation. Provide sufficient information to permit manual checks of the results.

Each set of computer printouts shall be preceded by an index and by a description of the computation performed. If several sets of computations are submitted, they shall be accompanied by a general table of contents in addition to the individual indices.

When the computer output is large, it shall be divided into volumes at logical division points. All final computer results used in design shall be separated from the total pages of computer output that might be included in the design calculations for ease of review.

2.5 CONSTRUCTION SPECIFICATIONS

If the Contractor determines that features of this contract design by the Contractor require additional specifications, they shall be submitted for review and approval. Specifications shall be prepared in accordance with the UFGS (Uniform Facilities Guide Specifications) format. The Contractor-prepared specifications shall include as a minimum, all applicable specification sections referenced by the UFGS. Where the UFGS does not reference a specification section for specific work to be performed by this contract, the Contractor shall be responsible for creating the required specification in the UFGS format.

2.5.1 Use of Unified Facilities Guide Specifications (UFGS)

If additional specifications are deemed necessary by the Contractor, UFGS (Uniform Federal Guide Specifications) are required 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.

Specifications for UFGS are in SpecsIntact format. SpecsIntact is government sponsored software used to edit specifications for government contracts. The software is available at the following link: http://specsintact.ksc.nasa.gov/index.asp.

2.5.2 Quality Control and Testing

Any additional specifications deemed necessary by the Contractor shall include required quality control and further indicate all testing to be conducted by the Contractor, its subcontractors, vendors and/or suppliers.

2.5.3 Ambiguities and indefinite specifications

Ambiguities, indefinite specification requirements (e.g., highest quality, workmanlike manner, as necessary, where appropriate, as directed etc) and language open to interpretation is unacceptable.

2.5.4 Industry Standards

2.5.4.1 U.S. Industry Standards

The Specifications shall be based on internationally accepted U.S. industry Standards, or as indicated in Section 01 01 50. Customarily accepted publications may be found in the UNIFIED MASTER REFERENCE LIST (UMRL) which may be located at the following URL: http://www.hnd.usace.army.mil/techinfo/UFGS/UFGSref.htm.

To access the UMRL select the "Unified Facilities Guide Specifications" tab and scroll down to Unified Master Reference List (UMRL) (PDF version).

Examples of U.S. standards are: National Fire Protection Association (NFPA), International Building Code (IBC), American Concrete Institute (ACI), American Water Works Association (AWWA), ADAAG (ADA Accessibility Guidelines) for Buildings and Facilities, etc. Standards referenced shall be by specific issue; the revision letter, date or other specific identification shall be included.

This document lists publications referenced in the Unified Facilities Guide Specifications (UFGS) of the Corps of Engineers (USACE), the Naval Facilities Engineering Command (NAVFAC), the Air Force Civil Engineer Support Agency (AFCESA), and the guide specifications of the National Aeronautics and Space Administration (NASA). This document is maintained by the National Institute of Building Sciences (NIBS) based on information provided by the agencies involved and the standards producing organizations. The listing is current with information available to NIBS on the date of this publication.

Standards referenced in specifications and drawings prepared by the Contractor shall be by specific issue; the revision letter, date or other specific identification shall be included.

2.6 DRAWINGS

2.6.1 Computer Assisted Design and Drafting (CAD)

Computer Assisted Design and Drafting (CAD) is required for all Afghanistan Engineer District South contracts. Only personnel proficient in the preparation of CAD drawings shall be employed to modify the contract drawings or prepare new drawings. The CAD deliverables shall meet the requirements of the A/E/C CAD Standards (V 3.0 or newer). The A/E/C CAD Standards may be downloaded at the CAD/BIM Technology Center at the following link: https://cadbim.usace.army.mil/default.aspx?p=s&t=13&i=4 or the website http://www.aed.usace.army.mil/engineeringtop2010.asp under the "Government Provided CAD Files" link.

The Contractor shall furnish all softcopy design submittals (and As-Builts) using software applications in either DWG format (Auto Desk, AutoCad Release 2009 or newer) or DGN format (Bentley Systems, MicroStation, version 8.0 or newer). Use of unregistered or student copies of software applications to prepare design drawings **IS NOT PERMITTED**. In addition, the Contractor is required to submit the softcopy design submittals in PDF (Adobe Acrobat) format.

CD media submitted containing the softcopy design submittals shall be organized per the instructions below and the diagram in Section 1335a:

CD Title:

Project Name and Location:
Project Number:
Submittal Number:
Date:
Contractor Name, Address, Telephone Number and email

Folders and Folder Contents/Structure:

Main Folder Name	Subfolders, Files and File Format	Description
Administrative	Multiple PDF files	Files shall include the contract, task order, approved modifications, approved BCDs, approved variations and non-administrative modifications (do not provide time extensions, COR appointments, and Requests for Information/responses, etc).
Design Analysis	One pdf file with identical contents as the printed document of the submittal.	All data, discussion, calculations and information presented in the printed Design analysis.
Specifications	One folder specifications in word format. One folder with specifications in pdf format.	All specification sections including table of contents edited as appropriate for the submittal stage of the project[2].
Geotechnical Report	One file in pdf format	All data, graphs, charts and tables generated during the geotechnical investigation.
PDF Drawings	One Binder of pdf files.	PDF Drawings. Files will be saved in a Binder and organized in the same order as indicated on the sheet index
CAD Drawings	DGN or DWG files organized in the following folders. Each folder shall contain only drawings pertaining to that discipline. General (Cover Sheet/ Index of Drawings, Vicinity Maps) Civil Architectural Structural Mechanical Plumbing Electrical Telecommunications	CAD Drawings. All referenced files are to be attached without drive or directories and placed in the same folder it is referencing. Do not save or use paths. Do not use live nesting when attaching reference files.

Notes:
1. The administrative folder shall provide documents submitted by the contractor and received from the COR related to the contract. These documents shall include Requests for Information related to design issues, Variation Requests, Modifications to the Contract. In addition, the folder shall contain a copy of the signed contract, relevant task orders and change orders.
2. DO NOT INCLUDE standard drawings or specifications provided to the Contractor as part of this document or as part of the contract.

2.6.2 Drawings

Drawings shall be prepared in the English language with metric (SI) units of measure. All drawings and details of the working drawings shall be labeled and cross-referenced, thoroughly checked and coordinated with other engineering disciplines. At the final design submittal (100%) the Contractor shall have incorporated all design review comments generated by previous design review(s), have completed all of the constructability and coordination comments, and have the drawings in a Ready-to-Build condition. The drawings shall be complete at this time and contain all the details necessary to ensure a clear understanding of the work throughout construction. Prior to submitting the 100% Final Design drawings, the Contractor shall follow the procedures as described in Section 3 of the AED Design Requirements for CAD Design Guide.

2.6.3 Drawing Size Border Sheets

All drawings shall be prepared in size "A1" border sheets (594mm by 841mm). Hardcopy design submissions may be printed on half size drawing sheets (“A3”, 297 mm by 420 mm) for purposes of saving paper and for ease of review. If drawings are not readable in the half size reduction, the Contractor shall submit all drawings in A1 border sheets. All final contract drawing sets (As-Builts) shall be submitted on A1 border sheets. Drawing sheets shall be trimmed to specified size if necessary.

2.6.4 Sequence of Design Drawings

Referencing the A/E/C CAD Standard the sequence of drawings shall follow the sequence as shown below:

Discipline

1. General
2. Hazardous Materials
3. Survey/Mapping
4. Geotechnical
5. Civil
6. Landscape
7. Structural
8. Architectural
9. Interiors
10. Equipment
11. Fire Protection
12. Plumbing
13. Process
14. Mechanical

15. Electrical
16. Telecommunications
17. Resource
18. Other Disciplines
19. Sub-Contractor/Shop Drawings
20. Operations

2.6.5 Drawing Folder Structure

CAD files shall be organized in folder names as described in Paragraph 2.6.4. For multi-building projects, a folder of each building type shall be created and the applicable folders shown in each building type folder.

2.6.6 Drawing Sheet Assembly

CAD files will be organized in what is described as "**Option 1a**" (page 9 in the A/E/C CAD Standards Drawing Sheet Assembly manual), normally referred to as "Model Space and Paper Space" in Autodesk Autocad applications and "Design Model and Sheet Model" in Bentley Microstation applications. All files will be drawn consistently in the same manner using this option throughout the entire project.

2.6.7 Model Files

Model files represent the building's physical layout and components such as floor plans, elevations and details. Model files shall be drawn to full size (1:1) in metric units in the default model view. Floor Plan Model files represent one floor. Example: do not use one model drawing file to draw several floor plan drawings with several border files. One paper space layout shall be provided per plotted sheet. Model files being referenced into another shall have insertion coordinates (x,y,z) of 0,0,0 in model space. The exception for model files with insertion coordinates other than 0,0,0 shall be the civil site plans (using Georeferencing and real-world coordinates.) Dimensioning shall be in millimeters unless noted otherwise, drawn associatively, and not be "forced". Example: if a wall is drawn 1:1, as 150 mm but the dimensioned number is modified to 200, this is unacceptable.

2.6.8 Border Sheet Files

Border sheet files are referenced into drawing files (in Paper Space) for plotting and viewing purposes. Every border sheet file has a drawing area, Title Block information and sheet trim border. The Afghanistan Engineer District – South uses a common Title Block sheet border for each project. The project Title Block sheet border with "sheet independent" data is referenced into each drawing. When a drawing file is created, "sheet dependent" Title Block data, such as the Sheet Identification and Title, is added to the specific drawing file and located in Paper Space where the Title Block is referenced and viewed. AED-S Title Block drawings may be downloaded at : http://www.aed.usace.army.mil/engineeringtop2010.asp under the "Government Provided CAD Files" link.

2.6.9 Layer/Level names

Layer or level files names shall follow the guidelines of the A/E/C CAD Standards V4.0. For AutoCAD, [discipline].dwt (drawing template files) shall be used to import the proper layers that will be inclusive of the correct line type, color, and line thickness of the respective layer. Templates to be used are found on the CAD/BIM Technology Center at the following link: https://cadbim.usace.army.mil/default.aspx?p=s&t=13&i=4, or at the website: http://www.aed.usace.army.mil/engineeringtop2010.asp under the "Government Provided CAD Files" link.

2.6.10 Drawing File Naming Convention

The sheet identifier will consist of the discipline designator, the sheet type designator and the sheet sequence number as referenced in the A/E/C CAD Standards V4.0.

2.6.11 Sheet Identification Block

The sheet identifier will follow the format of the border sheet file. This will consist of the discipline designator, the sheet type designator and the sheet sequence number as referenced in the A/E/C CAD Standards Manual.

2.6.12 Drawing Scales

The scales indicated on the following list shall be the guide in determining the scale for all drawings. Bar scales shall be provided on drawings as printed copies may lose their plotted scale through generational copying.

TYPICAL DRAWING SCALES	
DRAWING TYPE	**METRIC**
SITE PLAN	1:200
	1:400
	1:500
	1:600
	1:700
	1:1000
	1:2000
	1:5000
	1:6000
	1:10000
	1:20000
FLOOR PLAN	1:50
	1:100
ROOF PLAN	1:200
EXTERIOR ELEVATIONS	1:100
	1:200
INTERIOR ELEVATIONS	1:50
	1:100
CROSS SECTIONS	1:50
	1:100
	1:200
WALL SECTIONS	1:20

STAIR DETAILS	1:10
DETAILS	1:5

2.6.13 Symbols, Line styles, & Patterns

Approved symbols, line styles, and patterns shall be in accordance with AEC CAD Standards V 3.0 or newer (see Appendix D of the A/E/C CAD Standards). The approved symbols, line styles, and patterns associated with AutoCAD software maybe downloaded at the following link:

https://tsc.wes.army.mil/products/standards/aec/aecstdsym.asp

2.6.14 Plotter Prepared Original Drawings AND PDF FILES

Design files shall be developed in anticipation of plotting on a monochrome, vector plotter. Line density shall be equivalent to that produced by black India ink: half tone plots are only acceptable where the half-tone color setting of RGB (red, green blue) settings equal a value of 153. (Please refer to the A/E/C CAD Standards). **Drawings plotted in color are not acceptable.** Manual changes to plotted originals are not acceptable. A separate Adobe PDF file shall be made of each drawing file oriented in "Landscape". Each PDF drawing file shall then be compiled into one "binder" PDF file for each set of drawings following the order of the Sheet Index.

2.6.15 Title and Revision Block

Only AED-S Title and Revision Blocks are allowed. These are available at the website for download at: http://www.aed.usace.army.mil/engineeringtop2010.asp under the "Government Provided CAD Files" link.

2.6.16 Legends

For each submittal, legends of symbols and lists of abbreviations shall be placed on the drawings. They shall include all of the symbols and abbreviations used in the drawing set, but shall exclude any symbols and abbreviations not used. Since many symbols are limited to certain design disciplines, there is a definite advantage to the use of separate legends on the initial sheet of each design discipline or in the Standard Details package for each discipline. If legends have not been shown by discipline, a legend shall be placed on the first drawing.

2.6.17 Location/column Grid

To facilitate the location of project elements and the coordination of the various disciplines' drawings, all plans shall indicate a column line or planning grid, and all floor plans (except structural plans) shall show room numbers.

2.6.18 Composite and Key Plans

If the plan of a large building or structure must be placed on two or more sheets in order to maintain proper scale, the overall plan (key plan) shall be placed on one sheet at a smaller scale to accommodate entire building/site. Key plans shall be used not only to relate large scale plans to total floor plans but also to relate individual buildings to large complexes of buildings. This key plan with match lines shall be referenced on all segmented drawings and shall be placed in a convenient location to indicate the relative location of the represented plan area by crosshatching.

2.6.19 Specifications Placed on the Drawings

Details of standard products or items which are adequately covered by specifications shall not be included on the drawings.

2.6.20 Revisions

Drawing revisions shall be prepared only on the original CAD files. A revision history (located in the Title Block) is required on all sheets.

2.6.21 Binding

All volumes of drawing prints shall be firmly bound and shall have covers of heavier bond than the drawing sheets. If posts are used to fasten sheets together, the drilled holes on the bond edges of the sheets shall be on 8-1/2-inch centers.

2.6.22 Government Provided files

All CAD related files provided by the Government to the Contractor (AutoCad and MicroStation Afghanistan Engineering District-South Title Block and Cover/Index sheet files, AutoCAD template files) may be downloaded through the following website:

http://www.aed.usace.army.mil/engineeringtop2010.asp under the "Government Provided CAD Files" link.

If Contractor is unable to access this site, a CD will be provided upon request to the Project Manager.

PART 3. EXECUTION

3.1 GENERAL

3.1.1 Design Concept Coordination Meeting

Shortly after Notice To Proceed (NTP) the Government may require meeting(s) to review the Design Submittal process or discuss various aspects of the contract to enable prompt and efficient initiation of contract actions. Meeting(s) will be held to assure attention is focused on key project requirements (necessary Contractor design and Government review that is required to provide Construction Clearance), to discuss features and items of work that need to be submitted early due to long lead time items, or discuss other concepts/ideas that will help accelerate the contract work. Other Design Coordination meetings may be requested throughout the contract period if Government review of various Contractor Design Submittals indicate poor design and plan or specification quality in order to clearly explain the changes and improvements required of the contractor, assure understanding of Government comments, code references and required investigations and calculations, to move forward with acceptable design and satisfactory plans and specifications.

3.1.2 Government Design Changes

Government design changes which do not increase construction costs shall be made at no charge to the Government. The Contracting Officer may request design submittals in addition to those listed when deemed necessary to adequately describe the work covered in the contract documents. Submittals shall be made in the respective number of copies and to the respective addresses set forth in the paragraph entitled SUBMITTAL PROCEDURE. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements.

3.2 SUBMITTAL REGISTER

3.2.1 Design Submittals

The Contractor shall submit as part of his Project Schedule Design Submittal milestone dates. The Contractor shall post all actual dates of submittal actions (including clearance for construction) as they occur.

3.2.2 Construction Submittal Register (ENG Form 4288)

Attached to this section is ENG Form 4288 which the Contractor is responsible for developing for this contract. All design and construction submittals shall be shown on this register. The submittal register shall be the controlling document and will be used to control all submittals throughout the life of the contract. The Contractor shall maintain and update the register on a monthly basis for the Contracting Officer's approval.

3.3 TRANSMITTAL FORM (ENG Form 4025)

The sample transmittal form (ENG Form 4025) attached to this section shall be used for submitting both design and construction submittals in accordance with the instructions on the reverse side of the form. These forms will be furnished to the Contractor. This form shall be properly completed by filling out all the heading blank spaces and identifying each item submitted. Special care will be exercised to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item.

3.4 PROGRESS SCHEDULE

The Contractor shall prepare and submit a design progress schedule to the Contracting Officer. The Critical Path Method (CPM) of network calculation shall be used to generate the Project Schedule. The progress schedule shall show, as a percentage of the total design price, the various items included in the contract and the order in which the Contractor proposes to carry on the work, with dates on which he will start the features of the work and the contemplated dates for completing same. Significant milestones such as review submittals shall be annotated. The Contractor shall assign sufficient technical, supervisory and administrative personnel to insure the prosecution of the work in accordance with the progress schedule. The Contractor shall correct the progress schedule at the end of each month and submit as required to the Contracting Officer. The approved Project Schedule shall be used to measure the progress of the work, to aid in evaluating time extensions, and to provide the basis of all progress payments.

3.5 SCHEDULING

3.5.1 Design Submittals

Adequate time (a minimum of 18 full calendar days exclusive of mailing time) shall be allowed for TAS review and comment in DrChecks$_{SM}$. **This time period starts on the next full day after delivery of the Design Submittal to both TAS and the Area Office. If a Design Review is received by TAS or the Area Office but not the other, the design review does not start until both TAS and the Area Office have full design submittals.** If the Contractor fails to submit design submittals in a timely fashion, or repetitively submits design submittals that are not in strict conformance with the Contract documents, no part of the time lost due to such actions shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

3.5.2 Construction Submittals

Contractor furnished Government Approved Construction Submittals (GA) for items noted in Paragraph 1.2.5 of this Section, or others as required by the COR, shall be submitted to the Area or Resident Office, per directions given at the Pre-Construction meeting. Adequate time (a minimum of 18 full calendar days exclusive of mailing time) shall be allowed for TAS review and comment.

3.5.3 Post Design Construction Submittals

Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of 18 full calendar days exclusive of mailing time) shall be allowed for review and approval. If the Contractor fails to submit post design construction submittals in a timely fashion, or repetitively submits submittals that are not in strict conformance with the Contract documents, no part of the time

lost due to actions shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

3.6 SUBMITTAL PROCEDURE

3.6.1 Design Submittals

3.6.1.1 Afghanistan Engineer District South (AES)

One (1) half-size hard copy and two (2) soft copies (electronic version) of all design submittals (calculations, reports of field tests, design analysis, plans, specifications, etc) shall be transmitted to the Government at the following address, by means of ENG Form 4025:

AFGHANISTAN ENGINEER DISTRICT SOUTH (TAS)

(1) DHL, FEDEX, UPS or any other courier service:
U.S. Army Corps of Engineers
Afghanistan Engineer District-South
Kandahar Air Field
USACE-TAS
APO AE 09355
Attention: Chief, Engineering Branch

The soft copy (electronic version) and CD case shall both be clearly labeled (hand written information is not acceptable – typed labels are required) with contract information (contract #, title, contractor name, specific design submittal stage including if it is a Resubmittal, date of submission, components of the submittal – design analysis, plans, specifications, and if more than one CD then state 1 of "X", 2 of "X", etc., anti-virus information below, etc.)

The Contractor shall scan the soft copy (electronic version) of each Design Submittal using most up-to-date version of recognized Industry-standard anti-virus software (Symantec, Norton, etc.) to insure that no viruses are contained in it prior to acceptance by TAS. The label shall indicate it has been scanned for viruses and the anti-virus software and version clearly indicated.

3.6.1.2 Resident/Area Engineer Office

Complete design submittals shall be provided to the Area and/or Resident Engineer Office such that these are received **at the same time** as these submittals are delivered to the AES address in Para. 3.6.1.1. At the Pre-Construction meeting, the Contractor will be furnished the Area and/or Resident Office address to which these submittals shall be provided along with the number and size of hard and soft (electronic version) copies required for these offices. As per Paragraph 3.6.1.1, soft copies are to be properly labeled and checked for viruses by the contractor prior to delivery.

3.6.1.3 Editable CAD Format As-Builts

In accordance with Contract Clause 52.227-7022 entitled "GOVERNMENT RIGHTS (UNLIMITED)", the Government has non-exclusive rights to use the design on other projects. Therefore, the As-Builts furnished to the Government must be in an editable format. See Section 01 78 00A CLOSEOUT SUBMITTALS, Paragraphs 1.1 and 1.2, for all requirements associated with submission of editable CAD format As-Builts required as part of this contract.

3.6.2 Post Design Construction Submittals

One (1) copy of all post design construction submittals shall be transmitted to:

AFGHANISTAN ENGINEER DISTRICT SOUTH (TAS)

(1) DHL, FEDEX, UPS or any other courier service:
U.S. Army Corps of Engineers
Afghanistan Engineer District-south
Kandahar Air Field
USACE-TAS
APO AE 09355
Attention: Chief, Engineering Branch

3.6.3 Submittal Numbering System

Instructions on the numbering system to be used for construction submittals follows.

3.6.3.1 Submittals

Shop drawings and materials are listed on the Submittal Register (ENG Form 4288) as follows:

List is prepared according to contract specifications and drawings, picking up all items involved in the project.

This list is divided into sections as indicated in the specifications. For example:

Section	01015	"Technical Requirements"
Section	01335	“Design Submittals”
Section	02831	"Chain-Link Fence"
Section	02710	"Sub-drainage System"
Section	03300	"Concrete For Building Construction"
Section	04200	"Masonry"

3.6.3.2 Numbering procedures for transmittal on ENG FORM 4025

Each Specification Section will have various requirements for submittals (design information, product data, test reports, procedures, etc.) to the Government for Approval (GA) or For Information Only (FIO). Items from different Sections cannot be submitted on the same ENG Form 4025. When furnishing one or more items from the same Section at a given time, a single ENG Form 4025 can be used to identify and submit these items. Block ‘b” of the 4025 entitled “DESCRIPTION OF ITEM SUBMITTED” should provide an accurate and unique description of each item being proposed by the Contractor. Item numbers (block “a” of the 4025 entitled “ITEM NO.”) will be automatically generated in QCS for each ENG Form 4025. QCS will track and automatically generate the “ITEM NO.” for all following ENG Form 4025s for the same Section number. To illustrate, a transmittal for the 65% Design Submittal required by Section 01335 might have the following Items:

ITEM NO. 1	Topographic Information
ITEM NO. 2	Geotechnical Report
ITEM NO. 3	Foundation Design
ITEM NO. 4	65% Plans
ITEM NO. 5	Outline of Construction Specifications to be used

If this was the first submittal furnished by the Contractor for Section 01335, then a Transmittal Number of 01335-1 would be generated using QCS. As new transmittals are generated in QCS, the last digit of the transmittal is increased incrementally, as follows:

Transmittal No. 01335-2

Transmittal No. 01335-3

Transmittal No. 01335-4

and so forth. The first transmittal submitted from each Specification Section will be “-1”, in other words, there will never be a “Transmittal No. 01335-0”.

The above illustration is true for all other Specification Sections included in the Request for Proposal or in the Construction Specifications compiled by the Contractor in the prosecution of work under the solicitation.

3.6.3.3 Resubmittals

Should the Contractor be required to resubmit any transmittal due to one or more items on that transmittal being Coded “C” (Cleared for Construction, except as noted in attached comments, Resubmission Required) or “E” (NOT Cleared for Construction, see attached comments, resubmission required) by the Government, QCS will be used to generate the same transmittal number followed by the number "-1" for the first re-submittal, "-2" for the second re-submittal, "-3" for the third re-submittal, etc.

As an example, assume the 65% Design Submittal is provided to the Government as Transmittal 01335-9. Due to omissions or errors in that Submittal which result in a Code “E” being given, then the subsequent 65% Design Re-submittal #1 would be “Transmittal 01335-9.1”. Should a re-submittal again be necessary, it would be Design Re-submittal #2 and would be submitted as “Transmittal 01335-9.2”.

The purpose of this system is to avoid deviations from the Submittal Register and to track submittals in both RMS and DrChecks$_{SM}$. It should be noted that a new transmittal number following the above system CANNOT be generated in QCS unless the prior transmittal has been given a Code. If the Contractor is having difficulty generating the correct transmittal number, contact the COR to resolve the matter.

The Contractor use the above nomenclature and date of submission to the Government for Plan Cover Sheets; title blocks for all drawings; all Specification Cover Sheets; all specification pages; all Design Analysis Cover Sheets and associated pages; and similar labeling for all other documents included in the submittal.

See the attachment titled “1335a-Attachments-AES.pdf” (Figures 1-4) for required Title Block Required Annotations drawing guidance.

3.6.4 Variations

If design or construction submittals show variations from the contract parameters and/or requirements due to site conditions, the Contractor shall justify such variations in writing, at the time of submission. Additionally, the Contractor shall also annotate block "h" entitled "variation" of ENG FORM 4025. After design submittals have been reviewed and cleared for construction by the Contracting Officer, no resubmittal for the purpose of substituting materials, equipment, systems, and patented processes shall be considered.

3.6.5 Non-Compliance

The Contracting Officer will notify the Contractor of any detected noncompliance with the requirements of this specification. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the worksite, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

3.7 REVIEW OF CONTRACTOR PREPARED DESIGN DOCUMENTS

3.7.1 general

The work under contract will be subject to continuous review by representatives of the Contracting Officer. Additionally, joint design review conferences with representation by all organizations having a direct interest in the items under review may be held. The Contractor shall furnish copies of all drawings and related documents to be reviewed at the review conference on or before the date indicated by the Government. Additional conferences

pertaining to specific problems may be requested by the Contractor or may be directed by the Contracting Officer as necessary to progress the work. The Contractor shall prepare minutes of all conferences and shall furnish two copies to the Contracting Officer within seven (7) days after the conference.

3.7.2 Contractor's Quality Control Organization Review

The Contractor shall thoroughly review each submittal prior to submission to the Contracting Officer to assure it is complete, correct and unified. This review shall be for the purposes of eliminating errors, interferences, and inconsistencies, and of incorporating design criteria, review comments, specifications, and any additional information required. The Contractor shall give evidence of such review of all items in each submittal ENG Form 4025, by annotating Column "g" (titled "For Contractor Use Code") of this Form with the letter "A," meaning the Contractor has reviewed it and is indicating it is "Approved as Submitted". Design submittals submitted to the Contracting Officer without evidence of the above requirements or the Contractor's certified approval will be returned for resubmission. No part of the time lost due to such resubmissions shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

3.7.3 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 monthly. After receipt, the Government will be allowed 18 full days to review and comment on all Design Submittals, except as noted below. This time period starts on the next full day after delivery of the Design Submittal to TAS.

If a design submittal is deficient (errors on ENG Form 4025; incorrect drawing title block information; missing or incomplete features required in the submittal; etc.), it will be returned immediately without further review for correction and resubmission. The review time will begin when the corrected submittal is received. The Contractor may be liable for liquidated damages owed to the Government for returned design submittals due to deficiencies.

The contractor shall not begin construction work until the Government has reviewed the Contractor's Design Submittal and cleared it for construction. Clearance for construction does not mean Government approval. Government review shall not be construed as a complete check but will evaluate the general design approach and adherence to contract parameters. The Government Review is often limited in time and scope. Therefore, the Contractor shall not consider any review performed by the Government as an excuse for incomplete work.

Upon completion of the review the Contractor will be notified by the Contracting Officer Representative that the DrChecks$_{SM}$ file is open for viewing and response to TAS comments. The Contracting Officer will indicate whether the Design Submittal, or portions thereof, has or has not been cleared for construction using the following action codes:

A – Cleared for Construction

B – Cleared for Construction, except as noted in attached comments

C – Cleared for Construction, except as noted in attached comments, resubmission required

E - NOT Cleared for Construction, see attached comments, resubmission required

FX – Receipt acknowledged, does not comply as noted with contract requirements.

These codes shall NOT be used by the Contractor.

Design submittals Cleared for Construction by the Contracting Officer shall not relieve the Contractor from responsibility for any design errors or omissions and any liability associated with such errors, nor from responsibility for complying with the requirements of this contract.

3.7.3.1 Incorporation of Government Review Comments

The Contractor shall review each comment, furnish a complete response in DrChecks$_{SM}$ as to how the comment will be addressed in the Design Analysis, Plans and Specifications, or other Design Submittal stipulations required in this Contract. The Contractor will then incorporate each comment into the design submittal along with other work required at the next Design Submittal stage. The Contractor shall furnish disposition of all comments in DrChecks$_{SM}$, with the next scheduled submittal. The disposition shall identify action taken with citation of location within the relevant design document. Generalized statements of intention such as "will comply" or "will revise the specification" are not acceptable. During the design review process, comments will be made on the design submittals that will change the drawings and specifications. The Government will make no additional payments to the Contractor for the incorporation of comments. Review comments are considered part of the contract administration process.

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 is cautioned that if he believes the action required by any comment exceeds the requirements of this contract, he should flag the comment in DrChecks$_{SM}$ as a scope change, and notify the COR in writing immediately.

If a design submittal is over one (1) day late in accordance with the latest design schedule, the Government review period may be extended 7 days. Submittal date revisions must be made in writing at least five (5) days prior to the submittal.

3.7.3.2 Conferences

As necessary, conferences will be conducted between the Contractor and the Government to resolve review comments.

A review conference may be held at the completion of TAS review and subsequent Contractor response for each design submittal. The review conference will be held at the Corps District Office in Kandahar, Afghanistan. The Contractor shall bring the personnel that developed the design submittal to the review conference.

3.7.3.3 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.

3.7.4 Design Discrepancies

The Contractor shall be responsible for the correction of incomplete design data, omissions, and design discrepancies which become apparent during construction. The Contractor shall provide the Contracting Officer with a proposed recommendation for correcting a design error, within three (3) calendar days after notification by the Contracting Officer. The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the worksite, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor. Should extensions of design, fabrication plans and/or specific manufacturer's details be required as a result of a Government issued Change Order, the Government will make an equitable adjustment in accordance with Contract Clause 52.243-4 entitled "CHANGES".

3.8 Phased or "Fast-Track" Design

3.8.1 General

If approved by the Government, design and construction sequencing may be effected on an incremental basis as each approved phase or portion (e.g., demolition, geotechnical, site work, exterior utilities, foundations, substructure, superstructure, exterior closure, roofing, interior construction, mechanical, electrical, etc.) of the design is completed. The sequencing of the fast track design may be required to conform Section 01 33 16 DESIGN BUILD AFTER AWARD.

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 (CFC) letter for each design phase. Any work performed by the Contractor prior to receipt of the clearance for construction, shall be at the Contractor's own risk and expense. Work cleared for construction that does not conform to the design parameters and/or requirements of this contract shall be corrected by the Contractor at no additional cost or time to the Government.

3.9 Conduct of Work

3.9.1 Performance

Perform the work diligently and aggressively, and promptly advise the Contracting Officer of all significant developments.

3.9.2 Telephone Conversations

Prepare a summary, and promptly furnish a copy thereof to the Contracting Officer, of all telephone conversations relating to the design work under this contract.

3.9.3 Cooperation with Others

Cooperate fully with other firms, consultants and contractors performing work under the program to which this contract pertains, upon being advised by the Contracting Officer that such firms or individuals have a legitimate interest in the program, have need-to-know status, and proper security clearance where required.

3.9.4 Technical Criteria

All designs, drawings, and specifications shall be prepared in accordance with the contract documents and with the applicable publications referenced therein. As soon as possible, the Contractor shall obtain copies of all publications applicable to this contract. Any deviations from the technical criteria contained in the contract documents or in the applicable publications, including the use of criteria obtained from the user or other sources, must receive prior approval of the Contracting Officer. Where the technical criteria contained or referred to herein are not met, the Contractor will be required to conform his design to the same at his own time and expense.

3.9.5 Conflicts

Any conflicts, ambiguities, questions or problems encountered by the Contractor in following the criteria shall be immediately submitted in writing to the Contracting Officer with the Contractor's recommendations. Prior to submission to the Government the Contractor shall take appropriate measures to obtain clarification of design criteria requirements, to acquire all pertinent design information, and to incorporate such information in the work being performed.

3.9.6 Design Priorities

The design of this project shall consider the remote location and harsh environment of this project and the impact this will have on sources of technical supply, the cost of construction, the low level of maintenance, and the difficulty of obtaining replacement parts. Unless stated otherwise in this contract, the following design priorities shall be followed.

3.9.6.1 Construction Life Span

Buildings and facilities shall be designed and constructed to serve a life expectancy of more than 25 years, to be energy efficient, and to have finishes, materials, and systems that are low maintenance and low life cycle cost.

3.9.6.2 Operability

Systems including but not necessarily limited to mechanical, electrical, communications, etc., must be simple to operate and easy to maintain.

3.9.6.3 Standardization

Use of standardized materials, products, equipment, and systems is necessary to minimize the requirements for replacement parts, storage facilities, and service requirements.

3.9.6.4 Topographic Surveys, Easements, and Utilities

Unless otherwise stated in the contract, the Contractor will be responsible for detailed topographic mapping, available easements, and utility information for the project.

3.9.6.5 Horizontal and Vertical Control

The survey monuments shall be based on UTM WGS 1984 coordinate system. The horizontal and vertical control established on site shall be a closed loop with third order accuracy and procedures. All of the control points established at the site shall be plotted at the appropriate coordinate point and shall be identified by name or number, and adjusted elevations. The location of the project site, as determined by the surveyor shall be submitted in writing to the Contracting Officer.

3.9.7 Occupational Safety and Health Act

The facilities, systems, and equipment designed under this contract shall comply with the Occupational Safety and Health Act (OSHA), Code of Federal Regulations, Title 29, Chapter XVII, Parts 1910 and 1926. Any problems in incorporating these standards due to conflicts with other technical criteria shall be submitted to the Contracting Officer for resolution.

3.9.8 Asbestos Containing Materials

Asbestos containing material (ACM) will not be used in the design of new structures or systems. In the event no other material is available which will perform the required function or where the use of other material would be cost prohibitive, a waiver for the use of asbestos containing materials must be obtained from TAS.

3.9.8.1 Existing Construction

Asbestos containing materials (ACM) presently included in existing construction to be rehabilitated or otherwise modified as a result of this project shall be removed and a non-asbestos containing material substituted in lieu thereof.

3.9.8.2 Suspected Asbestos Containing Materials

All such structures and systems shall be inspected to determine the presence or probable presence of ACM. When ACM is suspected, a documented survey will be performed. The survey will be developed into an abatement design and will be made a part of the design documents. In the event no other material is available which will perform the required function or the use of a substitute material would be cost prohibitive due to initial cost and tear-out of existing construction, a waiver for the retention of the asbestos containing material must be obtained from the Contracting Officer.

3.10 ATTACHMENTS

The following attachments form an integral part of this specification:

ENG FORM 4025-R, Mar 95 - Transmittal of Shop Drawings, Equipment Data, Material Samples, or Manufacturer's Certificate of Compliance (2 pages)

ENG FORM 4288-R, Mar 95 - Submittal Register

Figure 1 – AES Title Block

Figure 2 – AES Management Block

Figure 3 – AES Issue Block & Required Notations

Figure 4 – Border Sheet Size

-- END OF SECTION -

SECTION 01 58 00

PROJECT IDENTIFICATION

09/12

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.

AMERICAN WOOD PROTECTION ASSOCIATION (AWPA)

AWPA C1 (2003) All Timber Products - Preservative Treatment by Pressure Processes

AWPA C2 (2003) Lumber, Timber, Bridge Ties and Mine Ties - Preservative Treatment by Pressure Processes

U.S. ARMY CORPS OF ENGINEERS (USACE)

EP 310-1-6a(2006) Sign Standards Manual, VOL 1

EP 310-1-6b(2006) Sign Standards Manual, VOL 2, Appendices

Exhibit A – Construction Project Signage for Afghanistan

1.2. SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are [for Contractor Quality Control approval.][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 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Preliminary one line drawings of project rendering ;G

SD-04 Samples

Final framed rendering and copies; G

Facility Recognition Plaque; G

1.3. PROJECT SIGN

1.3.1.Construction Project Signs (USACE)

Furnish the construction project sign package, maintain the signs during construction, and remove the signs from the job site upon completion of the project. The construction project sign package consists of two signs: one for project identification and the other to show the on-the-job safety performance of the contractor. The package shall conform to the requirements of EP 310-1-6a and EP 310-1-6b, specifically Section 16. Submit the sign legend orders as described in Section 16 of EP 310-1-6a prior to erecting the signs.

The sign shall show the standard information for the following;

a. Government of Afghanistan
b. Ministry of Energy and Water
c. Contracting company.

Note the example attached illustrates that of the Afghan National Police that is not required here.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

Exhibit A
Construction Project Signage for Afghanistan

(TAS section Ref 13315-2)

TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE *(Read instructions on the reverse side prior to initiating this form)*	DATE	TRANSMITTAL NO.

SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS *(This section will be initiated by the contractor)*

TO:	FROM:	CONTRACT NO.	CHECK ONE: ☐ THIS IS A NEW TRANSMITTAL ☐ THIS IS A RESUBMITTAL OF TRANSMITTAL _____
SPECIFICATION SEC. NO. *(Cover only one section with each transmittal)*	PROJECT TITLE AND LOCATION		CHECK ONE: THIS TRANSMITTAL IS FOR ☐ FIO ☐ GOV'T. APPROVAL

ITEM NO. *a.*	DESCRIPTION OF ITEM SUBMITTED *(Type size, model number/etc.)* *b.*	MFG OR CONTR. CAT., CURVE DRAWING OR BROCHURE NO. *(See instruction no. 8)* *c.*	NO. OF COPIES *d.*	CONTRACT REFERENCE DOCUMENT		FOR CONTRACTOR USE CODE *g.*	VARIATION *(See instruction No. 6)* *h.*	FOR CE USE CODE *i.*
				SPEC. PARA. NO. *e.*	DRAWING SHEET NO. *f.*			

REMARKS	I certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as other wise stated. _____ NAME AND SIGNATURE OF CONTRACTOR

SECTION II - APPROVAL ACTION

ENCLOSURES RETURNED *(List by Item No.)*	NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY	DATE

INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.

2. Each transmittal shall be numbered consecutively in the space provided for "Transmittal No.". This number, in addition to the contract number, will form a serial number for identifying each submittal. For new submittals or resubmittals mark the appropriate box; on resubmittals, insert transmittal number of last submission as well as the new submittal number.

3. The "Item No." will be the same "Item No." as indicated on ENG FORM 4288-R for each entry on this form.

4. Submittals requiring expeditious handling will be submitted on a separate form.

5. Separate transmittal form will be used for submittals under separate sections of the specifications.

6. A check shall be placed in the "Variation" column when a submittal is not in accordance with the plans and specifications--also, a written statement to that effect shall be included in the space provided for "Remarks".

7. Form is self-transmittal, letter of transmittal is not required.

8. When a sample of material or Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate" in column c, Section I.

9. U.S. Army Corps of Engineers approving authority will assign action codes as indicated below in space provided in Section I, column i to each item submitted. In addition they will ensure enclosures are indicated and attached to the form prior to return to the contractor. The Contractor will assign action codes as indicated below in Section I, column g, to each item submitted.

THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED

A	--	Approved as submitted.	E	--	Disapproved (See attached).
B	--	Approved, except as noted on drawings.	F	--	Receipt acknowledged.
C	--	Approved, except as noted on drawings. Refer to attached sheet resubmission required.	FX	--	Receipt acknowledged, does not comply as noted with contract requirements.
D	--	Will be returned by separate correspondence.	G	--	Other *(Specify)*

10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

(Reverse of ENG Form 4025-R)

SUBMITTAL REGISTER

(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION

CONTRACTOR

SPECIFICATION SECTION

ACTIVITY NO a.	TRANS-MITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	TYPE OF SUBMITTAL: DATA f.	DRAWINGS g.	INSTRUCTIONS h.	SCHEDULES i.	STATEMENTS j.	REPORTS k.	CERTIFICATES l.	SAMPLES m.	RECORDS n.	O&M MANUALS o.	CLASSIFICATION: INFORMATION ONLY p.	GOVERNMENT APPROVED q.	REVIEWER r.	CONTRACTOR SCHEDULE DATES: SUBMIT s.	APPROVAL NEEDED BY t.	MATERIAL NEEDED BY u.	CONTRACTOR ACTION: CODE v.	DATE w.	SUBMIT TO GOVERN-MENT x.	GOVERNMENT ACTION: CODE y.	DATE z.	REMARKS aa.

ENG FORM 4288-R, JAN 97 EDITION OF MAR 95 IS OBSOLETE. PAGE _____ O _____ PAGES (Proponent:

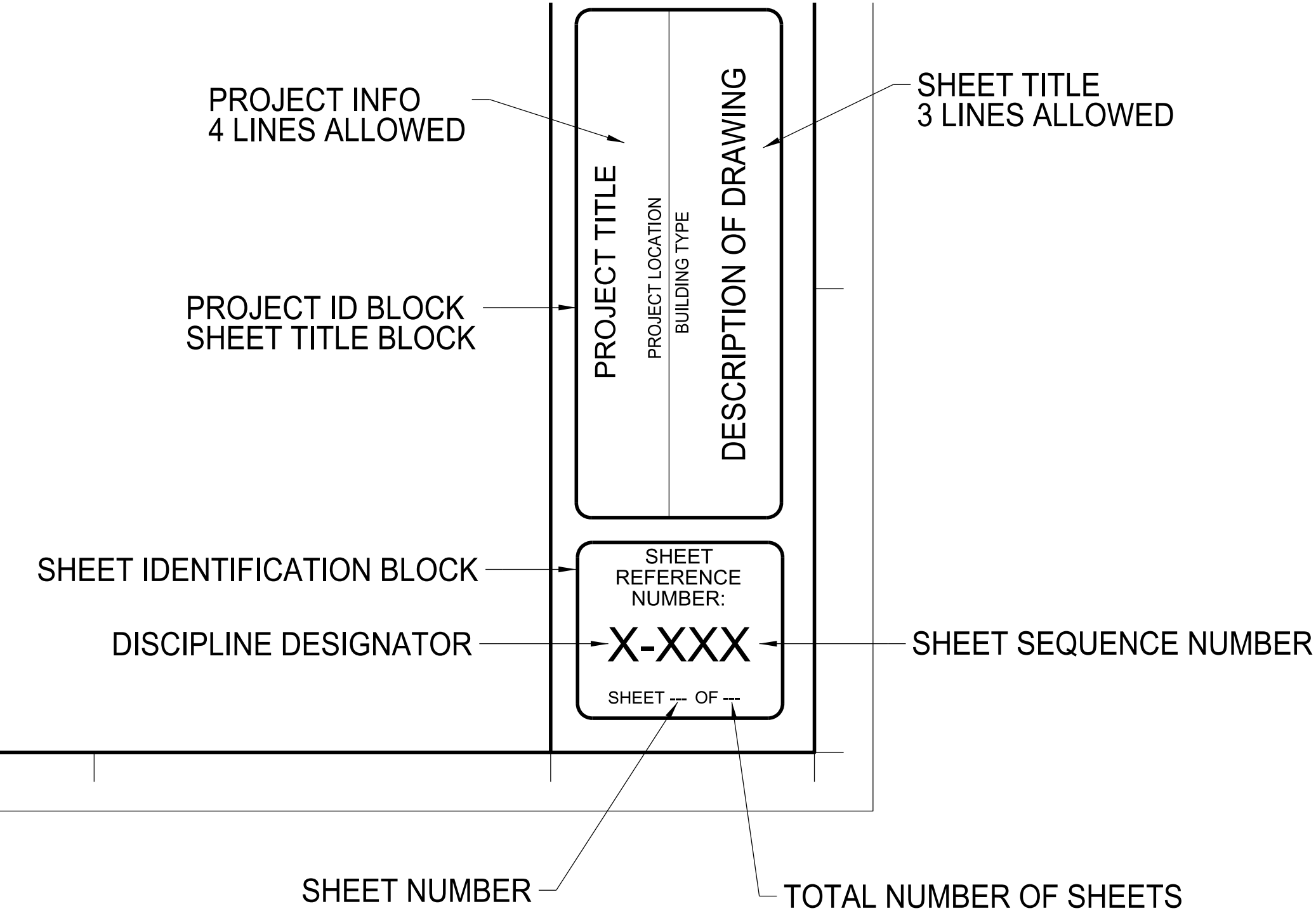


Figure 1: AED-S Title Block

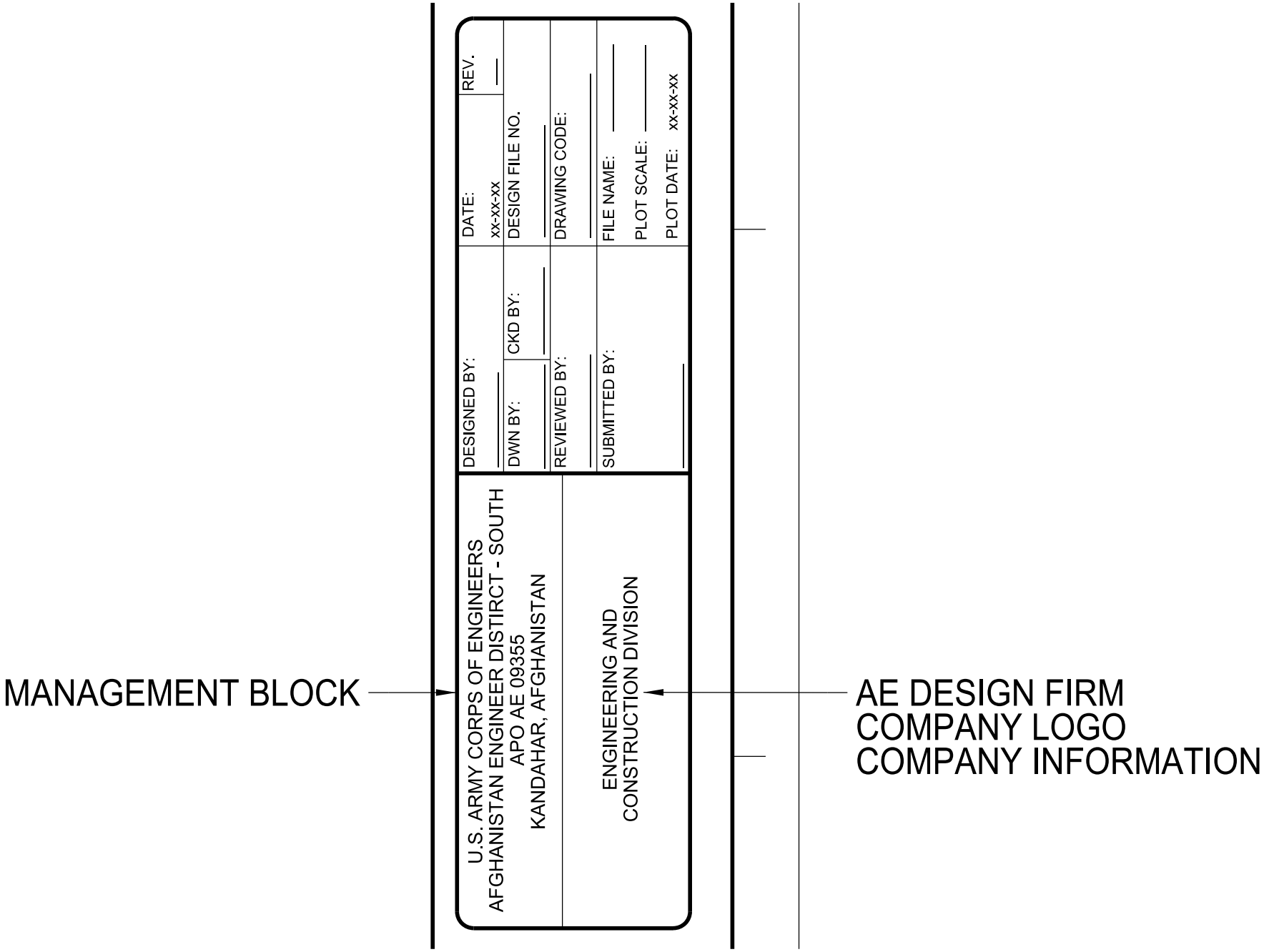


Figure 2: AED-S Management Block

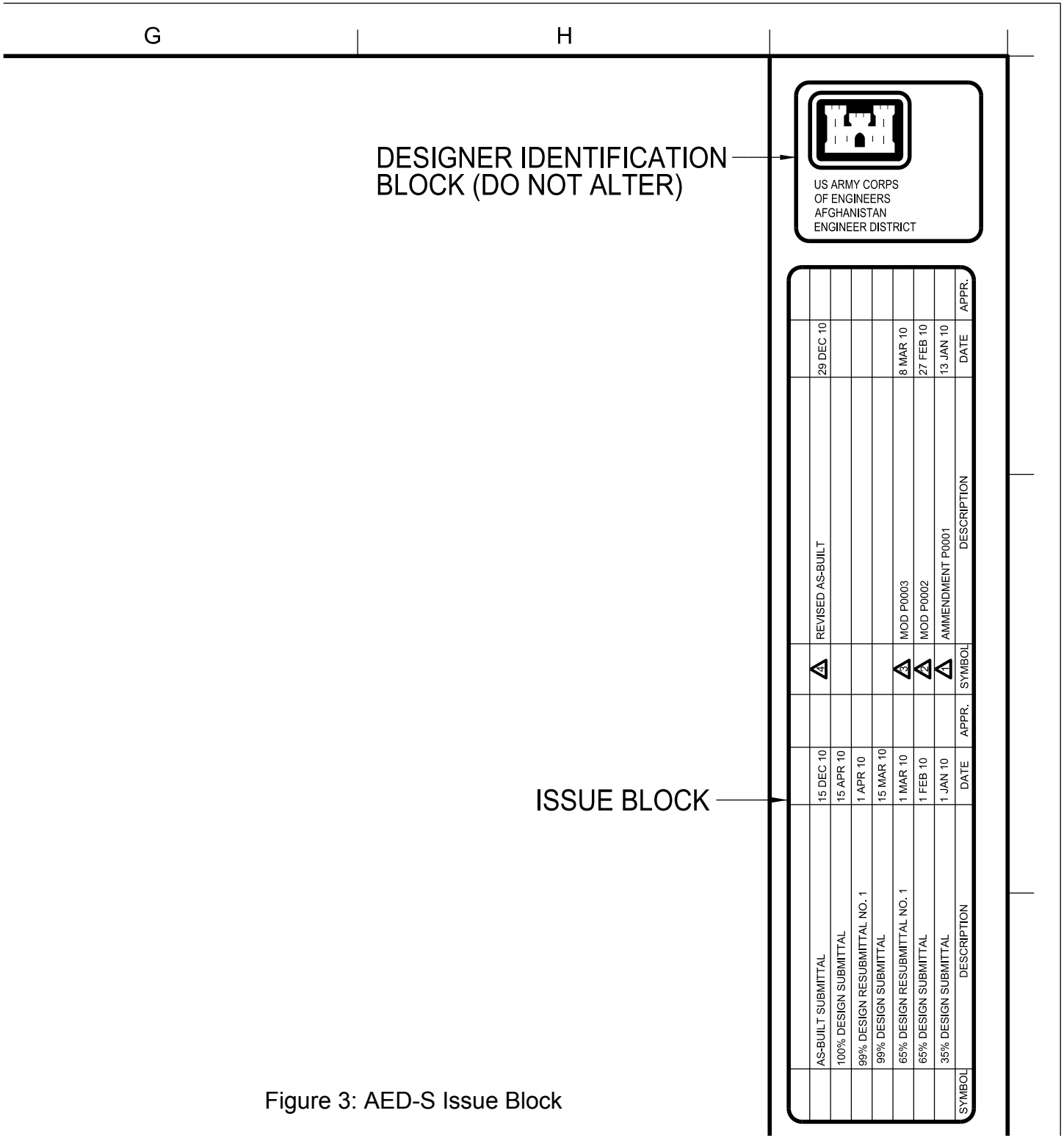


Figure 3: AED-S Issue Block

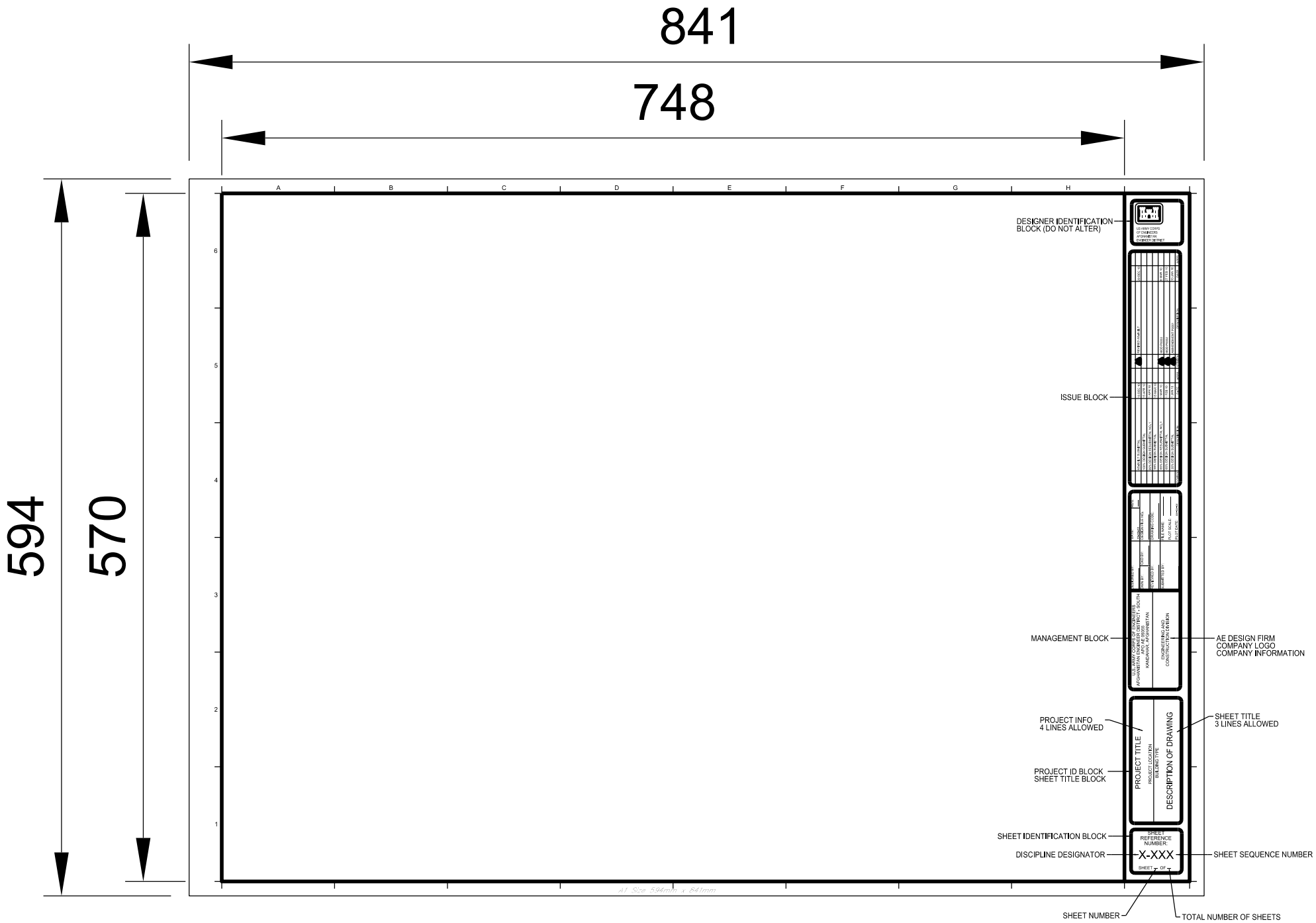


Figure 4: AED-S Sheet Dimensions

ELECTRONIC SUBMITTAL DOCUMENT FORMAT

PART 1 - GENERAL: Throughout the design process, the DB Contractor shall submit electronic packages for review at each Design Phase identified in the Request for Proposals. To facilitate reviews, submittal packages shall conform to the following file structure and format.

1.1. File Structure: Submittal packages that can be contained on a single disc shall use the file structure shown in Figure 1.

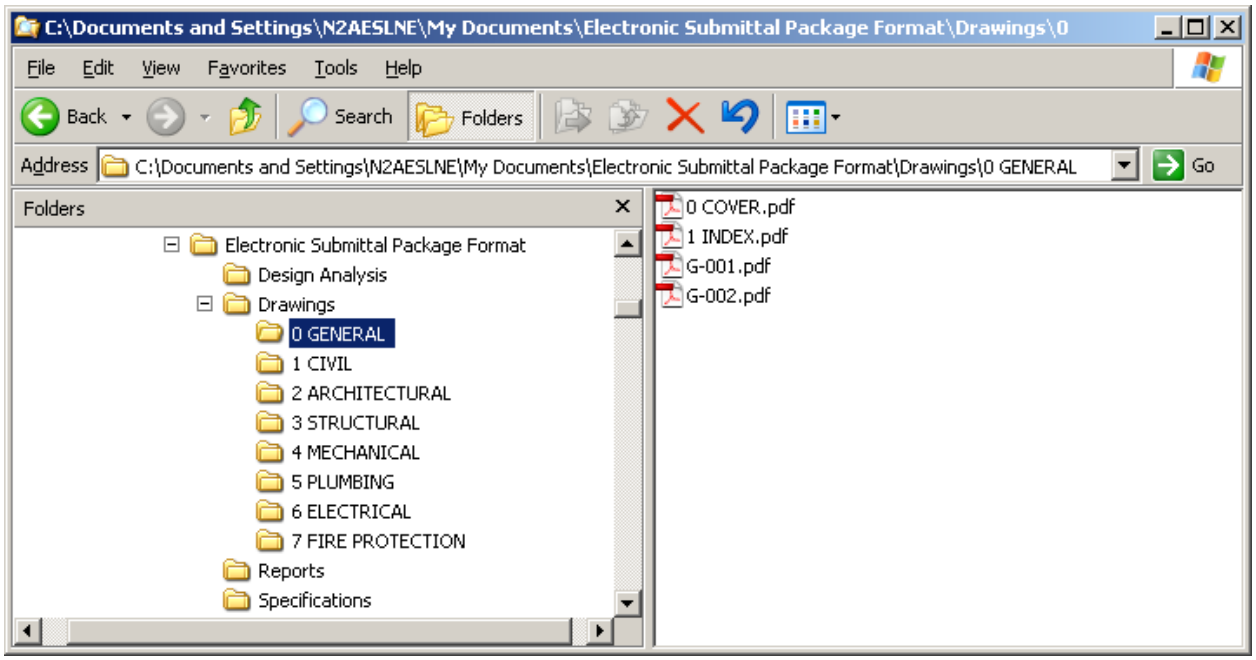


Figure 1: Submittal package file structure

1.2. Design Analysis: The design analysis directory shall contain all design analysis and calculation documents necessary for the current design stage. All design analysis and calculations shall be compiled into a single document containing a table of contents and page numbers. As additional analysis and calculation documents are created in progressive design phases, insert these documents into their appropriate section of the Design Analysis. Avoid lengthy appendices except in the case where numerical output sheets from analysis software are included. All documentation shall be organized by discipline: Civil, Architectural, Structural, Mechanical and Electrical.

1.2.A. Some projects requiring complex plumbing, communications and fire protection systems may require additional sections covering these specific systems. Note that water supply and sanitary sewer systems beyond 1.5 meters of the building envelope are Civil systems, not Plumbing systems.

1.2.B. If the project involves a compound comprised of several structures, clearly identify which building is being analyzed. In these cases, the major divisions of the Design Analysis shall be by discipline with subdivisions by building such that all

calculations for a particular discipline will be found in one section of the document. For example, a compound containing three separate buildings would have three separate seismic loading analysis calculations in the structural section.

1.3. Drawings: Drawings shall be arranged by discipline. Subdirectories shall be made corresponding to discipline only. Folders labeled for specific disciplines as shown in Figure 1 shall contain all drawings in the project applicable to that discipline. Note that these discipline specific folders are to contain only drawings and no other type of document. Drawings must be submitted in pdf form at a minimum. Files shall be named by reference number (i.e. C-101). If multiple file types for submittal drawings are provided, place all file types for each discipline in the same folder; do not subdivide the discipline specific folders for separate file types. Also, include a single pdf file containing all drawings in the project in this folder. The sheets in this file should follow the order indicated in the index sheet. This file should be named to indicate the contract number and submittal stage.

1.3.A. GENERAL: A folder labeled “0 GENERAL” shall contain the cover sheet, index sheet, list of legends and abbreviations sheet, project location and vicinity sheet, and site survey sheets.

1.3.B. CIVIL: A folder labeled “1 CIVIL” shall contain all site survey drawings and all civil drawings for the project. Note that the pipe networks for water supply systems, sanitary sewer systems and storm drainage systems are civil drawings, not plumbing drawings. Also note that gates, fences and small site structures are typically part of the civil discipline.

1.3.C. ARCHITECTURAL: A folder labeled “2 ARCHITECTURAL” shall contain all architectural drawings for the project. Note that life safety drawings denote architectural features and belong in this folder.

1.3.D. STRUCTURAL: A folder labeled “3 STRUCTURAL” shall contain all structural drawings for the project.

1.3.E. MECHANICAL: A folder labeled “4 MECHANICAL” shall contain all HVAC drawings for the project.

1.3.F. PLUMBING: A folder labeled “5 PLUMBING” shall contain all indoor plumbing systems (i.e. domestic water, waste & vent, LPG or propane, compressed air, diesel or fuel oil, etc.) for the project. Note that water supply and sanitary sewer systems beyond 1.5 meters of the building envelope are Civil systems, not Plumbing systems.

1.3.G. ELECTRICAL: A folder labeled “6 ELECTRICAL” shall contain all electrical drawings for the project. Note that communication and fire alarm systems are electrical systems and belong in this folder for most projects.

1.3.H. FIRE PROTECTION: A folder labeled “7 FIRE PROTECTION” shall contain all indoor fire protection systems (i.e. sprinklers, fire pumps, etc.) for the project.

1.4. Reports: The reports folder shall contain all certified reports required in the contract, including the Geotechnical Report, Water Quality Report and any other reports specifically called for in the contract. No subdirectories shall be created in this folder.

1.5. Specifications: All project specifications shall be contained in this folder. Include the project table of contents and name it so that it is easily identifiable (naming it “00000 Project Table of Contents” should ensure that it is at the top of the list). Specification sections should be named by number only so that they sort in ascending order as indicated on the project table of contents, or all project specifications shall be collated into a single file indexed at each section. No subdirectories shall be created in this folder.

PART 2 - PRODUCTS: (NOT APPLICABLE)

PART 3 - EXECUTION: (NOT APPLICABLE)

- - END SECTION - -

DIVISION 01 – GENERAL REQUIREMENTS

SECTION 01 33 16

DESIGN-BUILD: DESIGN AFTER AWARD

TABLE OF CONTENTS

PART 1. GENERAL 3
1.1 SUMMARY 3
1.2 SUBMITTALS 3
1.3 CONTRACTOR-ENGINEER RELATIONSHIP 4
1.4 DESIGNER OF RECORD 4
1.5 DESIGN BASIS 4
1.6 SPECIAL CONTRACT REQUIREMENTS FOR DESIGN BUILD 4
PART 2. PRODUCTS 5
PART 3. EXECUTION 5
3.1 PRE-WORK ACTIVITIES AND CONFERENCES 5
3.2 DESIGN BUILD PROCESS 5
3.3 DESIGN SUBMITTALS 7
3.4 DESIGN CONFIGURATION MANAGEMENT 10
3.5 INTERIM DESIGN REQUIREMENTS 10
3.6 FINAL DESIGN REQUIREMENTS 12
3.7 DESIGN COMPLETE CONSTRUCTION DOCUMENT REQUIREMENTS 14
3.8 TRANSMITTAL FORM (ENG FORM 4025) 14
3.9 TRACKING COMMENTS IN DRCHECKS$_{SM}$ 14
3.10 PROJECT SCHEDULE 17

-THIS PAGE INTENTIONALL LEFT BLANK-

PART 1. GENERAL

1.1 SUMMARY

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

1.1.1 References

Referenced Sections

Section 01 32 01, PROJECT SCHEDULE

Section 01 33 15 SUBMITTAL PROCEDURES FOR DESIGN-BUILD PROJECTS

Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS

Section 01 45 00, QUALITY CONTROL

Section 01 01 50 TECHNICAL REQUIREMENTS

Section 00 55 50, DESIGN CONCEPT DOCUMENTS

Section 01 78 39 PROJECT RECORD DOCUMENTS

FAR Clauses

Clauses 52.242-14, SUSPENSION OF WORK, and 52.249-10, DEFAULT

Clause 52.236-23, RESPONSIBILITY OF THE ARCHITECT-ENGINEER CONTRACTOR

Clause 52.236-25, REQUIREMENTS FOR REGISTRATION OF DESIGNERS

Section 0800 SCR Clauses for Design- Build

Design Build Contract-Order of Precedence

Key Personnel, Subcontractors, and Outside Associates or Consultants)

Responsibility of the Contractor for Design

Warranty of Construction Work

Warranty of Design

Sequence of Design/Construction (Fast Track)

Constructor’s Role During Design

Recommended Insurance Coverage

Value Engineering After Award

Partnering (Highly Recommended)

Deviating From the Accepted Design

Bulletins

Engineering and Construction Bulletin No. ECB 2006-15, Subject: Standardizing Computer Aided Design (CAD) and Geographic Information Systems (GIS) Deliverables for all Military Design and Construction Projects

1.2 SUBMITTALS

Government review is required for submittals listed below Government approval is required for submittals with a "G" designation and Designer of Record (DOR) approval is required for submittals with a "DA" designation:

SD-01 Preconstruction Submittals

Design Quality Control Plan; G

Interim Design Submittals; G

Final Design Submittals; G

Design Complete Submittals; G

Design and Code Checklists; G

1.3 CONTRACTOR-ENGINEER RELATIONSHIP

All items in the scope of work shall be designed and built as one project by a single contractor. The contractor may be a single firm or a team of firms that includes registered Architects and Engineers either employed by or subcontracted to the contractor. Licensing jurisdiction of Architects and Engineers of record shall be verifiable. The contractor shall be the Architect/Engineer-of-Record, regardless of whether the contractor utilizes services of licensed architects and engineers employed by its firm or subcontracts with independent architectural and/or engineering firm(s). The contractor shall be solely liable for design errors and/or omissions and should be insured as the A-E firm against design errors and omissions. For this specification, the term "Government" is defined as the Contracting Officer for the US Army Corps of Engineers, Afghanistan Engineering District South (AES).

1.4 DESIGNER OF RECORD

The Design-Build Contractor (Design-Builder, D-B, or simply Contractor) shall identify, for approval, the Designer of Record (DOR) who will be responsible for each area of design. One DOR may be responsible for more than one area. All areas of design disciplines shall be accounted for by a listed, Professional Registered, DOR. The DOR(s) shall stamp, sign, and date each design drawing and other design deliverables under their responsible discipline at each design submittal stage (see Section, Contract Clause 52.236-25, REQUIREMENTS FOR REGISTRATION OF DESIGNERS).

The DOR(s) shall also be responsible for maintaining the integrity of the design and for compliance with the contract requirements through construction and documentation of the as-constructed condition by coordination, review and approval of extensions of design, material, equipment and other construction submittals, review and approval or disapproval of requested deviations to the accepted design or to the contract, coordination with the Government of the above activities, and by performing other typical professional designer responsibilities.

Section 01 45 00 Contractor Quality Control further specifies experience requirements for the DOR, marking of design submittals, and responsibility for conformance with the submitted Design Quality Control Plan (DQP).

1.5 DESIGN BASIS

Section 00 55 50, DESIGN CONCEPT DOCUMENTS identifies project documents furnished herewith to be used as the basis for the project design. The Contractor shall be required to use the concept documents as a starting point and then "extend" the design to completion, and ultimately produce the final plans and construction specifications. Section 00 55 00 also provides the results of Government review and assumptions on existing conditions. In preparing this request for proposal, the Government has effectively produced conceptual level designs from these documents and produced working estimates of cost. A qualified Contractor should be able to review the same documents, perform independent research as may be appropriate, and prepare an adequate response to this request for proposal.

1.6 SPECIAL CONTRACT REQUIREMENTS FOR DESIGN BUILD

Section 0800 of this contract include the Special Contract Requirements (SCR) for the design build process that are not otherwise in the Federal Acquisition Regulations (FAR). The following SCRs for this design-build project are included:

- Design Build Contract-Order of Precedence

- Key Personnel, Subcontractors, and Outside Associates or Consultants)
- Responsibility of the Contractor for Design
- Warranty of Construction Work
- Warranty of Design
- Sequence of Design/Construction (Fast Track)
- Constructor's Role During Design
- Recommended Insurance Coverage
- Value Engineering After Award
- Partnering
- Deviating From the Accepted Design

PART 2. PRODUCTS

Design products are further specified in Section 01 33 15 SUBMITTAL PROCEDURES – PART 2 PRODUCTS.

PART 3. EXECUTION

3.1 PRE-WORK ACTIVITIES AND CONFERENCES

3.1.1 Design Quality Control Plan

The D-B Contractor shall submit for Government Approval, a Design Quality Control Plan in accordance with Section 014500, QUALITY CONTROL, before design may proceed.

3.1.2 Post Award Conference

The Government will conduct a post award contract administration conference at the project site, as soon as possible after contract award. This will be coordinated with issuance of the contract notice to proceed (NTP). The Contractor, lead DOR and major sub-contractor representatives shall participate. Government representatives will include Government Project Engineer/COR , facility users, facility command representatives, and installation representatives. Prior to the meeting, the Government will provide an agenda, goals, meeting place and time.

The post award conference shall include determination and introduction of contact persons, their authorities, contract administration requirements, discussion of expected processes, and coordination of subsequent meetings for quality control. See Section 014500, QUALITY CONTROL, and paragraph titled Initial Design Conference).

3.1.3 USACE Team

The Government will introduce USACE team members, U.S. and Afghan military command, Kajaki Dam Operations personnel, and representatives from other Contracting firms working at the dam. The D-B Contractor shall introduce major subcontractors, and other needed staff. Expectations and duties of each person shall be defined for all participants. A meeting roster shall be developed and distributed by the Government with complete contact information including name, office, project role, phone, mailing and physical address, and email address. Contact information shall include all job site and duty locations.

3.2 DESIGN BUILD PROCESS

3.2.1 Design Development

The Government and Contractor shall establish comprehensive design development processes including conduct of conferences, expectations of design development at conferences, design approval, and project closeout. The Government will explain contract requirements and the D-B Contractor shall review their proposed project schedule and suggest ways to streamline processes.

3.2.2 Design Conference

The initial design conference may be scheduled and conducted at the project installation within 60 days of contract award, although it is recommended that the partnering process be initiated with or before the initial design conference. All Designers of Record shall participate in the conference. The purpose of the meeting is to introduce everyone, to make sure any needs the Contractor has are assigned, establish schedule dates and critical milestones, and determine the informational requirements of all parties. The D-B Contractor shall conduct the initial design conference.

3.2.3 Pre-Construction Conference

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

3.2.4 Sequence of Design Build (Fast Track)

The Kajaki Dam - Tunnel Works project requires an expedited design-build sequence that also follows a carefully sequenced construction operation due to the nature of the tunnel operations, limitations on hydro-regulation of the reservoir, and the detailed inspections that cannot physically be performed until construction begins. The dam safety instrumentation is in general much more independent of operations at the project site and may therefore be executed with more flexibility.

Due to the long lead time on the manufacture of some items e.g. fixed cone valves, rotovalves, and bridge crane, the design work should begin as soon as possible. The Government has prescribed these items as much as possible to facilitate design and or use of commercial items.

In general, construction should begin with site inspections resulting in preliminary evaluations and reports. Subsequent designs shall be completed progressively at different levels, i.e. Preliminary (35%), Interim (65%), Final (99%), and Design Complete (100%). The tasks defining level of completion is partly specified herein and partly subjective and depends on the DOR.

The sequence is referred to as “Fast-Track” in the sense that the build phase may proceed before final design at the Interim Phase of design, and as separate packages, subject to the issuance of a Clearance for Construction Letter from the Contracting Officer.

The sequencing shall be completed according to Table 1 below.

Design/Build Phase	**Submittal**
35%	Inspection Reports, e.g., Electrical Load Study, Report on sites for Dam Safety Instrumentation, Inspect and Evaluate Access Bridge to Tower,
65%	• Catalogue cuts and shop drawings of commercial items, e.g. auxiliary tunnel equipment, Shop drawings for the fixed cone valves and HPUs for the Rotovalves. • Interim design drawings, e.g. partially completed As-built drawings for electrical and hydro electric systems, piezometer designs. • Construction specifications for major items to be constructed. • Commissioning Plan for Bridge Crane, Rotovalves and Fixed Jet Valves If there are any deviations from design, the Contractor shall re-submit the Commissioning Plan with subsequent Final Design (99%) packages.
99%	• Final documents waiting on final review of documentation by USACE, e.g. completed electrical drawings, or Dam Safety Instrumentation Report. • Training Plans, Lesson Plans, and O&M Manuals shall be submitted along with the Final Design (99%) Packages. Video recordings of all hands on training of project personnel shall be submitted no later than the Final Design stage and prior to any class room training. Professional videos shall be produced after the hands on training sessions according to Section 016600 Training and shall be submitted with the Design Complete package.
100%	• Final Drawings and products from earlier phases with all documents stamped by professional engineer.

3.2.5 Design Build Of Features Optional to Contract

Some items listed in Section 01 01 40 Summary of Work are optional to the contract and therefore to be executed at the discretion of the Contracting Officer. In general, these options will be executed as early as possible and in part dictated by the results of some inspections to be completed by the Contractor. The Notice to Proceed (NTP) for design and build of any option item shall be executed by a “no later than date” determined by the date of submission for inspection, plus the Government review period, plus 18 days.

3.3 DESIGN SUBMITTALS

3.3.1 General

Contractor furnished design submittals are the various design documents which primarily consist of field investigations, calculations, design analysis, drawings and construction specifications.

In addition, for each design submittal, the contractor shall submit all non-administrative modifications issued for the contract as part of the Design Submittal package to enable TAS to validate that these modifications have been incorporated into this design submittal.

The Contractor shall clearly label and date all design submittals to reflect the current design stage and date of submission to the Government to avoid confusion between current and previous submittals. The Contractor shall not begin construction work until the Government has reviewed and approved the work presented in each Design Submittal, including complete resolution of all comments, and the Contracting Officer has cleared work for construction. Clearance for construction shall not be construed as meaning Government approval. Unless otherwise indicated, the risk for the design is the sole responsibility of the Contractor.

The sole responsibility of ensuring that the design submittals comply with contract documents remains with the Contractor, in accordance with this section of the contract. The Government retains the right to comment on the design at any design stage, and the lack of Government comments at a given review cannot be used as a basis for the Contractor to fail to address the Government's comments on subsequent reviews, regardless of design stage. Furthermore, approval of incomplete designs will not relieve the Contractor of the responsibility for any error which may exist, and which may require rework or other appropriate adjustment to the contract terms, as determined at the sole discretion of the Government. It is the sole responsibility of the Contractor to ensure that submittals do or do not comply with the contract documents. Government review, clearance for construction, or approval by the Contracting Officer shall not relieve the Contractor from responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this contract. Government review, clearance for construction, or approval of post design construction submittals shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory.

3.3.2 Total Design Package

A “total design package” is defined as plans, and constructions specifications along with design analyses and inspection reports for all technical disciplines.

3.3.3 Separate Design Package

The Contractor may request a separation of features for design. At the discretion of the COR, the Contractor may sub-divide the design into separate packages for each stage of design. For example, items combined in a single bid item such as “Valve Design” may be designed separately. However, due to potential constraints imposed by the site, operations or the Government, the Contracting Officer may refuse to separate design packages and withhold the CFC letter.

If a separate package is created, the Contractor may proceed with the construction work after the Government has issued a Clearance for Construction (CFC) letter, and review comments have been addressed and resolved to the Government's satisfaction.

3.3.4 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 Cleared for Construction (CFC) Letter. Such partial notices to proceed shall be solely at the discretion of the Contracting Officer. The Contractor must obtain the approval of the Designer of Record (DOR) and the Government’s concurrence for any Contractor proposed revision to the professionally stamped and sealed design reviewed and Cleared for Construction by the Government, before proceeding with the revision. The Government reserves the right to non-concur with any revision to the design, which may impact furniture, furnishings, equipment selections or operations decisions that were made, based on the reviewed and cleared for construction design. Any revision to the design, which deviates from the contract requirements (i.e., the RFP and the accepted proposal), will require a modification, pursuant to the Contract Clause 52.243-4 entitled “CHANGES”, in addition to Government concurrence. The Government reserves the right to disapprove such a revision. Unless the Government initiates a change to the contract requirements, or the Government determines that the Government furnished design criteria are incorrect and must be revised, any Contractor initiated proposed change to the contract requirements, which results in additional cost, shall strictly be at the Contractor's expense. The Contractor shall track all approved revisions to the reviewed and cleared for construction design and shall incorporate them into the As-Built design documentation, in accordance with Section 01 78 00A, CLOSEOUT SUBMITTALS, Paragraphs 1.1 and 1.2, which lists all requirements associated with submission of editable CAD format As-Builts required as part of this contract. The Designer of Record shall

document its professional concurrence on the As-Builts for any revisions by affixing its stamp and seal on the drawings and construction specifications.

3.3.5 For Information Only Submittals

Some items do not need Government review or approval but do need to be supplied for information purposes. This includes Items such as catalogue sheets for commercial items that are to be furnished and installed as opposed to designed and fabricated.

3.3.6 Interim Design Submittals

The Contractor shall submit a single interim design for review, representing all design disciplines. As required in Section 013201, PROJECT SCHEDULE, the Contractor shall schedule its design and construction packaging plan to meet the contract completion period. This submittal is the Government's primary opportunity to review and approve the design for conformance to the solicitation and to the accepted contract proposal and to the building codes at a point where required revisions may be still made, while minimizing lost design effort to keep the design on track with the contract requirements. The requirements for the interim design review submittals and review conferences are described in paragraph INTERIM DESIGN REQUIREMENTS. This is not necessarily a hold point for the design process; the Contractor may designate the interim design submittal(s) as a snapshot and proceed with design development at its own risk. However, due to the sensitive nature of the project and downstream consequences, the Contractor shall not proceed with any construction until the CFC letter has been issued by the Contracting Officer.

3.3.7 Final Design Submittals

Final Design Submittals are required for each design package prior to Government acceptance of that design package for construction. The requirements for the final design submittal review conferences and the Government's acceptance for start of construction are described in paragraph FINAL DESIGN REQUIREMENTS.

3.3.8 Design Complete Submittals

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

3.3.9 Holiday Periods for Government Review or Actions

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

3.3.10 Late Submittals and Reviews

If the Contractor cannot meet its scheduled submittal date for a design package, it must revise the proposed submittal date and notify the Government in writing, at least two weeks prior to the submittal due date, in order to accommodate the Government reviewers' other scheduled activities. If a design submittal is over one (1) day late in accordance with the latest revised design schedule, or if notification of a proposed design schedule change is less than seven (7) days from the anticipated design submittal receipt date, the Government review period may be extended up to seven (7) days due to reviewers' schedule conflicts. If the Government is late in meeting its review commitment and the delay increases the Contractor's cost or delays completion of the project, Contract Clauses 52.242-14, SUSPENSION OF WORK, and 52.249-10, DEFAULT, provide the respective remedy or relief for the delay.

3.3.11 Government Review And Acceptance Of Design Submittals

Government review and acceptance of design submittals is for contract conformance only and shall not relieve the Contractor from responsibility to fully adhere to the requirements of the contract, including the Contractor's accepted contract proposal, or limit the Contractor's responsibility of design as prescribed under Section , Contract Clause 52.236-23, RESPONSIBILITY OF THE ARCHITECT-ENGINEER CONTRACTOR, or limit the Government's rights under the terms of the contract. The Government reserves the right to rescind inadvertent acceptance of design submittals containing contract deviations not separately and expressly identified in the submittal for Government consideration and approval.

Additional details on the Government review and submittal procedures for design packages are provided in Section 01 33 15 SUBMITTAL PROCEDURES paragraph REVIEW OF CONTRACTOR PREPARED DESIGN DOUMENTS.

3.4 DESIGN CONFIGURATION MANAGEMENT

3.4.1 Internal Procedures

The Contractor shall develop and maintain effective, acceptable Design Configuration Management (DCM) procedures to control and track all revisions to the design documents after the Interim Design submittal through submission of the As-Constructed documents. During the design process, this will facilitate and help streamline the design and review schedule. After the final design is accepted, this process provides control of and documents revisions to the accepted design. The system shall include appropriate authorities and concurrences to authorize revisions, including documentation as to why the revision must be made. The DCM data shall be available to the Government reviewers at all times. The Contractor may use its own internal system with interactive Government concurrences, where necessary or may use the Government's "DrChecks Design Review and Checking System."

3.4.2 Tracking Design Review Comments

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

3.4.3 Design and Code Checklists

The Contractor shall develop and complete various discipline-specific checklists to be used during the design and quality control of each submittal. These completed checklists shall be submitted with each design submittal, as applicable, as part of the project documentation. See Section 014500, QUALITY CONTROL.

3.5 INTERIM DESIGN REQUIREMENTS

3.5.1 General

At least one interim design submittal, review and conference is required for each design package. The D-B Contractor may include additional interim design conferences or over-the-shoulder reviews, as needed, to assure continued Government concurrence with the design work. The interim submittal review periods and conferences shall be included in the project schedule and shall indicate what part of the design work is at what percentage of completion, per Section 013201, PROJECT SCHEDULE, subparagraph entitled Design and Permit Activities. The required interim design conferences shall be held when interim design requirements are reached per paragraph entitled Interim Design Deliverables.

3.5.2 Interim Design Deliverables

Interim design deliverables shall include drawings, construction specifications, submittal register, and design analysis for the part of design that the D-B Contractor considers ready for review at 65% level of completion. Inspection reports specified in Section 01 01 50 TECHNICAL REQUIREMENTS shall also be provided to facilitate conference and subsequent direction from the government on design selections. The inspection and evaluation reports shall be "final" and stamped by the DOR.

3.5.2.1 Design Analyses

The designers of record shall prepare and present design analyses with calculations necessary to substantiate and support all design documents submitted. For parts including sitework, site specific civil calculations shall be included. For parts including structural work, structural calculations shall be included. For parts including mechanical work, mechanical calculations shall be included. For parts including electrical work, lighting calculations to determine maintained foot-candle levels, electrical load analysis and calculations, electrical short circuit and protective device coordination analysis and calculations and arc fault calculations shall be included. The Contractor shall submit the geotechnical evaluation report, reports of soil and rock borings and logs, as well as any other investigations performed.

3.5.2.2 Drawings and Construction Specifications

Specifications shall conform to the requirements outlined in Section 01 33 15 SUBMITTAL PROCEDURES – see paragraph CONSTRUCTION SPECIFICATIONS. Drawings shall also conform to the requirements outlined in Section 01 33 15 SUBMITTAL PROCEDURES – see paragraph DRAWINGS.

3.5.3 Procedures

a. After receipt of an Interim Design submittal, the Government will be allowed up to 18 calendar days after receipt of the submittal to review and comment on the interim design submittal. For smaller design packages, especially those that involve only one or a few separate design disciplines, the parties may agree on a shorter review period or alternative review methods (e.g., over-the-shoulder or electronic file sharing). For each interim design review submittal, the COR will furnish to the Contractor, a single consolidated, validated listing of all comments from the various design sections and from other concerned agencies involved in the review process using the DrChecks Design Review and Checking System. The review will be for conformance with the technical requirements of the solicitation and the Contractor's RFP proposal. The Contractor shall furnish disposition of all comments, in writing, through DrChecks. If the Contractor disagrees technically with any comment or comments and does not intend to comply with the comment, the Contractor shall clearly outline, with ample justification, the reasons for noncompliance prior to the closure of the review period in order to provide ample time for the comment to be resolved. The Contractor is cautioned that if it believes the action required by any comment exceeds the requirements of this contract, that it should take no action and notify the COR in writing immediately.

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

c. The Interim Review Conference will be held for each design submittal. The location will be determined by the COR.. The Contractor shall bring the personnel that developed the design submittal to the review conference. The conference will take place the week after the Contractor receives the Government's comments. For smaller fast-track packages that involve only a few reviewers, the parties may agree to alternative conferencing methods, such as teleconferencing or televideo.

3.5.4 Interim Review Conference Documentation

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

3.5.5 Government Review of Interim Design Package

The government will review a "total" Interim Design Package that includes all Plans and Specifications at 65% level of completion, design analyses, final inspection and evaluation reports (if any specified) used to support the design. The Government will check the basis for design and determine if the design has been "extended" according to the performance criteria provided. The government will review the package to determine if design is in conformance to specified codes and criteria. In general, the prescribed specifications provided in Section 01 01 50 Technical Requirements are limited to that necessary to form a design basis at the conceptual level. Therefore, the government will also perform a check on any prescribed specifications. It will be the responsibility of the DOR to demonstrate that any deviation from the prescribed specifications is necessary and this must be documented in the submittal. The Contracting Officer must approve any deviation before issuing CFC Letter.

The full and comprehensive details in the plans and specifications required for Final Design may not be necessary to determine conformance to specified codes and criteria, and therefore not necessarily be a barrier to issuing a CFC letter. Upon received the CFC letter, the Contactor may further extend design and/or initiate construction at risk.

3.6 FINAL DESIGN REQUIREMENTS

3.6.1 General

A final design review and review conference will be held upon completion of final design at the project installation, or - where equipment is available - by video teleconference or a combination thereof, for any design package to receive Government acceptance to allow release of the design package for construction. For smaller separate design packages, the parties may agree on alternative reviews and conferences (e.g., conference calls and electronic file sharing, etc.). The Contractor shall include the final design conference in the project schedule and shall indicate what part of the design work is at 100 percent completion. The final design conference will be held after the Government has had up to 18 calendar days, after receipt of the submittal, to review the final design package and supporting data. For smaller packages, especially those involving only one or a few design disciplines the parties may agree on a shorter review period.

3.6.2 Final Design Deliverables

Final design deliverables shall include drawings, specifications, submittal register, and design analysis for the part of design that the D-B Contractor considers ready for review at 99% level of completion.

3.6.2.1 Design Analyses

Further to the requirements for Interim Design Analyses the contractor shall update analyses for any required changes. The DOR shall specifically draw attention to any changes and that those changes do not deviate from the contract and code requirements.

3.6.2.2 Final Design Review Conference Documentation

The D-B Contractor shall prepare meeting minutes and shall enter final resolution of all comments into DrChecks. Copies of comments, annotated with comment action agreed on, will be made available to all parties before the

conference adjourns. Unresolved problems will be resolved by immediate follow-up action at the end of conferences. Valid comments shall be incorporated. The Government reserves the right to reject design document submittals if comments are significant. Participants shall determine if any comments are critical enough to require further design development prior to Government concurrence.

3.6.2.3 Government Review of Final Design Package

The government will review a "total" Final Design Package that includes all updated Plans and Specifications at 99% level of completion, and updated design analyses. The government will review the package to determine if the package still meets the contract requirements especially if there has been any deviation from the interim design (65%). In general, the specific details for the updated plans and specifications, and updated design analyses must meet the code and professional standards for As-Built design.

3.6.3 FINAL DESIGN DELIVERABLES

3.6.3.1 General

Final design deliverables of a design package for Government review and acceptance shall consist of: 100-percent complete drawings, 100-percent Division 02-49 specifications, submittal register, design analysis, and any permits required by the contract for each package submitted. Prior to the final design conference, the Contractor shall ensure that the Design Configuration Management (DCM) data and all review comment resolutions are up-to-date. The Contractor shall also have performed independent technical reviews (ITR) and back-checks of previous comment resolutions, as required by Section 014500 QUALITY CONTROL, paragraph Additional Requirements for Design Quality Control (DQC) Plan.

3.6.3.2 Drawings

a. Submit drawings complete with all contract requirements incorporated into the documents to provide a 100 percent design for each package submitted. Prepare all drawings with the Computer-Aided Design and Drafting (CADD) system, organized and easily referenced electronically, presenting complete construction information (see paragraph 3.6.3.3, CADD System).

b. The design documents shall be in compliance with Section 01 33 15, SUBMITTAL PROCEDURES FOR DESIGN-BUILD PROJECTS. The D-B Contractor shall use approved vertical Corps of Engineers title blocks and borders on all drawings with the appropriate firm name included within the title block area.

c. The Contractor shall provide complete, detailed drawings that illustrate conformance with the contract. The Contractor is encouraged to utilize graphics, views, notes, and details which make the drawings easier to review or to construct but is also encouraged to keep such materials to those that are necessary.

3.6.3.3 CADD System

Use of CADD is mandatory. A complete set of computerized drawing files shall be submitted. Additionally, all plans and shop drawings shall be published to Adobe PDF. All computerized drawing files shall be submitted in MicroStation file format in the same model and sheet space as the design drawings. If the drawing files are to be created in other than MicroStation (versions 8 or newer), then the proposed CADD software and the conversion software shall be submitted for approval. All conversions shall be made prior to delivery.

3.6.3.4 Paper Copies

A complete set of paper copies of the drawings, printed as standard full-size drawings, per Section 01 33 15, SUBMITTAL PROCEDURES FOR DESIGN-BUILD CONTRACTS shall be submitted. The Designers of Record shall stamp and sign original hard copy sheets as Released For Construction, and provide copies for distribution from this set.

3.6.3.5 Design Analysis

The designers of record shall prepare a design analysis with calculations necessary to validate and support all design work submitted. The responsible DOR shall stamp, sign and date the design analysis. Identify the software used where applicable (name, version, vendor). Generally, provide design analyses individually, in an original (file copy) and one copy for the assigned Government reviewer. Do not combine multi-disciplined volumes of design-analysis, unless multiple copies are provided to facilitate multiple reviewers (one copy per each separate design analysis included in a volume).

3.6.3.6 Specifications

Further to the Interim Design Requirements, specifications shall be 100 percent complete and in final form. Prepare and submit specification sections (Division 02-49) as required to define project design requirements, materials, and workmanship; to coordinate with design drawings; to obtain accurate subcontractor bids; and to permit construction of the project features.

3.6.3.7 Submittal Register

The D-B Contractor shall prepare and update the Submittal Register and submit it with each design package. The Contracting Officer or Contracting Officer's Representative may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections.

3.6.3.8 Acceptance and Clearance for Construction

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

3.7 DESIGN COMPLETE CONSTRUCTION DOCUMENT REQUIREMENTS

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

3.8 TRANSMITTAL FORM (ENG FORM 4025)

The sample transmittal form (ENG Form 4025 - Attachment A2) shall be used for submittals in accordance with the instructions on the reverse side of the form per Section 013315, SUBMITTAL PROCEDURES FOR DESIGN-BUILD PROJECTS.

3.9 TRACKING COMMENTS IN DRCHECKS$_{SM}$

3.9.1 General

All TAS Design Submittal review comments will be documented using the standard design review tool for the U.S. Army Corps of Engineers, a web-based application called "DrChecks$_{SM}$". The web link to DrChecks$_{SM}$ is:

https://www.projnet.org/projnet/binKornHome/index.cfm

The D-B Contractor shall enter, track, and back-check comments. Designers of Record shall annotate comments timely and specifically to indicate exactly what action will be taken or why the action is not required. Comments considered critical by the conference participants shall be flagged as such.

3.9.2 DrChecks Review Comments

a. The D-B Contractor shall monitor DrChecks to assure all comments are annotated and agreed to by the designers and reviewers prior to the next submittal. The DrChecks comments and responses shall be printed and included in the design analysis for record.
b. Conference participants (reviewers) will expect coordination between Design Analysis calculations and the submitted design. Reviewers will also focus on the design submittal's satisfaction of the contract requirements.
c. The Designers of Record shall answer each comment in DrChecks with a formal response prior to the next submittal, clearly indicating what action will be taken and what drawing/spec will change. Designers of Record are encouraged to directly contact reviewers to discuss and agree to the formal comment responses rather than relying only on DrChecks and review meetings to discuss comments. With the next design conference, reviewers will back-check answers to the comments against the submittal, in addition to reviewing additional design work.
d. Comments that, in the D-B Contractor's opinion, require effort outside the scope of the contract shall be clearly indicated as such in DrChecks. The D-B Contractor shall not proceed with work outside the contract until a modification to the contract is properly executed, if one is necessary.

3.9.3 DrChecks Initial Account Set-Up

a. Upon notification of award, the contractor shall immediately coordinate with the Chief, Quality Assurance Branch, TAS to acquire a vendor identification and a brief tutorial on the use of DrChecks$_{SM}$. The contractor is responsible for providing their own DrChecks$_{SM}$ Administrator within their own design staff personnel to access and accomplish actions within DrChecks$_{SM}$.
b. To initialize an office's use of DrChecks, choose a contact person within the office to call the DrChecks Help Desk at 800-428-HELP, weekdays from 8AM-5PM, United States Central time (Coordinated Universal Time -06). This POC will be given an office password to distribute to others in the office. Individuals can then go to the hyperlink at {http://www.projnet.org} and register as a first time user. Upon registration, each user will be given a personal password to the DrChecks system.
c. Once the office and individuals are registered, the COE's project manager or lead reviewer will assign the individuals and/or offices to the specific project for review. At this point, persons assigned can make comments, annotate comments, and close comments, depending on their particular assignment.

3.9.4 Notification to Contractor

At completion of the government review, a notification will be issued to the Contractor by the Contracting Officer’s representative that the particular DrChecks$_{SM}$ file will be opened to the Contractor. Until this time, the Contractor is not able to view any TAS comments for that particular Design Submittal.

3.9.5 DrChecks Reviewer Role

The D-B Contractor shall take the role of the reviewer to enter comments into the DrChecks system that result from each design conference. To enter comments:

a. Log into DrChecks.
b. Click on the appropriate project.
c. Click on the appropriate review conference. An Add comment screen will appear.
d. Select or fill out the appropriate sections (particularly comment discipline and type of document for sorting) of the comment form and enter the comment in the space provided.

e. Click the Add Comment button. The comment will be added to the database and a fresh screen will appear for the next comment you have.
f. Once comments are all entered, exit DrChecks by choosing "My Account" and then Logout.

3.9.6 DrChecks Comment Evaluation

The role of the designers of record is to evaluate and respond to the comments entered by the D-B Contractor. To respond to comments:

a. Log into DrChecks.
b. Click on the appropriate project.
c. Under "Evaluate" click on the number under "Pending."
d. Locate the comments that require your evaluation. (Note: If you know the comment number you can use the Quick Pick window on your home page in DrChecks; enter the number and click on go.)
e. Select the appropriate evaluation (concur, non-concur, for information only, or check and resolve) and add the response.
f. Click on the Add button. The evaluation will be added to the database and a fresh screen will appear with the next comment.
g. Once evaluations are all entered, exit DrChecks by choosing "My Account" and then Logout.
h. Collaboration between designer and reviewer regarding clarification of complicated comments is encouraged by direct communication. The resultant agreement is documented in Dr.Checks by the evaluator.

3.9.7 DrChecks Back-check

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

a. Log into DrChecks.
b. Click on the appropriate project.
c. Under "My Backcheck" click on the number under "Pending."
d. If you agree with the designer's response select "Close Comment" and add a closing response if desired.
e. If you do not agree with the designer's response or the submittal does not reflect the response given, select "Issue Open," enter additional information.
f. Click on the Add button. The back-check will be added to the database and a fresh screen will appear with the next comment.
g. Once back-checks are all entered, exit DrChecks by choosing "My Account" and then Logout. The design is completed and final when there are no pending comments to be evaluated and there are no pending or open comments under back-check.

3.9.8 DrChecks Comment Clarification

If any review comment requires clarification and/or amplification to assure understanding, the Contractor shall notify the Contracting Officer. The Contractor is cautioned in that if he believes the action required by any comment exceeds the requirements of this contract, that he should take no action and notify the COR in writing immediately.

3.10 PROJECT SCHEDULE

The following is an internal design schedule and is subject to modification by the Offeror to suit their particular method of operation. Overall time constraints are required and cannot be changed except by contract modification. Prospective Offerors shall be required to submit a complete schedule for design and construction that meets or exceeds the overall time goals of the Government for this project.

Written Notice to Proceed (NTP)	Duration	Following Contract Award
Phase 1: Pre-build activities including contract administration, site visit, design conference, 35% design submittals	90	90
Mandatory Phase 2: 65%G design submittals on mandatory items, and completion of evaluations and reports. Optional items contingent on funding and discretion of CO.	60	150
Mandatory Phase 3: Procure mandatory items, e.g. fixed cone valves, hoist for tower. Optional items contingent on evaluations and discretion of CO.	240	390
Mandatory Phase 4: Build/install procured items	120	510
Mandatory Phase 5 - Commissioning Phase, testing, inspections, training of project personnel, 99%G and 100%DA, design submittals	90	600
Warranty Period Inspection (See Section Project Schedule)	120, 270	-

– SECTION END –

SECTION TABLE OF CONTENTS

DIVISION 01 – GENERAL REQUIREMENTS

SECTION 01 35 26

SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS

PART 1 GENERAL....4
1.1. SUMMARY....4
1.2. REFERENCES....4
1.3. SUBMITTALS....5
1.4. UNEXPLODED ORDINANCE (UXO)/MINES....6
1.5. DEFINITIONS....6
1.6. DRUG PREVENTION PROGRAM....7
1.7. REGULATORY REQUIREMENTS....7
1.8. SITE QUALIFICATIONS, DUTIES AND MEETINGS....7
1.8.1. Personnel Qualifications....7
1.8.1.1. Site Safety and Health Officer (SSHO)....7
1.8.1.2. Competent Person for Confined Space Entry....8
1.8.1.3. Crane Operators....8
1.8.1.4. Divers....8
1.8.2. Personnel Duties....9
1.8.2.1. Site Safety and Health Officer (SSHO)/Superintendent....9
1.8.2.2. Competent person....9
1.9. MEETINGS....9
1.9.1. Preconstruction Conference....9
1.9.2. Safety Meetings....10
1.10. TRAINING....10
1.10.1. New Employee Indoctrination....10
1.10.2. Periodic Training....10
1.10.3. Training on Activity Hazard Analysis (AHA)....10
1.11. ACCIDENT PREVENTION PLAN (APP)....10
1.11.1. EM 385-1-1 Contents....11
1.12. ACTIVITY HAZARD ANALYSIS (AHA)....12
1.13. DISPLAY OF SAFETY INFORMATION....12
1.14. SITE SAFETY REFERENCE MATERIALS....12
1.15. EMERGENCY MEDICAL TREATMENT....12
1.16. REPORTS....12
1.16.1. Accident Reports....12
1.16.2. Accident Notification....12

1.16.3. Monthly Exposure Reports 13
1.16.4. Crane Reports 13
1.17. HOT WORK 13
1.18. SAFE CLEARANCE PROCEDURE PLAN 13
PART 2 PRODUCTS 13
PART 3 EXECUTION 13
3.1. CONSTRUCTION AND/OR OTHER WORK 13
3.1.1. Falling Object Protection 14
3.1.2. Hazardous Material Use 14
3.1.3. Hazardous Material Exclusions 14
3.1.4. Unforeseen Hazardous Material 15
3.2. FALL HAZARD PROTECTION AND PREVENTION PROGRAM 15
3.2.1. Training 15
3.2.2. Fall Protection Equipment 15
3.2.3. Personal Fall Arrest Equipment 15
3.2.4. Fall Protection for Roofing Work 16
3.2.5. Existing Anchorage 16
3.2.6. Horizontal Lifelines 16
3.2.7. Guardrails and Safety Nets 16
3.2.8. Rescue and Evacuation Procedures 16
3.3. SCAFFOLDING 16
3.4. EQUIPMENT 17
3.4.1. Material Handling Equipment 17
3.4.2. Weight Handling Equipment 17
3.5. EXCAVATIONS 18
3.5.1. Utility Locations 18
3.5.2. Utility Location Verification 18
3.5.3. Shoring Systems 19
3.5.4. Trenching Machinery 19
3.6. UTILITIES WITHIN CONCRETE SLABS 19
3.7. ELECTRICAL 19
3.7.1. Conduct of Electrical Work 19
3.7.2. Portable Extension Cords 19
3.8. WORK IN CONFINED SPACES 20
3.9. CRYSTALLINE SILICA 20
3.10. DEMOLITION 20
3.10.1. Demolition Plan 20
3.10.2. Protection of Personnel 20
3.10.3. Protection of Structures 21

3.11. Dive operations 21
3.12. Barge operations 21
3.13. HELICOPTER OPERATIONS 21
3.14. CRANE OPERATIONS 21
3.15. HOUSEKEEPING 21
3.15.1. Clean-Up 21

SECTION 01 35 26
SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS

PART 1 GENERAL

1.1. SUMMARY

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.

1.2. REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A10.32	Personal Fall Protection - Safety Requirements for Construction and Demolition Operations
ANSI Z359 (2010)	Safety Requirements for Personal Fall Arrest Systems
ASME B30.3(2009)	Construction Tower Cranes

ASME INTERNATIONAL (ASME)

ASME B30.22(2010)	Articulating Boom Cranes
ASME B30.5(2007)	Mobile and Locomotive Cranes

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10(2010)	Portable Fire Extinguishers
NFPA 241(2009)	Safeguarding Construction, Alteration, and Demolition Operations
NFPA 51B(2009)	Fire Prevention During Welding, Cutting, and Other Hot Work
NFPA 70(2012)	National Electrical Code
NFPA 70E(2010)	Electrical Safety in the Workplace

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1(2008)	Safety and Health Requirements

[including all changes located at http://140.194.76.129/publications/eng-manuals/, Dari Option available]

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 1919	Gear Certification
29 CFR 1926	Safety and Health Regulations for Construction
29 FR 1926.500	Fall Protection

1.3. SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION SUBMITTAL PROCEDURES FOR DESIGN-BUILD PROJECTS:

SD-01 Preconstruction Submittals

Submittal	Paragraph
Accident Prevention Plan (APP); G, District Safety Office	1.4
Activity Hazard Analysis (AHA); G, District Safety Office	1.11
Crane Critical Lift Plan; G, District Safety Office	1.11.1 (d)
Proof of qualification for Crane Operators; G, District Safety Office	1.8.1.3
Demolition Plan/Safe Clearance Procedures; G	1.18
Outage Request; G	3.7.1
Loading Plan for Cranes and Heavy Equipment.	3.14

SD-06 Test Reports

Reports: Submit reports as their incidence occurs, in accordance with the requirements of the paragraph entitled, "Reports."

Accident Reports; G	1.16.1
Monthly Exposure Reports; G	1.16.3

Crane Reports; G	1.16.4

SD-07 Certificates

Confined Space Entry Permit; FIO	1.8.1.2
Hot Work Permits; FIO	1.17

Submit one copy of each permit/certificate attached to each Daily Quality Control Report.

1.4. UNEXPLODED ORDINANCE (UXO)/MINES

The Contractor **IS NOT** responsible for the clearance or removal of mines and unexploded ordnance (UXO) from the site prior to the commencement of construction. The existing site has had numerous construction projects including underground utilities and foundations etc., and has been occupied and under security for an extended period of time. This site is therefore classified as "LOW PROBABILITY" for existence of UXO/Mines, but the contractor shall be aware that this site does not have demining certificates.

If a UXO/mine is encountered during project construction, the Contractor shall immediately stop work in the affected area, mark the area of the UXO/Mine and immediately notify the Contracting Officer, COR or the Government Construction Representative.

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

NOTE 1: For UXO/mine information, the following points of contact from the UN Mine Action Center of Afghanistan are provided:

Mohammad Sediq, Chief of Operations,
mohammad.sediq@macca.org.af
+93 (0)705 966 400 and +93 (0) 700 295 207
Mr. Mullah Jan
MACCA Senior Operations Manager
Mullah.jan@macca.org.af
+93 (0) 700 295 207

UXO Safety/ Mine clearance COR, USACE
tas.uxo-deminingsafety@usace.army.mil

Jeffrey Helmick USACE OESS/COR Mine Clearance AES
jeffrey.a.helmick2@usace.army.mil
Roshan: 079-403-1452
Comm: 540-723-6129

Before initiation of work at the job site, all Accident Prevention Plans, and any other safety related plans shall be submitted and reviewed by the TAS Safety Office.

1.5. DEFINITIONS

a. Competent Person for Fall Protection. A person who is capable of identifying hazardous or dangerous conditions in the personal fall arrest system or any component thereof, as well as their application and use with related equipment, and has the authority to take prompt corrective measures to eliminate the hazards of falling.

b. High Visibility Accident. Any mishap which may generate publicity and/or high visibility.

c. Medical Treatment. Treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even through provided by a physician or registered personnel.

d. Qualified Person for Fall Protection. A person with a recognized degree or professional certificate, extensive knowledge, training and experience in the field of fall protection who is capable of performing design, analysis, and evaluation of fall protection systems and equipment.

e. Recordable Injuries or Illnesses. Any work-related injury or illness that results in:

(1) Death, regardless of the time between the injury and death, or the length of the illness;

(2) Days away from work (any time lost after day of injury/illness onset);

(3) Restricted work;

(4) Transfer to another job;

(5) Medical treatment beyond first aid;

(6) Loss of consciousness; or

(7) A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (1) through (6) above.

f. "USACE" property and equipment specified in USACE EM 385-1-1 should be interpreted as Government property and equipment.

1.6. 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.

1.7. REGULATORY REQUIREMENTS

In addition to the detailed requirements included in the provisions of this contract, work performed shall comply with USACE EM 385-1-1.

1.8. SITE QUALIFICATIONS, DUTIES AND MEETINGS

1.8.1.Personnel Qualifications

1.8.1.1. Site Safety and Health Officer (SSHO)

Site Safety and Health Officer (SSHO) shall be provided at the work site at all times to perform safety and occupational health management, surveillance, inspections, and safety enforcement for the Contractor. The Contractor Quality Control (QC) person cannot be the SSHO on this project.

The SSHO shall meet the following requirements: Certification card for 30-hour OSHA construction safety class or equivalent (NCCCO or European) within the last 3 years. SSHO must be fluent in English and the local language for communication with the GDA. Competent person training as needed.

Site Safety and Health Officer (SSHO) shall meet the requirements of EM 385-1-1

1. The SSHO is also required to have five (5) years of construction industry safety experience or three (3) years if he/she possesses a Certified Safety Professional (CSP) or safety and health degree. (For complex or high hazard projects, the SSHO shall have a minimum of ten (10) years of safety-related work with at least five (5) years experience on similar type projects.

2. The SSHO(s), as a minimum, must have completed the 30-hour OSHA Construction safety class or as an equivalent, 30 hours of formal construction safety and health training covering the subjects of the OSHA 30-hour course (see Appendix A, paragraph 4.b. in EM385-1-1 applicable to the work to be performed and given by qualified instructors.

3. SSHOs shall maintain this competency through 24 hours of formal safety and health related coursework every four (4) years.

The SSHO shall have the following level of experience:

1. A minimum of 5 years safety work on similar projects.
2. 30-hour OSHA construction safety class or equivalent within the last 5 years.
3. An average of at least 24 hours of formal safety training each year for the past 5 years.
4. Competent person training as needed.

1.8.1.2. 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 Contractor to assess confined spaces and who possesses demonstrated knowledge, skill and ability to:

a. Identify the structure, location, and designation of confined space and permit-required confined spaces where work is done;

b. Calibrate and use testing equipment including but not limited to, oxygen indicators, combustible gas indicators, carbon monoxide indicators, and carbon dioxide indicators, and to interpret accurately the test results of that equipment;

c. Assess hazardous conditions including atmospheric hazards in confined space and adjacent spaces and specify the necessary protection and precautions to be taken;

d. Determine ventilation requirements for confined space entries and operations;

e. Assess hazards associated with hot work in confined and adjacent space and determine fire watch requirements; and,

f. Maintain records required.

1.8.1.3. Crane Operators

Crane operators shall meet the requirements in USACE EM 385-1-1, Section 16.B. (See Change 6 at http://140.194.76.129/publications/eng-manuals)

1.8.1.4. Divers

All divers shall meet the requirements of EM385-1-1 (2008) Section 30 and Appendix O. Failure to meet these requirements will be cause for rejection or cessation of operations.

1.8.2.Personnel Duties

1.8.2.1. Site Safety and Health Officer (SSHO)/Superintendent

a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Safety inspection logs shall be attached to the Contractors' daily quality control report.

b. Conduct mishap investigations and complete required reports. Maintain an accident/injury log such as the OSHA Form 300 or host nation equivalent, and Daily Production reports for prime and sub-contractors.

c. Be on site at all times while work is being performed.

d. Attend the pre-construction conference, pre-work meetings including preparatory inspection meeting, and periodic in-progress meetings.

e. Implement and enforce accepted APPS and AHAs.

f. Maintain a safety and health deficiency tracking system that monitors outstanding deficiencies until resolution. A list of unresolved safety and health deficiencies shall be posted on the safety bulletin board.

g. Ensure sub-contractor compliance with safety and health requirements.

Failure to perform the above duties will result in dismissal of the superintendent and/or SSHO, and a project work stoppage. The project work stoppage will remain in effect pending approval of a suitable replacement.

1.8.2.2. Competent person

A Competent Person shall be provided for all of the hazards identified in the Contractor's Safety and Health Program in accordance with the accepted Accident Prevention Plan, and shall be on-site at all times when the work that presents the hazards associated with their professional expertise is being performed. Provide the credentials of the Competent Persons(s) to the Contracting Officer for acceptance in consultation with the Safety Office.

1.9. MEETINGS

1.9.1.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.

1.9.2. 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.

1.10. TRAINING

1.10.1. 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.

1.10.2. 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.

1.10.3. Training on Activity Hazard Analysis (AHA)

Prior to beginning a new phase, training will be provided to all affected

1.11. 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. An TAS Minimum Basic Outline for Contractor APP Template is provided at the end of this section. Cover all paragraph and subparagraph elements in USACE EM 385-1-1, Appendix A, "Minimum Basic Outline for Accident Prevention Plan". Specific requirements for some of the APP elements are described below. The APP shall be job-specific and shall address any unusual or unique aspects of the project or activity for which it is written. The APP shall interface with the Contractor's overall safety and health program. Any portions of the Contractor's overall safety and health program referenced in the APP shall be included in the applicable APP element and made site-specific. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The APP shall be signed by the person and firm (senior person) preparing the APP, the Contractor, the on-site superintendent, the designated site safety and health officer.

In addition to following the requirements defined by EM 385-1-1, the Contractor shall submit for approval as part of the APP a DBA Insurance Plan describing how the following will be met including: (1) properly and promptly submit an injury claim within seven days of the incident, (2) provide Resident/Area Engineer with copies of submitted claim(3) gathering contact information of workers and their family, (4) follow-up on claim's status, (5) provided weekly claims report status to the Resident/Area Engineer,(6) providing prompt payment to an injured worker, or the family of a deceased worker, and (7) provide Resident/Area Engineer confirmation that payment has been provided from DBA insurance provider.

Submit the APP to the Contracting Officer 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP.

Once accepted by the Contracting Officer, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP will be cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified.

Once work begins, changes to the accepted APP shall be made with the knowledge and concurrence of the Contracting Officer, project superintendent, SSHO and quality control manager. Should any hazard become evident, stop work in the area, secure the area, and develop a plan to remove the hazard. Notify the Contracting Officer within 24 hours of discovery. In the interim, all necessary action shall be taken to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public, and the environment.

Copies of the accepted plan will be maintained at the Contracting Officer's office and at the job site.

The APP shall be continuously reviewed and amended, as necessary, throughout the life of the contract. Unusual or high-hazard activities not identified in the original APP shall be incorporated in the plan as they are discovered.

1.11.1. 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. Current competent person and safety training certificates shall be included in the Accident Prevention Plan (APP).

c. Confined Space Entry Plan. Develop a confined space entry plan in accordance with USACE EM 385-1-1, Section 34, and any other federal, state and local regulatory requirements identified in this contract. Identify the qualified person's name and qualifications, training, and experience. Delineate the qualified person's authority to direct work stoppage in the event of hazardous conditions. Include procedure for rescue by contractor personnel and the coordination with emergency responders. (If there is no confined space work, include a statement that no confined space work exists and none will be created.)

d. Crane Critical Lift Plan. Prepare and sign weight handling critical lift plans for lifts over 75 percent of the capacity of the crane or hoist (or lifts over 50 percent of the capacity of a barge mounted mobile crane's hoists) at any radius of lift; lifts involving more than one crane or hoist; lifts of personnel; and lifts involving non-routine rigging or operation, sensitive equipment, or unusual safety risks. The plan shall be submitted 15 calendar days prior to on-site work and include the requirements of USACE EM 385-1-1, paragraph 16.H. and the following:

(1) For lifts of personnel, the plan shall demonstrate compliance with the requirements of EM 385-1-1, Section 16.T.

(2) For barge mounted mobile cranes, barge stability calculations identifying barge list and trim based on anticipated loading; and load charts based on calculated list and trim shall be submitted for review. Limitations on list and trim for proposed marine plant equipment shall be verified by a registered Naval Architect.

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).

1.12. 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.

1.13. 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.

1.14. SITE SAFETY REFERENCE MATERIALS

Maintain safety-related references applicable to the project. Maintain applicable equipment manufacturer's manuals.

1.15. 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. EM385-1-1 03A03 requires that the level of available medical treatment be progressive with the number of personnel comprising the work population (including security personnel).

1.16. REPORTS

1.16.1. 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.

1.16.2. Accident Notification

Notify the Contracting Officer as soon as practical, but not later than eight hours, after any accident meeting the definition of Recordable Injuries or Illnesses or High Visibility Accidents, property damage equal to or greater than $2,000. Information shall include contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (to include type of construction equipment used, PPE used, etc.). For all accidents involving a fatality, permanent total disability, hospitalization of three or more persons, or property damage of $500,000 or more, the Contractor shall promptly suspend all operations at the scene of the accident and notify the Resident Engineer of the occurrence.

The Contractor shall immediately provide for the rescue and/or care of the injured. Except in situations where safety may be compromised, access to the area shall be restricted and the scene left undisturbed until investigated by a Government appointed board of investigation and until the Contractor is authorized to resume operations.

1.16.3. 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.

1.16.4. Crane Reports

Submit crane inspection reports required in accordance with USACE EM 385-1-1, Appendix I and as specified herein with Daily Reports of Inspections.

1.17. 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 Site Safety and Health Officer. 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.

1.18. SAFE CLEARANCE PROCEDURE PLAN

Prior to any on-site demolition, dis-assembly, or interruption of service for any system components generating hazardous energy, a plan defining safe clearance procedures for lock-out/tag-out shall be submitted for review and acceptance by the Government.

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.13 of EM 385-1-1.

The Contractor shall require subcontractors to submit their plan of operations showing methods they propose to use in accomplishing major phases of work.

The Contractor shall be prepared to discuss the plans in conferences convened by the Contracting Officer prior to starting work on each major phase of operation. Plans shall include all pertinent information such as layout of haul roads, access roads, storage areas, electrical distribution lines, methods of providing minimum exposure to overhead loads, and methods of access to work areas. The plan for accomplishing the initial work phase shall be submitted within 15 calendar days after award of the contract. Plans for subsequent major phases of work shall be submitted not later than 15 calendar days prior to initiation of work on each major phase.

All areas where construction, demolition, alteration, building, or similarly related activities take place, all workers shall have the following minimum personal protective clothing and equipment:

1. Short sleeve shirt.
2. Long trousers.
3. Safety-toed safety boots.
4. Hard hat.
5. Eye protection

Eye and face protection equipment shall meet the requirements of ANSI/ American Society of Safety Engineers (ASSE) Z87.1, and bear a legible and permanent "Z87" logo to indicate compliance with the standard. Eye and face protection equipment shall be distinctly marked to facilitate identification of the manufacturer and provides side protection.

Persons involved in activities that subject the hands to injury (for example, cuts, abrasions, punctures, burns, chemical irritants, toxins, vibration, and forces that can restrict blood flow) shall select and use hand protection appropriate for the hazard in accordance with ANSI/International Safety Equipment Association (ISEA) 105.

Protective equipment shall be of heat, fire, chemical, and/or electrical-resistive material when conditions require protection against such hazards.

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-isocynates, lead-based paint are prohibited. The Contracting Officer, upon written request by the Contractor, may consider exceptions to the use of any of the above excluded materials.

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.B.

3.2.2.Fall Protection Equipment

The Contractor shall enforce use of the fall protection equipment designated for each specific work activity in the Fall Protection and Prevention Plan and/or AHA at all times when an employee is on a surface1.8 m(6 feet) or more above lower levels. Fall protection systems such as guardrails, personnel fall arrest system, safety nets, etc., are required when working within 1.8m (6 feet) of any leading edge. Personal fall arrest systems are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition, Elevating Work Platforms/Scissors Lifts: Scissors lifts shall be equipped with standard guardrails. In addition to the guardrail provided, if the scissor lift is equipped with a manufactured anchorage, a restraint system shall be used in addition to guardrails. Lanyards used with the restraint system shall be sufficiently short to prohibit workers from climbing out of, or being ejected from, the platform.

3.2.3.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.

3.2.4.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.

3.2.5.Existing Anchorage

Existing anchorages, to be used for attachment of personal fall arrest equipment, shall be certified (or re-certified) by a qualified person for fall protection in accordance with ANSI Z359.1 or European Union equivalent. Exiting horizontal lifeline anchorages shall be certified (or re-certified) by a registered professional engineer with experience in designing horizontal lifeline systems.

3.2.6.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.

3.2.7.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.

3.2.8.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. All excavations shall conform with the requirements of Section 25 of EM 385-1-1.

The competent person for excavations performed as a result of contract work shall be on-site when excavation work is being performed, and shall inspect the excavation, the adjacent areas, and protective systems daily; before each work shift; throughout the work shifts as dictated by the work being done; after every rainstorm; after other events that could increase hazards, e.g., snowstorm, windstorm, thaw, earthquake, etc.; when fissures, tension cracks, sloughing, undercutting, water seepage, bulging at the bottom or other similar conditions occur; when there is a change in size, location or placement of the spoil pile; and where there is any indication or change in adjacent structures. The competent person shall be able to demonstrate the following: training, experience, and knowledge of, soil analysis, use of protective systems; and requirements of EM 385-1-1 and 29 CFR 1926 Subpart P. They also need the ability to detect conditions that could result in cave-ins, failures in protective systems, hazardous atmospheres, and other hazards including those associated with confined spaces. They shall have the authority to take prompt corrective measures to eliminate existing and predictable hazards and stop work when required.

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. Manufacture tabulated data and specifications or registered engineer tabulated data for shoring or benching systems shall be readily available on-site for review. Job-made shoring or shielding shall have the registered professional engineer stamp, specifications, and tabulated data. Extreme care must be used when excavating near direct burial electric underground cables.

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. Energized work may never be performed without prior authorization. An energized work permit shall be submitted to GDA for acceptance in acceptance in accordance with 385-1-1, Section 11.A02.c. When racking in or live switching of circuit breakers, no additional person other than the switch operator will be allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method. When working in energized substations, only qualified electrical workers shall be permitted to enter. When work requires Contractor to work near energized circuits as defined by the NFPA 70, high voltage personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves with leather protective sleeves, fire retarding shirts, coveralls, face shields, and safety glasses. In addition, provide electrical arc flash protection for personnel as required by NFPA 70E. Insulating blankets, hearing protection, and switching suits may also be required, depending on the specific job and as delineated in the Contractor's AHA.

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 34 of USACE EM 385-1-1. Any potential for a hazard in the confined space requires a permit system to be used.

a. Entry Procedures. Prohibit entry into a confined space by personnel for any purpose, including hot work, until the qualified person has conducted appropriate tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. All hazards pertaining to the space shall be reviewed with each employee during review of the AHA.

b. Forced air ventilation is required for all confined space entry operations and the minimum air exchange requirements must be maintained to ensure exposure to any hazardous atmosphere is kept below its' action level. Ventilation shall conform with the requirements of Section 06.G of 385-1-1.

c. Additional detailed requirements for ventilation in the valve room of the tunnel are provided in Section 010150 TECHNICAL REQUIRMENTS.

d. Ensure the use of rescue and retrieval devices in confined spaces greater than 1.5 m (5 feet) in depth. Conform to Section 34 of USACE EM 385-1-1.

e. Sewer wet wells require continuous atmosphere monitoring with audible alarm for toxic gas detection.

f. Include training information for employees who will be involved as entrants and attendants for the work. Conform to Section 34 of USACE EM 385-1-1.

g. 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 06.H. The Contractor shall develop and implement effective exposure control and elimination procedures to include dust control systems, engineering controls, and establishment of work area boundaries, as well as medical surveillance, training, air monitoring, and personal protective equipment.

3.10. DEMOLITION

3.10.1. Demolition Plan

The Contractor shall submit a written demolition plan for all demolition work to be carried on the site. In addition, the demolition plan shall be signed by a Professional Registered Engineer and meet the requirements of the Corps of Engineers Safety and Health Manual, EM 385-1-1, section 23. The demolition plan shall be submitted to the COR at least 1 week before the beginning of the work, including structural calculations for the demolition, if necessary. The demolition work shall not begin before the Contractor has received a written approval from the COR.

3.10.2. Protection of Personnel

During the demolition work the Contractor shall continuously evaluate the condition of the structure being demolished and take immediate action to protect all personnel working in and around the demolition site. No area, section, or component of floors, roofs, walls, columns, pilasters, or other structural element will be allowed to be left standing without sufficient bracing, shoring, or lateral support to prevent collapse or failure while workers remove debris or perform other work in the immediate area.

3.10.3. Protection of Structures

Floors, roofs, walls, columns, pilasters, and other structural components that are designed and constructed to stand without lateral support or shoring, and are determined to be in stable condition, shall remain standing without additional bracing, shoring, or lateral support until demolished, unless directed otherwise by the COR. The Contractor shall ensure that no elements determined to be unstable are left unsupported and shall be responsible for placing and securing bracing, shoring, or lateral supports as may be required as a result of any cutting, removal, or demolition work performed under this contract.

Interior concrete or masonry walls shall be demolished from the top down unless a Registered Engineer can demonstrate that an alternate method poses no additional safety hazards.

3.11. DIVE OPERATIONS

All dive operations shall meet be performed in accordance with EM385-1-1 (2008), specifically Section 30 and Appendix O. Failure to meet these requirements shall be cause for rejection or cessation of operations. The Contractor shall submit a dive operations plan identifying the crew structure, limitations and scope of dive operations, equipment to be used, periods of exposure, and emergency evacuation procedures.

3.12. BARGE OPERATIONS

All barge or water operations shall be performed in accordance with EM385-1-1 (2008), specifically Section 19 and Section 16.L.

3.13. HELICOPTER OPERATIONS

All helicopter operations shall be performed in accordance with EM385-1-1 (2008), specifically Section 19 and Section 16.P.

3.14. CRANE OPERATIONS

All heavy lift operations regardless of the type of crane or mount shall be described in a Loading Plan for Cranes and Heavy Equipment. For example, helicopter or barge operations may be required for work on the tower and that work must be coordinated with other operations and the information provided to the SSHO and the Government for situational awareness and safety. Further, the tunnel works will require crane operations to lift bulk heads, remove jet valves, and service to interior of the tunnel located below the accessible roadway. The Loading Plan for Cranes and Heavy Equipment must be provided at least 14 days prior to the lift.

3.15. HOUSEKEEPING

3.15.1. Clean-Up

The Contractor shall be responsible for cleaning up. The Contractor shall require his personnel to keep the immediate work site clean of all dirt and debris resulting from work under this contract. Accumulated dirt and debris shall be hauled off and disposed of in accordance with local law and at least once a week by the Contractor. Additionally, all debris in work areas shall be cleaned up daily or more frequently if necessary. Construction debris may be temporarily located in an approved location; however garbage accumulation must be removed each day.

Stairwells used by the Contractor during execution of work shall be cleaned daily. Cloths, mops, and brushes containing combustible materials shall be disposed of or stored outside of the buildings in tight covered metal containers. Paints and thinners shall not be poured into inlets of the interior or exterior sewage system. Paint, stains, and other residues on adjacent surfaces or fixtures caused by the Contractor shall be carefully removed and cleaned to original finish. Upon completion of the work, the Contractor shall remove all construction equipment, materials and debris resulting from the work. The entire work site and the area used by Contractor personnel shall be left clean.

-- END OF SECTION --

SECTION 01 35 50
ENVIRONMENTAL PROTECTION

1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ISLAMIC REPUBLIC OF AFGHANISTAN

Official Gazette No. 912 Environmental Law (2007)

U.S. DEPARTMENT OF DEFENSE (DoD)

DoD 4715.05-G Overseas Environmental Baseline Guidance Document (OEBGD) (2007)

U.S. ARMY (DA)

AR 200-1 Environmental Protection and Enhancement (2007)

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 Safety and Health Requirements Manual (2009)

Contract Clause: 52.236-12 "Cleaning Up".

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.

Items	Paragraph
Environmental Protection Plan	1.7

1.3 DEFINITIONS

1.3.1 Environmental Pollution

The condition resulting from the presence of chemical, mineral, radioactive, or biological substances that:

a. Alter the natural environment.

b. Adversely affect human health or the quality of life, biosystems, the environment, in structures and equipment, recreational opportunities, aesthetics, and/or natural beauty.

1.3.2 Environmental Protection

Environmental protection is the prevention/control of pollution.

1.3.3 Hazardous Material (HM)

A hazardous material is a useful product that requires special management because it has hazardous characteristics (ignitability, corrosivity, reactivity, or toxicity) that could pose dangers to human health or the environment. A HM becomes a Hazardous Waste when it can no longer be used for its intended purpose.

1.3.4 Hazardous Waste (HW)

A hazardous waste is a discarded material with hazardous characteristics that could pose dangers to human health or the environment.

1.3.5 Contractor Generated Hazardous Waste

Hazardous wastes generated or discarded by the Contractor. This includes materials not fully consumed during the course of construction - for example, paint thinners (i.e. methyl ethyl ketone, toluene etc.), waste thinners, excess paints, excess solvents, waste solvents, and fuel/oils/lubricants.

1.4 GENERAL REQUIREMENTS

The Contractor shall minimize environmental pollution and damage that may occur as the result of construction operations. The Contractor shall be responsible for delays resulting from failure to comply with environmental laws and regulations.

1.5 SUBCONTRACTORS

The Contractor shall ensure compliance with this section by all subcontractors, suppliers, and vendors.

1.6 LAWS AND REGULATIONS

The Contractor shall comply with all applicable Afghanistan environmental, natural and cultural resources, and historic preservation laws and regulations.

1.7 ENVIRONMENTAL PROTECTION PLAN

The Contractor shall submit an Environmental Protection Plan as part of the 35% design submittal for review and approval by the Contracting Officer. The purpose of the Environmental Protection Plan is to present an overview of known or potential environmental (natural and cultural) issues which the Contractor must address during construction. The Environmental Protection Plan shall be current and maintained onsite by the Contractor. The Environmental Protection Plan shall, at a minimum, contain the following:

1.7.1 Contents

The environmental protection plan shall include, but shall not be limited to, the following:

1. Name(s) of the on-site Environmental Manager who is responsible for ensuring adherence to the Environmental Protection Plan and monitoring and documenting environmental procedures.
2. An erosion and sediment control plan which identifies the type and location of the erosion and sediment controls to be provided. The plan shall include monitoring and reporting requirements to assure that the control measures are effective.
3. Work area plan showing the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas including methods for protection of features to be preserved within authorized work areas.
4. Spill Control plan shall include the procedures, instructions, and reports to be used in the event of an unforeseen spill of a hazardous material. This plan shall include as a minimum:
    a. The name of the individual who will immediately notify the Contracting Officer and report any spills or hazardous substance releases. The plan shall contain a list of the required reporting channels and telephone numbers.
    b. A list of materials and equipment contained in the job site spill kit (see Appendix for minimum requirements).
    c. The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency.
    d. The methods and procedures to be used for expeditious contaminant cleanup.
5. An air pollution control plan detailing how trash is disposed of without debris burning.
6. A non-hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
7. A contaminant prevention plan that identifies potentially hazardous substances to be used on the job site and identifies the intended actions to prevent introduction of such materials into the air, water, or ground. As new hazardous materials are brought on site or removed from the site, the plan shall be updated.
8. A hazardous waste plan that identifies potentially hazardous waste that may be generated by the project.
9. A waste water management plan that identifies the methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities.

10. A plan that defines procedures for identifying and protecting historical, archaeological, cultural resources known to be on the project site. The plan shall identify lines of communication between Contractor personnel and the Contracting Officer.

1.7.2 Unidentified issues

During Construction, the Contractor shall be responsible for identifying, implementing, and submitting, for approval, any additional requirements to be included in the Environmental Protection Plan.

1.8 PROTECTION FEATURES

The Contractor shall prepare a brief report including a plan describing the features requiring protection under the provisions of the Contract Clauses. This survey report shall be signed by both the Contractor and the Contracting Officer upon mutual agreement as to its accuracy and completeness.

1.9 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Any deviations, requested by the Contractor, from the drawings, plans and specifications which may have an environmental impact will be subject to approval by the Contracting Officer.

1.10 NOTIFICATION

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with elements of the Contractor's Environmental Protection plan. Upon notification or discovery of noncompliance, the Contractor shall propose corrective action to the COR and take such action when approved by the COR. The Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions shall be granted or equitable adjustments allowed to the Contractor for any such suspensions.

2 PRODUCTS

Not used.

3 EXECUTION

3.1 ENVIRONMENTAL PERMITS AND COMMITMENTS

The Contractor shall be responsible for obtaining and complying with all permits and commitments required by Afghanistan environmental, natural and cultural resources, and historic preservation laws and regulations.

3.2 LAND RESOURCES

The Contractor shall confine all activities to areas defined by the drawings and specifications. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. The Contractor shall provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs. Stone, soil, or other materials displaced into uncleared areas shall be removed by the Contractor.

3.2.1 Work Area Limits

Prior to commencing construction activities, the Contractor shall mark the areas that need not be disturbed under this contract. Where construction operations are to be conducted during darkness, any markers shall be visible in the dark. The Contractor's personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.

3.2.2 Landscape

Features indicated to be preserved shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques. The Contractor shall restore landscape features damaged or destroyed during construction operations outside the limits of the approved work area.

3.2.3 Erosion and Sediment Controls

The Contractor shall be responsible for providing erosion and sediment control measures. The COR shall approve erosion and sediment controls prior to installation. Any temporary measures shall be removed after the area has been stabilized.

3.2.4 Contractor Facilities and Work Areas

The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas designated on the drawings or as directed by the Contracting Officer. Temporary movement or relocation of Contractor facilities shall be made only when approved. Erosion and sediment controls shall be provided for on-site borrow and spoil areas to prevent sediment from entering nearby waters. Temporary excavation and embankments for plant and/or work areas shall be controlled to protect adjacent areas.

3.2.5 Tree Protection

All costs associated with tree protection requirements required by specifications and drawings are the full responsibility of the Contractor. The Contractor shall exercise care when excavating trenches in the vicinity of trees.

3.3 WATER RESOURCES

The Contractor shall monitor construction activities to prevent pollution of surface and ground waters. Toxic or hazardous chemicals shall not be applied to soil or vegetation unless otherwise indicated. All water areas affected by construction activities shall be monitored by the Contractor.

3.3.1 Cofferdams, Diversions, and Dewatering Operations

Construction operations surface waters shall be controlled at all times to maintain compliance with designated uses of the surface water body.

3.3.2 Stream Crossings

Constructed stream crossings (wet or dry) shall not block the natural flow of water when present.

3.4 AIR RESOURCES

3.4.1 Burning

All areas within facility perimeter fence line are designated as no burn areas.

3.5 CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL

3.5.1 Chemicals and Chemical Wastes

Chemicals shall not be spilled on the ground or water. Dispensing areas shall be clean and not subject to repetitive spills. Corrective action shall be quickly performed and documented. This documentation will be periodically reviewed by the Government. Chemical waste shall be collected in corrosion resistant, compatible containers. Wastes shall be classified, managed, stored, and disposed at an appropriate disposal site.

3.5.2 Contractor Hazardous Material / Generated Hazardous Wastes / Excess Hazardous Materials

The Contractor shall be responsible for storage, describing, packaging, labeling, and marking hazardous waste and hazardous material. The Contractor shall manage and store hazardous material and waste in a designated area designed to segregate and prevent mixing of incompatible chemicals. The area will be dry, securable and have warning signs appropriate for the wastes being accumulated. Facilities or areas shall provide adequate ventilation, containment, and protection from the elements. Contractor vehicles are not considered a proper storage facility. No HM or HW shall be stored in vehicles overnight or for any length of time. The Spills of hazardous or toxic materials shall be immediately reported to the Contracting Officer. Cleanup and cleanup costs due to spills shall be the Contractor's responsibility.

3.5.3 Fuel and Lubricants

Equipment and motor vehicle fueling, lubrication and storage shall be conducted on containment surfaces to minimize spills evaporation.

3.5.4 Waste Water

Disposal of waste water shall be as specified below.

a. Waste water from construction activities shall not be discharged prior to being treated to remove pollutants. The Contractor shall dispose of the construction related waste water off site, unless on-site disposal is approved by the Contracting Officers Representative.
b. Water generated from the flushing of lines after decontamination or decontamination in conjunction with hydrostatic testing or only hydrostatic testing shall be discharged into areas where the liquids will percolate into the ground.

3.6 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

If during construction activities any historical, archaeological, and cultural resources are discovered or found, all activities that may damage or alter such resources shall be temporarily suspended. Resources include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, the Contractor shall immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. The Contractor shall secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

3.7 BIOLOGICAL RESOURCES

The Contractor shall minimize interference with, disturbance to, and damage to fish, wildlife, and plants including their habitat. The Contractor shall protect animal and plant species including their habitat in accordance with Afghanistan regulations.

3.8 MAINTENANCE OF POLLUTION CONTROL

The Contractor shall maintain permanent and temporary pollution control facilities and devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

3.9 POST CONSTRUCTION CLEANUP

The Contractor shall clean up all areas used for construction in accordance with Contract Clause 52.236-12 "CLEANING UP". The Contractor shall, unless otherwise instructed in writing by the Contracting Officer, obliterate all signs of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. The disturbed area shall be graded, filled and the entire area restored to its original condition.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 01 – GENERAL REQUIREMENTS

SECTION 01 40 00

SECURITY

PART 1 GENERAL....3

1.1 RELATED SECTIONS....3

1.2 SUBMITTALS....3

1.3 SPECIFIC CONTRACT SECURITY ASSESSMENT....3

1.4 GOVERNMENT PREREQUISITES TO CONTRACTOR DEPLOYMENT OF SITE SECURITY PERSONNEL....3

1.5 GOVERNMENT REPRESENTATIVES....4

1.6 SECUIRTY COORDINATION....4

1.7 SECURITY PLAN....4

1.8 SECURITY RATING....4

1.9 SITE SECURITY FOR PROJECTS OUTSIDE OF ACTIVE COALITION FORCE BASES....4

1.10 ESTIMATED THREAT ASSESSMENT....5

1.11 ADDITIONAL CIVILIAN ARMING requirements....5

1.12 SECUIRTY PLAN SUBMITTAL REQUIREMENTS....5

1.13 COMMUNICATION....5

1.14 CONTRACTOR PROVIDED EQUIPMENT....6

1.15 KEY CONTROL....6

1.16 CRITICAL INFORMATION TO REPORT....6

PART 2 PRODUCTS....6

PART 3 EXECUTION....6

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 01 40 00
SECURITY

PART 1 GENERAL

1.1 RELATED SECTIONS

SECTION 01 33 15 SUBMITTAL PROCEDURES FOR DESIGN-BUILD PROJECTS

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 SECTION 01 33 15 SUBMITTAL PROCEDURES FOR DESIGN-BUILD PROJECTS:

Section	Paragraph
Security Plan	1.11

1.3 SPECIFIC CONTRACT SECURITY ASSESSMENT

The Contractor shall construct the Project in an active war zone where International Security Assistance Forces (ISAF) may conduct offensive and defensive operations against a variety of hostile forces, to include members of the Taliban. The Contractor understands that it may not receive any support whatsoever in securing the Project site and in securing the transportation of materials to the Project site. Neither U.S. Government nor other ISAF forces are available to provide exclusive security for the Project. The Contractor is responsible for securing the Project site and in securing the transportation of materials to the Project site. The Contracting Officer possesses no ability to control the operations of either ISAF or hostile forces. The Government, acting in its sovereign capacity in its prosecution of its operations, may take actions which directly or indirectly affect the Contractor. These kinds of acts are general in application, not specifically directed at the Contractor. The Contractor recognizes that such actions may be taken, and that they will not entitle the Contractor to make claims for excusable or compensable delays. The Contractor possesses sufficient information about the specific security situation at the site to enable it to formulate an appropriate security plan. The Contractor understands that the security situation at the Project is subject to significant transformation in a short time span based on the changing operational picture in the region. The Contractor's security plan will take this factor into account.

1.4 GOVERNMENT PREREQUISITES TO CONTRACTOR DEPLOYMENT OF SITE SECURITY PERSONNEL

The following regulations and policies apply to Contractor Provided Site Security Personnel:

a. DODI 3020.41; **Contractor Personnel Authorized to Accompany the U.S. Armed Forces**; 3 OCT 2005 (available at www.dtic.mil/whs/directives/corres/pdf/302041p.pdf).

b. DODI 3020.50; **Private Security Contractors (PSCs) Operating in Contingency Operations**; 22 JUL 2009 (available at www.dtic.mil/whs/directives/corres/pdf/302050p.pdf).

c. USCENTCOM Contracting Command, **Acquisition Instruction**; 5 NOV 2010 (available at http://c3-training.net/policy.html).

d. DFARS Subpart 225.74, Defense Contractors Outside the United States.

The Contractor understands its responsibilities under these regulations, policies, and standard contract clauses, as well as its responsibilities under Afghan law, with regard to its contracts for and employment of security personnel.

The Contractor is not authorized to deploy any site security personnel until it complies with all prerequisites identified in these references. The Contractor acknowledges that its repeated failure to comply with these regulations, policies, and standard contract clauses constitute grounds for the Government to terminate the Contractor for default.

1.5 GOVERNMENT REPRESENTATIVES

During the Project, USACE may disseminate essential security information to the Contractor and will attempt to assist with any Contractor's questions and concerns. The USACE Area Office OIC/NCOIC will serve as the Area Office Security Officer and the Resident Office OIC/NCOIC will serve as the Resident Office Security Officer (collectively "the Security Officers").

1.6 SECURITY COORDINATION

Contractor will be required to coordinate construction site security with any Afghan or Coalition Forces and Local Governments that are available, if any, to assist the Contractor on a case-by-case basis. Coordination does **not** include nor imply making any unauthorized or illegal payments to the local ANA/ANP or Local/Provincial Government Officials for permission or protection to construct the project. The Contractor will immediately inform the Government if asked to make any such payments, and the Government will provide further direction to the Contractor. Corruption will not be tolerated at any level, under any circumstances. Conducting business in this manner will be grounds for termination of the contract.

1.7 SECURITY PLAN

The Security Officers will review and approve all current and future Contractor security plans prior to submittal approval by the authorized representative of the Contracting Officer. The Security Officers shall ensure that all Contractor security plans are in accordance with the Contract requirements. The security plans shall address movement of Contractor labor, material, and equipment. The Security Officers will lead the quality assurance program to ensure Contractors are executing their approved security plans. The Government will not allow the Contractor to start work on the Project site without an approved security plan.

1.8 SECURITY RATING

Each contract or task order will be assigned a rating by the Area Office Security Officer. This rating will determine the level of approval for the security plan. Assistance from the District's J2/J3 may be required to assess the rating. Ratings and approval levels are below:

a. Extremely High Risk: District Commander
b. High Risk: Deputy CDR, Chief of E&C, Area OIC, J2 OIC, or J3 OIC
c. Moderate Risk: Chief of Construction, Area OIC/NCOIC, or Area Engineer
d. Low Risk: Resident OIC/NCIOC, Resident Engineer

The rating assigned is in no way an indication that the security situation at the site will remain at a constant level throughout the Project.

1.9 SITE SECURITY FOR PROJECTS OUTSIDE OF ACTIVE COALITION FORCE BASES

The Contractor shall develop a site security plan and program to provide 24 hr/7 days a week security for the Project throughout its performance. The security plan must consider all construction-related sites; batch plants, material sources, stockpiles, worker camps and any other location where there is a major construction effort. The plan must also address security as it relates to the transportation of materials, equipment, personnel, and other items and individuals to the site. The Contractor is expected to perform all required actions to protect the construction site compound from theft and vandalism and personnel from physical harm. These measures are strictly for the protection and defense of the on-site people and property; Contractors are not authorized to conduct any type of

offensive operations. For security of road construction, transportation of supplies, and equipment convoys, see the appropriate section below.

1.10 ESTIMATED THREAT ASSESSMENT

The Contractor shall develop a site security plan to cover a range of security operations from low to high threat. Included in this security plan shall be the capability for a surge of manpower and equipment required during high threat conditions. The Contractor shall notify all on-site personnel of increased threats and protective action to take.

1.11 ADDITIONAL CIVILIAN ARMING REQUIREMENTS

The Contractor shall include in its security plan, and must continue to maintain throughout the Project, current information on the following items for all its armed civilian personnel:

a. MOI license number,
b. AISA license,
c. Armed Contractor & subcontractor company names,
d. Contract number/title,
e. Contracting agency (USACE-AES),
f. Type of work,
g. Number/type of weapons authorized,
h. POC for company with contact details,
i. Government Contracting Officer and COR with contact details,
j. Number of security personnel by type (U.S., Afghan, Other),
k. Company's country of registration/origin, names,
l. Photos
m. Tazkira numbers of security personnel as well as those personnel with access to weapons/ammo and those persons who will be handling or transporting explosives

In addition the Contractor shall immediately update any change to the coordinates of the Contractor's base camps, quarries, and current work locations. The Contractor shall submit, prior to the commencement of construction, a plan for security protection, with a list of the chain of command. Perimeter security shall prevent unauthorized site access and provide safety protection to the Contractor workforce and government personnel for the duration of the project

1.12 SECURITY PLAN SUBMITTAL REQUIREMENTS

Contractors will submit all security plans in accordance with contract Section 01 33 15 – Submittal Procedures.

1.13 COMMUNICATION

The Contractor shall operate a 24/7 security operations center with communication capability to each guard on duty and the ability to notify all on-site personnel of increased threats and protective actions to take. The operations center shall also have 24/7 communication with the local Coalition, ANA, or ANP security forces. The Contractor shall have communication with the Resident Office Security Officer at all times for rapid emergency response; the Resident Office Security Officer will give the Contractor the District J2/J3 contact information. Communication can be via cell phone, email, satellite phones, VHF, HF, CODAN, text, or other communication technologies compatible with the Government's capabilities. The Contractor will provide the Government with their contact information (names, numbers, frequencies, email addresses, transponder IDs, etc.) for the site encompassing all available communication means.

1.14 CONTRACTOR PROVIDED EQUIPMENT

The Contractor will provide the operational security equipment including but not limited to weapons, radios, uniforms, vehicles, vehicle fuel, phones, and other equipment as proposed by the Contractor to provide complete site security.

1.15 KEY CONTROL

The Contractor shall establish and implement methods in writing to ensure that all keys issued by the Contractor are not lost or misplaced and are not used by unauthorized persons. The Contractor shall develop procedures covering key control that will be included in their quality control system (See Section 01 45 10). The project managers will keep a master log of all keys and provide a copy to the contracting officer's representative (COR) for verification. If a key is lost or stolen, the Contractor shall pay to have all impacted locks changed/rekeyed immediately.

1.16 CRITICAL INFORMATION TO REPORT

The Government is responsible for the management and oversight of DOD Contracted AC/PSCs delivering services throughout Afghanistan. Given the impact of either Contractor misbehavior or catastrophic attacks against Contractors, it is critical that information regarding AC/PSC incidents is communicated quickly and accurately to the Government for purposes of management, fact-finding, and mitigation where necessary. The Government must receive the information addressed below. The Contractor shall report any of these information requirements immediately to the Resident Office Security Officer:

a. AC/PSC Escalation of Force to include the use of weapons resulting in the death or injury of an Afghan citizen, coalition, or U.S. service member, other government official, or Contractor
b. AC/PSC accidents, traffic, or otherwise, resulting in the death or injury of an Afghan citizen, coalition, or U.S. service member, governmental official, or Contractor.
c. Attacks against AC/PSC activities by Anti-Afghan Forces resulting in the death or injury of an Afghan citizen, coalition or US service member, governmental official, or Contractor.
d. Reports of "lost convoys." These are AC/PSC escort or independent activities which have lost contact with their companies.
e. AC/PSC Escalation of Force, accidents, or other activities that result in significant damage to Afghan or USG vehicles, materials or facilities.
f. Anti-Afghan Force actions including small arms fires (SAF), RPG fire, indirect fire (IDF), improvised explosive devices (IEDs), and/or complex attacks against AC/PSC activities.
Contractor accidental or negligent discharge of a weapon.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

--End of Section--

SECTION TABLE OF CONTENTS

DIVISION 01 – GENERAL REQUIREMENTS

SECTION 01 41 50

METRIC MEASUREMENTS

PART 1 GENERAL 1
1.1. REFERENCES 1
1.2. GENERAL 1
1.3. USE OF MEASUREMENTS IN SPECIFICATIONS 1
1.3.1. Hard Metric 1
1.3.2. Soft Metric 1
1.3.3. Neutral 2
1.4. COORDINATION 2
1.5. RELATIONSHIP TO SUBMITTALS 2
PART 2 PRODUCTS 2
PART 3 EXECUTION 2

SECTION 01 41 50

METRIC MEASUREMENTS

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 in the text by basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM E 621	(1994e1; R 1999) Use of Metric (SI) Units in Building Design and Construction (Committee E-6 Supplement to E380)
IEEE/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 expressed as a soft metric, unless 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 IEEE/ASTM SI 10 and ASTM E 621 as the basis for establishing metric measurements required to be used in submittals.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

– END OF SECTION –

SECTION 01 45 00

CONTRACTOR QUALITY CONTROL

PART 1. GENERAL

1.1 RELATED SECTIONS

Section 01 45 00.10 QUALITY CONTROL SYSTEM

Section 01 33 15 SUBMITTAL PROCEDURES FOR DESIGN-BUILD PROJECTS

Section 01 33 16 DESIGN BUILD AFTER AWARD

SPECIAL CONTRACT REQUIREMENTS

1.2 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

1.3 SUBMITALS

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 information shall be submitted to the Contracting Officer in accordance with the provisions of Section 01 33 15 SUBMITTAL PROCEDURES FOR DESIGN-BUILD PROJECTS or Section 01 33 16 DESIGN BUILD AFTER AWARD.

Items	Paragraph
Contractor Quality Control (CQC) Plan; G (Including CQM Course Certificate)	2.3
Design Quality Control (DQC) Plan; G	2.3.2

1.4 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

2.1 GENERAL REQUIREMENTS

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clauses and this specification section. The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all design and construction operations, both onsite and offsite, and shall be keyed to the proposed construction sequence. The site project superintendent will be held responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the contract. The site project superintendent in this context shall be the highest level manager responsible for the overall construction activities at the site, including quality and production. The site project superintendent shall maintain a physical presence at the site at all times, except as otherwise acceptable to the Contracting Officer, and shall be responsible for all construction and construction related activities at the site.

2.2 CQM TRAINING REQUIREMENT

Before project design and construction begin, the Contractor's Quality Control Manager is required to have completed the U.S. Army Corps of Engineers (USACE) Construction Quality Management (CQM) course, or equivalent. The CQM course will be offered periodically by the Afghanistan Engineer District (AED), USACE. Additional approved CQM courses include those offered by the Commercial Technical Training Center (in Jalalabad) and the Champion Technical Training Center (in Kabul). The Quality Assurance Branch of the AED can provide information related to AED offerings of the CQM course, as well as contact information for training centers. Alternative CQM courses, other than those mentioned above, must be approved by the Quality Assurance Branch.

The contractor's quality control plan, must include "The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function." For the QC Manager, qualifications must include a certificate demonstrating completion of an approved CQM course.

2.3 CONTRACTOR QUALITY CONTROL (CQC) PLAN

The Contractor shall submit for review by the Government, not later than five (5) days after receipt of Notice-to-Proceed (NTP) the proposed Contractor Quality Control (CQC) Plan. The plan shall identify personnel, procedures, control, instructions, records, and forms to be used.

2.3.1 Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all design and 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 Section 01335 SUBMITTAL PROCEDURES FOR DESIGN-BUILD PROJECTS.

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 design and 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 feature under a particular section. This list will be agreed upon during the coordination meeting.

2.3.2 Additional Requirements for Design Quality Control (DQC) Plan

The following additional requirements apply to the Design Quality Control (DQC) plan:

(1) The Contractor shall develop,submit for review, and maintain a Design Quality Control (DQC) Plan as an effective means to implement his quality control program to 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.

2.3.3 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes in the CQC plan and operations including removal of personnel, as necessary, to obtain the quality specified.

2.3.4 Notification of Changes

After acceptance of the CQC plan, the Contractor shall notify the Contracting Officer in writing a minimum of seven calendar days prior to any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

2.4 COORDINATION MEETING

After the Pre-construction Conference, before start of construction, and prior to acceptance by the Government of the CQC Plan, the Contractor shall meet with the Contracting Officer or Authorized Representative and discuss the Contractor's quality control system. The CQC Plan shall be submitted for review a minimum of 5 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both on-site and off-site work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting shall be prepared by the Government and signed by both the Contractor and the Contracting Officer. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures, which may require corrective action by the Contractor.

2.5 QUALITY CONTROL ORGANIZATION

2.5.1 Personnel Requirements

The requirements for the CQC organization are a CQC System Manager, and sufficient number of additional qualified personnel to ensure safety and contract compliance. Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly will also be included as part of the CQC organization. The Contractor's CQC staff shall maintain a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure contract compliance. The CQC staff shall be subject to acceptance by the Contracting Officer. The Contractor shall provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Complete records of all letters, material submittals, shop drawing submittals, schedules and all other project documentation shall be promptly furnished to the CQC organization by the Contractor. The CQC organization shall be responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

2.5.2 CQC System Manager

The Contractor shall identify an individual within his organization at the site of the work who shall be responsible for overall management of the CQC and have the authority to act in all CQC matters for the Contractor. The CQC system manager shall be a graduate engineer, graduate architect, or a graduate construction manager, with experience on construction projects similar in type to this contract OR a construction person with a minimum of ten (10) years in related work. The CQC System Manager shall be on the site at all times during construction and shall be employed by the Contractor. The CQC System Manager shall be assigned no other duties. An alternate for the CQC System Manager will be identified in the plan to serve in the event of the CQC system manager's absence. The requirements for the alternate will be the same as for the designated CQC manager.

In addition to the above experience and/or education requirements, the CQC System Manager shall have completed the course entitled "Construction Quality Management For Contractors". This course is periodically offered by the government, and inquiries as to the next course offering may be directed to the local construction field office.

2.5.3 Additional Requirement

0.0.1 CQC Specialists

In addition to CQC personnel previously specified, the Contractor shall provide as part of the CQC organization specialized personnel to assist the CQC System Manager in the areas listed below. These personnel may be employees of the prime Contractor or subcontractors. The CQC specialists shall be responsible to the CQC System Manager; be physically present at the construction site during work on their areas of responsibility; have the necessary education and/or experience in accordance with the experience matrix listed herein. These individuals may perform other duties but must be allowed sufficient time to perform their assigned quality control duties as described in the Quality Control Plan or they may be assigned only CQC duties, at the Contractor's option. The Contractor may elect for a person to perform one or more of the functions listed below, provided that the person meets the appropriate qualifications and has adequate time to properly cover the function.

EXPERIENCE MATRIX

Area	Minimum Qualifications
a. Mechanical	Graduate Engineer with 10 years work experience in the type of work to be performed on this project and must be a registered professional engineer.
b. Electrical	Graduate Engineer with 10 years work experience in the type of work to be performed on this project and must be a registered professional engineer.
c. Structural	Graduate Engineer with 10 years work experience in the type of work to be performed on this project and must be a registered professional engineer.
d. Geotechnical	Graduate Engineer with 10 years work experience in the type of work to be performed on this project and must be a registered professional engineer.
e. Geologist	Graduate Geologist with 10 years work experience in the type of work to be performed on this project and must be a registered professional geologist.
f. Submittals	Submittal Clerk with a minimum of 5 years experience.

2.5.4 Organizational Changes

The Contractor shall maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

2.6 SUBMITTALS AND DELIVERABLES

Submittals, if needed, shall be made as specified in Section 013315 SUBMITTAL PROCEDURES FOR DESIGN-BUILD PROJECTS. The CQC organization shall be responsible for certifying that all submittals and deliverables are in compliance with the contract requirements.

2.7 CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control shall be conducted by the CQC System Manager for each definable feature of the construction work as follows:

2.7.1 Preparatory Phase

The preparatory phase of quality control shall be performed prior to beginning work on each definable feature of work, after all required documents and materials are approved/accepted, and after copies are at the work site. This phase shall include:

a. A review of each paragraph of applicable specifications, reference codes, and standards. A copy of those sections of referenced codes and standards, in the English language unless specifically approved otherwise by the Contracting Officer, applicable to that portion of the work to be accomplished in the field shall be made available by the Contractor at the preparatory inspection. These copies shall be maintained in the field and available for use by Government personnel until final acceptance of the work.

b. A review of the contract drawings.

c. A check to assure that all materials and/or equipment have been tested, submitted, and approved.

d. A check to assure that provisions have been made to provide required control inspection and testing.

e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.

f. A physical examination of required materials, equipment, and sample work to verify that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

g. Reviews of the appropriate activity hazard analysis to ensure safety requirements are met.

h. Discussion of procedures for constructing the work including repetitive deficiencies, construction tolerances and workmanship standards for that feature of work.

i. A check to ensure that the Contracting Officer has accepted the portion of the plan for the work to be performed.

j. Discussion of the initial control phase.

k. The Government shall be notified at least 24 hours in advance of beginning any of the required action of the preparatory phase. This phase shall include a meeting conducted by the CQC system manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC system manager and attached to the daily QC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

2.7.2 Initial Phase

The initial phase of quality control shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

a. A check of preliminary work to ensure that it is in compliance with contract requirements. Review minutes of the preparatory meeting.

b. Verification of full contract compliance. Verify required control inspection and testing.

c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with sample panels as appropriate.

d. Resolve all differences.

e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.

f. The Government shall be notified at least 24 hours in advance of beginning the initial phase. Separate minutes of this phase shall be prepared by the CQC system manager and attached to the daily QC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.

g. The initial phase should be repeated for each new crew to work on-site, or any time acceptable specified quality standards are not being met.

2.7.3 Follow-up Phase

The follow-up phase of quality control shall be performed to assure continuing compliance with contract requirements, including control testing, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted, and all noted deficiencies corrected, prior to the start of additional features of work that may be affected by the deficient work. The Contractor shall not build upon nor conceal non-conforming work.

2.7.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases may be required by the Contracting Officer on the same definable features of work if the quality of on-going work is unacceptable; if there are changes in the applicable QC staff or in the on-site production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

2.8 TESTS

2.8.1 Testing Procedure

The Contractor shall perform tests specified or required to verify that control measures are adequate to provide a product that conforms to contract requirements. Upon request, the Contractor shall furnish to the Government duplicate samples of test specimens for possible testing by the Government. Costs incidental to the transportation of samples or materials shall be borne by the Contractor.

Testing includes operation and/or acceptance tests when specified. A list of tests to be performed shall be furnished as a part of the CQC plan. The list shall give the test name, frequency, specification paragraph containing the test requirements, the personnel and laboratory responsible for each type of test, and an estimate of the number of tests required. The Contractor shall perform the following activities and record and provide the following data:

a. Verify that testing procedures comply with contract requirements.

b. Verify that facilities and testing equipment are available and comply with testing standards.

c. Check test instrument calibration data against certified standards.

d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

e. Results of all tests taken, both passing and failing tests, shall be recorded on the Quality Control report for the date taken. Specification paragraph/item reference, location where tests were taken, and the sequential control number identifying the test will be given. Actual test reports may be submitted later, if approved by the Contracting Officer, with a reference to the test number and date taken. An information copy of tests performed by an off-site or commercial test facility will be provided directly to the Contracting Officer. Failure to submit timely test reports, as stated, may result in nonpayment for related work performed and disapproval of the test facility for this contract.

2.9 COMPLETION INSPECTION

2.9.1 Punch-Out Inspection

Near the end of the work, or any increment of the work established by a time stated in the Contract Clause 52.211-10, "COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK", or by the specifications, the CQC Manager shall conduct an inspection of the work. A punch list of items which do not conform to the approved drawings and specifications shall be prepared and included in the CQC documentation, as required by paragraph DOCUMENTATION. The list of deficiencies shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government Pre-Final inspection.

3.9.2 Pre-Final Inspection

The Government will perform the pre-final inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. The Contractor's CQC System Manager shall ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Any items noted on the Pre-Final inspection shall be corrected in a timely manner. These inspections and any deficiency corrections required by this paragraph shall be accomplished within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

2.9.2 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative shall be in attendance at the final acceptance inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups, and major commands may also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notice shall be given to the Contracting Officer at least 14 days prior to the final acceptance inspection and shall include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the Contract Clause 52.246-12 entitled "INSPECTION OF CONSTRUCTION".

PART 3. EXECUTION

3.1 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.

3.2 SAMPLE FORMS

In accordance with Section 01 45 00.10 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 CQC Plan.

3.3 NOTIFICATION OF NONCOMPLIANCE

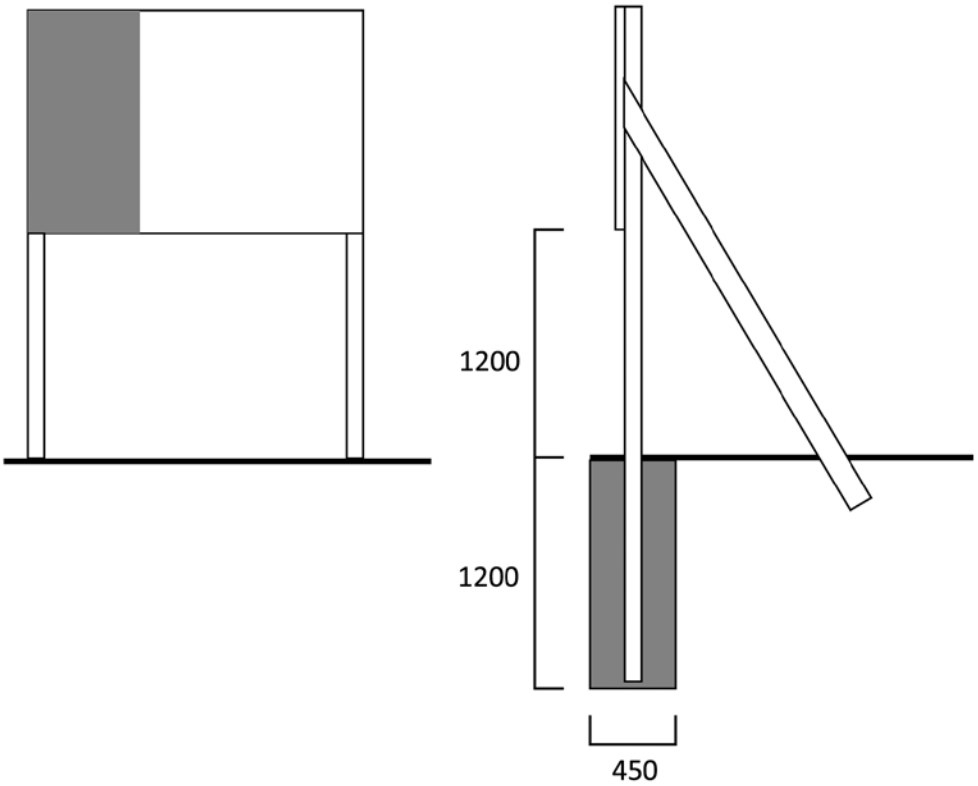
The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose 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. 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 --

Construction Project Sign Dimensions (mm)

T1:	Text Group 1	Typeface: 150mm Large Standard Dari Font Color: White
T2:	Text Group 2	Typeface: 150mm Large Standard Dari Font Color: Black
T3:	Text Group 3	75mm Small Standard Dari Font Color: Black
T4:	Text Group 4	35mm Helvetica Bold, all capital letters Color: Light Yellow, matching GIROA logo
T5:	Text Group 5	35mm Helvetica Bold Color: Green, Pantone 370 PC
T6:	Text Group 6	45mm Helvetica Bold Color: Green, Pantone 370 PC

Mounting Diagram



Ministry of Defense

Government of the Islamic Republic of Afghanistan

SECTION TABLE OF CONTENTS

DIVISION 01 – GENERAL REQUIREMENTS

SECTION 01 64 00

START UP, TESTING AND COMMISSIONING

PART 1 GENERAL....3
1.1. SUMMARY....3
1.1.1. General Requirements....3
1.1.2. Related Sections....3
1.1.3. Submittals....3
1.2. CONSTRAINTS....4
1.3. DEFINITIONS....4
1.3.1. Commissioning....4
1.3.2. Commissioning Manager....4
1.3.3. Commissioning Plan....4
1.3.4. System Integrator (SI)....4
1.3.5. Control System Functional Acceptance Test (CSFAT)....4
1.3.6. Field Tests....5
1.3.7. Functional Test....5
1.3.8. Installation Checks and Testing....5
1.3.9. Operational Testing....5
1.3.10. Performance Test....5
1.3.11. Start-Up Test....5
1.3.12. Start-Up Re-test....5
1.4. SUBMITTALS....5
1.4.1. General....5
1.4.2. Interim Design (65%) Submittals....5
1.4.3. Final Design (99%) Submittals....6
1.4.4. Start-up Plan....8
1.4.5. Final Test Reports....8
1.4.6. Device Settings....8
1.4.7. Factory and Field Test Manuals....8
1.5. QUALITY CONTROL....8
1.6. TESTING REQUIREMENTS....9
1.6.1. Factory Testing....9
1.6.2. Functional Testing....9
1.6.3. Performance Testing....10
1.7. COMMISSIONING REQUIREMENTS....11

1.7.1. Calibration 11
1.7.2. Manufacturer Field Service Testing and Inspection 11
1.7.3. Dynamic Balancing of Equipment 11
1.7.4. Installation Checks and Pre-Operational Testing 12
1.8. STARTUP REQUIREMENTS 13
1.8.1. Startup Testing 13
1.8.2. Operational Testing 14
1.9. TESTING and SUMMARY REQUIREMENTS 14
1.9.1. Startup, Testing, and Commissioning Coordination Meetings 14
1.9.2. Re-Testing 14
1.9.3. Pre-Turnover (Post-Testing Period) 15
1.10. PAYMENT 15
PART 2 PRODUCTS 15
PART 3 EXECUTION 15

SECTION 01 64 00

START UP, TESTING AND COMMISSIONING

PART 1 GENERAL

1.1. SUMMARY

This Section includes the requirements for integrated services to start-up, test, commission, and turnover all Contractor furnished equipment and related work. The purpose of this Section is to define the Contractor requirements for bringing individual equipment, systems, and facilities online and for proving proper operation and performance of that work. Contractor is required to develop, submit, and maintain detailed plans for these activities as specified elsewhere in this Section or other Sections of the RFP.

1.1.1. General Requirements

The Contractor shall furnish all labor, tools, instruments, and consumable materials required to perform all testing activities specified. The Contractor shall be responsible for costs associated with outside subcontractors or testing agencies required to perform or certify the work.

Any consumables or expendables consumed during testing shall be replaced following testing so that equipment is ready for operation by the owner.

1.1.2. Related Sections

a. Section 01 01 50 TECHNICAL REQUIREMENTS

b. Section 01 22 00 MEASUREMENT AND PAYMENT

c. Section 01 33 15 SUBMITTAL PROCEDURES FOR DESIGN-BUILD PROJECTS

d. Section 01 33 16 DESIGN BUILD AFTER AWARD

e. Section 01 45 00.10 QUALITY CONTROL SYSTEM (QCS).

f. Section 01 66 40 TRAINING

g. Section 01 77 00 CLOSEOUT PROCEDURES

h. Section 01 78 10 OPERATION AND MAINTENANCE DATA

1.1.3. 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.

Items	Paragraph
Commissioning Package at 65% Design (a.k.a Commissioning Plans)	1.4.2
Commissioning Package at 99% Design (a.k.a Start Up & Testing) Including all of the following:	1.4.3
Start-Up Plan	1.4.4
Final Test Reports	1.4.5
Device Settings	1.4.6
Factory and Field Test Manuals	1.4.7
Factory Testing	1.6.1
Functional Testing	1.6.2

Performance Testing	1.6.3
Dynamic Balancing Report	1.7.3

1.2. CONSTRAINTS

The Contractor shall be responsible for developing a comprehensive startup, testing, and commissioning plan to meet the project requirements and to fully coordinate with related existing systems and local stakeholder needs.

1.3. DEFINITIONS

1.3.1. Commissioning

Commissioning generally refers to all field activities on equipment or systems between the time that equipment (or system) is turned over from the construction team and the time that the equipment (or system) is ready for functional and performance testing. All commissioning activities shall be managed by a designated Commissioning Manager directly employed by the Contractor.

1.3.2. Commissioning Manager

An employee of the Contractor responsible for coordinating and managing all commissioning activities and related documentation.

1.3.3. Commissioning Plan

The Commissioning Plan is the document that describes the goals of the commissioning effort and the specific procedures that will be performed to demonstrate the installation meets the intended level of performance and operability. The plan shall include:

1. A narrative describing an overview of the commissioning process.
2. A list of each major component and the associated testing requirements for that component as defined by the manufacturer and by specification or standards listed in the Invitation to Bid.
3. A listing of specific testing procedures for the items listed above along with acceptance criteria.
4. A detailed checklist of performance tests including all manufacturer recommended tests, all subcomponents of installed systems, including switches, sensors, control panels, indicator lamps, motor performance, leakage tests, equipment access, and all other items that represent a complete documented review of the performance of the installed systems.

The Commissioning Plan is developed early in the design process and modified throughout the design and construction process by the project stakeholders in a formalized process. The value of the Commissioning Plan is the early identification of goals and requirements which will assist Quality Control and design efforts.

1.3.4. System Integrator (SI)

The System Integrator (SI) is the party responsible for interfacing the facility control systems. The SI duties include, but are not limited to, performing all work necessary to design, select, furnish, customize, debug, supervise installation, connect, calibrate, field modify existing control and instrumentation wirings and place into operation all hardware, communication lines and equipment, and provide all programming of all software. The SI shall provide all field commissioning services required to properly commission the control system. The System Integrator shall coordinate scheduling of work, testing, training of Government personnel, and documentation with the Contractor's Commissioning Manager.

1.3.5. Control System Functional Acceptance Test (CSFAT)

The control systems functional acceptance testing demonstrates the proper interaction of the individual facility and overall control system components and the related equipment individual control systems. The Systems Integrator will be responsible for this test.

1.3.6. Field Tests

Denotes all field testing including installation testing, functional, performance, and start-up tests.

1.3.7. Functional Test

The field testing is required to determine whether the installed equipment or system will operate in a satisfactory manner and as specified. The functional test is a point-by-point test to confirm that all components associated with the equipment or systems are operating properly. All non-operating adjustments, cold alignment checks, cleaning shall be completed prior to functional tests.

1.3.8. Installation Checks and Testing

Field testing shall be by the Contractor or equipment manufacturers to ensure that all installation work has been performed satisfactorily and in compliance with manufacturer's requirements. Equipment suppliers or manufacturers must sign-off on the installation checks and testing before further commissioning work can proceed.

1.3.9. Operational Testing

Field testing shall demonstrate sustained operation of the facilities in actual operating conditions.

1.3.10. Performance Test

The field testing is required to demonstrate the individual equipment or system meets all of the contract performance requirements.

1.3.11. Start-Up Test

A field test of all systems operating together is required to demonstrate satisfactory performance of the facilities as a whole, for the specified start-up test period without failure and to the satisfaction of the Contractor and the Contracting Officer. Successful completion of start-up testing is a pre-requisite for substantial completion.

1.3.12. Start-Up Re-test

At Contracting Officer's discretion, minor issues that are observed during Start-up Testing may be noted and re-tested following substantial completion. The Start-up Re-Test will repeat those portions of the Startup Test that are required to close-out those minor issues.

1.4. SUBMITTALS

1.4.1. General

Unless otherwise indicated, delivery of all test plans required for the systematic factory and field tests for all equipment and systems installed or provided for field use under this contract shall be made at least eight weeks in advance of the date the Contractor wishes to begin such testing. Once the Government has reviewed and taken no exception to the Contractor's test plans, the Contractor shall reproduce the plans in sufficient number for the Contractor's purposes and an additional three copies for delivery to the Government. No test work shall begin until the Contractor has delivered the specified number of final test plans to the Government. Submittals shall be made as required in Section 01 33 15 SUBMITTAL PROCEDURES FOR DESIGN-BUILD PROJECTS. In addition, the following specific commissioning related information shall be submitted:

1.4.2. Interim Design (65%) Submittals

1.4.2.1. Submit a Commissioning Plan along with the following:

a. A list of all factory and field tests with reference to appropriate specification sections and submittal dates.

b. Commissioning Manager's qualifications & past project experience including contact names, addresses, and current telephone numbers that can be used to verify the accuracy of the provided information.

c. Manufacturer's representatives' resumes demonstrating their qualifications and ability to perform the specified services.

d. Details and descriptions of the record keeping plan and systems to be employed by Contractor for retention of all start-up, testing, and commissioning documentation.

e. The goal of the 35% submittal is to establish the framework of the plan. The Commissioning Plan shall be organized to anticipate the additional requirements as listed below.

1.4.3. Final Design (99%) Submittals

1.4.3.1. The Government understands that some items cannot be completed by the Interim Design (65%) stage. Therefore, if necessary, and at the discretion of the COR, the Interim Design (65%) submittals listed above may be submitted at the Final Design (99%) stage. The contractor is encouraged to produce as complete a package as possible or risk having to re-submit the Interim Design (65%). The following items shall be added to the Commissioning Plan:

a. Test Plan and procedures for all tests:
   i. All test procedures shall be comprehensive, neatly organized, type written, and numbered step-by-step.
   ii. Equipment and system test documentation shall include the date of the test, equipment number or system name, nature of the test, test objectives, test results, test instruments employed and signature spaces for the Government's witness and the Contractor's Quality Assurance Manager. Documentation shall be provided for the following tests as a minimum:
      - Metallurgical tests
      - Factory tests
      - Field calibration work and tests
      - Field pressure and leak tests
      - Field functional tests
      - Field performance tests
      - Field start-up tests
      - Field operational tests

1.4.3.2. Submit a detailed test plan of all testing activities describing the tests to be performed, the staff or organization responsible for the tests, and documentation processes necessary to record the results of all tests. The Contractor shall develop test plans detailing the coordinated, sequential testing of each item of equipment and system installed or provided for field use under this contract. Each test plan shall be specific to the item of equipment or system to be tested. Test plans shall identify by specific equipment or tag number each device or control station to be manipulated or observed during the test procedure and the specific results to be observed or obtained. Test plans shall also be specific as to support systems required to complete the test work, subcontractors' and manufacturers' representatives to be present and expected test duration. As a minimum, the test plans shall include the following information:

a. Step-by-step proving procedure for all control and electrical circuits by imposing low voltage currents and using appropriate indicators to affirm that the circuit is properly identified and connected to the proper device.

b. Calibration of all instruments and control sensors.

c. Testing of each individual item of mechanical, electrical, and instrumentation equipment. Tests shall be selected to duplicate the operating conditions.

d. Operational tests designed to duplicate, as closely as possible, operating conditions described in other Sections:
   i. Detailed test methods, including sample calculations and reference to standards as required or applicable.

ii. Comprehensive schedule of all factory and field tests. The schedule shall be in bar chart form, plotted against calendar time, shall detail the equipment and systems to be tested, and shall be coordinated with the Contractor's construction schedule. The schedule shall show the contemplated start date, duration of the test and completion of each test. No testing activity shall take place until the Contractor has submitted a schedule to which the Government takes no exception. The test schedule shall be updated weekly, showing actual dates of test work, indicating systems and equipment testing completed satisfactorily and meeting the requirements of this project manual. List all equipment testing by specification section number and name. Include the following for each equipment/system:

- Specification section and paragraph number
- Test type (factory, functional, performance, start-up)
- Test procedure submittal dates
- Testing and start-up dates
- Test report submittal dates

After initial submittal, update and provide test schedules on a weekly basis (or as arranged with the Commissioning Manager and the COR) at project progress meetings and/or test coordination meetings. All data for testing schedules shall be full coordinated with the overall project schedule.

All communication systems and systems designed for control through the facility control system will require testing and coordination with the project Systems Integrator (SI). The Contractor shall make scheduling allowances for these tests and incorporate this information into the construction schedule.

Pre-test checklist to ensure readiness and any safety measures are in-place.

Pre-operational checklists or procedures from each equipment manufacturer showing all installation checks or tests that must be completed prior to operation of the equipment.

Safety turnover procedures for all equipment and systems clearly demonstrating the safety processes to be followed as equipment or systems are turned-over from construction to commissioning.

Descriptions and drawings showing any temporary systems or facilities that will be installed to facilitate testing. Temporary systems for testing shall be incorporated into the testing schedule to indicate the installation and removal sequences for the temporary components.

Details of all necessary adjustments, balancing, required equipment isolation or configuration, test equipment and instruments, calibration, and personnel needed.

List of all installation checks and testing work that will be performed for mechanical, electrical, and instrumentation equipment.

i. Specific calibration program for all instruments, meters, monitors, gages, and other instrumentation provided under this Contract.

ii. Specific calibration program for all testing instruments that will be used for performing tests of equipment and systems installed under this Contract. Include the credentials and certification of any testing laboratories required by the Contractor for calibration of test equipment.

iii. Acceptance Criteria: For each test phase, specifically indicate what is considered an acceptable test result.

iv. Data Forms: Include the test name, equipment (with tag numbers as applicable) or system name, specification section and paragraph number, test instrument tag numbers, test date, space for testing personnel names, test data names, and units, reference equations for all calculated values, and signature lines for manufacturer’s representative, Contractor and Contracting Officer witness.

1.4.4. Start-up Plan

In addition to submitting test procedures, the Contractor shall develop and submit a start-up plan. The start-up plan shall systematically describe the details of preparing for and starting each system at all facilities at the beginning of the start-up tests. The start-up plan shall also include detail procedures for the systematic shutdown of all systems at the facility.

1.4.4.1. At a minimum, the start-up plan shall include the proposed chronological sequence of activities and detailed procedures for starting or shutting down facilities and systems. In addition, provide the following detailed information:

a. A list of new and existing facilities, equipment, and systems with applicable references to device name and Government tag number that must be in operation before the startup test can begin

b. CAD drawings and schematics highlighting the facilities, systems, and equipment included in the start-up testing

c. Expendables required for the start-up test

d. The chronological sequence of activities clearly divided into activities to be completed in preparation for start-up test versus activities completed during the start-up test

e. Expected durations of each test activity

1.4.5. Final Test Reports

Upon successful completion of testing for each equipment item or system, the Contractor shall submit complete typewritten test reports including data forms.

Upon substantial completion, all factory, functional and performance test reports shall be inserted by the Contractor into the applicable O&M data packages.

1.4.6. Device Settings

Submit all final device settings for all field adjustable devices. These settings shall be incorporated into the final O&M manuals for each piece of equipment supplied.

1.4.7. Factory and Field Test Manuals

When all factory and field testing is complete, submit all test documents in bound form and electronic copy (on DVD). This consolidated submittal is in addition to the individual submittal of test procedures and test results. Format requirement for this field testing manual shall be the same as for the final closeout submittals specified in Section 01 77 00 CLOSEOUT PROCEDURES, including section dividers by system or equipment. Note: Electrical Equipment data shall be provided on approved NETA forms and Instrumentation and Control data shall be provided on ISA forms.

1.5. QUALITY CONTROL

All startup, testing, and commissioning activities, work, and personnel shall be subject to the general Project Quality Control Systems requirements specified in Section 01 45 00.10 QUALITY CONTROL SYSTEM (QCS). All documentation created for or generated by testing activities shall be considered part of the project quality documentation.

For the purposes of this Section, a system shall include all items of equipment, devices and appurtenances connected in such a fashion as their operation or function complements, protects or controls the operation or function of the others. The Contractor shall coordinate the activities of all subcontractors and suppliers to implement the requirements of this Section.

All testing will be witnessed by the Government. All test plans and reports shall include signoff by the Government witness.

1.6. TESTING REQUIREMENTS

1.6.1. Factory Testing

Factory testing of equipment or systems shall be submitted as necessary. All factory testing for a system or individual equipment item shall be complete, with results approved by the Contracting Officer, prior to shipment of that system or equipment to the job site.

1.6.1.1. Minimum requirements for factory tests shall be as given below and as indicated in the individual equipment or system specifications:

a. Complete test plans and schedules for all factory tests.

b. Contractor shall plan for all factory tests to be witnessed by the Government. At the Government's discretion certain factory tests may not be witnessed by the Government. The Government will issue a waiver for un-witnessed factory tests that the Contractor shall include in their final documentation. Results from all tests, whether witnessed or un-witnessed, shall be submitted to the Contracting Officer.

c. Factory test conditions shall be made as close to field conditions as is practical and shall be approved by the Contracting Officer prior to commencing factory tests.

d. Factory tests shall be conducted to prove that the equipment or system performs in accordance with the specifications and is ready for shipment to the job site.

1.6.2. Functional Testing

1.6.2.1. Functional tests shall not proceed until the Contracting Officer has received and approved the items listed below:

a. Interconnection and Loop diagrams

b. All factory test reports

c. Manufacturer's Certificate of Proper Installation (where required)

d. Equipment or system functional test submittal

e. All specified spare parts and special tools

f. Draft O&M Manuals

1.6.2.2. Each functional test shall include:

Device Calibrations, Loop Checks, and Electrical Commissioning:

a. Calibration Check: Verify that all devices have been properly field calibrated and that field calibration tags have been completed and installed.

b. Loop Checks if not performed as part of pre-operational testing.

c. Electrical Commissioning of related wiring and equipment.

1.6.2.3. All device calibrations, loop checks and electrical systems commissioning shall be completed and accepted by the Government prior to starting the remaining functional test elements specified hereinafter.

a. Installation Check: Check for proper rotation, adjustment, alignment, balancing, mechanical and electrical connections, proper lubrication, and any other conditions that may damage or impair equipment from functioning properly.

b. Operations Check: Check for proper operation of all system components.

c. Controls Check: Demonstrate proper function of all local and remote controls, instrumentation, and other equipment functions.

d. Alarms Check: Simulate alarm conditions and verify the proper operation of each alarm at the specified set point. Simulations shall be by means of direct element stimulation whenever possible or by other means when direct element stimulation is not practical as determined by the Government

e. Run Check: Each system or equipment item shall be operated continuously for a minimum of one (1)-hour or three complete operating cycles, unless noted otherwise.

f. Additional Test Requirements: The individual technical specifications or the equipment manufacturer may specify additional functional test requirements for each component or system.

1.6.3. Performance Testing

1.6.3.1. Performance tests shall demonstrate that the equipment or systems meets all specified performance requirements described in the individual technical specifications.

1.6.3.2. Where previous functional testing has been configured to prove performance of individual components or systems, the Contractor may request waiving performance testing of that equipment. Such requests must be approved by the Contracting Officer before the performance tests can be waived. All baseline data shall be available from the functional testing if performance testing is to be waived.

1.6.3.3. Performance Tests

Once all affected equipment has been subjected to the required preoperational checkout procedures and functional testing and the Contracting Officer has witnessed and has not found deficiencies in that portion of the work, individual items of equipment and systems may be started and operated under simulated operating conditions to determine as nearly as possible whether the equipment and systems meet the requirements of these specifications.

The equipment shall be operated to determine machine operating characteristics, including noise, temperatures and vibration; to observe performance characteristics; and to permit initial adjustment of operating controls.

When testing requires the availability of auxiliary systems such as looped piping, electrical power, compressed air, control air, or instrumentation which have not yet been placed in service, the Contractor shall provide acceptable substitute sources, capable of meeting the requirements of the machine, device, or system at no additional cost to the Government. Disposal methods for test media shall be subject to review by the Government.

During the functional test period, the Contractor shall obtain baseline operating data on all equipment with motors greater than 1 horsepower to include amperage, bearing temperatures, and vibration. The baseline data shall be collected for the Government to enter in a preventive maintenance system.

Test results shall be within the tolerances set forth in the detailed technical criteria sections of Section 01 01 50 TECHNICAL REQUIREMENTS and in the specifications provided by the Contractor. If no tolerances have been specified, test results shall conform to tolerances established by recognized industry practice. Where, in the case of an otherwise satisfactory functional test, any doubt, dispute, or difference should arise between the Government and the Contractor regarding the test results or the methods or equipment used in the performance of such test, then the Contracting Officer may order the test to be repeated.

If the repeat test, using such modified methods or equipment as the Contracting Officer may require, confirms the previous test, then all costs in connection with the repeat test will be paid by the Government. Otherwise, the costs shall be borne by the Contractor. Where the results of any functional test fail to comply with the contract

requirements for such test, then such repeat tests as may be necessary to achieve the contract requirements shall be made by the Contractor at his expense. The Contractor shall provide, at no expense to the Government, all power, fuel, compressed air supplies, water, chemicals, and any other necessary consumable item, all labor, temporary piping, heating, ventilating, and air conditioning for any areas where permanent facilities are not complete and operable at the time of functional tests, and all other items and work, required to complete the functional tests. Temporary facilities shall be maintained until permanent systems are in service.

1.7. COMMISSIONING REQUIREMENTS

1.7.1. Calibration

All test equipment (gages, meters, thermometers, analysis instruments, and other equipment) used for calibrating or verifying the performance of equipment installed under this contract shall be calibrated as specified in cited test codes, standards or procedures. In no case shall the calibration be less than plus or minus 2 percent of actual value at full scale. Test equipment employed for individual test runs shall be selected so that expected values as indicated by the detailed performance specifications will fall between 60 and 85 percent of full scale. Pressure gages shall be calibrated in accordance with ANSI/ASME B40.1. Thermometers shall be calibrated in accordance with ASTM E77 and shall be furnished with a certified calibration curve.

Calibration of analysis instruments, sensors, gages, and meters installed under this contract shall proceed on a system-by-system basis. No equipment or system performance acceptance tests shall be performed until instruments, gages, and meters to be installed in that particular system have been calibrated and the calibration work has been witnessed by the Government.

1.7.2. Manufacturer Field Service Testing and Inspection

A manufacturer’s authorized representative shall perform all services when manufacturer’s services are specified in this section or are specified in any other technical section of the RFP. The authorized representative shall be factory trained and experienced in the technical applications, installation, operation and maintenance of the equipment, subsystem or system. Additional qualifications may be specified elsewhere.

Manufacturer’s representatives shall be subject to the acceptance of the Contracting Officer. No substitute representatives will be allowed without prior written approval by the Contracting Officer.

Manufacturer’s representatives shall be qualified for the work to be performed and different representatives may be required for specific tasks (installation assistance, testing, start-up, training, etc.).

Where required, the Manufacturer's or Supplier's field personnel shall perform the following:

a. Observe the erection, installation, start-up and testing of equipment.

b. Instruct and guide Contractor in proper procedures.

c. Supervise the initial start-up, operational check, and any required adjustments of equipment.

d. Training as required by Section 01 66 40 TRAINING.

e. Furnish a written report to Contracting Officer covering all Work done at least once each week and when Work on each item of equipment or system is completed.

Contractor shall provide five (5) day's notice prior to the arrival of any Manufacturer's and Supplier's field personnel at the site.

1.7.3. Dynamic Balancing of Equipment

Perform dynamic balancing of rotating equipment.

a. Record initial dynamic balance analysis data, including vibration velocity and vibration displacement at the rated speed of equipment.

b. Identify and quantify unbalance and make corrections as necessary to meet manufacturer specifications.

c. Record final dynamic balance analysis data, including vibration velocity and vibration displacement at the rated speed of equipment.

Submit dynamic balancing report. The dynamic balancing report shall be included in the Operations and Maintenance Manual. Equipment vibration testing is considered part of installation checks and testing and shall be completed before any functional testing of equipment begins.

1.7.4. Installation Checks and Pre-Operational Testing

An installation check and pre-operations testing shall be performed on the equipment prior to operation of the equipment and prior to any functional testing.

A Certificate of Proper Installation shall be provided for valve and hoist installation. A qualified representative from the manufacturer shall visit the site, inspect the installed equipment, and observe any installation testing required. The manufacturer's representative shall sign the Certificate of Proper Installation certifying that the equipment is properly installed and ready for functional testing.

1.7.4.1. Placing Equipment in Operation:

Place all Equipment and Materials installed under this Contract into successful operation according to instructions of the Supplier, Manufacturer, or field representative, including making all required adjustments, tests, operation checks, and the following:

a. Cleaning, sounding, blowing-out, and flushing of lubricating oil and water systems, and other pipelines.

b. Lubrication, fuels, supplies, power, consumables, water, and labor to be supplied by the Contractor for the duration of start up and testing, and until substantial completion of the work.

c. Tests of lubrication system safety interlocks and system performance.

Final alignment checks and measurements made under observation of Government staff or designated agent. Alignment checks shall include opening connections, if required, to ensure there are no abnormal stresses on equipment from pipes, ducts, or other attachments. Alignment shall be within tolerances specified by the Manufacturer, and measurements shall be recorded and furnished to Contracting Officer.

1.7.4.2. Motor rotation checks

Before connecting couplings, verify that motor rotors rotate freely. Verify that the motors rotate in the correct direction to corresponding control inputs.

1.7.4.3. Anchor-bolt tensions, grout and shims

Tighten anchor bolts with calibrated torque wrenches using care not to over stress bolts. Check condition of grout and shims to ensure proper contact and installation.

1.7.4.4. Pressure and leakage tests

Pressure and leakage tests shall be conducted in accordance with applicable portions of the Specifications. All acceptance tests shall be witnessed by the Government. Evidence of successful completion of the pressure and leakage tests shall be the Contracting Officer's signature on the test forms prepared by the Contractor.

1.7.4.5. Final Installation

a. After acceptance of alignment and installation, and where specified, affix major equipment in place using standard tapered dowels with jack-out nuts at head end to facilitate removal.

b. Record all above operations on forms acceptable to the Contracting Officer, including Certificate of Proper Installation, where required.

c. Furnish all necessary personnel as part of the Work to accomplish the above operations until such time as individual items, systems, equipment, or sections of the plant are acceptable for operation by the Owner.

1.8. STARTUP REQUIREMENTS

1.8.1. Startup Testing

The start-up testing procedure shall verify that all facilities are completely installed, that all systems are correctly set up and that the facilities will reliably function over time in real world conditions.

The start-up test shall not proceed until all of the following have been completed:

a. All factory, functional and performance test record have been approved by Government. Copies of these test records shall be available on-site as well.

b. All draft O&M manuals have been approved by the Government.

c. Owner's personnel have been trained in accordance with the individual technical specifications.

d. All tagging and labeling including but not limited to piping, conduit, panels, and equipment, have been completed.

e. All near final as-built drawings (not CAD set) that are still subject to further updating for incomplete work, have been approved by the Government.

f. Start-up test procedures have been approved by the Government. The Contractor shall coordinate with the Government to start-up the facility equipment and systems as outlined in the Contractor's start-up plan.

Only Contractor's personnel approved by the Government shall operate the equipment and systems during the startup test. It is the intent of this section that the performance of any and all: turbine equipment, valves, compressed air systems, mechanical systems, electrical sub-systems and systems, and controls be tested as a complete, operational, and integrated system conforming to the performance and design parameters outlined in this Contract. The entire facility shall be tested in the normal operational sequence in all control modes.

The system start-up test procedure is intended to demonstrate satisfactory operation and integration of the control system and all the mechanical and electrical sub-systems and systems, and accessory equipment including but not be limited to:

a. Demonstrate all control sequences at a prescribed operating range defined by head, flow rate, and power demand under normal operating conditions.

b. Repeat control sequences as required in order to test each subsystem. Check and record all system flows, levels and pressures.

The start-up test requires that all new work of this Contract shall operate as designed and function in an uninterrupted and trouble-free manner with no mechanical or electrical failures for an extended time period.

During the test periods, the Facilities shall operate without failure, with exceptions to demonstrate non-normal functioning.

The start-up test shall be conducted at a time and date to be mutually agreed upon by the Contractor and the Government.

The Contractor shall provide the services of all-technical and craft personnel required to support the work covered under the Contract during the entire start-up testing. Additionally, the Contractor shall arrange for on-call services of these personnel as needed to respond to emergencies.

Contractor shall maintain the appropriate staff (either on site or on call) to be able to respond immediately (24-hours per day) to system or equipment related questions and to correct deficiencies until Startup Testing is complete.

The Contractor shall install any temporary connections, bulkheads, intake gates, and make other provisions necessary for the anticipated operating conditions. During the operational testing period, the Contractor's Commissioning Manager and testing team shall monitor the characteristics of each machine and system and report any unusual conditions to the Contracting Officer.

At the satisfactory conclusion of the start-up test, dismantle and remove all temporary valving, hoses and other equipment used during the test.

All deficiencies found during start-up testing, and subsequent correction thereof must be inspected by the Government.

1.8.2. Operational Testing

Following successful completion of start-up testing and any re-testing requirements, Contractor shall initiate operational testing of the facilities.

During operational testing Contractor shall be available to correct any deficiencies or problems which are encountered during the testing period.

Contractor shall correct all deficiencies noted during the operational testing prior to final completion.

1.9. TESTING AND SUMMARY REQUIREMENTS

1.9.1. Startup, Testing, and Commissioning Coordination Meetings

Weekly meetings shall be held to discuss overall scheduling, procedures, strategy, and preparations for the forthcoming startup, testing, or commissioning activities. The first meeting shall be conducted no later than 30 calendar days prior to the first scheduled activities.

These weekly planning meetings shall continue until all field tests are completed and approved by the Government.

The Contractor shall attend all meetings, and the Contractor shall provide suitable representation from each subcontractor having testing responsibilities so that informed decisions can be made during the meetings.

1.9.2. Re-Testing

If any portion of any test does not pass, the Contractor shall correct the problem in a timely manner and repeat the test until it passes to the satisfaction of the Government.

If any failure of any component or system occurs during the start-up testing, then the entire test shall be restarted. If the Contractor determines that the failure is minor and recommends continuation of the test rather re-starting, then the Contracting Officer may permit continuation of testing at their sole discretion.

If a failure of any component should occur during the start-up test, the Contractor shall be responsible for the actual cost of any idle time due to such failure. Such costs of idle time shall include personnel costs of Government personnel who are assigned to coordinate, assist and witness the start-up test, personnel costs of the Government’s duly authorized representatives, rental of equipment and any other incidental costs of the delay.

1.9.3. Pre-Turnover (Post-Testing Period)

Once testing has been completed, all equipment shall be made ready for turnover to the Government. All machines shall be rechecked for proper alignment, realigned, if necessary, and dowelled in place. All equipment shall be checked for loose connections, unusual movement, or other indications of improper operating characteristics. Any deficiencies shall be corrected to the satisfaction of the Government. All machines or devices which exhibit unusual or unacceptable operating characteristics shall be disassembled and inspected. They shall then be repaired or removed from the site and replaced at no cost to the Government.

Prior to turnover, Contractor shall perform the following minimum activities to restore equipment and systems to turnover-ready conditions:

a. Drain and flush all cooling and lubrication systems and refill as recommended by the equipment manufacturer.

b. Fill all fuel tanks.

c. Replace any spare parts, test equipment, batteries, or similar expendables that were consumed or damaged during the testing procedures.

1.10. PAYMENT

i. See Section 01 22 00 MEASUREMENT AND PAYMENT, last paragraph of Part 1.

PART 2 PRODUCTS
Not used.

PART 3 EXECUTION
Not used.

– END OF SECTION –

SECTION TABLE OF CONTENTS

DIVISION 01 – GENERAL REQUIREMENTS

SECTION 01 66 40

TRAINING

PART 1. GENERAL....3
1.1 Summary....3
1.2 Related Sections....3
1.3 Submittals....3
1.4 Quality Control....3
PART 2. PRODUCTS....4
2.1 General:....4
2.2 Location....4
2.3 Lesson Plans....4
2.4 Format and Content....4
2.4.1 Equipment Specific Training....5
2.4.2 Overall Facility and Embankment Dam Instrumentation Training....6
2.5 Video Recording....6
PART 3. EXECUTION....6
3.1 Training....6
3.2 Operation and Maintenance Data....7
3.3 Services....7
3.3.1 Class Room Training....7
3.3.2 Hands On Training....7
3.4 Location of primary element....7
3.4.1 Class Room Training....7
3.4.2 Hands On Training....8

THIS PAGE INTENTIONALLY LEFT BLANK

PART 1. GENERAL

1.1 SUMMARY

This section contains requirements for training the Owner/Operator's personnel, by persons retained by the Contractor specifically for the purpose, in the proper operation and maintenance of the equipment and systems installed and/or rehabilitated under this contract and how that equipment is integrated with the rest of the equipment in the Irrigation System and Instrumentation Improvements.

The following general categories of training shall be provided:

a. Equipment specific operations and maintenance training, conducted by qualified staff from the equipment or system supplier in conjunction with the O&M Data Package.

b. Overall facility operations and maintenance training, conducted by qualified staff employed by Design- Builder.

1.2 RELATED SECTIONS

Section 01 33 15, SUBMITTAL PROCEDURES FOR DESIGN-BUILD PROJECTS
Section 01 33 16 DESIGN BUILD AFTER AWARD
Section 01 64 00 STARTUP TESTING AND COMISSIONING
Section 01 66 40, TRAINING
Section 01 77 00 CLOSEOUT PROCEDURES
Section 01 78 10 OPERATION AND MAINTENANCE DATA

1.3 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 information shall be submitted to the Contracting Officer in accordance with the provisions of Section 01 33 15 SUBMITTAL PROCEDURES FOR DESIGN-BUILD PROJECTS.

Items	Paragraph
Training Plan at 65% Design	2.1
Lesson plans including training manuals at 99% Design	2.3
Video Recordings in DVD Format at 100% Design	2.5

1.4 QUALITY CONTROL

All training shall be scheduled and coordinated by Contractor’s Commissioning Manager or other designated staff that report directly to the Commissioning Manager. All training materials and documentation shall be controlled by the project quality control plans and policies.

PART 2. PRODUCTS

2.1 GENERAL:

Contractor shall provide a Training Plan for each Interim Design Package (65%). Subject of each training session, identity and qualifications of individuals to be conducting the training, and tentative date and time of each training session.

The Contractor shall provide operational and maintenance training for all systems furnished and/or rehabilitated under this contract in accordance with this section. The training shall not take place until the operation and maintenance data packages are submitted and approved in accordance with this section. Training will be given to personnel responsible for the operation and maintenance of the system at the installation. 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 an elementary school education. Students speak Pashto and do not have a sophisticated technical background. As a result, the contractor will be responsible for providing a trainer fluent in Pashto. Provide qualifications of the trainer to the COR for review. The trainer may be a fluent Pashto translator, with material being translated from English from a trainer who also speaks English. Due to the educational level of the staff, the handouts for procedures shall be graphical in nature with simple, straightforward narrative.

The Contractor shall video record the training session and provide the recordings in DVD format to the Government. A copy of the DVD shall be provided in the regional format for Southeast Asia (region 2) as well as for the United States (region 1).

All errors or deficiencies in the O&M Data Packages identified by contractor, site, or government personnel shall be identified, tracked and resolved as required in Section 01 78 10, OPERATION AND MAINTENCANCE DATA.

2.2 LOCATION

Training sessions shall take place on site in Afghanistan.

2.3 LESSON PLANS

Contractor shall provide a Lesson Plan for each Final Design Package (99%). Formal written lesson plans shall be prepared for each training session. The lesson plans shall be in Pashto and English. Lesson plans shall contain an outline of the material to be presented along with a description of visual aids to be utilized during the session. Each plan shall contain a time allocation for each subject. One complete set of originals, in each language, of the lesson plans, training manuals, handouts, visual aids, and reference material shall be the property of the Government and shall be suitably bound for proper organization and easy reproduction. The Contractor shall furnish 5 copies of necessary training manuals, handouts, visual aids and reference materials in each language at least 1 week prior to each training session.

Lesson plans for each training session to be conducted by the manufacturer's representatives or Contractor. In addition, training manuals, handouts, visual aids, and other reference materials shall be included.

2.4 FORMAT AND CONTENT

Each training session shall be comprised of time spent both in the classroom and at the specific location of the subject equipment or system, or at the specific dam instrument locations or sites with the field instrument. As a minimum, the training session shall cover the following subjects for each item of equipment, monitoring instrument, or system:

2.4.1 Equipment Specific Training

2.4.1.1 Familiarization

a. Review catalog, parts lists, drawings, etc., which have been previously provided for the plant files and operation and maintenance manuals
b. Observe the installation of the specific equipment items
c. Demonstrate the unit and indicate how all parts of the specifications are met
d. Answer questions

2.4.1.2 Safety

a. Using material previously provided, review safety references
b. Discuss proper precautions around equipment and safety for access to embankment instrumentation locations or sites for both personnel and transport of equipment in the field

2.4.1.3 Operation

a. Using material previously provided, review reference literature
b. Explain all modes of operation (including emergency)
c. Supervise Government or Operator's personnel on proper use of the equipment and handling of equipment in the field for instrument readings and surveys

2.4.1.4 Preventive Maintenance

Using material previously provided, review preventive maintenance (PM) lists including:

a. Reference material
b. Daily, weekly, monthly, quarterly, semiannual, and annual Pm requirements
c. Show how to perform PM requirements
d. Show Operator's personnel what to look for as indicators of equipment problems
e. Perform battery checks and charging of field instruments' batteries prior to use and rotation of fresh batteries in fixed instruments
f. Perform cleaning of instruments or equipment prior and after field use

2.4.1.5 Corrective Maintenance

a. List possible problems
b. Discuss repairs--point out special problems
c. Open up equipment and demonstrate procedures, where practical

2.4.1.6 Parts

a. Show how to use previously provided parts list and order parts
b. Check over spare parts on hand
c. Make recommendations regarding additional parts that should be available

2.4.1.7 Equipment Representatives

a. Where to order parts: Name, address, telephone.
b. Service problems: Who to call ?, How to get emergency help?

2.4.1.8 Operation and Maintenance Manuals

Review any other material submitted and update material, as required.

2.4.2 Overall Facility and Embankment Dam Instrumentation Training

2.4.2.1 Familiarization

a. Review major components of the facilities and discuss their intended interaction and operation.
b. Review the facility control descriptions and normal operating procedures from the operations and maintenance manuals.
c. Answer questions.

2.4.2.2 Safety

a. Discuss overall facility safety issues and safety measures incorporated into facility design.
b. Review safety shutdown, alarming, and other automatic safety features.

2.4.2.3 Operation

a. Describe general operation of each major sub-system and the overall facility.
b. Explain all modes of operation (including emergency).
c. Explain all features of the facility control systems including:
d. Available control modes and methods to switch from one mode to another.
e. Setpoint adjustment for any systems.
f. Emergency and process interlocks.
g. Alarm displays and reset/acknowledgement functions.
h. Any reporting functions implemented for the control system.
i. Local control overrides

2.4.3 SITE OPERATION AND MAINTENANCE DATA PACKAGE

a. Review any other material submitted.
b. Review process for field data reduction for each instrument or system and interpretation of results.
c. Update material, as required

2.5 VIDEO RECORDING

The hands on training and any videos provided by the manufacturer and equipment suppliers is intended to satisfy the training needs for the existing project personnel. However, there is a future need for training of Afghans by Afghans. Therefore, all hands on and class room training must be video recorded. Further, all videos must be professionally edited and produced with final dubbing in the appropriate language with English subtitles (including those produced in studios outside Afghanistan and supplied by the equipment manufacturers). The Contractor shall record each hands on training session, post process the videos and submit the recordings according to Section 013315 Submittal Procedures for Design Build Projects and Section 013316 Design Build After Award. The Contractor shall advise all manufacturers providing training sessions that the material will be recorded. Contractor shall make available to the Government and/or Operator such utility services and accommodation as may be required to facilitate the production of the video record.

PART 3. EXECUTION

3.1 TRAINING

Training shall be conducted in conjunction with the testing periods. Classes shall be scheduled such that classroom sessions are interspersed with field instruction in logical sequence. The Contractor shall arrange to have the training conducted on consecutive days, with no more than 6 hours of classes scheduled for any one day. Concurrent classes shall not be allowed.

3.2 OPERATION AND MAINTENANCE DATA

Acceptable operation and maintenance data for the specific equipment shall be provided to the Government prior to the start of any training. Video recording shall take place concurrently with all training sessions.

3.3 SERVICES

The following services shall be provided for each item of equipment or system as required in individual specification sections. Additional services shall be provided, where specifically required in individual specification sections.

3.3.1 Class Room Training

As a minimum classroom equipment training for operations personnel will include:

a. Using slides and drawings, discuss the equipment's specific location in the plant and an operational overview
b. Purpose and plant function of the equipment
c. A working knowledge of the operating theory of the equipment
d. Start-up, shutdown, normal operation, and emergency operating procedures, including a discussion on system integration and electrical interlocks, if any
e. Identify and discuss safety items and procedures
f. Routine preventative maintenance, including specific details on lubrication and maintenance of corrosion protection of the equipment and ancillary components
g. Operator detection, without test instruments, of specific equipment trouble symptoms.
h. Required equipment exercise procedures and intervals
i. Routine disassembly and assembly of equipment if applicable for purposes such as operator inspection of equipment

3.3.2 Hands On Training

As a minimum, hands-on equipment training for operations personnel will include:

a. Identify location of equipment and review the purpose
b. Identifying piping and flow options
c. Identifying valves and their purpose
d. Identifying instrumentation

3.4 LOCATION OF PRIMARY ELEMENT.

a. Location of instrument readout.
b. Discuss purpose, basic operation, and information interpretation.
c. Discuss, demonstrate, and perform standard operating procedures and round checks.
d. Discuss and perform the preventative maintenance activities.
e. Discuss and perform start-up and shutdown procedures.
f. Perform the required equipment exercise procedures.
g. Perform routine disassembly and assembly of equipment if applicable.
h. Identify and review safety items and perform safety procedures, if feasible.

3.4.1 Class Room Training

As a minimum classroom equipment training for operations personnel will include:

a. Theory of operation.
b. Description and function of equipment.
c. Start-up and shutdown procedures.
d. Normal and major repair procedures.

e. Equipment inspection and troubleshooting procedures including the use of applicable test instruments and the "pass" and "no pass" test instrument readings.
f. Routine and long-term calibration procedures.
g. Safety procedures.
h. Preventative maintenance such as lubrication; normal maintenance such as belt, seal, and bearing replacement; and up to major repairs such as replacement of major equipment part(s) with the use of special tools, bridge cranes, welding jigs, etc.

3.4.2 Hands On Training

a. As a minimum, hands-on equipment training for operations personnel will include:
b. Locate and identify equipment components.
c. Review the equipment function and theory of operation.
d. Review normal repair procedures.
e. Perform start-up and shutdown procedures.
f. Review and perform the safety procedures.
g. Perform Operator approved practice maintenance and repair job(s), including mechanical and electrical adjustments and calibration and troubleshooting equipment problems.

-- END OF SECTION --

SECTION TABLE OF CONTENTS

DIVISION 01 – GENERAL REQUIREMENTS

SECTION 01 78 00

CLOSEOUT SUBMITTALS

PART 1 GENERAL....3
1.1 RELATED SECTIONS....3
1.2 SUBMITTALS....3
1.3 PROJECT RECORD DOCUMENTS....3
1.3.1 As-Built Drawings....3
1.3.1.1 Government Furnished Materials....3
1.3.1.2 Working As-Built and Final As-Built Drawings....3
1.3.1.3 Drawing Preparation....5
1.3.1.4 Computer Aided Design and Drafting (CADD) Drawings....5
1.3.1.5 Payment....6
1.3.2 As-Built Record of Equipment and Materials....6
1.3.3 Final Approved Shop Drawings....6
1.3.4 Construction Contract Specifications....6
1.3.5 Real Property Equipment....6
1.4 WARRANTY MANAGEMENT....6
1.4.1 Warranty Management Plan....6
1.4.2 Pre-Warranty Conference....7
1.4.3 Contractor's Response to Construction Warranty Service Requirements....7
1.4.4 Warranty Tags....9
1.5 MECHANICAL TESTING, ADJUSTING, BALANCING, AND COMMISSIONING....9
1.6 FINAL CLEANING....10
1.7 OPERATION AND MAINTENANCE MANUALS....10
PART 2 PRODUCTS....10
PART 3 EXECUTION....10

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 01 78 00
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.1 RELATED SECTIONS

Section 01 33 15 SUBMITTAL PROCEDURES FOR DESIGN-BUILD PROJECTS

1.2 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 01 33 15 SUBMITTAL PROCEDURES FOR DESIGN-BUILD PROJECTS and as described herein:

SD-02 Shop Drawings	Paragraph
As-Built Drawings; G	1.3.1
SD-03 Product Data	
As-Built Record of Equipment and Materials; G	1.3.2
Warranty Management Plan; G	1.41
Warranty Tags; G	1.4.4

1.3 PROJECT RECORD DOCUMENTS

1.3.1 As-Built Drawings

This paragraph covers as-built drawings completed, 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.

Drawings showing final as-built conditions of the project. The local language of Afghanistan, Pashto or Dari shall be added to project As-Built drawings. The final CADD as-built drawings shall consist of three (3) sets of electronic CADD drawing files in the specified format, and one (1) set of full size and one (1) set of half size paper copies of the approved as-built drawings. One electronic copy of the As-Built drawings and the paper copies of the As-Built drawings shall be delivered to the O&M Regional Site manager at the Resident Office or Area Office responsible for contract administration. Two electronic copies of the As-Built drawings shall be mailed or delivered to the KAF O&M Branch.

1.3.1.1 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.

1.3.1.2 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.

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:

a. Directions in the modification for posting descriptive changes shall be followed.

b. A Modification Circle shall be placed at the location of each deletion.

c. For new details or sections which are added to a drawing, a Modification Circle shall be placed by the detail or section title.

d. For minor changes, a Modification Circle shall be placed by the area changed on the drawing (each location).

e. 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.

f. For changes to schedules or drawings, a Modification Circle shall be placed either by the schedule heading or by the change in the schedule.

g. 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.

1.3.1.3 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.

1.3.1.4 Computer Aided Design and Drafting (CADD) Drawings

a. Only personnel proficient in the preparation of CADD drawings shall be employed to modify the contract drawings or prepare additional new drawings. Additions and corrections to the contract drawings shall be equal in quality and detail to that of the originals. Line colors, line weights, lettering, layering conventions, and symbols shall be the same as the original line colors, line weights, lettering, layering conventions, and symbols. If additional drawings are required, they shall be prepared using the specified electronic file format applying the same graphic standards specified for original drawings. The title block and drawing border to be used for any new final as-built drawings shall be identical to that used on the contract drawings. Additions and corrections to the contract drawings shall be accomplished using CADD files. The Contractor will be furnished "as-designed" drawings in AutoCAD Release 2007 or Microstation VM format compatible with a Windows XP operating system. The electronic files will be supplied on compact disc, read-only memory (CD-ROM). The Contractor shall be responsible for providing all program files and hardware necessary to prepare final as-built drawings.

b. Prior to submittal of the first design submittal involving CADD drawings, the Contractor shall prepare one typical CADD drawing for the project and furnish, via ENG Form 4025, the electronic CADD drawing file for review and approval by the Contracting Officer. All Government comments involving changes to this single drawing shall be accomplished and resubmittal(s) made until the Government is satisfied that all CADD Standards are being followed and all subsequent drawings will also be in compliance with these Standards.

c. When final revisions have been completed, the cover sheet drawing shall show the wording "RECORD DRAWING AS-BUILT" followed by the name of the Contractor in letters at least 5 mm high. All other contract drawings shall be marked either "As-Built" drawing denoting no revisions on the sheet or "Revised As-Built" denoting one or more revisions. Original contract drawings shall be dated in the revision block.

d. After Government approval of all of the working as-built drawings for a phase of work, the Contractor shall prepare the final CADD as-built drawings for that phase of work and submit two sets of full size paper copy prints of these drawings for Government review, comparison with approved red-line marked up drawings, and approval. The Government will promptly return one set of prints annotated with any necessary corrections to the CADD file(s) if corrections are required prior to approval. Within 20 days of substantial completion of all phases of work, the Contractor shall submit the final as-built drawing package for the entire project. The submittal shall consist of one set of electronic files on compact disc, read-only memory (CD-ROM), one set of full size paper prints and one set of the approved working as-built drawings. They shall be complete in all details and identical in form and function to the contract drawing files supplied by the Government. Any transactions or adjustments necessary to accomplish this is the responsibility of the Contractor. The Government reserves the right to reject any drawing files it deems incompatible with the CADD system. Upon approval by the Government of the final as-built drawing package for the entire project, the Contractor shall provide the number of as-built copies noted above.

e. Paper prints, drawing files and storage media submitted will become the property of the Government upon final approval. Failure to submit final as-built drawing files and marked prints as specified shall be cause for withholding any payment due the Contractor under this contract. Approval and acceptance of final as-built drawings shall be accomplished before final payment is made to the Contractor.

f. The contractor shall in addition to other requirements, provide all as-built documentation in PDF format maintaining all drawing layer information.

1.3.1.5 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.

1.3.2 As-Built Record of Equipment and Materials

The Contractor shall furnish one copy of preliminary record of equipment and materials used on the project 15 days prior to final inspection. This preliminary submittal will be reviewed and returned 2 days after final inspection with Government comments. Two sets of final record of equipment and materials shall be submitted 10 days after final inspection. The designations shall be keyed to the related area depicted on the contract drawings. The record shall list the following data:

Furnish the record of materials used in the following format:

MATERIALS DESIGNATION	SPECIFICATION	MANUFACTURER	MATERIALS USED (MANUFACTURER'S DESIGNATION)	WHERE USED

1.3.3 Final Approved Shop Drawings

The Contractor shall furnish final approved project shop drawings 30 days after transfer of the completed facility.

1.3.4 Construction Contract Specifications

The Contractor shall furnish final as-built construction contract specifications, including modifications thereto, 30 days after transfer of the completed facility.

1.3.5 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.

1.4 WARRANTY MANAGEMENT

1.4.1 Warranty Management Plan

The Contractor shall develop a warranty management plan which shall contain information relevant to the Contract Clause 52.246-21 entitled “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:

   I. Name of item.
   II. Model and serial numbers.
   III. Location where installed.
   IV. Name and phone numbers of manufacturers or suppliers.
   V. Names, addresses and telephone numbers of sources of spare parts.
   VI. 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.
   VII. Cross-reference to warranty certificates as applicable.
   VIII. Starting point and duration of warranty period.
   IX. Summary of maintenance procedures required to continue the warranty in force.
   X. Cross-reference to specific pertinent Operation and Maintenance manuals.
   XI. Organization, names and phone numbers of persons to call for warranty service.
   XII. 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.

1.4.2 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.

1.4.3 Contractor's Response to Construction Warranty Service Requirements

Following oral or written notification by the Contracting Officer, the Contractor shall respond to construction warranty service requirements in accordance with the "Construction Warranty Service Priority List" and the three categories of priorities listed below. The Contractor shall submit a report on any warranty item that has been repaired during the warranty period. The report shall include the cause of the problem, date reported, corrective action taken, and when the repair was completed. If the Contractor does not perform the construction warranty within the timeframes specified, the Government will perform the work and backcharge the construction warranty payment item established.

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.

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.

Third Priority Code 3. All other work to be initiated within 3 work days and work continuously to completion or relief.

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.

1.4.4 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.

Type of product/material_____.
Model number_____.
Serial number_____.
Contract number_____.
Warranty period_____from_____to_____.
Inspector's signature_____.
Construction Contractor_____.
Address_____.
Telephone number_____.

Warranty contact_____
Address_____.
Telephone number_____.

Warranty response time priority code_____.
WARNING - PROJECT PERSONNEL TO PERFORM ONLY OPERATIONAL MAINTENANCE DURING THE WARRANTY PERIOD.

1.5 MECHANICAL TESTING, ADJUSTING, BALANCING, AND COMMISSIONING

Prior to final inspection and transfer of the completed facility; all reports, statements, certificates, and completed checklists for testing, adjusting, balancing, and commissioning of mechanical systems shall be submitted to and approved by the Contracting Officer as specified inapplicable technical specification sections.

1.6 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.

1.7 OPERATION AND MAINTENANCE MANUALS

Two electronic copies in English of all Operation and Maintenance (O&M) manuals shall be submitted as follows:

U.S. Army Corps of Engineers
Afghanistan Engineering District – South
Att:, O&M
Kandahar Air Field, Afghanistan
APO, AE 09355

One hard paper copy and an electronic copy of the O&M manuals in English, Pashto, and Dari shall be delivered to the O&M Regional Site manager at the Resident Office or Area Office responsible for contract administration.

Operation manuals and maintenance manuals shall be provided in a common volume, complete, clearly differentiated and separately indexed.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- END OF SECTION --

SECTION 01 78 10
OPERATION AND MAINTENANCE DATA

1. PART 1 GENERAL 3
1.1 SUMMARY 3
1.1.1 General Requirements 3
1.1.2 Related Sections 3
1.1.3 Submittals 3
1.2 SUBMISSION OF OPERATION AND MAINTENANCE DATA 3
1.2.1 Package Quality 4
1.2.2 Package Content 4
1.2.3 Changes to Submittals 4
1.2.4 Testing and Training Evaluation and Revision of the O&M Data Package Submittal 4
1.2.5 Final O&M Data Package 4
1.3 TYPES OF INFORMATION REQUIRED IN O&M DATA PACKAGES 4
1.3.1 Operating Instructions 4
1.3.2 Preventive Maintenance 5
1.3.3 Corrective Maintenance (Repair) 5
1.3.4 Corrective Maintenance Work-Hours 6
1.3.5 Appendices 6
1.3.6 Parts Identification 6
1.4 O&M DATA PACKAGE FORMAT 7
1.4.1 Initial O&M Data Packages 7
1.4.2 Final O&M Data Package 7
1.4.3 Hard Bound Format 7
1.4.4 Electronic Format 8
2. PART 2 PRODUCTS 8
2.1 BINDER REQUIREMENTS 8
3. PART 3 EXECUTION 8
3.1 TRAINING 8
3.2 SPECIFIC REQUIREMENTS 8
3.3 PARTS CATALOGS 8
3.4 OPERATIONS DATA 9
3.5 MAINTENANCE DATA 9
3.6 FAILURE TO SUBMIT OPERATIONS AND MAINTENANCE DATA 9
3.7 PAYMENT 9

THIS PAGE INTENTIONALLY LEFT BLANK

1. PART 1 GENERAL

1.1 SUMMARY

This Section includes the requirements for Contractor Operation and Maintenance (O&M) data. This section specifies the general requirements, O&M data language, quality and content, as well as types of information and operations to be covered.

1.1.1 General Requirements

The Contractor shall furnish all labor, tools, instruments, and consumable materials required to provide all O&M data specified. The Contractor shall be responsible for costs associated with outside subcontractors or testing agencies required to perform or certify the work.

1.1.2 Related Sections

a. Section 01 33 15 SUBMITTAL PROCEDURES FOR DESIGN-BUILD PROJECTS.

b. Section 01 33 16 DESIGN BUILD AFTER AWARD

c. Section 016400 START UP, TESTING AND COMMISSIONING

d. Section 01 66 40 TRAINING

e. Section 017700 CLOSEOUT PROCEDURES

f. Section 017810 OPERATION AND MAINTENANCE DATA

1.1.3 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 information shall be submitted to the Contracting Officer in accordance with the provisions of Section 01 33 15, SUBMITTAL PROCEDURES FOR DESIGN-BUILD PROJECTS:

Submittals	Paragraph
SD-03/08/10	
Operation and Maintenance Data; G	1.2
Pre-commissioning Data Package with Operation and Maintenance Data	1.2.4
Final Data Package with Operation and Maintenance Data	1.2.5

1.2 SUBMISSION OF OPERATION AND MAINTENANCE DATA

Contractor shall submit Operation and Maintenance 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 01 33 15 SUBMITTAL PROCEDURES FOR DESIGN-BUILD PROJECTS. The O&M data shall be “bi-lingual” in Pashto and English.

1.2.1 Package Quality

Documents must be fully legible. Poor quality copies and material with hole punches obliterating the text or drawings will not be accepted.

1.2.2 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.

1.2.3 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.

1.2.4 Testing and Training Evaluation and Revision of the O&M Data Package Submittal

The approved pre-commissioning data package with manufacturer-originated changes or revisions shall be used for the testing and training identified in Section 016400 START UP, TESTING AND COMMISSIONING and Section 016640 TRAINING. During the execution of the requirements of Sections 01 64 00 and 01 66 40 any errors or deficiencies identified by the contractor, site or government personnel shall be formally identified, tracked (a resolution log), and incorporated into the O&M data package. The resolution log shall include a description of the issue, the source of the issue's identification, and a description of how the issue what addressed including reference to the location in the data package. The contractor shall submit both the revised O&M data package and resolution log for government approval at least 30 days prior to Site Closeout.

1.2.5 Final O&M Data Package

After all comments and revisions have been incorporated into the O&M data package, and the government has approved the O&M Data Package, the contractor shall submit the Final O&M data package for that site in accordance with Section 017700 CLOSE OUT PROCEDURES and the requirements listed below.

1.3 TYPES OF INFORMATION REQUIRED IN O&M DATA PACKAGES

1.3.1 Operating Instructions

Include specific instructions, procedures, and illustrations for the following phases of operation:

1.3.1.1 Safety Precautions

List personnel hazards and equipment or product safety precautions for all operating conditions.

1.3.1.2 Operator Prestart

Include procedures required to set up and prepare each system for use.

1.3.1.3 Startup, Shutdown, and Post-Shutdown Procedures

Provide narrative description for Startup, Shutdown and Post-shutdown operating procedures including the control sequence for each procedure.

1.3.1.4 Normal Operations

Provide narrative description of Normal Operating Procedures. Include Control Diagrams with data to explain operation and control of systems and specific equipment.

1.3.1.5 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.

1.3.1.6 Operator Service Requirements

Include instructions for services to be performed by the operator such as lubrication, adjustment, inspection, and recording gage readings.

1.3.1.7 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.

1.3.2 Preventive Maintenance

Include the following information for preventive and scheduled maintenance to minimize corrective maintenance and repair.

1.3.2.1 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.

1.3.2.2 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.

1.3.3 Corrective Maintenance (Repair)

Include manufacturer's recommended procedures and instructions for correcting problems and making repairs.

1.3.3.1 Troubleshooting Guides and Diagnostic Techniques

Include step-by-step procedures to promptly isolate the cause of typical malfunctions. Describe clearly why the checkout is performed and what conditions are to be sought. Identify tests or inspections and test equipment required to determine whether parts and equipment may be reused or require replacement.

1.3.3.2 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.

1.3.3.3 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.

1.3.3.4 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.

1.3.3.5 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.

1.3.3.6 Exploded View, Section, and Assembly Drawings

Include drawings clearly indicating the position of parts in each final assembly, as well as detailed indications or descriptions of how parts or sub-assemblies fit into the greater assembly. Note critical assembly procedures or steps, as well as requirements for assembly with consumables, such as anti-galling or threadlocking compounds. Include torque values for fasteners in both foot-pounds and Newton-meters on the drawings.

1.3.4 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.

1.3.5 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:

1.3.6 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

1.3.6.1 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.

1.3.6.2 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.

1.3.6.3 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.

1.3.6.4 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.

1.4 O&M DATA PACKAGE FORMAT

All O&M Data Packages shall be submitted in accordance with the requirements of Section 013315 SUBMITTAL PROCEDURES FOR DESIGN-BUILD PROJECTS.

1.4.1 Initial O&M Data Packages

All Non-Final O&M data packages shall be submitted in both unbound hard copy format and electronic format in Adobe-Acrobat (.pdf) file format. Each submittal shall include a minimum of three (3) copies in both formats.

1.4.2 Final O&M Data Package

The Final O&M Data package for each site shall be submitted in both a hard bound copy and electronic format after all final revisions have be incorporated and formal government comments addressed, including those identified during the testing required in Section 016400 START UP, TESTING AND COMMISSIONING and Section 016640 TRAINING.

1.4.3 Hard Bound Format

The contractor shall provide a minimum of 6 (six) hard bound copies of the O&M data package. Each data package cover shall be clearly titled in all three languages listed above, detailing at a minimum the site and date. The copies shall be sectioned by language.

1.4.4 Electronic Format

The electronic format shall be Adobe-Acrobat (.pdf) and fit on a single DVD/CD. The contractor shall provide a minimum of 6 (six) electronic copies of the O&M data package. The data package shall be divided into three files, one for each of the three languages listed above. Each file shall have each chapter and/or section bookmarked with title.

2. PART 2 PRODUCTS

2.1 BINDER REQUIREMENTS

Data for equipment shall be assembled in a binder for 8 1/2- by 11-inch sheets with slide binding or screwpost fastening for replacement. Loose-leaf ring binders are not acceptable. A title on the cover shall show the project name, equipment or system, contract, and bid item numbers.

3. PART 3 EXECUTION

3.1 TRAINING

the Contractor shall provide operational and maintenance training for all systems furnished under this contract in accordance with this section and Section01 66 40 Training. 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 aide 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 video record the training session on CD/DVD and provide the recordings to the Government.

3.2 SPECIFIC REQUIREMENTS

Shop assembly or special drawings for manuals or parts catalogs shall be of a size that requires folding only in left to right coordinate. Each sheet shall be numbered and an index shall be provided. All standard catalog cuts, manufacturer's data, parts sheets, or illustrations shall be originals. One copy of such manual shall contain all original copies. Non-permanent copies are not acceptable. All nonapplicable data such as description of other models, optional equipment not included, etc. shall be marked out. If reference is made to other drawings or data they shall be included. The manual shall list equipment covered; the manufacturer; and name, address, and telephone number of the local representative.

3.3 PARTS CATALOGS

Parts catalogs shall include identification, nomenclature, part numbers, required parts, recommended spare parts stocked, and spare parts supplied. Data shall match equipment furnished. Standard catalog data will not be acceptable unless irrelevant parts are marked out and relevant parts are clearly identified.

3.4 OPERATIONS DATA

Operations data in the Operation and Maintenance Manual shall include operating instructions, procedures, sequences, and precautions; and description of parts. Subcontractors, suppliers, and manufacturers shall be coordinated to assure complete submittals on interrelated components. Instructions shall be included for all systems designed or furnished.

3.5 MAINTENANCE DATA

Maintenance data in the Operation and Maintenance Manual shall include instructions for lubrication, dismantling, assembly, repair and adjustment; parts catalogs; electric schematic and connection diagrams; hydraulic circuit diagrams with control and relief valve settings; control and interlock system diagrams; and lists of special tools required.
Lubrication instructions shall be for service intended and shall include tables indicating items, frequencies, grades, and types of lubricants. Instructions shall include clearances, bolt torques, pressure settings, and other data.

3.6 FAILURE TO SUBMIT OPERATIONS AND MAINTENANCE DATA

Where operations and maintenance (O&M) data are required, failure to furnish the data is justification to hold or adjust the retained percentage in accordance with Section Contract Clause 52.232-5 entitled "PAYMENTS UNDER FIXED PRICE CONSTRUCTION CONTRACTS". Final payment will not be made until all six copies of the O&M manuals have been accepted. Moreover, failure to provide O&M Manuals as required in this section will result in a final unsatisfactory overall performance rating, despite the nature of all other ratings.

3.7 PAYMENT

Separate payment will be not be made for compliance with this section. All costs for Operations and Maintenance Data are to be included in the contract prices of the various items. The Operations and Maintenance Data will be jointly inspected for accuracy and completeness by a GQAR and a responsible representative of the Contractor prior to submission. Final payment will not be made until the final Operations and Maintenance Data as required in this section will result in a final unsatisfactory overall performance rating, despite the nature of all other ratings.

-- END OF SECTION --

SECTION 35 20 16.29 25

CONE VALVE OPERATING MECHANISMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Designing, manufacturing, and installing new operating mechanisms for the three existing 84-inch Rotovalve cone valves.

1.2 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. Where a date is given for referenced standards, that edition shall be used. Where no date is given for referenced standards, the latest edition available on the date of Notice Inviting Bids shall be used.

B. American National Standards Institute (ANSI): Standards as specified herein.

C. American society for Testing and Materials (ASTM): Standards as specified herein.

D. American Welding Society (AWS): Standards as specified herein.

E. Steel Structures Painting Council (SSPC): Standards as specified herein.

1.3 SUBMITTALS

A. Submit shop Drawings and Data for the replacement operating mechanisms for the existing 84-inch Rotovalve cone valves, including material description and overall assembly of the components.

B. Provide service manuals for the refurbished 84-inch Rotovalve cone valves which shall include all previously approved drawings and data, and operation and maintenance instructions.

C. Provide written instructions for installation of the operating mechanism components to be replaced.

D. Prepare and submit a commissioning plan for the refurbished Rotovalve cone valves to demonstrate that the valves function as intended, manufactured, and designed. As a minimum, the commissioning shall include a full closure

Rotovalve cone valve closure for each valve, with the downstream fixed-cone valve open 15 percent. Refer to the U.S. Bureau of Reclamation – Inspection of Mechanical Features, by E. E. Gonzales, May 1964, Pages 1through 13.

E. Submit a plan for measuring and reporting the leakage from the 84-inch Rotovalve cone valves at full reservoir head, with the valves fully closed.

PART 2 PRODUCTS

2.1 CONE VALVE OPERATING MECHANISMS

A. The engineering data required for designing the new equipment is in the possession of the Rodney Hunt Company, Orange MA, as they have the original drawings and data for the Rotovalve cone valves, and manufacture these types of valves.

B. The operating system components described below shall be installed to replace the existing operating mechanisms.

C. The Rotovalve cone valve operating mechanisms consist of all components connected to the hydraulic cylinders required to lift and rotate the valve plug.

D. The components include, but are not limited to the roller, rotator lever, operator rod, lift lever, lifter link, lift nut, crosshead, guide rods, and seating adjuster.

E. The design, fabrication, and selection of materials shall be the responsibility of the Contractor and supplier of the components, but subject to review and approval.

F. Other valve components required to restore the Rotovalve cone valves to proper operating condition shall be included.

G. The trunnion greasing system shall also be replaced.

H. Spare Parts and Tools

1. Provide sufficient spare parts and tools (including American wrenches for American fasteners, if furnished) to maintain the equipment for a period of at least 10 years.

I. Shipping

1. The hydraulic cylinders shall be shipped with the piston rods retracted and filled with the hydraulic oil specified. Risers shall be provided at the cylinder ports to allow for thermal expansion of the oil.

2. Operating mechanism components shall be wrapped, crated, and otherwise protected during shipment. All components shall be identified and labeled.

2.2 MARKING AND COATINGS

A. Marking: Slide gate markings shall include attached nameplates, listing manufacturer, class, size, and year of manufacture.

B. Coatings:

1. Shop finish the exterior and interior of the operating mechanism components, as follows:

a) Surface Preparation:	SSPC-SP-6	
b) First Coat:	High Solids Epoxy	5.0 to 8.0 Mils DFT
c) Second Coat:	High Solids Epoxy	5.0 to 8.0 Mils DFT
d) Total DFT		10.0 to 16.0 Mils

2. Unless otherwise specified, stainless steel and bronze surfaces shall not be painted.

3. Provide 6 gallons of paint for touchup and coating repair.

PART 3 EXECUTION

3.1 GENERAL

A. Equipment removed from the site for rehabilitation and replacement shall become the property of the Contractor.

B. Install the Rotovalve cone valve operating mechanism components in accordance with the manufacturer's instructions and these specifications.

3.2 CONE VALVE OPERATING MECHANISM INSTALLATION

A. The existing operating mechanism on each Rotovalve cone valve shall be removed for disposal off-site.

B. Prior to installation of new operating mechanisms, the Rotovalve cone valves shall be thorough cleaned and inspected to observe any broken or damaged components remaining in the valves. Any damaged components shall be repaired or replaced prior to installing any new equipment.

C. Install the new operating mechanisms in accordance with the manufacturer's instructions.

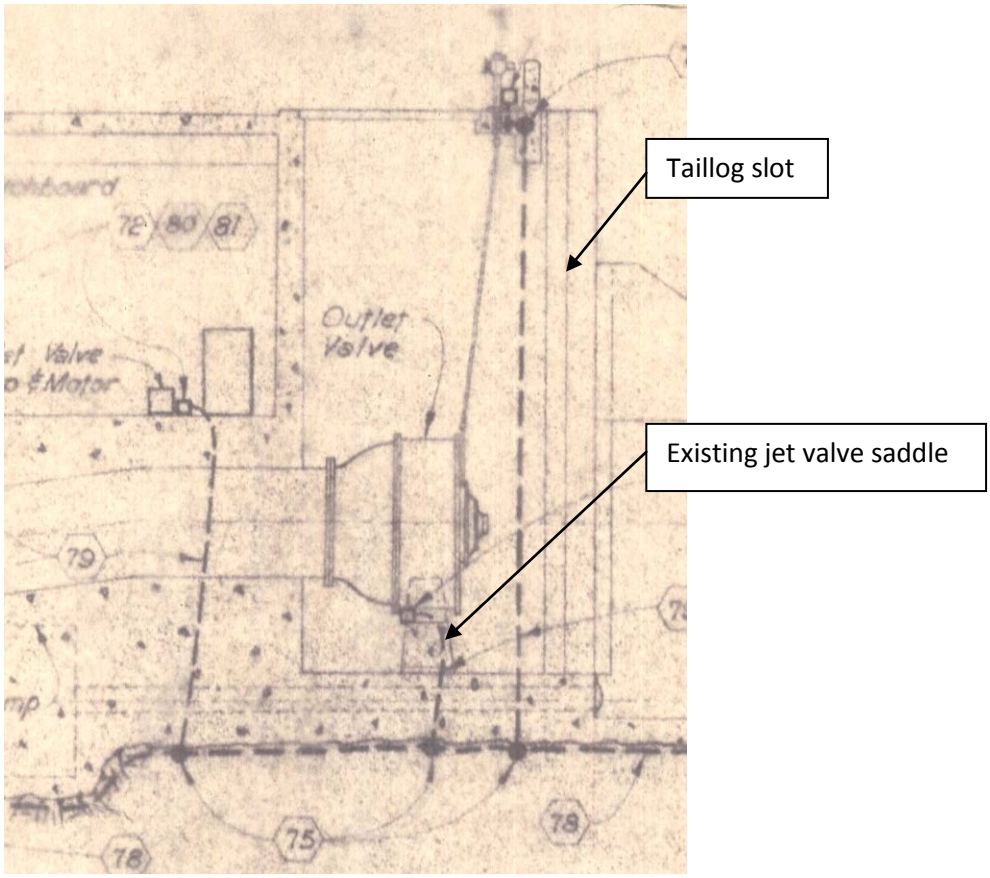
D. Operate each Rotovalve cone valve sufficiently to demonstrate that the plug lifts and begins rotation, then reverse the procedure to restore the valve to the initial position. Operate the Rotovalve cone valves through two open-close cycles, while unwatered or in the balanced-head condition.

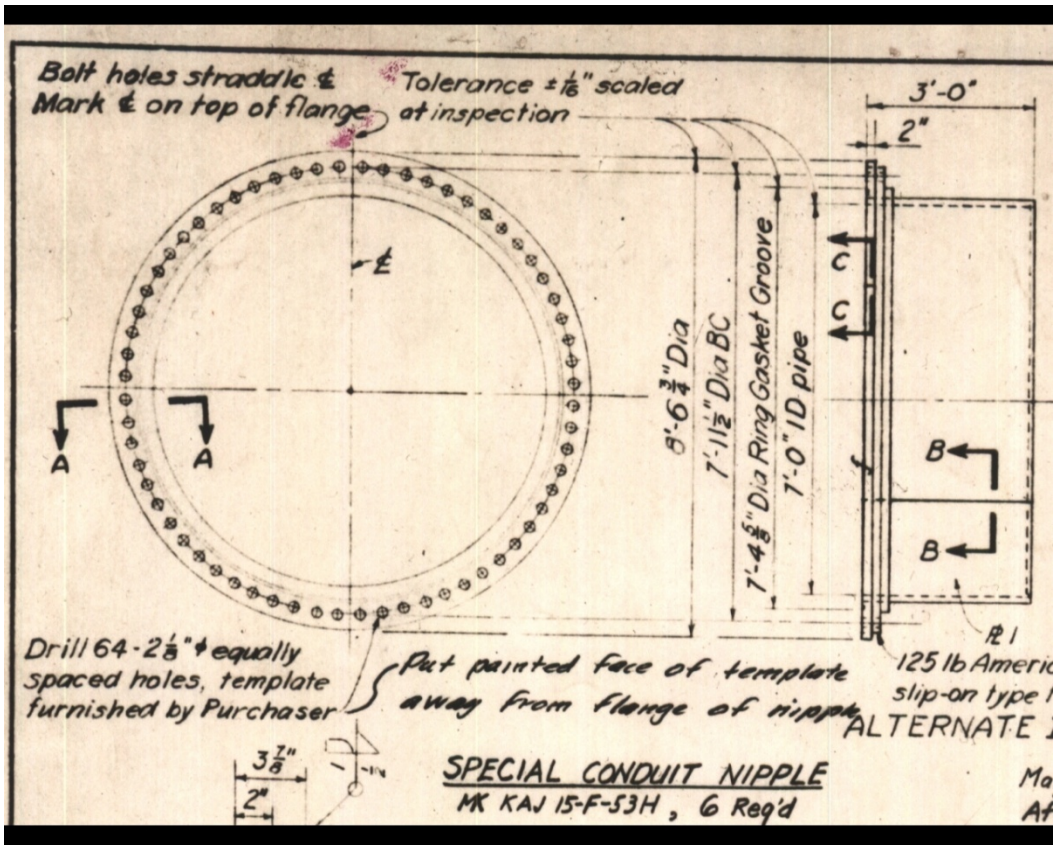
E. Fully commission the Rotovalve cone valves according to the commissioning plan submitted.

END OF SECTION

HOLLOW JET VALVE CONFIGURATION SECTION35.20.16.25 A1

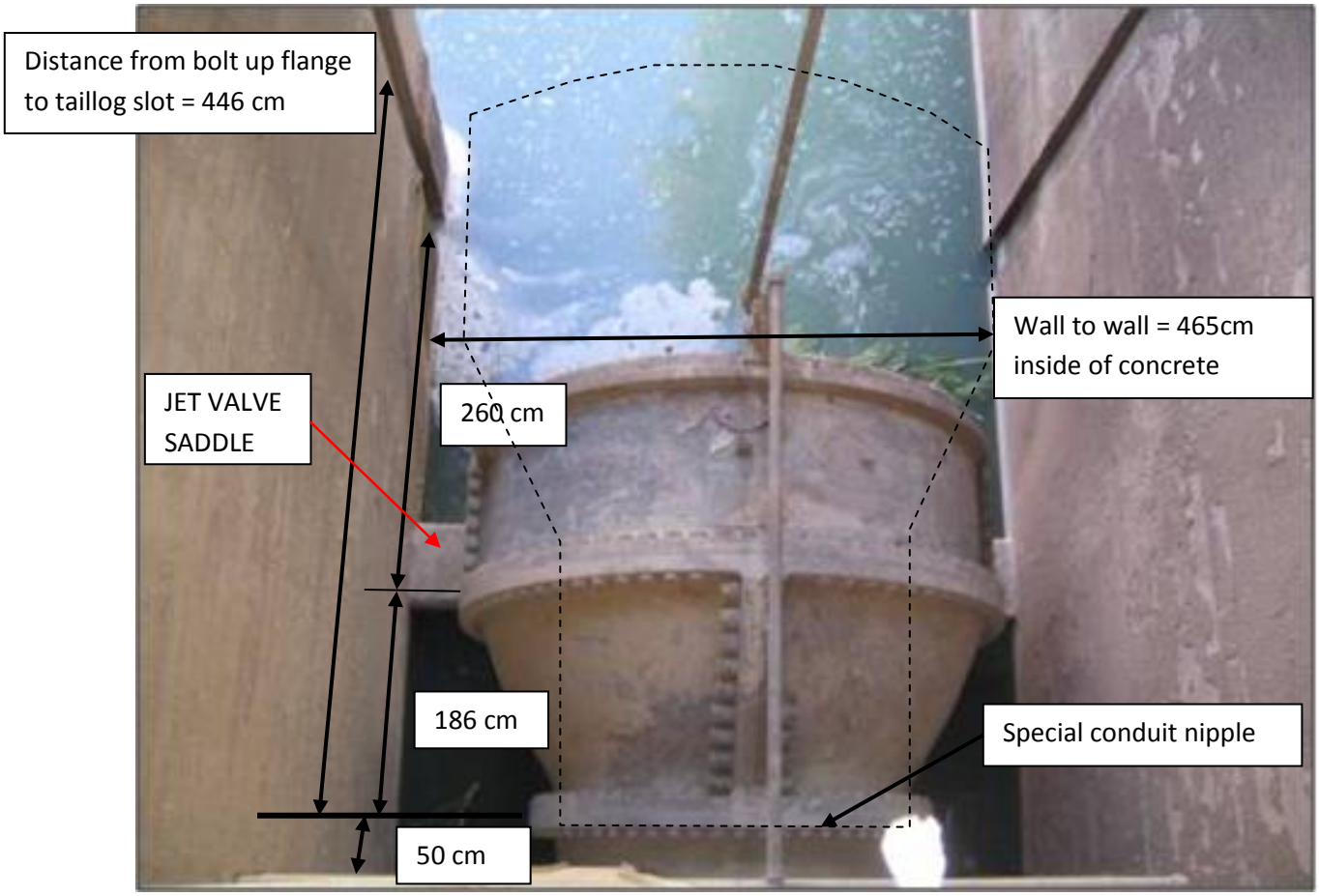
THESE DRAWINGS/PHOTOS ARE FOR REFERENCE ONLY, DIMENSION MUST BE CONFIRMED BY CONTRACTOR





HOLLOW JET VALVE CONFIGURATION SECTION35.20.16.25 A1

Flange to bolt jet valve to



THESE DRAWINGS/PHOTOS ARE FOR REFERENCE ONLY, DIMENSION MUST BE CONFIRMED BY CONTRACTOR

New Fixed Cone Valves that are commercially available are generally longer
Than the exisitng Holoow Jet Valve Type and therefore do not fit within the existing tail log slots
As illustrated by the dashed blak lines.

SECTION 35 20 19.23 25
FIXED-CONE VALVES

PART 1 GENERAL

1.1 SUMMARY

A. This section includes removal of three existing 84-inch hollow-jet valves.

B. This section includes furnishing and installing three 84-inch motor-operated, hooded, fixed-cone valves to replace the existing hollow-jet valves.

1.2 REFERENCES

A. American Gear Manufacturers Association (AGMA).

B. American National Standards Institute (ANSI): Standards as specified herein.

C. American Society for Testing and Materials (ASTM)

1. ASTM A36 Carbon Structural Steel
2. ASTM A 240 Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
3. ASTM A 276 Stainless Steel Bars and Shapes.
4. ASTM A 499 Steel Bars and Shapes, Carbon Rolled from “T” Rails
5. ASTM A 516 Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower-Temperature Service.
6. ASTM F 593 Stainless Steel Bolts, Hex Cap Screws, and Studs.
7. ASTM F 594 Stainless Steel Nuts.

D. American Water Works Association (AWWA)

1. AWWA C542 Electric Motor Actuators for Valves and Slide Gates

E. American Welding Society (AWS): Standards as specified herein.

F. National Electrical Manufacturers Association (NEMA)

1. NEMA 250 Enclosures for Electrical Equipment (1000V Maximum)

G. NSF International (NSF)

1. NSF 61 Drinking Water System Components- Health Effects

H. The Society for Protective Coatings (SSPC)

1. SSPC SP 1 Solvent Cleaning
2. SSPC SP 10/NACE No. 2 Near-White Blast Cleaning
3. SSPC SP 6/NACE No. 3 Commercial Blast Cleaning
4. SSPC PA 1 Shop, Field, and Maintenance Painting of Steel

1.3 SUBMITTALS

A. Submit in accordance with Section 01 33 00: Submittals.

B. Shop Drawings and Product Data

1. Submit for review and approval prior to demolition and fabrication.
2. Submit a detailed plan for removal and disposition of three existing 84-inch hollow-jet valves.
3. Shop drawings showing details of the 84-inch fixed-cone valves, motor-operators, and accessories.
4. All data required to locate and install the fixed-cone valves and accessories and demonstrate compliance with the specified material requirements.

C. Closeout Submittals

1. Service manuals for the fixed-cone valves, motor-actuators, and accessories.
2. Manufacturer's prepared table of valve discharge coefficients with one axis showing the discharge coefficient and the other axis showing the percent open or (sleeve travel/diameter).

1.4 QUALITY ASSURANCE

A. Valve manufacturer shall have at least 5 years previous experience with hooded fixed-cone valves of comparable size, head, and flow application.

1.5 DELIVERY, STORAGE, AND HANDLING

A. The valves shall be shipped fully assembled, except that the electric motor-operator and connecting shafts may be removed. The sleeves shall be forced in the closed position to prevent movement.

B. After painted surfaces are dry, coat machined surfaces and holes, plain and threaded, with rust preventive grease prior to shipping.

C. All parts of the valves shall be crated, wrapped, and otherwise protected from damage during shipment. Repair damage to the valve and appurtenances (including coating) caused by inadequate or careless handling, loading, and shipping practices, at no cost to the Government.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable manufacturers: Rodney Hunt Company, Steel-Fab, Inc., or approved equal.

2.2 DESIGN REQUIREMENTS

A. The motor-operated 84-inch hooded fixed-cone valves shall be designed for 265 feet of reservoir head and designed with ample factors of safety for satisfactory operation under the specified head conditions.

B. The hooded fixed-cone valves shall have a minimum coefficient of discharge of 0.78.

C. The 84-inch fixed-cone valves shall be required to control the flow of water from the 84-inch steel conduit. The valves will be used to control and aerate the free discharge of water into the atmosphere and will be designed to operate at any position between 5 percent open and fully open without excess vibration.

D. The valves and electric motor actuators shall be furnished with all necessary parts and accessories indicated on the Drawings, specified, or otherwise required for a complete, properly operating installation.

2.3 FIXED-CONE VALVES

A. Materials: Conform to the following:

1. Valve Body and Valve Sleeve: Carbon Steel, ASTM A 516 Grade 70; and stainless steel ASTM A 240, Type 304L.
2. Hood: Stainless Steel, ASTM A240, Type 304L
3. Seats: Stainless Steel, ASTM A240 or A276, Type 304L
4. Packing Glands: Stainless Steel, ASTM A276, Type 304
5. Operating Stems: Stainless Steel, ASTM A 276, Type 304

B. Fixed-Cone Valve Components

1. Valve Body

a. The valve body shall be cylindrical with internal radial ribs, have a deflector cone on the downstream end, and include an upstream end flange for connection to the flanged outlet pipe. The internal ribs and deflector cone shall extend beyond the downstream end of the valve body a sufficient distance to permit the rated discharge capacity.

b. The deflector cone shall have an included angle of 90 degrees to provide proper operation with the concrete stilling chamber surrounding the valve.

c. The sealing and sliding surfaces of the body shall be stainless steel. Bearing surfaces of the body upon which the valve sleeve shall slide shall be stainless steel.

d. The mounting flange shall be in accordance with AWWA Class E, for use with either a flat-faced or O-ring gasket. The flange bolt pattern shall match the existing flange on the 84 inch spool, which is shown with an O-ring groove (Contractor to verify dimensions and gasket configuration). The drawing for the existing pipe flange is included with the Contract Drawings.

e. Provide an adjustable support under the fixed-cone valve bodies to reduce the valve loading on the existing pipe flange that extends from the wall, to be attached to the concrete floor of the valve structure with stainless steel anchor bolts and grout pads.

2. Valve Sleeve

a. The valve sleeve shall consist of a cylinder designed to slide over the valve body. The sleeve will slide upstream to open and downstream to close off the valve ports. The sleeve shall seal continuously against the valve body on the upstream end.

b. Bearing surfaces which slide upon the valve body shall be bronze.

3. Hood

a. The hood shall be attached to the downstream end of the sleeve. The hood will reduce the discharge spray by confining the exiting water jet.

b. The hood shall have several radial internal rib supports, arranged to slide on a self-lubricating bushing. The rib supports shall be hollow with an opening of sufficient size to provide aeration of the jet.

c. The design of the hood shall be based on previous designs of successful applications of similar installations, and shall have a maximum outside diameter of 150 inches.

4. Seals

a. The fixed-cone valves shall be designed to withstand the maximum reservoir head in a closed position. The valve shall effectively seal to prevent damage to the seals and seats by small leaks during the time the valve is closed.

b. The valve body shall have a removable seat attached with stainless steel fasteners to the downstream end. The sealing contact surface of the seat shall be stainless steel.

c. The upstream end of the valve sleeve or body shall be machined to receive a packing seal between the sleeve and valve body. The seal shall slide upon a stainless steel surface and shall be retained by a stainless steel gland and fasteners.

C. Valve Motor-Actuator

1. The electric motor-actuator shall include the motor, operator unit gearing, limit switch gearing, limit switches, torque switches, integral reversing starter, local control facilities, valve position transmitter, stem nut, declutch lever, auxiliary hand wheel, and terminals for remote control and indication connections, as a self-contained unit. A mechanically connected and an integral digital LCD position indicator shall be furnished with the operator.

2. The valve actuators shall be Aura, Rotor, Limitorque, or approved equal, and shall be furnished in accordance with AWWA C542.

3. Motor-actuators shall be mounted on cast iron floor stand pedestals to be installed on the floor or grating above the fixed-cone valves, with the handwheel approximately 36 inches above the floor.

4. All electrical enclosures shall be lockable, and the unit shall be weatherproof, NEMA 250, Type 4, as a minimum.

5. Integral Motor Starter and Transformer:

a. The reversing starter, control transformer, and local controls shall be integral with the valve actuator, suitably housed to prevent breathing and condensation buildup.

b. The controls supply transformer shall be fed from two of the incoming three phases. It shall have the necessary tapings and be adequately rated to provide power to the following functions:

1) 115 VAC energization of the contactor coils
2) 24 VDC output where required for remote controls
3) Supply all the internal electrical circuits

c. The primary windings shall be protected by replaceable fuses.

d. The reversing starter shall be rated for at least 60 starts per hour.

6. Motor shall be of high torque, totally enclosed, non-ventilated construction, with motor leads brought into the limit switch compartment without having external

piping or conduit box. Motor insulation shall be NEMA Class F. Maximum motor temperature rise shall be limited to Class B insulation values in accordance with NEMA MG-1.

7. Motor shall be of sufficient size to open or close the fixed-cone valve against the maximum expected differential pressure when voltage to the motor terminals is 10 percent above or 20 percent below motor nameplate voltage. The motor duty rating shall be sufficient for one complete open to close to open cycle (or reverse) without exceeding its temperature rating. Motor shall be prelubricated and all bearings shall be anti-friction type. Motor temperature shall be sensed by a thermostat to protect against overheating.
8. Power supply: 400 volts, 3-phase, 50 Hz for motors and controls.
9. Actuator shall be double reduction unit with the capability of quickly changing the output speed with a simple motor change. Gears shall be manufactured in accordance with AGMA standards.
10. The valve motor-operator shall be designed to operate the fixed-cone valve through full travel in either the opening or closing direction in approximately 7 minutes.
11. The valve actuator shall have a minimum of two limit switch assemblies and a minimum of eight heavy-duty contacts. Contacts shall be convertible from NO to NC or reverse.
12. Provide control stations direct mounted on the actuator. Three pushbuttons or a three position selector switch labeled “OPEN”, “CLOSE”, “STOP”, one selector switch labeled “LOCAL”, “OFF”, ”REMOTE”, and two indicating lamps, RED for open and Green for closed, shall be furnished on the control station. The control station shall be suitable for outdoor service.
13. The indicating lamps shall be rated for 115 VAC, 50 Hz, single-phase. The selector switch shall have a minimum of two electrically separate contacts for each position. The pushbutton and/or selector switch contacts shall be rated for 115 VAC, 50 Hz, single-phase, 5 amperes continuous current.
14. Provide a handwheel for manual operation. The handwheel shall not rotate during motor operation. When in manual operating mode, the unit shall remain in this mode until motor is energized at which time the valve operator will automatically return to electric operation, and shall remain in motor position until handwheel operation is desired. Movement from motor operation to handwheel operation shall be accomplished by a positive declutching lever that will disengage the motor and motor gearing mechanically but not electrically. Provide the lever with a tamperproof hasp, padlockable when disengaged from hand operation. Hand operation shall be reasonably fast and require not more than 40 lbs. of rim effort at a maximum required torque. It shall not be possible for the unit to be simultaneously in manual and motor operation. The handwheel shall be at least 15 inches in diameter.
15. Motor and controller may have an internal, self-controlling heater(s) for dehumidification of the electrical components in the damp operating atmosphere, if required by the manufacturer. If supplied, the heater(s) shall be 115 VAC, single-phase, 50 Hz, not exceeding 500 watts, and shall have a separate independent power supply.
16. Provide a mechanical and electronic position indicator. (See para 2.3(C)(1) The position indicator shall be an easily readable dial or electronic display, calibrated from 0 to 100 % valve position in increments of 10 percent or less.
17. Provide a position transmitter consisting of a precision potentiometer and resistance to current convertor or integrally mounted output card for remote valve position indication. The potentiometer shall have a 0.25% linearity and

0.15% resolution. The potentiometer shall be rated a minimum of 3 watts. The resistance to current convertor shall have a 4 - 20 ma output capable of driving a 1200 ohm load.

18. The actuator shall be capable of functioning in an ambient temperature range from -20 degrees F to 120 degrees F.
19. The actuator shall be supplied with a startup kit comprising installation instructions, electrical wiring diagram, and sufficient spare cover screws and seals to provide for loss during the commissioning period.
20. The Actuator shall be performance tested and individual certificates shall be supplied. The test equipment should simulate a typical valve load, and the following parameters shall be recorded:

    a. Current at maximum torque setting
    b. Torque at maximum torque setting
    c. Actuator output speed or operating time
    d. In addition, test certificate should record details of the specification, such as gear ratios for both manual and electric operation, closing direction, and wiring diagram number.

D. Fabrication

1. Welding procedures, materials, and equipment shall be in accordance with American Welding Society (AWS) D1.1 and D1.6.
2. All welds shall be stress relieved by vibratory stress relieving prior to final machining. At a minimum all CJP welds in the body cylinder tube shall be inspected using the Ultrasonic Examination Method (UT); remaining welds shall be inspected using either the Magnetic Particle Examination method (MT) or by the Liquid Penetrant Examination method.

E. Shop Testing

1. Notification: Notify the CONTRACTING OFFICER in writing a minimum of 21 calendar days in advance of beginning shop tests.
2. The fixed-cone valves shall be completely assembled in the shop, including the hoods, and inspected for proper assembly fit, and operation. The following operational tests shall be performed:

    a. While unwatered, each fixed-cone valve shall be opened and closed at least three times using the electric motor-operator, and shall be operated at least 10 percent travel in each direction using the handwheel on the motor-operator. Any required adjustments or corrections shall be made until the valve operates properly. A record of the operating amperage required to open and close the valve shall be supplied.
    b. A blind flange and gasket shall be attached to the upstream flange of each valve and the sleeve shall be closed. All air shall be vented and a water pressure of 175 pounds per square inch shall be applied for 30 minutes while the sleeve and body are examined for leaks. If leakage through the body is found, the source of the leakage shall be eliminated by repairing or replacement.
    c. With the blind flange in place, there shall be no leakage past the upstream sleeve seal at 115 pounds per square inch for 15 minutes, and the leakage past the downstream sleeve seal and seat shall not exceed 35 ounces per minute at 115 psi. If necessary, adjustments or repairs shall

be made to meet the leakage requirements. A record of the actual leakage observed during tests shall be provided.

3. The CONTRACTING OFFICER may make visits to the manufacturer's facilities to review progress of the work. Shop testing shall be done in the presence of the CONTRACTING OFFICER, unless waived.
4. Submit completed test results within 10 days of completing all tests, and at least two days before shipping from the factory.

2.4 PAINT, PROTECTIVE FINISHES, AND MARKING

A. Marking: Fixed-cone valve markings, including attached nameplates, listing manufacturer, class, size, and year of manufacture.

B. Shop Coat the interior and exterior of the carbon steel surfaces of the fixed-cone valve bodies, sleeves, and other carbon steel components with an NSF Standard 61approved high-solids epoxy in accordance with the following:

1.	Surface Preparation:	SSPC-SP-10
2.	First Coat: High-Solids Epoxy	5.0 to 8.0 mils DFT
3.	Second Coat: High-Solids Epoxy	5.0 to 8.0 mils DFT
4.	Total DFT	10.0 to 16.0 Mils

C. Shop coat the exterior of the motor-actuators and pedestals for the fixed-cone valves in accordance with the following:

1.	Surface Preparation:	SSPC –SP-6
2.	First Coat: High-Solids Epoxy	5.0 to 8.0 mils DFT
3.	Second Coat: Alkyd Semi-Gloss Enamel	1.5 to 2.5 mils DFT
4.	Third Coat: Alkyd Semi-Gloss Enamel	1.5 to 2.5 mils DFT
5.	Total DFT	8.0 to 13.0 Mils

D. Do not paint stainless steel and bronze surfaces.

2.5 PRESSURE TAP

A. NPT pressure tap capable of reading up to 200 psi. The display shall be readable from the deck above or located on the deck near the valve actuator.

PART 3 EXECUTION

3.1 HOLLOW-JET VALVE REMOVAL

A. The Contractor shall remove and dispose of the three existing 84-inch hollow-jet valves at the outlet works, according to the detailed plan submitted.

B. Use extreme caution to avoid damage to the existing pipe flanges, so that the new fixed-cone valves can be installed on the existing flanges.

C. The hollow-jet area shall then be prepared for installation of the new 84-inch hooded fixed-cone valves.

D. The unpainted, machined pipe flange faces and bolt holes shall be thoroughly cleaned and coated with rust preventive coating while awaiting installation of the new fixed-cone valves, to prevent corrosion buildup.

E. The existing hollow-jet valves will become the property of the Contractor for demolition and disposal.

3.2 FIXED-CONE VALVE INSTALLATION

A. Install the fixed-cone valves, valve actuators, and accessories, including electrical and piping connections, in accordance with the Specifications and as shown on the Drawings.

B. Clean rust preventive coating from fixed-cone valve components and piping flanges prior to installation.

C. If the existing pipe flanges have O-ring grooves, install the fixed-cone valves with O-ring gaskets. If there are no O-ring groves in the existing pipe flange faces, install the fixed-cone valves with flat-face gaskets.

D. Provide new fasteners for attaching the fixed-cone valves to the existing pipe flanges.

3.3 PRESSURE TAP INSTALLATION

A. Install a pressure tap just upstream of the outlet valves to aid in the hydraulic analysis of flow conditions through the range of valve operation and head conditions. The system discharge curve will be developed from this analysis (by Other).

3.4 FIELD QUALITY CONTROL

A. Provide the services of the valve manufacturer's Field Representative or a trained mechanic, with experience in installation and commissioning of high-head (greater than 30 meters) free discharge valves at dams, to provide on-site technical direction through installation, startup and tests, and instructions for operating personnel.

B. After completed installation of the fixed-cone valve, adjust the motor-actuator controls according to the manufacturer's instructions and operate each valve through two complete cycles with the conduit dewatered. Record the amperage required to operate each valve. Operate each fixed-cone valve at least 10 percent in both directions using the handwheel on the motor-actuator.

C. With the maximum available reservoir head, operate each fixed-cone valve through two complete open and close cycles using the electric motor-actuator. Initial valve opening shall be in small steps of 5 percent increments to 20 percent open and then close the valve. Open the valve to 20 percent open, and then open in 10 percent increments to 50 percent, and then close the valve. Open the valve to 50 percent, then to 75 percent, and then to 100 percent and then close the valve. Observe the fixed-cone valve for any unusual noise or vibration, and observe the leakage past the sleeve seat at the maximum available reservoir head.

1. Maximum Allowable Leakage: 35 ounces per minute.
2. Measure the amperage required to operate the fixed-cone valve under reservoir head.

D. Touchup Painting: Immediately after installation, touch-up paint on exposed areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

E. Provide a certificate of proper installation indicating the valve and control system is installed and functioning properly and the specified tolerances are met.

END OF SECTION

SECTION 41 24 26.00

CONE VALVE HYDRAULIC CONTROL SYSTEM AND CYLINDERS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Designing, manufacturing, and installing six replacement hydraulic cylinders for the three existing 84-inch Rotovalve cone valves.

B. Designing, manufacturing, and delivering three new hydraulic power units for operating the existing 84-inch Rotovalve cone valves.

C. Providing a portable manually-operated hydraulic pumping unit for operating the existing 84-inch Rotovalve cone Valves.

1.2 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. Where a date is given for referenced standards, that edition shall be used. Where no date is given for referenced standards, the latest edition available on the date of Notice Inviting Bids shall be used.

B. American National Standards Institute (ANSI): Standards as specified herein.

C. American society for Testing and Materials (ASTM): Standards as specified herein.

D. American Welding Society (AWS): Standards as specified herein.

E. National Electrical Manufacturers Association (NEMA): Standards as specified herein.

F. National Fluid Power Association (NFPA): Standards as specified herein.

G. Steel Structures Painting Council (SSPC): Standards as specified herein.

1.3 SUBMITTALS

A. Submit Shop Drawings and Data for the replacement hydraulic cylinders for the existing 84-inch Rotovalve cone valves.

B. Submit Shop Drawings and Data for review and approval prior to fabrication, showing details of the hydraulic power units and oil reservoirs, electric/hydraulic component catalog data, and all data required to locate and install the hydraulic power units.

C. Submit Shop Drawings and data for the manually-operated hydraulic pumping unit.

D. Provide service manuals for the hydraulic power units, manually-operated pumping unit, hydraulic cylinders, and appurtenances which shall include all previously approved drawings and data, and operation and maintenance instructions.

E. Provide written instructions for installation of the hydraulic power unit, hydraulic cylinders, and appurtenances.

F. Prepare and submit a commissioning plan for the new hydraulic power units systems to demonstrate that the units function as intended, manufactured, and designed.

G. Prepare and submit a commissioning plan for the refurbished Rotovalve cone valves to demonstrate that the valves function as intended, manufactured, and designed. As a minimum, the commissioning shall include a full closure Rotovalve cone valve closure for each valve, with the downstream fixed-cone valve open 15 percent. Refer to the U.S. Bureau of Reclamation – Inspection of Mechanical Features, by E. E. Gonzales, May 1964, Pages 1through 13.

H. Submit a plan for measuring and reporting the leakage from the 84-inch Rotovalve cone valves at full reservoir head, with the valves fully closed.

1.4 QUALITY ASSURANCE

A. The hydraulic control system manufacturer shall have a minimum of five years experience designing and manufacturing hydraulic systems of comparable size and design characteristics.

PART 2 PRODUCTS

2.1 HYDRAULIC CYLINDERS

A. Hydraulic Cylinders

1. Six new hydraulic cylinders shall be furnished and installed on the existing 84-inch Rotovalve cone valves. The engineering data required

for designing the new equipment is in the possession of the Rodney Hunt Company, Orange, MA, as they have the original drawings and data for the Rotovalve cone valves, and manufacture these same types of valves.

2. The hydraulic cylinders shall be designed and manufactured in accordance with the Requirements of the National Fluid Power Association (NFPA) standards. The hydraulic cylinders shall be high-pressure, non-cushioned type, suitable for nonshock operating pressure of 3,000 psi (20,684 KPa).

3. The cylinder rods shall be chrome-plated 17-4 PH stainless steel, with a minimum yield strength of 110,000 psi.

4. The double acting pistons shall be packed for drop tight operation with hydraulic pressure applied in either direction.

5. Wrench flats shall be provided on the rod end at the connection to the gate leaf.

6. The bore diameter and rod diameter of the hydraulic cylinders shall be selected to operate the existing Rotovalve cone valves at a maximum system pressure of 1,500psi (10,342 KPa).

7. The hydraulic cylinder ports shall be provided with flanged connections for SAE O-ring flanges.

B. Shipping

1. The hydraulic cylinders shall be shipped with the piston rods retracted and filled with the hydraulic oil specified. Risers shall be provided at the cylinder ports to allow for thermal expansion of the oil.

2. Operating mechanism components shall be wrapped, crated, and otherwise protected during shipment. All components shall be identified and labeled.

2.2 HYDRALIC POWER UNIT

A. General

1. Three hydraulic power units shall be designed and fabricated to operate the three existing Rotovalve cone valves with the new replacement hydraulic cylinders. Each hydraulic power unit shall be dedicated to operate one Rotovalve cone valve, and each valve has two hydraulic cylinders.

2. When it is desired to operate a Rotovalve cone valve, the appropriate OPEN or CLOSE pushbutton will be depressed momentarily. A pump will be started and the plug of the cone valve will be lifted by operation of the lift cylinder. When the lift cylinder has been fully stroked, the rotation cylinder will be operated to open or close the valve. When the rotation cylinder has been fully stroked, the lift cylinder will be actuated to reseat the plug. Once the lift cylinder reseats the plug, the pump will be de-energized.

3. Each Rotovalve cone valve is equipped with limit switches to detect that the plug has been lifted/lowered and rotated as far as possible. This information will be used to sequence the two cylinders on each valve, de-energize the pump motor and solenoid valves, and actuate the position indicator lamps.

4. OPEN and CLOSED indicating lights are to be provided to indicate end of travel condition for the operator, actuated by limit switches integral to each valve operating system.

5. The hydraulic power unit shall be suitable for indoor installation within an operating chamber in the dam.

6. Each unit shall be skid-mounted, with all operating components contained within. Skids shall be designed so that the units can be moved with a standard lift truck or forklift, and individual skids shall be grounded.

7. Each skid shall be provided with a seven-pound ABC-type fire extinguisher.

8. To provide proper design coordination and optimum operation, the hydraulic power unit shall be furnished by the manufacturer providing the replacement hydraulic cylinders and appurtenances.

B. Requirements

1. The hydraulic power unit shall be an integrated, self-contained unit, complete with oil reservoir, electric motors, hydraulic pumps, filters, solenoid operated directional valves, relief valve, counterbalance valve, pressure switch, pressure gauge, shutoff valves, and necessary electrical equipment. The power unit shall be provided with a drip pan to catch the hydraulic oil from drips and leaks that may develop.

2. The hydraulic power unit shall be capable of opening or closing each 84-inch Rotovalve cone valve in approximately 5 minutes.

3. The Rotovalve cone valves shall operate at a hydraulic pressure of approximately 1,500 psi (10,342 KPa), and the maximum hydraulic system pressure shall be 1,750 psi (12,056 KPa).

4. The oil reservoir shall be designed and fabricated in accordance with National Fluid Power Association (NFPA) Standards. The reservoir shall include a drain, access for inspection and cleaning, a desiccant filler-breather assembly, a temperature indicating sight gauge, and two low-level oil level switches. The oil reservoir shall be located above the oil pumps to provide positive pressure to the inlet of the pumps.

5. Internal fluid lines in the power unit shall be sized to provide an oil velocity of no more than 15 feet per second in pressure lines and 5 feet per second in suction lines.

6. Provisions for remote monitoring of low oil level, high oil temperature, and low oil pressure, less than 500 psi (348 KPa) when operating, shall be provided.

7. Two oil pumps shall be provided, with each pump capable of providing the volume of oil required for the desired valve operation. The oil pumps shall be variable volume pressure compensated piston pumps, with the compensators set at 1,500 psi (10,342 KPa).

8. Two electric motors shall be provided, one for each hydraulic pump. The motors shall be connected electrically to alternate pump units for each valve operation. The motors do not operate simultaneously.

9. The electric motors shall be totally enclosed, and fan cooled, with cast iron frames, providing the necessary power to operate the hydraulic pumps at the maximum pressure required without exceeding the nameplate rating. The motors shall be operated on 400 volt, 50 hertz, 3-phase alternating current, at an altitude of 4,000 feet (1150 meters), and a temperature range of 30 to100 degrees F.

10. Two 3-position solenoid-operated directional control valves shall be provided in each unit to control oil flow and pressure to the Rotovalve cone valves. The directional control valves shall allow oil pressure to lift or lower the plug and open or close the valve, while returning oil from the hydraulic cylinders to the oil reservoir. The valves not selected for operation shall remain blocked in position by the alternate directional control valve.

11. Flow control valves shall be provided to adjust the operating speed of each function of the Rotovalve cone valves.

12. A relief valve shall be provided to limit the operating pressure in the control system to 1,750 psi (12,056 KPa). The relief valve shall be capable of handling the combined volume of both hydraulic oil pumps.

13. Counterbalanced valves or pilot-operated check valves shall be provided, one in each hydraulic line to the port of each hydraulic cylinder, so that the valves will not operate, unless hydraulic pressure is applied to the desired port of the hydraulic cylinders.

14. Provide five 3,000 psi (20,000 KPa) dual scale pressure gauge (Reading in psi and MPa or KPa), at least 2-1/2 inches in diameter for each system. The gauge shall be attached to the pump discharge line and to the each end of each hydraulic cylinder. Each gauge shall be equipped with a shutoff/snubber valve.

15. One suction filter and one pressure filter shall be provided for oil pump and control valve protection. The suction filter shall be equipped with a 25-micron filter element, with an internal bypass and a visual servicing indicator. The pressure filter shall be equipped with a 10-micron filter element, with an internal bypass and a visual servicing indicator. The oil filters shall use replaceable elements, and ten spare elements shall be furnished for each filter.

16. Provide a low oil-level sensor for remote indication of low oil level, a high oil temperature sensor for remote sensing, and a low pressure sensor for remote sensing of oil pressure less than 500 psi when the hydraulic system is operating.

17. The hydraulic oil furnished for filling and testing the power unit shall be new, clean, light hydraulic oil, rust and oxidation inhibiting. The hydraulic oil shall be premium grade, petroleum based hydraulic fluid, equal to Mobile DTE 24.

18. The fluid line connections shall be quick-connect fittings to attach to quick-connect fittings on flexible hoses. The fittings shall be liquid-tight, such that disconnecting a hose does not introduce air into nor allow fluid to leak from the system.

19. Provide at least 5-meter long flexible hydraulic hoses with quick-connect fittings, for connecting each hydraulic power unit to the respective Rotovalve cone valve. Contractor shall coordinate with the manufacturer the actual lengths of flexible hydraulic hoses required. The quick-connect fittings shall be arranged to prevent the hoes from being connected to the wrong ports of the HPU or valve hydraulic cylinders.

20. Provide a lockable, stainless steel electrical enclosure, meeting NEMA 250. Type 4X standards, to house all electrical components and provide terminals for power connections and electrical disconnects. Provide a pushbutton panel with “OPEN, CLOSE, and STOP pushbuttons, with seal-in contact so that the pushbuttons do not have to be continually pressed for gate operation. Each control panel includes the following devices:

    a. One (1) three phase non-fused disconnect switch

    b. One (1) 400/115 VAC control power transformer

    c. Two (2) motor circuit protectors (magnetic trip only circuit breakers)

    d. Two (2) motor starters with adjustable overload relays

    e. One (1) POWER ON light (white)

    f. One (1)PUMP 1 FAIL push-to-test light (red)

    g. One (1) PUMP 2 FAIL push-to-test light (red)

    h. One (1) OPEN pushbutton

    i. One (1) CLOSE pushbutton

    j. One (1) STOP pushbutton

    k. One (1) OPENED push-to-test light (red)

    l. One (1) CLOSED push-to-test light (green)

    m. One (1) LOW OIL push-to-test light (amber)

    n. One (1) PUMP OFF/LOW OIL push-to-test light (red)

    o. One (1) MAXIMUM RUN TIME light (red)

    p. One (1) RESET pushbutton

    q. One (1) Thermostatically controlled enclosure

    r. One (1) GFCI duplex receptacle

    s. Industrial control relays to provide required control logic

t. General purpose plug-in type relays as necessary for signal isolation

21. The following spare parts shall be provided:

a. Ten (10) replacement elements for the return filters and suction filters.

b. Ten (10) set of spare fuses.

c. Ten (10) spare lamps of each type of lamp used in the control panel.

d. Five (5) 55 gallon drums of hydraulic fluid.

C. Fabrication

1. The hydraulic power unit shall be fabricated and assembled into a complete, self-contained unit. All electrical wiring shall be installed, to connect to the electrical/hydraulic components to a single enclosure.

2. The hydraulic components in the hydraulic power unit shall be connected with stainless steel hydraulic fluid line tubing of suitable diameter and wall thickness, meeting NFPA Standards. The directional control valves, relief valve, and counterbalance or pilot-operated check valves shall be subplate or stack mounted for removal and installation without disturbing the connecting piping.

3. Where threaded connections are required, pipe thread compound shall be applied to the male thread, but not on the third of the thread nearest the end of the fitting. Pipe thread tape will not be allowed.

D. Shop Testing

1. The Government or authorized representative shall have free entry at all times while fabrication is under way and/or tests are being conducted to ascertain that materials and products being furnished are in accordance with the Contract Documents. Contractor shall notify Government a minimum of 10 days in advance of shop tests so that Government may, at his option, witness the tests.

2. The hydraulic power unit shall be test-operated in the shop to ensure that it delivers the required quantity of oil at the specified pressure. The relief valve shall be adjusted to maintain the specified pressure during testing. The hydraulic power unit shall be operated during the testing to

demonstrate that all the hydraulic and electrical components function properly. Discharge from the hydraulic pumps shall be measured for 15 minutes, and the source any observed leaks shall be repaired, and the hydraulic power unit retested.

E. Shipping and Storage

1. The hydraulic power unit oil reservoir shall be drained.

2. The hydraulic power unit shall be shipped assembled, and all parts of the power unit shall be crated, wrapped, or otherwise protected from damage during shipment.

2.3 PORTABLE HAND PUMP UNIT

A. A single portable hand pump unit shall be provided to permit operation of the Rotovalve cone valves during a power outage if an HPU is unavailable. The portable unit shall be equipped with hoses for connection to the valve operating mechanisms in the same manner as the HPUs are connected.

2.4 MARKING AND COATINGS

A. Marking: Slide gate markings shall include attached nameplates, listing manufacturer, class, size, and year of manufacture.

B. Coatings:

a. Shop finish the exterior of the hydraulic power units and Rotovalve cone valve hydraulic cylinders, and field coat the exterior of the Rotovalve cone valves, as follows:

1) Surface Preparation:	SSPC-SP-6	
2) First Coat:	High Solids Epoxy	5.0 to 8.0 Mils DFT
3) Second Coat:	High Solids Epoxy	5.0 to 8.0 Mils DFT
4) Total DFT		10.0 to 16.0 Mils

b. Unless otherwise specified, stainless steel and bronze surfaces shall not be painted.

c. Electrical/hydraulic components in the hydraulic power unit shall be painted with the manufacturer’s standard coating.

d. Provide 6 gallons of paint for touchup and coating repair. Paint containers shall be 1 gallon in size.

PART 3 EXECUTION

3.1 GENERAL

A. Equipment removed from the site for rehabilitation and replacement shall become the property of the Contractor.

B. Install hydraulic cylinders, hydraulic power unit, and appurtenances in accordance with the manufacturer's instructions and these specifications.

3.2 HYDRAULIC CYLINDER INSTALLATION

A. The existing hydraulic cylinders on each Rotovalve cone valve shall be removed for disposal off-site.

B. Install the new hydraulic cylinders in accordance with the manufacturer's instructions.

C. Paint the Rotovalve cone valves as specified above.

3.3 HYDRAULIC CONTROL SYSTEM INSTALLATION

A. Drain, disconnect and remove the existing hydraulic power units for disposal off-site.

B. The hydraulic control system installation shall include the placement of the hydraulic power units on the concrete floor of the control chamber, with each hydraulic power unit adjacent to the respective Rotovalve cone valve.

C. The oil reservoir shall be cleaned prior to filling with hydraulic oil. Fill the system with oil supplied by the hydrauic power unit manufacturer.

D. All electrical connections shall be made.

E. Connect the flexible hoses to the designated Rotovalve cone valve in the proper order for operation of the valve.

F. With the reservoir head balanced on the Rotovalve cone valve, operate the valve through three complete cycles, observing the operation for any unusual noise or vibration.

G. Record the hydraulic pressure in the hydraulic power unit required to operate each valve.

3.4 MANUALLY-OPERATED HYDRAULIC PUMPING UNIT

A. Connect the manually-operated hydraulic pumping unit to one of the Rotovalve cone valves.

B. Fill the system with the hydraulic oil furnished by the manufacturer.

C. Operate the Rotovalve cone valve sufficiently to demonstrate that the plug lifts and begins rotation, then reverse the procedure to restore the valve to the initial position. Operate the Rotovalve cone valves through the open-close cycles three times, while unwatered or in the balanced-head condition.

D. Fully commission the Rotovalve cone valves according to the commissioning plan submitted.

END OF SECTION