

**STATEMENT OF WORK**  
**FOR**  
**CIVIL ENGINEERING – BUILDING & UTILITIES MECHANICAL**  
**PROGRAM IDIO**

PREPARED BY  
Engineering Section,  
Test Support Division, Civil Engineer  
Branch  
ARNOLD AIR FORCE BASE  
TENNESSEE 37389

**DATED: TBD**

DRAFT

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## 1.0 TASK ORDER ISSUANCE PROCEDURES

A. As requirements are identified, a site visit may be scheduled with the contractor(s) to verify measurements and elements of work. Procedures for issuing task orders are stated as follows:

### 1. General

- a. Each basic contract award made as a result of this solicitation will cite a unique contract number. Individual task orders placed under each basic contract will be numbered sequentially, beginning with task order 0001.
- b. Orders will be placed on a DD Form 1155, Order for Supplies or Services.
- c. The Government will not be obligated to reimburse the Contractor for work performed or any costs incurred, nor shall the Contractor be obligated to perform or otherwise incur costs except as authorized by executed task orders.
- d. Task orders will be firm-fixed price and clearly define the statement of work to be performed or the performance desired. Each TO will contain applicable provisions and the specification package required for that project.
- e. Task order evaluation methods may include Low Price Technically Acceptable (LPTA) or tradeoff. Each TO will state the method of evaluation.
- f. Task order projects may be non-complex, performance-oriented tasks requiring no design, minimal design, may be complex construction requiring design development for design-build construction, or a combination thereof.
- g. Contract holders are expected, in good faith, to participate in the task order competitions. In the event a Mechanical Installation Maintenance and Repair IDIQ awardee is unable to submit a proposal on a particular RFP, the Contractor is required to notify the CO in writing within five (5) working days from receipt of the RFP of the reason(s) for non-participation.
- h. All terms and conditions identified in the basic contract are in full force by reference.

### 2. Competition

- a. Competition for task orders is limited to those awardees under this contract. All awardees will be given a fair opportunity to be considered for each TO. Upon determining the need to issue a TO, all awardees will be considered equally against the stated criteria.
- b. Unless the CO applies the exceptions noted below, each TO will be awarded as a result of competition. The CO's decision as to the selection for award of a TO cannot be protested unless the protest is on the grounds that the order increases the scope, period, or maximum value of the contract.
- c. Each Contractor shall be given a fair opportunity to be considered for award of a TO. The CO reserves the right to make award of a TO without competition based upon one of the circumstances described below:
  - i. The agency need for the supplies or services are so urgent

that providing a fair opportunity would result in unacceptable delays;

- ii. Only one awardee is capable of providing the supplies or services required at the level of quality required because the supplies or services ordered are unique or highly specialized;
- iii. The order must be issued on a sole-source basis in the interest of economy and efficiency as a logical follow-on to an order already issued under the contract, provided that all awardees were given a fair opportunity to be considered for the original order; or
- iv. It is necessary to place an order to satisfy a minimum guarantee; or
- v. A statute expressly authorizes or requires that the purchase be made from a specific source.

3. Preparation of Offers

- a. Offerors are expected to participate in site visits as well as read and understand the statement of work, drawings, specifications, schedule, and all instructions. Failure to do so will be at the Offeror's risk.
- b. Each Offeror shall furnish the information required by the TO RFP.

## **2.0 GENERAL SCOPE**

This is an indefinite delivery, indefinite quantity contract (IDIQ) for design build or mechanical construction efforts at Arnold AFB, TN. The Contractor shall provide all labor, materials, equipment, transportation, supervision, quality control and other items necessary to design, manage and accomplish the work. Each construction project will be awarded by an individual Task Order ("TO") issued against the basic contract and specifying work in support of equipment installation and real property maintenance, repair, alteration, and new construction. The Contractors shall furnish all materials, equipment and personnel necessary to manage and accomplish the work unless otherwise directed by the Government.

**A.** This contract includes TOs in the following areas of design of mechanical projects, mechanical installation, minor construction, maintenance and repair:

- 1. HVAC systems (to include direct digital controls).
- 2. Water production, distribution, and fire systems.
- 3. Steam production and distribution systems.

**B.** Execution will be directed by one of the following TO types:

- 1. Design-Build: The Contractor shall be provided with a TO. The Contractor will initiate and complete design build project execution IAW the TO requirements. The level of design may be tailored by the Government depending on TO complexity.
- 2. Construction: The Contractor shall be provided a complete design document package to execute the IAW TO requirements. The package will include the Statement of Work (SOW), drawings, technical specifications and any other preliminary data required to complete the TO.

- C. For purposes of this document, installation means installation of Contractor or Government provided equipment.

### **3.0 REFERENCED CODES, STANDARDS, AND TESTING**

- A. Codes and standards referred to in this specification shall be the latest adopted issue at the date of proposal, unless otherwise specifically indicated.
- B. All mechanical and electrical work shall conform to National Fire Protection Association (NFPA) codes as stipulated by the individual orders.
- C. All materials and equipment used in the work shall be subject to inspection and testing in accordance with accepted standards to establish conformance with specifications and suitability for uses intended, unless otherwise specified in the contract.
- D. If the contract documents, the Government instructions, state laws, or regulations, require that any work be inspected or tested, the Contractor shall give the Government 14 days' notice of readiness of the work for inspection or testing and the fixed date for inspection or testing. The Contractor shall at all times permit the Government to visit and inspect the work and shall maintain proper facilities and provide safe access for such inspection. Work requiring testing, inspection or verification shall not be covered up without such test, inspection, or approval.
- E. Final Approvals. The Contractor shall obtain all final approvals for the work, in the form of such certificates that are required by all Governmental agencies having jurisdiction over the work.
- G. The Contractor shall follow Occupational Safety and Health Administration (OSHA), National Electric Code (NEC), NFPA and other safety standards that are applicable to the job as well as those in Appendix 1.
- H. All Design shall include the safety standards in Appendix 1.

### **4.0 LOCATION**

- A. The work will be located in various facilities and locations at Arnold Air Force Base, Tennessee. Project sites will include office buildings, utility systems and industrial areas.

### **5.0 WORK CONDITIONS**

- A. Furnish new components and devices, complete, with all necessary materials for installation to meet this objective. Schedule all work in advance with the Air Force Project Manager (AF PM). Do not interrupt existing utilities or commence work requiring power outages without signed authorization from the AF PM. Each

outage shall be submitted to the AF PM for Government approval in accordance with each delivery order. Outage dates will be given on holidays and/or weekends depending upon the Government's schedule for facility usage. Submit a contract progress schedule outlining a detailed phasing of work no later than 30 days before start of work. Schedule shall include the major elements of work, including work that will be accomplished during the outages, systems that each outage will be affecting, material submittals, procurement dates, mobilization, on-site work, and detailed construction progress milestones.

- B.** Keep work area clean and free from waste and debris. Dispose of waste as directed by the AF PM.
- C.** Do not close or obstruct egress width to any building or site exit without written permission from the AF PM.
- D.** Do not disable or disrupt building fire or life safety systems without written permission from the AF PM.
- E.** Conform to procedure applicable when any hazardous or contaminated materials are discovered.
- F.** Cease operations immediately for any unsafe conditions and notify the AF PM. Do not resume operations until authorized by the AF PM.
- G.** Provide temporary barricades and other forms of protection as required to protect Government personnel and the general public from injury due to the work.
- H.** Provide protective measures as required to provide free and safe passage of Government personnel and the general public to and from occupied portions of the building.
- I.** Remove protections at the completion of work.
- J.** Do not close, block, or otherwise obstruct streets, walks, or other occupied or used facilities without written permission from the AF PM.
- K.** All scaffolding shall be in accordance with OSHA standards and inspected by an OSHA competent person.
- L.** Do not interrupt existing utilities or commence power outages without signed authorization from the AF PM. Minor outages require 14 days' notice and major outages require 45 days' notice. Base wide utility outages will be specified in the TO when they will be granted. All or the vast majority of work associated with the raw water utility including valves and other piping accessories shall be performed during a one-month secondary reservoir outage. The outage shall be coordinated with the AF PM and shall occur, typically, between the months of November through February. Outage dates may change based on Government operations.
- M.** Digging Permits: The Contractor shall request a digging permit 14 days

before being granted permission to dig by the Government.

**N. Available Utilities:**

(a) Water: All reasonable required amounts of potable water and raw water will be made available without cost to the Contractor from existing systems, outlets, and supplies near the vicinity of the work. All water shall be carefully conserved. Temporary connections to the potable water system will require protection via a certified/tested Backflow Preventor(BFP). All temporary connections and piping installed by the Contractor in a manner satisfactory to the Contracting Officer before final acceptance of work.

(b) Electricity: All reasonably required amounts of 60Hz electric power at 110V and 480V will be made available without cost to the Contractor from existing electrical systems near the vicinity of the work. The Contractor shall install and maintain at no cost to the Government any necessary supply connections and facilities in a manner satisfactory to the Contracting Officer. All electrical services shall be removed in a manner satisfactory to the Contracting Officer before final acceptance of work.

- O.** The Contractor shall provide toilet facilities in a ratio of not fewer than one for each 30 persons or fraction thereof. Connection to any existing sanitary sewer manholes may be made. The Contractor shall supply drinking water from connections to existing potable water system. The Contractor shall take proper precautions to protect the water system from damage and contamination. Any temporary connections made for drinking water or toilet facilities shall be removed by the Contractor in a manner satisfactory to the Contracting Officer before final acceptance of work.

## **6.0 PROJECT ADMINISTRATION**

- A.** Project management: The Contractor shall be responsible for the overall management of each TO performed under this contract. The Contractor shall be responsible for timely status reporting as specified in the TO. The Contractor shall also ensure that quality work is completed on schedule and within the allocated budget. The contractor shall provide daily work reports during physical construction. The contractor shall update project schedules when they change and submit to the AF PM.
- B.** Project supervision: The Contractor shall identify the primary POC during all phases of the TO. The Contractor shall notify the CO in writing of the intended project superintendent before the issuance of the Notice to Proceed (NTP). If the superintendent is changed during the TO Period of Performance (PoP), the Contractor shall notify the CO in writing of the intended replacement. The designated superintendent or delegated representative shall be on site anytime construction work is being performed. The Contractor shall provide the CO and the Air Force Project Manager (AF PM) with the names of a primary and alternate POCs telephone numbers, in case of emergency.
- C.** Removal of Contractor's Employees: The Contractor agrees to utilize only experienced, responsible and capable people in the performance of work. The

CO may require that the Contractor remove employees who endanger persons or property, whose continued employment under this contract is inconsistent with the installation commander's safety and security interests of good order and discipline, or who are determined by the CO or AF PM as being incapable of rendering the services IAW this contract.

- D. Business Relations:** The Contractor shall successfully integrate and coordinate all activities needed to execute the TO. The Contractor shall manage the timeliness, completeness and quality of problem identification. The Contractor shall provide corrective action plans, proposal submittals, timely identification of issues and effective management of subcontractors. The Contractor shall coordinate and cooperate closely with associate contractors involved in the execution of AEDC's mission.
- E. Meetings:** The Contractor shall attend and/or support meetings and teleconferences to discuss technical requirements, issues and project progress and status. Meeting requirements will be identified with each TO. The Contractor shall prepare and submit for review, an agenda, presentation materials and minutes for meetings attended, as applicable. Meeting minutes shall include any action items and identify the responsible person for action items. Contractor personnel and their subcontractors shall identify themselves as Contractors of subcontractors during meetings, on meeting minutes, telephone conversations, in electronic messages, or correspondence related to this contract.
- F. Submittals Log:** The Contractor shall be responsible for providing an updated submittals log to include actual submitted date, current disposition, Government response with date, and need by date.
- G. Master Work Permits:** The Contractor will be responsible for coordinating a Government issued, Master Work Permit prior to performing any site work, especially digging of any type. The Contractor will be given assistance, by the Government, in the coordination of the Master Work Permit request. Thereafter, Government assistance will be limited to an as-needed basis in the event of unusual circumstances. It will be the Contractor's responsibility to coordinate completion of the Master Work Permit and request to have existing utilities located & marked as indicated on the completed form, prior to the beginning of digging operations in the individual areas, as well as maintaining the markings. This coordination is anticipated to take approximately (14) working days to complete per request.

## **7.0 PERFORMANCE CAPABILITIES**

- A.** As a minimum, the Contractor must be capable of performing at least 25% of the cost of the contracted work, not including the cost of materials, using his in-house work force. This does not include administration or management effort.
- B.** The operational schedule at Arnold AFB may limit job site access. The Contractor shall have personnel on-site within 48 hours of being notified that the job site will be available.



## **8.0 SECURITY REQUIREMENTS**

- A.** The Contractor shall be required to comply with all security directives and other security requirements identified in this contract. These requirements apply to all contractors on Arnold AFB in the performance of their contract.
- B.** Pass and Identification Items: The Contractor shall ensure the pass and identification items required for contract performance are obtained for employees and non-Government-owned vehicles. The Contractor shall retrieve all identification media, including vehicle passes from employees who depart for any reason before the contract expires, e.g., terminated for cause, retirement, etc.
- C.** For Official Use Only (FOUO): The Contractor shall comply with Freedom of Information Act (FOIA) requirements IAW DOD 5400.7-R, FOIA Program, Chapter 4. This regulation sets policy and procedures for the disclosure of records to the public and for marking, handling, transmitting, and safeguarding FOUO material.
- D.** The Contractor shall safeguard FOUO information provided under this contract as specified in DODM 5200.01-V4, DoD Information Security Program: Controlled Unclassified Information. CUI is information that does not meet the standards for National Security Classification under Executive Order 13526, dtd Dec 2009, but is pertinent to the national interests of the United States or to the important interests of entities of the Federal Government, and (ii) under law or policy that requires protection from unauthorized disclosure, special handling safeguards, or prescribed limits on exchange or dissemination. If lost, misused, compromised or accessed by unauthorized persons could adversely affect US national interest, the conduct of DoD programs, or the privacy of DoD personnel. It comes in many forms; personal data under the privacy Act, personnel records, privileged data (chaplain and judge advocate records), investigative data, scientific and technical information (STINFO), export-controlled data (critical technologies), proprietary data, or For Official Use Only data. Sensitive information meets the criteria for exemption from mandatory public disclosure under the Freedom of Information Act (FOIA). For guidance with marking CUI, contact AEDC/TSD-IP at (931) 454-3290.
- E.** If access to Controlled Unclassified Information/Export Control/STINFO information is required the Contractor shall be required to be registered as a certified government Contractor through the Joint Certification Office, Defense Logistics Information Service (DLIS). To request DLIS Certification submit a DD Form 2345, Militarily Critical Technical Data Agreement, to the DLIS, Battle Creek, MI address indicated at the top of the DD Form 2345 along with a copy of the company's State Business License, Incorporation Certificate, Sales Tax Identification Form or other documentation, which verifies the legitimacy of the company. A copy of their DD2345, Militarily Critical Technical Data Agreement, must be provided when issued. Export Controlled Data. Except as allowed by DFARS252.225.7048, Export-Controlled Items and AFMCFARS Supplement 5327.303, foreign nationals shall not have access to export-controlled information without an export license. All export control laws as stipulated in both Export Administration Regulation and International Traffic In Arms Regulation must be followed without exception. For

guidance in applying appropriate Export Control markings, contact AEDC/XP2 at (931) 454- 7329.

- F.** The Contractor must obtain Foreign Disclosure Office (FDO) approval through the Contracting Officer prior to allowing any non-U.S. or un-validated U.S. Lawful Permanent Resident persons access to CUI or export-controlled information. (Also, see DFARS252.225.7048, Export-Controlled Items and AFMCFARS Supplement 5327.303).
- G.** Reporting Requirements: Contractor personnel shall report to an appropriate authority any information or circumstances of which they are aware may pose a threat to the security of DOD personnel, Contractor personnel, resources, and classified or unclassified defense information. Contractor employees shall be briefed by their immediate supervisor upon initial on-base assignment.
- H.** Physical Security: The Contractor shall be responsible for safeguarding all Government property and controlled forms provided for Contractor use. At the end of each work period, all Government facilities, equipment and materials shall be secured.
- I.** Computer Security (COMPUSEC)/Automated Information System Requirements: If access to unclassified computer systems is required the following requirements apply; Users must be a US Citizen, or receive AEDC or AFMC Foreign Disclosure Office (FDO) approval prior to access being granted; users must complete a GC 591 to request access, requestor must have a favorable NACI, or an approved Interim AIS Request on file, requestor must complete the AF Information Assurance (IA) Training. Users bringing Portable Electronic Devices on base wanting to connect to AEDC computer systems/networks shall comply with established AEDC procedures. The Contractor shall accomplish all Information Assurance tasks identified in; AFRPD 33-2, Information Assurance Program, and AFI 33-200, Information Assurance (IA) Management to include all tasks and directives identified therein including, but not limited to; AFSSI 300 Series - COMSEC Equipment, AFSSI 400 Series - COMSEC Operation, AFSSI 700 Series EMSEC, and 8500 Series - IA Implementation, or their replacements. National and DoD level documents shall be used as mandatory directives in lieu of, or in addition to AF directives, as appropriate. The Contractor shall comply with the DOD 5200.2-R, Personnel Security Program; and local host base COMPUSEC requirements. Ensure employees complete any additional computer security training requirements mandated by the host base.
- J.** Information Security (INFOSEC): Information, regardless of media, shall be controlled and maintained IAW with the NISPOM and guidance provided by the SSA.
- K.** Privacy Act: Comply with AFI 33-332, Privacy Act Program, when collecting and maintaining information protected by the Privacy Act of 1974, Title 5, U.S.C., Section 552a. Remove or destroy official records only IAW Air Force Records Information Management System, (AFRIMS) located on the internet at: <[https://www.my.af.mil/gcss-af61a/afirms/afirms/rds/rds\\_series.cfm](https://www.my.af.mil/gcss-af61a/afirms/afirms/rds/rds_series.cfm)>.

- L.** Operations Security (OPSEC): Comply with AFD 10-11 and AFI 10-701, Operations Security, and DoD 5220.22-R, Industrial Security Regulation (ISR), Chapter 10, local plans and publications.
- M.** Contractor Consent to Background Checks: The Contractor shall not employ persons to perform under this contract if such employee is deemed or identified as a potential threat to the health, safety, security, general well-being or operational mission of the installation and its population, nor shall the Contractor or subcontractor employ persons under this contract who have an outstanding criminal warrant as identified by the Tennessee Information Enforcement System (TIES) through the National Crime Information Center. TIES checks will verify if a person is wanted by local, state, or federal agencies. All Contractor and subcontractor personnel must consent to TIES background checks. Contractor and subcontractor personnel who do not consent to a TIES check will be denied access to the installation. Information required to conduct a TIES check includes: full name, driver's license number, and/or social security number, date of birth of the person entering the installation, and completion of a background check questionnaire. The Contractor must have this information ready to provide to the Visitor Control Center, if requested.
- N.** Contractors must ensure their employees and those of their subcontracts have the proper credentials allowing them to work in the United States. Persons later found to be undocumented or illegal aliens will be remanded to the proper authorities.
- O.** The Contractor shall not be entitled to any compensation for delays or expenses associated with complying with the provisions of this clause. Furthermore, nothing in this clause shall excuse the Contractor from proceeding with the contract as required.
- P.** Access to Installation During Force Protection Conditions (FPCONs): Gaining access to the installation will be done IAW the requirements outlined in the local Antiterrorism/Integrated Defense Plan(s). Contractors will also be assigned a mission essential designation IAW requirements contained in Antiterrorism/Integrated Defense Plan(s). Only the installation commander or the unit commander requesting contract support will assign the mission essential designation.
- Q.** Property Protection: Property protection for the facility where the Contractors' primary work center is located will be the responsibility of the local facility manager and local Security Manager, or their duly authorized representative IAW AFI 31-101, Integrated Defense, and command/local directives to include AAFB Plan 31-101. The Contractor must safeguard all government-owned equipment and materials in his/her possession or use.
- R.** Government shall provide all escorts required for access to secure areas while working on construction areas at Arnold AFB.
- S.** All Contractor personnel must be escorted at all times in a controlled/restricted area by an escort furnished by the Government. Work requiring escorts will be

scheduled 15 calendar days prior to starting work unless this requirement is waived by the CO.

- T.** Projects in a secured area may require a local agency check by the Base Security Police of the Contractor, his employees, and all sub-tier contractors prior to commencement of on-site work. The Contractor should allow approximately 30 calendar days to accomplish the check.

## **9.0 SAFETY**

- A.** The Contractor is solely obligated for compliance with OSHA, CFR 1910 and 1926, AFSOH 91-501, NFPA 101 and other applicable laws and regulations for the protection of the contractor employees, subcontractors, Government employees and Government property. The Government shall assume no liability of responsibility for the Contractor's compliance or non-compliance with such requirements. The Contractor shall furnish to each of his/her employees a place of employment, which is free from recognized hazards associated with prescribed tasks. The Contractor is responsible for compliance with OSHA Public Law and the resultant standards identified within. In addition, the Contractor is required to flow down the safety requirements/specifications to all subcontractors.
- B.** In addition, the Contractor shall comply with the following:
  - a. Air Force Safety requires that Contractors performing on Air Force installations provide their employees safety and health protection equal in quality to that provided to Air Force employees. However, the Contractor will be responsible for managing their health and safety program.
  - b. Contractors are required to flow down Safety requirements to all subcontractors who qualify as applicable contractors under their contract.
  - c. Contractors are required to submit a Safety and Health Plan and corresponding site safety checklist to the AEDC Safety Office, Contracting Officer and Project Manager within 10 days after contract award. The plan shall be made available to the installation safety office for acceptance prior to contract performance.
  - d. Contractors are required to submit their TCIR and DART rates and OSHA 300A form along with their safety and health plan. The TCIR and DART rates will be reviewed by AEDC Safety and contract performance.
  - e. Contractor's performance will be accountable for compliance with their safety and health plan, to include mishap reporting.
  - f. Contractors shall ensure their employees and subcontractors report (No later than 24 hours) pertinent facts regarding all mishaps. Contractors will cooperate in any safety investigation, to include toxicology testing.
  - g. Contractors are required to identify the processes and procedures used to track compliance with the Safety and Health Plan.
- C.** The Contractor Safety and Health Plan must demonstrate a management commitment to employee safety and health. The plan shall include application and responsibility to subcontractors and shall include as a minimum the following elements:
  - a. Worksite hazard analysis with base-line hazard identification and required control measures.
  - b. Job site analysis which lists the hazards associated with performing the task

and the applied control measures.

- c. Corrective action plan for identified hazards and identifying individual responsible for corrective actions and tracking of hazards.
- d. Inspection program for each worksite to include identifying the individual conducting the inspection and the frequency of inspection.
- e. Employee hazard reporting procedures.
- f. Procedures for accident investigation and reporting.
- g. Emergency response plan including first aid/injury procedures
- h. Employee safety and health training requirements and documentation process.
- i. Identify applicable safety rules and regulations.
- j. Identify Safety roles and responsibilities of management, supervisors, employees and contractor safety coordinator.

## **10.0 ENVIRONMENTAL**

- A.** Contractor shall comply, and assure that all sub-contractors comply with all applicable federal, state and local laws, regulations, ordinances, policies and standards related to environmental matters. Copies of local policies and procedures can be reviewed at Base Environmental Office, Building 100 Suite B-310, or phone (931) 454-6290.
- B.** The use of materials which have been identified by Government agencies as being hazardous or creating potentially hazardous conditions will not be allowed on any project. Specifically, products containing lead, asbestos, polychlorinated biphenyl (PCB), and ozone depleting chemicals are prohibited. The Contractor shall assume a strict and cautious position in responding to reports of other materials which may be identified as hazardous during the construction period.
- C.** If any material originally specified or approved for use in the work should become listed as suspected or verified as being hazardous, the Contractor shall immediately notify the CO and initiate efforts to postpone the installation or use of the material until the matter can be investigated.
- D.** Some projects will include abatement of asbestos and other hazardous material.
- E.** Follow the AEDC Commander's Environmental Policy Letter (Attachment 10).

## **11.0 EXCAVATION:**

- A.** Obtain a digging permit.
- B.** When using a backhoe to dig, the Contractor may not use a bucket with teeth. If teeth are on the bucket they must install a plate across the teeth unless otherwise approved by AF PM.
- C.** Contractor must hand dig within 2 feet of marked utilities unless utilities have been

located with hydro/air knife excavation.

- D.** For 161kv the Contractor shall hand dig within 5 feet unless a waiver is granted by the AF PM for holes that are shallower than the 161 kv cable or located with hydro/air knife excavation.
- E.** In congested areas hydro/air knife excavation can be required by the Government.
  - a. Soil must be sampled and tested prior to hydro/air knife evacuation as determined by the AF PM.
    - 1. Sampling and lab testing is the responsibility of the construction contractor.
    - 2. For each 10 cubic yards of soil, collect one sample to be used for compositing. Samples should be collected at least one foot below the ground surface, preferably about the median depth of the proposed excavation.
    - 3. Composite samples for laboratory analysis shall include Toxicity Characteristic Leaching Procedures (TCLP) Metals, TCLP volatiles (VOCs), PCBs, and EPH (extractable petroleum hydrocarbons). The table of required constituents for each category can be obtained from TSDCI.
  - b. The construction contractor shall submit an Excavation, Dewatering, and Disposal plan (EDD).
  - c. Soil analysis results and EDD must be provided to AF PM before hydro/air knife excavation can be approved. AF PM will submit the soil analysis results to AF Environmental (TSDCI) to determine disposition of the slurry.
  - d. Soil sample test results come back positive for regulated compound contamination:
    - 1. If the material excavated is not going to be used as backfill at the excavated site, the slurry mixture must be dewatered adjacent to the excavated site with equipment provided by the construction contractor prior to offsite disposal or other disposition. TSDCI will provide guidance on disposition options once contamination levels are determined.
    - 2. If the material excavated is going to be used as backfill at the excavated site, the slurry mixture must be dewatered adjacent to the excavated site with equipment provided by the construction contractor prior to backfill operations.
- F.** An approved disposal area is located approximately two(2) miles from most anticipated construction sites. This area is approved for surplus earth, stone, broken concrete, asphalt, and building materials waste. Building materials waste also includes containers, dunnage, and other related items.

## **12.0 QUALITY CONTROL**

- A.** Contractor shall develop and maintain a quality program to ensure services are performed in accordance with commonly accepted commercial practices. The

Contractor shall develop and implement procedures to identify and prevent defective services from recurring.

- B.** The Government will appoint a representative(s) to monitor performance to ensure services are received. The AF PM will evaluate the Contractor's performance through daily on-site inspections and receipt of complaints from site personnel. The Government may inspect each task as completed or increase the number of quality control inspections if deemed appropriate because of repeated failures discovered during quality control inspections or because of repeated customer complaints. Likewise, the Government may decrease the number of quality control inspections if merited by performance.
- C.** The Contractor is responsible for the quality, technical accuracy and the coordination of all design, drawings, specifications and other services supplied under this contract. The Contractor shall, without additional compensation, correct or revise any errors, deficiencies, or inadequacies in its designs, drawings, specifications and other services.
- D.** Neither the Government's review, approval, acceptance, nor payment for the services required under this contract, shall be construed to operate as a waiver of any rights under this contract or of any cause of action arising out of the performance of this contract. The Contractor shall remain liable to the Government IAW applicable law for all damages to the Government caused by the Contractor's negligent performance of any of the services rendered under this contract.
- E.** Engineers or architects registered to practice in the particular professional field shall be involved in preparing, reviewing and approving the design. The engineer or architect for the Contractor shall be an individual, firm or any duly authorized representative thereof, professionally engaged in the practice of engineering and/or architecture, qualified by registration and experience and licensure in the applicable state to offer the services specified to the public.
- F.** The Contractor shall perform a code analysis for each TO and submit a list of applicable codes and standards for Government approval prior to initiating preliminary design.
- G.** The Contractor's design shall consider the phasing of construction to minimize impacts and/or outages to AEDC operations.
- H.** Designs shall include life cycle cost effective energy conservation systems / features and comply with the following:

  - a. Designs shall include all life cycle cost effective energy conservation systems/features IAW current Executive Orders, DoD Instruction 4170.11, Energy Independence and Security Act of 2007, and Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings. Energy cost budgets shall be reduced by 30 percent for all new construction and 20 percent for all renovations as compared to American Society of Heating, Refrigerating and Air-Conditioning Engineers

(ASHRAE) 90.1 baseline building performance ratings. Submit alternate proposals, if appropriate, which would reduce energy consumption below the expected energy budget. Indicate the effect on facility construction and operation costs of any such proposals.

- b. If a design contains energy-consuming products listed in the ENERGY STAR Program or Federal Energy Management Program (FEMP) the Contractor shall specify products which meet ENERGY STAR and FEMP requirements and are in the upper 25 percent of energy efficiency in their class.
- c. For products that consume power in a standby mode and are listed on FEMP's Low Standby Power Devices product listing, the corresponding wattage recommendation, the Contractor shall specify items which use no more than one watt in their standby power consuming mode. When it is impracticable to meet the one watt requirement the Contractor shall specify items with the lowest standby wattage practicable.
- d. EPA and USDA-designated items: Contractor shall specify products containing recovered materials and bio-based products to the maximum extent practicable without jeopardizing the intended use of the product while maintaining a satisfactory level of competition at a reasonable price. Product information is available at [www.epa.gov/cpg/products.htm](http://www.epa.gov/cpg/products.htm) and [www.usda.gov/biopreferred](http://www.usda.gov/biopreferred).

### **13.0 SITE MEETING AND PRE-CONSTRUCTION CONFERENCES**

- A. After the award of the contract and after the issuance of the first discrete task order under this contract, the Government will conduct a conference to acquaint the Contractor with Government policies and procedures that are to be observed during the prosecution of the work and to develop mutual understanding relative to the administration of the contract. At this time the Contractor shall familiarize themselves with the general state of the facilities, any special conditions that they may encounter.

### **14.0 SUBMITTALS**

- A. The Contractor shall submit a 'submittal schedule' indicating calendar dates for each submittal.
- B. All items indicated in the specification for each task order shall be submitted for approval:
  - a. Any other items required, per specifications, shall be submitted for approval when requested by the CO or the designated representative.
  - b. Submittals that may be required by this contract shall be made in four



- printed copies. Copies of the printed submittals will not be returned to the Contractor.
- c. The Contractor must submit for approval those items that deviate from the specifications. Submission will be on an AF Form 3000.
  - d. Contractor shall submit weekly submittal log with submittal status.
- C.** At the pre-construction conference, the Contractor, AF PM, and the Contract Administrator will review the submittal requirements. The Contractor must be prepared to discuss the delivery dates for those submittals that are required, or for the items the Contractor plans to submit for approval. Once approved, the submission deadlines shall be incorporated into the Schedule of Materials submittals.
- D.** The Contractor is reminded that any item(s) installed prior to the COs approval is being done at his/her own expense. If any item does not meet the Contract requirements as determined by the CO, the Contractor will be required to remove these items at his/her own expense.
- E.** Equipment submittals, unless otherwise specified, shall conform with the following:
- a. Submittals shall be complete with the manufacturer's product description literature. **SUBMITTALS WITH INSUFFICIENT LITERATURE WILL BE DISAPPROVED.**
  - b. Submittals shall include a complete listing of all associated parameters contained in the Technical Specifications and Drawings (materials, finishes, capacities, temperatures, pressures, electrical characteristics, etc.). **THE CO OR HIS/HER TECHNICAL REPRESENTATIVE WILL NOT TRANSFER INFORMATION FROM THE TECHNICAL SPECIFICATIONS AND DRAWINGS TO THE SUBMITTALS. INCOMPLETE SUBMITTALS WILL BE DISAPPROVED.**
  - c. Submittals shall be clearly marked to differentiate between the applicable and extraneous portions. **THE CO OR HIS/HER TECHNICAL REPRESENTATIVE WILL NOT MARK THE SUBMITTALS. UNMARKED SUBMITTALS WILL BE DISAPPROVED.**
- F.** When Automated Data Processing Systems (ADPS) are used to perform design calculations, the design analysis shall include descriptions of the computer programs used and copies of the ADPS input data and output summaries. Preparation of the descriptions that must accompany each set of ADPS printouts shall include the following:
- a. Explain the design method, including assumptions, theories, and formulas.
  - b. Include applicable diagrams, adequately identified.
  - c. State exactly the computation performed by the computer.
  - d. Provide all necessary explanations of the computer printout format, symbols and abbreviations.
  - e. Use adequate and consistent notation.
  - f. Provide sufficient information to permit manual checks of the results.

- G. Responsibility:** The Government's review of Contractor submittals shall not relieve the Contractor of the entire responsibility for the correctness of details and dimensions and conformance to the specifications. The Contractor shall assume all responsibility and risk for any mistakes and/or costs due to any errors in submittals.
- H. Final Design Drawings and Documentation:** Final design documentation including drawings, specifications, estimates and other required deliverables. Electronic documentation submitted shall include every associated component file of drawings and other documentation, including raster images, jpeg, tiff, Excel and any related items required to view, modify, or manipulate the electronic files. Electronically provide all final design documentation and drawings in AutoCAD 2013 format or later and as Portable Document Format (PDF) files.
- I. Record (As-Built) Drawings:** Record drawings showing final configuration of work accomplished. Show all changes, additions and deviations from the original TO drawings and documentation; including but not limited to, actual routing of field routing of cabling/conduit/piping, final I/O counts, wiring details and final connection details regardless of the level of design drawing detail. If no changes occur, provide certification to that effect. Redlined hardcopies shall be maintained by the Contractor during construction to accurately show as-built conditions during the progress of the job. Redline drawings are only acceptable as Record (As-Built) drawings when the Contractor is not provided access to the original drawings in a format that is editable. If electronic, provide drawings in AutoCAD 2013 format or later and as PDF files. The Contractor shall additionally include any associated component file of the drawings, including raster images, jpeg, tiff, Excel and any related items required to view, modify, or manipulate the electronic files. Submit to the CO for approval prior to applying for final payment.
- J. Design drawings:** Design drawings shall contain all necessary views, details, dimensions, notes, bill of materials, etc., which accurately and clearly convey all aspects of the Contractor's design. Design drawings shall contain sufficient detail for the Government to assess validity of the design and conformance with the TO and for the Contractor's fabricator(s) to generate fabrication drawings without need for further explanation from the designer. Design drawings and specifications shall be prepared in design submittals such that AEDC could construct the project without any additional assistance from the Contractor. Drawings shall be generated using AutoCAD 2013 or later. The Contractor's shall electronically submit both AutoCAD format and PDF. PDF files shall be electronically generated from the AutoCAD drawings (photocopying is prohibited). The Contractor shall use standard AEDC title blocks and borders on all design drawings, supplied by the Government. The Contractor's design drawings shall use U.S. Customary units. Dimensions shall be in terms of inches or feet or a combination thereof as

applicable. Elevations shall be drawn to a  $1/8" = 1'-0"$  scale and other visual information as required. The site and exterior utility drawings shall use a minimum scale of  $1" = 30'$  unless otherwise indicated. Additionally, the overall site plan for this project shall be on one drawing sheet.

- K. Manufacturer drawings:** The Contractor shall electronically submit fully legible PDF format file(s). Even though CADD drawings are not required to be submitted, all drawings created by manufacturers for this project shall be created using a CADD program and the PDF file(s) electronically generated from the CADD file to maximize readability (photocopying is prohibited). Manufacturer drawings may use the International System of Units (SI) if the products were designed and fabricated in SI units, otherwise, manufacturer drawings shall be submitted in U.S. Customary units.

## **15.0 DESIGN REQUIREMENTS:**

- A. Design drawings:** Design drawings shall contain all necessary views, details, dimensions, notes, bill of materials, etc., which accurately and clearly convey all aspects of the Contractor's design. Design drawings shall contain sufficient detail for the Government to assess validity of the design and conformance with the TO and for the Contractor's fabricator(s) to generate fabrication drawings without need for further explanation from the designer. Design drawings and specifications shall be prepared in design submittals such that AEDC could construct the project without any additional assistance from the Contractor. Drawings shall be generated using AutoCAD 2013 or later. The Contractor's shall electronically submit both AutoCAD format and PDF. PDF files shall be electronically generated from the AutoCAD drawings (photocopying is prohibited). The Contractor shall use standard AEDC title blocks and borders on all design drawings, supplied by the Government. The Contractor's design drawings shall use U.S. Customary units. Dimensions shall be in terms of inches or feet or a combination thereof as applicable. Elevations shall be drawn to a  $1/8" = 1'-0"$  scale and other visual information as required. The site and exterior utility drawings shall use a minimum scale of  $1" = 30'$  unless otherwise indicated. Additionally, the overall site plan for this project shall be on one drawing sheet.
- B. Specifications:**
- a. Specification format shall conform to the Construction Specifications Institute (CSI)'s Manual of Practice. Specifications shall consist of one editable electronic set of specifications in Microsoft Word (e.g., .doc or .docx file format) and one electronic set in PDF format.
  - b. Considerations for specifications include, but are not limited to:
    1. The use of small amounts of materials, which are not complicated in their application, does not require coverage in the written specifications provided descriptive information and applicable standards, if required, are noted on the drawings.

2. References in specifications shall be to widely recognized standards or specifications promulgated by governments, industries, or technical societies. In all instances when there is an applicable specification or standard, a reference thereto as well as the latest date of the standard shall be used.
  3. Brand names may be used but shall be prefaced by the phrase “brand name or equal”. When a “brand name or equal” description is necessary, specifications shall clearly identify and describe the particular physical, functional, or other characteristics of the brand-name items which are considered essential to satisfying the requirement.
- c. The Contractor shall develop submittal requirements required during construction as part of the design phase of the contract. This shall be done by the Contractor’s designer by producing a contractor submittal register during design. A submittal register shall be attached to each section of the specifications for the submittal requirements of that section. The Contractor’s designer shall be responsible for listing all required submittals necessary to ensure the project requirements are met. The register shall identify submittal items such as shop drawings, manufacturer’s literature, certificates of compliance, material samples, guarantees, test results, etc. that the Contractor shall submit for review and/or approval action during the life of the construction contract. The Contractor shall place all the submittal register pages in an appendix of the final specifications.

**C. Design Submittal Requirements, Reviews, and Meetings:**

- a. Design submittal requirements for individual units of work are specified in the TO and should comply with the following requirements for each type of submittal. The Contractor shall electronically submit each submittal in a file type and media format defined by the Government in the TO unless otherwise specified.
- b. Design submittal requirements are described in Attachment 2. The TO will identify tailoring of design submittal content, if necessary. Design submittals shall be made at the 30-percent, 60-percent, 90-percent and final design stages or as stated in each TO.
- c. Required documents shall be submitted 14 calendar days prior to a review or IAW the schedule given in the specific instructions for each TO. The Contractor shall electronically submit documents in a file type and media format defined by the Government in the TO. The time required by the Government to review submittals made by the Contractor under this contract will be negotiated on each TO.
- d. The Contractor shall present design packages as part of design reviews. The reviews may be tailored, as noted in each TO. Unless otherwise noted, design reviews will be conducted at the AEDC location of performance. It is the Contractor’s responsibility to schedule and coordinate attendance of all personnel that developed the design

submittal at each review. The designers for each discipline shall attend all design reviews.

- e. After each review of the design package submittals, the Contractor shall make changes and corrections as necessary. The Contractor is cautioned that if he believes the action required by any comment exceeds the requirements of the TO, that he should take no action and notify the CO in writing immediately. All review comments for each submittal shall otherwise be incorporated into the following design submittal. The Contractor shall supply the CO written disposition of the review comments within 14 calendar days of receipt of the comments.
- f. The Contractor shall prepare and submit minutes for each review or meeting. Minutes shall be submitted to the CO or their representative within 3 business days after the meeting.
- g. During each project design, the Government retains the right to continue to provide input and finalize the concept up through the final design submittal.
- h. Government approval will not relieve the Contractor of the responsibility for any error, which may exist, as the Contractor is responsible for the design and construction of all work.
- i. See Attachment 2 for Design Submittal requirements.

## **16.0 DELIVERY, STORAGE AND HANDLING**

- A.** Deliver all equipment properly packaged in factory containers and/or mounted on shipping skids.
- B.** Contractor shall store all equipment in a clean, dry space, and protect from dirt, fumes, moisture, construction debris, and traffic. Ensure that all equipment is prepared for anticipated storage conditions.
- D.** Where equipment is stored outdoors, ensure electrical components are stored above grade and enclose with watertight wrapping. Provide 120V temporary power to space heaters or provide temporary heat where required.
- E.** For large equipment to be stored on site, notify AF PM a minimum of two weeks prior to delivery. Contractor shall offload equipment at a location designated by the AF PM.
- E.** All handling, loading, and offloading of all equipment shall be done by the Contractor.

- F. Handle and store all equipment in accordance with manufacturer's instructions.
- G. The contractor shall provide adequate storage for the equipment to meet the manufacturer's storage specifications

#### **17.0 CONSTRUCTION SITE FENCING AND BARRICADES**

- A. The Contractor shall limit the area and nature of the construction operations to that which is authorized in the plans or specifications or approved by the Government.
- B. The Government shall at all times have access to the work, and the Contractor shall maintain such access during the work
- C. The Contractor shall use construction fencing to enclose a work area whenever there is potential hazard to passersby such as open excavation, heavy equipment, falling debris, hazardous materials, etc. Fencing shall be considered Contractor supplied equipment and should be factored into the Contractor's coefficient, unless the CO deems the individual TO requirements so extensive as to warrant separate payment under the individual delivery order. Construction fencing shall be maintained in good condition throughout each performance period.
- D. The Contractor shall provide and maintain an adequate supply of movable barricades for use on job sites. Each barricade shall be self-supporting, wood or metal construction, minimum of 42" high, with reflective surfaces. These barricades shall be considered Contractor supplied equipment and should be factored into the Contractor's proposal. They shall be maintained in good condition throughout the contract period and remain the property of the Contractor.
- H. Barricades on streets or in areas with heavy pedestrian traffic must have battery-powered flashers for night use. Cones may only be used to temporarily block pedestrian traffic. Extended pedestrian blockages or road traffic must use barricades with tape strung between. All barricades (up to 100 linear feet), cones, etc., are part of the Contractor supplied equipment/supplies and shall be factored into the Contractor's proposal, unless the CO deems the individual TO requirements so extensive as to warrant separate payment under the individual order.
- F. All open excavation shall be secured with barricades, webbed fencing, or flashing lighted barricades on all sides, and have nylon web construction fencing completely surrounding the site, a minimum of 5' away from the hole.
- G. All excavation sites shall be covered at all times the job site is not manned, and shall have temporary nylon web fence and, if directed, barricades, installed around sites. All tools shall be secured in such a way as to prevent any injury to personnel, and clearly barricaded/fenced off with warning tape surrounding the items. Plywood used for barriers; barricades and fencing (up to 100 linear feet); cones, etc., are part of the Contractor supplied equipment/supplies and shall be factored into the Contractor's proposal, unless the CO deems the individual

requirements so extensive as to warrant separate payment under the individual delivery order.

## **18.0 SCHEDULING**

- A.** Task Orders greater than or equal to 60 days in duration require an AF-3064 progress schedule submitted to the AF PM within 14 days of award. In addition, the follow scheduling requirements shall be met:
- a. **Project Scheduler:** Designate an authorized representative to be responsible for the preparation of the schedule and all required updating and production of reports. The authorized representative must have a minimum of 2 years' experience scheduling construction projects similar in size and nature to this project with scheduling software that meets the requirements of this specification. Representative must have a comprehensive knowledge of CPM scheduling principles and application.
  - b. **Contractor Scheduling Software:** The scheduling software utilized to produce and update the schedules required herein must be capable of meeting all requirements of this specification.
  - c. **General Requirements:** Prepare for approval a Project Schedule, as specified herein, pursuant to FAR Clause 52.236-15 Schedules for Construction Contracts. Show in the schedule the proposed sequence to perform the work and dates contemplated for starting and completing all schedule activities. The scheduling of the entire project is required. The scheduling of construction is the responsibility of the Contractor. Contractor management personnel must actively participate in its development. Subcontractors and suppliers working on the project must also contribute in developing and maintaining an accurate Project Schedule. Provide a schedule that is a forward planning as well as a project monitoring tool. Use the Critical Path Method (CPM) of network calculation to generate all Project Schedules. Prepare each Project Schedule using the Precedence Diagram Method (PDM).
  - d. **Basis for Payment and cost Loading:** The schedule is the basis for determining contract earnings during each update period and therefore the amount of each progress payment. The aggregate value of all activities coded to a contract CLIN must equal the value of the CLIN.
  - e. **Activity Cost Loading:** Activity cost loading must be reasonable and without front-end loading. Provide additional documentation to demonstrate reasonableness if requested by the Contracting Officer.
  - f. **Level of Detail Required:** Develop the Project Schedule to the appropriate level of detail to address major milestones and to allow for satisfactory project planning and execution. Failure to develop the Project Schedule to an appropriate level of detail will result in its disapproval. The Contracting Officer will consider, but is not limited to, the following characteristics and requirements to determine appropriate level of detail:

- i. Activity Durations: Reasonable activity durations are those that allow the progress of ongoing activities to be accurately determined between update periods. Less than 2 percent of all non-procurement activities may have Original Durations (OD) greater than 20 work days or 30 calendar days.
- ii. Procurement Activities: Include activities associated with the critical submittals and their approvals, procurement, fabrication, and delivery of long lead materials, equipment, fabricated assemblies, and supplies. Long lead procurement activities are those with an anticipated procurement sequence of over 90 calendar days.
- iii. Mandatory Tasks: Include the following activities/tasks in the initial project schedule and all updates.
  1. Submission, review and acceptance of Preconstruction Submittals (individual activity for each).
  2. Submission of mechanical/electrical/information systems layout drawings.
  3. Long procurement activities
  4. Submission and approval of O & M manuals.
  5. Submission and approval of as-built drawings.
  6. Submission and approval of testing and air balance (TAB).
  7. Submission and approval of fire protection specialist.
  8. Submission and approval of Building Commissioning Plan, test data, and reports: Develop the schedule logic associated with testing and commissioning of mechanical systems to a level of detail consistent with the contract commissioning requirements. All tasks associated with all building testing and commissioning will be completed prior to submission of building commissioning report and subsequent contract completion.
  9. Contractor's pre-final inspection.
  10. Correction of punch list from Contractor's pre-final inspection.
  11. Government's pre-final inspection.
  12. Correction of punch list from Government's pre-final inspection.
  13. Final inspection.
  14. Government Activities: Show Government and other agency activities that could impact progress. These activities include, but are not limited to: approvals, environmental permit approvals by State regulators, inspections, utility tie-in, Government Furnished Equipment (GFE) and Notice to Proceed (NTP) for phasing requirements.



- iv. Project Start Date Milestone and Constraint: The first activity in the project schedule must be a start milestone titled "NTP Acknowledged," which must have a "Start On" constraint date equal to the date that the NTP is acknowledged.
- v. End Project Finish Milestone and Constraint: The last activity in the schedule must be a finish milestone titled "End Project." Constrain the project schedule to the Contract Completion Date in such a way that if the schedule calculates an early finish, then the float calculation for "End Project" milestone reflects positive float on the longest path. If the project schedule calculates a late finish, then the "End Project" milestone float calculation reflects negative float on the longest path. The Government is under no obligation to accelerate Government activities to support a Contractor's early completion.
- vi. Open Ended Logic: Only two open ended activities are allowed: the first activity "NTP Acknowledged" may have no predecessor logic, and the last activity - "End Project" may have no successor logic. Predecessor open ended logic may be allowed in a time impact analyses upon the Contracting Officer's approval.
- vii. Default Progress Data Disallowed: Actual Start and Finish dates must not automatically update with default mechanisms included in the scheduling software. Updating of the percent complete and the remaining duration of any activity must be independent functions. Disable program features that calculate one of these parameters from the other. Activity Actual Start (AS) and Actual Finish (AF) dates assigned during the updating process must match those dates provided in the Contractor Quality Control Reports. Failure to document the AS and AF dates in the Daily Quality Control report will result in disapproval of the Contractor's schedule.
- viii. Out of Sequence Activities: Activities that have progressed before all preceding logic has been satisfied (Out-of-Sequence Progress) will be allowed only on a case-by-case basis subject to approval by the Contracting Officer. Propose logic corrections to eliminate out of sequence progress or justify not changing the sequencing for approval prior to submitting an updated project schedule. Address out of sequence progress or logic changes in the Narrative Report and in the periodic schedule update meetings.
- ix. Added or Deleted Activities: Do not delete activities from the project schedule or add new activities to the schedule without approval from the Contracting Officer. Activity ID and description changes are considered new activities and cannot be changed without Contracting Officer approval.

- x. Original Durations: Activity Original Durations (OD) must be reasonable to perform the work item. OD changes are prohibited unless justification is provided and approved by the Contracting Officer.
- xi. Leads, Lags, and Start to Finish Relationships: Lags must be reasonable as determined by the Government and not used in place of realistic original durations, must not be in place to artificially absorb float, or to replace proper schedule logic. Leads (negative lags) are prohibited. Start to Finish (SF) relationships are prohibited.
- xii. Percent Complete: Update the percent complete for each activity started, based on the realistic assessment of earned value. Activities which are complete but for remaining minor punch list work and which do not restrain the initiation of successor activities may be declared 100 percent complete to allow for proper schedule management.
- xiii. Remaining Duration: Update the remaining duration for each activity based on the number of estimated work days it will take to complete the activity. Remaining duration may not mathematically correlate with percentage found under paragraph entitled Percent Complete.
- xiv. PROJECT SCHEDULE SUBMISSIONS: Provide the submissions as described below. If the Contractor fails or refuses to furnish the information and schedule updates as set forth herein, then the Contractor will be deemed not to have provided an estimate upon which a progress payment can be made. Review comments made by the Government on the schedule(s) do not relieve the Contractor from compliance with requirements of the Contract Documents.
- xv. Preliminary Project Schedule: Within 15 calendar days after the NTP is acknowledged submit the Preliminary Project Schedule defining the planned operations detailed for the first 90 calendar days for approval. The approved Preliminary Project Schedule will be used for payment purposes not to exceed 90 calendar days after NTP. Completely cost load the Preliminary Project Schedule to balance the contract award CLINS shown on the Price Schedule. The Preliminary Project Schedule may be summary in nature for the remaining performance period. It must be early start and late finish constrained and logically tied as specified. The Preliminary Project Schedule forms the basis for the Initial Project Schedule specified herein and must include all of the required plan and program preparations, submissions and approvals identified in the contract (for example, Quality Control Plan, Safety Plan, and Environmental Protection Plan) as well as design activities, planned submissions of all early design packages, permitting activities, design review conference activities, and other non-construction activities

intended to occur within the first 90 calendar days. Government acceptance of the associated design package(s) and all other specified Program and Plan approvals must occur prior to any planned construction activities.

- xvi. **Initial Project Schedule:** Submit the Initial Project Schedule for approval within 42 calendar days after notice to proceed is issued. The schedule must demonstrate a reasonable and realistic sequence of activities which represent all work through the entire contract performance period. No payment will be made for work items not fully detailed in the Project Schedule.
- xvii. **Periodic Schedule Updates:** Update the Project Schedule on a regular basis, monthly at a minimum. Provide a draft Periodic Schedule Update for review at the schedule update meetings as prescribed in the paragraph PERIODIC SCHEDULE UPDATE MEETINGS. These updates will enable the Government to assess Contractor's progress. Update information including Actual Start Dates (AS), Actual Finish Dates (AF), Remaining Durations (RD), and Percent Complete is subject to the approval of the Government at the meeting. Update information including Actual Start Dates (AS), Actual Finish Dates (AF), Remaining Durations (RD), and Percent Complete is subject to the approval of the Government at the meeting. AS and AF dates must match the date(s) reported on the Contractor's Quality Control Report for an activity start or finish.
- xviii. **SUBMISSION REQUIREMENTS:** Submit the following items for the Preliminary Schedule, Initial Schedule, and every Periodic Schedule Update throughout the life of the project:
  - 1. **Narrative Report:** Provide a Narrative Report with each schedule submission. The Narrative Report is expected to communicate to the Government the thorough analysis of the schedule output and the plans to compensate for any problems, either current or potential, which are revealed through that analysis. Include the following information as minimum in the Narrative Report:
    - a. Identify and discuss the work scheduled to start in the next update period.
    - b. 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.
    - c. Identify and discuss all schedule changes by activity ID and activity name including what specifically was changed and why the change was needed. Include at a minimum

new and deleted activities, logic changes, duration changes, calendar changes, lag changes, resource changes, and actual start and finish date changes.

d. Identify and discuss out-of-sequence work.

2. Schedule Reports: The format, filtering, organizing and sorting for each schedule report will be as directed by the Contracting Officer. Typically, reports contain Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date, Total Float, Actual Start Date, Actual Finish Date, and Percent Complete. Provide the reports electronically in .pdf format. Provide a schedule log, network diagram readable on 11x17 paper, critical path (defined as the longest path).

- xix. Periodic Schedule Updates: Submit the complete Periodic Schedule Update of the Project Schedule containing all approved progress, revisions, and adjustments, not later than 4 work days after the periodic schedule update meeting.
- xx. Weekly Progress Meetings: Conduct a weekly meeting with the Government (or as otherwise mutually agreed to) between the meetings described in paragraph entitled PERIODIC SCHEDULE UPDATE MEETINGS for the purpose of jointly reviewing the actual progress of the project as compared to the as planned progress and to review planned activities for the upcoming two weeks. Use the current approved schedule update for the purposes of this meeting and for the production and review of reports. At the weekly progress meeting, address the status of RFIs, RFPs and Submittals.
- xxi. Requests for Time Extensions: Provide a justification of delay to the Contracting Officer in accordance with the contract provisions and clauses for approval within 10 days of a delay occurring. Also prepare a time impact analysis for each Government request for proposal (RFP) to justify time extensions.
- xxii. Justification of Delay: Provide a description of the event(s) that caused the delay and/or impact to the work. As part of the description, identify all schedule activities impacted. Show that the event that caused the delay/impact was the responsibility of the Government. Provide a time impact analysis that demonstrates the effects of the delay or impact on the project completion date or interim completion date(s). Evaluate multiple impacts chronologically; each with its own justification of delay. With multiple impacts consider any concurrency of delay. A time extension and the schedule fragnet becomes part of

- the project schedule and all future schedule updates upon approval by the Contracting Officer.
- xxiii. Time Impact Analysis: Prepare a time impact analysis for approval by the Contracting Officer based on industry standard AACE 52R-06. Utilize a copy of the last approved schedule prior to the first day of the impact or delay for the time impact analysis. If Contracting Officer determines the time frame between the last approved schedule and the first day of impact is too great, prepare an interim updated schedule to perform the time impact analysis. Unless approved by the Contracting Officer, no other changes may be incorporated into the schedule being used to justify the time impact.
  - xxiv. Fragnet: Prepare a proposed fragnet for time impact analysis consisting of a sequence of new activities that are proposed to be added to the project schedule to demonstrate the influence of the delay or impact to the project's contractual dates. Clearly show how the proposed fragnet is to be tied into the project schedule including all predecessors and successors to the fragnet activities. The proposed fragnet must be approved by the Contracting Officer prior to incorporation into the project schedule.
  - xxv. Time Extension: The Contracting Officer must approve the Justification of Delay including the time impact analysis before a time extension will be granted. No time extension will be granted unless the delay consumes all available Project Float and extends the projected finish date ("End Project" milestone) beyond the Contract Completion Date. The time extension will be in calendar days. Actual delays that are found to be caused by the Contractor's own actions, which result in a calculated schedule delay will not be a cause for an extension to the performance period, completion date, or any interim milestone date.
  - xxvi. Failure to Perform: Failure to perform work and maintain progress in accordance with the supplemental recovery plan may result in an interim and final unsatisfactory performance rating and may result in corrective action directed by the Contracting Officer pursuant to FAR 52.236-15 Schedules for Construction Contracts, FAR 52.249-10 Default (Fixed-Price Construction), and other contract provisions.
  - xxvii. Recovery Schedule: Should the Contracting Officer find it necessary, submit a recovery schedule pursuant to FAR 52.236-15 Schedules for Construction Contracts.
- B.** The schedule can be altered for reasons including but not limited to Government delay, inclement weather, and unforeseen circumstances only by the decision of the CO.

- C. The Contractor may be paid for materials on site; however, they must appear on the Contract Progress Schedule and be inventoried by the AF PM prior to payment.
- D. Provisions must be made to leave each entrance secured at the end of work each day and to minimize the duration of time each entrance is worked on from start to completion. Any work, which affects the use of a required building exit, must be coordinated with the Government.
- E. Construction may not begin until the final design documents are approved by the Government, except for “fast-tracked” design-build projects. Once the design is approved, design changes are not allowed without Government approval. In many cases, fast-tracked design-build projects (projects for which construction begins at a mutually agreed point prior to completion of the design and construction drawings) will be clearly defined in the TO with various fast-tracked phases. In case of a fast-tracked project, construction may start only upon completion and approval of the design phases as defined in the TO.
- F. Unless prior approval is granted by the Government all major materials must be on site prior to beginning demolition.

#### **19.0 INAPPROPRIATE MATERIAL AND WORKMANSHIP**

- A. The Contractor assumes responsibility for the actions of all his employees, sub-contractors, and suppliers when on Arnold AFB. In accordance with contract clause 52.236-5, entitled Material and Workmanship, the CO may require, in writing that the Contractor remove from the work any employee the CO deems incompetent, careless, or otherwise objectionable.

## **APPENDIX 1 - REFERENCES, REGULATORY, CODES, AND STANDARD DESIGN & CONSTRUCTION CRITERIA**

The most applicable references are listed below, although others may apply. The Contractor shall perform a code analysis to determine the specific codes applicable to each task order. In the event of a conflict between commercial and Air Force, regulations, codes, standards, instructions, technical letters, manuals, and handbooks, the more stringent criteria will generally apply. Proposed codes which meet the technical requirements will be considered, if in the best interest of the Government. Latest editions of the publications of the organizations listed below shall be used.

AASHTO American Association of State Highway and Transportation  
Officials  
ACI American Concrete Institute  
AI Asphalt Institute  
AIA American Institute of Architects  
AIHA American Industrial Hygiene Association  
AISC American Institute of Steel Construction  
ANSI American National Standards Institute  
API American Petroleum Institute  
ARI Air-Conditioning and Refrigeration Institute  
ASA Acoustical Society of America  
ASCE American Society of Civil Engineers  
ASHRAE American Society of Heating, Refrigerating, and Air-Conditioning  
Engineers  
ASME American Society of Mechanical Engineers  
ASSE American Society of Safety Engineers  
ASTM American Society for Testing and Materials  
AWS American Welding Society  
AWWA American Water Works Association  
BHMA Builders Hardware Manufacturers Association  
CFR Department of Labor - Code of Federal Regulation  
CNRA California Natural Resources Agency  
CSI Construction Specifications Institute  
EIA Electronic Industry Association  
EPA Environmental Protection Agency  
ICSSC Interagency Committee on Seismic Safety in Construction  
IMC International Mechanical Code  
IPC International Plumbing Code  
IBC International Building Code  
ICC International Code Council  
IEEE Institute of Electrical and Electronics Engineers  
IES Illuminating Engineering Society  
ISA Instrumentation Society Of America  
ISO International Organization for Standardization  
MDNR Maryland Department of Natural Resources  
MSS Manufacturers Standardization Society of the Valve and Fittings  
Industry

NACE National Association of Corrosion Engineers  
 NAPHCC National Association of Plumbing, Heating, and Cooling Contractors  
 NEBB National Environmental Balancing Bureau  
 NEC National Electrical Code  
 NEHRP National Earthquake Hazard Reduction Program  
 NEMA National Electrical Manufacturers Association  
 NETA InterNational Electrical Testing Association  
 NFPA National Fire Protection Association  
 NIBS National Institute of Building Sciences  
 NIST National Institute of Standards and Technology  
 NOIA National Concrete Masonry Association  
 NSF National Sanitation Foundation  
 OSHA Occupational Safety and Health Administration  
 SCAQMD South Coast Air Quality Management District  
 SMACNA Sheet Metal and Air-Conditioning Contractors National Association  
 SSPC Society for Protective Coatings  
 SSPC Steel Structures Painting Council  
 TDEC Tennessee Department of Environment and Conservation  
 TIA Telecommunications Industry Association  
 UFC Unified Facilities Criteria  
 UL Underwriter's Laboratories

#### 1.1 AEDC Operating Instructions and Standards

- AEDCOI 21-1, Foreign Object Damage Prevention Program
- AEDCOI 21-2, Hold and Impoundment
- AEDCOI 21-205, Tactical Integration Group
- CCP-100, AEDC Protective Coatings and Corrosion Control Plan
- AEDC-STD-CM-1, Configuration Management
- AEDC-STD-SE-1, AEDC Standard System Engineering
- TSS-SE-HNDBK, Test Systems Sustainment Systems Engineering Handbook
- AEDC-ENGR-STD-T-1, AEDC Standard Pressure Vessels
- AEDC-ENGR-STD-T-2, AEDC Standard Pressure Piping
- AEDC-ENGR-STD-T-3, AEDC Standard Engineering Drawing and Drafting Practices
- AEDC-ENGR-STD-T-4, AEDC Standard For Procurement Documentation
- AEDC-ENGR-STD-T-5, AEDC Standard Welding Practices
- Arnold AFB Architectural Compatibility Standards
- AFTCI 91-203 AEDCSUP, AFTC Test Safety Review Policy
- AEDCI 21-3, Tool Control
  - AEDCI 63-3733, Organizational Engineering
  - Asbestos Removal CSI Section 02 08 00 modified for AEDC
- Lead and Heavy Metal Removal CSI Section 02 08 50 modified for AEDC

#### 1.2 Regulations:

- 10 CFR 435 Energy Conservation Voluntary Performance Standards for New



Buildings. Mandatory for Federal Buildings

- Energy Policy Act
- AFFARS 52.223-9 Estimate of Percentage of Recovered Material Content for EPA-Designated Items, 2008.
- AFFARS 5352.223-9000 Elimination of Use of Class I Ozone Depleting Substances (ODS), April 2003.

#### 1.3 Air Force Engineering Technical Letters:

- AF ETL 01-1: Reliability and Maintainability Design Checklist
- AF ETL 02-12, Communications and Information Systems Criteria for Air Force Facilities, 2008
- AF ETL 11-21, Emergency and Standby Generator Design, Maintenance and Testing Criteria , 2011
- AF ETL 01-18, Fire Protection Engineering Criteria
- AF ETL 01-18, Fire Protection Engineering Criteria-Electronic Equipment Installations, 24 October 2001
- AF ETL 08-13, Incorporating Sustainable Design and Development (SDD) and Facility Energy Attributes in the Air Force Construction Program, 14 September 2008

#### 1.4 Air Force Instruction (AFI):

- AFI 32-10141, Planning and Programming Fire Safety Deficiency Correction Projects
- AFI 32-1032, Planning and Programming Appropriated Funded Maintenance, Repair, and Construction Projects
- AFI 32-1068, Heating Systems and Unfired Pressure Vessels
- AFI 32-7042, Waste Management
- AFI 32-7086, Hazardous Materials Management Plan

#### 1.5 Air Force Manuals and Military Handbooks:

- AFMAN 91-201, Explosives Safety Standards
- MIL-HDBK 1004/6 Lightning Protection 1988
- Air Force Handbook 32-1084, Facility Requirements

## **APPENDIX 2 – DESIGN SUBMITTAL REQUIREMENTS**

### **30-PERCENT DESIGN**

1. The 30-percent design submission shall include, but not be limited to, the following items:
  - a. Concept design narrative
  - b. Concept drawings
  - c. Project specifications outline
  - d. Risk assessment
  - e. Preliminary hazards list
  - f. Preliminary schedule
  - g. List of applicable codes and standards based on code analysis
2. Concept design narrative:
  - a. Design approach that addresses major disciplines associated with the design solution
  - b. System and subsystem requirements, including derived requirements, traceable back to TO documentation
  - c. Assumptions and constraints
  - d. O&M impacts
  - e. Analysis and calculations
3. Concept drawings, as applicable:
  - a. Mechanical / Electrical / ID&C:
    - (1) Location plan and general characteristics of major equipment
    - (2) Preliminary layout of ducts/piping/conduits
    - (3) Preliminary Piping & Instrumentation Diagram (P&ID)
  - b. Civil:
    - (1) Site plan showing existing drainage, roads and sidewalks, parking and routing of electric, telephone, gas, water, sewer, and other utilities
    - (2) Footings and foundations, including structural
    - (3) Geotechnical
  - c. Demolition plans generally depicting equipment, utilities and site infrastructure to be removed with interface points
4. The risk assessment shall identify high-level risks and mitigation measures.
5. Provide a list of preliminary safety hazards resulting from changes introduced by the design. (Reference SHE standard A4 System Safety, Annex H - Hazards Checklist)

6. The project specifications shall be in the Construction Specifications Institute (CSI) format and outline all applicable sections. Project specifications shall outline and be inclusive of all applicable disciplines, codes and standards references in the design concept narrative. Specifications selected due to an identified risk, requirement, assumption, and/or constraint shall be noted as such.

7. Provide a preliminary schedule of activities with emphasis on how the work will be broken down and progress measured. Provide a Gantt chart that depicts the logical sequence of work from design through closeout including major activities, milestones, outages, start & completion dates and predecessors & successors to depict the critical path.

8. Propose all applicable engineering codes and standards as they apply to each system.

### **60-PERCENT DESIGN**

1. The preceding design will be completed to 60-percent and shall include the integration of the Government review comments resulting from the previous review. The 60-percent design submission shall include, but not be limited to, the following items:

- a. Design drawings with appropriate detail
- b. Design documentation/data
- c. Project specifications
- d. Commissioning Plan outline
- e. Risk Management Plan outline
- f. Preliminary hazards analysis
- g. List of training requirements
- h. Schedule
- i. List of applicable codes and standards based on code analysis

#### **2. Design Drawings:**

a. Preliminary site plans shall show the locations of each proposed building and facility, critical grades, contours, drainage and relation of buildings and facilities to existing buildings, facilities, street systems, above and underground utilities, entrances and finished grades. Present grades shall be indicated. At locations where survey controls (coordinate systems or base lines) have been established, buildings and facilities shall be tied-in to such control. Logs of subsurface explorations shall be shown. (As applicable)

b. Preliminary designs for buildings and structures/equipment shall be two-line drawings showing floor plans, elevations and locations of principal items of installed equipment IAW the following, as applicable:

- (1) All required controlling dimensions shall be clearly indicated.
- (2) Floor plans with dimensions and functional arrangement of all areas including corridors, exits, stairs and utility spaces properly related to exterior access, road, parking and service areas. Individual treatment shall be given items involving special design and/or deviations from accepted standards and of complex design. Gross floor areas shall be shown for each floor and for the entire building.

Floor and roof framing and loadings shall be indicated to scale. Pertinent information regarding fire prevention and safety requirements shall be shown. Design dead, live, snow, wind, seismic any special loading and all load combinations shall be shown.

(3) Elevations shall include story heights, fenestration and adaptation to finished grades at the site.

(4) Sections of structures, including framing, partitions, suspended ceilings and ducts shall be shown.

(5) Typical wall sections shall be shown at a scale of no less than  $\frac{3}{4}$  inch = 1 foot or engineering scale equivalent. Sections shall include material and thicknesses, methods of attachment and type of windows with relation thereof to supporting structural columns or walls.

c. Preliminary designs for mechanical systems to include, but are not limited to: high-pressure air ducting, valves and associated equipment; plant mechanical equipment; cooling water lines, valves and associated equipment; refrigeration; fire protection; hoists and cranes; and special mechanical features.

(1) Location, capacity and space requirements of all major items of equipment shall be indicated.

(2) Whether piping and ducting is exposed or concealed is required. Functional areas where piping is exposed shall also be delineated.

(3) Installation floor plans shall show piping as single line with pipe size and service delineated adjacent to pipe. Piping in areas with physical constraints shall be shown as double line and shall include critical dimensions.

(4) Elevations shall be provided of major equipment items showing connecting ductwork and piping. Elevations shall be shown as required to clarify physical constraints and delineate critical dimensions.

(5) Details shall be provided for equipment mounting, equipment bases and equipment supports.

(6) Details shall be provided for floor, roof and wall penetrations.

(7) Welding symbols shall be included when welding is required.

(8) Piping schematics shall be provided for each system.

(9) Schedules shall be provided for equipment including but not limited to chillers, fans, pumps, control valves, piping specialties and variable frequency drives. Schedules shall include device or equipment number and pertinent information such as type, size, flow coefficient, flow rate, pattern, design conditions, operating parameters, performance requirements and suggested manufacturer and model numbers.

(10) Drawings shall include a legend that clearly identifies each symbol used on the mechanical drawings.

(11) Drawings shall also include all notes required for installation.

d. Preliminary designs for electrical systems to include, but are not limited to: electrical service, distribution, and all related equipment.

- (1) Location, physical capacity and space requirements of all major items of equipment shall be shown including interior unit substations, motor control breakers/centers, service equipment and panels.
- (2) Electrical load analysis shall be provided,
- (3) Elevations shall be provided of major equipment items showing connecting conduit and wiring. Elevations shall be shown as required to clarify physical constraints and delineate critical dimensions.
- (4) Details shall be provided for equipment mounting, equipment bases and equipment supports.
- (5) Details shall be provided for floor, roof and wall penetrations.
- (6) One-line diagrams of high-voltage and low-voltage systems shall indicate equipment-connect load, circuit breaker and disconnect switch ratings, circuit breaker trip settings, fuse sizes and types, and wire sizes to each load.
- (7) Detailed schematics and wiring diagrams shall show interconnecting wires and cabling between individual components and equipment, and wiring up to the AEDC interfaces. Details as a minimum shall include identification of all Contractor-provided wire and cable as to type, number of conductors, shielding and color code (where applicable). Each cable and individual wire shall have a unique identification. Individual terminal points on terminal blocks shall be numbered.
- (8) Conduits, including those to be wired by others, shall be shown together with indication as to whether conduits are exposed. Functional areas having exposed conduits shall be delineated.
- (9) Riser diagrams showing service equipment, feeders and panels, other than branch circuits shall be shown. Power, communication and electronic features shall be indicated in sufficient detail to identify requirements clearly and to indicate the means of satisfying the requirements.
- (10) Schedules shall be provided for equipment. Schedules shall include device or equipment number and pertinent information such as type, size, design conditions, operating parameters, performance requirements and suggested manufacturer and model numbers.
- (11) Drawings shall include a legend that clearly identifies each symbol used on the mechanical drawings.
- (12) Drawings shall also include all notes required for installation.

e. P&ID control schematics for all equipment shall be provided showing all end devices. A sequence of operations shall be provided on the drawings for each major equipment item. The sequence of operation shall provide detailed explanations for all control logic and shall be written in present tense.

f. Provide printouts of Graphic Displays and all software code and related items for any user interface displays.

g. Prepare required information assurance documentation, to include network diagrams and system security configuration documentation, as specified

within the TO. This documentation will support the submission of required accreditation.

h. Demolition plans and elevations shall clearly delineate the equipment, utilities and site infrastructure to be removed with clear interface points.

i. Note any Government-furnished equipment / Government-furnished property to be installed by the Contractor, and equipment to be furnished and installed by the Government.

3. Design documentation/data:

a. Document requirements traceability from TO requirements to written specifications

b. Document O&M planning

c. Address mechanical/electrical design criteria and conditions being utilized during analysis

d. Address civil/structural areas to include, but not limited to:

(1) Geotechnical Reports, Boring plans and logs, including allowable bearing capacities and friction bearing capacities;

(2) Footing and Foundation structural calculations;

(3) Design loads (dead, live, snow, wind, seismic, any special loading and all load combinations); and

(4) All structural calculations.

e. Document routing and capacities of existing/proposed cooling water, power, air ducting, communication and fire alarm systems; loads, capacities and general arrangement; and illumination level of proposed lighting

4. Detailed specifications shall cover all proposed construction materials and equipment to be incorporated in the project as the result of designs by the Contractor. Detailed specifications shall be coordinated with the requirements for detailed design drawings. Describe any proposed deviations from the standard guide specifications.

5. The Commissioning Plan outline shall identify all major equipment and systems requiring verification.

6. Risk Management Plan outline:

a. Identify cost, schedule and performance risks, beyond the high-level risks previously identified

b. Thoroughly describe mitigation strategies for each significant risk

7. Provide an analysis of the preliminary safety hazards resulting from changes introduced by the design. Elaborate on proposed mitigation measures for the preliminary hazards listed in the 30% design and those resulting from the 60% design effort.

8. Provide a list of the training requirements to include training materials and sessions necessary to train operations and maintenance personnel on any system modifications that impact O&M practices.
9. Provide an updated schedule. Activities shall be divided into measureable tasks useful for progress assessments. Further breakdown may be required to include interactions between the Contractor and Government, such as submittal approvals ahead of associated work, design reviews, large material deliveries, on-site work, inspections and system outages. Ensure relationships (predecessors and successors) between major activities, milestones, Government/Contractor interaction, start and completion dates accurately represent how the work will be performed.
10. Provide an updated code analysis.

### **90-PERCENT DESIGN**

1. The preceding design will be completed to 90-percent and shall include the integration of the Government review comments resulting from the previous reviews. The 90-percent design submission shall include, but not be limited to, the following items:
  - a. Completed design drawings
  - b. Completed design documentation/data
  - c. Completed project specifications
  - d. Commissioning Plan
  - e. Risk Management Plan
  - f. Training Plan
  - g. Updated schedule
  - h. Finalized list of applicable codes and standards
2. Update the Commissioning Plan to address the steps and methods to be used, as well as required AEDC operational support.
3. Risk Management Plan:
  - a. Update cost, schedule and performance risks and
  - b. Update mitigation strategies for each significant risk.

### **FINAL DESIGN**

The final design shall include all items in the 90-percent Design Submittal, any necessary revisions to provide a complete, comprehensive submittal. Drawings shall be 100-percent complete, stamped and signed by the appropriate registered discipline that performed the design. Registration shall be in the state in which the work is located.