

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE	PAGE OF PAGES
			J	1 57
2. AMENDMENT/MODIFICATION NO. P00001	3. EFFECTIVE DATE 04-Feb-2015	4. REQUISITION/PURCHASE REQ. NO. 0010591458-0001	5. PROJECT NO.(If applicable) PWC010113	
6. ISSUED BY INSTAL & VEHICLE SUP CONTRACTING DIV 6501 E. 11 MILE ROAD WARREN MI 48397-5000	CODE W56HZV	7. ADMINISTERED BY (If other than item 6) INSTAL & VEHICLE SUP CONTRACTING DIV LAURA K. SZEP CCTA-HDC-A/MS 350 LAURA.K.SZEP.CIV@MAIL.MIL WARREN MI 48397-5000		CODE W56HZV
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code) C & J GENERAL CONTRACTORS, INC. KENNETH JORDAN 34463 SANDPABLE ST STERLING HEIGHTS MI 48310-5560			9A. AMENDMENT OF SOLICITATION NO.	
			9B. DATED (SEE ITEM 11)	
			X	10A. MOD. OF CONTRACT/ORDER NO. W56HZV-14-C-L730
			X	10B. DATED (SEE ITEM 13) 30-Sep-2014
CODE 5X8F5	FACILITY CODE			
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS				
<input type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer <input type="checkbox"/> is extended, <input type="checkbox"/> is not extended. Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.				
12. ACCOUNTING AND APPROPRIATION DATA (If required)				
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.				
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.				
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).				
X C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: FAR 43.103(a)				
D. OTHER (Specify type of modification and authority)				
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input checked="" type="checkbox"/> is required to sign this document and return <u>1</u> copies to the issuing office.				
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) Modification Control Number: wiebell15228 Reference Purchase Request: 0010591458-0001 The purpose of modification P00001 is to change due dates in Section 1.2. Commencement, Prosecution and Completion of Work in the Scope of Work. 1. Section 1.2.b will change the 65 Percent Design Submittal date from: 60 calendar days, to: 5 January 2015. 2. Section 1.2.c will change the 100 Percent Design submittal date from: 105 calendar days, to: 19 February 2015. 3. Section 1.2.d will change the Released for Construction Design submittal date from: 135 calendar days, to: 21 March 2015 4. Section 1.2.e will change the Construction Ready for Use date from: 225 calendar days, to: 19 June 2015. 5. Section 1.2.f will change the Complete Entire Work date from: 255 calendar days, to: 19 July 2015. 6. To update FAR Clause 52.211-10, Commencement, Prosecution, and Completion of Work in Section I of the contract. 7. To update FAR Clause 52.211-12, Liquidated Damages--Construction in Section I of the contract. 8. All other terms and conditions remain the same. Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.				
15A. NAME AND TITLE OF SIGNER (Type or print)			16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) JOHN SARTI / CONTRACTING OFFICER TEL: 586-282-6524 EMAIL: john.m.sarti2.civ@mail.mil	
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY <u>John Sarti</u> (Signature of Contracting Officer)		16C. DATE SIGNED 04-Feb-2015
(Signature of person authorized to sign)				

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SUMMARY OF CHANGES

SECTION C - DESCRIPTIONS AND SPECIFICATIONS

The following have been modified:

STATEMENT OF WORK



Directorate of Public Works
Detroit Arsenal

Design-Build Statement of Work

**Project Title: Repair CARDOX System,
Building 212
Work Order Number PWC010113**

**U.S. Army Garrison - Detroit Arsenal
Directorate of Public Works
Warren, MI**

29 September 2014
FINAL Document

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SECTION 01 02 10.00 06

PROJECT DESCRIPTION AND DESIGN REQUIREMENTS
04/13

PART 1 DESIGN OBJECTIVES

1.1 PROJECT DESCRIPTION

The contractor shall provide as part of this project design-build services to design and perform the mechanical, electrical, fire protection and fire alarm/detection work as described in this Statement of Work (SOW).

Carbon dioxide (CARDOX or CO2) fire suppression system serving Building 212 shall be repaired to meet applicable codes and standards.

Electronic MicroStation V8 XM computer-aided design and drafting (CADD) files or Adobe Acrobat Portable Document Format (PDF) files, include the existing building floor plans and utility plans, may be provided by the Detroit Arsenal (DTA) Directorate of Public Works (DPW) on compact disc (CD) as part of this SOW for design development. Additional files for the Contractor's reference may also be provided on this CD. The Contractor shall field verify all files and drawings provided by the Detroit Arsenal DPW for accuracy prior to cost proposal submission.

Design and construction shall comply with the requirements contained in this SOW. The design and technical criteria contained and cited in this SOW, the Detroit Arsenal Installation Design Guide (IDG) (Appendix 19), the Department of Defense (DoD) Unified Facilities Criteria (UFC), and the Unified Facilities Guide Specifications (UFGS) shall establish minimum standards for design and construction quality. The Contractor shall adhere to the requirements included in the Detroit Arsenal (DTA) IDG. The Contractor shall adhere to the International Building Code (IBC), published by the International Code Council, as referenced by the UFC and UFGS. The Designers of Record shall use the UFGS and the requirements contained in this SOW to fully develop the technical specifications and construction drawings.

The Contractor shall comply with the latest editions of all codes, standards, regulations, specifications, and requirements as of the date of issuance of this SOW. If there is a conflict between requirements in this SOW and the UFGS then the requirements of this SOW shall take precedence and shall be adhered to.

The Contractor shall provide extended parts and labor warranties on all equipment, products, and items, including fire protection and fire alarm equipment, lightning protection equipment, and all other equipment as specified in the Unified Facilities Guide Specifications (UFGS). In addition to submitting warranty information when specified in the Unified Facility Guide Specifications, all product warranty information shall also be provided at the time product data information is submitted to the Government for review. Parts and labor warranties shall be provided for the maximum number of years specified in the Unified Facilities Guide Specifications for all products.

1.1.1 Bid Options

Bid Option 1: The Contractor shall remove all existing fire alarm devices in the basement. The Contractor shall provide new notification, initiating devices, tamper/flow switches, and head-end equipment as part of the fire alarm design in the basement. The Contractor shall provide all programming, testing, terminations, and re-programming for the Fire Alarm system complying with NFPA 72. Contractor shall be responsible for providing all conduit, dedicated branch circuits, low-voltage wiring, circuit breakers, and all other associated supporting devices for a complete Fire Alarm system design in the basement.

Bid option-2 The Contractor shall remove and legally dispose of existing CO2 tank and install 2 new 6ton each Cardox tanks with all electrical and control items and related items for a complete system, if this is taken than remove item #23 & 21 & 2 (three valves only).

Bid Option-3 The Contractor shall provide and install new gas detection panel Fenwal net 6000 and all associated conduit and wiring and programming.

1.2 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK

The Contractor shall be required to:

- a. commence work under this contract within the time allotted under the SOW,
- b. complete the 65 Percent Design submittal, including submission of written responses to all Government comments and completion of the design review meeting, not later than **5 January 2015** after date of receipt of notice to proceed.
- c. complete the 100 Percent Design submittal, including submission of written responses to all Government comments and completion of the design review meeting, not later than **19 February 2015** after date of receipt of notice to proceed.
- d. complete the entire project design ready for construction (Released for Construction Design submittal), including submission of written responses to all Government comments and completion of the design review meeting, not later than **21 March 2015** after date of receipt of notice to proceed.
- e. complete all construction to be ready for use not later than **19 June 2015** after date of receipt of notice to proceed. The time stated for completion shall include final inspection punch list item completion and Government acceptance, final cleanup, and completion of all requirements to authorize beneficial occupancy.
- f. complete the entire work not later than **19 July 2015** after date of receipt of notice to proceed. The time stated for completion shall include as-built drawings, operation and maintenance manuals, operational tests, reports, equipment lists, training, instructions, and all other required project closeout documents.

1.3 APPLICABLE CRITERIA

Applicable design and construction criteria are specifically indicated in Department of Defense (DoD) Unified Facilities Criteria (UFC) and the Unified Facilities Guide Specifications (UFGS). Criteria shall be taken

from the most current references as of the date of issue of the SOW, unless noted otherwise. Referenced codes and standards are minimum acceptable criteria. Administrative, contractual, and procedural features of the contract shall be as described in other sections of the SOW.

1.4 ENERGY STANDARD COMPLIANCE

The building shall comply with the provisions of the Energy Policy Act (EPA) 2005, in addition to American Society of Heating, Refrigerating and Air-Condition Engineers (ASHRAE) Standard 90.1 - Energy Standard for Buildings. As a separate part or section of the Design Analysis, demonstrate compliance with the EPA using calculations, vendor literature, equipment catalog sheets, compliance forms, worksheets, and narrative descriptions of the building envelope, heating, ventilating, and air-conditioning (HVAC) systems, service water heating, electrical power, lighting, and other equipment and systems.

1.5 ACCESSIBILITY REQUIREMENTS

The facility shall be fully accessible to physically disabled persons and shall conform to the *Architectural Barriers Act (ABA) Standard for Department of Defense (DoD) Facilities*.

1.6 FORCE PROTECTION & ANTI-TERRORISM CONSIDERATIONS

N/A

1.7 HAZARDOUS MATERIALS ABATEMENT

Asbestos abatement is required during demolition. Lead-based paint is present in the building and shall be considered for workers during demolition.

The Designer of Record shall edit UFGS Specification Section 02 82 14.00 10, ASBESTOS HAZARD CONTROL ACTIVITIES for abatement of asbestos and UFGS Specification Section 02 82 33.13 20, REMOVAL/CONTROL AND DISPOSAL OF PAINT WITH LEAD for worker safety in removing materials coated with lead-based paint.

All asbestos insulation that is removed shall be replaced with non-asbestos insulation material in accordance with UFC and UFGS insulation specifications.

The Contractor shall adhere to the third party neutral consultant final clearance requirements stated in the "ASBESTOS" paragraph of the contract.

The Contractor shall maintain floor material warranties when abatement measures are taken on existing floors.

Hazardous materials abatement shall be performed in accordance with Appendix A, Standard Environmental Protection Requirements and Appendix B, Other Standard Environmental Protection Requirements.

1.7.1 Asbestos Survey

Available asbestos survey information is included in appendix 15 for use in preparing proposals. The Contractor shall remove all asbestos identified

in the asbestos report throughout the entire project area as part of this project except for the following items if they are not affected by this project; caulking that is not affected by this project, asbestos below a raised access floor that is not affected by this project, and asbestos that is obstructed by furniture that is not affected by this project. The Contractor's cost proposal shall include the removal of all asbestos which is identified as "Assumed" asbestos indicated in the asbestos report and the removal of all known asbestos indicated in the asbestos report except for the exceptions listed above. Asbestos shall be removed and disposed of in accordance with Federal, state, and installation requirements. The asbestos waste shall be disposed of via HAZMART.

1.8 PERMITS

The Contractor shall be responsible for preparing, filing, and paying for any fees required to obtain all necessary permits for the construction of this project.

Permits shall be prepared and filed in accordance with Appendix A, Standard Environmental Protection Requirements and Appendix B, Other Standard Environmental Protection Requirements.

1.9 FINAL CLEANING

Clean the premises in accordance with FAR clause 52.236-12 and additional requirements stated here. Remove stains, foreign substances, and temporary labels from surfaces. Clean equipment and fixtures to a sanitary condition. Clean or replace filters of operating equipment if cleaning is not possible or practicable. Remove waste, surplus materials, and rubbish from the site. Remove all temporary structures, barricades, project signs, fences, and construction facilities.

1.10 FURNITURE RECONFIGURATION, REMOVAL, AND COORDINATION

N/A

1.11 COORDINATION

The Contractor shall coordinate, through the COR, with the proposed tenant for the placement, installation, finish selections, of tenant furnished material and equipment. The Contractor shall coordinate with other contractors to prevent interference with their work and to allow them access to the work areas.

The project area will remain occupied by the tenant during construction. If it becomes necessary to interrupt work activities in buildings and/or areas for construction purposes, permission to do so shall be requested by the Contractor in writing to the Contracting Officer fourteen (14) calendar days prior to commencing work and shall be subject to COR approval. Written requests for street closing shall be submitted for approval by the COR fourteen (14) calendar days prior to closing the street.

Work in connection with this contract which requires utility outages (electrical, water, gas, steam,...) which will close down or limit (as determined by the Contracting Officer) normal activities in the building, construction area, or other affected areas, shall be performed by the Contractor at a time other than regular working hours of the organization

occupying the facility. Work in connection with this contract which requires road closures shall be performed by the Contractor at a time other than regular working hours. Work required by the Contractor on non-standard basis or at premium pay shall be done at no additional cost to the Government. Request for utility outages and road closures shall be submitted to the COR, in writing, fourteen (14) calendar days prior to commencing work and shall be subject to COR approval.

Obtain DPW approval of interruption by submitting the Construction Impact Notification Form in accordance with the contract.

The Contractor shall coordinate work efforts with all affected utility companies. This includes initial contact to each utility company and coordination prior to and during construction.

1.12 CONSTRUCTION SITE PLAN

Prior to the start of work, the contractor shall submit a site plan showing the locations and dimensions of temporary facilities (including layouts and details, equipment and material storage area (onsite and offsite), and access and haul routes, avenues of ingress/egress to the fenced area, and details of the fence installation). The contractor shall identify any areas which may have to be graveled to prevent the tracking of mud. The contractor shall indicate if the use of a supplemental or other staging area is desired. The contractor shall show locations of safety and construction fences, site trailers, construction entrances, trash dumpsters, temporary sanitary facilities, and worker parking areas.

All Contractor staging areas and storage areas shall be limited to areas within five (5) feet of the project area boundaries.

The Contractor shall comply with UFGS Specification Section 01 50 00, TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS.

PART 2 DESIGN AND CONSTRUCTION REQUIREMENTS

2.1 FUNCTIONAL AND AREA REQUIREMENTS

2.1.1 Gross Area Definition

Gross building area is measured to the outside face of exterior enclosure walls. The gross floor area of the project shall be determined by the Contractor to meet all SOW requirements including minimum net areas indicated in this SOW.

2.1.2 Net Area Definition

Net area is measured to the inside face of the room or space walls.

2.2 ARCHITECTURAL

2.2.1 Technical Requirements

2.2.1.1 Design and Installation Standards and Codes

The architectural design and construction shall conform to the current versions of all applicable Unified Facilities Criteria (UFC). The project architectural design and construction shall be in accordance with the latest edition of the Department of Defense (DoD) Unified Facilities Guide Specifications (UFGS). The design and construction shall conform to all standards and codes referenced in the UFGS specifications under the applicable architectural specification sections.

Major criteria references for building design are listed below (additional requirements are included throughout the UFGS specification sections):

National Fire Codes, published by the National Fire Protection Association (NFPA), including NFPA 101 Life Safety Code

International Building Code (IBC)

UFC 3-600-01 Design: Fire Protection Engineering for Facilities

2.2.1.2 Scope of Work

The work shall include completion of architectural design as described herein and as detailed by the contractor's Architect Designer of Record. Any surfaces or finishes affected by this shall be restored using matching materials and finishes. See SOW (statement of work) and scope of work drawings (Appendix 1) for details.

2.2.1.3 Detroit Arsenal Specific Requirements

Where existing walls are removed, the Contractor shall provide design and construction to relocate existing appurtenances; such as, fire extinguisher cabinets. The Contractor shall propose new appurtenance location in the design drawings for Government review and approval.

All piping, ductwork, conduit, wiring, and cabling shall be routed within walls, ceilings, or pipe chases to the maximum extent possible.

All paint work shall be performed in accordance with UFGS Specification Section 09 90 00, PAINTS AND COATINGS.

2.3 STRUCTURAL

2.3.1 Technical Requirements

2.3.1.1 Design and Installation Standards and Codes

The structural design and construction shall conform to the current versions of all applicable Unified Facilities Criteria (UFC). The project structural design and construction shall be in accordance with the latest edition of the Department of Defense (DoD) Unified Facilities Guide Specifications (UFGS). The design and construction shall conform to all standards and codes referenced in the UFGS specifications under the applicable structural specification sections.

Major criteria references for building design are listed below (additional requirements are included throughout the UFGS specification sections):

International Building Code, IBC

American Society of Civil Engineers (ASCE) 7, Minimum Design Loads for Buildings and Other Structures

Building Code Requirements for Structural Concrete and Commentary, American Concrete Institute (ACI) 318

PCI Design Handbook - Precast and Prestressed Concrete

Building Code Requirements for Masonry Structures and Specifications for Masonry Structures and Commentaries, ACI 530

Cold-Formed Steel Design Manual, AISI

Specifications for the Design of Cold-Formed Steel Structural Members, AISI

41st Edition Catalog of Standard Specifications and Load Tables for Steel Joists and Joist Girders

Steel Deck Institute Design Manual

Manual of Steel Construction - Allowable Stress Design (ASD), American Institute of Steel Construction or Manual of Steel Construction - Load and Resistance Factor Design (LRFD), American Institute of Steel Construction

Specification for Structural Joints Using ASTM A325 or A490 Bolts

Structural Welding Code - Steel, ANSI/AWS D1.1

PCI Design Handbook - Precast and Prestressed Concrete

FEMA 302 - NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures

UFC4-010-10, DoD Minimum Antiterrorism Standards for Buildings

2.3.1.2 Scope of Work

The work includes completion of structural design as described herein and as detailed by the Structural Designer of Record.

No particular structural system is selected or recommended by the Government; therefore, the structural design is the Contractor's responsibility within the parameters given in this section.

The criteria established herein shall be used for the determination of structural loads, the analysis and design of all structural systems, and the construction of all structural systems. All structural calculations shall be checked and initialed by a registered engineer other than the original design engineer. Construction documents (drawings and specifications) shall be sealed and signed by a professional engineer registered to perform work in the jurisdiction.

See SOW (statement of work) and scope of work drawings (Appendix 1) for details.

2.4 MECHANICAL & HVAC

2.4.1 Technical Requirements

2.4.1.1 Design and Installation Standards and Codes

The HVAC design and installation shall conform to the current versions of all applicable Unified Facilities Criteria (UFC), the International Mechanical Code (as referenced by the UFC and UFGS), National Fire Protection Association (NFPA) 90A Standard for the Installation of Air-Conditioning and Ventilating Systems, the National Electrical Code, and ASHRAE Standard 62.1 Ventilation for Acceptable Indoor Air Quality. All new heating, ventilating, and air-conditioning (HVAC) systems and equipment shall conform to the Energy Policy Act (EPAct) of 2005. The selection of new HVAC systems shall be based on life cycle cost analysis. The project HVAC design and construction shall be in accordance with the latest edition of the Department of Defense (DoD) Unified Facilities Guide Specifications (UFGS). The design and installation shall conform to all standards and codes referenced in the UFGS specifications.

2.4.1.2 Scope of Work

The work includes completion of HVAC system design and construction to provide completely functional HVAC systems as described herein and as detailed by the HVAC System Designer of Record.

Refrigeration of the CARDOX tank shall be replaced with a new one of same capacity.

2.4.1.3 Detroit Arsenal Specific Requirements

All abandoned HVAC systems, equipment, ductwork, piping, equipment pads, and any other abandoned HVAC system component within the project area boundaries shall be removed.

Floor or ground placed HVAC or refrigeration equipment shall be mounted on concrete pads.

2.4.1.4 Piping Systems

Piping systems shall be installed in accordance with the requirements of UFGS Specifications and based on the material, type, and joining specified below (all piping shall be flushed):

Piping System	Material	Type	Joining
Refrigeration	Copper	Type ACR	95-5

2.4.1.5 Insulation

Pipe, ductwork, and equipment insulation shall be installed in accordance with requirements of UFGS Specification Section 23 07 00 THERMAL INSULATION FOR MECHANICAL SYSTEMS.

All new refrigerant piping shall be insulated with rubber insulation with UV protection.

2.4.1.6 Testing, Adjusting, and Balancing

Testing, adjusting, and balancing of each HVAC or refrigeration system shall be accomplished in accordance with the requirements of UFGS Specification Section 23 05 93.00 10 TESTING, ADJUSTING, AND BALANCING OF HVAC SYSTEMS.

2.4.1.7 Commissioning

Commissioning of all HVAC systems and refrigeration equipment, including controls, shall be in accordance with the requirements of UFGS Specification Section 23 08 00.00 10 COMMISSIONING OF HVAC SYSTEMS.

2.4.1.8 Training

The Contractor shall conduct a training course for the operating of all HVAC operating systems and individual items of equipment in accordance with the requirements of UFGS Specifications.

2.4.2 HVAC Drawings

The design drawings shall be fully coordinated with the design analysis and specifications. Depict all items to be removed, for instance, HVAC equipment, chilled water piping, ductwork, HVAC systems and components, and any other HVAC system components, on HVAC demolition drawings. The Contractor shall provide plans, piping diagrams and isometrics, mechanical room sections, water and air flow diagrams, details, schedules, control diagrams, sequences of operation, and other applicable details as necessary to define the design requirements. Large-scale plans of congested areas shall be provided. Coordinate with architectural design for provision of access panels for all concealed valves, traps, and air vents. Floor plans shall use the architectural floor plans as a basis, with the building outline half-toned. Unless otherwise indicated, all floor plans shall be drawn at (1/8" = 1'-0")1:100 scale and shall show all room names and numbers. An exception to this are administrative areas being air-conditioned shall be (1/4" = 1'-0")1:50 scale and mechanical room plans shall be (1/2" = 1'-0")1:20 scale. Sheet reference number sequencing shall be in accordance with the U.S. National CAD Standard requirements.

Show on mechanical HVAC drawings, all items of mechanical equipment, including boiler room equipment, HVAC equipment layout, air handling units, air distribution and exhaust systems, and any other applicable HVAC equipment to determine proper space allocation within the intent of the architectural layout requirements. Plans, elevations, and sections shall be developed to insure that major equipment items, piping, and ductwork cause no interference with structural members, electrical equipment, or other building or system elements.

An index sheet identifying all HVAC drawings shall be provided. The index shall include drawing design file numbers, drawing numbers, sheet numbers, and drawing descriptions.

An HVAC abbreviation, legend, and general notes sheet shall be provided. This sheet shall include all HVAC abbreviations and symbols that will be used on the drawings. Symbols shall be grouped into sections.

All existing exterior mechanical utilities and utilities which are to be removed shall be indicated on the Site Removal Plan located in the civil section of the drawing package.

All existing and new mechanical utilities shall be indicated on the Site Composite Utilities Plan located in the civil section of the drawing package. The location of existing exterior utilities shall be thoroughly checked and indicated on plans and profiles, thus preventing interference with new services. The utility drawing shall indicate all new utilities, including tie-in points, and existing utilities which are to be abandoned.

- i. Refrigerant Piping Diagram
- ii. Mechanical Schedule Sheets

Schedules shall be provided for each item of mechanical equipment. Furnished typical equipment schedules shall be used whenever possible and shall be revised and completed as necessary to suit the project requirements.

2.4.3 Specifications

UFGS specification sections shall be edited and coordinated with the drawings and design analysis to identify the proposed product and installation requirements.

The HVAC UFGS specification sections shall include (in addition to additional HVAC UFGS specifications required by the Designer of Record):

23 05 93 TESTING, ADJUSTING AND BALANCING OF HVAC SYSTEMS
 23 07 00 THERMAL INSULATION FOR MECHANICAL SYSTEMS
 23 08 00 COMMISSIONING OF HVAC SYSTEM
 23 23 00 REFRIGERANT PIPING
 23 82 02 UNITARY HEATING AND COOLING EQUIPMENT

The specifications shall be updated, shall be completely edited, and shall be fully coordinated with the drawings to accurately and clearly identify the final product and installation requirements for the facility.

2.4.4 Design Analysis Narrative

The narrative portion of the design analysis shall contain a narrative description and analysis for the HVAC portions of the design. The basis and reasons for specific engineering decisions, special features, and unusual requirements shall be explained or summarized. If it is necessary to deviate from criteria or standard practice, reasons shall also be included. Design statements shall be provided in sufficient detail to enable the reviewer to get a clear picture and understanding of all included work. Narrative shall be complete relative to scope and intended design approaches. The total scope projected to final design shall be outlined in a form that will be conveniently adapted, expanded, and detailed at the final design stage. If alternatives were to be evaluated and selected by

the designer, findings, and conclusions shall be included. The design analysis shall carry a complete narrative for every item and system covered in the design, and shall include the following:

2.4.5 Design Analysis Calculations

The Design Analysis Calculations shall provide an estimate of the heating, cooling, and ventilation loads to determine a selection of the type and size of mechanical equipment to be used. Design calculations shall be provided in sufficient detail to enable the reviewer to get a clear understanding of all work. Data shall be furnished to support basic design decisions related to sizing of major equipment and materials and performance of specific systems or equipment. Calculations shall be performed by computerized procedures. Use of standardized charts, curves, tables, and graphs shall generally be acceptable for portions of required calculations. Such data must be from a recognized source which is identified in the design analysis and shall be included with the calculations.

2.4.6 Energy Conservation

Mechanical designs shall be economical, maintainable, and energy conservative with full consideration given to the functional requirements and planned life of the facility. Emphasis shall be given to heat reclamation, outside air usage, and other energy conservation measures for mechanical systems.

2.5 ELECTRICAL

2.5.1 Technical Requirements

2.5.1.1 Design and Installation Standards and Codes

The electrical design and installation shall conform to the current versions of all applicable Unified Facilities Criteria (UFC), all applicable National Fire Protection Association (NFPA) standards, all applicable Institute of Electrical and Electronics Engineers (IEEE) standards, all applicable National Electrical Manufacturers Association (NEMA) standards, all applicable Illumination Engineering Society (IES) standards, all applicable Electronic Industries Alliance/Telecommunications Industry Association (EIA/TIA) standards, and all standards and codes referenced in the UFGS specifications. All distribution equipment/devised shall be UL listed and conform to NEC and the standards of IEEE, ANSI, and NEMA. Publications, codes, specifications, and standards shall be used as the basis for the project design. Publications and codes that imply recommendations shall be taken to be mandatory. Where there are conflicting criteria, the most stringent requirements take precedence.

2.5.1.2 Scope of Work

The work includes completion of electrical system design and construction to provide completely functional electrical systems as described herein and as detailed by the Electrical Designer of Record. The electrical system shall be designed under the supervision of a registered professional electrical engineer for quality assurance.

See SOW (statement of work) and scope of work drawings (Appendix 1) for details.

2.5.1.3 Detroit Arsenal Specific Requirements

All abandoned electrical systems, equipment, lighting, conduit, equipment pads, and any other abandoned electrical system component within the project area boundaries shall be removed.

All conduit, wiring, and cabling shall be photographed by the Contractor and shall be inspected by the Contractor and COR prior to burying, covering, or concealing. The Contractor shall provide all photographs to the COR in electronic Adobe Acrobat Portable Document Format (PDF).

2.5.1.4 Coordination of Electrical Criteria

Electrical criteria provided in this section shall be coordinated with the architectural section, mechanical section, fire protection section, structural section, interior design section, civil and site section, force protection and security section, and all other sections of this SOW. The number and location of electrical equipment indicated in the electrical requirements are approximate. Contractor design shall meet the intent of the electrical requirements provided in this section. Contractor shall coordinate the final locations of electrical equipment with the Contracting Officer.

2.5.1.5 Materials and Equipment

All material and equipment shall conform to the requirements of the American National Standards Institute (ANSI), the American Society of Testing and Materials (ASTM), or other national trade associations.

2.5.1.6 Interior Branch and Control Wiring

Interior branch and control wiring shall be stranded copper, THHN/THWN, and shall be run in rigid metal conduit (RMC) or electrical metallic tubing (EMT). Interior branch and control wiring running in hollow metal stud partitions or running through non-masonry walls may be metal clad cable (MC) if #6AWG or smaller. Metal clad cable shall be a maximum of 6-feet in length. In areas where walls are not disturbed or reconstructed and wiring cannot be run within existing walls, surface metal raceway may be used within the habitable space of the room. All above ceiling and in wall wiring shall be in conduit and sized according to the NEC. Minimum conductor size for branch and control circuit wiring shall be No. 12AWG. All equipment and circuit grounds shall be provided, installed and connected with green wire in strict accordance with the requirements of NFPA 70 (NEC). Minimum interior conductor raceway size shall be 3/4". If existing control wiring in the project area located above plenum ceilings is plenum rated without conduit then the Contractor shall install plenum rated control wiring without conduit. Interior branch and control wiring installation shall be in accordance with UFC 3-520-01 and UFGS DIVISION 26.

All existing circuits that are replaced shall be demolished including associated wiring and conduit which shall be removed back to the source. Electrical service to and in the building shall be maintained at all times. In the event a power disruption is necessary, the contractor shall submit the Construction Impact Notification Form in accordance with the contract.

2.5.1.7 Motors

Motors shall be of the high energy efficient type. Motor starters for mechanical and special equipment shall be furnished as an integral part of the mechanical or special systems. Motor installation and control shall be in accordance with UFGS DIVISION 26.

2.5.1.8 Motor Efficiencies

Minimum motor efficiencies shall be either Energy Star rated or in accordance with the Department of Energy (DOE) Buying Energy Efficient Products Recommendations. Applications that require definite purpose, special purpose, special frame, or special mounted polyphase induction motors are excluded from these efficiency requirements. Motors provided as an integral part of motor driven equipment are excluded from this requirement if a minimum seasonal or overall efficiency requirement is indicated for that equipment.

2.5.2 Drawings

Drawing scale shall match architectural drawing requirements. Drawings shall be complete and accurate in every detail and shall include arrangements and types of light fixtures, receptacles, switching, location of special features, and necessary details. Drawings shall also include legends, fixture schedules, panel schedules, one-line diagrams, layout or functional diagrams for each of the various systems, riser diagrams if applicable, estimated maximum demand for each panel and for the entire building, and any other relative information which will help clear up any questionable items on the plans or in the specifications.

All drawings provided to the Contractor shall be field verified for accuracy.

2.5.3 Specifications

Submit prescriptive specification sections to specify the quality, characteristics, installation procedures, and testing requirements for all items of the proposed electrical design.

2.6 TELECOMMUNICATIONS

2.6.1 Technical Requirements

2.6.1.1 Design and Installation Standards and Codes

The telecommunications design and installation shall conform to the current versions of all applicable Unified Facilities Criteria (UFC), Technical Criteria for Installation Information Infrastructure Architecture (I3A), ANSI/TIA/EIA specifications and all standards and codes referenced in the UFGS specifications. Publications, codes, specifications, and standards shall be used as the basis for the project design. Publications and codes that imply recommendations shall be taken to be mandatory. Where there are conflicting criteria, the most stringent requirements take precedence.

2.6.1.2 Scope of Work

The work includes completion of telecommunications system design and

installation to provide completely functional telecommunication systems as described herein and as detailed by the Designer of Record. The Network Enterprise Center (NEC) representative shall be consulted prior to project design and installation for additional telecommunications system requirements.

2.6.1.3 Detroit Arsenal Specific Requirements (Network Enterprise Center)

All abandoned telecommunication systems, equipment, wiring, conduit, and any other abandoned telecommunication system components associated with this project and within the project area boundaries shall be removed by the Contractor.

All conduit, wiring, and cabling shall be photographed by the Contractor and shall be inspected by the Contractor and COR prior to burying, covering, or concealing. The Contractor shall provide all photographs to the COR in electronic Adobe Acrobat Portable Document Format (PDF).

Telecommunications inspections conducted by a Network Enterprise Center representative will be required for all projects at the following intervals:

- Pre-Installation Meeting to address any Contractor RFIs and to communicate Network Enterprise Center specific requirements.
- 50% Installation Inspection to review progress of telecommunications installation at the 50% phase for adherence to specifications and standards.
- 100% Installation Inspection to review the final telecommunications installation at the 100% phase for adherence to specifications and standards.

All cabling test results and as-built drawings in CAD format shall be submitted together to the Network Enterprise Center representative for approval prior to 100% Installation Inspection.

All furniture (workstations and desks) shall be provided with communication wiring (LAN and telephone wiring).

Category 5e LAN cable may be reused if existing with approval from the Detroit Arsenal NEC representative through the COR. The Contractor shall be responsible for replacing any existing Category 5e LAN cables that are deemed unusable, damaged, or otherwise fail testing requirements after cabling has been reinstalled. It shall not be "assumed" that all existing Category 5e cabling is in good working order.

Category 3 telephone cable may NOT be reused if existing. All existing Category 3 telephone cable found to be part of the project shall be replaced with Category 6 rated cabling. All new telephone cabling shall be Category 6 as specified below.

The Network Enterprise Center at Detroit Arsenal requires only qualified and experienced telecommunications contractors perform installation services in the construction of the Detroit Arsenal structured cabling infrastructure. The Contractor, by responding to a bid, represents that their company possesses the qualifications, certifications, capabilities, test equipment, expertise, and personnel necessary to provide an efficient and successful installation of properly operating components. It is required that the

Telecommunications Contractor supervisor/foreman shall be a Building Industry Consulting Service International (BICSI) certified ITS Technician and a BICSI member in good standing. It is also required that a minimum 25% of the Telecommunication Contractor's installers shall be BICSI certified ITS Installers and BICSI members in good standing.

2.6.1.4 Telecommunications

Installation shall be in accordance with the Technical Criteria for the Installation Information Infrastructure Architecture (I3A) and other requirements as follows. Cable and jacks shall be Category 6 per EIA/TIA 568B, Commercial Building Telecommunications Cabling Standard. The Contractor shall provide wiring from outlet jack to termination on applicable patch panel. All components within cabling system shall conform to the category rating specified herein. Follow requirements of ANSI/TIA/EIA-569-B for telecommunications closets and equipment rooms. Telecommunications work shall be in accordance with UFC 3-580-01 and UFGS DIVISION 26. All cable ties installed within telecommunications rooms shall be Velcro strap type, no Nylon tie wraps will be accepted.

2.7 FIRE PROTECTION

2.7.1 Technical Requirements

2.7.1.1 Design and Installation Standards and Codes

The fire protection design for all facilities shall be in accordance with the current version of UFC 3-600-01 Fire Protection Engineering for Facilities and with the current versions of the International Building Code (as referenced by the UFC and UFGS) and the National Fire Protection Association (NFPA) standards and codes.

2.7.1.2 Scope of Work

This project will require design-build services to design and perform the **fire protection and detection** work as described in this Statement of Work (SOW). The work includes completion of fire protection system design and construction to provide completely functional fire protection systems as described herein and as detailed by the Fire Protection Engineer.

Designer of Record shall be licensed professional engineer in Fire Protection Engineering with a minimum of 5 years experience.

Contractor shall have successfully installed at least two low-pressure carbon dioxide fire extinguishing systems conforming to the requirements of NFPA and of the same type and design specified herein.

Construction submittals shall include shop drawings, design data, calculations, plans, as-builts, product literature, test reports, certifications and operation and maintenance data.

Contractors shop drawings and design calculations shall be prepared by a National Institute for Certification in Engineering Technologies (NICET) engineering technician with minimum Level-III certification in Special Hazard System program.

All submittals and design plans and specifications shall be submitted for approval by the COR.

Using the reference drawings (pdf format provided in the appendices) the Contractor shall develop new CADD drawings plans and sections for installation of new and existing piping and associated equipment required by NFPA 12. CADD drawings are to electronic MicroStation V8 XM computer aided design and drafting. These CADD drawings shall include pipe layout, locations of devices such as pressure sirens, isolation lockout valves, odorizers, signs, horn/strobes, pneumatic time delays, pipe sizes, approximate flow and discharge rates, required discharge and concentration requirements. The current existing CO2 system discharge in pounds is indicated on reference drawings. The Contractor shall provide design calculations along with the drawings to show compliance with NFPA concentration requirements. Fuels being used in test cells are Military and commercial grade diesel fuels. Also the Contractor shall provide sequence of operation and manuals for the CO2 systems, along with training to operation personnel in the facility. Guide specifications shall be edited to include training requirements. Contractor shall develop all appropriate technical specifications using UFGS as guidelines and the 2004 MasterFormat Construction Specifications Institute, see Appendix 2 for list of guide specification. List is not all inclusive.

Test cell #5 and equipment rooms in the basement below the test cell are being modified under a current contract. Contractor shall modify the existing CO2 piping and discharge configurations as required to insure concentration levels meet NFPA 12 requirements. Appendix 8 contains new configuration information.

New Lockout valves shall be supervised by the New Chemetron System area module and SLX panel. The valves shall have an indicating light located in the control room to indicate when the valve is closed. When the lockout valve is closed the testing equipment will not be operational. Coordinate with TARDEC through the COR on location of light and control wiring required to prevent operation of testing cells.

See Technical Specifications and Contract Drawings. The Contractor shall modify the existing CO2 fire suppression system so that the system is in compliance with NFPA 12-2011. All test cells and stand alone fuel room 18 and electrical rooms will not be required to have the pneumatic time delay features. This exception is due to the need to avoid delays in activation of fire suppression to protect equipment and controls. However, all other CO2 system shall be provided with time delay features where personnel (occupied areas) are present at times during testing (control/fuel rooms). Test cell #9 which has an existing pneumatic time delay located on the basement floor shall be removed and piping removed and reworked as required to have a fully functional system, see photos 38 & 39.

All 28 CO2 zones shall have the following equipment installed: new ANSI certified CO2 warning signs (as required in all locations per NFPA 12), ball type isolation lockout valve installed, pressure sirens, new electric horn/strobe appliance device to replace old horn and red light. The Contractor shall provide odorizer as per NFPA 12 in equipment service rooms 6, 7, and 8 served by one CO2 system in the basement. See Appendix 10 for diagram of isolation lockout valve and approximate location of installation of the odorizer.

Replace all red light indicating appliances in test cells, second floor equipment rooms and control rooms with new fire alarm horn/strobe to indicate CO2 discharge, see photos 53, 61, 173 and 176.

The Contractor shall provide and install new horn/strobe (red light) discharge indicating appliances inside and outside of doorways in the basement leading from one zone to another zone. For example if discharge of equipment rooms 6, 7 & 8 are activated and building alarm sounds for evacuation, then personnel should not enter that area of the basement. The Contractor shall provide and install horn/strobe indicating discharge of CO2 beyond the doorway between storage room 1 and mechanical equipment room 17. The Contractor shall provide and install the same discharge appliance device on the doorway from mechanical equipment room 17 and service corridor room 19 if discharge takes place either in dynamometer pits 1 or 2 or test cell #9 to prevent personnel from evacuating thru the discharge area. The Contractor shall provide appropriate signage as required by NFPA 12.

The Contractor shall provide and install a new Chemetron SLX Addressable panel in the main hall wall (see photos 170 & 171). This panel shall have output relays to a new Simplex miniplex remote panel with the appropriate amount of relay and battery requirements. See Appendix 5 for sketches of existing Chemetron Micro cabinets (converted to SLX modules for monitoring, see Appendix 11 for existing control panel information and Appendix 12 for terminal block information) wired to new SLX panel and then relayed to Simplex miniplex and then wired to main Simplex 4100U Alarm panel.

The Contractor shall design a new line heat detection system SAFE Linear Heat Detection or equal rated for 220°F in all test cells, equipment room 6, 7 & 8, fuel room 18, machine, dynamotor and fan rooms associated with test cells (if not already equipped with heat detectors) to meet manufacturer's and NFPA 72 requirements. Heat detection is for fire alarm system panel only and is not associated with the CO2 fire suppression system. Heat detection system shall be wired to existing Simplex Addressable pull station, detector or as required to insure that heat detection system is Addressable and connected to the existing 4100U Simplex Addressable Panel. Install required wiring and conduit as required to insure a full operational and addressable system. See Appendix 6 for typical sketch.

The Contractor shall install new CO2 detectors including conduit and associated wiring in the basement at intervals required by code. As a minimum, there is to be a detector located at the bottom of each stairway door entrance into the basement (stairs "A", "B", "C", "D", "H" and "J"). The two existing detectors located by the CO2 tank in the basement are to be removed and install new, see photos 126 - 129. The Contractor shall remove and reinstall the existing Fenwalnet 6000 panel, digital meters and sensors. The existing Fenwalnet 6000 CO2 detection panel and and required associated equipment as required by CO2 detection manufacturer shall be located as required to insure a complete operational addressable system. The existing panel is to be relocated from the basement to the main hallway near the fire alarm panels. The new panel shall be addressable and connected to Simplex Addressable Modules for alarm, supervisory and trouble. The Simplex modules shall be wired to the existing 4100U panel, see Appendix 7 for sketch of gas detection panel monitoring.

There are currently three existing CO2 horn/strobes (blue light) located in the building stairways, these are to remain. The Contractor shall install

new CO2 horn/strobes (blue light) as required at all stairway entrances to basement not currently protected.

The contractor shall retrofit 25 existing CARDOX pull stations with new 24 Vdc lights on unit (Appendix 4). Current unit is 110VAc and is together in conduit with 24 Vdc wiring which is not allowed by Code. Conduit and proper wiring shall be installed to meet Code, see photos 134, 135, 136 163, 164 and 175 and Appendix 7 for list of pull stations for CARDOX system.

There are 5 CO2 hand held hose stations located throughout the buildings. The Contractor shall remove these hose stations and CO2 piping capped at the main, see photos 6, 42, 59, 83, 84, 85 and 142.

Photos give indication of the location, type and size where firestopping shall be addressed by the Contractor, see Appendix 13. The Contractor shall identify all piping penetrations thru walls and floors, including test cell areas, all CO2 piping shall be firestopped throughout the entire building. Photos show the piping penetrations to be core drilled and not currently firestopped. See Appendix reference drawings for size and locations of all CO2 piping and penetrations. All penetrations, opening (photo 125) or core holes thru concrete or masonry walls/floors shall have a 2 hour fire rating. All CO2 piping penetrations thru walls and floors shall be firestopped throughout the building with UL listed materials, refer to Specification Section: FIRESTOPPING.

Existing CO2 Tank refrigerant unit shall be removed and replaced with a new unit of the same size.

CO2 shall have outer shell removed and insulation replaced after the tank has been emptied and inspected & tested for structural integrity by pneumatically testing using CO2 gas at a pressure required by Chemtron for a 2-hour period with no leakage or reduction in gage pressure. Gages shall be calibrated. The Contractor shall provide a report of condition of CO2 tank before installing new insulation with the appropriate R Value as recommended Chemtron on exterior of tank. After insulation has been applied to tank, the outer shell shall be reinstalled by the Contractor.

Existing 12.5 Ton CO2 Tank located in the basement shall be filled two times to the 100% liquid level @ 300 psig as indicated on the tank gages. The first fill shall be used for testing of concentration requirements per NFPA or as required by Chemtron due to piping changes or room revisions. After all testing is completed the tank shall be refilled to 100% liquid level.

The Contractor shall replace with new all pressure switches associated with master or selector valves for the CO2 system in basement area.

The Contractor shall replace with new all pressure relief devices designed to operate at 450 psig on the field closed piping system between selector and master valves. The existing tank relief valves shall be removed and new ones installed with the appropriate pressure ratings as required by the manufacturer Chemtron, see photos 167 & 168 for location.

The Contractor shall install new automatic control smoke-fire dampers in openings and ductwork penetrating all concrete and masonry walls in the electrical rooms 12 and 132. Smoke dampers shall be controlled by the CO2 system. When the CO2 system is activated the smoke dampers shall close. The Contractor shall provide all necessary wiring and conduits for operation of

smoke dampers. Permanently close-off and seal the door louvers to electrical room 132 to ensure CO2 fire suppression remains in room. See photos 99, 101, 132 and 133.

The Contractor shall remove existing light wells in test cell walls and fill in with grout, unless being used for conduits to control rooms. The light wells shall be firestopped as required by specification section 07 84 00. See photos 97, 115, 117, 118, 120, 146 and 148.

The Contractor shall remove and cap the CO2 piping at the main from Machine room 2 (labeled as Room 117 on reference drawings) to control room 112.

New wet pipe sprinkler system shall be installed in the following spaces:

- i) Hallway area that is being created by the removal wall between test cell 5 and the control room from the test cell 10 (room 112).
- ii) Test cell #10 (room 112).

This system is to be designed with a density of 0.20 gpm/square foot and the area of coverage for each sprinkler head can be no greater than 130 square feet, using quick response sprinkler heads. The new system shall be an extension of the existing wet pipe sprinkler system already installed in the building. New sprinkler shall meet requirements of UFGS specification 21 13 13.00 10.

The Contractor shall rebuild the 5 master and all selectors valves in accordance with the requirements of Chemetron Fire Systems (CARDOX) for pressure operated valves. See Appendix 9 Inspection and Maintenance Procedures for the valves and reference drawings for sizes and locations of all valves.

2.7.1.3 Detroit Arsenal Specific Requirements

All abandoned fire protection systems, equipment, piping, and any other abandoned fire protection system component within the project area boundaries shall be removed.

All piping, conduit, wiring, and cabling shall be photographed by the Contractor and shall be inspected by the Contractor and COR prior to burying, covering, or concealing. The Contractor shall provide all photographs to the COR in electronic Adobe Acrobat Portable Document Format (PDF).

Use of halon for fire suppression systems or fire extinguishers is prohibited.

The Contractor shall assess existing walls and doors in the project area to determine whether the walls and doors require modification to meet wall and door fire rating requirements in conformance with UFC, NFPA, DTA IDG, and UFGS requirements. These requirements shall be determined and included in the cost proposal for this project. Fire damper, smoke damper, HVAC, electrical, and all other work to meet this requirement shall be provided in the cost proposal. All fire protection requirements shall be included in the cost proposal.

The Contractor shall notify the COR, the DTA Fire Protection and Prevention Division, and the DTA DPW Base Operations Contractor of the proposed times and dates of fire suppression system and fire alarm system testing at least 7 calendar days prior to any tests. The tests shall be witnessed by the COR, by a Detroit Arsenal fire inspector, and by a DTA DPW Base Operations Contractor representative. The Government will have final approval of the times and dates of the tests.

The Detroit Arsenal DPW, the Detroit Arsenal Fire Protection and Prevention Division, and the Detroit Arsenal DPW Base Operations Contractor representative shall be notified two weeks prior to work on fire suppression systems and fire alarm systems.

The Government may perform testing of existing fire alarm systems in the existing building where this project will be performed prior to the start of construction. If fire alarm system testing is performed by the Government, the Contractor shall attend. The COR will notify the Contractor of the fire alarm system testing scheduled date and time.

The Contractor shall provide a fire watch during construction in accordance with UFC and NFPA requirements for fire protection system down time during construction. The fire watch shall cover all areas of the facility where the fire protection systems are down due to project construction. Impairments affecting the performance of installed fire protection features shall be corrected immediately. The Contractor shall strictly adhere to the requirements of the latest edition of UFC 3-601-02 Operation and Maintenance: Inspection, Testing, and Maintenance of Fire Protection Systems for systems out-of-service or impaired systems. The procedures specified shall be followed by the Contractor and the signage required shall be provided by the Contractor.

The Contractor shall be aware of all parking signs. Parking in any fire lanes is prohibited and all violators will be ticketed. Vehicles leaking liquids shall be taken off base, additionally, vehicles leaking large amounts of liquid are subject to be towed off the installation at the discretion of the DTA Fire Department Incident Commander.

The Contractor shall provide Material Safety Data Sheets (MSDS) to the DTA Fire Department for all chemicals to be used and stored on the premises. MSDS will be provided to the HAZMART and bar coding for all chemical products used and stored on the premise. All chemicals shall be stored in safe and proper containers when not in use.

The General Contractor's superintendent or safety officer only will be issued a hot work permit. The Contractor shall require a hot work permit for all work producing sparks, flames, or heat occurring within the confines of the installation (indoors or outdoors). The Detroit Arsenal fire inspectors issue hot work permits on a daily basis. The Contractor shall request the hot work permit by contacting the Detroit Arsenal Fire Department business number at (586) 282-6021 or (586) 282-5564.

A hot work permit will be issued after completion of inspection of the work area. The Contractor shall provide the proper size and type of fire extinguisher at the work site. The Contractor is not permitted to use building facility fire extinguishers. The Contractor responsible for the work being performed shall be required to sign the hot work permit. The Contractor shall observe a 30-minute cool down period after all hot work is

completed. Afterwards, the Contractor shall contact the DTA Fire Department to re-inspect the work. After all conditions are safe and met, the permit will be cancelled out.

Contractors shall not leave the job site without closing the permit. Failure to do so will result in no further permits being issued to the Contractor. All sub-contractors shall adhere to the aforementioned requirements in order to maintain the permit.

Where Automated External Defibrillators (AEDs) are required to be relocated, the Contractor shall provide design and construction to relocate the AEDs, AED cabinets, and AED cabinet cardiovascular system LAN drop. The cabinet power supply and door alarm shall be connected to the DTA fire alarm system. Cabinets for AEDs shall be provided with supervisory switch monitored by the DTA fire alarm system.

The Contractor shall be aware of all work within a building involving raising dust or producing smoke that may set off a smoke detector, requiring the fire protection system to be put on a bypass in order to prevent trouble signals.

The Contractor shall provide new duct mounted smoke detectors in all new or modified air distribution systems in accordance with UFGS requirements and in accordance with the latest edition of NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems.

Shutdown of alarm devices for demolition or construction work will be completed by the DTA Base Operations Contractor and shall be coordinated with the DTA Fire Department to insure the downstream (outside work area) devices remain operational. Where fire alarm devices are required to be shutdown in a project work area, the Contractor shall perform all work required to bypass any area inside the project work area to insure all downstream fire alarm devices serving any other portion of the facility remain operational. The Contractor shall provide design, material furnishing, and installation of all wiring and components to bypass the project work area fire alarm devices. The Contractor shall coordinate this work on the fire alarm system with the DTA Base Operations Contractor and the DTA Fire Department. Work shall not begin until approved by the COR.

2.7.1.4 Fire Protection Engineer

The Contractor shall provide the services of a qualified registered fire protection engineer. A qualified registered fire protection engineer shall meet one of the following requirements: (a) An engineer having a Bachelor of Science or Master of Science Degree in Fire Protection Engineering from an accredited university engineering program, plus a minimum of 5 years work experience in fire protection engineering; (b) A registered professional engineer (P.E.) who has passed the National Council of Examiners for Engineering and Surveys (NCEE) fire protection engineering written examination. The Fire Protection Engineer shall be an integral part of the design team and shall be involved in all aspects of the design of the fire protection systems. The Contractor shall submit the credentials of the qualified Fire Protection Engineer to the Contracting Officer's Representative (COR). The Fire Protection Engineer shall certify in writing that the design is in compliance with the current edition of UFC 3-600-01 and all applicable criteria. This certification shall be submitted with the 100 percent design submission.

2.7.1.5 Fire Protection and Life Safety Code Review

The Fire Protection Engineer and the Architectural Designer of Record shall perform and coordinate a fire protection and life safety code review of the proposed design.

The code review shall be submitted with the 100 Percent Design submittal and the Released for Construction Design submittal on a drawing sheet and in the design analysis. The code review shall include type of construction; height and area limitations; classification of occupancy; building separation or exposure protection; specific compliance with Unified Facilities Criteria, NFPA codes, and the IBC. The code review shall include requirements for fire-rated walls, doors, and fire dampers and an analysis of automatic fire suppression systems and protected areas, water supplies, smoke control systems, fire alarm systems, including connection to the base-wide system, fire detection systems, standpipe systems, fire extinguishers, interior finish ratings, and other pertinent fire protection data.

The 100 Percent Design submittal and the Released for Construction Design submittal shall include life safety floor plans indicating egress travel distances, occupancy hazard areas, ratings and locations of fire-resistive assemblies, fire extinguisher locations, fire alarm pull box locations, exit sign locations, emergency light locations, heat and smoke detector locations, visual fire alarm signal locations, fire alarm locations, fire department connection, and other data necessary to exhibit compliance with life safety code requirements.

2.7.1.6 Carbon-Dioxide Fire Extinguishing System

Carbon-Dioxide fire extinguishing systems shall be designed and installed in accordance with UFC 3-600-01 and requirements of UFGS Specification Section 21 21 00.00 40 CARBON-DIOXIDE FIRE EXTINGUISHING SYSTEMS.

2.7.1.7 Fire Extinguishers

If the design requires fire extinguisher(s), provide all new fire extinguishers and fire extinguisher cabinets in accordance with UFGS Specification Section 10 44 16, FIRE EXTINGUISHERS. All new fire extinguishers and fire extinguisher cabinets shall be provided in accordance with the latest edition of UFC 3-600-01 and NFPA 10, Standard for Portable Fire Extinguishers requirements.

All new ABC type fire extinguishers shall be minimum 10 pounds. All new ABC type fire extinguishers shall be provided in new fire extinguisher cabinets with new fire extinguisher signage. Where new 10 pound ABC type fire extinguishers are provided, all new ABC type fire extinguisher cabinets shall be sized for a minimum 20 pound fire extinguisher capacity. New fire extinguisher cabinets shall be aluminum.

2.7.1.8 Fire Alarm and Detection Systems

The Contractor shall provide a complete fire alarm and detection system, conforming to requirements of UFC 3-600-01, NFPA 72, and NFPA 101. Speakers integrated with strobes shall be used for annunciation. Manual pull stations shall be located near each exit, adjacent to the fire alarm control

panel (FACP), and along each path of egress. Water flow indicators shall be used to monitor sprinkler risers. Water flow alarms shall transmit a signal to the fire alarm panel. Tamper monitoring switches shall be located on the sprinkler control valves. An alarm shall release magnetic door holders and shall activate dampers and shutdown fans. Smoke detectors shall be located throughout the project area in all unsprinklered areas and shall be provided where required by UFC and NFPA standards, including one located above the FACP. All new fire sprinkler systems shall activate both local and remote (fire department) alarms in accordance with UFC requirements. Prior to cost proposal submission, the Contractor shall verify all existing fire sprinkler systems throughout the entire project area activate both local and remote (fire department) alarms. If any fire sprinkler system throughout the entire project area does not activate both local and remote (fire department) alarms then the Contractor shall provide design and construction to tie the fire sprinkler system into the fire alarm systems to activate both local and remote (fire department) alarms. Duct mounted smoke detectors shall be installed in accordance with the latest edition of NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems for automatic shutdown in the event of a fire. Air handling unit starters shall be equipped with normally closed contacts for fire alarm system interface to avoid unit shutdown with electrical power removed from the fire alarm panel. Initiation of a detector, sprinkler flow switch, or manual pull station shall sound all alarms in the building, shut down air handlers, and signal the Detroit Arsenal Fire Protection and Prevention Division.

All new initiation devices shall be addressable devices, unless specifically approved otherwise by the Government.

Addressable smoke detectors and pull stations shall be provided in accordance with UFC 3-600-01 and NFPA 72 requirements.

All new fire alarm control panels shall be SimplexGrinnell 4100ES panels with fiber optic communication to the Detroit Arsenal fire station. The central alarm panel shall be located in an occupied central location. Addressable smoke detectors and pull stations shall be utilized in accordance with UFC 3-600-01 and NFPA 72. All new fire alarm control panels shall have 25 percent spare capacity for adding circuits. Locate all end-of-line resistors in the fire alarm system control panel for maintenance purposes. In addition, the contractor shall provide fire alarm outputs for control of HVAC equipment shutdown, door release, and elevator recall to be controlled by the fire panel rather than directly by the initiation devices in the field. Such releases, recalls, and shutdowns shall be arranged such that loss of 120VAC or 24VDC power by the fire panel will not activate the release, recall, or shutdown functions.

The circuitry configuration for initiation and notification devices may be Class B unless specified otherwise by the Government.

All **new** fire alarm wiring shall be in 3/4-inch red conduit and all **new** junction boxes that contain fire alarm wiring shall be painted red. All fire alarm related work shall meet Simplex specifications for installation and operation.

Utilize wire types and gauges as recommended by the equipment manufacturer. Copper conductors shall be used.

AC power or AC control wiring are not to be run in the same conduit as 24VDC fire alarm wiring or fire alarm communication wiring.

Personnel responsible for making final connections at the fire alarm panel and personnel responsible for supervision of final connections at all field devices shall be National Institute for Certification in Engineering Technologies (NICET), Fire Alarm Systems Level II certified, in accordance with NFPA standards.

The Contractor shall coordinate routing of the fire alarm system with the COR, the DTA Fire Protection and Prevention Division, and the DTA DPW Base Operations Contractor.

The Contractor shall test the fire alarm and fire detection systems in accordance with the latest editions of NFPA 72, National Fire Alarm and Signaling Code, UFGS fire alarm and fire detection system testing specifications, and the manufacturer's recommendations. The Contractor shall verify that all new and existing fire alarm initiation devices tied to the fire alarm control are fully functional for the entire system reporting back to the fire station. The Contractor shall coordinate verification testing with the COR, the DTA Fire Protection and Prevention Division, and the DTA DPW Base Operations Contractor after all system testing has been completed by the Contractor. The Contractor shall notify the COR, the DTA Fire Protection and Prevention Division, and the DTA DPW Base Operations Contractor of the proposed times and dates of fire alarm and fire detection system testing at least 7 calendar days prior to any tests.

The fire alarm transmitter shall be fully compatible with the existing proprietary supervising station receiving equipment manufactured by SimplexGrinnell presently in use at the Detroit Arsenal.

The system shall be connected to the head end equipment by two (2) 6-strand dedicated fiber optic circuits. Programming is required to fully integrate the facility into the existing Fire Department Central Reporting System. The Contractor shall provide all head end programming and graphics to make the system fully operational and functional. This includes data entry for all the new points connected to the system as well as making any additions or changes in the system configuration files. The Contractor shall provide all the graphics development and entry to include attaching the proper points to each graphic display. All graphics shall match the existing system graphics; including, color, layout, legend, and all other existing graphic schemes.

2.7.2 Drawings

Features of fire protection, their ratings, and the hazards requiring them, shall be clearly indicated. Fire sprinkler systems, fire alarm systems, and fire detection systems shall all be clearly indicated on the drawings. Fire detection, mass notification, and fire sprinkler systems shall be laid out and detailed sufficiently to indicate the designers understanding of UFGS DIVISION 21 - FIRE SUPPRESSION and the fire alarm, fire detection, and mass notification system specification sections. When other functions co-exist with the fire protection functions, their integration shall be clearly indicated, with an analysis that describes how both functions will be served. The Contractor shall provide a separate, composite type floor plan which makes an accurate presentation of these various features and functions. As part of the submittal, provide a set of plans that show

emergency egress for the facility. Depict all items to be removed, for instance, fire alarm panels, fire sprinkler piping, and any other fire protection system component, on the fire protection demolition drawings.

2.7.3 Specifications

The Contractor's project Fire Protection Engineer shall provide edited UFGS DIVISION 21 - FIRE SUPPRESSION and edited UFGS fire alarm system, fire detection system, and mass notification specification sections from UFGS DIVISION 28 - ELECTRONIC SAFETY AND SECURITY. Specification sections shall be coordinated with the drawings to accurately and clearly identify the product and installation requirements for the facility.

All items identified in the specifications that are not required shall be marked for deletion in accordance with the requirements stated in this SOW. Those items of equipment, materials, or installation requirements that are required are not permitted to be modified or changed from that presently shown.

2.7.4 Design Analysis

The design analysis shall include a separate fire protection report containing review statements and comments on the following items:

- a. Location and rating of fire walls and fire partitions
- b. Column, floor, and roof protection
- c. Path of travel for emergency egress and operation of panic exits
- d. Access to building for fire fighting
- e. Design and placement of fire and smoke stop doors
- f. Labeled windows, where required
- g. Venting of smoke
- h. Placement of hand fire extinguisher cabinets
- i. Complete description, including type and adequacy, of the fire sprinkler system
- j. Building exterior fire protection facilities and building clearances
- k. Type of occupancy
- l. Zoning of fixed fire protection systems
- m. Complete description, including type and adequacy of fire alarm systems (including fire alarm zones) and detection systems
- n. Zoning of fire alarm and detection systems
- o. Number of zones of fire alarm and detection systems that are separately transmitted to the base or installation fire department

- p. List of design criteria
- q. Design conditions
- r. Design calculations
- s. Complete description of the building fire protection features
- t. Other pertinent information of value for future use in construction contract administration, substantiation of design methods, or permanent record shall be included

2.8 ENVIRONMENTAL PROTECTION COMPLIANCE

Environmental protection shall be in accordance with Appendix A, Standard Environmental Protection Requirements and Appendix B, Other Standard Environmental Protection Requirements.

2.9 SAFETY

2.9.1 Technical Requirements

The Contractor shall adhere to the current installation safety requirements, MIOSHA safety requirements, OSHA safety requirements, the safety requirements included in UFGS Specification Section 01 35 26 GOVERNMENT SAFETY REQUIREMENTS, and the United States Army Corps of Engineer's codes and standards.

The Contractor shall provide preparation and submittal of a site specific Accident Prevention Plan and/or a Health and Safety Plan. The Contractor safety plan shall comply with Michigan OSHA requirements and the latest edition of U.S. Army Corps of Engineers Manual EM-385-1-1. The safety plan shall establish a comprehensive training program which consists of engineering, education, training, and enforcement of safety standards and shall comply with regulatory directives regarding accident prevention and control and safety education and promotion. The Contractor shall construct dust barrier partitions as required to separate construction areas from occupied areas. Exits shall be clear of equipment, materials, and debris. Construction partitions shall be provided in accordance with EM-385-1-1.

2.9.2 Drawings

The drawings shall clearly identify the amounts and locations of hazardous material.

2.9.3 Specifications

At a minimum, the pertinent UFGS specifications shall be completely edited and coordinated with the drawings.

01 35 26	GOVERNMENTAL SAFETY REQUIREMENTS
01 35 30	SAFETY, HEALTH, AND EMERGENCY RESPONSE (HTRW/UST)
01 35 29	SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS
02 82 14.00 10	ASBESTOS HAZARD CONTROL ACTIVITIES
02 82 33.13 20	REMOVAL/CONTROL AND DISPOSAL OF PAINT WITH LEAD
02 83 13.00 20	LEAD IN CONSTRUCTION

02 84 16	HANDLING OF LIGHTING BALLASTS AND LAMPS CONTAINING PCBS AND MERCURY
02 84 33	REMOVAL AND DISPOSAL OF POLYCHLORINATED BIPHENYLS (PCBS)
31 21 13	RADON MITIGATION

Any interference with the civil, mechanical, electrical, geotechnical, and environmental specifications shall be addressed and reviewed to extract the list of sampling and analysis requirements.

2.9.4 Design Analysis Narrative

The Design Analysis Narrative shall list all conditions impacting safe work on the project for each of the sections listed above. Potentially hazardous conditions, such as, materials shall be identified. The basis and reasons for specific decisions, special features, and unusual requirements shall be explained or summarized. If it is necessary to deviate from criteria or standard practice, reasons shall be included. Design statements shall be provided in sufficient detail to enable the reviewer to get a clear picture and understanding of all included work. Narrative shall be complete relative to scope and design approaches. The design analysis shall carry a complete narrative for every item covered in the design.

2.9.5 Design Analysis Calculations

Amount and location of hazardous materials (asbestos, lead paint, PCBs, and other hazardous materials) shall be addressed.

2.9.6 Basis, Specific Goals, Objectives, and Priorities for Hazardous Material

The Design Analysis shall establish specific goals, objectives, and priorities for safety (including the removal, handling, and disposal of hazardous materials). Identify, explain, and document use of design criteria and state how the design meets goals, objectives, and priorities. Identify the preferred site development concept. Show how systematic planning has been used in the design and will meet the objectives. Systematic planning ensures high decision confidence and stakeholder satisfaction. It shall list various regulatory, scientific, and engineering decisions that must be made in order to achieve the desired outcome. List unknowns that stand in the way of making those decisions and strategies to eliminate or manage the unknowns.

2.10 SUSTAINABLE DESIGN

The goals for improving the sustainability of facilities include: (a) use resources efficiently and minimize raw material resource consumption, including energy, water, land and materials, both during the construction process and throughout the life of the facility, (b) maximize resource reuse while maintaining financial stewardship, (c) move away from fossil fuels towards renewable energy sources, (d) create a healthy and productive work environment for all who use the facility, (e) build facilities of long-term value, and (f) protect and, where appropriate, restore the natural environment.

Sustainable design techniques shall be considered as they relate to building design, construction, operation, and deconstruction. Techniques which conserve energy, improve livability, and can be justified by life cycle cost analysis as cost effective are encouraged.

2.11 DEMOLITION AND DECONSTRUCTION

Demolition and deconstruction shall be performed in accordance with UFGS Specification Section 02 41 00, DEMOLITION AND DECONSTRUCTION. Deconstructed materials shall become the property of the Contractor as indicated in UFGS Specification Section 02 41 00, DEMOLITION AND DECONSTRUCTION unless otherwise indicated or specified. Materials not owned by the Government and not used in construction shall be disposed of on Government property.

2.12 COST ENGINEERING INSTRUCTIONS

The Contractor shall submit a professional quality cost proposal in accordance with the policies and procedures stated in the "Cost Estimates" paragraph of the contract.

-- End of Section --

SECTION 01 03 00.00 06

DESIGN AND CONSTRUCTION SUBMISSION REQUIREMENTS
04/13

PART 1 GENERAL

1.1 INTRODUCTION

a. Design

This section includes general requirements for developing and submitting a design including preparation of drawings, specifications, design analyses and other design deliverables conforming to the requirements contained in this section. Distribution requirements for design deliverables is also covered in this section.

b. Construction

This section includes distribution requirements for the construction set of design deliverables and distribution requirements for DD Form 1354 and as-built drawings. Included also are the construction submittal classifications for use in editing the technical guide specifications and instructions on revisions to accepted design during construction.

1.2 DESIGNER OF RECORD

The Design-Build (D-B) Contractor shall identify the Designer of Record for each area of work, also to be indicated in the Design Quality Control Plan. One Designer of Record may be responsible for not more than two design disciplines. All areas of design disciplines including mechanical, electrical, **fire protection and detection** shall be accounted for by a listed, Professional Registered, Designer of Record. The Designers of Record shall stamp, sign, and date each design drawing submitted under their responsible discipline for the 100 Percent Design; Corrected Final Design; and Released for Construction Design submittals.

Designers of Record shall be employees of, or contracted directly by, the Prime Contractor, or shall be an employee of an independent design firm that is contracted directly by the Prime Contractor. The Designer of Record shall not be an owner, employee, agent, or consultant of a construction subcontractor hired for this project.

1.3 REFERENCES

1.3.1 The Construction Specifications Institute (CSI)

CSI MasterFormat (latest edition) Master List of Section Titles and Numbers

1.3.2 U.S. National CAD Standard

(a) The A/E/C CAD Standard (compliant with the U.S. National CAD Standard) can be found at:

<https://cadbim.usace.army.mil/CAD>

1.3.3 Web Sites

In addition to the web sites listed in this section, other SOW Sections may list web sites where design criteria references used in this solicitation package may be found.

(a) UNIFIED FACILITIES CRITERIA (UFC), TECHNICAL MANUALS (TM), TECHNICAL INSTRUCTIONS (TI), AIR FORCE MANUALS (AFM), ENGINEERING TECHNICAL LETTERS (ETL), ARMY ARCHITECTURAL AND ENGINEERING DESIGN CRITERIA (AEI), SUSTAINABLE DESIGN DOCUMENTS, AND MILITARY HANDBOOKS (MIL HNDBK) can be obtained from the following internet addresses:

<http://www.hnd.usace.army.mil/techinfo/engpubs.htm>.

<http://www.wbdg.org/>

Additional web sites are as follows:

(1) TECHNICAL MANUALS, ETL's, ETC.:

www.usace.army.mil/inet/usace-docs

Click on "Information", then the desired publication.

(2) AIR FORCE DESIGN CRITERIA:

<http://afpubs.hq.af.mil>

(3) UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

http://www.wbdg.org/ccb/browse_org.php?o=70

Guide specification numbers and titles referenced in the solicitation may vary from the actual specification numbers and titles available at the website listed above.

SpecsIntact software may be downloaded at the following Internet address:

<http://si.ksc.nasa.gov/SpecsIntact/software/software.htm>

SI Version 4.0 (Version SI4.2.0.785) or later shall be used. The new unified submittal format shall be selected for file format.

1.4 ENGLISH UNITS REQUIREMENTS

Drawings shall be stated in English units of measure. Specifications shall be stated in English units of measure, unless the UFGS specifications provide only a metric unit followed by the English equivalency in parentheses or where requirements for equipment are only available in metric units.

1.5 SUBMISSION OF DESIGN DRAWINGS, SPECIFICATIONS, AND DESIGN ANALYSES

1.5.1 Design Certification

Within each design submittal, the Contractor shall certify that all items submitted in the design documents (after construction award) comply with this SOW, the Division 1 specifications, the Detroit Arsenal Installation Design Guide (IDG), and mandatory requirements of the UFGS. The criteria specified in this SOW are binding contract criteria and in case of any conflict, after award, between the SOW criteria and Contractor's submittals, the SOW criteria will govern unless there is a written and signed agreement between the Contracting Officer and the Contractor waiving a specific requirement. The Contractor shall present with the letter of transmittal for each design submittal (including the Released for Construction Design submittal) a certification that the submittal (plans, specifications, design analysis, etc.) complies with the requirements stated above, similar to that shown at Attachment A of this section. The Contractor's Designers of Record shall confirm and be responsible for the technical accuracy and adequacy of all aspects of the project design.

1.5.2 Deviations

Deviations from the SOW technical requirements shall be identified in the letter of transmittal and design certification letter. Deviations from the SOW technical requirements will be considered and accepted by the Contracting Officer, if the changes result in a significant improvement to the project or if the changes exceed the minimum SOW technical requirements.

1.5.3 Field Inspection

The Contractor shall verify field conditions which are significant to design, by field inspection, researching and obtaining all necessary existing facility as-built drawings and reproducing them for his own use as necessary, and discussing status with knowledgeable personnel. The information shall be reflected in the design documents.

1.5.3.1 Photographs

The Contractor shall furnish digital photographs on CD-ROM depicting the progress of work during construction and after final inspection by the Contracting Officer's Representative (COR) of the conditions at the completion of the contract.

The monthly photography shall be performed between the first and fifth of each month and the CD's with digital photographs shall be submitted no later than the 10th of each month during the construction phase of the contract (from start of construction through completion of final inspection). The photograph CD shall be submitted in accordance with the submittal requirements of this SOW. A minimum of six views from different positions shall be taken as direction to show, as much as possible, work accomplished during the previous month, and a minimum of six views shall be taken of the completed work. Additional views and positions may be required by the COR to depict the work done.

Photographs shall be at least 4 megapixels and shall be in JPEG format. Each CD shall be identified with the date made, contract title and number, location of work, and a brief description of the work depicted.

No separate payment will be made for these services and all costs in connection thereto shall be considered a subsidiary obligation of the Contractor.

1.5.4 Drawings

1.5.4.1 Software Requirements

All design drawings shall be done by the Contractor using MicroStation V8 (.dgn) file format. The format shall conform to the U.S. National CAD Standard.

1.5.4.2 SOW Drawings

The drawings furnished with this solicitation will be furnished to the Contractor in AutoCAD (.dwg) file format or MicroStation V8 (.dgn) file format.

1.5.5 Design Documents

Design documents, as required by the 65 Percent Design and 100 Percent Design submittals stated hereafter, shall include construction drawings, specifications, design analysis, and other design deliverables for categories; such as **mechanical, electrical, fire protection and detection**. Specifications shall be in sufficient detail to fully describe and demonstrate the quality of materials, the installation and performance of equipment, and the quality of workmanship. Detailing and installation of all equipment and materials shall comply with the manufacturer's recommendations. The design analysis shall be for each discipline of work and shall include all features with the necessary calculations, tables, methods and sources used in determining equipment and material sizes and capacities, and shall provide sufficient information to support the design.

1.5.6 Conferences

After contract award, the Prime Contractor and the Contractor Designer of Record representatives shall attend the Preconstruction Conference at the Detroit Arsenal (DTA) Directorate of Public Works (DPW).

In addition, a minimum of one design review conference during design will be held at the DTA DPW at the 65 percent completion stage of the design. The Prime Contractor and the Contractor Designer of Record representatives shall attend the design review conference, visit the site, meet with key using agency points of contact, address any appropriate discussion items, and make additional trips as necessary during the design to accomplish the work.

1.5.7 Document Packaging

The 65 Percent Design submittal includes the site and utility design and the building design complete to a 65 percent level. These documents shall be packaged and stamped "For Review Only - 65 Percent Design"; and each sheet of the drawings shall also be stamped. The 100 Percent Design submittal includes 100 percent complete site and utility design and building design and shall be stamped "For Review Only - 100 Percent Design", and each sheet of the drawings shall also be stamped. The design submittal(s) after the Government review of the 100 Percent Design shall be stamped "Released for Construction Design"; and each sheet of the drawings shall also be stamped. The Released for Construction Design submittal is for making corrections resulting from review comments and for preparing the final project

documents. No additional time for completion of the contract will be granted to the Contractor due to insufficient design submittals.

PART 2 PRODUCTS

PART 3 EXECUTION

3.1 CONTRACTOR'S GENERAL DESIGN SUBMITTAL REQUIREMENTS

The design submittals for this project shall be submitted as indicated below. The design submittals shall be submitted to the Distribution Addresses listed below and shall include specifications, drawings, and design analysis in electronic format on CD as described below. Drawings shall be submitted in hardcopy and electronic format.

65 Percent Design for all disciplines.

100 Percent Design for all disciplines.

Released for Construction Design for all disciplines.

3.2 CONSTRUCTOR'S ROLE DURING DESIGN

The Contractor's construction management key personnel shall be actively involved during the design process to effectively integrate the design and construction requirements of this contract. In addition to the typical required construction activities, the constructor's involvement includes actions such as: integrating the design schedule into the master project schedule to maximize the effectiveness of fast-tracking design and construction (within the limits allowed in the contract), ensuring constructability and economy of the design, integrating the shop drawing and installation drawing process into the design, executing the material and equipment acquisition programs to meet critical schedules, effectively interfacing the construction Quality Control (QC) program with the design QC program, and maintaining and providing the design team with accurate, up-to-date, redline and as-built documentation. The Contractor shall require and manage the active involvement of key trade subcontractors in the above activities. All work shall be performed in accordance with the Construction Quality Management (CQM) process in UFGS Specification Section 01 45 00.00 10 QUALITY CONTROL.

The project schedule shall be provided in accordance with UFGS Specification Section 01 32 01.00 10 PROJECT SCHEDULE. The Contractor shall, within five calendar days after contract notice to proceed, prepare and submit for approval the practicable project schedule. The project schedule shall show the order in which the Contractor proposes to perform the work and the dates on which the Contractor contemplates starting and completing the salient features of work. The work shall be scheduled so that, upon the start of design and the start of construction, work progresses in a continuous and diligent manner. A project schedule that does not reflect steady and reasonable progress throughout the design and construction periods will be rejected by the Government. Weekly progress reports and contractor progress reports are required covering the period from notice to proceed through final inspection and contract closeout. The project schedule shall be submitted to the COR in electronic Adobe Acrobat Portable Document Format (PDF) and electronic Microsoft Project format. The ENG Form 4025 shall be submitted in electronic Adobe Acrobat Portable Document Format (PDF) and shall be digitally signed by the Contractor.

3.3 DRAWINGS

Prepare, organize, and present drawings in the format specified herein. Provide drawings complete, accurate and explicit enough to show compliance with the SOW requirements and to permit construction. Drawings illustrating systems proposed to meet the requirements of the SOW performance specifications shall reflect proper detailing for each system to assure appropriate use, proper fit, compatibility of components and coordination with the design analysis and specifications required by this section. Coordinate drawings to ensure there are no conflicts between design disciplines and between drawings and specifications. The electronic drawings shall be in accordance with both the U.S. National CAD Standard and the Detroit Arsenal (DTA) Directorate of Public Works (DPW) CADD Standard which includes graphics (text fonts, text heights, and line weights), naming conventions (file names, sheet names, and level names), drawing assembly (referencing), sheet file composition, and all other specifications of the U.S. National CAD Standard and DTA DPW CADD Standard. A copy of the DTA DPW CADD Standard will be provided to the Contractor upon written request to the COR.

3.3.1 Drawings Format

Full size drawings are considered Arch D (24 inches x 36 inches). Half-size drawings are considered Arch C (18 inches x 24 inches). With written approval from the Contracting Officer's Representative, the Contractor may choose to consider the use of Arch 30 (30 inches x 42 inches), where size or scope of the project requires the use of larger drawing sheets. Title block shall be as indicated in the U.S. National CAD Standard and shall be based on the Detroit Arsenal title block. The Cover Sheet of the Contractor prepared drawings shall bear the stamp or seal and signature of the registered architect or appropriate engineer responsible for the work. One full size and one half size hardcopy set of drawings shall be sent to the Activity Distribution Addresses listed below. Electronic copies of drawings, provided on CD, shall be sent to the Activity Distribution Addresses listed below, in MicroStation V8 format and Adobe Acrobat Portable Document Format (PDF). The drawings in Adobe Acrobat PDF format shall be provided in one single file containing all drawings in the design package. The drawings in Adobe Acrobat PDF format shall be directly converted from the source files and shall be searchable Adobe Acrobat PDF files (the drawing files shall not be scanned). The hardcopy and electronic drawings shall be provided for the 65 Percent Design submission, the 100 Percent Design submission, the Released for Construction Design submission, and the As-Built Drawing submission.

3.3.2 Drawings Sequence

Arrange drawings by design discipline in accordance with the U.S. National CAD Standard.

3.3.3 Drawings Required

As a minimum, the Contractor shall prepare and submit the following design drawings:

- a. Title Sheet, Index of Drawings, Legend and Abbreviations.
- b. Utility Drawings

- c. Mechanical Drawings
- d. Electrical Drawings
- e. Fire Protection Drawings

3.4 SPECIFICATIONS

3.4.1 Project Specifications

3.4.1.1 General Requirements

The Contractor shall develop project specifications utilizing unedited Unified Facilities Guide Specifications (UFGS), designated specification sections furnished with this SOW, and the development of additional project specifications not covered by UFGS. UFGS may be downloaded in SpecsIntact SGML (zipped) file format at the internet address listed above. Specifications shall be edited utilizing the latest edition of MasterFormat numbering system. The Contractor shall utilize SpecsIntact software.

3.4.1.2 Technical Specifications

The Contractor shall be required to use unedited UFGS sections for developing project specifications. Specification paragraphs and subparagraphs shall not be rewritten to lessen the quality of the original technical specification sections, unless directed otherwise. The technical guide specifications describe the type and quality of material and installation normally acceptable for United States Army Corps of Engineers construction, and often represent specific agreement between the Government and the applicable industry. The provision of the technical guide specification shall not be changed without justification. Justifications and identification for additional materials shall be identified in the design analysis under the appropriate design discipline. Designer notes shall not appear in any design submittals. Only bracketed choices and inapplicable items shall be marked for deletion. These items shall be removed in the Released for Construction Design specifications submittal. The Contractor shall complete the editing of all options in these specifications. Where designer notes are provided, the Contractor shall edit the choice in accordance with the recommendations and guidance of the notes, except where specific guidance has been provided with this SOW (i.e. submittal paragraph).

3.4.1.3 Editing Technical Specifications

(1) Incorporating Established SOW Requirements into Guide Specifications

Where specific requirements in regards to materials, methods, and end function requirements are provided in the edited SOW Division 1 provided in this SOW, the unedited Unified Facilities Guide Specifications (UFGS) shall be edited to reflect these requirements. Variations to these requirements will not be permitted, unless authorized as a design deviation by the Contracting Officer.

(2) Requirements of Guide Specifications Not Established By SOW Requirements

Where specific direction has not been provided in regards to materials, methods, and end function requirements, the final requirements will be a result of the completed design by the Contractor.

The applicable unedited UFGS sections, Divisions 2 through 49, shall be edited to:

- (a). Provide the highest quality that can be provided within the cost and time authorized;
- (b). Meet or exceed the criteria requirements established by the solicitation;
- (c). Meet applicable Federal, state, and local codes; and
- (d). Do not sacrifice aesthetics, user requirements established by the solicitation, life-cycle economy, energy conservation, environmental protection or life safety.

Lessening the quality of the UFGS specifications shall not be made unless the Contractor provides the Contracting Officer documentation as to why the standards established by the UFGS sections cannot be made and the Contracting Officer approves. This documentation shall be included as a design deviation.

(3) ADDITIONS: If the specifications of the UFGS do not cover a feature that is in the project, new sentences and/or paragraphs shall be inserted in the proper locations to adequately cover the feature of work. Additions shall not lessen the quality of materials indicated by the specifications. If a new material is added, it shall be properly referenced in "Applicable Publications," "MATERIALS," "SUBMITTAL," "TESTS," and "INSTALLATION" paragraphs.

(4) DELETION OF INAPPLICABLE TEXT MATERIAL, AS NECESSARY, TO TAILOR THE SPECIFICATIONS TO FIT THE PROJECT: After deletion has been made to all inapplicable paragraphs, subparagraphs, choices, and schedules from the body of the specifications (including the correction of lists in "Submittals," "Tests," and "Installation" paragraphs), delete all non-applicable references listed in the preceding "APPLICABLE PUBLICATIONS" and "MATERIALS" paragraphs. Deletions shall not lessen the quality of materials indicated by the specifications.

(5) Do not remove any special code markings for submittals, references, tests or section references, unless the text is not required.

(6) REFERENCES TO SPECIFICATION SECTIONS: The Contractor shall be responsible for coordinating section references, along with the technical requirements, to specific specification sections (number and title) within the project specifications. Section references (title and number) shall be revised to reflect the titles and numbers of specification sections used.

(7) REFERENCES: The Contractor shall be responsible for coordinating references or publications referenced in the text of each specification with those references listed at the beginning of each section. See paragraph: Reports below. The SpecsIntact software removes references or publications not referenced in the text from the Reference Article, when printing from the Jobs menu.

(8) SUBMITTALS: Each section of the specifications includes a submittal paragraph which lists all applicable Contractor submittals. Submittals

shall be properly marked as outlined in the SpecsIntact documentation and in this section. These codings are used for automatic generation of the Submittal Register in the SpecsIntact Software. These codings must not be deleted from the text, unless the submittal is not required. The Submittal Item text between the coding shall be identical (word for word, including punctuation and spacing) to the paragraph text in the reference paragraph(s). Text may be either upper or lower case letters. An example of a submittal paragraph is provided in Attachment C, "Sample Submittal Paragraph".

During the design phase, the Contractor's designer(s) shall develop a complete list of required construction submittals in each technical specification. The list is to be used in preparing the Submittal Register for approval by the Contracting Officer's Representative (COR).

See UFGS Specification Section 01 33 00 SUBMITTAL PROCEDURES, for complete instructions related to submittal descriptions, classifications, numbers, and submittal process. Unless directed otherwise by the Contracting Officer, the words "Government Approval" associated with "G" designated submittals shall be interpreted as defined herein and in section 01 33 00 SUBMITTAL PROCEDURES.

Submittal Classifications defined in Section 01 33 00 are G-DO, G-AO, and FIO. One of these designations shall be used for all submittal requirements. For each submittal requirement in the guide specification, designers shall indicate a submittal type (G-DO, G-AO, or FIO) or shall delete the requirement for the submittal if it is not required. The references to "G-AE" and "G-PO" submittal types in the designer notes of the technical guide specifications shall be disregarded and submittals shall be designated G-DO, G-AO, or FIO as determined by the Designer in accordance with the instructions in this section and Section 01 33 00 SUBMITTAL PROCEDURES. There shall be no "G-AE" or "G-PO" submittals in the submittal register.

To designate a submittal item as FIO, mark the semi-colon following the submittal item and also the submittal tags up to the Item tag for deletion (i.e. "; [], []"). Designers shall identify submittal classifications for all required submittals.

(9) USE OF UFGS SECTIONS: Unless directed otherwise, use UFGS sections. UFGS sections are joint effort of the U.S. Army Corps of Engineers (USACE), the Naval Facilities Engineering Command (NAVFAC), National Aeronautics and Space Administration (NASA) and the Air Force Civil Engineer Support Agency (AFCEA). In instances where more than one UFGS section addresses the same material or system requirement, use the section developed by the USACE specification proponent (general rule of thumb). Available UFGS sections with the numbers ending ".00 10", ".00 20" or ".00 40" following the section number are sections that have not yet been unified by the different Government design agencies. The ending numbers designate the specification proponent (".00 10" is for USACE, ".00 40" for NASA and ".00 20" is for NAVFAC). Where UFGS sections include tailoring options for both the various proponents (Army, NASA, and Navy) use the Army tailoring option unless otherwise indicated in this SOW. Where conflicts exist that cannot be resolved, the Contracting Officer shall be contacted to resolve the issue.

3.4.1.4 Developing Additional Project Specifications

If the need should arise for developing project specifications on materials and items not covered by the UFGS, the Contractor shall develop specifications utilizing commercial Construction Specifications Institute (CSI), 49 Division, 3 Part Section Format. These specifications shall conform to the applicable criteria requirements indicated in the solicitation. For these specification sections, write at the Mediumscope level of detail as described in CSI MasterFormat. Use Mediumscope level section numbers and titles as identified in CSI MasterFormat. Adjust section numbers which conflict with the specifications used in the project specifications. Each of these developed specification sections shall be in the same format as the CSI format specifications included in the UFGS (including the submittal paragraph). Commercially available guide specifications such as "SpecText" published by The Construction Specifications Institute and "MasterSpec" published by The American Institute of Architects may be used, subject to the format, coding and submittal paragraph requirements if UFGS specification sections are not available. References to the "Architect/Engineer" and the "Owner" shall be changed to refer to the "Government" or "Contracting Officer," as appropriate. The specifications shall clearly identify, where appropriate, the specific products chosen to meet the requirements of the specifications (manufacturers' brand names and model numbers or similar product information). The Contractor shall be responsible for coordinating references, along with the technical requirements, to specific specification sections (number and title) within the project specifications. Section references (title and number) shall be revised to reflect the titles and numbers of specification sections used.

3.4.1.5 Division 0 and 1 Sections

Include Division 0 and 1 specification sections indicated below as part of the project specifications, unless directed otherwise:

01 32 01.00 10 PROJECT SCHEDULE,
 01 33 00 SUBMITTAL PROCEDURES,
 01 35 26 GOVERNMENT SAFETY REQUIREMENTS,
 01 45 01 USACE QUALITY CONTROL,
 01 57 20.00 10 ENVIRONMENTAL PROTECTION,
 01 62 35 RECYCLED / RECOVERED MATERIALS,
 01 74 19 CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT,
 01 78 00 CLOSEOUT SUBMITTALS,
 01 78 23 OPERATION AND MAINTENANCE DATA,

All other Division 1 Specifications required by the Contract shall be the responsibility of the Contractor.

3.4.1.6 Format for Project Specifications

Submit the project specifications, including a cover page and table of contents, printed with a word processor (using SpecsIntact software) using good quality white paper. For the 65 percent and 100 Percent Design submittals, editing of the UFGS shall be shown as indicated in the SpecsIntact documentation for text deletions and for text insertions (i.e. 65 percent and 100 percent review specifications shall be printed to show all insertions and deletions). The Released for Construction Design specifications with review comments incorporated shall be cleaned up (markings for insertion and deletion removed) and shall be submitted in electronic format on electronic media (a Microsoft Windows compatible CD-ROM

and compatible with the "SpecsIntact" micro computer software package). The cover page and attachments to specification sections shall be prepared in a Microsoft Word (compatible with Microsoft Word 2007) format. In addition to the electronic SpecsIntact formatted specifications, a single Adobe Acrobat PDF file, containing all specification sections for this project, shall be provided on CD with the 65 Percent Design, the 100 Percent Design, and the Released for Construction Design submittals.

Format shall be as outlined in the SpecsIntact documentation.

Each specification section shall include a Section Table of Contents which is combined with the page numbering of the specification section.

The Cover page shall be similar to the SOW Cover page and shall include:

- a. Project title, project number, activity and location
- b. Construction contract number
- c. Construction Contractor's name and address
- d. Design firm's name and address
- e. Names of design team members (Designers of Record) responsible for each Contractor prepared technical discipline of the project specification
- f. Name and signature of a Principal of the design firm

The Table of Contents shall list the specification section numbers and titles contained in the project specifications.

3.4.1.7 Reports

The Contractor shall submit the following SpecsIntact reports with the 100 Percent Design and the Released for Construction Design submittals: Address Verification, Reference Verification, Section Verification, Bracket Verification, Submittal Verification, and Submittal Register. References shall be reconciled when printing reports. The reports to be submitted for review shall be after the Contractor has corrected the errors generated by these reports. From the errors generated by the reference verification reports, fix only those errors where there is a discrepancy with the issue date of a publication (i.e., NFPA 70, revise to the latest code requirement). Address, Reference, and Submittal Reconciliation shall be completed prior to submittal of the 100 Percent Design.

3.4.2 Construction Submittals

All construction submittals shall be in accordance with Specification Section 01 33 00, "SUBMITTAL PROCEDURES".

Construction submittal types and products, including the submittal description numbers and data package numbers, shall be included in the specification sections, where required. When appropriate, use specific product terms instead of the generic product terms contained in the specifications sections (e.g., asphalt shingles, built-up roofing, EPDM single ply, etc. vs. roof covering; concrete masonry units, brick, metal

siding, etc. vs. exterior skin; mineral fiber board, block, batt or blanket, polystyrene, polyurethane, polyisocyanurate board vs. insulation).

All submittals shall be provided in electronic Adobe Acrobat Portable Document Format (PDF). The ENG Form 4025 shall be provided in electronic Adobe Acrobat Portable Document Format (PDF) and shall be digitally signed by the Contractor. Submittals which require hardcopy submission; such as samples, shall be provided in hardcopy format (one hardcopy of the submittal) and shall be provided with an accompanying electronic digitally signed Adobe Acrobat PDF copy of the ENG Form 4025 and a hardcopy of the ENG Form 4025. One electronic copy and two hardcopies shall be provided for all drawing submittals. Electronic copies of design submittals shall be provided in the formats specified in this SOW.

Submittal review comments and submittal classification will be provided in hardcopy or electronic format by the Government.

The Government will have fourteen (14) calendar days to review and respond to construction submittals after date of receipt of the construction submittal.

3.4.2.1 Submittals Register (Form)

Prepare and maintain a Submittals Register. The Submittal Register (ENG Form 4288 "Submittal Register") shall be prepared using SpecsIntact Software. Additional instructions for completing the form are contained in Specification Section 01 33 00, "SUBMITTAL PROCEDURES."

Fill in columns "c" through "f" and submit with the 100 Percent Design submittal. The Submittal Register will be returned to the Contractor along with the reviewed and accepted design.

Resubmit the Submittal Register as a construction submittal as required in Specification Section 01 33 00, "SUBMITTAL PROCEDURES." The Contractor shall provide an electronic copy of the accepted submittal register (navy4288.txt file), generated by the SpecsIntact software, in both SpecsIntact file format and Adobe Acrobat Portable Document Format (PDF), seven (7) calendar days prior to the pre-construction conference. Remaining columns will be filled in at the appropriate time and by the appropriate authorities during construction.

3.5 DESIGN ANALYSES

Prepare design analyses (basis of design and calculations) for each design discipline. Specific requirements relative to the technical content to be provided are specified herein. The design analyses shall include a basis of design and calculations for each discipline. The design analyses shall be a presentation of facts to demonstrate that the concept of the project is fully understood and that the design is based on sound engineering. The design analysis for each discipline shall include:

a. A basis of design consisting of:

(1) An introductory description of the project concept which addresses the salient points of the design;

(2) An orderly and comprehensive documentation of criteria, rationale, assumptions, and reasoning for system selection.

b. Calculations required to support the design.

The Contractor shall not make reference to the SOW to avoid stating the requirements for the basis for design.

3.5.1 Format

The design analysis shall include: a cover page indicating the stage of design "PRELIMINARY DESIGN ANALYSIS" for 65 Percent Design submittal and "FINAL DESIGN ANALYSIS" for 100 Percent Design submittal, the project title, the fiscal year, the location, name of designer who prepared the design analysis ("Prepared By:") followed by the Name of Architect-Engineer (A-E) Contractor and Construction Contractor, location of A-E and Construction Contractor Office involved with the design, construction contract number, table of contents, and tabbed separations for each part of design analysis for quick reference. The cover sheet shall indicate the volume number and total number of volumes for the project. Provide a cover sheet for each volume. Submit design analyses prepared on 8 1/2 by 11 inch white paper. The design analysis for all disciplines shall be bound in one volume, excluding calculations. Multiple volumes for individual disciplines, appropriately numbered, may be provided, when required. An electronic copy of the design analysis submittal shall be submitted in Adobe Acrobat PDF format. Narratives shall be provided in decimal paragraph numbering system (i.e. 1, 1.1, 1.1.1, 1.1.1.1 etc.). Narratives shall be an original document that does not copy the text from the SOW document sections, unless directed otherwise, and shall be written in the same tense (Past or Present) for the entire design analysis. Each part of the design analysis shall include part numbering and page numbering (consecutive page numbering for each part). Organize design analysis narrative into the following parts, as follows:

3.5.1.1 Part 1 - General Description.

This part will provide statements of purpose, authority and applicable criteria. A description of the project and a summary of the economic factors influencing the choice of the **mechanical, electrical, fire protection and detection** systems used in the project shall be provided along with an indication of how initial costs and life cycle costs were considered.

a. Purpose. Include the following statement under the heading of "PURPOSE":

"Sample Statement: The purpose of this project is to provide a facility which allows for adequate comprehensive programs for both military personnel and their dependents. The anticipated average daily attendant for this facility will be 450 persons. The facility provides for adequate support for athletics, aerobic activities, auxiliary administrative support, parking and support area."

b. Authority. Provide the following authorization statement under the heading "AUTHORITY" for the project:

"Sample: The preparation of design documents was authorized by Design Directive dated (31 January 2009)."

c. Applicable Criteria. Provide a list of the general criteria that pertains to all disciplines used in the design. Specific criteria used in a particular engineering/architectural discipline shall be listed in the text of the appropriate discipline in Part 2 of the design analysis. Such criteria shall be referenced accordingly.

d. Project Description. Provide a description of the project and summary of economic factors influencing the choice of materials and systems used in the project.

3.5.1.2 Part 2 - Design Requirements and Provisions.

This part of the design analysis shall provide statements of factors considered and provided in the design along with supporting justification of design decisions and design calculations. Include narratives for each of the following areas or disciplines; **Mechanical, Electrical, Fire Protection & detection, Environmental Protection Compliance, Safety, and Sustainable Design.**

3.5.2 Calculations

All calculations shall be placed in separate appendix volume(s). Calculations shall include a cover page similar to the design analysis narrative cover page, a table of contents, index page, a summary of criteria for each appendix, the project title, and the location identified on every page of the calculations. All calculation pages shall be clearly legible. Each discipline which requires calculations shall be consecutively numbered (Example: A-1, A-2, A-3 etc. for Water Supply and Wastewater Calculations and B-1, B-2, B-3, etc. for Structural Calculations) and the date. Cite criteria from which the calculations, rationale, and formulae are extracted by publication number, title, edition, and page number. The cover page and each page of calculations shall also include the names of the persons originating and checking the calculations. The person checking the calculations shall be a registered professional engineer other than the originator. In addition, the signature and seal of the appropriate registered professional engineer responsible for the work shall appear on the cover page of the calculations for each discipline. Each appendix index page shall list subtopics (e.g. for Structural - Loads, Materials, References, Wind Analysis, Footing Design, Wall Design, Column Design, etc.) with pages numbers where each of these subtopics can be found in the calculations.

Computer printouts shall be consecutively page numbered and identified similar to the calculations. Identify the computer program name, source, and version. All schematic models used for computer input shall be provided.

3.5.3 Design Review Meetings

Formal design review meetings shall be held at DTA DPW Building 205 Conference Room for the following milestone meetings

65 Percent Design Submittal
100 Percent Design Submittal

The design review meetings shall be scheduled after all comments have been received and addressed by the Contractor. The Contractor shall provide all design review comment responses to the COR. The COR will schedule the design review meeting with the Contractor and appropriate Government personnel.

Design review meetings shall not be taken as an approval or acceptance and do not relieve the Contractor from responsibility for compliance with the SOW solicitation, code regulations, or betterments, either listed with the Contractor's proposal or identified during the proposal evaluation.

For each design review meeting, the Contractor shall provide adequate copies of annotated comments to all conference participants. Unresolved comments and problems will be resolved by immediate follow-on action at the end of the meetings. Valid comments will be incorporated.

In addition, the Contractor shall request a design progress meeting to the COR after 35 percent design is complete. The COR may schedule the design progress meeting with the Contractor and appropriate Government personnel. The Contractor shall bring 35 percent design drawings and specifications to the meeting. The Contractor shall brief the Government personnel on all aspects of the 35 percent design package. The intent of the 35 percent design progress meeting is to address all design issues, conflicts, concerns, and questions. Additional design progress meetings may be requested by the Contractor or the COR and may be scheduled by the COR to address issues, conflicts, concerns, and questions.

3.5.4 Requests for Information, Meeting Minutes, and Comments

Copies of Requests for Information (RFIs) made by the Contractor to the Government shall be included as an appendix to the design analysis. An index of each RFI, which documents the RFI number, the date the RFI was given to the Government, the date the RFI was answered by the Government, and the response provided by the Government shall be provided. The Government will have fourteen (14) calendar days to respond to RFIs after date of receipt of the RFI.

The Contractor shall record meeting minutes at each meeting attended. The Contractor shall submit the meeting minutes to each person that attended the meeting via e-mail message no later than three (3) calendar days after the meeting occurs. Any RFI, from any meetings, shall be formally submitted separately by the Contractor. A copy of all meeting minutes and design review comments (if any) with responses shall be included as an appendix to the design analysis.

Appendices for RFIs, meeting minutes, and design review comments shall have page numbering that follows the same format as for Calculations listed above.

3.6 DESIGN CERTIFICATION

The Contractor shall provide certification signed by an officer of the Contractor's company attesting that the drawings, specifications, and design analyses prepared for construction meet the requirements of the SOW. The certification shall accompany the submission of the design documents along with names and disciplines for the Designers of Record. This design

certification shall include a list of deviations (variations) from the solicitation or accepted final design. Prepare the design certification and transmittal letter in the format shown on Attachment A or Attachment B included at the end of this section.

3.7 65 PERCENT DESIGN SUBMITTALS

The 65 Percent Design submittal shall consist of 65 percent complete drawings and specifications for all areas of design disciplines including **mechanical, electrical, fire protection and detection**. All design calculations for all disciplines shall be provided with the 65 Percent Design submittal. The design calculations provided with the 65 Percent Design submittal shall be 100 percent complete. The design analysis shall be 100 percent complete and shall be provided with the 65 Percent Design submittal.

3.8 100 PERCENT DESIGN SUBMITTALS

The 100 Percent Design submittal shall consist of 100 percent complete drawings, specifications, and design analysis for all areas of design disciplines including **mechanical, electrical, fire protection and detection**.

3.9 REVIEW BY GOVERNMENT

3.9.1 Distribution of Design Documents for Conformance Review

(a) The Government shall receive design submittal review responses from the Contractor prior to design review conferences as specified in the paragraph below. All submittals shall be transmitted by express mail. Originals of transmittal letters shall be sent to the Detroit Arsenal Directorate of Public Works and copies shall accompany each mail package. Transmittal letters shall indicate distribution by use of the "ATTN" code shown in the address. Design document sets shall include the items listed below. Some of the construction submittals are also listed. Design submittals shall be submitted as a complete package (i.e. drawings, specifications, design analysis,...). The distribution listed below also applies to all design reviews and design packages accepted for construction.

(b) For the 65 Percent Design, the 100 Percent Design, and the Released for Construction Design submittals, if the Government requires more time than the number of days specified, the Contractor will be granted an extension of time equal to the number of calendar days of delay.

3.9.1.1 Design Submittal Items

Electronic copies of each required submittal (unless specified otherwise in this SOW); Design Analysis, Specifications, Drawings (half size hardcopy set, full size hardcopy set, and electronic copy), Submittal Register, Review Comments, Requests For Information, Meeting Minutes, Design Certification Letter, Operation and Maintenance Manuals, As-Built Drawings (half size hardcopy set, full size hardcopy set, and electronic copy), and DD Form 1354 - Transfer and Acceptance of Military Real Property, shall be sent to the Activity Distribution Addresses listed in the paragraph below as required for the 65 Percent Design submittal, the 100 Percent Design submittal, the Released for Construction Design submittal, and for the project completion submittals.

3.9.1.2 Activity Distribution Addresses

Department of the Army
US Army Garrison - Detroit Arsenal
6501 East Eleven Mile Road
Mail Stop 117 (Attn: Karen Carnago)
Warren, Michigan 48397-5000

Army Contracting Command - Warren (ACC-WRN)
6501 East Eleven Mile Road
Mail Stop 350 (Attn: John Sarti)
Warren, Michigan 48397-5000

3.9.2 Review Comments

For each design submittal, the Contractor will be furnished comments from the Detroit Arsenal Directorate of Public Works, and other agencies involved in the review process, approximately fourteen (14) calendar days after receipt, unless indicated otherwise. Annotated comments and responses to all design review comments, including the disposition of all comments, shall be furnished in writing by the Contractor within seven (7) calendar days of the review comments receipt. The Government will schedule the design review conference within seven (7) calendar days from receipt of the design review responses from the Contractor.

In responding to review comments presented by the Government, the Contractor's designer shall state how and where comments were addressed or will be addressed with the next design submittal.

All Government review comments on the 65 Percent Design shall be resolved prior to distribution of the 100 Percent Design documents. The Contractor shall furnish copies of annotated review comments indicating disposition of all comments with the 100 Percent Design document set.

All Government review comments on the 100 Percent Design shall be resolved prior to distribution of the Released for Construction Design documents. The Contractor shall furnish copies of annotated review comments indicating disposition of all comments with the Construction document set.

For each design review meeting, the Contractor shall provide adequate copies of annotated comments to all conference participants. Unresolved comments and problems will be resolved by immediate follow-on action at the end of the conferences. Valid comments shall be incorporated.

After receipt of final corrected Released for Construction Design documents, the Detroit Arsenal Directorate of Public Works will recommend acceptance to proceed with construction as stated in this SOW.

3.9.3 Delays

Delays caused by the Contractor in completion of the 65 Percent Design, the 100 Percent Design, or the Released for Construction Design will not be considered as valid reasons to delay completion of the entire design. The Government may not be held liable for delays caused by re-submittal efforts caused by designs submitted which are rejected by the reviewers.

3.10 RELEASED FOR CONSTRUCTION DESIGN

Upon the Contractor's completion of the Released for Construction Design submittal, the Contractor shall reproduce copies of the design documents (accepted for the purposes of beginning construction) subject to the incorporation of the 100 Percent Design review comments. The Cover Sheet of the Contractor prepared drawings shall bear the stamp or seal and signature of the registered architect or appropriate engineer responsible for the work. The date on each drawing shall reflect the month and year that the drawings were cleared for the purposes of beginning construction. The cover sheet of the drawings, the cover sheet of the specifications, and the cover sheet of the design analysis shall include the date that the design documents were cleared for the purposes of beginning construction. The Contractor shall provide the design analysis, the design drawings, and the specifications in electronic formats as specified above. Drawings shall be provided in electronic and hardcopy format as specified above. Distribution shall be as indicated above. The originals will be retained by the Contractor for recording of as-built conditions. Upon completion of the project, the accepted design documents corrected to reflect as-built conditions shall be supplied to the Government.

The Contractor will be notified in writing by the Contracting Officer's Representative (COR) of Construction Notice to Proceed (NTP) when the design has been cleared for construction, accepted by the Government, and therefore considered Released for Construction Design documents.

3.10.1 Accuracy and Completeness of Design

Reviews by the Government of the design documents shall not be construed to be an endorsement of the accuracy or completeness of the design. Design deficiencies or omissions in the accepted design shall be the responsibility of the Contractor.

3.11 REVISIONS TO THE ACCEPTED DESIGN

3.11.1 Minimization of Design Revisions

The accepted design will be used by all parties involved in construction and in administration of the contract. Therefore, it is imperative that the design documents be kept up to date and an effective system of making and distributing changes be implemented. Since changes to the design increase risk of construction errors and deplete available administrative resources, every effort shall be made to minimize revisions to the accepted design. One of the measures of the Contractor's effectiveness of management will be how well the goal of minimizing changes to the accepted design is met. The use of effective quality control during design and the utilization of experienced and capable designers are some of the means that are expected to be used to accomplish this goal.

3.11.2 Supplemental Design Package and Certification

If revisions to the accepted design (Released for Construction Design) become necessary, the Contractor shall submit a Supplemental Design Package using Attachment B "Supplemental Design Certification and Transmittal Form" attached at the end of this specification section. This Supplemental Design Package shall be submitted as a "G-DO" construction submittal in accordance with Section 01 33 00 SUBMITTAL PROCEDURES. The revisions will be considered

a "Variation" and the list of deviations from the accepted design shall be identified on the Supplemental Design Certification and Transmittal Form and on the construction submittal form ENG Form 4025. Variations from the Released for Construction Design set must be approved by the Contractor's Designer and the Contractor's Quality Control Representative and shall be accepted by the Contracting Officer as conforming with the SOW before construction of items affected by these revisions may commence. The Contractor shall comply with all the requirements of paragraph "VARIATIONS" of Section 01 33 00 SUBMITTAL PROCEDURES in preparation of the Supplemental Design Package.

3.12 AS-BUILT DRAWING SUBMITTALS

An as-built drawing is a construction drawing revised to reflect the final as-built conditions of the project as a result of modifications and corrections to the project design required during construction. The final as-built drawings shall not have the appearance of marked up drawings. The final as-built drawings shall appear as professionally prepared drawings as if they were the "as-designed" drawings.

As-Built Drawings shall be provided in accordance with UFGS Specification Section 01 78 00 CLOSEOUT SUBMITTALS. Redline as-built drawings shall be provided to the Contracting Officer's Representative (COR) prior to the pre-final and final inspections.

3.12.1 Maintenance of As-Built Drawings

The Contractor shall keep a record set of working as-built drawings at the job site, marked in red, of all changes and corrections from the contract drawings. The Contractor shall enter changes and corrections on drawings promptly to reflect "Current Construction". The CADD files shall be updated at least on a monthly basis. The marked-up set of drawings shall reflect any changes, alterations, adjustments, or modifications. Changes must be reflected on all sheets affected by the change. Changes shall include marking the drawings to reflect structural details, foundation layouts, equipment sizes, and other extensions of design. Both paper and electronic documents shall be available at all times and shall be provided promptly to the Contracting Officer when requested.

Final as-built drawings shall reflect actual room numbers adopted by the end user.

3.12.2 Computer-Aided Design and Drafting (CADD) As-Built Drawings

Only personnel proficient in the preparation of CADD drawings shall be employed to prepare and modify the construction drawings or prepare additional new drawings. As-Built drawings shall be provided in MicroStation format. As-Built drawings shall be provided in conformance with the U.S. National CAD Standard. Additions and corrections to the construction drawings shall be in conformance with the Nation CADD Standard. The Contractor shall provide as-built drawings in MicroStation format in conformance with the U.S. National CAD Standard regardless of the software and standard in which the CADD drawings are provided to the Contractor by the Government. Conversions and corrections to the drawings provided by the Government to the Contractor shall be made by the Contractor. Line work, line weights, lettering, layering conventions, and symbols shall be in conformance with the U.S. National CAD Standard. If additional drawings are

required, they shall be prepared in MicroStation format and shall be in conformance with the U.S. National CAD Standard. The title block and drawing border to be used for any new final as-built drawings shall be identical to that used on the contract drawings.

All work by the Contractor shall be done on files in MicroStation format. Translation of files to a different format, for the purpose of as-built production, and then retranslating back to the format originally provided, will not be acceptable unless the Government provided the files in AutoCAD format. If the Government provided drawings are in AutoCAD format then the Contractor shall convert the files to MicroStation format and provide the drawings in MicroStation format. The Government will review final as-built drawings for accuracy and the Contractor shall make all required corrections, changes, additions, and deletions.

When final revisions have been completed, the cover sheet drawing shall show the wording "RECORD DRAWING AS-BUILT" followed by the name of the Contractor. All other contract drawings shall be marked in the bottom right-hand corner of each drawing either "AS-BUILT" drawing denoting no revisions on the sheet, or "REVISED AS-BUILT" denoting one or more revisions. Original contract drawings shall be dated in the revision block.

3.12.3 As-Built Conditions that are Different from Contract Drawings

All as-built conditions that are different, such as dimensions, road alignments and grades, and drainage and elevations, from the contract drawings shall be accurately reflected on each drawing. Any options shown on drawings and not selected shall be deleted and options selected shall be clearly reflected on final as-built drawings.

In addition, as-built information that exceeds the detail shown on the contract drawings include those that reflect structural details, foundation layouts, equipment, sizes, mechanical and electrical room layouts, and other extensions of design, that were not shown in the project design documents because the exact details were not known until after the time of approved shop drawings. It is recognized that these shop drawing submittals (revised showing as-built conditions) will serve as the as-built record without actual incorporation into the contract drawings. Furnish all such shop drawings in CADD format. Fire protection details shall be included such as wiring, piping, and equipment drawings.

3.12.4 Final As-Built Drawings

At the time of Beneficial Occupancy of the project or at a designated phase of the project, final as-built CADD files shall be provided to the Contracting Officer to include the following:

- (1) On CD in MicroStation V8 format
- (2) On CD in Adobe Acrobat PDF format (one file of all drawings)
- (3) The record set of approved working as-built drawings (one full size hardcopy set and one half size hardcopy set)

In the event the Contractor accomplishes additional work after this submittal, which changes the as-built conditions, the Contractor shall furnish a new CD with all drawing sheets (MicroStation V8 and Adobe Acrobat PDF files) and a new full size set of affected sheets.

Title Blocks shall be clearly marked to indicate final as-built drawings.

All other documents such as; design analysis, catalog cuts, and certification documents, which are not available in native electronic format, shall be scanned and provided in an organized manner in Adobe Acrobat PDF format.

3.13 OPERATION AND MAINTENANCE DATA

Submit Operation and Maintenance (O&M) Data specifically applicable to this contract and a complete and concise depiction of the provided equipment, product, or system, stressing and enhancing the importance of system interactions, troubleshooting, and long-term preventative maintenance and operation. The subcontractors shall compile and prepare data and deliver to the Contractor prior to the training of Government personnel. The Contractor shall compile and prepare aggregate O&M data including clarifying and updating the original sequences of operation to as-built conditions. Organize and present information in sufficient detail to clearly explain O&M requirements at the system, equipment, component, and subassembly level. Include an index preceding each submittal. The O&M Data shall be provided in accordance with the requirements of UFGS Specification Section 01 78 23 OPERATION AND MAINTENANCE DATA.

The Contractor shall provide one complete electronic copy of the final O&M data in Adobe Acrobat PDF format on CD to the COR. The ENG Form 4025 shall be provided in Adobe Acrobat PDF format and shall be digitally signed by the Contractor.

3.14 DD FORM 1354, TRANSFER AND ACCEPTANCE OF MILITARY REAL PROPERTY

The Contractor shall prepare and provide, for acceptance, completed DD Form 1354 "Transfer and Acceptance of Military Real Property." The DD Form 1354 shall be filled out in accordance with the latest edition of UFC 1-300-08, Criteria for Transfer and Acceptance of Military Real Property. The Contractor shall provide all three types of DD Form 1354; including, Draft, Interim, and Final, as described in UFC 1-300-08. Each submittal of the DD Form 1354 shall be provided electronically in Adobe Acrobat PDF format.

Attachment A - DESIGN CERTIFICATION AND TRANSMITTAL LETTER

[Contractor's Letterhead]

[Date: _____]
[Contract No. _____]

[Reviewing Component Address]

Subj: DESIGN CERTIFICATION AND TRANSMITTAL LETTER
[Project Title _____]
[Project Location _____]
[Contract No. _____]

Gentlemen

Enclosed are the following documents, which I hereby certify are in compliance with the contract requirements and can be used to commence construction subject to Government Conformance Review:

- 1. Design Drawings
- 2. Project Specification
- 3. Design Analysis
 - a. Civil
 - b. Water Supply and Wastewater Collection
 - c. Architectural
 - d. Interior Design
 - e. Structural
 - f. Mechanical
 - g. Fire Protection
 - h. Electrical
 - i. Communications
 - j. Environmental Protection, Compliance and Permits
 - k. Health and Safety
 - l. Sustainable Design
- 4. Submittals Register
- 5. All other Design Deliverables
- 6. Deviations (List of Deviations with Justification Attached)

[Typed Name and Signature of an
Officer of the Contractor's Company]

Copy to:
[As standard with the Contractor]

Attachment B - SUPPLEMENTAL DESIGN CERTIFICATION AND TRANSMITTAL FORM

[Contractor's Letterhead]

[Date: _____]
[Contract No. _____]

[Reviewing Component Address]

Subj: SUPPLEMENTAL DESIGN CERTIFICATION AND TRANSMITTAL FORM
[Project Title _____]
[Project Location _____]
[Contract No. _____]

Gentlemen:

The supplemental design items listed below and the attached documents, unless identified otherwise, I hereby certify are in compliance with the contract requirements and are compatible with other elements of work, subject to Government conformance review:

- 1. Nature and Features of the Design Variation(s):
- 2. Why each Design Variation is desirable and Beneficial to the Government:
- 3. List of any additional Deviations from the SOW:
- 4. List of Specific Documents Supporting Design Variation(s):
 - a. Design Drawings
 - (1) Sketches:
 - (2) Reissued Drawings:
 - (3) Descriptive Changes:
 - b. Project Specifications
 - (1) Reissued or New Sections:
 - (2) Descriptive Changes:
 - c. Design Analysis
 - (1) Reissued Pages:
 - (2) Reissued or New Calculations:
 - d. Any other Design Deliverable:

[Typed Name and Signature of an
Officer of the Contractor's Company]

Copy to:
[As standard with the Contractor]

ATTACHMENT C SAMPLE SUBMITTAL PARAGRAPH

The below listing is an example of a typical submittal paragraph as it may appear within the technical guide specifications and with the appropriate text for the submittal review designations, G-DO, G-AO, or FIO (blank).

1.4_ SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Fire Sprinkler Design Drawings; G-DO

SD-03 Product Data

Meters

Regulators

SD-08 Manufacturer's Instructions

Dielectric Unions

Pressure Reducing Valves

SD-10 Operation and Maintenance Data

Wet Pipe Sprinkler System; G-AO

-- End of Section --

SECTION I - CONTRACT CLAUSES

The following have been modified:

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

The Contractor shall be required to (a) commence work under this contract within 7 calendar days after the date the Contractor receives the notice to proceed, (b) prosecute the work diligently, and (c) complete the entire work ready for use not later than 19 June 2015. The time stated for completion shall include final cleanup of the premises.

(End of clause)

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

(a) If the Contractor fails to complete the work by **19 June 2015**, the Contractor shall pay liquidated damages to the Government in the amount of \$494.13 for each calendar day of delay until the work is accepted.

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

(End of clause)

(End of Summary of Changes)