MS0114

PROJECT # FTEV 14-1057 DATE: 1 APRIL 2015

DEPARTMENT OF THE AIR FORCE
SPECIAL OPERATIONS COMMAND
1 SPECIAL OPERATIONS WING

UPGRADE ELECTRICAL SERVICE HANGAR 90700

HURLBURT FIELD, FLORIDA

INDEX

END OF INDEX

SECTION 01 00 00: GENERAL REQUIREMENTS

PART 1 GENERAL

1.01 INTENT:

A. The intent of this project is to provide the Government with a fully complete and useable building meeting all the requirements for its intended use, constructed to high standards and the requirements of the Contract Documents. A fully complete and useable building is defined as one that is constructed to meet the aesthetic, functional and structural properties required by the drawings, specifications, amendments issued prior to receipt of bids/proposals, and modifications issued after award of the contract. All work shall be constructed to meet or exceed industry or government standards, whichever is more stringent. All construction shall be executed in a professional manner resulting in a finished product of highest quality. All materials, equipment, and other products used in the construction shall be new or approved recyclable materials from an approved source. All new work shall be maintained in a clean condition, and shall be installed plumb, square, true to line and grade, and shall conform to the stated dimensions, notes, schedules, etc. The work shall be properly secured, consistent in quality, fit and finish, and installation, etc.

1.02 APPLICABILITY:

A. This section of the specification is applicable to all sections that follow.

1.03 INTERPRETATION OF CONTRACT DOCUMENTS:

A. Prospective bidders desiring further information, interpretation or clarification of the contract documents shall forward a written request to the Contracting Officer**. The Contracting Officer is the sole authority for interpretation of intent of work and for approval of quality of materials and workmanship. Failure to request the above shall not be the basis for a change order. DO NOT ASSUME THAT YOUR INTERPRETATION IS CORRECT.**

1.04 CONFLICTS, DISCREPANCIES OR AMBIGUITIES:

A. Prior to submittal of a bid or proposal by the prime/general contractor, it is expected that each subcontractor, equipment and/or material supplier, and others associated with the project, shall have carefully examined as necessary, the drawings, specifications, and all addenda issued prior to the date of submission of the bid or proposal. Any and all conflicts, discrepancies or ambiguous language reasonably ascertainable from an inspection of the above and the project site that will affect the cost, quality, fit, finish, labor specified or required, equipment and/or materials specified or required, etc., necessary to **fully complete the project and make it operational for it's intended use, must immediately be brought to the attention of the prime/general contractor. The prime/general contractor must immediately notify the Contracting Officer in writing prior to submitting a bid or proposal and request written clarification of the conflict and/or discrepancy.**

B. Conflicts, discrepancies and ambiguous language that are inconsistent with the intent as stated above include but are not limited to:
   1. Ambiguous notes or statements or drawings or details.
   2. Conflicting information on the drawings and/or in the specifications.
   3. Errors or inconsistencies in schedules.
   4. Dimensional errors.
   5. Incomplete notes or dimensions or schedules.
   6. Extraneous notes, dimensions or schedules that conflict with the drawings or specifications.

C. **Conflicts, discrepancies or ambiguities brought to the attention of the Contracting Officer AFTER award of contract WILL NOT be considered as a basis for a change in the work.**

D. The intent of the above paragraphs is to increase the involvement of all persons associated with the project, particularly during the bid or proposal phase. Increased involvement during this phase will enhance the accuracy of the bid or proposal and reduce the potential for issuance of change orders during the construction phase.

1.05 DEFINITIONS:

A. **"Contract Documents":** Contract Documents consist of the Contract, drawings and specifications, all addenda issued prior to submission of the bid/proposal and all modifications and/or other directives issued after the award/execution of the contract. The intent of the Contract Documents is to provide the Contractor with all items of work necessary for the proper execution and completion of the project. The items listed are complementary, what is required by one shall be as binding as if required by all. In the event of a conflict between the drawings and the specifications, the specifications shall take precedence over the drawings, **unless** otherwise noted on the drawings. The Contractor shall perform all work consistent with and reasonably inferable from the Contract Documents as necessary to produce the intended results.

B. **"Government":** The government is the United States of America. The government is the owner of the project.

C. **"Prime Contractor":** The Prime/General Contractor is the person or entity who is qualified, bonded and insured, and who is responsible for preparing the bid/proposal and submitting it to the government. If the bid/proposal is accepted, the prime contractor will enter into a contract with the government to construct the work in accordance with the Contract Documents. The term "contractor" is used throughout the contract documents, and is synonymous with Prime/General Contractor, and means the contractor or the contractor's authorized representative.

D. **"Subcontractor":** A Subcontractor is a person or entity who prepares and submits a bid/proposal for a portion of the work to the contractor for his use in preparing his bid/proposal. During the construction phase, the subcontractor has a direct contract with the contractor to perform a portion of the work.

E. **"Material/Equipment Suppliers":** Material/equipment suppliers are person(s) or entities who prepare and submit a bid/proposal to the contractor for his use in preparing his bid/proposal. During the construction phase, the material equipment supplier has a direct contract with the contractor to provide certain materials or equipment to be incorporated into the work.

F. **"Project":** The project is the total construction of the work to be performed under the contract documents and may be the whole or part and which may include construction by the government.

G. **"Work":** The term work means the providing of construction services required by the contract documents, and includes all labor, materials, equipment and other incidentals necessary to fulfill the contractor's obligations. The work constitutes the whole project.

H. **"Changes in the Work":** Changes in the work may be accomplished after award of contract without invalidating the contract. Changes in the work shall be based upon a mutual agreement between the contractor and the government. Changes in the work shall be performed under applicable provisions of the contract documents unless otherwise provided for in the change. The time to complete the additional work shall also be a part of the agreement.

1.06 COORDINATION:

A. **The prime contractor is responsible for the overall coordination of the project during the bid and or the proposal phase and the construction phase.**

1. Coordinate **bid and or the proposal phase** to assure that all materials, labor, equipment, etc., to be used in the construction of the project and necessary for the completion of the prime contractor's bid/proposal, as defined in 1.01 above, are included in the bids of the respective suppliers and/or subcontractors work, i.e., civil, architectural, plumbing, HVAC, or electrical.
2. Coordinate **construction phase** to assure efficient and orderly progression of the work. Coordination shall include, but is not limited to, periodic meetings between the contractor and subcontractors to coordinate the work of each trade one with the other, installation of one part of the work that is dependent on the installation of other components either before or after it's own installation, the materials and equipment needed to properly complete the work and ordering of those materials and equipment, preparation of schedules, layouts and phasing of the work as required to meet the government's stated needs, installation of and removal of temporary facilities, preparation and delivery of submittals including shop drawings, manufacturer's product data, etc., scheduling of construction activities in the sequence required to obtain the best results, installation of different components within the allotted space to assure maximum accessibility for required maintenance or repair, periodic inspections of the work to assure compliance with the Contract Documents, visual inspections of the work to assure compliance with aesthetic requirements, maintenance and completion of all contract closeout documents including the

coordination of supporting closeout documents by all subcontractors, maintenance and completion of Construction Data Worksheet, verification of new utility connections to each item of existing and new equipment, verify measurements of existing and new work prior to installation of various components, proper storage of materials at the site particularly items requiring specific environmental conditions, protection of completed new work to minimize damage by other trades, cleaning, correction of punch list items of work after the final inspection, correction of warranty items during the warranty period, etc.

3. The prime contractor, each subcontractor, each equipment or material supplier and others who may be affiliated with the project are individually responsible for field verification of existing and new conditions that will affect their work, including the work of associated trades. Do not order, fabricate or install new items without field verification. Any discrepancy between the actual field dimension(s) and the size shown on the drawings, specifications, shop drawings, manufacturer's product data, etc. must immediately be brought to the attention of the prime contractor, project inspector and Contracting Officer. The prime contractor shall request written direction from the Contracting Officer.
4. Prior to performing any Site work or work below grade, the Contractor must obtain a completed and signed copy of AF FORM 103, Base Civil Engineering Work Clearance Request.
5. Prior to bringing any lasers on Hurlburt Field, the contractor shall notify the Bio Environmental office 881-1822 and the Safety Office 884-2610.

B. Individual sections of this specification are taken from the Base Master Specification. Therefore, not all products (materials, equipment, etc.) specified may be required to complete the construction of this project. In accordance with 1.05 above, the contractor, each subcontractor, equipment and/or material supplier, and others associated with the project, must carefully examine the drawings to determine which products are required to fully complete the work. See paragraph 1.04 Discrepancies.

1.07 CONSTRUCTION DATA WORKSHEET

A. The contractor must complete the checklist attached at the end of this section.
   1. Section 1.a. General Data Required: The government will complete Category Code and Facility number.
   2. Section 1.b. Systems in Building: All.

1.08 METHODS:

A. The site shall be prepared, maintained, and operated by the contractor throughout the Work. Such preparation, maintenance, and operation include but are not limited to:
   1. Preparation: Prevent damage to all existing construction, existing equipment and furnishings, existing utilities and paved areas, and new items such as recently installed materials and equipment, new stored materials, trees/shrubs/landscape features identified to remain at the site, and privately owned vehicles in and around the work site. The contractor responsible for the damage will be held liable for the repair or replacement of the damaged item as directed by the Contracting Officer.
   2. Safety and Security: Occupied and unoccupied facilities must be maintained in a safe manner to prevent the possibility of injury to the occupants and workmen. Upon completion of the days work, the contractor is responsible for securing the facility to prevent unlawful entry to the facility. If the interior of the facility or any equipment or furnishings are damaged due to the contractor's failure to properly secure the facility, the prime contractor and/or the subcontractor responsible for securing the facility will be held liable for the repair of the facility and replacement of the damaged equipment or furnishings as directed by the Contracting Officer.
   3. Maintenance: Maintain the site in a neat and orderly manner to include daily trash/debris removal, stacking of material, control of surface drainage, mowing, and road sweeping.
   4. Operation: Follow Occupational Safety and Health Administration requirements, US Army Corps of Engineers Safety and Health Requirements Manual EM 385-1-1, base law enforcement and base fire marshal requirements.
   5. Trailers used for storage and/or temporary field offices shall be clean and well maintained and display only the name of the contractor or subcontractor.

1.09 CONSTRUCTION:

A. All work will be of professional quality. Intent of construction includes but is not limited to the following:
   1. Utility connections shall be clean and complete. Contractor must request a utility outage from the Contracting Officer no less than 3 working days prior to a scheduled outage for a single facility, and 14 days for outages affecting multiple facilities.
   2. Backfilling and compaction will be performed so settling shall not occur.

3. All disturbed areas and all new graded areas shall be graded smooth and sodded. Seeding will be permitted only if indicated on the drawings and/or approved by the Contracting Officer. Also, see other applicable sections(s) of the specification.
4. Construction shall be built to minimum industry tolerances unless otherwise noted and shall be square, true to line and grade, plumb and straight. Construct to the dimensions and elevations given on the drawings.
5. Finishes shall be consistent in color and texture, and shall cover all exposed surfaces, including obscure surfaces.
6. All work shall be constructed and/or installed in strict accordance with the manufacturer's written instructions, copies of which must be included with submittal documents.
7. **Road/pavement cuts are not permitted** unless approved by the Contracting Officer. If approved, road/pavement cuts must be submitted to the 1Special Operations Civil Engineering Squadron, Programs Flight (1 SOCES/CEP) in writing, two weeks prior to the scheduled road/pavement cut.
8. Under no circumstances will a utility outage or road cut be permitted without the required notification unless the Base Civil Engineer deems it an emergency.
9. Any contractor that connects to a Hurlburt Field fire hydrant for water usage must use an approved backflow preventer and provide proof to the 1 SOCES/CEAN (ASSETT Management Flight) through the Contracting Officer that they are using a certified backflow prevention device. The certificate must be current to within 12 months of the date of connection and through the duration of water usage. Certification must be by a Certified Backflow Tester certified by the State.
10. Temporary electric power, natural gas and water used by the contractor during construction shall be provided by the government at no cost to the contractor. The contractor shall provide temporary meters for each utility. Each temporary meter shall be read by the contractor monthly on the last working day of the month and submitted to the Hurlburt Field Energy Manager on that same day. At the completion of the project and acceptance by the government, the contractor shall remove the temporary meters and make the final connections to the utility.

1.10 CONSTRUCTION STANDARDS:

A. This project shall be constructed to conform to the latest edition of the following standards.
   1. ASTM: American Society for Testing and Materials
   2. ACI: American Concrete Institute
   3. International Code Council
      a. International Building Code
      b. International Fuel Gas Code
      c. International Mechanical Code
      d. International Plumbing Code
      e. NFPA: National Fire Protection Association.
      f. NEC: National Electric Code
      g. Unified Facilities Criteria (UFC) UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings.
      h. Unified Facilities Criteria (UFC) UFC 3-600-01, Fire Protection Engineering for Facilities.
      i. Americans with Disabilities Act
      j. ASCE 7-98
      k. 1 Special Operations Civil Engineer Squadron Design & Construction Standards. (Copy in 1 SOCES Engineering Flight office)
      l. Unified Facilities Criteria (UFC) UFC 3-210-10, Low Impact Development.

B. The contractor is required to comply with all aspects of the Federal Aviation Regulation (FAR), Part 77, **Objects Affecting Navigable Airspace**, for all work associated with this contract. This includes, but is not limited to, the use of any and all equipment used to construct the facility and the facility itself. The contractor is required to obtain **all necessary permits including FAA form 7460-1 (latest edition) and provide all necessary notices** associated with this requirement. All work within the following areas must be coordinated in writing with the Contracting Officer 21 days in advance of commencement of the work:
   1. LATERAL CLEARANCE AREA: A line 1000 feet from and parallel to the centerline of the runway.
   2. TAXIWAY SETBACK: A line 200 feet from and parallel to the centerline of any taxiway.
   3. APRON SETBACK: A line 125 feet from and parallel to the edge of the aircraft-parking apron.
   4. CLEAR ZONE: A line 1500 feet from and parallel to the centerline of the runway beginning at the runway threshold and continuing for a distance of 3000 feet north and south of the ends of the runway.

C. A copy of FAR Part 77, and permit applications may be obtained from:
   ARP Division ASO-600

Federal Aviation Administration
P. O. Box 20636
Atlanta, Georgia 30320
Phone 404-3056700

1.11 SUBSTITUTIONS:

A. Throughout these specifications and/or on the drawings one or more **"Trade Names"** for a product may be listed. When this occurs, all parties agree that the phrases: **"or equal," "or approved equal," and "or equal as approved,"** follow each **"Trade Name"** listed. The contractor may submit substitute products, meeting the identified salient characteristics (physical and functional), to the Contracting Officer for review and approval. The term "Trade Names" includes Acceptable Manufacturers listed under PART 2 PRODUCTS of the specifications.

B. Approval Required:
   1. The Contract is based on the standards of quality established in the Contract Documents.
   2. All products proposed for use, including those specified by required attributes and performance shall require approval by the Contracting Officer before being incorporated into the work.
   3. **Do not substitute materials, equipment, or methods unless such substitution has been specifically reviewed and approved for this Contract by the Contracting Officer.**
   4. Refer to section 01 60 00 for substitution submittal requirements.

C. **Do not assume that materials, equipment or methods submitted, as a substitution, will be approved as equal. The Contracting Officer is the sole interpreter of the Contract Documents.**

1.12 ASBESTOS:

A. See section 01 56 00, Environmental Protection

1.13 LEAD BASED PAINT

A. See section 01 56 00, Environmental Protection

1.14 HAZARDOUS MATERIALS AND WASTE

A. See section 01 56 00, Environmental Protection

1.15 CONTRACT PROGRESS REPORT

A. Contractor progress reports shall be made in a timely manner and in accordance with the contract documents.

B. Contractor shall use the Contract Progress Report form at the end of this section. As indicated on the form, all listed items of work may not be applicable to this project. Contractor shall submit completed form to include only those items of work applicable to this project.

C. Item 73, "Close-Out Documents" has been assigned a value of 3%:
   1. This amount will be withheld from final payment until such time as all project record documents; "As-Built" drawings, operation & maintenance manuals & data, spare parts & maintenance products, warranties, maintenance service, etc., have been turned over to the government. The withholding of payment is not a penalty but is being done to assure compliance with specification Section 01 70 00 CONTRACT CLOSEOUT.
   2. **The government will not provide a final inspection or accept Beneficial Occupancy of the building until all the above documents have been turned over to the government.** The contractor and subcontractors are advised to prepare these documents as the work progresses and not wait until the end of the project.

1.16 CONTRACT PROGRESS SCHEDULE

A. The contractor must provide a copy of the Contract Progress Schedule for review by the Contracting Officer and the Construction Manager no later than 5 calendar days after the issuance of the Notice to Proceed. If disapproved, the contractor shall resubmit the revised Contract Progress Schedule within 2 days of the date of the disapproval. The Contract Progress Schedule must be approved within 10 days of the date of the disapproval. **No construction work shall start without an approved Contract Progress Schedule.**

B. The Contract Progress Schedule must be based on the data in the Contract Progress Report attached to the

end of the section.

C. In order to satisfy the contract requirements that work commence within 10 days of Notice to Proceed, the contractor may commence the submittal process in accordance with Section 01 33 00.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

CONSTRUCTION DATA WORKSHEET

1. GENERAL DATA REQUIRED:

A. PROJECT INFORMATION:

Project No.: Contract No.: _____, Completion Date: _____
Category Code: _____, Facility No.: _____, Total Cost: _____
Liquidated Damages_____. Number of Floors: _____
General Description: _____
_____
_____

B. SYSTEMS IN BUILDING:

Category Code	Unit of Nomenclature	Measure	Amount	Cost	Description (If Required)
880-211	Closed Head Auto Sprinkler	HD/SF	____/___	_____	_____
880-217	AFFF PA Sprink Sys	HD/SF	____/___	_____	_____
880-221	Auto Fire Detection System (Include Pull Stations)	SF/EA	____/___	_____	_____
880-232	Foam Fire System	EA	_____	_____	_____
872-841	Security Alarm System	EA	_____	_____	_____
811-147	Electric Emergency Power Generator	KW	_____	_____	_____
	Storage Tank for Heating Or Generator Fuel (Type Fuel)	GA	_____	_____	_____
	Storage Tank for Heating	GA	_____	_____	_____
821-115	Heating Plt 750/3500 MB	MB	_____	_____	_____
821-116	Heating Plt over 3500 MB	MB	_____	_____	_____
	Storage Tank for Heating	GA	_____	_____	_____
890-125	A/C Plt less 5 TN	TN	_____	_____	_____
890-121	A/C Plt 5 to 25 TN	TN	_____	_____	_____
826-122	A/C Plt 25 to 100 TN	TN	_____	_____	_____
826-123	A/C Plt Over 100 TN	TN	_____	_____	_____
890-126	A/C Window Units	SF/TN	____/___	_____	_____
824-464	Gas Mains	LF	_____	_____	_____
844-368	Water Supply, Non-Potable	KG	_____	_____	_____
852-261	Veh. Parking (Ops)	SY	_____	_____	_____
852-262	Veh. Parking (Non-Org)	SY	_____	_____	_____
132-133	Pad, Equip	SY	_____	_____	_____
132-134	Ant. Spt Stru	EA	_____	_____	_____
890-272	EMCS Field Equip	EA	_____	_____	_____
812-223	Prim Dist Line OH	LF	_____	_____	_____
	Transformers	KV	_____	_____	_____
812-224	Sec Dist Line OH	LF	_____	_____	_____
812-225	Prim Dist Line UG	LF	_____	_____	_____
812-226	Sec Dist Line UG	LF	_____	_____	_____
812-926	Exterior Lighting (Street or Parking area Lights)	EA	_____	_____	_____
812-928	Traffic Lights	EA	_____	_____	_____
831-157	Industrial Waste Fuel Spill Collection (Oil/Fuel)	KG	_____	_____	_____
831-169	Sewage Septic Tank (Facility # it supports)	KG	_____	_____	_____
832-266	Sanitary Sewer Main	LF	_____	_____	_____
832-267	Sanitary Sewage Pump Station	SF	_____	_____	_____
842-245	Water Dist Mains	LF	_____	_____	_____
843-314	Fire Protection Water Main	LF	_____	_____	_____
843-315	Fire Hydrants	EA	_____	_____	_____
851-143	Curbs & Gutters (Transition between Road & Parking lot)	SY	_____	_____	_____

C. RELATED FACILITIES:

Category Code	Nomenclature	UM	Amount	Cost	Description (If Reqd.)
851-145	Driveway	SY			851-147 Road SY
871-183	Storm Drain Disposal	LF			
872-245	Fence, Boundary	LF			
872-247	Fence, Security	LF			
872-248	Fence, Interior	LF			
852-289	Sidewalk	SY			
890-269	Cathodic Protection Sys	EA			
890-181	Utility Line Duct-Elec	LF			
890-181	Utility Line Duct-Comm	LF			
890-158	Load and Unload Platform	EA			
832-255	Industrial Waste Main	LF			

This checklist includes only the basic general construction category codes. More detailed category code listing information is available through the Real Property office, 884-6167.

CONTRACT PROGRESS REPORT

CONTRACTOR		ADDRESS	
REPORT NO.	PERIOD COVERED FROM TO	PROJECT NO. / TITLE	
CONTRACT AMOUNT $		CONTRACT NO.	COMPLETION DATE

NOTE:
ALL ITEMS LISTED MAY NOT BE APPLICABLE TO THIS PROJECT. CONTRACTOR SHALL SUBMIT COMPLETED FORM TO INCLUDE ONLY THOSE ITEMS THAT ARE APPLICABLE TO THIS PROJECT.

LINE NO.	WORK ELEMENTS	% OF TOTAL JOB	% COMPLETED THIS PERIOD	% COMPLETE CUMULATIVE
1	MOBILIZATION			
2	DEMOLITION - ARCHITECTURAL			
3	ASBESTOS / LEAD ABATEMENT			
4	SITE PREPARATION			
5	SITE UTILITIES			
6	SITE IRRIGATION SYSTEM			
7	SITE FINISH GRADING			
8	SITE LANDSCAPING			
9	ASPHALT PAVING / BASE			
10	CONCRETE CURB / GUTTER			
11	CONCRETE BUILDING SLAB / VAPOR BARRIER			
12	CONCRETE WALKS / LANDINGS			
13	CONCRETE FOOTINGS			
14	CONCRETE BEAMS / COLUMNS			
15	MASONRY FOUNDATIONS			
16	MASONRY SCREENWALLS			
17	MASONRY VENEER			
18	STRUCTURAL STEEL			
19	MISCELLANEOUS METALS / HANDRAILS / GRATES			
20	WOOD AND PLASTICS			
21	WALL INSULATION			
22	ROOF INSULATION			
23	EIFS			
24	WINDOWS			
25	EXTERIOR DOORS			
26	STOREFRONT			
27	OVERHEAD COILING DOORS			
28	INTERIOR DOORS			
29	HARDWARE			
30	EXTERIOR METAL STUDWALLS / SHEATHING			
31	INTERIOR METAL STUDWALLS / SHEATHING			
32	PAINTING			
33	WALL COVERING			
34	TOILET ACCESSORIES			
35	TOILET PARTITIONS / URINAL SCREEN			
36	SIGNAGE			
37	RAISED ACCESS FLOOR			

LINE NO.	WORK ELEMENTS	% OF TOTAL	% THIS PERIOD	% CUMULATIVE
38	PRE-ENGINEERED METAL BUILDING (PEMB)			
39	PEMB ROOF / FASCIA			
41	ELEVATORS / CONVEYING SYSTEMS			
42	DEMOLITION - MECHANICAL / PLUMBING			
43	NEW WATER / SEWER / NATURAL GAS SERVICE			
44	PLUMBING ROUGH-IN UNDER SLAB			
45	HVAC ROUGH-IN UNDER SLAB			
46	PLUMBING ROUGH-IN ABOVE SLAB			
47	PLUMBING FIXTURE / TRIM-OUT			
48	COMPRESSED AIR SYSTEM			
49	PIPE AND DUCT INSULATION			
50	DUCTWORK			
51	HYDRONIC PIPING			
52	FIRE SUPPRESSION			
53	HVAC EQUIPMENT			
54	GRILLES / DIFFUSERS/ TRIM-OUT			
55	CONTROLS			
56	TEST AND BALANCE			
57	DEMOLITION - ELECTRICAL			
58	ELECTRIC SERVICE TEMPORARY			
59	TRANSFORMER			
60	PRIMARY OVERHEAD ELECTRIC SERVICE			
61	PRIMARY UNDERGROUND ELECTRIC SERVICE			
62	SECONDARY OH ELECTRIC SERVICE			
63	SECONDARY UG ELECTRIC SERVICE			
64	ELECTRIC ROUGH-IN			
65	COMM / LAN ROUGH-IN			
66	FIRE DETECTION ROUGH-IN			
67	FIRE DETECTION EQUIPMENT / TRIM-OUT			
68	COMM / LAN TRIM-OUT			
69	ELECTRIC FIXTURES / TRIM-OUT			
70	EXTERIOR LIGHTING			
71	BONDING			
72	DEMOBILIZATION			
73	CLOSE-OUT DOCUMENTS	3%		
	TOTAL			
	SCHEDULED AMOUNT THIS BILLING			
	TOTAL BID AMOUNT: SCHEDULED:		ACTUAL:	

INSPECTOR SIGNATURE: CONCUR NOT CONCUR (CIRCLE)

PROGRESS OR COMPLETION CERTIFICATE

I HEREBY CERTIFY THAT THE CONTRACTOR HAS SATISFACTORILY COMPLETED THE INDICATED PERCENTAGE OF THE CONTRACT SPECIFICATIONS

SUBMITTED BY OR FOR

CONTRACTOR: BASE CIVIL ENGINEER:

TYPE OR PRINT NAME AND TITLE	SIGNATURE	DATE

REVIEWED BY OR FOR CONTRACTING OFFICER

TYPE OR PRINT NAME AND TITLE	SIGNATURE	DATE

SECTION 01 09 00 REFERENCE STANDARDS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Applicability of Reference Standards.

B. Provision of Reference Standards at site.

C. Source and acronyms used for Reference Standards in Contract Documents.

1.02 APPLICABILITY OF REFERENCE STANDARDS

A. For products or workmanship specified by association, trade, or Federal Standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

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

C. Use the latest standard, except when a specific date is specified.

D. Disregard payment provisions contained in any portion of the referenced specifications and standards.

E. If the specified reference standard(s) conflicts with the Contract Documents, request clarification from the Contracting Officer before proceeding.

1.03 PROVISION OF REFERENCE STANDARDS AT SITE

A. When required by individual specifications sections, obtain a copy of the standard. Maintain a copy at the jobsite during submittals, planning, and progress of the specific work until completion.

1.04 ABBREVIATIONS & NAMES

A. Where acronyms or abbreviations are used in the specifications or other Contract Documents, they mean the recognized name of the trade association, standards-generating organization, and authority having jurisdiction or other entity applicable. Refer to “Encyclopedia of Associations” published by Gale Research Co., available in most libraries.

1.05 SOURCE FOR REFERENCE STANDARDS

AAMA American Architectural Manufactures Association
1827 Walden Office Square, Suite 550
Schaumburg, IL 60173-4268

AASHTO American Association of State Highway and Transportation Officials
444 N. Capital St., NW, Suite 249
Washington, DC 20001

ACI American Concrete Institute
P.O. Box 19150
Detroit, MI 48219

ACPA American Concrete Pipe Association
8300 Boone Blvd., #400
Vienna, VA 22182

AWPA American Wood Protection Association
P.O. Box 361784
Birmingham, AL 35236-1784

AF&PA American Forest and Paper Association

111 Nineteenth Street, NW, Suite 800
Washington, DC 20036

AISI American Iron and Steel Institute
25 Massachusetts Avenue, NW Suite 800
Washington, DC 20001

AISC American Institute of Steel Construction
One East Wacker Drive, Suite 700
Chicago, IL 60601-1802

AITC American Institute of Timber Construction
7012 S. Revere Parkway Suite 140
Centennial, CO 80112

ALSC American Lumber Standard Committee
P.O. Box 210
Germantown, MD 20875-0210

ANSI American National Standards Institute
11 West 42nd St.
New York, NY 10036

APA/EWA APA – The Engineered Wood Association
Order From:
http://www.apawood.org

ASCE American Society of Civil Engineers
1801 Alexander Bell Drive
Reston, VA 20191-4400

ASHRAE American Society of Heating, Refrigerating, and Air-Conditioning Engineers
1791 Tullie Circle, N. E
Atlanta, GA 30329

ASNT American Society for Non-destructive Testing
4153 Arlingate Plaza
Columbus, OH 43228-0518

ASTM American Society for Testing and Materials
1916 Race Street
Philadelphia, PA 19103

AWI Architectural Woodwork Institute
46179 Westlake Drive, Suite 120
Potomac Falls, VA 20165-5874

AWPA American Wood Protection Association
P.O. Box 361784
Birmingham, AL 35236-1784

AWS American Welding Society
P.O. Box 351040
Miami, FL 33135

AWWA American Water Works Association
6666 West Quincy
Denver, CO 80235

BHMA Builders Hardware Manufacturers Association

355 Lexington Avenue, 15th Floor
New York, NY 10017

CFR Code of Federal Regulations
Order from:
Superintendent of Documents
Government Printing Office
Washington, DC 20402-9371

CISCA Ceilings and Interior Systems Construction Association
405 Illinois Avenue, 2B
St. Charles, IL 60174

CRI The Carpet and Rug Institute
P.O. Box 2048
Dalton, GA 30722-2048

CRSI Concrete Reinforcing Steel Institute
933 No. Plum Grove Rd.
Schaumburg, IL 60173-4758

CS United States Department of Commerce Standard
Order from:
National Technical Information Service
5285 Port Royal Rd.
Springfield, VA 22161

DHI Door and Hardware Institute
14150 Newbrook Dr.
Chantilly, VA 20151

EIMA EIFS Industry Members Association
2600 N.W. Lake Rd.
Camas, WA 98607-8542

FAA Federal Aviation Administration
Department of Transportation
Order from:
Superintendent of Documents
Government Printing Office
Washington, DC 20402-9371
For documents offered at no cost, order from:
Dept. of Transportation
ATTN: M443.2
400 Seventh St., SW
Washington, DC 20590

FDOT Florida Department of Transportation
Order from:
http://www.dot.state.fl.us/mapsandpublications/

FM FM Global
270 Central Avenue
P.O. Box 7500
Johnston, RI 02919-4923

FS Federal Specifications
Order from:
Standardization Documents Order Desk

Bldg 4, Section D
700 Robbins Ave.
Philadelphia, PA 19111-5094

FSC Forest Stewardship Council
212 Third Avenue North, Suite 504
Minneapolis, MN 55401

FTM-STD Federal Test Method Standards
Order from:
Standardization Documents Order Desk
Bldg 4, Section D
700 Robbins Ave.
Philadelphia, PA 19111-5094

GA Gypsum Association
6525 Belcrest Road, Suite 480
Hyattsville, MD 20782

GC Green Seal
1001 Connecticut Avenue, NW
Suite 827
Washington, DC 20036-5525

MS Military Specifications (MILSPEC)
Standardization Documents Order Desk
Bldg 4, Section D
700 Robbins Ave.
Philadelphia, PA 19111-5094

MSS Manufacturers' Standardization Society of the Valve and Fittings Industry
127 Park St., NE
Vienna, VA 22180

NAAMM National Association of Architectural Metal Manufacturers
800 Roosevelt Rd, Bldg. C, Suite 312
Glen Ellyn, IL 60137

NBS National Bureau of Standards
(U. S. Department of Commerce)
Gaithersburg, MD 20234

NEMA National Fire Protection Association
1 Batterymarch Park
Quincy , MA 02169-7471

NFPA American Wood Protection Association
P.O. Box 361784
Birmingham, AL 35236-1784

NIOSH National Institute for Occupational Safety and Health
(Centers for Disease Control and Prevention)
Order From:
http://www.cdc.gov/niosh/docs/203-154/method-cas1.html

OSHA Occupational Safety and Health Administration
(U.S. Department of Labor)
Order from:
Superintendent of Documents
Government Printing Office

Washington, DC 20402-9371

SCAQMD South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765

SCS Scientific Certification Systems
2000 Powell Street, Suite 600
Emeryville, CA 94608

SDI Steel Deck Institute
P.O. Box 25
Fox River Grove, IL 60021

SJI Steel Joist Institute
234 W. Cheves Street
Florence, SC 29501

SMACNA Sheet Metal and Air Conditioning Contractors' National Association
4201 Lafayette Center Drive
Chantilly, VA 20151-1219

SPIB Southern Pine Inspection Bureau
P.O. Box 10915
Pensacola, FL 32524-0915

SSMA The Steel Stud Manufacturers Association
35 East Wacker Drive, Suite 850
Chicago, IL 60601-2106

SSPC The Society for Protective Coatings
40 24th Street
6th Floor
Pittsburgh, PA 15222

TCNA Tile Council of North America
100 Clemson Research Blvd.
Anderson, SC 29625

UL Underwriters Laboratories, Inc.
2600 N.W. Lake Rd.
Camas, WA 98607-8542

PART 2 - PRODUCTS: NOT USED.

PART 3 - EXECUTION: NOT USED.

END OF SECTION

SECTION 01 10 00: SUMMARY OF WORK

PART 1 GENERAL

1.01 WORK INCLUDED:

A. The contractor shall furnish all labor, materials, tools, supervision and equipment and perform all operations necessary to accomplish all work complete in place, as shown on the drawings, specified herein, or as needed to construct FTEV 14-1057, Upgrade Electrical Service Hangar 90700.

1.02 JOB DESCRIPTION:

A. The work to be performed includes, but is not necessarily limited to, the following principal features:
   1. Remove existing indoor unit substations and associated medium voltage feeders and vacuum breakers from within Hangar 90700.
   2. Install pad mounted transformers outside of the hangar. Install a transformer on the north side of the facility, and a separate transformer on the south side of the facility. Extend two underground secondary services into the facility.
   3. Install new main service switchboards on the first floor level, one on the north side of the facility and one on the south side of the facility. Provide permanent nameplates on each switchboard as detailed on the contract drawings.
   4. Install new switchboards to replace the existing unit substations on the pylon mezzanines. Reconnect and/or replace existing secondary feeders, as indicated on the contract drawings.
   5. Connect the existing hangar door power panels ahead of the main breakers in the new main service switchboards.

1.03 CONTRACTOR USE OF SITE AND PREMISES

A. Limit use of site to allow Owner visitation and inspection.

B. The contractor and subcontractors are permitted to use existing utilities available at the site. Use is subject to approval by the Contracting Officer. The 1 Special Operations Civil Engineering Squadron must approve all connections. Connection to existing water mains must utilize a backflow preventer, certified within the 12 months prior to use on base.

1.04 DISPOSAL

A. All scrap materials and debris shall be disposed of in an on- site dumpster. When full, it shall be emptied at a legally approved dumpsite off- base. It shall be the responsibility of the contractor to provide the dumpster and for the selection of the dumpsite. Provide Contracting Officer with name(s) of waste disposal company and approved dumpsite.

1.05 STORAGE AREA

A. Contractor lay-down/materials storage site shall be as shown on the drawings or as approved by the Contracting Officer.

B. A minimum of a 6 foot high temporary visual barrier shall surround the area.

C. The area must be maintained in a reasonably clean manner. All empty boxes, paper and trash must be deposited in the on-site construction dumpster.

1.06 SAFETY

A. The pertinent sections of the following publications are applicable to all work on this project.
   1. U.S. Army Corps of Engineers: EM 385-1-1, Safety and Health Requirements Manual.
   2. Air Force Instruction (AFI) 91-202.
   3. AFOSH Standard 48.139. See Specification Section 01 00 00 General Requirements paragraph 1.06.A.5.

1.07 HAUL ROUTE AND LITTER

A. The Contractor shall utilize only the designated haul route for the project for access to and from the site as shown on the Drawings.

1.08 USE OF BARGE AREA

A. Use of the barge off loading area is not allowed except as approved, in writing, by the Contracting Officer. Contractor must request usage of the barge site, in writing, to the Contracting Officer a minimum of 30 days prior to expected deliveries. Contractor must also submit a schedule of all deliveries. Under no circumstances should the contractor assume such requests will be approved. Contractor should plan to have materials delivered by other means.

B. If usage of the barge site is approved, the contractor must meet the following requirements:
   1. Crane boom height cannot exceed eighty (80) feet from mean water elevation.
   2. Crane boom must have a red flag and an operational blinking obstruction light.
   3. Contractor will be responsible for surrounding water quality per the State of Florida Regulations. Prior to delivery of any barge/crane or tug, contractor must install full-depth turbidity barriers both east and west of the site to extend beyond limits of off loading operations.
   4. Off loading operations will be during daylight hours only. Operations will not start before 0700 (7:00 AM) and boom must be lowered to deck height by 1700 hours (5:00 PM) each day.
   5. Contractor is required to provide the name and number of a responsible party, and contact information of the tug/crane operator at site to **both** of the following:
      a. The Contracting Officer.
      b. Hurlburt Tower: Hurlburt Tower – 884-4795. (If tower cannot be contacted notify the Airfield Manager – 884-4491.
   6. Upon notification of inclement weather, off loading operations must cease and the boom lowered to deck height. Do not raise boom until cleared by the Hurlburt Tower. All barges and equipment must be secured. Upon notification of Hurcon conditions, the contractor must remove all barges, cranes, tugs, and associated equipment from the site. The government will not be responsible for any delays or costs associated to weather.
   7. If notified to do so by the Contracting Officer or Hurlburt Tower, operations must cease and the boom lowered to deck height. Under no circumstances should the boom be raised until cleared by the notifying authority. The government will not be responsible for any associated delays or costs.

C. If these requirements cannot be met, the contractor is prohibited from using the barge site. Failure to adhere to these requirements during operations will result in immediate revocation of site use at no expense to the government. Site must be maintained per specifications and contractor will be responsible for any and all clean-up after operations.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.01 INSPECTION

A. The contractor shall accomplish work in an orderly progression of steps to satisfy the performance requirements of this specification.

3.02 HOURS OF WORK

A. The normal hours of a workday shall be between 7:00 A.M. and 4:00 P.M., Monday through Friday, except holidays and observed holidays. The contractor may elect, at his option, to work hours other than normal duty hours if approved by the Contracting Officer. All work time, other than normal working days, shall be requested in writing, 3 days in advance.

3.03 PHOTOGRAPHS

A. The contractor will take before and after photographs of the work. "Before" photos will be submitted before the start of work. "After" photos will be submitted before the acceptance of the work. A minimum of 24 photos of each will be required. Photos must show exterior and interior areas of the building that are to receive the new work. The intent is to show the amount of change. Photos may be submitted by the Air Force for design and construction awards. All photos taken shall be in digital format and submitted on CD. Submit one copy of before and after photos.

3.04 QUALITY CONTROL

A. The contractor shall establish and maintain quality control to assure compliance with Contract Documents, and maintain records of his quality control for materials, equipment and construction operations.

3.05 CONSTRUCTION LAYOUT & VERIFICATION:

A. The contractor shall employ a Florida Registered Land Surveyor to layout the building and other site features in accordance with the drawings. Potential problems that will affect the site geometry shall immediately be brought to the attention of the Contracting Officer.

B. Horizontal and Vertical Control shall conform to Hurlburt Field Datum: Horizontal NAD-83; Vertical NAVD-88.

C. Upon completion of the project and prior to the submission of the "As-Built" drawings (See Section 01 70 00 Contract Closeout), the contractor shall employ a Florida Registered Land Surveyor to perform the following Horizontal Control by use of Global Positioning Satellite (GPS) to sub-meter accuracy, and Vertical Control using the above datum.:

1. Location of building corners.
2. Buried water mains, sanitary and/or storm water sewers including all valves, cleanouts, horizontal turns, etc.
3. Elevations at top of manhole(s), lift stations, storm water structures or similar above ground structures.
4. Invert elevations of all manholes and stub-outs intended for future connections to the system.

3.06 WARRANTY INSPECTION

A. A warranty inspection will be held thirty (30) days prior to the expiration of the contractor’s one-year warranty. The inspection will be held at the project site. Those in attendance shall include the contractor, the Contracting Officer, the project inspector, and the occupant. The purpose of this inspection will be to identify current or re-occurring problems associated with the project and past warranty calls and corrective action taken to remedy them. The contractor shall contact the Contracting Officer to determine the date of the inspection. The Contracting Officer shall contact the appropriate government agencies and confirm the date the inspection is to take place.

B. A list of problems identified at the inspection will be provided to all those in attendance. All problems must be corrected to the satisfaction of the government prior to the expiration of the warranty

END OF SECTION

SECTION 01 33 00: SUBMITTALS

PART I GENERAL

1.01 WORK INCLUDED:

A. Throughout the Contract Documents, the minimum acceptable quality of workmanship and materials has been defined by manufacturer's name and catalog number, reference to recognized industry and Government standards, or description of required attributes and performance.

B. Make all submittals required by the Contract Documents in a timely manner to allow construction of the building within the allotted performance time.
   1. Long lead items such as pre-engineered metal building systems, electrical and mechanical systems, special equipment, etc. must be submitted within 15 days of Notice to Proceed.
   2. All submittals must be made within 45 days of Notice to Proceed.
   3. **Late submittals that result in delayed delivery of materials and equipment, which will affect the completion and acceptance of the building by the government, will not be a justification for a time extension.**
   4. Revise, submit and/or resubmit (submittals) as necessary to establish compliance with the specified requirements.

1.02 QUALITY ASSURANCE:

A. Coordination of Submittals: Prior to each submittal, carefully review and coordinate all aspects of each item being submitted and verify that each item and the submittal for it conforms in all respects with the requirements of the Contract Documents. **By affixing his signature to each submittal, the contractor certifies that this coordination and verification has been performed.**

B. Certificates of Compliance:
   1. Certify that all materials used in the work comply with all specified provisions thereof. Certification shall not be construed as relieving the contractor from furnishing satisfactory materials if, after tests are performed on selected samples' the material is found to not meet specific requirements.
   2. Show on each certification the name and location of the work, name and address of contractor, quantity and date or dates of shipment or delivery to which the certificate applies, and name of the manufacturing or fabricating company. An officer of the manufacturing or fabrication company shall sign certificates.
   3. In addition to the above information, all laboratory test reports submitted with Certificates of Compliance shall show the date or dates of testing, the specified requirements for which testing was performed, and results of the test or tests.

PART 2 PRODUCTS

2.01 SHOP DRAWINGS AND COORDINATION DRAWINGS:

A. Shop Drawings: Make all shop Drawings accurately to a scale sufficiently large to show all pertinent aspects of the item and its method of connection to the work.

2.02 MANUFACTURER'S LITERATURE:

A. Where contents of submitted literature from manufacturers includes data not pertinent to the submittal, clearly indicate which portion of the contents is being submitted for review.

PART 3 EXECUTION

3.01 IDENTIFICATION OF SUBMITTALS:

A. General: Consecutively number all submittals.

B. Internal Identifications: On at least the first page of each copy of each submittal and elsewhere as required for positive identification, clearly indicate the submittal number in which the item was included.

C. **Indicate FTEV Number, Project Title and Contract Number**

3.02 COORDINATION OF SUBMITTALS:

A. **General:** Prior to submittal for approval, use all means necessary to fully coordinate all material including, but not necessarily limited to:
   1. Determine and verify all interface conditions, catalog numbers and similar data.
   2. Coordinate with other trades as required.
   3. Clearly indicate all deviations from requirements of the Contract Documents.

B. **Grouping of submittals:** Unless otherwise specified, make all submittals in groups containing all associated items to ensure that information is available for checking each item when it is received. Partial submittals will be rejected as not complying with the provisions of the Contract Documents and the contractor shall be strictly liable for all delays so occasioned.

C. **Interior Finish Materials/Colors/Samples:** All interior finish materials/colors/samples, includIng but not limited to, flooring, base, paint/stain, wall coverings, acoustic ceiling/suspension system, acoustical treatment, window treatment, laminated plastic for base/wall cabinets/countertops, interior signage, etc., shall be submitted as a group **(one submittal**) to allow the government to review/approve/disapprove and select/coordinate the interior finish materials/colors prior to being incorporated into the work. Upon receipt of the government's approved selections, the contractor shall provide the government with actual samples of each item for the record, minimum size 4"x4", except laminate plastic chips shall be manufacturer's standard size.

D. **Exterior Finish Materials/Colors/Samples:** All exterior finish materials/colors/samples, including but not limited to, brick, concrete masonry, exterior insulation finish system, stucco, paint/stain, roofing/flashing, exterior signage, pavers, windows, doors, etc., shall be submitted as a group (one submittal) to allow the government to review/approve/disapprove and /select/coordinate the exterior finish materials/colors prior to being incorporated into the work. Upon receipt of the government's approved selections, the contractor shall provide the government with actual samples of each item for the record, minimum size 4"x4".

3.03 SUBMITTAL APPROVAL:

A. **General:** Approval by the Contracting Officer shall not be construed as a complete check, but only that the general method of construction and detailing is satisfactory. **Review and approval by government shall not relieve the contractor from responsibility for errors that may exist, or from liability for failure to comply with the intent of the Contract Documents.**

B. **Revisions After Approval:** When a submittal has been approved, a re-submittal by the contractor for the purpose of substitution of materials or equipment, will not be considered unless accompanied by an acceptable explanation as to why the substitution is necessary.

C. **Unnecessary Submissions:** When the contractor elects to provide the materials, equipment, etc., that was used as the basis for the design and is the exact: Manufacture's name, catalog number, size, and finish as shown in the drawings or specified herein, no submittal is required. The contractor however shall submit a letter to the Contracting Officer stating that he will use the specified product. All field-testing associated with the material or equipment, etc. must be performed and submitted to the Contracting Officer for approval.

3.04 SCHEDULE OF MATERIAL SUBMITTALS.

A. Assign numbers to these items to be submitted, beginning with the number 1 and continuing through the last submittal. Items that are disapproved and require resubmittal shall be numbered with the original submittal number followed by R1 if the first resubmittal of the item, R2 if the second resubmittal, and so on, until final approval is given.

END OF SECTION

SCHEDULE OF MATERIAL SUBMITTALS		PROJECT NO. FTEV 14-1057															PROJECT TITLE UPGRADE ELECTRICAL SERVICE HANGAR 90700						SOLICITATION/CONTRACT #	
TO BE COMPLETED BY PROJECT ENGINEER																	TO BE COMPLETED BY CONTRACT ADMINISTRATOR							
LINE NUMBER	ITEM OR DESCRIPTION OF ITEM, CONTRACT REFERENCE, TYPE OF SUBMITTAL	SHOP DRAWINGS	MANUFACTURER'S DATA	SAMPLES	CERTIFICATE/CERTIFICATION	SUSTAINABLE CERTIFICATES	PRODUCT COST DATA	PERF. TEST REPORTS	SAMPLE FOR TESTING	DELIVERY TICKETS	WARRANTY FORM/FORMS	MIX DESIGN	INSTALLATION PROCEDURES	EXTRA STOCK	O & M MANUAL & LEGAL REQ'S	SCHEDULES & PLANS	MANF. / INSTALLER QUAL.	DATE RECEIVED	DATE TO CIVIL ENGINEERING	SUBMITTAL NUMBER	APPROVED	DISAPPROVED	CONTRACTOR RESUBMITTAL	FINAL APPROVAL	REMARKS
	01 10 00 DD Form 1354																								
	01 10 00 Photos																								1 digital copy on CD
	01 56 00 Environment Protection	4			4					4					4	4									
	01 81 13 Green Procurement	4	4	4	4								4												
	02 41 19 Selective Structure Demo															4									
	03 30 00 Cast-in-Place Concrete		4	1		4	4	4				4	4												
	26 05 00 Basic Electrical Requirements	4	4												4										
	26 05 13 Medium Voltage Cable		4														4								
	26 05 19 Building Wire and Cable		4										4												
	26 05 26 Grounding and Bonding		4					4					4												
	26 05 27 Secondary Grounding For Electr	4																							
	26 05 34 Boxes		4																						
	26 12 00 Distribution Transformers	4	4												4										
	26 24 16 Panel Boards	4												X											
	26 28 19 Disconnect Switches	4	4																						

SECTION 01 41 00: TESTING LABORATORY SERVICES

PART 1 GENERAL

1.01 REFERENCES:

A. ASTM D3740 – Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as used in Engineering Design and Construction.

B. ASTM E329 – Standard Specification for Agencies Engaged in Construction Inspection, Special Inspection, or Testing Materials Used in Construction.

1.02 SELECTION AND PAYMENT:

A. Contractor shall employ and pay for services of an independent testing laboratory to perform specified inspection and testing. One laboratory shall perform all tests for project.

B. The Government will employ and pay for services of an independent testing laboratory to perform inspection and testing deemed to be in the best interest of the Government. The contractor will be responsible for the cost of all inspections, testing and replacement of Work not meeting the Contract Documents.

C. Employment of testing laboratory shall in no way relieve contractor of obligation to perform Work in accordance with requirements of Contract Documents.

1.03 QUALITY ASSURANCE:

A. Comply with requirements of ASTM E329 and ASTM D3740.

B. Laboratory: Licensed and authorized to operate in State of Florida.

C. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either National Bureau of Standards (NBS) or accepted values of natural physical constants.

D. Certification: Current Certification by Construction Materials Council, Inc.

1.04 CONTRACTOR SUBMITTALS:

A. Prior to start of Work, submit testing laboratory name, address and telephone number, and the name or names of the Professional Engineer(s), currently registered in the state of Florida, who will be certifying the reports or tests and a responsible officer of the company

B. Submit copy of report of laboratory facilities inspection made by Materials Reference Laboratory of National Bureau of Standards (NBS) during most recent tour of inspection, with memorandum of remedies of any deficiencies reported by the inspection.

1.05 LABORATORY RESPONSIBILITIES:

A. Provide qualified personnel at site.

B. Perform specified inspection, sampling, making cylinders, etc., and testing of all products in accordance with Contract Documents.

C. Ascertain compliance of materials and mixes with requirements of Contract Documents.

D. Provide certified copies of the reports or tests as per 1.06 below. The Professional Engineer shall affix his name and date to all reports or tests before affixing his impression seal over both.

1.06 LABORATORY REPORTS:

A. **After each inspection and test and prior to providing copies to the contractor, the Testing Laboratory shall promptly forward one (1) copy of each laboratory report directly to the Contracting Officer for record purposes. Mail to Contracting Officer, 1 SOCONS, 350 Tully St., Hurlburt Field, FL 32544.**

B. Contractor shall submit four (4) copies of each laboratory report as per Section 01 33 00 to the Contracting Officer for review and approval.

C. Include:
1. Date issued.
2. Project title and number.
3. Name of inspector.
4. Date and time of sampling or inspection.
5. Identification of product and specifications section.
6. Location in the project.
7. Type of inspection or test.
8. Date of test.
9. Results of test.
10. Conformance with Contract Documents.

D. When requested by Contracting Officer, provide interpretation of test results.

1.07 LIMITS ON TESTING LABORATORY AUTHORITY:

A. Laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.

B. Laboratory may not approve or accept any portion of the Work.

C. Laboratory may not assume any duties of the contractor.

D. Laboratory has no authority to stop the Work.

1.08 CONTRACTOR RESPONSIBILITIES:

A. Notify laboratory of the location of the construction site and samples of materials proposed to be used, which require testing.

B. Provide laboratory all proposed mix designs.

C. Cooperate with laboratory personnel and provide access to the Work, to manufacturer's literature and other pertinent data.

D. Provide incidental labor and facilities to provide access to Work to be tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.

E. Notify laboratory a minimum of 24 hours prior to expected time for operations requiring inspection, sampling, and testing services.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 56 00 ENVIRONMENTAL PROTECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. The environmental protection required for this contract.

1.02. REFERENCES

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

1. **CODE OF FEDERAL REGULATIONS (CFR)**
   29 CFR 1910.1200, Hazard Communication Standard
   40 CFR 110, Discharge of Oil
   40 CFR 112, Oil Pollution Prevention
   40 CFR 122, EPA administered permit programs
   40 CFR 125, National Pollutant Discharge Elimination System (NPDES)
   40 CFR 260-271, Resource Conservation and Recovery Act (RCRA)
   40 CFR 260-279, Hazardous Waste and Used Oil Management
   40 CFR 300, National Oil and Hazardous Substances Pollution Contingency Plan
   40 CFR 355, Emergency Planning and Notification
   40 CFR 403, General Pretreatment Regulations for Existing and New Sources of Pollution
   49 CFR 171-172, General Information, Regulations and Definitions, and Hazardous Waste
2. **ENVIRONMENTAL PROTECTION AGENCY (EPA)**
   EPA PL 96-510, Comprehensive Environmental Response Compensation & Liability Act
3. **FLORIDA ADMINISTRATION CODE (FAC)**
   FAC 62-25, Regulation of Stormwater Discharge
   FAC 62-150, Hazardous Substance Release Notification
   FAC 62-210, Stationary Sources – General Requirements
   FAC 62-212, Stationary Sources – Preconstruction Review
   FAC 62-621.300(2), Discharge of Groundwater From Any Non-Contaminated Site
   FAC 62-330, Environmental Resource Permitting in Northwest Florida
   FAC 62-555, Permitting, Construction, Operation, and Maintenance of Public Water Systems
   FAC 62-604, Collection Systems and Transmission Facilities
   FAC 62-730, Hazardous Waste
   FAC 62-762, Aboveground Storage Tank Systems
   FAC 62-770, Petroleum Contamination Site Cleanup Criteria
4. **HURLBURT FIELD INSTRUCTIONS AND DIRECTIVES**
   Hurlburt Field Directive for Mercury and Fluorescent Lamps
   Hurlburt Field Ozone Depleting Management Plan
   Hurlburt Field Spill Prevention Control and Countermeasure (SPCC) Plan
   Hurlburt Field Installation Restoration Program (IRP) Management Action Plan
   Hurlburt Field Hazardous Waste Management Plan
   Hurlburt Field Asbestos Management and Operations Plan
   Hurlburt Field Lead Based Paint and Lead Hazard Plan
   Hurlburt Field Landscape Development Plan
   Hurlburt Field Environmental Policy
5. **AIR FORCE INSTRUCTIONS AND DIRECTIVES**
   AFI 23-204 Organizational Fuel Tanks
   AFI 32-7001 Environmental Management
   AFI 32-7042 Waste Management
   AFI 32-7044 Storage Tank Compliance
   AFI 32-7064 Natural Resources
   AFI 32-7086 Hazardous Materials Management

1.03 QUALITY ASSURANCE

A. Contractor shall establish and maintain quality control for environmental protection of all items set forth herein. The Contractor shall record on daily reports any problems in complying with laws, regulations, permit requirements, ordinances, and corrective action taken. The Contractor shall immediately inform the Contracting Officer of any environmental problem.

1.04 CONTRACTOR COMPLIANCE

A. Permits: The contractor shall ensure that all required environmental permits are in their possession prior to start of construction and/or installing or operating any new or modified equipment or processes or disturbing or clearing any land area.

B. The contractor shall be responsible for operating within permit limits and abiding by all permit conditions. 1 SOCES/CEIE shall be notified immediately of any exceedances of permit limits or violation of permit conditions. The contractor shall immediately notify 1 SOCES/CEIE of any unforeseen environmental conditions, which may conflict with approved permits. Any certifications required by permits shall be the responsibility of the contractor. Copies of all permits and certifications shall be submitted to the contracting office for 1 SOCES/CEIE in electronic format (.dwg, pdf, or .doc).

C. All certifications, notices and documentation required by environmental permits shall be the responsibility of the contractor, but must be coordinated through the contracting office and 1 SOCES/CEIE prior to submittal to regulatory agencies.
   1. Sanitary Sewer Permit: The government will provide a copy of the permit to the contractor prior to start of construction. After construction, the line will not be put into use until the permit clearance has been applied for and obtained. All necessary paperwork (Certification of Completion Form, as-builts, etc.) will be submitted to the contracting office for 1 SOCES/CEIE. The regulatory agency has 30 days to review. Work is not considered complete until the permit clearance has been applied for and obtained.
   2. Potable Water Permit: The government will provide a copy of the permit to the contractor prior to start of construction. After construction, the line will not be put into use until the permit clearance has been applied for and obtained. For phased projects a permit clearance can be obtained for each phase by submitting a certification of completion package for each phase as a partial completion on the entire permitted project. All necessary paperwork (Certification of Completion Form, as-builts, bacteriologicals, pressure test results, etc) will be submitted to the contracting office for 1 SOCES/CEIE. The regulatory agency has 30 days to review. Work is not considered complete until the permit clearance has been applied for and obtained.
   3. Irrigation Permit: The government will provide a copy of the permit to the contractor prior to start of construction. After construction, the system will not be put into use until the permit clearance has been applied for and obtained. All necessary paperwork (Certification of Completion Form, as-builts, etc) will be submitted to the contracting office for 1 SOCES/CEIE. The regulatory agency has 30 days to review. Work is not considered complete until the permit clearance has been applied for and obtained.
   4. Wetland Permit: The government will provide a copy of the permit application to the contractor prior to start of construction. Prior to start of any construction in a wetland, a Joint Application for Environmental Resource Permit must be completed by the contractor. Completion of the application package to include site plan, and signed/sealed drawings must be submitted to the 1 SOCES/CEIE for coordination. The application must note all best management practices (BMP's) such as silt screens and must show locations.. The regulatory agency has 30 days to request additional information. All necessary paperwork (Certification of Completion Form, as-builts, etc) will be submitted to the contracting office for 1 SOCES/CEAN. The regulatory agency has 30 days to review. Work is not considered complete until the permit clearance has been applied for and obtained.
   5. Generic Stormwater Permit for Stormwater Discharge from Large and Small Construction Activities, F.A.C. 62-621; and Environmental Resource Permit F.A.C. 62-330 if applicable :
      a. Prior to start of Construction:
         1. Prior to start of any site work the contractor shall submit to the contracting office for 1 SOCES/CEIE in electronic format; 1 copy of the Notice of Intent (NOI) Form 62-621.300(4)(b); proof of fee payment; 1 copy of the signed Stormwater Pollution Prevention Plan (SWPPP) and map; 1 copy of the letter from the regulatory agency issuing the permit for the project;
         2. If F.A.C. 62-330 is applicable, in electronic format: 1 copy of application package signed and sealed with Form 62-330.060(1) or 10-2 General Permit certification record; ; 1 copy of the drainage delineation, 1 copy of the supporting engineering calculations, 1 copy of the geotechnical report (where applicable), 1 copy of the survey (where applicable), 1 copy regulatory agency letter issuing permit number; 1 copy of the proof of submittal to regulatory agency of the Construction Commencement Notice Form 62-330.350(1) at least 48 hours prior to start of construction.

b. During Construction::
   1. The contractor shall provide to the contracting office for 1 SOCES/CEIE at the end of each month, in electronic format, signed weekly and storm event inspection reports; and the Notice of Termination (NOT) Form 62-621.300(6) within 14 days of final stabilization of the site. Copies of the reports must also be kept on-site.
   2. If F.A.C. 62-330 is applicable: 1 copy of Form 62-330.310(1) As-Built Certification by the Engineer of record within 30 days after completion of construction.

6. Copies of all required forms and guidance can be found at http://www.dep.state.fl.us/ .

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 SUBMITTALS

A. The Contractor shall submit an Environmental Protection Plan within 15 days after receipt of the notice to proceed. Approval of the Contractor's plan will not relieve the Contractor of responsibility for adequate and continuing control of pollutants and other environmental protection measures. The contractor shall obtain approval by the Contracting Officer prior to the start of construction, modification, or demolition for all project facilities and/or equipment. The plan shall include, but shall not be limited to, the following:
   1. Legal Requirements: A list of Federal, State, and local laws, regulations, and permits concerning environmental protection, pollution control and abatement that are applicable to the Contractor's proposed operations and the requirements imposed by those laws, regulations, and permits. Whenever there is a conflict between Federal, State, or local laws, regulations, and permit requirements, the more restrictive provisions shall apply.
   2. Environmental Protection Procedures: Procedures to be implemented to provide the required environmental protection, to comply with the applicable laws and regulations, and to correct pollution due to accident, natural causes, or failure to follow the procedures of the environmental protection plan.
   3. Drawings: Drawings showing locations of any proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials shall be included.
   4. Solid Waste Management Plan: See paragraph titled Solid Waste.
   5. Emergency Response and Spill Prevention Plan: See paragraph titled Emergency Response and Spill Prevention.
   6. Hazard Material List: See paragraph titled Hazardous Materials.
   7. Storm Water Pollution Prevention Plan: See paragraph titled Water Resources.
   8. Hazard Waste Management and Disposal Plan: See paragraph titled Hazardous Waste.
   9. Summary of Solid Waste Generated: See paragraph titled Solid Waste Implementation.

3.02 NATURAL RESOURCES

A. ENVIRONMENTAL RESOURCES: The environmental resources within the project boundaries and those affected outside the limits of permanent work under this contract shall be protected during the entire period of this contract. The Contractor shall confine activities to areas defined by the drawings and specifications except where tree replacement is required. Environmental protections shall be as stated in the following subparagraphs:
   1. The contractor shall confine all activities to areas defined by the drawings and specifications. In areas indicated on the drawing or specified to be cleared, the Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without permission. Trees, shrubs and other vegetation not identified for removal shall be protected against removal, injury, defacing and scarring-no ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. Where such emergency use is permitted, the Contractor shall provide effective protection for land and vegetation resources at all times.
   2. The Contractor shall not park vehicles or equipment within the drip line of trees. Prior to trimming or removal of trees, contractor shall coordinate with 1 SOCES/CEIE. All verified merchantable timber that is removed shall be limbed and stacked butt to butt in an out of the way location. Trees that are damaged or removed shall be replaced according to guidance found in the Hurlburt Field 2009 Landscape Development Plan

3. Prior to any construction, the Contractor shall mark the areas not to be disturbed under this contract. Isolated areas within the general work area, which are to be saved and protected, shall also be marked or fenced. The Contractor's personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.
4. All earthwork shall be planned and conducted to minimize the duration of exposure of unprotected soils. Side and back slopes shall be protected as soon as practicable upon completion of rough grading. Earthwork brought to final grade shall be finished as indicated.
5. The Contractor shall construct or install temporary and permanent erosion and sedimentation control features as indicated on the drawings. Erosion control measures on drawings shall be augmented if necessary to ensure effectiveness. Berms, dikes, drains, sedimentation basins, grassing, and mulching shall be maintained until permanent drainage and erosion control facilities are completed and operative.
6. The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas designated on the drawings or as directed by the Contracting Officer. Temporary movement or relocation of Contractor facilities shall be made only when approved. Borrow areas shall be managed to minimize erosion and to prevent sediment from entering nearby waters. Spoil areas shall be managed and controlled to limit spoil intrusion into areas designated on the drawings and to prevent erosion of soil or sediment from entering nearby waters. Spoil areas shall be developed in accordance with the grading plan indicated on the drawings. Temporary excavation and embankments for plant and/or work areas shall be controlled to protect adjacent areas from despoilment.
7. The Contractor shall thoroughly clean all construction equipment previously used at other sites before it is brought into the work areas, ensuring that soil residuals are removed and that egg deposits from plant pests are not present; the Contractor shall consult with the USDA jurisdictional office for additional cleaning requirements.

B. Protection of Fish and Wildlife Resources: All species of wildlife are protected on Hurlburt Field, Florida. Feeding, possessing, capturing, and attempting to capture, kill or otherwise harass wildlife is prohibited.

C. Black Bear and American Alligator: Black bear and American alligator sightings are common on Hurlburt Field. It is against the law to feed, possess, capture or attempt to capture, kill or otherwise harass these species. Feeding, possession, or harassment of an alligator is a second-degree misdemeanor. If a bear is sighted or if an alligator is found to be in an enclosed area, posing immediate threat or is affecting traffic, contact the 1 SOCES/CEIE (884-4651) as soon as possible. Construction sites must be cleared of any food or drink items at the end of each workday. Any items that could attract wildlife must be carried off the base or placed in a dumpster. Ensure all dumpster doors and lids are securely closed at the end of the day to deter bears or other wildlife from entering and feeding.

3.03 CULTURAL RESOURCES

A. Historical, Archaeological, and Cultural Resources: Existing historical, archaeological, and cultural resources within the Contractor's work area will be so designated by the Contracting Officer if any has been identified. The Contractor shall take precautions to preserve all such resources as they existed at the time they were first pointed out. The Contractor shall provide and install protection measures for these resources and be responsible for their preservation during the life of the contract. Protection measures will be provided by 1 SOCES/CEIE after consultation with the State Historic Preservation Officer on a case-by-case basis.

B. Artifacts Discovered During Construction: If during excavation or other construction activities any previously unidentified or unanticipated resources are discovered or found, all activities that may damage or alter such resources shall be temporarily suspended. Resources covered by this paragraph include but are not limited to: any human skeletal remains or burials; artifacts; shell, bone, charcoal, or other deposits; rocks or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, the Contractor shall immediately stop work and notify the Contracting Officer and 1 SOCES/CEIE.

3.04 WATER RESOURCES

A. The Contractor shall keep construction activities under surveillance, management, and control implementing “good house-keeping” practices to avoid pollution of surface and ground waters.

The contractor shall ensure that all employees and subcontractors are aware that dumping of any substance to ground, storm systems,wetlands or water bodies is prohibited, unless express written approval is provided from the contracting office and 1 SOCES/CEIE. All spills of hazardous materials, hazardous waste, petroleum, toxic substances, wastewaters, or materials that generate an oxygen demand in water bodies must be properly cleaned up immediately. Toxic or hazardous chemicals shall not be applied to soil or vegetation when such application may cause contamination. Monitoring of water areas affected by construction shall be the Contractor's responsibility.

B. Wetlands: Monitoring of wetland and water resources affected by construction activities shall be the responsibility of the Contractor and performed in accordance with the Clean Water Act and all Federal and State rules, laws, and standards. During construction, best management practices (BMP's) will be required to maintain soil erosion measures and a minimum distance of 15 feet and average of 25 feet from jurisdictional wetlands and water areas that could be adversely affected by construction activities. Contractor shall ensure that all erosion control products are free of invasive species. Contractor should plan for all events which will cause extreme conditions that may result in failure of BMP's. All fines and penalties assessed for wetlands violations affected by construction activities shall be the responsibility of the contractor.

C. Stormwater: The contractor shall use proper control and management techniques to ensure stormwater criteria are met in accordance with Federal, State, and local stormwater regulations. The contractor must comply with the Hurlburt Field Stormwater Management Plan.

D. Where erodible soils or other erodible materials are present, no matter the total size of the affected area, erosion control measures must be installed/implemented prior to start of construction and in accordance with the Floirda Stormwater, Erosion, and Sedimentation Control Inspector's Manual available at www.dep.state.fl.us/. This applies to construction areas, storage areas, and laydown areas. Erosion control measures must remain in place and be properly maintained until the site is properly stabilized. .

E. In some cases where severe erosion results in waters becoming turbid despite control measures, regular turbidity monitoring and documentation shall be necessary. Any such documentation shall be forwarded to the contracting office for 1 SOCES/CEIE review..

F. Stream Crossings shall allow movement of materials or equipment without violating water pollution control standards of the Federal, State or local government.

G. Landscaping: All new landscaping will be watered in accordance with the current stage of the Hurlburt Field Water Conservation Policy. All irrigation work will need to be coordinated with 1 SOCES/CEIE & 1SOCES/CEC. The use of potable water for irrigation systems is prohibited. New plantings should follow guidance utlined in the Hurlburt Field Landscape Development Plan.

H. Contractor is not authorized sewage holding tanks on base and must procure a portable toilet service contract. The contract must include the correct removal of sewage and maintenance of the portable toilet.

I. Projects that construct facilities with a footprint greater than 5,000 gross square feet, or expand the footprint of existing facilities by more than 5,000 gross square feet must maintain or restore to the maximum extent technically feasible the project predevelopment hydrology per section 438 of the Energy Independence and Security Act (EISA).

J. Dewatering: The requirements stated in Ch. 62-621.300(2), F.A.C. must be met before the commencement of any discharge of produced groundwater from a non-contaminated site activity to surface waters of the state (e.g. wetlands, stormwater systems). Any reportable documents associated with the compliance of this regulation shall be sent to the contracting office for 1 SOCES/CEIE review prior to the submittal to the Florida Department of Environmental Protection (FDEP). For dewatering operations that discharge to groundwaters of the state, a site-specific exemption letter must be obtained from the FDEP. In order for the contractor to obtain this exemption letter, a letter must be submitted stating the scope of the operation, estimated amount of water to be discharged during the operation, as well as best management practices that will be used during the dewatering operation to ensure no produced groundwater will be discharged to

surface waters of the state. This letter shall be sent to the contracting office for 1 SOCES/CEIE review prior to the submittal to the FDEP.

3.05 AFFIRMATIVE PROCUREMENT

A. Per Executive Order 13101, the Environmental Protection Agency (EPA) requires that all government purchases of designated items shall contain at least the minimal amount of post-consumer and/or total recovered materials. EPA-designated items fall into the following categories:

- Bio-based Products
- Construction Products
- Landscape Products
- Miscellaneous Products
- Non-Paper Office Products
- Paper and Paper Products
- Park and Recreation Products
- Transportation Products
- Vehicular Products

Specific requirements can be found at the EPA's website: http://www.epa.gov/cpg/products.htm. Also, see section 01 54 00: Green Procurement.

3.06 AIR RESOURCES

A. Equipment operation and activities or processes performed by the Contractor in accomplishing the specified construction shall be in accordance with the State rules and all Federal emission and performance laws and standards. Ambient Air Quality Standards set by the Environmental Protection Agency shall be maintained. The Contractor shall monitor all air areas affected by the construction activities. Monitoring results will be periodically reviewed by 1 SOCES/CEIE to ensure compliance.

B. Ozone Depleting Substances: The contractor shall adhere to Air Force and HFLD policies regarding halons and chlorofluorocarbons (CFCs). The contractor shall not introduce any Class I Ozone Depleting Substances (ODS) to Hurlburt Field during the course of this contract. The contractor shall be responsible for the recovery and recycling of all Class II ODS, including any necessary sampling marking, labeling, and disposal. The contractor may access the Hurlburt Field ODS Management Plan for guidance. However, the contractor shall remain ultimately responsible for any ODS work related to these tasks. Any work performed on equipment containing ODS used as refrigerants shall only be done by EPA certified technicians. Certification cards shall be on their person at all times. Intentional venting of ODS is strictly prohibited. Any work performed on equipment containing ODS used as refrigerants should only be done by EPA-certified technicians. Certification cards should be on their person at all times.

C. Particulates: Dust particles; aerosols and gaseous by-products from construction activities; and processing and preparation of materials, shall be controlled at all times, including weekends, holidays and hours when work is not in progress. The Contractor shall maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates which would cause the air pollution standards to be exceeded or which would cause a hazard or a nuisance. All reasonable precautions shall be taken during earthmoving and grading activitiesto control small particulate matter from becoming airborne. Water or other dust suppressants shall be used as necessary on unpaved surfaces, open stockpiles and conveyor systems to reduce emissions of dust. All reasonable precautions shall be taken to prevent the deposition of "drag-out" dirt on paved surfaces, and all drag dirt shall be removed from paved roadways at the end of each shift. The Contractor must have sufficient, competent equipment available to accomplish these tasks. Particulate control shall be performed as the work proceeds and whenever a particulate nuisance or hazard occurs by employing BMP's.

D. Employ the following BMP's to minimize air pollutants:

1. Limit the entry/exit of vehicles to the site to minimize track-in and track-out of aggregate and construction materials.
2. Apply water or other dust suppressants to unpaved roads..
3. Keep stock piles and open containers covered when not in use.
4. Landscape or vegetate as soon as practical.
5. Use water-based paints and low VOC surface coatings as per section 09 90 00.

3.07 SOLID WASTE

A. The contractor shall make every attempt to reduce the generation of solid and hazardous waste to the maximum extent possible. The contractor shall utilize the Base Recycling Center (884-

7577) for any office paper, cardboard, plastic, or metal wastes related to a project whenever possible. All wastes, whether recycled or landfilled, shall be weighed prior to disposal. Detailed disposition, to include; manifests, weight tickets, receipts, and invoices , information shall be reported by the fifth day of each quarter to 1 SOCES/CEIE. Solid wastes (excluding clearing debris) shall be placed in containers and emptied, recycled or land-filled, on a regular schedule. Containers used for solid waste shall be kept covered and closed at all times and shall be leak-proof. Solid waste, including refuse and construction and demolition debris, shall not be stored within 200 feet of jurisdictional wetlands or water bodies in accordance with FDEP regulation 62-701.300. Design for pads that will house solid waste dumpsters must reflect the 200 feet set-back from jurisdictional wetlands, water bodies and any stormwater conveyance structure. Segregation measures shall be employed so that no hazardous or toxic waste is co-mingled with solid waste. The Contractor shall transport solid waste (items not utilized by Base Recycling Center) off Government property and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal. Vehicles used in transporting refuse shall be covered and enclosed to prevent spillage. Expense and cleanup of any spills on or off base are always the responsibility of the contractor.

B. Solid Waste Management Plan: The Solid Waste Management Plan, refer to paragraph titled Submittals, shall include, but not limited to, the following:
   1. Description and estimated quantities of the proposed job-site waste to be generated.
   2. Landfill Options: The name of the landfill(s) where trash will be disposed of, applicable landfill tipping fee(s), and the projected cost of disposing of all project waste in the landfill(s).
   3. Waste Diversion: A list of the waste materials from the project that will be separated for reuse, salvage, or recycling, associated weights and estimated cost savings shall be reported to 1 SOCES/CEIE by the 5th day of each quarter.
   4. Handling Procedures: A description of the means by which any waste materials identified in item 3 above will be stored and a description of the means to be employed in recycling the above materials consistent with requirements for acceptance by designated facilities.
   5. Transportation: A description of the means of transportation of the waste and recycled materials (whether materials will be site-separated and self-hauled to designated center, or whether mixed materials will be collected by a waste hauler and removed from the site). Request manufacturers to use the minimum packaging required for protection and identification of project products, and to use packaging materials with recycled content where economically feasible in accordance with FAR, Executive Order 13101, and the Hurlburt Field Affirmative Procurement Plan.
   6. Submit cost information on the Solid Waste Management Plan for **Solid Waste Disposal, Recycling, Cost savings for wastes diverted from the landfill** to the Contracting Officer by 5th day of each quarter.

C. Solid Waste Management Plan Implementation
   1. The Contractor shall designate an on-site party (or parties) responsible for instructing workers and overseeing and documenting results of the Solid Management Plan for the project.
   2. The Contractor shall distribute copies of the Solid Management Plan to key personnel and submit the plan to the Contracting Officer as part of the Environmental Protection Plan (see Submittals section).
   3. The Contractor shall provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties.
   4. The Contractor shall lay out and label a specific area to facilitate separation of materials for potential recycling, salvage, reuse, and return. Recycling and waste bin areas are to be kept neat and clean and clearly marked in order to avoid contamination of materials.
   5. The Contractor shall **submit with each Application for Progress Payment, a Summary of Solid Waste Generated** by the project to 1 SOCES/CEIE. Failure to submit this information shall render the Application for Payment incomplete and shall delay Progress Payment. The Summary shall be submitted on a form acceptable to the Owner and shall contain the following information:
      a. The amount (in tons) of material land-filled from the project, the identity of the landfill, the total amount of tipping fees paid at the landfill, and the total disposal cost. Include manifests, weight tickets, receipt, and invoices.
      b. For **each** material recycled, reused or salvaged from the project, the amount (in tons), the date removed from the job-site, the receiving party, the transportation cost, the amount of any money paid or received for the recycled or salvaged material, and the net

total cost or savings of salvage or recycling each material. Attach manifests, weight tickets, receipts, and invoices.

c. Any serviceable or salvageable items not accepted by DRMO or Base Supply will become the property of the Contractor and will be properly handled, transported, and disposed of off-base by the Contractor in conformance with the Solid Management Plan and with all applicable federal, state, and local regulations.

3.08 HAZARDOUS WASTE (Includes Special and Universal Waste)

A. The contractor shall be considered the primary co-generator for all hazardous wastes generated throughout the duration of the contract. All hazardous waste management activities shall be coordinated and approved by 1 SOCES/CEIE.

B. The contractor's key personnel must attend the Hurlburt Field Hazardous Waste Awareness briefing prior to starting work on base. For reservations, contact Randy Trent at (850) 884-7923 or email randy.trent@hurlburt.af.mil.

C. The contractor is responsible for the management and disposal of all hazardous wastes he/she generates on base. All cost for labor, equipment, materials, transportation, and other services required to comply with federal, state and local laws governing hazardous/special waste management and disposal are the responsibility of the contractor.

D. The contractor shall characterize their waste streams using specific and technical knowledge, MSDS,s and/or sampling and analysis. This responsibility also includes preparation of waste profile sheets, manifests (regulated and non regulated) packaging, marking and labeling of wastes containers.

E. The contractor shall manage all hazardous waste, special waste, and universal waste IAW the HFLD Hazardous Waste Management Plan. The contractor shall ensure that all employees, including their subs, comply with the rules and procedures outlined in the Hurlburt Field Hazardous Waste Management Plan.

F. The contractor shall be familiar with and have immediate access to the following publications and regulations:
   1. Environmental Protection Agency (EPA): Title 40 Code of Federal Regulations, Parts 260-279
   2. Department of Transportation (DOT): Title 49 Code of Federal Regulations, Parts 171-177
   3. Hurlburt Field Hazardous Waste Management Plan

G. If transportation of Hazardous Wastes is required, the contractor shall possess or ensure the transportation company used for transportation of hazardous waste has a valid state and federal EPA identification number and all DOT requirements are met.

H. The contractor shall prepare profiles and manifests for all waste transported off base for disposal. A designated representative from 1 SOCES/CEIE, Environmental Element, must approve and sign the hazardous waste/non-hazardous waste manifest. Contractor shall ensure the signed manifest is returned to 1 SOCES/CEAN within 45 days from the time it's received at the disposal facility.

I. The Hurlburt Field Hazardous Waste Storage Facility may accept contractor's hazardous, special and universal waste (that was generated on base) depending on type of waste, quantities generated and provisions of the contract. 1 SOCES/CEIE must approve acceptance of the waste before it's generated.

3.09 HAZARDOUS MATERIALS

A. For the purposes of the document, Hazardous Materials (HM) are defined as any product material, chemical or substance listed in 49 CFR 172.101 (revised) and 40 CFR 302-304 (revised). Specifically, a HM is any substance or material, in any quantity or form that has the potential to harm human health or the environment or displays specific characteristics (reactive, corrosive, ignitable, and toxic).

B. Absolutely no HM shall be brought onto Hurlburt Field until that material is coordinated with Base Hazardous Material Program Manager per AFI 32-7086, Hazardous Materials Management . This requirement shall apply for all HM that the contractor intends to bring onto government property for any/all processes or applications. The contractor shall submit a complete hazardous material inventory list including manufacturer specific (Material) Safety Data Sheets (preferred electronic copy), part number/trade name, container size, estimated usage quantities, and any other supporting documentation for each HM used prior to contract start or introduction of that material to Hurlburt Field. The HM inventory shall include the contract number, performance period, and a contractor point of contactfor HM matters. Upon completion the Contractor shall provide actual usage quantities in writing to the HM Project Manager. All excess material and empty containers are the responsibility of the contractor and shall be removed accordingly at the end of the contract. Should contractor HM requirements change during the performance period, the Contractor shall immediately notify the HM Program Manager of such changes in writing.

C. Storage of Hazardous Materials: All HM shall be stored at Hurlburt Field with approval and coordination from 1 SOCES/CEIE, the base Fire Department (1 SOCES/CEF), and Wing Safety. The contractor shall observe HM storage practices in accordance with regulations, policies, plans and procedures employed by the base. HM storage shall be in a manner that limits exposure to rainfall and prevents releases to the environment.

D. All contractor personnel shall immediately report to the Contracting Officer and 1 SOCES/CEIE any hazardous materials, substances (including suspect asbestos containing materials), chemicals, or contaminated areas encountered. Further, the contractor personnel shall immediately cease work in the area unless the work is of an emergency nature and the risk of exposure can be mitigated by the use of personal protective equipment (PPE) or clothing. The government will determine the best means of sampling and corrective action and will notify the contractor accordingly.

E. The contractor shall not use, store, or handle any Class I ODS during the course of this contract.

F. All hazardous materials and waste resulting from construction projects (including renovation/repair and demolition) shall be managed in accordance with local, state, federal and Hurlburt Field rules and regulations.

3.10 TOXIC WASTE

A. Asbestos: All asbestos work must be accomplished in accordance with federal, state, and local laws and the Hurlburt Field Asbestos Management Plan. See Section 02 82 16.00 20.

1. Notice of Asbestos Renovation or Demolition, DEP Form 62-257.900(1) must be submitted to Florida Department of Environmental Protection at least 10 working days prior to any demolition and/or renovation regardless of whether asbestos is present or not. A copy of this notification and all asbestos surveys conducted must be provided to 1 SOCES/CEIE prior to performing any work. Upon completion of any asbestos abatement, the contractor will provide copies of all disposal waste manifests to 1 SOCES/CEIE, Toxic Substance Program Manager.
2. A copy of all submittals must be provided to 1 SOCES/CEIE with adequate time built in for review.
3. The use of materials, products or equipment containing asbestos **will not** be allowed in the construction of this project. See sample list below.
4. Prior to the commencement of construction, the prime contractor, each subcontractor and material/equipment supplier shall provide the Contracting Officer and 1 SOCES/CEIE with a Notarized statement that to the best of their knowledge, no asbestos will be used in the construction of this project. Additionally, the contractor must have available the most current *Material Data Safety Sheet* proving the materials contain no asbestos.
5. Sample list of Asbestos Containing Materials (ACM):
   Note: The following list does not include every product/material that may contain asbestos. It is intended as a general guide to show which types of material may contain asbestos.

- Cement pipes
- Asphalt floor tile
- Flooring backing
- Decorative plaster
- Spray-applied
- Cement wallboard
- Vinyl floor tile
- Construction mastics
- Textured paints/coatings
- Blown-in insulation
- Cement siding
- Vinyl sheet flooring
- Acoustical plaster
- Ceiling tiles & lay-in-panels
- Fireproofing materials

insulation
- Taping compounds (thermal)
- Laboratory hoods
- Fire curtains
- HVAC duct insulation
- Ductwork flexible fabric
- Heating and electrical
- Spackling compounds
- Roofing felt
- Fire doors
- Wallboard
- Electrical wiring insulation
- Packing materials (for wall/floor penetrations)
- Laboratory gloves
- Elevator equipment panels
- Boiler insulation
- Cooling towers
- Electrical panel partitions
- Chalkboards
- Base flashing
- Caulking/putties
- Joint compounds
- High temperature gaskets
- Fire blankets & table tops
- Elevator brake shoes
- Breeching insulation
- Pipe insulation (corrugated connections air cell, block, etc.)
- Electrical cloth ducts
- Roofing shingles
- Thermal paper products
- Adhesives
- Vinyl wall coverings

Caution needs to be taken to ensure materials purchased do not contain one or more % asbestos by volume.

B. Lighting Ballast: When fluorescent and mercury vapor fixtures are removed, the ballast must be examined for PCB labeling. Ballast is presumed to contain PCBs unless they are clearly labeled “NO PCBs”. Suspected ballast must be removed and disposed IAW Hurlburt Field directives.

C. Lead Based Paint: No paint containing lead shall be used during the course of this contract. The Occupational Health and Safety Act (OSHA) Lead Construction Standard, 29 CFR 1926.62 is in effect whenever materials are disturbed that contain any amount of lead. This will require contractors disturbing lead-based paint to institute medical surveillance, training, engineering controls, worker protection measures and employee monitoring until monitoring results per the lead paint standard demonstrate that employee exposure is below the action level and permissible exposure limit. The contractor on site must maintain all documentation regarding lead exposure by either historical data or project data. **This data shall also be made available to 1 SOCES/CEIE upon completion of the project.**
   1. Prior to the commencement of construction, the prime contractor, each subcontractor and material/equipment supplier shall provide to the Contracting Officer and 1 SOCES/CEIE with a Notarized statement that to the best of their knowledge, no lead based paint will be used in the construction of this project. Additionally, the contractor must have available the most current *Material Data Safety Sheet* proving that the paint does not have any lead content. If lead based paint has been identified, copies of surveys must be forwarded to 1 SOCES/CEIE, Toxic Substance Program Manager.
   2. The contractor shall be responsible for collection and disposal of all lead paint chips and lead paint-contaminated materials, and for accumulation of these chips/materials on site. The contractor shall test the paint materials, provide containers for proper disposal, and transport any resulting hazardous waste to an appropriate hazardous waste accumulation area should it test positive as hazardous waste. All necessary accumulation, disposal activities and documentation shall be coordinated with the 1 SOCES/CEIE flight.
   3. A copy of contractor’s exposure assessment data shall be provided to 1 SOCES/CEIE.
   4. Copies of all lead paint-related documentation generated from this project, including lead testing, air monitoring and hazardous waste manifests, shall be provided by the Contractor to the Contracting Officer. A copy shall be forwarded to the contracting office for 1 SOCES/CEIE within 10 working days of task completion.
   5. **On Military Family Housing Projects,** there shall be in-depth coordination with the 1SOCES/CEAN flight to allow for resident notification and necessary arrangements. **The contractor is strongly encouraged to coordinate closely with 1SOCES/CEIE for any required guidance on this critical issue**.
   6. Contractors performing renovation, repair and painting projects that disturb lead-based paint in homes, child care facilities, and schools built before 1978, must be certified and must follow specific work practices to prevent lead contamination (40 CFR Part 745). Upon completion of any lead base paint abatement, the contractor will provide copies of all disposal waste manifests to the contracting office for 1 SOCES/CEIE, Toxic Substance Program Manager.

3.11 SPILL PREVENTION:

A. The contractor is required to familiarize their employees with spill procedures, fire suppression systems and Material Safety Data Sheets for all materials used and/or stored at the project site. In the event of an oil, fuel or chemical spill, the contractor shall immediately notify the Hurlburt Field Fire Department by calling 911. The contractor shall also notify the Contracting Officer (CO) and provide a detailed, written spill report to the contracting office for 1 SOCES/CEIE within 24 hours describing the events of the release. Costs incurred from contractor related spills are the responsibility of the contractor. The contractor shall reimburse any government cost associated with spill response and clean-up.

B. The contractor shall provide and maintain spill containment equipment, sufficient in both type and quantity, at all sites involving the storage, use or handling of hazardous waste and hazardous materials. The type of spill equipment and quantity required will be identified in the contractor's site specific contingency plan. Equipment and materials must be adequate to contain any release and secondary containment must be in use as required.

C. If the contractor is required to stockpile contaminated soil for testing prior to disposal, the CO will inform the contractor of the stockpile location after consultation with 1 SOCES/CEIE.

D. Contractor vehicle and heavy equipment maintenance (including oil changing, lubrication, and vehicle washing) is not authorized on base.

E. **All fuel, oil, and chemical spills that occur on Hurlburt Field (regardless of amount) must be immediately reported to the base Fire Department by calling 911.**

3.12 LABORATORY REQUIREMENTS

A. The contractor shall as required use a laboratory capable of performing all analysis required to determine Resource Conservation and Recovery Act (RCRA) characteristics such as, but not limited to, Toxicity Characteristic Leaching Procedure (TCLP) metals, TCLP volatile and semi-volatile organic, flashpoint, reactivity, and pH. The laboratory shall also be capable of performing any analysis required to determine the applicability of the used oil criteria detailed in 40 CFR, Part 279. The contractor shall ensure that all analytical work is performed IAW the methods and procedures, including QA/QC requirements, detailed in EPA SW-8467. The analytical laboratory shall be capable of providing accurate, complete data within eight (8) working days. Field analysis and portable instrumentation shall not be used to fulfill laboratory requirements. Thecontractor shall retain all data on file for a minimum of three years and keep it readily available for inspection by any authorized agency, including 1 SOCES/CEIE Asset Management Flight. Chain-of-custody documents shall be included with these records. At the end of the contract, all of these data files may be transferred to 1 SOCES/CEIE.

3.13 POST CONSTRUCTION CLEANUP

A. The Contractor shall clean up all areas affected by construction and restore them back to their original condition to include landscaping, planting of trees, grass, and shrubs damaged by construction; and raking and disposal of debris such as roof shingles, paper, nails, glass, sheet metal, bricks, and waste concrete. Backfilled areas shall be compacted properly and replanted with grass.

3.14 INSTALLATION RESTORATION PROGRAM (IRP)

A. Contractors and Project Managers (PM) planning projects on Hurlburt Field should be aware of the potential to encounter soil/groundwater contamination throughout many areas of the base. The following guidance has been developed to assist in the planning, designing and construction of projects in possibly contaminated areas (IRP sites). The first set of guidance is the most stringent and involves projects planned in an area that has known contamination and regulatory Land Use Controls. The second set of guidance applies to projects planned near a known IRP site with suspected contamination. The last set of guidance is general and applies to any areas of the base where contamination has not been confirmed. It is imperative that planners, designers and contractors involve 1 SOCES/CEIE early and often in the planning, designing, and construction process to minimize the impact that contaminated soils/groundwater may have on their project.

B. Projects located on a site with known soil and/or groundwater contamination with land use controls:
   1. There are land use controls on this area imposed by an environmental regulatory agency designed to protect public health.
   2. Project Manager should investigate and plan to ensure all monitor wells/cleanup systems are avoided.
   3. Project Manager should submit detailed work plans to 1 SOCES/CEIE early in planning stages so 1 SOCES/CEIE can obtain concurrence from the regulatory agencies on project details.
   4. Project Manager should educate workers on potential to encounter contamination and also should ensure workers are adequately protected with personal protective equipment.
   5. If unusual soil or groundwater color/odor is encountered during subsurface work, contact 1 SOCES/CEIE.

C. Projects located near a site with known or suspected soil and/or groundwater contamination without land use controls:
   1. If unusual soil or groundwater color/odor is encountered during subsurface work, contact 1 SOCES/CEIE.
   2. Project Manager should investigate and plan to ensure all monitor wells/cleanup systems are avoided.
   3. Project Manager should educate workers on potential to encounter contamination and also should ensure workers are adequately protected with personal protective equipment.

D. Sites without land use controls and not in close proximity to known contamination or IRP site:
   1. If unusual soil or groundwater color/odor is encountered during subsurface work, contact 1 SOCES/CEIE.
   2. Project Manager should educate workers on potential to encounter contamination and also should ensure workers are adequately protected with personal protective equipment.

E. **Be aware that the regulatory agency can halt the project for long periods of time due to the discovery of contamination. 1 SOCES/CEIE is committed to expediting projects with IRP compliance related issues.**

3.15 STORAGE TANKS

A. 1 SOCES/CEAN must approve the use of fuel storage tanks on base, and the contractor must ensure adequate spill containment (spill kits) for any tanks approved for use on Hurlburt Field. The contractor must have written spill procedures for tanks and heavy equipment that they use on base. Temporary gasoline storage is **NOT** permitted on base.

B. POL/Storage Tanks: Storage tanks and POL can be a source of contamination if not managed appropriately. Contractor personnel obtaining fuels from Storage Tanks agree to follow all 62-762 FAC and the following list of Air Force Technical Order's to ensure compliance: 37-1-1, 37A-1-101, 42B-1-1, 42B-1-1S-2, 42B-1-16, 42B-1-22, 42B-1-23, and 42C-1-12.

C. Contractor must contact 1SOCES/CEIE for a copy of Hurlburt Field's Integrated Contingency Plan (ICP), if storage tank use is approved. A number of Federal and State agencies have regulations pertaining to pollution prevention and emergency response requirements of oil and hazardous storage and transfer facilities. The Hurlburt Field ICP has been developed to address the issues of spill prevention, discharge containment / cleanup, and emergency response actions.

END OF SECTION

SECTION 01 58 00 PROJECT IDENTIFICATION SIGN

PART 1 GENERAL

1.01 SECTION INCLUDES:
A. Project Identification Sign.

1.02 QUALITY ASSURANCE:
A. Design sign and structure in accordance with drawing shown on page 2 of this specification.

B. Use experienced professional sign painter.

C. Finishes shall be adequate to withstand weathering, fading, and chipping, for duration of construction.

PART 2 PRODUCTS

2.01 SIGN MATERIALS:
A. Structure and Framing: New, pressure-treated 4 x 4 x 12' support posts.

B. Sign Surfaces: Exterior grade plywood, A-C, 1/2" thick, 4'-0" x 8'-0".

C. Paint and Primers: Exterior professional quality, high-gloss alkyd enamel.

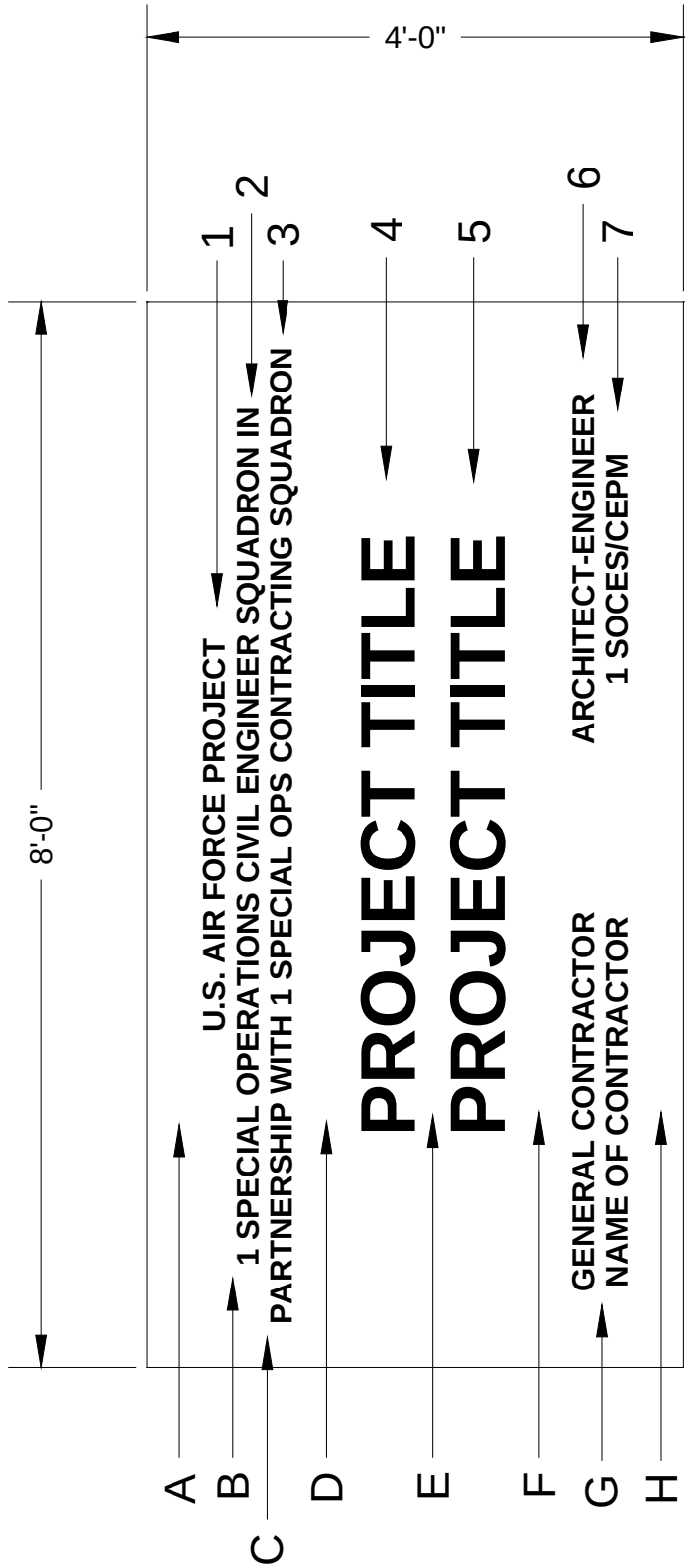
D. Lettering: Exterior quality paint as per above, or pre-cut vinyl self-adhesive products, in accordance with attached drawing.

PART 3 EXECUTION

3.01 INSTALLATION:
A. Install project identification sign within 15 days after Notice to Proceed.
   1. Install at a location of high public visibility adjacent to main entrance to site.
   2. Erect sign surface plumb and level. Anchor securely.
   3. Paint exposed surfaces of sign, supports, and framing.

3.02 MAINTENANCE:
A. Maintain sign and supports clean.
B. Repair deterioration and damage.

3.03 REMOVAL:
A. Remove signs, framing, supports, and foundations at completion of project and restore the area.



SPACE	HEIGHT	LINE	LETTER HEIGHT	STROKE
A	5"	1	2"	3/16"
B	1"	2	2"	3/16"
C	1"	3	2"	3/16"
D	6"	4	5"	1/2"
E	3"	5	5"	1/2"
F	6"	6	2"	3/16"
G	1"	7	2"	3/16"
H	5"			

1. USE 1/2" GRADE A-C EXTERIOR PLYWOOD
2. PAINT WITH EXTERIOR GLOSS ENAMEL:
   a. 1 COAT PRIMER
   b. 2 COATS COLOR #20122, FED. STANDARD 595B
   c. WHITE LETTERS
3. MOUNT SECURELY ON PRESSURE TREATED 4x4s, WITH BOTTOM 4' FROM GRADE
4. REMOVE SIGN AFTER COMPLETION OF CONSTRUCTION

END OF SECTION

SECTION 01 60 00 MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.01 PRODUCTS

A. Products means new material, machinery, components, equipment, fixtures and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the work. Products may also include existing materials or components required for reuse.

B. Do not use materials and equipment removed from existing premises except as specifically permitted by the Contract Documents and approved by the Contracting Officer.

C. Provide interchangeable components of the same manufacturer for similar components.

1.02 TRANSPORTATION AND HANDLING:

A. Transport and handle products in accordance with manufacturer's instructions.

B. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement or damage.

1.03 STORAGE AND PROTECTION:

A. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weathertight, climate controlled enclosures.

B. For exterior storage of fabricated products, place on sloped supports above ground.

C. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.

D. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

E. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement or damage.

F. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.

1.04 PRODUCT OPTIONS:

A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers with a Provision for substitutions: Submit a request for substitution for any manufacturer not named.

1.05 SUBSTITUTIONS:

A. Substitutions will be considered under provisions of Section 01 00 00.

B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

C. A request constitutes a representation that the contractor:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
   2. Will provide the same warranty for the substitution as for the specified product.

3. Will coordinate installation and make changes to other work which may be required for the work to be complete with no additional cost to the Government.
4. Waives claims for additional costs or time extension which may subsequently become apparent.
5. Will reimburse Government for redesign services associated with the request.

D. **Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals without separate written request, or when acceptance will require revision to the Contract Documents.**

E. Substitution Submittal Procedure:
1. Submit four (4) copies of request for substitution for consideration. Limit each request to one proposed substitution.
2. Submit shop Drawings, product data, and certified test results attesting to the proposed product equivalence.
3. Submit one (1) copy of the material specification, product data, and a physical sample of each finish material (carpet, rubber/vinyl base, wall covering, vinyl composition tile, ceramic tile, acoustical ceiling, etc.) of the specified material for which a substitution is proposed. This information will be used to compare the proposed substitution to the specified material to assure compliance with the contract requirements.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 65 00 STARTING OF SYSTEMS

PART I GENERAL

1.01 STARTING SYSTEMS

A. Coordinate schedule for start-up of various equipment and systems.

B. Notify project inspector 7 days prior to start-up of each item.

C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or other conditions, which may cause damage.

D. Verify that tests, meter readings and specified electrical characteristics agree with those required by the equipment or system manufacturer.

E. Verify wiring and support components for equipment are complete and tested.

F. Execute start-up under supervision of responsible manufacturer's representative if required by manufacturer or contractors' personnel in accordance with manufacturers' instructions.

G. When specified in individual Specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.

H. Submit a written report in accordance with applicable Section of Specifications that equipment or system has been properly installed in accordance with manufacturer's installation instructions and is functioning correctly.

1.02 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate operation and maintenance of products to Government personnel 7 days prior to date of final inspection.

B. Utilize operation and maintenance manuals as basis for demonstration. Review contents of manual with government personnel in detail to explain all aspects of operation and maintenance.

C. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled times, at equipment designated location.

D. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

1.03 TESTING, ADJUSTING AND BALANCING

A. Contractor will appoint, employ and pay for services of an independent firm to perform testing, adjusting and balancing.

B. Reports will be submitted by the independent firm to the Contracting Officer indicating observations and results of tests and indicating compliance or non-compliance with specified requirements and with the requirements of the Contract Documents.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 70 00 CONTRACT CLOSEOUT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Closeout procedures.

B. Final cleaning.

C. Adjusting.

D. Project record documents.

E. Operation and maintenance data.

F. Spare parts and maintenance products.

G. Warranties.

H. Maintenance service.

1.02 CLOSEOUT PROCEDURES

A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for final inspection.

B. Upon completion of final inspection, correct punch list items to the satisfaction of the government, and submit all closeout documents, the Government shall take beneficial occupancy of building (BOD). **All warranties will start when government takes BOD.**

C. Provide closeout submittals to Government as required by contract documents. Complete and submit attached closeout checklist.

1.03 FINAL CLEANING

A. Execute final cleaning prior to final inspection.

B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum and remove any stains from carpeted and soft surfaces.

C. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

D. Replace filters of operating equipment.

E. Clean debris from roofs, gutters, downspouts, and drainage systems.

F. Clean site; sweep paved areas, rake clean landscaped surfaces.

G. Remove waste and surplus materials, rubbish, and construction facilities from the site.

1.04 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

1.05 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.

2. Specifications.
3. Addenda.
4. Change Orders and other modifications to the Contract.
5. Reviewed Shop Drawings, Product Data, and Samples.
6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction. Do not put extraneous marks or other information on these documents. Maintain documents in good, clean condition free from tears or damage.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:
1. Manufacturer's name and product model and number.
2. Product substitutions or alternates utilized.
3. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each construction change on the respective drawing sheet or sheets to record actual construction including:
1. Addenda issued prior to receipt of bid or proposal.
2. Change orders issued during the construction phase.
3. Measured depths of foundations in relation to finish floor datum.
4. Measured horizontal and vertical locations of underground utilities and appurtenances referenced to permanent surface improvements.
5. Measured locations of external and internal utilities, and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
6. Field changes of dimension and detail.
7. Details not on original Contract drawings.
8. Field changes related to materials.

G. Prior to final inspection the contractor shall:
1. Submit original record documents to Contracting Officer. Contractor is advised to have a reproduced copy of the original record documents made for their records.
2. Obtain Disc copies of the contract drawings in current version of AUTOCAD used by 1SOCES/CEP. Verify with the project inspector. Correct drawing files (sheets) to reflect all as-built conditions based on the changes made as per item F. above. Add the words “AS BUILT” to the revision block of each sheet title block, the date the drawings were changed and the initials of the person making the change.
3. Submit one set of prints of the corrected contract drawing files to allow Base Civil engineer to verify accuracy of the corrected drawings against the record documents.
4. Upon review and approval of the corrected contract drawing files, provide disc copies to the government for their records.
5. Completed Construction Data Worksheet. See Section 01 00 00, paragraph 1.07
6. Project Closeout Check List. See end of section.
7. **See Section 01 00 00, paragraph 1.15.C referencing 3% payment retention until receipt and approval of Closeout Documents.**
8. **See Section 01 10 00, paragraph 3.05. referencing location of buildings, etc. to be submitted with As-Built documents.**

H. Upon acceptance of the building, project record documents and the “As Built” drawings by the Contracting Officer and the Base Civil Engineer, final payment will be made to the contractor

1.06 OPERATION AND MAINTENANCE DATA

A. Submit data bound in 8-1/2 x 11 inch text pages, three ring binders with durable plastic covers and digital electronic copy. General contractor shall assemble all O & M data required on project and submit as a single submittal.

B. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project, and subject matter of binder when multiple binders are required.

C. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.

D. Contents: Prepare a Table of Contents for each volume, with each Product or system description identified, typed on white paper, in three parts as follows:
   1. Part 1: Directory, listing names, addresses, and telephone numbers of Contractor, Subcontractors, and major equipment suppliers.
   2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
      a. Significant design criteria.
      b. List of equipment.
      c. Parts list for each component.
      d. Operating instructions.
      e. Maintenance instructions for equipment and systems.
      f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
   3. Part 3: Project documents and certificates, including the following:
      a. Shop drawings and product data.
      b. Air and water balance reports.
      c. Certificates.
      d. Photocopies of manufacturer's warranties.

E. Submit 1 draft copy of completed volumes 5 days prior to final inspection. This copy will be reviewed and returned after final inspection, with comments. Revise content of all document sets as required prior to final submission.

F. Submit two sets of revised final volumes, within 10 days after final inspection.

G. DIGITAL COPY: Contents of digital copy shall match those described for printed materials. Organize the digital copy, per Volume, with a Table of Contents (digital file folder structure) for Parts 1-3. Designated sections in file folders and subfolders shall be arranged by system and subdivided by specification section and information required. For example:
   A. Part 3 – Project Documents
      1. HVAC System
         a. Section 23 36 00 Air Terminal Units
            i. Shop drawings
            ii. Reports
            iii. Certifications
            iv. Warrantiies

1.07 SPARE PARTS AND MAINTENANCE PRODUCTS

A. Provide spare parts, maintenance, and extra products in quantities specified in individual specification sections.

B. Deliver to Project site and place in location as directed; obtain receipt prior to final payment.

1.08 CONTRACTOR/SUBCONTRACTOR WARRANTIES

A. Provide triplicate notarized copies.

B. Execute and assemble transferable warranty documents from Subcontractors, suppliers, and manufacturers.

C. Submit prior to final Application for Payment.

D. All warranties shall be submitted within 10 days from BOD with warranty start dates printed on warranties.

1.09 MAINTENANCE SERVICE

A. Furnish service and maintenance of components where indicated in specification sections during the warranty period.

B. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

C. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.

D. Maintenance service shall not be assigned or transferred to any agent or Subcontractor without prior written consent of the Government

PART 2 PRODUCTS (NOT USED);

PART 3 EXECUTION (NOT USED)

END OF SECTION

PROJECT CLOSEOUT CHECK LIST

PROJECT # AND TITLE: _____
CONTRACTOR: _____

CONTRACTOR (mark n/a next to those items that are not applicable for this project)

_____ TEST AND BALANCE REPORT SUBMITTED, APPROVED AND INCLUDED IN THE O&M MANUALS. REPORT SHALL BE SUBMITTED PRIOR TO FINAL INSPECTION.

_____ HAVE O&M MANUALS BEEN SUBMITTED AND APPROVED. MANUALS ARE TO BE ASSEMBLED BY THE GENERAL CONTRACTOR AND SUBMITTED UNDER A SINGLE COVER PER SECTION 01700. (SEE ATTACHED LIST). MANUALS SHALL BE SUBMITTED PRIOR TO FINAL INSPECTION.

_____ PUNCH LIST COMPLETED.

_____ HAS MECHANICAL AND ELECTRICAL IDENTIFICATION BEEN COMPLETED.

_____ HAS COMPLETED CONSTRUCTION DATA WORKSHEET.

_____ HAVE THE RECORD DOCUMENTS AND AS-BUILT DRAWINGS BEEN SUBMITTED AND APPROVED PER SECTION 01700.

_____ HAS THE DDC PROGRAMMING FOR THE HOST COMPUTER BEEN DOWN LOADED TO THE CONTROLS SHOP.

_____ HAS FINAL CLEANING BEEN COMPLETED.

_____ HAVE SPARE PARTS BEEN TURNED OVER TO THE GOVERNMENT. (SEE ATTACHED LIST)

_____ HAVE WARRANTIES BEEN SUBMITTED AND APPROVED. (SEE ATTACHED LIST)

_____ HAVE DIGITAL RECORD DRAWINGS BEEN SUBMITTED (SECTION 02811 LANDSCAPE IRRIGATION AND 15330 FIRE SUPPRESSION)

_____ HAS ALL REQUIRED TRAINING BEEN ACCOMPLISHED. (SEE ATTACHED LIST)

_____ HAS ALL REQUIRED TESTING BEEN ACCOMPLISHED. (SEE ATTACHED LIST).

_____ HAVE ITEMS TO BE TURNED OVER TO GOVERNMENT BEEN TURNED OVER.

_____ HAVE REPLACEMENT TREES BEEN PLANTED IN AUTHORIZED LOCATION

_____ IS CONSTRUCTION SITE STABLE, NO EROSION

_____ HAS ALL CONTRACTOR HAZMAT BEEN REMOVED FROM PROJECT SITE

_____ HAS CONTRACTOR SUBMITTED THE TOTAL HAZARDOUS MATERIALS USED DURING CONTRACT

_____ HAS CONTRACTOR PROVIDED WITNESSED AND NOTARIZED STATEMENT THAT PROJECT WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS INCLUDING ALL CHANGES MADE DURING THE CONSTRUCTION PHASE.

_____ WARRANTY FORM

PROJECT # AND TITLE: _____
CONTRACTOR: _____

INSPECTORS

_____ HAVE THE ABOVE ITEMS BEEN COMPLETED BY THE CONTRACTOR.

_____ HAS 100% COMPLETION LETTER AND BLUE BOOKS BEEN SENT TO CONTRACTING.

_____ HAS FINAL PAYMENT BEEN APPROVED.

_____ HAS WARRANTY DATE BEEN ESTABLISHED. DATE:_____

_____ HAVE RECORD DRAWINGS AND ORGINALS BEEN TURNED OVER TO DRAFTING FOR DOING AS-BUILTS AND FILING.

_____ HAVE O&M MANUALS BEEN TURNED OVER THE SHOPS.

_____ HAS 1354 BEEN COMPLETED AND TURNED OVER TO REAL PROPERTY ALONG WITH INPECTORS AND ENGINEERS FOLDERS. **

_____ HAS CONTRACTOR'S WRITTEN, WITNESSED AND NOTARIZED STATEMENT RE COMPLETION OF THE PROJECT BEEN TURNED OVER TO THE GOVERNMENT.
SEE SECTION 01 00 00 GENERAL REQUIREMENTS, PARAGRAPH 1.15.

_____ HAS PERFORMANCE EVALUATIONS BEEN RECEIVED, COMPLETED AND RETURNED.

_____ HAVE ASBESTOS RECORDS BEEN RECEIVED FROM CONTRACTOR AND TURNED OVER TO CEV.

_____ HAVE ENVIRONMENTAL PERMIT CERTIFICATIONS ISSUED FOR POTABLE WATER, SANITARY SEWER, OR STORMWATER BEEN CLOSED OUT.

** 1354 SHOULD BE COMPLETED PRIOR TO TURNING IN O&M MANUALS, AS-BUILTS DRAWINGS AND BLUE BOOKS.

PROJECT # AND TITLE: _____
CONTRACTOR: _____

SPARE PARTS

_____ Section 09 51 13 ceiling tile
_____ Section 12 21 13 blinds
_____ Section 23 54 00 filters
_____ Section 26 24 16 keys
_____ Section 26 52 00 lamps
_____ Section 09 65 00 flooring base
_____ Section 21 13 13 fire sup. heads
_____ Section 23 73 00 filters
_____ Section 26 28 26 keys
_____ Section 28 16 00 intrusion detection
_____ Section 23 81 23 computer room air conditioning units

O&M MANUALS

_____ Section 32 84 00 irrigation sys
_____ Section 09 68 00 carpet
_____ Section 22 13 43 lift stations
_____ Section 21 13 13 fire suppr.
_____ Section 22 11 19 plumbing spec.
_____ Section 22 30 00 pluming eq.
_____ Section 23 21 23 pumps
_____ Section 23 54 00 furn. & a/c
_____ Section 23 64 00 chillers
_____ Section 23 34 23 ventilators
_____ Section 23 09 23 controls
_____ Section 26 28 26 transfer switch
_____ Section 26 51 00 interior lights
_____ Section 26 33 00 emer. power
_____ Section 28 31 00 fire alarm
_____ Section 09 30 00 ceramic tile
_____ Section 10 44 00 fire extinguishers
_____ Section 21 13 18 high expansion foam system
_____ Section 22 10 00 plumbing piping
_____ Section 22 40 00 plumbing fixtures
_____ Section 23 21 16 hydronic spec.
_____ Section 23 52 34 boilers
_____ Section 23 55 00 unit heaters
_____ Section 23 73 00 air handlers
_____ Section 23 36 00 terminal units
_____ Section 26 12 00 transformers
_____ Section 26 24 27 bypass switch
_____ Section 26 56 00 site lighting
_____ Section 26 32 13 generators
_____ Section 28 13 00 intrusion detection
_____ Section 23 81 23 computer room air conditioning units
_____ Section 23 72 00 enthalpy and desiccant wheel systems

WARRANTIES

_____ Section 31 31 16 termite control
_____ Section 07 90 00 joint sealers
_____ Section 08 14 16 wood doors
_____ Section 13 34 19 metal bldgs
_____ Section 22 30 00 water heater
_____ Section 23 54 00 compressor
_____ Section 23 64 00 chiller
_____ Section 26 55 50 ballfield lighting
_____ Section 26 32 13 generator
_____ Section 23 81 23 computer room air conditioning units
_____ Section 21 13 18 high expansion foam system
_____ Section 07 42 13 metal roofing
_____ Section 07 52 00 bituminous roofing
_____ Section 13 34 19 metal bldg. roofing
_____ Section 22 40 00 water cooler
_____ Section 23 52 34 boiler
_____ Section 23 55 00 unit heater
_____ Section 23 36 00 terminal units
_____ Section 26 33 00 emer. power supply

TRAINING

_____ Section 23 52 34 boilers
_____ Section 23 09 23 controls
_____ Section 28 31 00 alarm system
_____ Section 23 81 23 computer room air conditioning units
_____ Section 21 13 18 high expansion foam system
_____ Section 23 64 00 chillers
_____ Section 26 32 13 generators

PROJECT # AND TITLE: _____
CONTRACTOR: _____

TESTING

_____	Section 31 23 23 backfill	_____	Section 31 23 16 trenching
_____	Section 32 12 16 paving	_____	Section 32 84 00 irrigation sys
_____	Section 03 30 00 concrete	_____	Section 04 05 03 mortar
_____	Section 22 13 43 lift stations	_____	Section 21 13 13 fire suppression
_____	Section 22 10 00 plumbing piping	_____	Section 22 15 00 compressed air
_____	Section 23 21 13 hydronic piping	_____	Section 23 52 34 boilers
_____	Section 23 64 00 chillers	_____	Section 23 81 26 heat pumps
_____	Section 23 81 26 OA Units	_____	Section 23 31 00 ductwork
_____	Section 23 09 23 controls	_____	Section 26 05 13 med-voltage cable
_____	Section 26 27 26 wiring devices	_____	Section 26 05 26 grounding
_____	Section 26 32 13 generators	_____	Section 28 31 00 alarm system
_____	Section 28 16 00 detection sys	_____	Section 27 00 00 LAN systems

_____ Section 23 81 23 computer room air conditioning units
_____ Section 23 72 00 enthalpy and desiccant wheel systems

P R O J E C T W A R R A N T Y F O R M

BUILDING NUMBER & STREET ADDRESS: _____

PROJECT NUMBER & TITLE: _____

CONTRACT NUMBER: _____

PROJECT MANAGER & PHONE NO: _____

CONTRACT SPECIALIST & PHONE NO. _____

DATE OF GOVERNMENT ACCEPTANCE: _____

GENERAL 0NE YEAR WARRANTY EXPIRATION DATE: _____

ONE YEAR WARRANTY INPSECTION DATE (30 days prior to expiration)_____

BRIEF DESCRIPTION OF WORK: _____

_____

_____

_____

_____

PRIME KTR, PHONE NO. & FAX NO. _____

HVAC SUBKTR, PHONE & FAX NO. _____

PLUMBING SUBKTR, PHONE & FAX NOS. _____

ELECTRICAL SUBKTR. PHONE & FAX NO'S _____

E X T E N D E D W A R R A N T I E S

SPEC.	ITEM & WARRANTY -	RESPONSIBLE PARTY (IES)
31 31 16	Termite Treatment, 5 yrs,	Prime ktr & installer
32 84 00	Irrigation System, 2 yr,	Prime ktr & subktr
04 20 00	Masonry, 2 yr,	Prime ktr & subktr
07 42 13	Preformed Metal Roofing, general, 2 yr	Prime ktr & subktr
	Panel finish, 20 year,	Manufacturer
	Leaking, 20 yr,	Manufacturer
07 52 00	Modified Bitumen Roofing, 10 yr,	Manufacturer
07 62 00	Sheet Metal Flashing & Trim, finish 20 yr,	Manufacturer
08 33 23	Overhead Rolling Doors, one year plus warranty,	Manufacturer
13 34 19	Pre-Engineered Building Systems, general, 2 yr,	Prime ktr & installer
	Siding finish, 5 yr,	Manufacturer
	Panel finish, 20 yr,	Manufacturer
	Leaking, 20 yr,	Manufacturer
22 40 00	Plumbing, water cooler compressor, 5 yr,	Manufacturer
22 30 00	Plumbing, water heater tank, 6 yr,	Manufacturer
22 15 00	Compressed Air Systems, air compressor, 5 yr,	Manufacturer
23 52 34	Finned Water Tube Boilers, boiler heat exchanger, 5 yr,	Manufacturer

E X T E N D E D W A R R A N T I E S, continued.

SPEC.	ITEM & WARRANTY -	RESPONSIBLE PARTY (IES)
23 54 00	Forced Air Furnaces &Split System Air Conditioning,	
	5 yr compressor, 10 yr heat exchanger,	Manufacturer
23 55 00	Fuel Fired Unit Heaters, unit heat exchanger, 5 yr,	Manufacturer
23 64 00	Air Cooled Water Chillers, 5 yr,	Manufacturer
26 55 50	Ballfield Lighting, 5 yr,	Manufacturer
26 33 00	Emergency Power Supply, 5 yr,	Manufacturer

G E N E R A L I N F O R M A T I O N

SPEC	ITEM DESCRIPTION; MANUFACTURER, SPEC #, STYLE, TYPE, COLOR, ETC.
04 20 00	Brick, _____
04 20 00	Concrete Masonry _____
04 20 00	Glass Masonry _____
06 41 00	Custom Casework _____
07 24 00	EIFS _____
07 42 13	Prefrmd. Roofing & Access. _____
07 52 00	Modif'd Bitumen Memb. Roofing _____
08 13 14	Steel Doors & Frames _____
08 14 16	Wood Doors _____
08 41 13	Alum. Entry & Storefront _____
08 51 13	Alum. Windows, Oper. & Fixed _____
08 71 00	Door H'dware Latchsets _____
	Locksets _____
	Closers _____
	Exit Devices _____
09 30 00	Cer. Tile Floor & Wall _____
09 51 13	Susp. Acoust. Ceiling _____
09 65 00	Resilient Floor _____
09 68 00	Carpet _____
09 90 00	Painting _____
10 21 14	Plas. Lam. Toil. Part's _____
10 26 00	Bumper, Corner & Wall Prot. _____
10 14 00	Interior Signage _____
10 28 00	Toil. & Bath Access. _____
12 21 13	Mini & Vert. Blinds _____
13 34 19	Pre-Engr. Bldg. Systems _____
26 12 00	Distribution Transfmers. _____
26 24 16	Panelboards _____
26 24 17	Load Centers _____

G E N E R A L I N F O R M A T I O N, continued.

SPEC	ITEM DESCRIPTION; MANUFACTURER, SPEC #, STYLE, TYPE, COLOR, ETC.
26 28 26	**Transfer Switch** _____
26 28 27	**By-pass Isolation Switch** _____
26 51 00	**Interior Luminaires** _____
26 56 00	**Site Lighting** _____
26 32 13	**Pkg. Engine Generator Syst.** _____
28 31 00	**Fire Detect. & Alarm Syst.** _____
28 16 00	**Intrusion Detect. Syst.** _____

I N S T R U C T I O N S

1. The prime contractor shall complete this form and provide it with the close out documentation.
2. Extended warranties; Provide name, phone and fax number for the responsible party (ies).
3. General Information; Provide name, phone and fax number, and pertinent information indicated for each item listed.
4. It may not be required to use all of the items listed under Extended Warranties and General Information, in the construction of this project. Should this occur, simply line through the item to indicate it was not used on this project.

_____ _____

Prime Contractor (See note below) Date

_____ _____

Mailing Address City, State and Zip Code

_____ _____

Phone Number Fax Number

_____

E-mail Address

If prime contractor is a corporation, affix the corporate seal below and provide signature of responsible party who can legally obligate the corporation.

SECTION 01 81 13: GREEN PROCUREMENT

PART 1 GENERAL

1.01 GREEN PROCUREMENT & POLLUTION PREVENTION

A. Green Procurement is a mandatory component of the Air Force pollution prevention program. The AF Installation Pollution Prevention Program Guide includes this goal for Green Procurement: “100% of all products purchased each year in each of U.S. EPA’s ‘Guideline Item’ categories shall contain recycled materials meeting U.S. EPA’s Guideline Criteria.”

B. Currently, reporting of green procurement purchases is limited to contracts having a total value greater than $100,000.00, which includes the purchase of any amount of U.S. EPA-designated items.

C. This document contains guidelines for implementing the RCRA, EO, DOD, and Air Force requirements

1.02 AUTHORITY & REFERENCES:

A. The Resource Conservation and Recovery Act (RCRA), section 6002 (42 U.S.C. 6962)

B. Executive Order (EO) 13101, Greening the Government through Waste Prevention, Recycling, and Federal Acquisition.

C. Title 40, Code of Federal Regulations (CFR), Part 247, Comprehensive Procurement Guideline for Products containing Recovered Material.

D. Federal Acquisition Regulations (FAR)

1.03 REGULATORY BACKGROUND

A. Section 6002 of RCRA requires federal agencies to give preference in the acquisition process to products and practices that conserve and protect natural resources and the environment. EO 13101 requires federal agencies to expand waste prevention and recycling programs, implement affirmative procurement programs for the United States Environmental Protection Agency (EPA) -designated items, and procure other environmentally preferable products and services. The stated purpose of the Green Procurement Program is to stimulate the market for recovered materials. As a result of EO 13101, the EPA issued the Comprehensive Procurement Guidelines (CPG’s) that have established the mandatory procurement by federal agencies of 36 items produced with recovered materials. The EPA has also issued Recovered Material Advisor Notices (RMANs) to accompany the CPGs and provide detailed information on the designated items.

B. Please direct all questions regarding the plan to the Contracting Officer for forwarding to the 1 SOCES/CEAN Environmental Flight, 8844651.

1.04 DOD AND AIR FORCE REQUIREMENTS

A. Green Procurement programs are required of all Air Force (USAF) installations. Department of Defense (DOD) Instruction 4715.4, Pollution Prevention, calls for program establishment in accordance with RCRA and EO 12873. Green Procurement is also addressed in Air Force Instruction (AFI) 32-7080, Pollution Prevention Program, and the 24 July 1995 Air Force Pollution Prevention Strategy. The Strategy sets program goals, and the AFI provides program guidance.

1.05 SUBMITTALS

A. Submit under provisions of Sections 01 00 00, 01 33 00 and 01 60 00.

B. Each contractor as defined in paragraph 1.08 Definitions must complete the form attached at the end of this section, indicating which products containing recycled or recovered products are going to be incorporated in the construction of this project. In accordance with paragraph 1.09 Exemptions, provide which exemption is applicable to each listed product.

C. Product Data: Submit manufacturer’s material specifications, installation instructions, physical characteristics,

D. Manufacturer's Certificate: Certify that products meet or exceed the specified requirements.

E. Sample: Submit sample for record.

1.06 RECYCLED OR RECOVERED PRODUCTS

A. Those construction materials identified on the Form at the end of this section.

1.07 QUALITY ASSURANCE

A. Manufacturer: Companies specializing in the manufacture of products that comply with the requirements of this section with a minimum of three (3) years documented experience.

1.08 DEFINITIONS:

A. GREEN PROCUREMENT: The purchase of environmentally preferable products manufactured from recycled and reclaimed materials.

B. ACQUISITION: The acquiring by contract with appropriated funds for supplies or services (including construction) by and for the use of the Federal Government through purchase or lease, whether the supplies or services are already in existence or must be created, developed, demonstrated, and evaluated. Acquisition begins at the point when agency needs are established and includes the description of requirements to satisfy agency needs, solicitation and selection of sources, award of contracts, contract financing, contract performance, contract administration, and those technical and management functions directly related to the process of fulfilling agency needs by contract.

C. CONTRACTOR (S): The prime contractor, subcontractors, material suppliers, and equipment suppliers who provide the products that will be used in the construction of this project.

D. ENVIRONMENTALLY PREFERABLE: Products or services having a lesser or reduced effect on human health and the environment when compared to competing products or services, serving the same purpose. This comparison may consider raw materials acquisition, production, manufacturing, packing, distribution, reuse, operation, maintenance, or product or service disposal. (EO 13101)

E. EPA DESIGNATED ITEM: An item that is or can be made with recovered material; that is listed by the Environmental Protection Agency (EPA) in a procurement guideline (40CFR, part 427); and for which EPA has advised purchasing recommendations in a related Recovered materials Advisory Notice (RMAN). (FAR 23.402)

F. EXECUTIVE AGENCY OR AGENCY: An executive agency as defined in 5 U.S.C. 105. For the purpose of this order, military departments, as defined in 5 U.S.C. 102 are covered under the auspices of the Department of Defense.

G. FORM: The Affirmative Procurement Reporting Form found at the end of this section.

H. POLLUTION PREVENTION: Source reduction as defined in the Pollution Prevention Act of 1990 (42 U.S.C. 13102), and other practices that reduce or eliminate the creation of pollutants through (a) increased efficiency in the use of raw materials, energy, water, or other resources; or (b) protection of natural resources by conservation.

I. PRODUCT: Materials and equipment that will be used in the construction of this project.

J. POST CONSUMER MATERIAL: A material or finished product that has served its intended use and has been discarded for disposal or recovery, having completed its life as a consumer item. "Postconsumer material" is a part of the broader category of "recovered material".

K. PROCUREMENT: The purchase and providing of products to be used in the construction of this project.

L. RECOVERED MATERIALS: Waste materials and by-products which have been recovered or diverted from solid waste, but such term does not include those materials and by-products generated from, and commonly reused within, an original manufacturing process. (EO 13101, 42 U.S.C. 6903 (19) and FAR 23.402)

M. RECYCLABILITY: The ability of a product or material to be recovered from or otherwise diverted from the solid waste stream for the purpose of recycling. (EO 13101)

N. RECYCLING: The series of activities, including collection, separation, and processing by which products or other materials are recovered from the solid waste steam for use in form of raw materials in the manufacture of new products other than fuel for producing heat or power by combustion. (EO 13101)

O. RECYCLED MATERIAL: A material utilized in place of raw or virgin material in product manufacturing consisting of materials derived from postconsumer waste, industrial scrap, material derived from agricultural wastes, and other items, all of which can be used in new product manufacturer. (EPA Guidelines & OFPP Policy Letter 92-4)

P. RECYCLED PRODUCT: A recycled product is one made completely or partially from waste materials or by-products recovered or diverted from the solid waste stream.

Q. SOLID WASTE: Garbage, refuse, sludges and other discarded materials including those from industrial, commercial, and agricultural operations, and from community activities. This excludes solids or dissolved materials in domestic sewage or other significant pollutants in water resources, such as silt, dissolved or suspended solids in industrial waste water effluents, dissolved materials in irrigation return flow, etc. (EPA Guidelines)

R. SPECIFICATION (S): A clear and accurate description of the technical requirements for materials, products, or services including the minimum requirement for materials' quality and construction and any equipment necessary for an acceptable product. In general, specifications are in the form of written descriptions, drawings, prints, commercial designations, industry standards, and other descriptive references.

S. UNREASONABLE PRICE: If the cost of the recycled content product exceeds the cost of a non-recycled item, the Air Force considers the cost to be unreasonable. (Air Force Affirmative Procurement Plan)

T. VERIFICATION: Procedures used by procuring agencies to confirm both vendor estimates and certifications of the percentages of recovered materials contained in the products supplied to them or to be used in the performance of a contract. (EPA Guidelines)

U. WASTE PREVENTION: Any change in the design, manufacturing, purchase, or use of materials or products (including packaging) to reduce their amount or toxicity before they are discarded. Waste prevention also refers to the reuse of products or materials.

V. WASTE REDUCTION: Preventing or decreasing the amount of waste being generated through waste prevention, recycling, or purchasing recycled and environmentally preferable products.

1. 09 EXEMPTIONS

A. U.S. EPA recommends minimum content levels for those items listed at paragraph 1.10. The minimum content levels are indicated in the Form. These levels are **mandatory** for Air Force procurements **unless one of the following exemptions applies.** RCRA provides the following exemptions from the requirement to purchase EPA-designated items:

1. The product is not available from a sufficient number of sources to maintain a satisfactory level of competition (i.e., available from two or more sources).
2. The product is not available within a reasonable period of time.
3 The product does not meet the performance standards in applicable specifications or fails to meet reasonable performance standards of the procuring agency.
4. The product is not available at a reasonable price. For Air Force purposes, "unreasonable price" is defined as follows: If the price of the recycled-content product exceeds the cost of a non-recycled item, then the price is considered unreasonable.

B. Each contractor is responsible for completion of the Form with respect to his or her work and products being provided. Each contractor shall provide written documentation to support his/her decision not to acquire items meeting the minimum content levels. This documentation shall be forwarded to the Contracting Officer for review and approval. In the event the documentation fails to support the contractor's findings, the Contracting Officer shall return the documentation to the contractor citing the reason(s) for disapproval. The contractor shall resubmit and address the deficiencies.

1.10 U.S. EPA-DESIGNATED ITEMS

A. The 54 U.S. EPA-designated items are listed below. **Not all of these items and the products listed under each item may be required in the construction of this project. Please refer to the drawings and specifications.** The executed Form shall be used to demonstrate compliance with the stated procurement requirements.

1. PAPER PRODUCTS
   - Item 1: All paper and paper products, excluding building and construction paper grades.
2. VEHICULAR PRODUCTS
   - Item 2: Lubricating oils containing re-refined oil, including engine lubricating oils, hydraulic fluids, and gear oils, but excluding marine and aviation oils.
   - Item 3: Tires, excluding airplane tires.
   - Item 4: Reclaimed engine coolants, excluding coolants used in non-vehicular applications
3. CONSTRUCTION PRODUCTS
   - Item 5: Building insulation products.
   - Item 6: Structural fiberboard products for applications other than building insulation.
   - Item 7: Laminated paperboard products for applications other than building insulation.
   - Item 8: Cement and concrete, including products such as pipe and block, containing fly ash.
   - Item 9: Cement and concrete, including concrete products such as pipe and block, containing ground-granulated blast furnace (GGBF) slag.
   - Item 10: Carpet made of polyester fiber for use in low- and medium-wear applications.
   - Item 11: Floor tiles containing recovered rubber or plastic.
   - Item 12: Patio blocks containing recovered rubber or plastic.
   - Item 25: Shower and restroom dividers/partitions containing recovered steel or plastic.
   - Item 26: Reprocessed and consolidated latex paint for specific uses.
   - Item 37: Carpet cushion
   - Item 38: Flowable fill.
   - Item 39: Railroad grade crossing surfaces.
4. TRANSPORTATION PRODUCTS
   - Item 13: Traffic barricades used in controlling or restricting vehicular traffic.
   - Item 14: Traffic cones used in controlling or restricting vehicular traffic.
   - Item 27: Parking stops.
   - Item 28: Channelizers used as temporary traffic control devices.
   - Item 29: Delineators used as temporary traffic control devices.
   - Item 30: Flexible delineators used as temporary traffic control devices.
5. PARK AND RECREATION PRODUCTS
   - Item 15: Playground surfaces containing recovered rubber or plastic.
   - Item 16: Running tracks containing recovered rubber or plastic.
   - Item 31: Plastic fencing.
   - Item 40: Park benches and picnic tables.
   - Item 41: Playground equipment.
6. LANDSCAPING PRODUCTS
   - Item 17: Hydraulic mulch products containing recovered paper or recovered wood.
   - Item 18: Compost made from yard trimmings, leaves, and/or grass clippings.
   - Item 32: Garden and soaker hoses containing recovered rubber or plastic.
   - Item 33: Lawn and garden edging containing recovered rubber or plastic.
   - Item 42: Food waste compost.
   - Item 43: Plastic lumber landscaping timbers and posts.
7. NON-PAPER OFFICE PRODUCTS
   - Item 19: Office recycling containers.
   - Item 20: Office waste receptacles.
   - Item 16: Plastic desktop accessories.
   - Item 22: Toner cartridges.
   - Item 23: Binders.
   - Item 24: Plastic trash bags.
   - Item 34: Printer ribbons (re-inked ribbons or re-inking equipment/service for ribbons).
   - Item 35: Plastic envelops.
   - Item 44: Solid plastic binders.
   - Item 45: Plastic clipboards.

Item 46: Plastic file folders.
Item 47: Plastic clip portfolios.
Item 48: Plastic presentation folders.

8. MISCELLANEOUS PRODUCTS
Item 36: Pallets
Item 49: Sorbents.
Item 50: Industrial drums.
Item 51: Awards and plaques.
Item 52: Mats
Item 53: Signage, including supports and posts.
Item 54: Manual grade strapping.

1.11 APPLICABILITY

A. These procedures apply to all contractors employed in the construction of this project.

B. Please direct all questions regarding the plan to the Contracting Officer for forwarding to the 1 SOCES/CEAN Environmental Flight, 884-4651.

1.12 INTENT

A. The intent of this section is to increase the awareness of all contractors as to the availability of products manufactured from or that contain recycled materials, thereby increasing the use of these products in the construction of this project.

B. The various sections of the specifications contain references to products to be used in the construction of this project. The listed product **may or may not** be manufactured from or contain recycled materials. **Therefore all contractor(s), subcontractors, equipment suppliers and material suppliers are responsible for compliance with this specification and those items/products listed on the Form. Recycled products shall be used wherever possible subject to the exemptions as per paragraph 1.09.**

C. Substitution of recycled materials or recycled products for specified products are subject to the provisions of paragraph 1.05 Submittals (above) and Section 01 00 00, paragraph 1.11.

PART 2 PRODUCTS

2.01 PARTIAL LIST OF PRODUCT SOURCES AND INFORMATION

A. GENERAL DATA:
1. GreenSpec Binder, Environmental Building News, www.ebuild.com
2. Certified Forest Products Council, www.certifiedwood.org/
3. Wiley Series in Sustainable Design, www.wiley.com/
4. The Carpet and Rug Institute, www.carpet-rug.com/
5. Information, McGraw-Hill, dialogue@mcgraw-hill.com
6. Florida Directory of Recycled Product Vendors, www.2.dep.state.fl.us/waste/programs/rbac/downloads/rbac_dir.pd
7. Oikos Green Building Source, News, searchable products data base, library, www.oikos.com
8. Green Design Network, News, publications, databases, www.greendesign.net
9. Green Works Recycled Content7 Product Guide, detailed vendors directory, www.metrokc.gov/greenworks/recycontent.htm>

B. DIVISION 03 00 00, CONCRETE
1. GranCem, granulated blast-furnace slag, www.grancem.com/
2. Syndesis, cement-based, pre-cast product workable with wood tools, www.syndesisinc.com/

C. DIVISION 04 00 00, MASONRY
1. Heble Building Systems, autoclaved aerated concrete blocks, www.heble.com/
2 Ytong Florida Ltd., autoclaved aerated concrete blocks, www.ytong-usa.com/

D. DIVISION 06 00 00, WOOD, PLASTICS, AND COMPOSITES
1. Avonite, solid surfacing, www.avonite.com/
2. Chemical Specialties, wood treatment, www.treatedwood.com/

3. Homasote Company, structural fiberboard, www.homasote.com/
4. Isoboard, fiberboard composed of straw fibers and non-toxic resins, www.isoboard.com/
5. TrusJoist Mac Millan, engineered wood products, www.homasote.com/

E. DIVISION 07 00 00, Thermal & Moisture Protection
1. Duro-Last Roofing, recycled PVC walkway pads, 1-800-2480280
2. Johns Manville, Insulation products, www.jm.com/
3. Majestic Skylines, rubber-based slate-look roofing for steep roofs, www.majesticskylines.com/
4. Owens-Corning, insulation products, www.owenscorning.com/

F. DIVISION 08 00 00, OPENINGS
1. Marvin Window & Door, windows, some meeting “Energy Star Label”, www.marvin.com/
2. Pella, energy efficient windows, www/pella.com/

G. DIVISION 09 00 00, FINISHES
1. Armstrong World Industries, Inc.-Flooring Systems, www.armstrong-floors.com/
2. Armstrong World Industries, Inc.-Ceiling Systems, www.ceilings.com/
3. Benjamin Moore & Co., VOC free acrylic interior latex paint, www.benjaminmoore.com/
4. CanFibre Group Ltd., all-green medium-density fiberboard, www.canfibre.com
5. Chemrex Inc., low-e interior paint, www.chemrex.com/
6. Collins & Aikman Floor coverings, carpet with 100% post-consumer backing, www.powerbond.com/
7. DesignTex, Inc., polyester panel fabric made from 100% PET fiber, www.dtex.com/
8. Dodge-Regupol, Inc., 100% recycled rubber-flooring, www.regupol.com/
9. Eco-sensitive modular tile, vinyl tile with 100% recycled carpet-backing, www.powerbond.com/
10. Environmental Stone Products, stone manufactured from 100% recycled glass, www.environmentalstone.com/
11. Glidden: residential interior latex paints 100% free of VOC, www.icipaintstores.com/
12 Homasote Inc., sound barrier, www.homasote.com/
13. Isoboard Enterprises, Inc. panel made from wheat straw and non-toxic resins, 1-503-2427345
14. Marley-Flexco Co., flooring made form 95% recycled truck and bus tires, www.marleyflexco.com/
15. The Mat Factory, Inc., interlocking roll-up tiles made from 100% postconsumer tire rubber and PVC plastic from electric cable covers, 1-949-6453122
16. Permafirm Pad Co., carpet pads made from almost 100% recycled content, 1-800-3446977
17. Sherwin Williams, VOC compliant paints and enamels, www.sherwin.com/
18. SierraPine Limited, formaldehyde-free particleboard and medium density fiberboard containing recycled/recovered wood fiber, www.sierrapine.com/
19. Summittville Tiles, impervious porcelain tiles using feldspar tailings, www.summitville.com/
20 Tectum, natural-fiber acoustical ceiling and wall panels, www.tectum.com/
21. Tiles with natural fibers, tiles made of a bio-alloy material and natural fibers, www.maderatile.com
22. USG Interiors, Inc., synthetic gypsum board, www.usg.com/
23. Decorative Architectural Tiles, floor, counter & wall tile made from 100 % postconsumer glass, 1-808-8857812
24. Forbo, linoleum-flooring utilizing renewable resources, www.forbo.com/

H. DIVISION 10 00 00, SPECIALTIES
1. The Access Store, modular ramping system made from 100% recycled rubber, www.accessstoe.com/
2. BP Solar, photovoltaic modules and systems, www.bp.com/bpsolar/index
3. Mecho Shade Systems, interior shadecloths, www.mechoshade.com/
4. R Control, structural insulated panel (SIP), www.mechoshade.com/

I. DIVISION 12 00 00, FURNISHINGS
1. Guilford of Maine, fabric from 100% recycled materials, www.terratex.com/
2. Phenix Biocomposites, tabletops made from soy based products free of petrochemicals, 1-800-3248187
3. Safe Solutions, LLC, furniture manufactured from waste wood, 1-970-2473333

J. DIVISION 14 00 00, CONVEYING EQUIPMENT
1. Montgomery KONE, AC girlies elevators, www.montgomery-kone.com/

K. DIVISION 26 00 00, ELECTRICAL
1. Advance Transformer Company, linear reactor ballast, www.advancetransformer.com/

2. Artemide Inc., energy efficient cold-cathode lighting, www.artemide.com/
3. Edison Price Lighting, track mounted metal-halide PAR 30 &38 lamps, 1-212-5216995
4. Leviton Manufacturing Corporation, Inc., occupancy sensors, www.leviton.com/
5. Phillips Lighting, energy efficient compact fluorescent lamps, www.phillips.com/lighting
6 Osram Sylvania, mercury-free lamps and energy efficient fluorescent lamps, www.osramsylvania.com/
7. Sensor Switch, lighting control occupancy sensors, www.sensorswitch.com/
8. Venture Lighting, pulse-start high performance lamp and ballast system, www.venturelighting.com/

PART 3 EXECUTION

3.01 INSTALLATION

A. Install materials and systems in accordance with manufacturer's written instructions and approved submittals. Install materials and systems in proper relation to adjacent construction and with uniform appearance.

B. Coordinate with work of other sections.

C. Restore damaged finishes and test for proper function.

D. Clean and protect work from damage.

END OF SECTION

GREEN PROCUREMENT REPORTING FORM
(PER EXECUTIVE ORDER 13101)

PROJECT NUMBER:_____
BLDG NUMBER:_____
PROJECT MANAGER_____
PROJECT INSPECTOR:_____
CONTRACTOR:_____
This form is to be completed by the Contractor and submitted through 1 SOCONS to 1 SOCEC. It is the responsibility of the 1 Special Operations Civil Engineering Squadron construction inspector to submit this data to 1 SOSCES/CEAN who in-turn reports it to AFSOC MAJCOM IAW E.O. 13101, Federal Acquisition, Recycling, and Waste Prevention.

RECYCLED OR RECOVERED PRODUCT	**% REQUIRED (MINIMUM)**	**% AVAIL (ACTUAL)**	**QUANTITY USED/UI**	**EXEMPTED 1,2,3,4**
-ROCK WOOL INSUL	75%			
-FIBERGLASS INSUL	20-25%			
-LOOSE FILL/SPRAY ON INSUL	75%			
-PERLITE COMP BOARD INSUL	23%			
-PLASTIC RIGID FOAM INSUL	9%			
-GLASS FIBER REINF FOAM INSUL	6%			
-PHENOLIC RIGID FOAM INSUL	5%			
-STRUCTURAL FIBER BD	80-100%			
-LAMINATED PAPER BD	100%			
-CEMENT/CONCRETE (FLYASH)	SEE SPEC			
-CARPET (PET)	25-100%			
-PATIO BLOCKS/RUBBER	90-100%			
-PATIO BLOCKS/PLASTIC	90-100%			
-FLOOR TILES/RUBBER	90-100%			
-FLOOR TILES/PLASTIC	90-100%			
-TRAFFIC CONES	50-100%			
-TRAFFIC BARRICADES	80-100%			
-PLAYGROUND SURFACES	90-100%			
-RUNNING TRACKS	90-100%			
-COMPOST	100%			
-WOOD-BASED HYDRAULIC MULCH	100%			
-PAPER-BASED HYDRAULIC MULCH	100%			
REPROCESSED LATEX PAINT WHITE, OFF-WHITE & PASTEL COLORS	20%			
REPROCESSED LATEX PAINT GREY, BROWN, EARTHTONES & OTHER DARK COLORS	50-99%			
CONSOLIDATED LATEX PAINT	100%			
PLASTIC/RUBBER PARKING STOPS	100%			
CONCRETE CONTAINING COAL FLY ASH PARKING STOPS	20-40%			
CONCRETE CONTAINING GGBF PARKING STOPS	25-70%			
PLASTIC SHOWER & RESTROOM DIVIDERS/PARTITIONS	20-100%			

CERTIFICATION

I hereby certify the Statement of Work/Specifications for the requisition/procurement of all materials listed on this form comply with EPA standards for recycled/recovered materials content.

_____	_____	_____
Contractor	Inspector	Environmental Flight

The following exemptions may apply to the non-procurement of recycled/recovered content materials:

1) The product does not meet appropriate performance standards
2) The product is not available within a reasonable time frame
3) The product is not available competitively (from two or more sources)
4) The product is only available at an unreasonable price (compared with a comparable non-recycled content product.)

SECTION 02 41 19: SELECTIVE STRUCTURE DEMOLITION

PART 1 GENERAL

1.01 SUMMARY

A. Provide all demolition as required by the Contract Documents.
   1. Demolish interior and exterior portions of structures including but not limited to, walls, partitions, windows, doors, roofing, paving/curb/guttering, site furniture, shrubs, trees, interior finishes, etc., and associated components.
   2. Demolish plumbing, mechanical, and electrical equipment and associated components
   3. Demolished materials shall become the property of the Contractor unless otherwise noted on the Drawings or in the Specifications.
   4. Remove and dispose of demolished materials at a legally approved dumpsite off base.
   5. Notify Contracting Officer prior to shut-off of existing utilities. Cap off utilities that are to remain in use.
   6. Where fasteners, bolts, piping, wiring, ductwork and/or equipment that is/are to be removed are attached to or pass through walls, floors, ceilings or roofs, the Contractor shall patch all holes or openings under 1(one) square foot in size to match adjacent construction. Patch holes or openings in fire rated walls as required to maintain fire rating.
   7. **Existing fire suppression systems, fire detection systems, and intrusion systems must remain active** unless approved by the Contracting Officer and the responsible agency (Fire Department/Security Forces). Required deactivation of systems, or portions thereof, during demolition/construction must be requested and approved 72 hours in advance. Contractor will be responsible for protection of premises during periods of deactivation. If necessary, provide temporary protection or services.

1.02 SUBMITTALS

A. Submit for approval selective demolition schedule, including schedule and methods for capping and continuing utility service, and clearing & grubbing schedule.

1.03 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Use experienced workmen.

1.04 PROJECT CONDITIONS

A. Government personnel will not occupy areas of Work during demolition.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.01 DEMOLITION

A. Do not damage building elements and improvements indicated to remain. Items of salvage value and not included on schedule of salvage items to be returned to Government may be removed from structure. Storage or sale of items at Project site is prohibited.

B. Do not close or obstruct streets, walks, drives or other occupied or used spaces or facilities without the written permission of the Contracting Officer and the authorities having jurisdiction. Do not interrupt utilities serving occupied or used facilities without the written permission of the Contracting Officer and authorities having jurisdiction. If necessary, provide temporary utilities

C. Cease operations if public safety or remaining structures are endangered. Perform temporary corrective measures until operations can be continued properly. Complete closure of Air Force roads will not be authorized.

END OF SECTION

SECTION 03 30 00 CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Slabs on grade, slabs on grade including integral footings, foundations, beams, columns, and elevated floor and roof slabs.

B. Equipment pads and thrust blocks.

C. Control, expansion and contraction joint devices.

1.02 REFERENCES

A. ACI 301 - Specifications for Structural Concrete.

B. ACI 304R – Guide for Measuring, Mixing, Transporting and Placing Concrete

C. ACI 305R - Hot Weather Concreting.

D. ACI 306R - Standard Specification for Cold Weather Concreting.

E. ACI 308R - Standard Specification for Curing Concrete.

F. ACI 318 - Building Code Requirements for Structural Concrete.

G. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.

H. ASTM C33 - Standard Specification for Concrete Aggregates.

I. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.

J. ASTM C94 - Standard Specification for Ready-Mixed Concrete.

K. ASTM C150 - Standard Specification for Portland Cement.

L. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.

M. ASTM C173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.

N. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.

O. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.

P. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete.

Q. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.

R. ASTM C685 - Standard Specification for Concrete Made By Volumetric Batching and Continuous Mixing.

S. ASTM D994 - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).

T. ASTM E1643 - Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs.

U. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

V. ASTM C1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).

W. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements

1.03 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Product Data: Provide data on joint devices, sealants, attachment accessories and admixtures.

C. Concrete mix design.

D. Submit manufacturer’s installation instructions.

E. Provide 12-inch long sample of expansion joint and control joint.

1.04 SUSTAINABLE DESIGN SUBMITTALS

A. Section 01 81 13 – Green Procurement: Requirements for sustainable design submittals.

B. Manufacturer's Certificate: Certify products meet or exceed specified sustainable design requirements.
   1. Materials Resources Certificates:
      a. Certify recycled material content for recycled content products.
      b. Certify source for regional materials and distance from Project site.
   2. Indoor Air Quality Certificates:
      a. Certify volatile organic compound content for each interior adhesive and sealant and related primer.

C. Product Cost Data: Submit cost of products to verify compliance with Project sustainable design requirements. Exclude cost of labor and equipment to install products.
   1. Provide cost data for the following products:
      a. Products with recycled material content.
      b. Regional products.

1.05 PROJECT RECORD DOCUMENTS

A. Accurately record actual locations of embedded utilities and components, which are concealed from view.

1.06 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 301.

B. Maintain one copy of each document on site.

C. Acquire cement and aggregate from same source for all work.

D. Conform to ACI 305R when concreting during hot weather.

E. Conform to ACI 306R when concreting during cold weather.

1.07 COORDINATION

A. Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.

PART 2 PRODUCTS

2.01 CONCRETE MATERIALS

A. Cement: ASTM C150, Type I - Normal or Type III - High Early Strength Portland type.

B. Fine and Coarse Aggregates: ASTM C33. Course aggregate shall be washed and shall consist of crushed stone. Particle shape of coarse shall be generally cubicle in shape.

C. Water: ACI 318; potable, Clean and not detrimental to concrete with no chloride ions.

2.02 ADMIXTURES

A. Air Entrainment: ASTM C260.

B. Chemical: ASTM C494, Type D - Water Reducing and Retarding or Type E - Water Reducing and Accelerating Admixture.

C. Fly Ash: ASTM C618. Type C or Type F (Loss on ignition for type F shall not exceed 6**%). If an approved pozzolanic material is used, the weight of flyash used shall not exceed 10% determined by dividing the weight of flyash by the weight of Portland cement.**

D. Use of all admixtures must be approved by the Contracting Officer. **The use of 'plastisizers' is prohibited unless approved by the Contracting Officer.**

2.03 ACCESSORIES

A. Bonding Agent: Polymer resin emulsion or two component modified epoxy resin.

B. Vapor Barrier: ASTM E1745, Class "B" reinforced, multi-ply vapor retarder (Water vapor resistance 0.3 perms, Tensile strength 30.0 lbf/in, Puncture resistance 1700 grams). Install in strict compliance with manufacturer's written instructions including filed taping of seams and installation of pipe boots penetrating through the slab.

C. Non-shrink Grout: ASTM C1107: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,400 psi in 48 hours and 7,000 psi in 28 days.

2.04 JOINT TYPES, DEVICES AND FILLER MATERIALS (Identify Type on Structural Drawings)

A. Isolation Joint (IJ): Asphalt impregnated glass fiber filler Type A: ASTM D994, minimum 1/2" inch thick or as indicated on drawings.

B. Exterior Construction Joint (ECJ): Integral galvanized steel, formed to tongue and groove profile, with removable top strip exposing sealant trough, and ribbed steel spikes with tongue to fit top screed edge.

C. Exterior Tooled Contraction Joint (ETC): Tool formed joint located between isolation joints.

C. Interior Transverse Construction Joint (ITC): Integral galvanized steel, formed to tongue and groove profile, with ribbed steel spikes with tongue to fit top screed edge with removable cap for sealant pocket.

D. Interior Longitudinal Contraction Joint (ILC): Joint that is saw cut into the surface of the concrete as soon as the concrete has hardened sufficiently to prevent aggregates from becoming dislodged by the cutting process (usually 4-12 hours after the concrete hardens) and completed before drying shrinkage causes cracking. Initial cut shall be 1/3 the thickness of the slab. After concrete has cured, joints shall be re-cut to ½" width x ½" depth. Provide foam backer rod and fill joint with sealant flush with top of slab.

E. All joint material shall match the thickness of the slab.

F. Sealant:
1. ASTM D6690: Hot applied synthetic rubber compound.
2. Cold applied two-part liquid neoprene.

2.05 CONCRETE MIX

A. Select proportions for normal weight concrete in accordance with ACI 301. Mix concrete in accordance with ACI 304R. Deliver concrete in accordance with ASTM C94.

B. Use accelerating admixtures in cold weather ONLY when approved by Contracting Officer. Use of admixtures will not relax cold weather placement requirements.

C. Accelerating admixtures shall not contain more than 0.1% calcium chloride.

D. Use set retarding admixtures during hot weather only when approved by Contracting Officer.

E. Add air entraining agent to normal weight concrete mix for work exposed to exterior.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify site conditions.

B. Verify requirements for concrete cover over reinforcement.

C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not cause hardship in placing concrete.

3.02 PREPARATION

A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions. Remove laitance, coatings, and unsound materials.

3.03 SCHEDULE - JOINT CONTROL

A. Floor Slab Perimeter and Exterior/Interior Isolation Joints: Joint filler Type A set 1/8 inch below floor slab elevation.

B. Exterior/Interior Construction Joints: Set joints to line and grade.

C. Contraction Joints: Saw-cut joints to dimensions shown on the drawings.

D. See 2.04. above.

3.04 PLACING CONCRETE

A. Place concrete in accordance with ACI 318.

B. Notify Contracting Officer minimum 24 hours prior to commencement of operations.

C. Ensure reinforcement, inserts, embedded parts, formed joint fillers and joint devices are not disturbed during concrete placement.

D. Install vapor barrier under interior slabs on grade. Lap joints minimum 8 inches and seal watertight by taping edges and ends.

E. Repair vapor barrier damaged during placement of concrete reinforcing. Repair with vapor barrier material; lap over damaged areas minimum 8 inches and seal watertight.

F. Install joint fillers, primer and sealant in accordance with manufacturer's instructions.

G. Install construction joint device in coordination with floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.

H. Install joint device anchors. Maintain correct position to allow joint cover flush with floor finish.

I. Deposit concrete at final position. Prevent segregation of mix.

J. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

K. Place concrete continuously between predetermined expansion, control, and construction joints.

L. Do not interrupt successive placements; do not permit cold joints to occur.

M. Saw cut joints within 12 hours of placing using 3/16-inch thick blade. Depth of cut shall not be less than one-third (1/3) the thickness of the slab.

N. Screed floors and slabs on grade level, maintaining surface flatness of maximum 1/4 inch in 10 feet.

3.05 CONCRETE TYPES AND FINISHING

A. Finish concrete floor surfaces in accordance with ACI 301.

B. Monolithic Foundation and Slab-on-Grade: 6” thick, 3,000 psi 28 day concrete, formed to line and grade. Steel trowel finishes surface of slab. Vertical surfaces shall be repaired/patched and finished no later than one day after form removal. Wet and rub surface with a carborundum brick or other approved abrasive, producing a satisfactory finish, smooth and uniform in color and texture. Seal all joints with an approved joint sealer.

C. Beams, Columns, Elevated Floor and Roof Slabs Exposed to View: 4,000 psi 28 day concrete. Patch/repair surfaces after form removal, wet and rub surface with a carborundum brick or other approved abrasive after patching/repair, producing a satisfactory finish, smooth and uniform in color and texture.

D. Exposed Exterior Sidewalks, Aprons, Landings, Steps: 4” thick, 3,000 psi 28 day concrete, air entrained, and non-slip broom finish.

E. Below Grade Footings, Single-Story Structures: 3,000 psi 28 day concrete, form finish.

F. Below Grade Footings, Multi-Story Structures: 4,000 psi 28 day concrete, form finish.

3.06 CURING AND PROTECTION

A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

C. Cure concrete floor surfaces to requirements of Section 03 39 00.

3.07 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed in accordance with ACI 301 and under provisions of Section 01 41 00.

B. Provide free access to work and cooperate with appointed firm.

C. Submit proposed mix design of each class of concrete to testing firm for review and approval prior to commencement of work.

D. Tests of cement and aggregates may be performed to ensure conformance with specified requirements.

E. Three concrete test cylinders will be taken for every 40 or less cubic yards of each class of concrete placed. Perform one compression test each at 7 days and 28 days, and one spare to be tested when directed by Contracting Officer.

F. One slump test will be taken for each set of test cylinders taken. Slump shall be within 3”-5” range except monolithic foundation and slab-on-grade shall be within 2”-4” range.

3.08 PATCHING

A. Allow Contracting Officer to inspect concrete surfaces immediately upon removal of forms.

B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Contracting Officer upon discovery.

C. Patch imperfections as directed in accordance with ACI 301.

3.09 DEFECTIVE CONCRETE

A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements. Concrete not conforming to specified strength in 28 days will be considered defective.

B. Defective concrete will be **removed and replaced**. Removal will be to the nearest construction joint in all directions. Repair of defective concrete will be permitted only upon approval from the Contracting Officer.

C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Contracting Officer for each individual area.

END OF SECTION

SECTION 26 05 00: BASIC ELECTRICAL REQUIREMENTS

PART 1 GENERAL

1.01 REFERENCES:

A. NFPA 70, National Electrical Code (Current edition and updates)

B. UFC 3-501-01, Electrical Engineering (Current edition and updates)

C. UFC 3-520-01, Interior Electrical Systems (Current edition and updates)

D. UFC 3-530-01 Design: Interior, Exterior Lighting and Controls (Current edition and updates)

E. UFC 3-550-01, Exterior Electrical Power Distribution (Current edition and updates)

F. UFC 3-560-01 Electrical Safety, O & M (Current edition and updates)

G. UFC 3-535-01 Visual Air Navigation Facilities (Current edition and updates)

1.02 SUBMITTALS:

A. Submit under provisions of Section 01 33 00.

B. Submit shop drawings and product data grouped to include complete submittals of related systems, products, and accessories in a single submittal.

C. Mark dimensions and values in units to match those specified.

1.03 REGULATORY REQUIREMENTS:

A. Electrical: Conform to NFPA 70.

B. Obtain permits, and request inspections from authority having jurisdiction.

1.04 PROJECT/SITE CONDITIONS:

A. Install Work in locations shown on Drawings, unless prevented by Project conditions.

B. Prepare drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission of Project Engineer before proceeding.

C. Within 30 days of receipt of notice to proceed and prior to starting installation, the Contractor shall submit to the Contracting Officer for approval a complete set of shop drawings to include all material and equipment proposed for installation Sealed by a registered electrical engineer or by a registered professional engineer having at least four years of current experience in the design of electrical systems. The individual's name, signature, and professional engineer number shall be included on all final design documents. All electrical system designs must be reviewed and stamped by an electrical engineer.

PART 2 (NOT USED)

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. New Underground Systems in Project shall conform to the following:

1. Riser Pole (unless otherwise specified in drawings or specs.)
   a. Shall have as a minimum; 15 kv Fused cutouts rated for the system, 9 kv arresters, and applicable rated mounting and support hardware.
2. Conduit (unless otherwise specified in drawings or specs.)
   a. Shall be 5 inch, PVC, schedule 40 or 5 inch red-colored High Density Polyethylene (HDPE. duct for underground installations.
   b. Primary Feeders shall be encased in 3 in concrete minimum or 5 to 6 feet below finished grade if not encased in concrete.

3. Old / Replaced overhead system shall be removed in total and disposed of by the contractor. (unless otherwise specified in drawings or specs.)
4. New transformers, primary sectionalizing enclosures, bypass switches, and associated hardware shall be mounted on a concrete base pad. (unless otherwise specified in drawings or specs.)
   a. Concrete pad shall be 6-inch minimum free concrete surface area at all sides of transformer.
   b. 6 inches minimum pad thickness, 4 inches may below grade
   c. Concrete to be 3500 psi rated minimum strength
   d. Provide opening in concrete slab for primary and secondary in accordance with manufacturer's recommendations.
5. All areas disturbed by trenching / digging for system installation shall be returned to the original (or better) condition prior to beginning of project.
   a. Under NO circumstances are RUNWAY, AIRCRAFT PARKING APRONS, and TAXIWAYS to be removed for installation of an underground system.
      1. These areas are to be DIRECTIONAL BORED UNDER and nonmetallic flexible raceway (HDPE) shall be installed for system installation.
   b. The Contract Officer may approve otherwise and written authorization must be obtained prior to beginning project.
6. Handholds or Pull boxes shall be placed at "ALL" underground circuit connections where a device is used for the connection.
   a. Minimum of 18-inch square accessible, covered, opening.
   b. Strength of handholes and their frames shall be vehicle load rated at all locations and conform to the requirements of IEEE C2.
   c. Precast concrete handholes shall have the required strength established by ASTM C 478.
   d. Frames covers shall be made of grey cast iron and a machine-finished seat shall be provided to ensure a matching joint between frame and cover. Cast iron shall comply with ASTM A 48, Class 30B, minimum.
   e. Handhole shall be provided with sump hole.
   f. Provide slack wrap of cable in handhole.
7. Cable fault indicators shall be installed on all cables in primary junction cabinets and 3 and 4 way switches.
   a. Cable fault indicators shall be automatically reset type which will return the indicator to "no fault" or non-tripped position with inrush current restraint – delayed trip..
   b. Unit shall be either single phase or three phase with remote indicator mounting option to provide convenient mounting on the panel enclosure. Single phase unit shall be provided with a single current sensing core assembly and a single indicator. Three phase unit shall have three independent sensing cores and one indicator assembly that contains three flags.
   c. Unit shall be voltage powered unit and completely sealed and submersible.
   d. Trip Level: set (ampere) to as specified by contracting officer.
8. Finish: All pad-mounted equipment shall be painted to meet ANSI standards for corrosion resistant coatings. Color of all equipment shall match Federal Standard 595B, color 20095. This coating shall be a factory finish. All pad-mounted equipment located South of U.S Highway 98 (Soundside) shall be Stainless Steel.

B. Above Ground Systems in Project
   1. New installed utility, light, and/or communication poles shall conform to the following: (unless otherwise specified in drawings or specs.)
      a. Pole and Foundation must be certified to withstand a 120 mph wind load with a 1.3 gust factor as a complete assembly. Calculations shall be provided and certified by a registered Professional Engineer.
      b. Poles will be placed no closer then 125 feet to an aircraft parking apron, runway, or taxiway.
      c. The Contract Officer may approve otherwise and written authorization must be obtained prior to beginning project.
   2. All electrical devices shall be rated for outdoor/weather use NEMA-3.
   3. All primary connections to the system shall have fused cutouts, arresters, and applicable hardware rated for the system connection.
   4. All external mounted electrical cutout/switch boxes shall be rated NEMA-3, fused, total phase disconnects.

C. Conductor and conductor sizes shall conform to the following:(unless otherwise specified in drawings or specs.)
   1. Conductors shall be of copper or copper strand
   2. Rated for an ambient temperature of no less then 75 degrees C.
   3. Maintain the circuit loads with no more then a 2 percent voltage drop.

4. Rated to maintain a 1.5 designed circuit load as a minimum.
5. Conductor and insulation rated for the circuit voltage, with 600 VAC as the minimum standard.
6. Conductor used on load circuits of voltage 110 VAC or higher shall be of a minimum size no smaller then #12 AWG, copper.
7. Conductor used on Service Drops, transformer to building, of voltage 110 VAC or higher shall be of a minimum size no smaller then #000 AWG, copper.
8. Conductor used on all primary circuits, 12.4 KV and higher, shall be of a minimum size no smaller then #2 AWG, copper.

D. General Standards, minimums (unless otherwise specified in drawings or specs.)
1. Control Voltage: 120 VAC
2. Conduit: PVC (schedule 40), EMT, or HDPE.
3. Secondary system voltage: 208/120 VAC, 3 phase, 4 wire
4. Primary system voltage: 12470 VAC, 3 phase
5. Transformers: liquid cooled, DELTA - WYE connected
6. Building interior junction ("J") boxes: 4" metal utility with blank cover.

3.02 TRAINING

A All training will be accomplished by the manufacturer of the equipment installed not by the Installing Company. The Contracting Officer will approve all training dates and times. All training will be done within 90 days of final acceptance of the project. Equipment manufacturer shall provide 1 day on site training for maintenance personnel and 5 days of technical training to the government at the manufacturing facility. Training shall allow for classroom instruction as well as individual hands on programming, troubleshooting and diagnostics exercises. The contractor shall furnish all literature, materials and training aids. Room and board costs shall be included for two government personnel. Factory training shall occur within 3 months of system acceptance. The training days will be Monday through Friday between 0700 and 1500.

END OF SECTION

SECTION 26 05 13 MEDIUM-VOLTAGE CABLE

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Medium voltage cable.

B. Cable terminations.

C. Above ground sectionalizing enclosures

D. Pad Mounted, three-way or four-way switchgear

1.02 REFERENCES:
A. International Electrical Testing Association:
   1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

B. NFPA 70 – National Electrical Code

1.03 SUBMITTALS
A. Submit under provisions of Section 01 33 00.

B. Product Data: Provide for cable, terminations, and accessories.

1.04 QUALIFICATIONS
A. Manufacturer: Company specializing in manufacturing Products specified in this Section with minimum five years experience.

B. Installer: Company specializing in installing Products specified in this Section with minimum three years experience.

1.05 REGULATORY REQUIREMENTS
A. Conform to requirements of NFPA 70, National Electrical Code (NEC).

B. Furnish products listed and classified by Underwriters Laboratories Inc. or testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.

C. UFC 3-550-01 Exterior Electrical Power Distribution (Current Addition).

1.06 DELIVERY, STORAGE, AND HANDLING
A. Deliver, store, protect, and handle products to site.

B. Accept cable and accessories on site in manufacturer's packaging. Inspect for damage.

C. Store and protect in accordance with manufacturer's instructions.

D. Protect from weather. Provide adequate ventilation to prevent condensation.

1.07 PROJECT CONDITIONS
A. Verify that field measurements are as shown on Drawings.

B. Verify routing and termination locations of cable bank prior to rough-in.

C. Cable routing is shown on Drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

PART 2 PRODUCTS

2.01 MEDIUM VOLTAGE CABLE

A. Description: NEMA WC 7; Ethylene Propylene Rubber insulated cable (EPR).

B. Voltage: 15 kV ungrounded.

C. Conductor: Copper, stranded, with concentric neutral. 3 phase, 1/3 neutral, Single phase, full concentric neutral.

D. Construction: Single conductor with concentric neutral. 133% Insulation Level, 90˚C Rating.

E. Insulation Jacket: PVC.

2.02 CABLE TERMINATIONS

A. Description: IEEE 48; Class 2 porcelain insulator cable terminator in kit form.

2.03 MODULAR CABLE TERMINATION

A. Description: IEEE 48; Class 1, molded rubber cable termination in kit form the stress cone, ground clamp, non-tracking rubber skirts, load break connector, rubber cap, and aerial lug.

2.04 TAPE TERMINATION

A. IEEE 48; Class 1, tape termination kit with semi- conductive tape, stress control tape, splicing tape, vinyl plastic tape, stress cone, mechanical ground straps, and cable preparation kit.

2.05 SEPARABLE CONNECTORS

A. Separable insulated connectors shall comply with IEEE Std 386. Separable insulated connector shall have a current rating of 200 Amp Loadbreak and 600 Amp Deadbreak, voltage class of 15 kV, 95KV BIL. 200 Amp Loadbreak and bolted type 600 Amp Deadbreak connectors shall be of suitable construction for the application and the type of cable connected, and shall include cable shield adaptors. All 200 Amp laterals shall have 200 Amp adapter Loadbreaks to 600 Amp Deadbreak bushing elbow adapters. External clamping points and test points shall be provided. All 200 Amp Loadbreak connectors and adapters shall provide 10KA fault-closing capability and suitable for energized loadmake/loadbreak operations. 600 Amp Deadbreak connectors and accessories shall provide 25KA sym., 10 cycles duration.

2.06 PRIMARY SECTIONALIZING ENCLOSURES

A. Construction: The equipment shall be dead front and shall be mounted in an outdoor (NEMA 3R), low profile cabinet designed for mounting on a concrete pad. The enclosure is to be constructed of a stainless steel or fiberglass material with minimum strength equivalent to 12 gauge galvanized steel, which is fully welded together to provide superior grounding and structural integrity. All metal surfaces shall be prepped for painting following welding by degreasing and phosphate coating with a high temperature, high-pressure spray or bath. A zinc chromate primer and finish coat follows this to a minimum of four mils dry build. See Section 16000, paragraph 3.01 for finish color. The enclosure shall have a sloped roof for water shed. The cabinet shall have an open bottom with a minimum one inch flange around the inside base. Three- or four-way junction shall be factory installed and junction shall be rated 600 Amp to establish loops, taps, and splices. 200 Amp Loadbreak elbows and adapters shall be provided for 200 Amp cable termination to 600 Amp junction. 600 Amp Deadbreak elbows and accessories shall be provided for 600 Amp cable termination. Access doors shall be provided with a three-point latch with padlock capability. All hardware and hinges shall be made of stainless steel. Removable lifting provisions shall be provided on each corner of the cabinet to allow for installation with standard utility equipment. The enclosure including paint, door latching and overall construction shall meet or exceed ANSI specification C57.12.28-1988 for pad mounted equipment security and paint requirements.

B. Features: The enclosures shall be 3-phase dead front.
   1: Parking stands shall be 12-gauge stainless steel.
   2: Three- or four-way junction enclosures: Enclosures indicated on the plans shall be three-phase, 600 amps or 200 amps junctions. The buss between junction modules shall be either 600 amps or 200 amps, tin plated, copper bars.
   3: Parking stand shall be provided with 18” high ground sleeve and handhole.

2.07 PAD MOUNTED SWITCHGEAR

A. General

1. The switchgear shall be in accordance with the one-line diagram, and shall conform to the following specification.
2. The switchgear shall consist of a gas-tight tank containing SF_6 gas, full load-interrupter switches and resettable fault interrupters with visible open gaps and integral visible grounds, and a microprocessor-based overcurrent control as required by the drawings. Load-interrupter switch terminals shall be equipped with bushings rated 600 amperes continuous, and fault-interrupter terminals shall be equipped with bushing wells rated 200 amperes continuous to provide for elbow connection. Manual operating mechanisms and viewing windows shall be located on the opposite side of the tank from the bushings and bushing wells so that operating personnel shall not be required to perform any routine operations in close proximity to high-voltage elbows and cables.
3. Ratings

   The ratings for the integrated switchgear shall be as designated below.

   Frequency, Hz..... 60Hz
   Short-Circuit Rating Amperes, RMS Symmetrical.....12,500
   kV, Maximum..... 15.5
   kV, BIL.....95
   Main Bus Continuous, Amperes 600
   Three-Pole Load-Interrupter Switches
   Continuous, Amperes 600
   Three-Time, Amperes, Peak 32,500
   10-Time, Amperes RMS Symmetrical 12,500
   10-Time, Amperes, Peak..... 32,500
   Fault Interrupters
   Continuous, Amperes 200
   Load Dropping, Amperes..... 200
   Fault Interrupting, Duty-Cycle
   Three-Time, Amperes RMS Symmetrical 12,500
   Ten-Time, Amperes RMS Symmetrical..... 12,500
   Fault-Closing, Duty-Cycle
   Three-Time, Amperes RMS Symmetrical 12,500
   Three-Time, Amperes, Peak 32,000
   10-Time, Amperes RMS Symmetrical 12,500
   10-Time, Amperes, Peak..... 32,5

4. Certification of Ratings
   a. The manufacturer of the switchgear shall be completely and solely responsible for the performance of the load-interrupter switch and fault interrupter as well as the complete integrated assembly as rated. The manufacturer shall furnish, upon request, certification of ratings of the load-interrupter switch, fault interrupter, and the integrated switchgear assembly consisting of switches and fault interrupters in combination with the gas-tight tank.

5. Compliance with Standards and Codes

   The switchgear shall conform to or exceed the applicable requirements of the following standards and codes:
   a. The applicable portions of ANSI C57.12.28, covering enclosure integrity for pad- mounted equipment.
   b. The applicable portions of ANSI C37.71, ANSI C37.72, ANSI C37.73, IEC 56, and IEC 265-1 (Class A), which specify test procedures and sequences for the load-interrupter switches, fault interrupters, and the complete switchgear assembly.

B. Construction

1. SF_6 -Gas Insulation
   a. The SF_6 gas shall conform to ASTM D2472.
   b. The switchgear shall be filled with SF_6 gas to a pressure of 7 psig at 68º F.
   c. The gas-tight tank shall be evacuated prior to filling with SF_6 gas to minimize moisture in the tank.
   d. The switchgear shall withstand system voltage at a gas pressure of 0 psig at 68º F.
   e. A gas-fill valve shall be provided.
   f. A temperature-compensated pressure gauge shall be provided that is color coded to show the operating range. The gauge shall be mounted inside the gas-tight tank (visible through a large viewing window) to provide consistent pressure readings regardless of the temperature or altitude at the installation site.

2. Gas-Tight Tank
   a. The tank shall be submersible and able to withstand up to 10 feet of water over the base.
   b. The tank shall be of welded construction and shall be made of type 304 stainless steel.
   c. A means of lifting the tank shall be provided.
3. Viewing Windows
   a. Each load-interrupter switch shall be provided with a large viewing window at least 6 inches by 12 inches to allow visual verification of the switch-blade position (open, closed, and grounded) while shining a flashlight on the blades.
   b. Each fault interrupter shall be provided with a large viewing window at least 6 inches by 12 inches to allow visual verification of the disconnect-blade position (open, closed, and grounded) while shining a flashlight on the blades.
   c. Viewing windows shall be located on the opposite side of the gear from the bushings and bushing wells so that operating personnel shall not be required to perform any routine operations in close proximity to high-voltage elbows and cables.
   d. A cover shall be provided for each viewing window to prevent operating personnel from viewing the flash which may occur during switching operations.
4. High-Voltage Bus
   a. Bus and interconnections shall withstand the stresses associated with short-circuit currents up through the maximum rating of the switchgear.
   b. Bus shall be Copper
5. Provisions for Grounding
   a. One ground-connection pad shall be provided on the gas-tight tank of the switchgear.
   b. The ground-connection pad shall be constructed of stainless steel and welded to the gas-tight tank, and shall have a short-circuit rating equal to that of the switchgear.
6. Terminations
   a. Terminals for load-interrupter switches shall have 600-ampere bushings, and terminals for fault interrupters shall have 200-ampere bushing wells.
   b. Bushings and bushing wells shall be located on one side of the gear to reduce the required operating clearance.
7. Bushings and Bushing Wells
   a. Bushings and bushing wells shall conform to ANSI/IEEE Standard 386 (ANSI Standard C119.2).
   b. Bushings and bushing wells shall include a semiconductive coating.
   c. Bushings and bushing wells shall be mounted in such a way that the semiconductive coating is solidly grounded to the gas-tight tank.

C. Basic Components

1. Load-Interrupter Switches
   a. The three-phase, gang-operated load-interrupter switches shall have a three-time and ten-time duty-cycle fault-closing rating as specified under “Ratings.” This rating defines the ability to close the switch the designated number of times against a three-phase fault with asymmetrical (peak) current in at least one phase equal to the rated value, with the switch remaining operable and able to carry and interrupt rated current. Certified test abstracts establishing such ratings shall be furnished upon request.
   b. The switch shall be provided with an integral ground position that is readily visible through the viewing window to eliminate the need for cable handling and exposure to high voltage to ground the equipment.
   c. The ground position shall have a three-time and ten-time duty-cycle fault-closing rating.
   d. The switch shall be provided with an open position that is readily visible through the viewing window to eliminate the need for cable handling and exposure to high voltage to establish a visible gap.
   e. The open gaps of the switch shall be sized to allow cable testing through a feedthru bushing or the back of the elbow.
2. Fault Interrupters
   a. Fault interrupters shall have a three-time and ten-time duty-cycle fault-closing and fault interrupting rating as specified under “Ratings.” This rating defines the fault interrupter’s ability to close the designated number of times against a three-phase fault with asymmetrical (peak) current in at least one phase equal to the rated value and clear the resulting fault current, with the interrupter remaining operable and able to carry and interrupt rated current. Certified test abstracts establishing such ratings shall be furnished upon request.
   b. The fault interrupter shall be provided with a disconnect with an integral ground position that is readily visible through the viewing window to eliminate the need for cable handling and exposure to high voltage to ground the equipment.
   c. The ground position shall have a three-time and ten-time duty-cycle fault-closing rating.

d. The disconnect shall be provided with an open position that is readily visible through the viewing window to eliminate the need for cable handling and exposure to high voltage to establish a visible gap.
e. The fault interrupter, including its three-position disconnect, shall be a single integrated design so that operation between the closed and open positions or the open and grounded positions is accomplished with a single, intuitive movement.
f. The open gaps of the disconnect shall be sized to allow cable testing through a feedthru bushing or the back of the elbow.
g. An internal indicator shall be provided for each fault interrupter to show when it is in the tripped condition. The indicator shall be clearly visible through the viewing window.

3. Operating Mechanisms
   a. Load-interrupter switches and fault interrupters shall be operated by means of a quick- make, quick-break mechanism.
   b. The manual handle shall charge the operating mechanism for opening, closing, and grounding of the switches and fault interrupters.
   c. A single, integrated operating mechanism shall fully operate each fault interrupter or load interrupter switch in a continuous movement, so that additional operations are not required to establish open or ground positions.
   d. Operating mechanisms shall be equipped with an operation selector to prevent inadver- tent operation from the closed position directly to the grounded position, or from the grounded position directly to the closed position. The operation selector shall require physical movement to the proper position to permit the next operation.
   e. Operating shafts shall be padlockable in any position to prevent operation.
   f. The operation selector shall be padlockable to prevent operation to the grounded position.
   g. The operating mechanism shall indicate switch position which shall be clearly visible from the normal operating position.
4. Overcurrent Control
   a. A microprocessor-based overcurrent control shall be provided to initiate fault interruption.
   b. The control shall be mounted in a watertight enclosure and shall be removable in the field without taking the gear out of service.
   c. Control settings shall be field programmable using a personal computer connected via a data port to the control. The data port shall be accessible from the exterior of the enclosure.
   d. Power and sensing for the control shall be supplied by integral current transformers.
   e. The minimum total clearing time (from initiation of the fault to total clearing) for fault interruption shall be 40 milliseconds (2.4 cycles) at 60 hertz or 44 milliseconds (2.2 cycles) at 50 hertz.
   f. The control shall feature time-current characteristic (TCC) curves including standard E-speed, K-speed, coordinating-speed tap, coordinating-speed main curves, and relay curves per IEEE C37.112-1996. Coordinating-speed tap curves shall optimize coordination with load-side weak-link/backup current-limiting fuse combinations, and coordinating-speed main curves shall optimize coordination with tap-interrupter curves.
   g. The standard E-speed curve shall have phase-overcurrent settings ranging from 25E through 400E. The standard K-speed curve shall have phase-overcurrent settings ranging from 25K through 200K. The coordinating-speed tap curve shall have phase-overcurrent and independent ground-overcurrent settings ranging from 50 amperes through 400 amperes. The coordinating-speed main curve shall have phase-overcurrent and independent ground-overcurrent settings ranging from 100 amperes through 800 amperes.
   h. The time-overcurrent relay curves conform to IEEE C37.112-1996 IEEE Standard Inverse-Time Characteristic Equations for Overcurrent Relays for the following curves: U.S. Moderately Inverse Curve U1, U.S. Inverse Curve U2, U.S. Very Inverse Curve U3, U.S. Extremely Inverse Curve U4, U.S. Short-Time Inverse Curve U5, I.E.C. Class A Curve (Standard Inverse) C1, I.E.C. Class B Curve (Very Inverse) C2, I.E.C. Class C Curve (Extremely Inverse) C3, I.E.C. Long-Time Inverse Curve C4, and I.E.C. Short-Time Inverse Curve C5.
   i. The control shall have instantaneous-trip (1 kA through 8 kA) and definite-time delay (32 ms through 96 ms) settings to allow tailoring of the coordinating-speed tap and coordinating-speed main curves to the application.
5. Optional Voltage Indication with provisions for low-voltage phasing
   a. Voltage indication with provisions for low-voltage phasing for each load-interrupter switch and fault interrupter by means of capacitive taps on the bushings shall be provided to eliminate the need for cable handling and exposure to high voltage to test the cables for voltage and phasing. This feature shall include a flashing LCD display to indicate the presence of voltage for each phase, and a solar panel to supply power for testing of the complete voltage-indication circuit and phasing circuit.

b. The voltage-indication feature shall be mounted on the covers for the viewing windows on the opposite side of the gear from the bushings and bushing wells so that operating personnel shall not be required to perform any routine operations in close proximity to high-voltage elbows and cables.

D. Switchgear Style

1. Pad-Mounted Style Enclosure
   a. The switchgear shall be provided with a pad-mounted enclosure suitable for installation of the gear on a concrete pad.
   b. The pad-mounted enclosure shall be separable from the switchgear to allow clear access to the bushings and bushing wells for cable termination.
   c. The basic material shall be 14-gauge hot-rolled, pickled, and oiled steel sheet. South of Highway 98 (Soundside) the basic material shall be stainless steel.
   d. The enclosure shall be provided with removable front and back panels, and hinged lift-up roof sections for access to the operating and termination compartments. Each roof section shall have a retainer to hold it in the open position.
   e Lift-up roof sections shall overlap the panels and shall have provisions for padlocking that incorporate a means to protect the padlock shackle from tampering.
   f. The base shall consist of continuous 90-degree flanges, turned inward and welded at the corners, for bolting to the concrete pad.
   g. Panel openings shall have 90-degree flanges, facing outward, that shall provide strength and rigidity as well as deep overlapping between panels and panel openings to guard against water entry.
   h. For bushings rated 600 amperes continuous, the termination compartment shall be of an adequate depth to accommodate encapsulated surge arresters mounted on 600-ampere elbows having 200-ampere interfaces.
   i. For bushing wells rated 200 amperes continuous, the termination compartment shall be of an adequate depth to accommodate 200-ampere elbows mounted on feedthru inserts.
   j. An instruction manual holder shall be provided.
   k. Non-removable lifting tabs shall be provided.
   l. An 18 inch base spacer shall be included.
2. Enclosure Finish
   a. All exterior welded seams shall be filled and sanded smooth for neat appearance.
   b. To remove oils and dirt, to form a chemically and anodically neutral conversion coating to improve the finish-to-metal bond, and to retard underfilm propagation of corrosion, all surfaces shall undergo a thorough pretreatment process comprised of a fully automated system of cleaning, rinsing, phosphatizing, sealing, drying, and cooling, before any protective coatings are applied. By utilizing an automated pretreatment process, the enclosure shall receive a highly consistent thorough treatment, eliminating fluctuations in reaction time, reaction temperature, and chemical concentrations.
   c. After pretreatment, protective coatings shall be applied that shall help resist corrosion and protect the steel enclosure. To establish the capability to resist corrosion and protect the enclosure, representative test specimens coated by the manufacturer's finishing system shall satisfactorily pass the following tests:
      (i) 4000 hours of exposure to salt-spray testing per ASTM B 117 with:
         (a) Underfilm corrosion not to extend more than Z\cx0 from the scribe as evaluated per ASTM D 1645, Procedure A, Method 2 (scraping); and
         (b) Loss of adhesion from bare metal not to extend more than Z\,0 from the scribe.
      (ii) 1000 hours of humidity testing per ASTM D 4585 using the Cleveland Condensing Type Humidity Cabinet with no blistering as evaluated per ASTM D 714.
      (iii) 500 hours of accelerated weathering testing per ASTM G 53 using lamp UVB-313 with no chalking as evaluated per ASTM D 659, and no more than 10% reduction of gloss as evaluated per ASTM D 523.
      (iv) Crosshatch adhesion testing per ASTM D 3359 Method B with no loss of finish.
      (v) 160-inch-pound impact adhesion testing per ASTM D 2794 with no chipping or cracking.
      (vi) Oil resistance testing consisting of a 72-hour immersion bath in mineral oil with no shift in color, no streaking, no blistering, and no loss of hardness.
      (vii) 3000 cycles of abrasion testing per ASTM 4060 with no penetration to the substrate.

   Certified test abstracts substantiating the above capabilities shall be furnished upon request.
   d. The finish shall be inspected for scuffs and scratches. Blemishes shall be touched up by hand to restore the protective integrity of the finish.
   e. The finish shall match Federal Standard 595B (Color 20095)

E. Labeling

1. Hazard-Alerting Signs
   a. The exterior of the pad-mounted enclosure (if furnished) shall be provided with "Warning—Keep Out—Hazardous Voltage Inside—Can Shock, Burn, or Cause Death" signs.
   b. Each unit of switchgear shall be provided with a "Danger—Hazardous Voltage—Failure to Follow These Instructions Will Likely Cause Shock, Burns, or Death" sign. The text shall further indicate that operating personnel must know and obey the employer's work rules, know the hazards involved, and use proper protective equipment and tools to work on this equipment.
   c. Each unit of switchgear shall be provided with a "Danger—Keep Away—Hazardous Voltage—Will Shock, Burn, or Cause Death" sign.
2. Nameplates, Ratings Labels, and Connection Diagrams
   a. Each unit of switchgear shall be provided with a nameplate indicating the manufacturer's name, catalog number, model number, date of manufacture, and serial number.
   b. Each unit of switchgear shall be provided with a ratings label indicating the following: voltage rating; main bus continuous rating; short-circuit rating; fault-interrupter ratings including interrupting and duty-cycle fault-closing; and load-interrupter switch ratings including duty-cycle fault-closing and short-time.

F. Accessories

1. An adapter cable for connecting an overcurrent control to a user-furnished personal computer (having a 25-pin or 9-pin serial communication port) in the field shall be provided.

2.08 GROUNDING

Neutral conductors, cable, shields, metallic cable sheaths and armor, metallic conduits, cable terminations, junction boxes, poles, surge arresters, fencing enclosing electrical equipment, and other non-current carrying metallic parts of equipment shall be grounded.

A. General requirements: A resistance of not greater than 25 ohms shall be provided, unless otherwise specified. Ground resistances shall be measured in normally dry conditions not less than 48 hours after rainfall. Resistances of systems requiring separate ground rods, rather than a counterpoise, shall be measured separately before bonding below grade. The combined ground resistance of separate systems bonded together below grade may be used to meet the specified ground resistance, but the minimum number of rods indicated must still be provided.
   (a) Ground rods: Ground rods shall be copper-clad steel conforming to UL 467 not less than 5/8-inch in diameter by 10 feet in length of the sectional type. Unless otherwise indicated, ground rods shall be driven into the ground until tops of rods are approximately 1 foot below finished grade. Counterpoise systems, the tops of ground rods shall be approximately at elevations of counterpoises. Where the specified ground resistance cannot be met with the indicated number of ground rods additional ground rods, longer ground rods, or deep-driven sectional rods shall be installed and connected until the specified resistance is obtained, except that not more than three additional 10-foot ground rods shall be required at any one installation. Ground rods shall be spaced as evenly as possible at least 6 feet apart and connected 2 feet below grade.
   (b) Connections: A fusion-welding process shall make connections below grade. A fusion-welding process shall make connections above grade. Where ground wires are connected to aluminum-composition conductors, specially treated or lined copper-to-aluminum connectors suitable for this purpose shall be utilized.

B. Neutral grounding: Neutral conductors shall be grounded. Ground wires shall not be less than No. 1/0 AWG, except where the rated phase current exceeds 400 amperes; the size of neutral ground wires shall be increased to not less than one-half the size of the cross-sectional area of the individual phase conductors. Neutral ground wires shall be protected by conduit where such wires run exposed above grade in non-fence enclosed areas or are run through concrete construction. Where concrete penetration is necessary, non-metallic conduit shall be cast flush with the points of concrete entrance and exit so as to provide an opening for the ground wire and the opening shall be sealed with a suitable compound after installation of the ground wire. Bends greater than 45 degrees in ground wire connections to the ground rods or counterpoises are not permitted.

C. Equipment grounding: Equipment frames of metal-enclosed equipment, medium-voltage cable shields at cable joints and terminations, metal splice boxes, and other non-current carrying metal items, shall be grounded unless otherwise indicated. Connections to Earth shall be made in the same manner as required for neutral grounding. Equipment or devices operating at less than 750 volts may be connected to secondary neutral grounds. Equipment operating at more than 750 volts to ground shall be provided with grounds separate from secondary neutral grounds, but both grounds shall be bonded together below grade at the ground rods or may utilize a common counterpoise.

2.09. TESTS

A. Operating test: After the installation is completed, the Contractor shall conduct an operating test for approval. Equipment shall be demonstrated to operate in accordance with the requirements herein. Tests shall be performed in the presence of the Contracting Officer. The Contractor shall furnish instruments and personnel required for the test and the Government will furnish the necessary electric power.

B. Ground-resistance measurements: Ground-resistance measurements of each ground rod shall be taken and certified by the Contractor to the Contracting Officer. No part of the electrical distribution system shall be energized prior to the resistance testing of that system's ground rods and grounding system and submission of test results to the Contracting Officer. Test reports shall indicate the location of the ground rod and grounding system and the resistance and the soil conditions at the time the test was performed. When the building water service is used as a ground or part of the grounding system, ground-resistance measurements shall also be made of this connection. Ground-resistance measurements shall be made in normally dry weather, not less than 48 hours after rainfall, and with the ground under test isolated from other grounds. The resistance to ground shall be measured using the all-of-potential method described in IEEE No. 142.

C. Medium-voltage cable test: After installation and before the operating test, the medium-voltage cable system shall be given a high potential test. Direct-current voltage shall be applied on each phase conductor of the system by connecting conductors as one terminal and connecting grounds or metallic shielding or sheaths of the cable as the other terminal for each test. Prior to making the test, the cables shall be isolated by opening applicable protective devices and disconnecting equipment. The method, voltage, length of time, and other characteristics of the test shall be in accordance with NEMA WC 7 or WC 8 for the particular type of cable installed, and shall not exceed the recommendations of IEEE No.404 for cable joints and IEEE No. 48 for cable terminations unless the cable and accessory manufacturers indicate higher voltages are acceptable for testing. Should any cable fail due to a weakness of conductor insulation or due to defects or injuries incidental to the installation or because of improper installation of cable, cable joints, terminations, or other connections, the Contractor shall make necessary repairs or replace cables as directed.

2.10 PAINTING AND FINISHING

A. Factory coating: Equipment and component items, including but not limited to primary sectionalizing equipment not hot-dip galvanized or porcelain enamel finished, shall be provided with corrosion resistant finishes which shall withstand 125 hours of exposure to the salt spray test specified in ASTM B 117 without loss of paint or release of adhesion of the paint primer coat to the metal surface in excess of 1/16 inch from the test mark. The scribe test mark and test evaluation shall be in accordance with ASTM.D 1654 with a rating of not less than 7 in accordance with Table 1, procedure
   a) Cut edges or otherwise damaged surfaces of hot-dip galvanized sheet steel or mill galvanized sheet steel shall be coated with a zinc paint conforming to Mil. Spec. Dod-P-21035.

B. Field painting: Painting required for surfaces not otherwise specified and finish painting of items only primed at the factory, shall receive two (2) coats of enamel conforming to TT-E-489, Class A.

2.11 QUALITY CONTROL

A. The Contractor shall establish and maintain quality control for operations under this section to assure compliance with contract requirements and maintain records of his quality control for all materials, equipment, and construction operations, including but not limited to the following:
   a) Preparatory inspection: To be conducted prior to commencing work.
   b) Submittal of all materials and shop drawings necessary for the accomplishment of the work.
   c) Approval of all materials and drawings prior to installation.
   d) Conditional approvals complied with.
   e) Review requirements of plans and specifications.
   f) Quiz personnel doing work to assure their understanding of contract requirements including workmanship and techniques.
   g) Proper storage of materials and equipment.

B. Initial inspection: To be conducted after a representative sample of the work is complete.
   a) Initial inspection shall be accomplished during a representative portion of the work.
      1) Layout and sub grade work
      2) Duct system installation
      3) Cable installation

4) Terminations and splices
5) Equipment installation
6) Grounding

C. Follow up inspection: These inspections shall be performed during the course of work and prior to completion. Not only shall these inspections include recheck on the above but also damage and defects and operational tests.
   a) A copy of these records and Contractor tests, as well as records of Corrective action taken, shall be furnished the Contract Officer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify installation conditions.

B. Verify that conduit is ready to receive cable.

3.02 PREPARATION

A. Use swab to clean conduit before pulling cables.

3.03 INSTALLATION

A. Install cable and accessories in accordance with manufacturer's instructions.

B. Avoid abrasion and other damage to cables during installation.

C. Use suitable lubricants and pulling equipment.

D. Do not exceed cable pulling tensions and bending radius.

E. Ground cable shield at each termination and splice.

F. Install cables in handholes along wall providing longest route.

G. Arrange cable in handholes to avoid interference with duct entrances.

H. Fireproof cables in handholes using fireproofing tape in half-lapped wrapping. Extend fireproofing one inch (25 mm) into duct.

I. Each circuit shall be identified by means of a fiber, laminated plastic, or non-ferrous metal tags, or approved equal, in each handhole, junction box, and each terminal. Each tag shall contain the following information; cable type, conductor size, circuit number, circuit voltage, cable destination and phase identification.

J. Cable Inspection: The cable reel shall be inspected for correct storage positions, signs of physical damage, and broken end seals. If end seal is broken, moisture shall be removed from cable in accordance with the cable manufacturer's recommendations.

K. Duct Cleaning: Duct shall be cleaned with an assembly that consists of a flexible mandrel (manufacturers standard product in lengths recommended for the specific size and type of duct) that is 1/4 inch less than inside diameter of duct, 2 wire brushes, and a rag. The cleaning assembly shall be pulled through a conduit a minimum of 2 times or until less than a volume of 8 cubic inches of debris is expelled from the duct.

L. Duct Lubrication: The cable lubricant shall be compatible with the cable jacket for cable that is being installed. Application of lubricant shall be in accordance with lubricant manufacturer's recommendations.

M. Cable Installation: The Contractor shall provide a cable feeding truck and a cable pulling winch as required. The Contractor shall provide a pulling grip or pulling eye in accordance with cable manufacturer's recommendations. The pulling grip or pulling eye apparatus shall be attached to polypropylene or manilla rope followed by lubricant front end packs and then by power cables. A dynamometer shall be used to monitor pulling tension. Pulling tension shall not exceed cable

manufacturer's recommendations. The Contractor shall not allow cables to cross over while cables are being fed into duct. For cable installation in cold weather, cables shall be kept at 50 degrees F temperature for at least 24 hours before installation.

N. Cable Installation Plan: The Contractor shall submit a cable installation plan for all cable pulls in accordance with the detail drawings portion of paragraph SUBMITTALS. Cable installation plan shall include:
   1. Site layout drawing with cable pulls identified in numeric order of expected pulling sequence and direction of cable pull.
   2. List of cable installation equipment.
   3. Lubricant manufacturer's application instructions.
   4. Procedure for resealing cable ends to prevent moisture from entering cable.
   5. Cable pulling tension calculations of all cable pulls.
   6. Cable percentage conduit fill.
   7. Cable sidewall thrust pressure.
   8. Cable minimum bend radius and minimum diameter of pulling wheel used.
   9. Cable jam ratio.
   10. Maximum allowable pulling tension on each different type and size of conductor.
   11. Maximum allowable pulling tension on pulling device.

O. Duct Line: Medium-voltage cables shall be installed in duct lines where indicated. Cable joints in medium-voltage cables shall be made in primary junction cabinets or switches only. Neutral and grounding conductors shall be installed in the same duct with their associated phase conductors.

P. Electric Handholes: Cables shall be routed around the interior walls and securely supported from walls on cable racks. Cable routing shall minimize cable crossover, provide access space for maintenance and installation of additional cables, and maintain cable separation in accordance with IEEE C2.

3.04 CABLE JOINTS

A. Medium-voltage cable joints shall be made by qualified cable splicers only. Qualifications of cable splicers shall be submitted for approval. Shields shall be applied as required to continue the shielding system through each entire cable joint. Shields may be integrally molded parts of preformed joints. Shields shall be grounded at each joint or in accordance with manufacturer's recommended practice. Cable joints shall provide insulation and jacket equivalent to that of the associated cable.

B. Loadbreak elbows, loadbreak junctions or deadbreak elbows, deadbreak junctions installed in the sectionalizing cabinet for splicing.

3.05 DUCT LINES

A. Requirements: Numbers and sizes of ducts shall be as indicated. Duct lines shall be laid with a minimum slope of 4 inches per 100 feet. Depending on the contour of the finished grade, the high-point may be at a terminal, a handhole, or between handholes. Short-radius manufactured 90-degree duct bends may be used only for pole or equipment risers, unless specifically indicated as acceptable. The minimum manufactured bend radius shall be 36 inches for ducts 3 inches or greater in diameter. Otherwise, long sweep bends having a minimum radius of 25 feet shall be used for a change of direction of more than 5 degrees, either horizontally or vertically. Both curved and straight sections may be used to form long sweep bends, but the maximum curve used shall be 30 degrees and manufactured beds shall be used. Ducts shall be provided with end bells whenever duct lines terminate in manholes or handholes.

B. Treatment: Ducts shall be kept clean of concrete, dirt, or foreign substances during construction. Field cuts requiring tapers shall be made with proper tools and match factory tapers. A coupling recommended by the duct manufacturer shall be used whenever an existing duct is connected to a duct of different materials or shape. Ducts shall be stored to avoid warping and deterioration with ends sufficiently plugged to prevent entry of any water or solid substances. Ducts shall be thoroughly cleaned before being laid. Plastic ducts shall be stored on a flat surface and protected from the direct rays of the sun.

C. Concrete Encasements: Ducts requiring concrete encasements shall comply with NFPA 70. Duct line encasements shall be monolithic construction. Tops of concrete encasements shall be not less than the cover requirements listed in NFPA 70.

3.06 FIELD QUALITY CONTROL

A. Inspect exposed cable sections for physical damage.

B. Inspect cable for proper connections as shown on Drawings.

C. Inspect shield grounding, cable supports, and terminations for proper installation.

3.07 PROTECTION

A. Protect installed cables from entrance of moisture.

3.08 TRAINING

A. All training will be accomplished by the manufacturer of the equipment installed not by the Installing Company. The Contracting Officer will approve all training dates and times. All training will be done within 90 days of final acceptance of the project. Equipment manufacturer shall provide 1 day on site training for maintenance personnel and 5 days of technical training to the government at the manufacturing facility. Training shall allow for classroom instruction as well as individual hands on programming, troubleshooting and diagnostics exercises. The contractor shall furnish all literature, materials and training aids. Room and board costs shall be included for two government personnel. Factory training shall occur within 3 months of system acceptance. The training days will be Monday through Friday between 0700 and 1500.

END OF SECTION

SECTION 26 05 19 BUILDING WIRE AND CABLE

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Building wire and cable.

B. Underground feeder and branch circuit cable.

C. Wiring connectors and connections.

1.02 REFERENCES
A. International Electrical Testing Association:
1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

B. National Fire Protection Association:
1. NFPA 70 - National Electrical Code.
2. NFPA 262 - Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces.

C. Underwriters Laboratories, Inc.:
1. UL 1277 - Standard for Safety for Electrical Power and Control Tray Cables with Optional Optical-Fiber Members.

1.03 SUBMITTALS
A. Submit under provisions of Section 01 33 00.

B. Product Data: Provide for each cable assembly type.

C. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements.

1.04 REGULATORY REQUIREMENTS
A. Conform to requirements of NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

C. UFC 3-520-01 Interior Electrical Systems (Current Addition)

1.05 PROJECT CONDITIONS:
A. Verify that field measurements are as shown on Drawings.

B. Wire and cable routing shown on Drawings is approximate unless dimensioned. Route wire and cable as required to meet Project Conditions.

C. Where wire and cable routing is not shown, and destination only is indicated, determine exact routing and lengths required.

PART 2 PRODUCTS

2.01 BUILDING WIRE AND CABLE
A. Description: Single conductor insulated wire.

B. Conductor: Copper.

C. Insulation Voltage Rating: 600 volts.

D. Insulation: ANSI/NFPA 70, Type THHN/THWN rated at 75 degrees C.

E. Minimum size: no less then Size #12 AWG on any load bearing circuit

2.02 UNDERGROUND FEEDER AND BRANCH CIRCUIT CABLE:

A. Description: ANSI/NFPA 70, Type UF.

B. Conductor: Copper.

C. Insulation Temperature Rating: 90 degrees C.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that mechanical work likely to damage wire and cable has been completed.

3.02 PREPARATION

A. Completely and thoroughly swab raceway before installing wire.

3.03 WIRING METHODS

A. Exterior Locations: Use only building wire Type THHN/THWN in conduit.

B. Use wiring methods indicated on Drawings.

3.04 INSTALLATION

A. Install products in accordance with manufacturers' instructions.

B. Use solid conductor for feeders and branch circuits 10 AWG and smaller.

C. Pull all conductors into raceway at same time.

D. Use suitable cable fittings and connectors.

E. Neatly train and lace wiring inside boxes, equipment, and panelboards.

F. Clean conductor surfaces before installing lugs and connectors.

G. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.

H. Use split bolt connectors for copper conductor splices and taps, 6 AWG and larger. Tape un-insulated conductors and connector with electrical tape to 150 percent of insulation rating of conductor.

I. Use solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.

J. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.

K. No Shared/Common neutrals allowed.

3.05 INTERFACE WITH OTHER PRODUCTS

A. Identify each conductor with its circuit number or other designation indicated on Drawings.

3.06 FIELD QUALITY CONTROL:

A. Inspect wire and cable for physical damage and proper connection.

B. Measure tightness of bolted connections and compare torque measurements with manufacturer's recommended values.

C. Verify continuity of each branch circuit conductor.

END OF SECTION

SECTION 26 05 26: GROUNDING AND BONDING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Grounding electrodes and conductors.

B. Equipment grounding conductors.

C. Bonding.

1.02 REFERENCES
A. Institute of Electrical and Electronics Engineers:
   1. IEEE 142 - Recommended Practice for Grounding of Industrial and Commercial Power Systems.
   2. IEEE 1100 - Recommended Practice for Powering and Grounding Electronic Equipment.

B. International Electrical Testing Association:
   1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

C. National Fire Protection Association:
   1. NFPA 70 - National Electrical Code.
   2. NFPA 99 - Standard for Health Care Facilities.

1.03 GROUNDING ELECTRODE SYSTEM
A. Rod electrode.

1.04 PERFORMANCE REQUIREMENTS
A. Grounding System Resistance: 25 ohms except as noted on the drawings.

B. All grounding and bonding shall comply with NFPA 70, section 250.

1.05 SUBMITTALS
A. Submit under provisions of Section 01 33 00.

B. Product Data: Provide data for grounding electrodes and connections.

C. Test Reports: Indicate overall resistance to ground.

D. Manufacturer's Instructions: Include instructions for storage, handling, protection, examination, preparation and installation of exothermic connectors.

1.06 REGULATORY REQUIREMENTS
A. Conform to requirements of NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

C. AIR FORCE INSTRUCTION 32-1065 (Current Addition)

PART 2 PRODUCTS

2.01 ROD ELECTRODE
A. Material: Copper.

B. Diameter: 3/4 inch.

C. Length: 20 feet.

2.02 MECHANICAL CONNECTORS

A. Material: Bronze.

2.03 WIRE

A. Material: Stranded copper.

B. Foundation Electrodes: 2 AWG.

C. Grounding Electrode Conductor: Size to meet NFPA 70 requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that final backfill and compaction has been completed before driving rod electrodes.

3.02 INSTALLATION

A. Install Products in accordance with manufacturer's instructions.

B. Install rod electrodes at locations indicated. Install additional rod electrodes as required to achieve specified resistance to ground.

C. Unless otherwise indicated, ground rod shall be driven into ground until top of rod is approximately 1foot below finished grade.

D. Install 2 AWG bare copper wire in foundation footing where indicated.

E. Provide bonding to meet Regulatory Requirements.

F. Equipment Grounding Conductor: Provide separate, insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing.

G. Bond all separately derived systems (SDS) including foundation reinforcement steel and building steel to main electrical ground. Communication, fire, video, etc., systems are considered SDS.

3.03 FIELD QUALITY CONTROL:

A. Inspect grounding and bonding system conductors and connections for tightness and proper installation.

B. Use suitable test instrument to measure resistance to ground of system. Perform testing in accordance with test instrument manufacturer's recommendations using the fall-of-potential method. Provide full fall of potential graph and submit as test result. Resistance shall not exceed 25 Ohms.

END OF SECTION

SECTION 26 05 27: SECONDARY GROUNDING

PART 1 GENERAL

1.01 WORK INCLUDED
A. Power system grounding.

B. Communication system grounding.

C. Electrical equipment and raceway grounding and bonding.

1.02 SYSTEM DESCRIPTION
A. Ground the electrical service system neutral at service entrance equipment to grounding electrodes.

B. Provide communications system ground rod at point of service entrance and connect to the building ground at the service entrance with 1/0 bare copper conductor.

C. Bond together system neutrals, service equipment enclosures, exposed non-current carrying metal parts of electrical equipment, metal raceway systems, grounding conductor in raceways and cables, receptacle ground connectors, and plumbing systems.

1.03 SUBMITTALS
A. Submit shop drawings under provisions of Section 01 33 00.

B. Indicate the layout of ground ring, location of system grounding electrode connections, and routing of grounding electrode conductor.

PART 2 PRODUCTS

2.01 MATERIALS
A. Ground Rods: Copper-encased steel, 3/4-inch (19 mm) diameter, minimum length 20 feet.

B. Ground Conductor: 1/0 bare copper.

PART 3 EXECUTION

3.01 INSTALLATION
A. Provide a separate insulated equipment-grounding conductor in feeder and branch circuits. Terminate each end on a grounding lug, bus, or bushing.

B. Provide grounding and bonding at the pad-mounted transformer.

3.02 FIELD QUALITY CONTROL
A. Inspect grounding and bonding system conductors and connections for tightness and proper installation.

B. Use suitable test instrument to measure resistance to ground of system. Perform testing in accordance with test instrument manufacturer's recommendations using the fall-of-potential method. Provide full-fall of-potential graph and submit as test result. Resistance shall not exceed 10 ohms.

END OF SECTION

SECTION 26 05 29: SUPPORTING DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Conduit and equipment supports.

B. Anchors and fasteners.

1.02 REFERENCES
A. ASTM International:
1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
2. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
3. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
4. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems.

B. FM Global:
1. FM - Approval Guide, A Guide to Equipment, Materials & Services Approved By Factory Mutual Research For Property Conservation.

C. National Fire Protection Association:
1. NFPA 70 - National Electrical Code.

D. Underwriters Laboratories Inc.:
1. UL 263 - Fire Tests of Building Construction and Materials.
2. UL 723 - Tests for Surface Burning Characteristics of Building Materials.
3. UL 1479 - Fire Tests of Through-Penetration Firestops.
4. UL 2079 - Tests for Fire Resistance of Building Joint Systems.
5. UL - Fire Resistance Directory.

E. Intertek Testing Services (Warnock Hersey Listed):
1. WH - Certification Listings.

1.03 REGULATORY REQUIREMENTS
A. Conform to requirements of NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. or testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.

PART 2 PRODUCTS

2.01 PRODUCT REQUIREMENTS
A. Materials and Finishes: Provide adequate corrosion resistance.

B. Provide materials, sizes, and types of anchors, fasteners and supports to carry the loads of equipment and conduit. Consider weight of wire in conduit when selecting products.

C. Anchors and Fasteners:
1. Concrete Structural Elements: Use expansion anchors
2. Steel Structural Elements: Use beam clamps, spring steel clips.
3. Concrete Surfaces: Use self-drilling anchors and expansion anchors.
4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Use toggle bolts and hollow wall fasteners.
5. Solid Masonry Walls: Use expansion anchors.
6. Sheet Metal: Use sheet metal screws.

PART 3 EXECUTION

3.01 INSTALLATION
A. Install products in accordance with manufacturer's instructions.

B. Provide anchors, fasteners, and supports in accordance with NECA "Standard of Installation".

C. Do not fasten supports to pipes, ducts, mechanical equipment, and conduit.

D. Obtain permission from Architect/Engineer before using powder-actuated anchors.

E. Obtain permission from Architect/Engineer before drilling or cutting structural members.

F. Fabricate supports from structural steel or steel channel. Rigidly weld members or use hexagon head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.

G. Install surface-mounted cabinets and panelboards with minimum of four anchors.

H. In wet and damp locations use steel channel supports to stand cabinets and panelboards one inch (25 mm) off wall.

END OF SECTION

SECTION 26 05 33: CONDUIT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal conduit.

B. Flexible metal conduit.

C. Liquid tight flexible metal conduit.

D. Electrical metallic tubing.

E. Nonmetal conduit.

F. High Density Polyethylene Nonmetallic Flexible Raceway (HDPE)

G. Fittings and conduit bodies.

1.02 REFERENCES

A. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.

B. ANSI C80.3 - Specification for Electrical Metallic Tubing, Zinc Coated.

C. ANSI C80.5 - Aluminum Rigid Conduit - (ARC).

D. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

E. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.

F. NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.

G. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers, and Box Supports.

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

I. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.

J. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

K. NFPA 70 – National Electrical Code

1.03 DESIGN REQUIREMENTS

A. Conduit Size: ANSI/NFPA 70.

1.04 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Product Data: Provide for metallic conduit, flexible metal conduit, liquid tight flexible metal conduit, metallic tubing, nonmetallic conduit, flexible nonmetallic conduit, fittings, and conduit bodies, HDPE (Red Colored).

1.05 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

C. UFC 3-520-01 Interior Electrical Systems (Current Addition)

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle products to site.

B. Accept conduit on site. Inspect for damage.

C. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

D. Protect PVC conduit from sunlight.

1.07 PROJECT CONDITIONS

A. Verify that field measurements are as shown on Drawings.

B. Verify routing and termination locations of conduit prior to rough-in.

C. Conduit routing is shown on Drawings in approximate locations unless dimensioned. Route as required to complete wiring system. Conceal all conduits within the construction unless noted otherwise.

D. Underground conduit installations under existing aircraft aprons, ramps, taxiways, and runways will be installed by boring, unless written authorization is received from the contracting officer.

PART 2 PRODUCTS

2.01 CONDUIT REQUIREMENTS

A. Minimum Size: 1/2 inch unless otherwise specified.

B. Underground Installations:
   1. More than Five Feet from Foundation Wall: Use rigid galvanized steel conduit or thick wall nonmetallic conduit.
   2. Within Five Feet from Foundation Wall and in or Under Slab on Grade: Use thick wall nonmetallic conduit.

C. Outdoor Locations, Above Grade: Use rigid galvanized steel.

D. In Slab Above Grade:
   1. Use thick wall nonmetallic conduit.

E. Wet and Damp Locations: Use rigid galvanized steel, electrical metallic tubing, thick wall nonmetallic conduit.

F. Dry Locations:
   1. Concealed: Use rigid steel, intermediate metal conduit, electrical metallic tubing.
   2. Exposed: Use rigid steel, intermediate metal conduit, electrical metallic tubing.

2.02 METAL CONDUIT

A. Rigid Steel Conduit: ANSI C80.1.

B. Electrical Metallic Tubing (EMT): ANSI C80.3.

C. Intermediate Metal Conduit (IMC): Rigid steel.

D. Fittings and Conduit Bodies: ANSI/NEMA FB 1, aluminum fittings may be used with steel conduit.

2.03 FLEXIBLE METAL CONDUIT

A. Description: Interlocked steel construction.

B. Fittings: ANSI/NEMA FB 1.

2.04 ELECTRICAL METALLIC TUBING (EMT)

A. Description: ANSI C80.3; galvanized tubing.

B. Fittings and Conduit Bodies: ANSI/NEMA FB 1, steel setscrew type.

2.05 NONMETALLIC CONDUIT

A. Description: NEMA TC 2; Schedule 40 PVC.

B. Fittings and Conduit Bodies: NEMA TC 3.

2.06 HIGH DENSITY POLYETHYLENE (HDPE) RACEWAY

A. Description: Red Colored, NEMA TC 7; SDR 13.5.

B. Fittings and Conduit Bodies: NEMA TC 6 and TC 8.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install conduit in accordance with NECA "Standard of Installation."

B. Install nonmetallic conduit in accordance with manufacturer's instructions.

C. Arrange supports to prevent misalignment during wiring installation.

D. Support conduit using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.

E. Group related conduits; support using conduit rack. Construct rack using steel channel provide space on each for 25 percent additional conduits.

F. Fasten conduit supports to building structure and surfaces under provisions of Section 26 05 29.

G. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports

H. Do not attach conduit to ceiling support wires.

I. Arrange conduit to maintain headroom and present neat appearance.

J. Route conduit parallel and perpendicular to walls.

K. Route conduit installed above accessible ceilings parallel and perpendicular to walls.

L. Route conduit in and under slab from point-to-point.

M. Do not cross conduits in slab.

N. Maintain adequate clearance between conduit and piping.

O. Maintain 12-inch (300 mm) clearance between conduit and surfaces with temperatures exceeding 104 degrees F (40 degrees C).

P. Cut conduit square using saw or pipe cutter; de-burr cut ends.

Q. Bring conduit to shoulder of fittings; fasten securely.

R. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.

S. Use conduit hubs or sealing locknuts to fasten conduit to sheet metal boxes in damp and wet locations.

T. Install no more than equivalent of three 90-degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Use factory elbows for bends in metal conduit larger than 2-inch (50 mm) size.

U. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.

V. Provide suitable fittings to accommodate expansion and deflection where conduit crosses control and expansion joints.

W. Provide suitable pull string in each empty conduit except sleeves and nipples.

X. Use suitable caps to protect installed conduit against entrance of dirt and moisture.

Y. Ground and bond conduit under provisions of Section 26 05 26.

Z. Identify conduit under provisions of Section 26 05 53.

AA. HDPE: Install HDPE by Directional boring, plowing, or open trench.

3.02 INTERFACE WITH OTHER PRODUCTS

A. Install conduit to preserve fire resistance rating of partitions and other elements.

END OF SECTION

SECTION 26 05 34: BOXES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Pull and junction boxes.

1.02 REFERENCES
A. ANSI/NEMA FB 1 - Fittings and Supports for Conduit and Cable Assemblies.

B. ANSI/NEMA OS 1 - Sheet-steel Outlet Boxes, Device Boxes, Covers, and Box Supports.

C. ANSI/NFPA 70 - National Electrical Code.

1.03 PROJECT RECORD DOCUMENTS
A. Accurately record actual locations and mounting heights of outlet, pull, and junction boxes.

1.04 REGULATORY REQUIREMENTS
A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

1.05 SUMITTALS
A. Submit under provisions of Section 01 33 00.

B. Product Data: Provide manufacturer's data on all boxes to be used.

1.06 PROJECT CONDITIONS
A. Verify field measurements are as shown on Drawings.

B. Electrical boxes are shown on Drawings in approximate locations unless dimensioned. Install at location required for box to serve intended purpose.

PART 2 PRODUCTS

2.01 OUTLET BOXES
A. Sheet Metal Outlet Boxes: ANSI/NEMA OS 1, galvanized steel.

B. Cast Boxes: NEMA FB 1, Type FD. Provide gasketed cover by box manufacturer.

2.02 PULL AND JUNCTION BOXES:
A. Sheet Metal Boxes: NEMA OS 1, galvanized steel.

PART 3 EXECUTION

3.01 INSTALLATION:
A. Install electrical boxes as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.

B. Install electrical boxes to maintain headroom and to present neat mechanical appearance.

C. Support boxes independently of conduit that is connected to two rigid metal conduits both supported within 12 inches of box.

D. Use cast outlet box in exterior locations exposed to the weather and wet locations.

END OF SECTION

SECTION 26 05 53: ELECTRICAL IDENTIFICATION

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Nameplates and labels.

B. Wire and cable markers.

C. Conduit markers.

1.02 REFERENCES
A. NFPA 70 - National Electrical Code.

1.03 REGULATORY REQUIREMENTS
A. Conform to requirements of NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. or testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.

C. All Labeling shall comply with UFC 3-560-01 Electrical Safety, O&M(Current Addition)

PART 2 PRODUCTS

2.01 NAMEPLATES AND LABELS
A. Nameplates: Engraved three-layer laminated plastic, white letters on black background.

B. Locations: Each electrical distribution and control equipment enclosure.
Example: PANEL A.

C. Letter Size:
1. Use 1/4-inch letters for identifying individual equipment and loads.
2. Use 1/2-inch letters for identifying grouped equipment and loads.

2.02 WIRE MARKERS
A. Description: Tape type wire markers.

B. Locations: Each conductor at panelboard gutters, pull boxes, outlet and junction boxes, and each load connection.

C. Legend:
1. Power and Lighting Circuits: Branch circuit or feeder number indicated on drawings.
2. Control Circuits: Control wire number indicated on schematic and interconnection diagrams and equipment manufacturer's shop drawings for control wiring.

2.03 CONDUIT MARKERS
A. Description: Tape.

B. Location: Furnish markers for each conduit longer than 6 feet.

C. Spacing: 20 feet on center.

D. Color:
1. 208 Volt System: Gray.
2. Telephone System: Blue.
3. Low Voltage System: Black.

2.04 UNDERGROUND WARNING TAPE
A. Description: 6-inch wide plastic tape, colored red with suitable warning legend describing buried electrical lines; Style No. 210 ELE as manufactured by Seton.

PART 3 EXECUTION

3.01 PREPARATION

A. Degrease and clean surfaces to receive nameplates and labels.

3.02 APPLICATION

A. Install nameplate and labels parallel to equipment lines.

B. Secure nameplate to equipment front using screws, rivets, or adhesive.

C. Secure nameplate to inside surface of door on panelboard that is recessed in finished locations.

D. Identify underground conduits using underground warning tape. Install one tape per trench at 3 inches below finished grade.

END OF SECTION

SECTION 26 12 00: DISTRIBUTION TRANSFORMERS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Liquid filled pad mounted distribution transformer.

1.02 REFERENCES
A. American National Standards Institute:
1. ANSI C37.47 - American National Standard Specifications for Distribution Fuse Disconnecting Switches, Fuse Supports, and Current-Limiting Fuses.
2. ANSI C57.12.26 - Pad-Mounted Compartmental-Type, Self-Cooled, Three-Phase Distribution Transformers for Use with Separable Insulated High-Voltage Connectors, High Voltage, 34 500 Grd Y/19 920 Volts and Below; 2500 kVA and Smaller.
3. ANSI C57.12.28 - Pad-Mounted Equipment - Enclosure Integrity.
4. ANSI C57.12.55 - Dry Type Transformers in Unit Installations, Including Unit Substations-Conformance Standard.

B. Institute of Electrical and Electronics Engineers:
1. IEEE 386 - Standard for Separable Insulated Connector Systems for Power Distribution Systems Above 600 V.
2. IEEE C57.12.00 - Standard General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers.
3. IEEE C57.12.90 - Standard Test Code for Liquid-Immersed Distribution, Power, and Regulating Transformers and IEEE Guide for Short Circuit Testing of Distribution and Power Transformers.
4. IEEE C57.12.91 - Standard Test Code for Dry-Type Distribution and Power Transformers.
5. IEEE C57.13 - Standard Requirements for Instrument Transformers.
6. IEEE C57.94 - Recommended Practice for Installation, Application, Operation, and Maintenance of Dry-Type General Purpose Distribution and Power Transformers.
7. IEEE C57.106 - Guide for Acceptance and Maintenance of Insulating Oil in Equipment.
8. IEEE C57.111 - Guide for Acceptance of Silicone Insulating Fluid and Its Maintenance in Transformers.
9. IEEE C57-121 - Guide for Acceptance and Maintenance of Less-Flammable Hydrocarbon Fluid in Transformers.

C. National Electrical Manufacturers Association:
1. NEMA 260 - Safety Labels for Pad mounted Switchgear and Transformers Sited in Public Areas.

D. International Electrical Testing Association:
1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

E. Underwriters Laboratories Inc.:
1. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures.

F. UFC 3-550-01 Exterior Electrical Power Distribution (Current Addition)

1.03 SUBMITTALS
A. Submit shop drawings under the provisions of Section 01 33 00.

B. Submit shop drawings indicating outline dimensions, connection and support points, weight, specified ratings and materials.

C. Submit product data indicating standard model design tests and options.

1.04 OPERATION AND MAINTENANCE DATA
A. Submit operation and maintenance data under provisions of Section 01 70 00.

B. Include procedures for sampling and maintaining fluid, cleaning unit, and replacing components.

1.05 QUALITY ASSURANCE

A. Manufacturer: Company specializing in distribution transformers with five years experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store and protect products.

PART 2 PRODUCTS

2.01 PAD MOUNTED TRANSFORMERS

A. Liquid-filled Transformers: ANSI C57.12.22; three-phase, pad mounted, mineral oil insulation, self-cooled transformer unit.

B. Capacity: (SEE DRAWINGS)

C. Transformer:
   1. Separate high- and low-voltage compartments.
   2. Impedance: 5.75 percent, or ANCI Standard.
   3. Basic Impulse Level: 95 kV.
   4. Primary taps: Externally-operated manually type tap changer. Two 2-1/2 percent above and two 2-1/2 percent below rated voltage.
   5. Cooling and Temperature Rise: ANSI C57.12.22; Class OA. 65 degrees C, self-cooled.
   6. K factor rating:
      1. K-4 for systems with 50% connected non-linear electronic loads. General transformers.
      2. K-13 for systems with 100% connected non-linear electronic loads. Computer loads.

D. Primary Voltage: 12,470 volts, delta connected; Primary Voltage: 12,470 volts, delta connected

E. Secondary Voltage: Wye connected, (SEE DRAWINGS).

F. Accessories: ANSI C57.12.22 standard accessories and dial type thermometer, liquid level gauge, one-inch drain valve and sampling device.

G. Cooling and Temperature Rise: ANSI/IEEE C57.12.01; Class AA. 220 degree C insulation class with 150 degree C rise over 40 degree C ambient.

H. Primary Terminations: Bushing wells to ANSI/IEEE 386; provide six for loop feed. Include bushings for insulated loadbreak connectors.

I. Primary Switching: Internal oil-immersed gang-operated load break switch. Provide two, for loop feed.

J. Primary Overcurrent Protection: Oil immersed, wet well, bayonet- type fuse link. Accessible from exterior front of transformer cabinet.

K. Secondary Terminations: Spade lugs.

L. Other Accessories: Primary lightning arrestors and secondary current transformers to ANSI/IEEE C57.13.

M. Finish: See Section 26 05 00, paragraph 3.01

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that pad is ready to receive work.

B. Verify field measurements are as instructed by manufacturer.

C. Verify that required utilities are available, in proper location and ready for use.

D. Beginning of installation means installer accepts conditions.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install safety labels to NEMA 260.

C. Do not feed through transformers. Provide Primary Junction Cabinet.

3.03 ADJUSTING

A. Adjust primary taps so that secondary voltage is within 2 percent of rated voltage.

END OF SECTION

SECTION 26 24 16: PANELBOARDS

PART 1 GENERAL

1.01 WORK INCLUDED
A. Lighting and appliance branch circuit panelboards.

1.02 REFERENCES
A. Institute of Electrical and Electronics Engineers:
   1. IEEE C62.41 - Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.

B. National Electrical Manufacturers Association:
   1. NEMA FU 1 - Low Voltage Cartridge Fuses.
   2. NEMA ICS 2 - Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated Not More Than 2000 Volts AC or 750 Volts DC.
   3. NEMA ICS 5 - Industrial Control and Systems: Control Circuit and Pilot Devices.
   4. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).
   5. NEMA PB 1 - Panelboards.
   6. NEMA PB 1.1 - General Instructions for Proper Installation, Operation, and Maintenance of Panelboards Rated 600 Volts or Less.

C. International Electrical Testing Association:
   1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

D. National Fire Protection Association:
   1. NFPA 70 - National Electrical Code.

E. Underwriters Laboratories Inc.:
   1. UL 50 - Cabinets and Boxes
   2. UL 67 - Safety for Panelboards.
   3. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures.
   4. UL 1283 - Electromagnetic Interference Filters.
   5. UL 1449 - Transient Voltage Surge Suppressors.
   6. UL 1699 - Arc-Fault Circuit Interrupters.

F. United Facilities Criteria:
   1. UFC 3-520-01 Interior Electrical Systems (Current Addition)

1.03 SUBMITTALS
A. Submit shop drawings for equipment and component devices under provisions of Section 01 33 00.

B. Include outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, circuit breaker and fusible switch arrangement and sizes.

1.04 SPARE PARTS
A. Keys: Furnish 2 each to Owner.

PART 2 PRODUCTS

2.01 BRANCH CIRCUIT PANELBOARDS:
A. Lighting and Appliance Branch Circuit Panelboards: NEMA PB1; circuit breaker type.

B. Enclosure: NEMA PB 1; Type 3R.

C. Provide surface cabinet front with concealed trim clamps, concealed hinge and flush lock all keyed alike. Finish in manufacturer's standard gray enamel.

D. Provide panelboards with copper bus, ratings as scheduled on Drawings. Provide copper ground bus in all panelboards.

E. Minimum Integrated Short Circuit Rating: 10,000 amperes rms symmetrical for 240-volt panelboards.

F. Molded Case Circuit Breakers: NEMA AB 1; bolt-on type thermal magnetic trip circuit breakers, with common trip handle for all poles. Provide circuit breakers UL listed as Type SWD for lighting circuits. Provide UL Class A ground fault interrupter circuit breakers where scheduled.

G. All panels to be provided with Main Breakers.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install panelboards plumb, in conformance with NEMA PB 1.1.

B. Height: 4 ft.

C. Provide filler plates for unused spaces in panelboards.

D. Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes required to balance phase loads.

3.02 FIELD QUALITY CONTROL

A. Measure steady state load currents at each panelboard feeder. Should the difference at any panelboard between phases exceed 20 percent, rearrange circuits in the panelboard to balance the phase loads within 20 percent. Take care to maintain proper phasing for multi-wire branch circuits.

B. Visual and Mechanical Inspection: Inspect for physical damage, proper alignment, anchorage, and grounding. Check proper installation and tightness of connections for circuit breakers, fusible switches, and fuses.

END OF SECTION

SECTION 26 28 19: DISCONNECT SWITCHES

PART 1 GENERAL

1.01 WORK INCLUDED
A. Disconnect switches.

B. Fuses.

C. Enclosures.

1.02 REFERENCES
A. National Electrical Manufacturers Association:
1. NEMA FU 1 - Low Voltage Cartridge Fuses.
2. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).

B. International Electrical Testing Association:
1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

1.03 SUBMITTALS
A. Submit product data under provisions of Section 01 33 00.

B. Include outline drawings with dimensions, and equipment ratings for voltage, capacity, horsepower, and short circuit.

PART 2 PRODUCTS

2.01 DISCONNECT SWITCHES
A. Fusible Switch Assemblies: Heavy-duty, quick-make, quick-break, and load interrupter enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position. Handle lockable in OFF position. Fuse Clips: Designed to accommodate Class R fuses.

B. Non-fusible Switch Assemblies: Heavy-duty, quick-make, quick-break, and load interrupter enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position. Handle lockable in OFF position.

C. Enclosures: Type as indicated on Drawings.

PART 3 EXECUTION

3.01 INSTALLATION
A. Install disconnect switches where indicated on Drawings.

B. Install fuses in fusible disconnect switches.

END OF SECTION

SECTION 26 35 33 SURGE SUPPRESSORS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Surge Protection Device

1.02 STANDARDS AND REFERENCES

A. Institute of Electrical and Electronics Engineers:
   1. IEEE 1100 - Recommended Practice for Powering and Grounding Electronic Equipment.
   2. IEEE C62.41 - Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.
   3. IEEE C62.45 - Guide on Surge Testing for Equipment Connected to Low-Voltage AC Power Circuits.

B. National Electrical Manufacturers Association:
   1. NEMA LS 1 - Low Voltage Surge Protection Devices.

C. National Fire Protection Association:
   1. NFPA 70 - National Electrical Code.
   2. NFPA 780 - Standard for the Installation of Lightning Protection Systems.

D. Underwriters Laboratories Inc.:
   1. UL 1283 - Electromagnetic Interference Filters.
   2. UL 1449 - Transient Voltage Surge Suppressors.

1.03 SUBMITTALS
A. Submit under provisions of Section 01 33 00.

PART 2 PRODUCTS

2.01 SYSTEM DESCRIPTION
A. The Surge Protection Device shall be constructed using multiple surge current diversion modules of metal oxide varistors (MOV) with each MOV individually fused. The modules shall be designed and constructed in a manner that ensures MOV surge current sharing. Use of gas tubes, silicon avalanche diodes or selenium cells are unacceptable unless documentation from a nationally recognized laboratory demonstrates current sharing of all dissimilar components at all surge current levels.

2.02 ELECTRICAL REQUIREMENTS
A. Nominal system operating voltage shall be:
   120/240 VAC, 1 Phase, 3Wire Plus Ground
   120/208 VAC, 3 Phase, 4 Wire Plus Ground, Wye.
   277/480 VAC, 3 Phase, 4 Wire Plus Ground, Wye or as shown on drawings

B. Maximum continuous operating voltage (MCOV):
   The surge suppressor and all components in the suppression path (including all current diversion components) maximum continuous operating voltage shall be greater than 115% of the nominal system operating voltage to ensure the ability of the system to withstand temporary RMS overvoltage (swell conditions).

C. Operating Frequency: The operating frequency range of the system shall be at least 47 - 63 Hertz.

2.03 FUSE AND THERMAL DISCONNECT
1. Surge Protection Device shall be internally fused to safely disconnect itself from the electrical system without damaging itself and rated to allow maximum specified surge current capacity. Surge Protection Device that utilize a single fuse to protect two or more suppression paths are not acceptable.
2. Fuse shall be capable of interrupting the AC power line short circuit fault current (KAIC). Short circuit rms current shall be at least 200KAIC or as shown on drawings.

3. Thermal disconnect device shall be installed on or near each MOV element that responds to excessive MOV heating by mechanically disconnecting the MOV from the power line.

2.04 DESIGN REQUIREMENTS

A. Protection Modes: The SPD shall provide protection as follows: All modes, L-N or L-L, L-G and N-G (Where applicable)
Note: L = Line, G = Ground, N = Neutral.

B. UL 1449 Ratings: The maximum UL 1449 listed surge ratings for each and/or all of the specified protection modes shall not exceed the following in any mode of protection:

Nominal System Voltage	Surge Voltage Rating
120/240 or 120/208 volt	400 volts
277/480 volt	800 volts

C. Noise Attenuation: The units shall be UL 1283 Listed as an electromagnetic interference filter. The filter shall provide insertion loss with a maximum of 60 dB from 100 KHz to 100 MHz per 50-Ohm Insertion Loss Methodology from MIL 220A.

2.05 PERFORMANCE RATINSG

A. Surge Current Capacity:

Location	Surge Rating per Mode	Surge Rating Per Phase (L-N plus L-G)
Main Distribution Panel	150 kA	300 kA
Branch Panels	80 kA	160 kA

2.06 BASIS OF DESIGN

A. Main panel unit Liebert Interceptor Series.

B. Branch Panel units Liebert Accuvar ACV Series.

2.07 ACCESSORIES

A. Surge suppressor at main distribution panel shall have red and green status indicators, audible alarm, and transient counter.

B. Surge suppressor at branch panels shall have red and green status indicators.

2.08 TESTING

A. Component Testing and Monitoring: Unit shall include an on-line circuit which tests and redundantly monitors individual components in all protection modes including neutral to ground (where applicable). Units that require external test sets or equipment are unacceptable.

PART 3 EXECUTION

3.01 INSTALLATION

A. The installing contractor shall install the parallel surge suppressor with short and straight conductors as practically possible. The contractor shall twist the surge suppressor input conductors together to reduce input conductor inductance. The contractor shall follow the surge suppressor manufacturer's recommended installation practices as found in the installation, operation and maintenance manual and comply with all applicable codes.

END OF SECTION

SECTION 32 31 13: CHAIN LINK FENCES AND GATES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. PVC Coated fence framework, fabric, components and accessories.

B. Excavation for post bases; concrete foundation for posts and center drop for gates.

C. Manual gates and related hardware.

1.02 REFERENCES

A. ANSI/ASTM A123 – Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.

B. ANSI/ASTM F567 - Standard Practice for Installation of Chain-Link Fence.

C. ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped Zinc Coated, Welded and Seamless.

D. ASTM A116 – Standard Specification for Metallic Coated, Steel Woven Wire Fence Fabric

E. ASTM A121 - Standard Specification for Metallic-Coated Carbon Steel Barbed Wire.

F. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

G. ASTM A392 - Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric.

H. ASTM A1011 - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength

I. ASTM C94 - Standard Specification for Ready-mixed Concrete.

J. ASTM F626 - Standard Specification for Fence Fittings.

K. ASTM F668 - Standard Specification for Polyvinyl Chloride (PVC) and Other Organic Polymer-Coated Steel Chain-Link Fence Fabric.

L. ASTM F1043 - Standard Specification for Strength and Protective Coatings on Steel Industrial Chain Link Fence Framework.

M. Chain Link Fence Manufacturers Institute (CLFMI) - Product Manual.

N. FS RR-F-191 - Fencing, Wire and Post Metal (and Gates, Chain Link Fence Fabric, and Accessories).

1.03 SYSTEM DESCRIPTION

A. Fence Height: 6'-0" feet with 3 strands of barbed wire at top, unless otherwise shown.

B. Line Post Spacing: At intervals not exceeding 10 feet, set in poured concrete foundation.

1.04 SUSTAINABLE DESIGN SUBMITTALS

A. Section 01 81 13 – Green Procurement: Requirements for sustainable design submittals.

B. Manufacturer's Certificate: Certify products meet or exceed specified sustainable design requirements.
   1. Materials Resources Certificates:
      a. Certify source and origin for salvaged and reused products.
      b. Certify recycled material content for recycled content products.
      c. Certify source for regional materials and distance from Project site.

C. Product Cost Data: Submit cost of products to verify compliance with Project sustainable design requirements. Exclude cost of labor and equipment to install products.

1. Provide cost data for the following products:
   a. Salvaged, refurbished, and reused products.
   b. Products with recycled material content.
   c. Regional products.

1.05 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Shop Drawings: Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, and schedule of components.

C. Product Data: Provide data on fabric, posts, accessories, fittings and hardware.

D. Samples: Submit two 6" x 6" samples of fence fabric; two samples each of hardware items, accessories, etc., illustrating construction and colored finish.

E. Manufacturer's Installation Instructions: Provide manufacturer's written installation instructions.

1.06 QUALITY ASSURANCE

A. Perform Work in accordance with ASTM F567, FS RR-F-191, and CLFMI.

B. Maintain one copy of each document on site.

1.07 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum three years documented experience.

B. Installer: Company specializing in the installation of chain-link fencing, approved by the fence manufacturer, and three years documented experience.

1.08 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on shop drawings.

PART 2 PRODUCTS

2.01 SUSTAINABILITY CHARACTERISTICS

A. Section 01 81 13 – Green Procurement: Requirements for sustainable design compliance.

B. Materials and Resources Characteristics:
   1. Recycled Content Materials: Furnish materials with maximum available recycled content.
   2. Regional Materials: Furnish materials extracted, processed, and manufactured within 500 miles (800 km) of Project site.

2.02 ACCEPTABLE MANUFACTURERS

A. Anchor Fence Company, Boundary Fence & Railing Systems, Inc., Semmerling, Southeastern Wire.

B. Substitutions: Under provisions of Section 01 00 00.

2.03 MATERIALS

A. Framing (Steel): ASTM A53; Schedule 40 steel pipe, standard weight, one piece without joints.

B. Fabric Wire (Steel): ASTM A392 zinc coated wire fabric or ASTM A116 galvanized wire fabric.

C. Barbed Wire: ASTM A121 galvanized steel wire, with galvanized steel barbs; 3 strands, 4 points at 3-inch o.c.

D. Concrete: Type specified in Section 01 33 00.

2.04 COMPONENTS

A. Line Posts: 1.9-inch diameter up to 6 feet high; 2.38-inch diameter, 6-8 feet high.

B. Corner, Gate and Terminal Posts: 3.5-inch diameter minimum, increase diameter as required to suite project conditions.

C. Top and Brace Rail: 1.66-inch diameter, plain end, sleeve coupled.

D. Gate Frame: 1.66-inch diameter for welded fittings and truss rod fabrication.

E. Fabric: 2 inch diamond mesh interwoven wire, 9 gage diameter core wire unless otherwise indicated on the drawings, top selvage twisted tight, bottom selvage knuckle end closed.

F. Tension Wire: 6 gage thick steel, single strand.

G. Tension Band: 12 gauge, galvanized, pressed steel, plain ends.

H. Tension Strap: 0.75" x 3/16" thick steel.

I. Tie Wire: Aluminum alloy wire.

2.05 ACCESSORIES

A. Caps: Cast steel galvanized or malleable iron galvanized; sized to post diameter, set screw retainer.

B. Fittings: Sleeves, bands, clips, rail ends, tension bars, fasteners and fittings; galvanized steel.

C. Extension Arms: Cast steel galvanized, to accommodate 3 strands of barbed wire, single arm, sloped to 45 degrees.

D. Gate Hardware: Fork latch with gravity drop, Center gate stop and drop rod, Mechanical keepers; two 180-degree gate hinges per leaf and hardware for padlock.

2.06 FINISHES

A. Materials, Components and Fabric: Vinyl coating, dark brown color, fused bonded, on fabric, framework and fittings shall conform to the following:
   i. Fabric: ASTM F668, Class 2B, 7-12 mils thickness.
   ii. Framework: ASTM F1043, 10-14 mils thickness.
   iii. Fittings, ASTM F 626, 10-14 mils thickness.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install framework, fabric, accessories and gates in accordance with ASTM F567 and manufacturer's instructions.

B. Set intermediate, terminal and gate posts plumb, in concrete footings with top of footing 2 inches above finish grade. Slope top of concrete for water runoff.

C. Line Post Footing Depth Below Finish Grade: ASTM F567.

D. Corner, Gate and Terminal Post Footing Depth Below Finish Grade: ASTM F567.

E. Brace each gate and corner post to adjacent line post with horizontal center brace rail and diagonal truss rods. Install brace rail, one bay from end and gate posts.

F. Provide top rail through line post tops and splice with 6-inch long rail sleeves.

G. Install center and bottom brace rail on corner gate leaves.

H. Stretch fabric between terminal posts or at intervals of 100 feet maximum, whichever is less.

I. Position bottom of fabric 2 inches above finished grade.

J. Fasten fabric to top rail, line posts, braces, and bottom tension wire with tie wire at maximum 15 inches on centers.

K. Attach fabric to end, corner, and gate posts with tension bars and tension bar clips.

L. Install bottom tension wire stretched taut between terminal posts.

M. Install support arms sloped outward and attach barbed wire; tension and secure.

N. Do not swing gate from building wall; provide gate posts.

O. Install gate with fabric and barbed wire overhang to match fence. Install three hinges per leaf, latch, catches, drop bolt, foot bolts and sockets, retainer and locking clamp.

P. Provide concrete center drop to footing depth and drop rod retainers at center of double gate openings.

3.02 ERECTION TOLERANCES

A. Maximum Variation From Plumb: 1/8" inch in 6 feet.

B. Maximum Offset From True Position: 1 inch.

C. Components shall not infringe adjacent property lines.

3.03 CLEAN-UP

A. Upon completion of work, remove all excess material, trash, boxes, wrappings, scraps, etc. from the area. Grade and rake the area below the fence leaving the area clean with the proper clearance between the finish grade and bottom of fence.

END OF SECTION

SECTION 33 71 73: ELECTRICAL UTILITY SERVICES

PART 1 GENERAL

1.01 WORK INCLUDED
A. Install an underground service entrance from the pad mounted transformer to the service equipment located in the mechanical room.

1.02 SYSTEM DESCRIPTION
A. System Voltage: 120/208 volts, three phase, four wire, 60 Hertz.

1.03 QUALITY ASSURANCE
A. Install service entrance in accordance with the National Electrical Code and the project drawings.

1.04 SUBMITTALS
A. Submit product data under provisions of Section 01 33 00.

PART 2 PRODUCTS

2.01 METERING EQUIPMENT

Electric Metering: NEMA/ANSI C12.10. Provide a socket-mounted electronic programmable outdoor watt-hour meter, surface mounted flush against the side of the low-voltage compartment of the transformer as indicated. Meter shall either be programmed at the factory or shall be programmed in the field. When field programming is performed, turn field programming device over to the Contracting Officer at completion of project. Meter shall be coordinated to system requirements.

1. Design: Provide meter designed for use on a 3-phase, 4-wire, 480Y/277 volt system with 3 current transformers. Electric meters shall be compatible with the existing wireless Sensus FlexNet Advanced Metering Infrastructure (FlexNet) system to include the existing FlexNet tower gateway base station, regional network interface system components and set to the approved system operating frequency provided by base personnel. Include necessary KYZ pulse initiation hardware for future connection to Energy Monitoring and Control System (EMCS).
2. Coordination: Provide meter coordinated with ratios of current transformers and transformer secondary voltage.
3. Class: 20; Form: 9S; Accuracy: +/- 1.0 percent; Finish: Class II
4. Cover: Polycarbonate and lockable to prevent tampering and unauthorized removal.
5. Kilowatt-hour Register: five digit electronic programmable type
6. Demand Register:
(a) Provide solid state
(b) Meter reading multiplier: Indicate multiplier on the meter face.
(c) Demand interval length: shall be programmed for 60 minutes with rolling demand up to six subintervals per interval.
7. Meter fusing: Provide a fuse block mounted in the secondary compartment containing one fuse per phase to protect the voltage input to the watt-hour meter. Size fuses as recommended by the meter manufacturer.
8. Socket: ANSI C12.7. Provide NEMA Type 3R, box-mounted socket having automatic circuit-closing bypass and having jaws compatible with requirements of the meter. Cover unused hub openings with blank hub plates. Paint box to match the pad-mounted transformer to which the box-mounted socket is attached.
9. Current transformers: IEEE C57.13. Provide butyl-molded window type current transformers with 600-volt insulation, 10 kV BIL and mount on the low-voltage bushings. Route current transformer leads in a location as remote as possible from the power transformer secondary cables to permit current measurements to be taken with hook-on-ammeters. Provide three current transformers per power transformer.

2.02 3 Phase Transformer Rated 13 Terminal Meter Socket with Test Switch

Transformer rated 13 terminal aluminum meter socket pre-wired with a 10 pin test switch
Meter Socket: Brooks Meter Devices part # 652-3060B13-468 or approved equal.

Test Switch: Brooks Meter Devices part # 110-2344N or approved equal.

DESIGN FEATURES
Aluminum
Ringless
2 piece cover
Industry standard Hub opening
Cover plate
Pre-wired with a 10 pin test switch.

1. Switch handle colors (left to right):
   P1 – Black
   P2 – Green
   P3 – Red
   Neutral
   C1 – Black
   CR – Black
   C2 – Green
   CR – Green
   C3 - Red
   CR – Red

2. Wiring for Form 9s meter socket (See figure 1).
   P1 – Black
   P2 – Green
   P3 – Red
   Neutral - White
   C1 – Black with white stripe
   CR1 – Black with white stripe
   C2 – Green with white stripe
   CR2 – Green with white stripe
   C3 - Red with white stripe
   CR 3– Red with white stripe

3. Wiring from transformer secondary to meter socket. (Installed by transformer manufacturer or contractor.)

   Use #12 8-C 20-10 UVS meter cable 75C with the following colors:
   Black
   Red
   Green
   White
   Black w/white stripe
   White w/Black stripe
   White w/Red stripe
   White w/Green stripe

   Transformer connections

   Voltage X1 to P1: Black
   Voltage X2 to P2: Green
   Voltage X3 to P3: Red
   Voltage Xo to Neutral: White
   Current 1 (X1) to C1: White with Black stripe
   Current 2 (X1) to C2: White with green stripe
   Current 3 (X1) to C3: White with red stripe
   In the transformer, Current 1 (X2), Current 2 (X2), and Current 3 (X3) wired together and wired to Neutral in the meter socket using black with white stripe insulated conductor. In meter socket, test switch: Neutral, CR1, CR2, CR3, and ground lug are wired together using white insulated conductor.

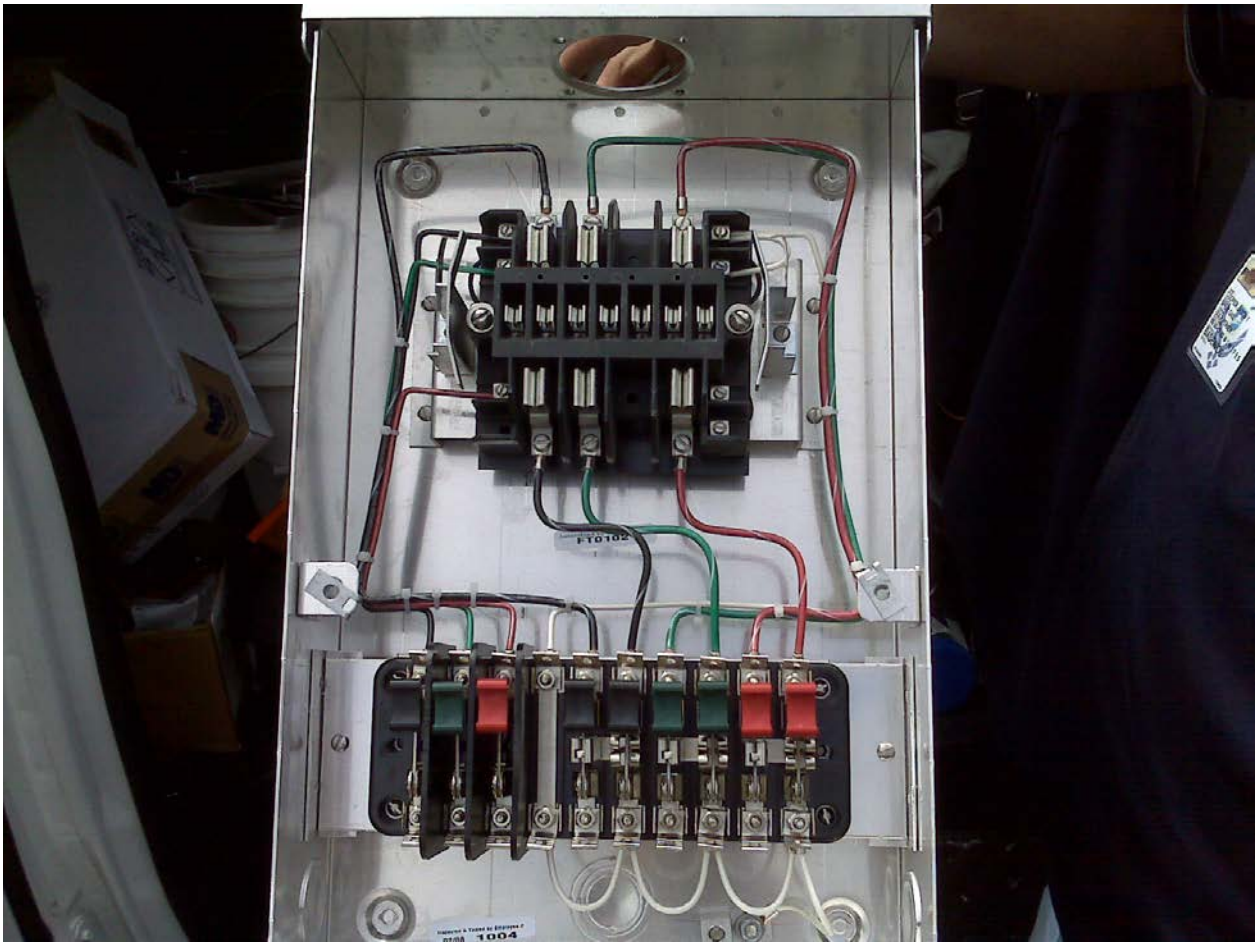


Figure 1: 13 Terminal Meter Socket prewired with Test Switch

PART 3 EXECUTION

3.01 INSTALLATION

A. Underground: Install service entrance conduits from the pad-mounted transformer to building service entrance equipment.

END OF SECTION