

**FINAL
TECHNICAL SPECIFICATIONS
FOR
AIRFIELD SIGNAGE INSTALLATION
PROJECT NO. MUHJ 08-7027
LANGLEY AIR FORCE BASE
HAMPTON, VIRGINIA**



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SECTION 00 01 15

LIST OF DRAWINGS

01/07

PART 1 GENERAL

1.1 SUMMARY

This section lists the drawings for the project pursuant to contract clause "DFARS 252.236-7001, Contract Drawings, Maps and Specifications."

1.2 CONTRACT DRAWINGS

Contract drawings are as follows:

DRAWING NO.	TITLE
C1.1	Title Sheet and Index of Drawings
C2.1	Quantity Sheet
C3.1	General Project Layout
C4.1	General Construction and Safety Notes
C5.1	Safety and Phasing Notes and Details
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REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES:

- A. Regulatory Codes.
- B. Air Force Regulations.
- C. Permits.

1.02 REGULATORY CODES: The latest editions of Federal, State, Industry and local codes which govern this work include, but may not be limited to:

A. Federal:

- 1. Part 1926 - Chapter of Title 29, Code of Federal Regulations.
- 2. Part 192 - Chapter of Title 49, Code of Federal Regulations.
- 3. Corps of Engineers Safety and Health Requirement Manual, EM385-1-1.
- 4. National Historic Preservation Act of 1966 as amended and 1980 as amended.
- 5. Executive Order 13101 - "Greening the Government through Waste Prevention, Recycling, and Federal Acquisition
- 6. Resource Conservation and Recovery Act Section 6002
- 7. FAR Clause 52.223-4 Recovered Materials Certification
- 8. FAR Clause 52.223-9 Certification of Percentage of Recovered Material Content for EPA Designated Items Used in Performance of the Contract
- 9. FAR Clause 52.223-10 Waste Reduction Program

B. State:

Virginia State Enforcement.

1.03 AIR FORCE REGULATIONS: The latest editions of the following Air Force Regulations shall apply to this work:

- A. MIL Handbook 1190, Facility Planning and Design Guide.
- B. Air Force Safety and Health Standard: AFR127-12, Air Force Occupational Safety and Health Program, and applicable standards.

1.04 PERMITS:

- A. The Contractor shall apply for and obtain the following permits, in addition to any other required permits, as applicable:
 - 1. Disposal of Hazardous Materials.

B. The Contractor shall be responsible for payment of any fees associated with acquiring the required permits and should reflect those costs in his/her bid proposal.

PART 2 - PRODUCTS: NOT USED.

PART 3 - EXECUTION: NOT USED.

XXX END OF SECTION XXX

SECTION 01 11 00

SPECIAL CONDITIONS

REVISED 15 MAY 2008

PART 1 GENERAL

1.1 REFERENCES

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

SECTION 01 12 00 Environmental Special Conditions (Langley AFB)

U.S. ARMY CORPS OF ENGINEERS (USACE) EM 385-1-1
(2003 or most current version) Safety and Health Requirements

1.2 SUBMITTALS

The following items specified herein shall be submitted in accordance with SUBMITTAL PROCEDURES:

SD-03 Product Data

Material Safety Data Sheet (MSDS) for each item
State and EPA Region 3 Notifications
Recycling Report
Trip Tickets
Affirmative Procurement Report
Exemption Form, Annex B to LAFB Affirmative Procurement Plan
32-7080
All Employee Names and Social Security Numbers
Work Clearance Requests (Air Force Form 103)
Quality Control (QC) Report

SD-11 Closeout Submittals

Survey Report
Metadata
Deliverables and Final As-builts
Three copies of Computer-Aided Drafting and Design (CADD) digital final as-built drawings on CD's
One As-Built (Redline) Drawings
Warranty of Construction
Equipment Warranty Certificate

Equipment Warranty/Guarantee Record

Submit 6 copies of an organized report bound in a durable, 3-ring water-resistant binder. The report shall contain a table of contents, an executive summary, an introduction, a results section and a discussion of the results.

1.2.1 SUBMITTAL PROCEDURES

1.2.1.1 Schedule of Material Submittals (Air Force Form 66)

Information, shop drawings, certificates, test data, etc., listed on the attached AF Form 66, Schedule of Material Submittals, shall be submitted for approval by the Contracting Officer, or his/her designated representative in accordance with the General Provisions. Whenever in this contract materials or drawings are required to be submitted by the Contractor to the Contracting Officer for approval and the material or drawings submitted are at variance with the specifications or Government drawings, but are, nevertheless, approved by the Contracting Officer, inadvertently and without consciousness of the variance, and regardless that a closer review could have revealed the variance, then such approval shall not be final unless the Contractor expressly noted on the material submittal or drawing that "this material or drawing varies from specifications in the following aspects -" or uses other works of similar clear meaning. In the event of such an inadvertent, erroneous approval, the Contracting Officer, upon discovering the variance at any stage, have the right to require the Contractor to do such rework and/or material replacement as is necessary to obtain compliance with the specifications, and the expense of such rework and/or material replacement shall be borne solely by the Contractor.

a. Submittals for technical compliance of final signage must be made individually for each sign. **SUBMITTALS FOR PANEL TEXT, COLORS, AND NUMBER OF MODULES, SHALL BE MADE SIMULTANEOUSLY FOR EACH INTERSECTION.** Final signage shall be scheduled for each intersection to include illumination type, type material, manufacturer, brand name or product number, and space for Government remarks.

1.3 SCOPE OF WORK

The work under this project consists of the demolition of existing signage and the installation of new signage, sign foundations, duct banks, and any other incidentals necessary to provide fully functioning lighted airfield signage at Langley AFB, as shown on the plans and/or directed by the Engineer.

1.3.1 Work Hours

Normal duty hours for Langley Air Force Base are 0730 through 1630, Monday through Friday. Work on weekends, recognized Federal holidays, or other than normal duty hours must be coordinated with the Contracting Officer (CO) or his/her designated representative.

1.3.2 General Working Conditions

a. Work shall be performed in such a manner as to cause minimum disruption to the users in the area.

b. The Contractor shall notify the Contracting Officer or his/her designated representative when he intends to work so Government inspection can be provided while work is in progress.

1.4 ORDER OF WORK

The Contractor shall coordinate all work with the Contracting Officer, or his/her designated representative, and the Base Civil Engineer. Before starting work at the job site, provide five days notice to the Contracting Officer or his/her designated representative and the Chief of Contract Management at 764-3268.

1.5 PHASING OF WORK

The Contractor will be allowed to work in a maximum of four locations in AOA at any one time. No open excavations will be permitted in the AOA at the conclusion of any workday. Airfield circuits shall be tested with the ATCT and Airfield Operations at the conclusion of every workday.

The Contractor shall use the following Sequence of Work in preparing his Contract Progress Schedule. It lists only highlights of the construction program and is not intended in any way as a complete scope of work. Each item shall be completed before the next item may be started. Work items not listed may be scheduled at any time.

1. Demolition of existing signage.
2. Excavate and install new sign foundation.
3. Install new sign modules and panels.
4. Install duct bank and grounding system.
5. Demolish existing signage and activate new signage.

1.6 APPLICABLE CODES AND REGULATIONS

The latest edition of the following Building Codes shall be used for all construction under this contract:

National Electrical Code (NEC)
ANSI C-2, National Electrical Safety Code (QIESC)
Life Safety Code, NFPA 101
National Fire Protection Association (NFPA)
MIL Handbook 1190
Unified Facilities Criteria (UFC) 3-600-01

NOTE: If there is a conflict between these codes or regulations and these contract specifications, the most stringent requirements shall apply at all times.

1.7 SALVAGE

Title to all materials and equipment to be demolished, excepting items indicated as Government salvage, shall be vested to the Contractor upon removal from the base except as noted below. The Government will not be responsible for the condition, loss or damage to such property after notice

to proceed. All unsalvageable material will be disposed of legally off-base.

1.7.1 Items Salvaged for the Government

The Contractor shall salvage the following existing materials to the Government as indicated below. Salvaged materials shall be cleaned, sorted, identified, bundled, boxed, etc. and delivered to the collection location identified below.

<u>ITEM</u>	<u>DELIVERY LOCATION</u>
Existing Signs	633d Civil Engineering Squadron

1.8 CONSTRUCTION STANDARDS

1.8.1 General

The Contractor is reminded that the construction site must be operated and maintained according to these specifications and is subject to inspection and enforcement according to all federal, state and local codes/regulations.

1.8.2 Office Trailers and Storage Units

1.8.2.1 Office Trailers

If a trailer is required for work and at the discretion of the Government, an office trailer may be located at the project site. The Contractor shall request Contracting Officer approval for the trailer location. The Contractor shall make the request in writing at least fourteen calendar days prior to placement of trailer at site. All office trailers shall be located in areas as directed by the Contracting Officer or his/her designated representative. Any office trailer shall be not more than 10' x 32' in size, provided with a skirt on all sides, in like new condition, and painted either Langley Brown (Federal Standard 595a, 20100), Langley Beige, or white. Office trailers in need of painting and / or repairs or that are in an unsightly condition will not be allowed at the project site. Displayed on the exterior of all trailers shall be a nameplate which has the name of the Contractor's company, name for Contractor's point(s) of contact (POC) and telephone number where he or she can be reached, contract number, project number, title and date trailer was placed on site where located.

1.8.2.2 Storage Units

The Contractor shall request Contracting Officer approval for the siting, size and color of Storage Units, CONEX boxes and dumpsters. The Contractor shall not bring any such items to the job site without the Contracting Officer's approval. All storage units shall be painted Langley Brown (Federal Standard 595a, 20100), Langley Beige or white. Displayed on the exterior of all storage units shall be a nameplate which has the name of the Contractor's company, name for Contractor's point(s) of contact (POC) and telephone number where he or she can be reached, contract number, project number, title and date unit was placed on site where located.

1.8.3 On-Site Storage Units

Availability and size of material lay down area shall be restricted as noted on the contract documents or as discussed during the preconstruction conference. The Contractor shall consolidate all bulk and/or large quantities of materials at the construction site in area(s) approved by the CO. All such items shall be stored neatly grouped together. Bulky or unsightly construction materials, heavy and/or light equipment, or tanks shall not be delivered to or stored on the construction site for any period longer than seven calendar days prior to use, installation in the project, or start of construction. The Contractor shall store all supplies and equipment on project site so as to preclude theft or damage. Protection and security for materials and equipment on site is the sole responsibility of the Contractor. The Contractor shall not use any area(s) for material or equipment storage that has not been approved by the CO or his/her designated representative.

1.8.4 Fencing and Screening

Contractor shall enclose the lay down area with a chain link fence that has been erected to a minimum height of six feet. Contractor's lay down area shall also be screened from view. Screening shall be fabricated of 100% Polypropylene, woven, 92% blockage fabric that has been mechanically attached to the fence for the full height of the fence. The edges of each section of screening fabric shall be finished with a reinforced hem. Attachment points shall be reinforced fabric built into the hem or metal grommets built into the hem. All fabric used for screening of the construction lay down area shall be **UV rated and dark brown or dark bronze in color. Fence screening fabric shall be inspected weekly to insure all sections remain properly in-stalled and taut at all times.**

1.8.5 Locksets

All locksets shall be compatible with the "Best Lock Corporation 7-Pin Interchangeable Cores", no specific brand. Cores themselves must work with the existing master systems in use at Langley AFB (Best Premium WB Keyway 7-Pin Cores, Part Number 1CP7WB2).

1.8.6 Communications

The Contractor shall design and install new communications in accordance with the most current version of 1ST COMM PREMISE WIRE DISTRIBUTION SYSTEM SPECIFICATIONS (Langley AFB).

1.8.7 Electrical Panels

Any electrical panel altered by the Contractor shall have every circuit and circuit modification legibly identified as to its clear, evident and specific purpose and use. The identification shall include sufficient detail to allow each circuit to be distinguished from all others. Spare positions that contain unused overcurrent devices or switches shall be described accordingly. The identification shall be included in a circuit directory that shall be located on the face or inside of the panel door in the case of a panelboard and located at each switch in a switchboard. No circuit shall be described in a manner that depends on transient conditions of occupancy. This is in accordance with 408.4 of the 2008 National Electric Code (NEC).

1.9 CONTRACTOR OPERATIONS

1.9.1 Grassy Areas

Grass and weed growth in excavated materials that are stockpiled on site shall be controlled and/or cut weekly. Weeds and grass within the construction site shall also be controlled and/or cut weekly and any bushes or shrubs shall be trimmed monthly. Areas disturbed by construction and/or those areas required by the plans to be "re-seeded" shall be re-established by hydroseeding only. Straw shall not be used as a cover for freshly seeded areas.

1.9.2 Privately Owned Vehicles (POVs)

POVs used by Contractor personnel to commute to work are required to park in existing parking lots. Contractor or Contractor's employees, including subcontractors, shall not park any personally owned vehicle (POV) or company and/or delivery vehicle on grassy areas near or in the construction site without prior approval from the Contracting Officer, or his/her designated representative. When allowed, parking on grassy areas will only be for short-term delivery purposes (to include heavy tools, equipment, construction materials, etc.). Use designated hard surfaces or existing parking lots near or within the project site for parking of POVs or company and/or delivery vehicles. Tire and track impressions (ruts) created on wet or soft soil by vehicles and/or equipment used in the Contractor's operations shall not be left for more than one day after removal of such vehicle or equipment that caused the rutting. The Contractor shall restore the affected area(s) of the site to its original condition within that one-day period.

1.9.3 Site Cleanup

During construction, the Contractor shall maintain all areas in a neat and orderly manner. Contractor shall keep the construction site cleaned daily of all construction trash, trash generated by employees, debris, and/or demolished building materials. If the work areas are not kept neat and orderly, the Contractor must return to the area to correct the unacceptable condition. During the laying of asphalt roads, streets and/or parking surfaces, areas soiled by residual asphalt shall be cleaned daily. The Contractor shall treat with lime entrances and exits to asphalt work site at his/her own expense.

1.9.4 Access Routes

Access routes to this project shall be limited through the Base as shown on the plans. The Contractor shall not use the gates at King Street Bridge or West Gate (Sweeney Boulevard) for haul route entry. When exiting the base, the haul route shall be through the West Gate only.

1.9.5 Removal of Formwork

The Contractor shall remove all concrete formwork and boards within fourteen calendar days after concrete pour.

1.9.6 Noise Control

The Contractor shall comply with all applicable state, local and installation laws, ordinances and regulations relative to noise control, to include applicable quiet hours exclusive to Langley Air Force Base. Work site is in a residential area of Langley Air Force Base. There shall be absolutely no construction activities in or around the construction site prior to or after the hours designated in "Work Hours" paragraph above without an approval from the Contracting Officer, or his/her designated representative. This restriction also applies to holidays also.

1.9.7 Excavations

All trenches/excavations shall be back filled and compacted to 95% of maximum Proctor density. Trenches will be top dressed with no less than three inches of shifted topsoil and then compacted. The finished area will be free of all debris, rocks and then graded to conform to the surrounding area. The area will be hydroseeded in accordance with SECTION 31 23 00.00 20 EXCAVATION AND FILL of the specifications.

1.9.8 In-Ground Obstructions

Any type of raised obstructions shall have the surrounding soil backfilled, compacted to 95% of maximum Proctor density, and graded. The area will be top dressed as above to within three inches of the top of obstruction. Ground level obstructions will have the area dressed to the level of the obstruction. The area will be hydroseeded in accordance with SECTION 31 23 00.00 20 EXCAVATION AND FILL of the specifications.

1.9.9 Architectural Compatibility

Due to Langley AFB's distinct historic architecture and the high visitor traffic it receives, several special actions are required during construction:

- a. The Contractor is solely responsible for spillage from his/her vehicles and such spillage shall be cleaned up immediately. For the duration of this contract and on a daily basis, the Contractor shall remove from all base roads and streets asphalt, mud, soil, rocks, trash and debris that result from his/her construction operation on base. All roads or streets affected shall be cleaned before close of business on the particular day affected. In the case of asphalt, roads will be cleaned and/or treated with lime immediately upon detection.
- b. Newly placed concrete curbing and sidewalks shall match existing, adjacent concrete in color and texture.
- c. Unprimed or factory-finished equipment installed on the exterior of facilities shall be painted with two coats of brown paint to match existing equipment.

1.9.10 Patching

All holes in walls or other parts of the structure where material or equipment is removed or replaced shall be sealed, painted, caulked or plugged neatly with original type of materials to match the existing part of

the structure so involved. All above work and materials shall be approved by the Contracting Officer or his/her designated representative.

1.9.11 Repairs

Replace or restore all pavement, curb and gutter, and sidewalk disturbed by operations under this contract to the original condition, except where shown or specified otherwise. Compact backfill in pavement repairs with mechanical tampers to affect a density equal to adjacent subgrade. Replace pavement with equal materials and equal thicknesses to that removed, unless indicated otherwise. Each pavement area shall be replaced immediately after the work operation for that area is completed. At the Contractor's option, a temporary repair with a surface of bituminous concrete may be made immediately and removed and the permanent repair made before completion of the contract.

1.9.12 Marking

Contractor shall not mark any curb or pavement with paint.

1.9.13 Protection Requirements

The Contractor shall at all times protect and preserve the property of the Government which is within the work area and could be affected by the accomplishment of the work specified and indicated, and all parties and individuals within or near the work areas who could be endangered by the installation of the work.

1.9.14 Accidental Spills

In the event of fuel spillage during the performance of this contract, the Contractor shall be responsible for its containment, clean-up and related disposal costs. The operator shall have sufficient spill supplies readily available on the pumping vehicle or at the site to contain any spillage. In the Event of a Contractor related release, the Contractor shall immediately notify the Environmental Management Office and take appropriate actions to correct its cause and prevent future occurrences. If the federal, state, or local authorities assess any monetary fine, penalty or assessment related to the release of any substance by the Contractor, his/her employees, or agents during the performance of this contract, the Contractor shall be solely liable for its payment, authorizes the United States Air Force to withhold such form of payment and otherwise indemnify and hold the United States Air Force harmless.

1.10 ENVIRONMENTAL PROTECTION. **PLEASE REFER TO LANGLEY AFB SECTION 01 12 00, ASSET MANAGEMENT SPECIAL CONDITIONS.**

1.11 PROTECTION OF GOVERNMENT PROPERTY

1.11.1 General

The Contractor shall at all times protect and preserve the property of the Government which is within the work area and could be affected by the accomplishment of the work specified and indicated, and all parties and individuals within or near the work areas who could be endangered by the installation of the work. Protection requirements include protecting the

interior of the facility from inclement weather. Any actions necessary for adequate protection are solely the Contractor's responsibility. Any temporary boarding of windows or doors must be painted Langley Brown or Langley Beige to match the exterior.

1.11.2 Protection of Equipment

Contractor is required to cover equipment that is to remain in place within the area of contract operations and protect it against damage or loss and store equipment that is removed in performance of work where directed or use in work as required by drawings and specifications. Equipment temporarily removed shall be protected and returned equal to its condition prior to starting work at no additional expense to the Government. Security for equipment or material that is to be reused and is removed for temporary storage shall be the sole responsibility of the Contractor.

1.11.3 Protection of Grounds

Contractor shall provide protective barriers for all grass, trees, shrubs, sidewalks, curbs and gutters within the construction boundary. Furthermore, such items, including grass, outside the construction boundary shall also be protected during delivery of materials and/or moving of equipment. Damages caused by the Contractor to existing grounds, plants, pavements, utilities, work by others, fixtures, or furnishings shall be repaired by the Contractor. Such repairs shall be of as good condition as existed before the damaging, unless such existing work is scheduled for removal or replacement by the work requirements of the contract. This requirement also pertains to grading of site to remove all clods and grade irregularities prior to final inspection and acceptance. The Contractor may be required to install temporary fencing to protect the site, at no cost to the Government.

1.12 SAFETY

1.12.1 Safety Barriers and Signs

Contractor shall provide barricades, traffic control signs and construction safety signs that meet industry standards. Actual location, size and final arrangement of these items shall be discussed and approved by the Contracting Officer prior to installation. Such approved items shall be of uniform size, design and color. All cones, barricades, warning lights, temporary signs and protective devices shall conform to the current requirements of the Federal Highway Administration's Manual of Uniform Traffic Control Devices for Streets and Highways (MUTCD) and the US Army Corps of Engineers Safety and Health Requirements Manual EM 385-1-1. http://mutcd.fhwa.dot.gov/pdfs/2003r1r2/pdf_index.htm

1.12.2 Employee Health and Safety

1.12.2.1 Compliance

In order to provide safety controls for protection to the life and health of employees and other persons; for prevention of damage to property, materials, supplies, and equipment; and for avoidance of work interruptions in the performance of this contract, the Contractor shall comply with all pertinent provisions of the Corps of Engineers Manual, EM 385-1-1 (2003), entitled "Safety and Health Requirements Manual," as amended. The

Contractor will also take or cause to be taken such additional measures as the Contracting Officer, or his/her designated representative may determine to be reasonably necessary for the purpose. A copy of the manual is available for review in the Civil Engineering Contract Management Section office (Bldg. 328) or copies can be obtained from the Government Printing Office, Washington DC 20402.

1.12.2.2 Subcontractor's Compliance

Compliance with the provisions of this clause by subcontractors will be the responsibility of the Contractor.

1.12.2.3 Safety Records

The Contractor will maintain an accurate record of, and will report to the Contracting Officer or his/her designated representative in the manner and on the forms prescribed by the Contracting Officer or his/her designated representative, exposure data and all accidents resulting in death, traumatic injury, occupational disease, and damage to property, materials, supplies and equipment incident to work performed under this contract.

1.12.2.4 Notification of Non-Compliance and Corrective Action

The Contracting Officer or his/her designated representative will notify the Contractor of any noncompliance with the foregoing provisions and the action to be taken. The Contractor shall, after receipt of such notice, immediately take corrective action. Such notice, when delivered to the Contractor or his/her representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails or refuses to comply promptly, the Contracting Officer or his/her designated representative may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

1.12.3 Applicable Publications

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

a. Code of Federal Regulations (CFR):

(1) OSHA General Industry Safety and Health Standards (29 CFR 1910), Publication V2206, OSHA Construction Industry Standards (29 CFR 1926). One source of these regulations is OSHA Publication 2207, which includes a combination of both Parts 1910 and 1926 as they relate to construction safety and health. They are for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, DC 20402.

b. National Emission Standards for Hazardous Air Pollutants (40 CFR, Part 61).

c. Federal Standard (Fed. Std.):

(1) 313A Material Safety Data Sheets, Preparation and the Submission to the BioEnvironmental Office on Langley AFB. Safety and Health Requirements Manual, EM 385-1-1

(2) Use of Asbestos Containing Material or any Class 1 ozone depleting chemical compounds is prohibited at Langley AFB, DA Circular 40-83-4

(3) Work covered by this section: This section is applicable to all work covered by this contract.

(4) Definition of Hazardous Materials: Refer to hazardous and toxic materials/substances included in Subparts H and Z of 29 CFR 1910 and to others as additionally defined in Fed. Std. 313. Those most commonly encountered include asbestos, lead paint, polychlorinated biphenyl's (PCBs), explosives and radioactive material, but may include others. The most likely products to contain asbestos are sprayed-on fireproofing, insulation, boiler lagging and pipe covering.

1.12.4 Precautions Against Hazards

1.12.4.1 Welding, Cutting and Burning

All welding and cutting operations shall be done in accordance with nationally recognized good practice. The current publications of the American Welding Society, 2501 NW 7th Street, Miami FL 33125, and the National Fire Protection Association, 470 Atlantic Ave., Boston MA 02110, shall be used as a minimum standard of nationally recognized safety procedures in welding and cutting.

The Contractor shall provide the necessary methods of fire extinguishment and fire prevention, and before operations begin, clear all welding and cutting operations with the representative of the Contracting Officer or his/her designated representative. The Contractor shall request and receive an AF Form 592, USAF Welding and Brazing Permit, before preparing for such operations.

The Contractor shall discontinue all burning, welding or cutting operations one hour prior to the end of the normal workday. The Contractor shall provide a workman to remain at the site for thirty minutes after discontinuing the above operations. This workman shall make a thorough inspection of the area for possible sources of latent combustion. Any unsafe conditions shall be reported to the Fire Department for their investigation - EMERGENCY PHONE NO 911.

1.12.4.2 Open Flames

The use of open-flame heating devices will not be allowed except by special permission of the Contracting Officer or his/her designated representative. Such permission will not be granted unless the Contractor has taken all venting precautions. Burning trash, brush or trees on the job site will not be allowed unless specific approval is granted for each incident by the Contracting Officer or his/her designated representative. Approval for the use of open fires and open-flame heating devices will in no way relieve the Contractor from the responsibility of any damage incurred because of fires

1.12.4.3 Flammable Liquid Storage

Flammable liquids shall be stored and handled in accordance with the Flammable Liquids Code (No. 30) of the National Fire Protection Association. Flammable liquids shall not be stored in the Contractors storage trailers.

1.12.4.4 Technical Services

The Langley Fire Department, Technical Services Section, (757) 764-4275, is available for assistance concerning fire hazard questions.

1.13 SECURITY

1.13.1 General Base Requirements

Access to Langley AFB is restricted to those Contractor and subcontractor employees required for the performance of this contract and only for the performance period of this contract. Contractor passes are issued by the Pass and Registration Section, Bldg 15 (Room 103), after a signed letter from the Contractor listing all employee names and social security numbers has been delivered to and approved by the Contracting Officer or his/her designated representative. Procedures for requesting Base Passes for employees and Contractor vehicles will be further explained during the preconstruction conference.

1.13.2 Emergency Security Situations

If a security violation is detected from any cause, it may result in the cessation of all work and evacuation of the area by all Contractor personnel to a point to be determined by the Security Police Supervisor at the scene. The control of construction personnel under these conditions is a Security Police Officer and their orders shall be followed in detail. Construction will be permitted to resume as quickly as possible. The individual causing the violation may be apprehended, and if so, will be processed and released to a responsible supervisor; such person might be away from his/her work site as long as 1 to 1½ hours. If a hostile situation is detected as a result of the construction activity, the entire crew may be removed from the area and detained until competent authority approved their release. All Security Police exercises will be scheduled to not interfere with construction personnel or with their work.

1.13.3 Work In Special Security Areas

1.13.3.1 Escorts

Government shall provide all escorts required for access to security areas while working on construction projects at LAFB.

1.13.3.2 Applicable Security Criteria

AFI 31-101, The Air Force Installation Security Program shall apply to construction projects at Langley AFB.

1.13.4 Restricted Areas

1.13.4.1 General

All work to be performed on this project is within the boundary of a USAF Restricted Area and will be confined to the immediate vicinity of the Airfield Operations Area. Full operational status of the mission and Security Forces will be maintained throughout the contract period. To facilitate contract work while preserving strict security, a Contractor free zone will be established around each work area, and a combination of entry control, internal movement and surveillance techniques will be employed. Security procedures and USAF Security Police actions will take precedence over all concerns at the time of emergencies or mission operations. The use of deadly force is authorized to protect government resources.

1.13.4.2 Entry Control

Entry into the work areas will be through the use of Air Force Form 75, Visitor Pass and an Entry Authority List provided by the Contractor to the Chief of Security Police. The Base Commander retains the authority to deny entry to any person(s). Security Police and Escort Officials execute this authority for the Base Commander.

1.13.4.3 Identification Permits

The Contractor is responsible for requiring each employee to display an identification permit while within the area. All identification permits shall be immediately delivered to the Contracting Officer or his/her designated representative, for cancellation upon release of any employee or termination of contract work, whichever is sooner. All Contractor personnel shall stay within the boundaries of the guarded work zone. Subcontractors, material deliverers or other workers must be pre-identified 48 hours in advance of their arrival by an Entry Authority List approved by the Contracting Officer or his/her designated representative. This list will contain the full name, SSAN and the base pass number (Air Force Form 75). If this notification is not received, some delay may be expected.

1.13.4.4 Search Procedures

Search procedures will be in effect at all times. Each time a Contractor personnel enters the secure area the vehicle and cargo, briefcases, toolboxes, etc. may be searched. Individuals are also subject to search by the use of a metal detector. Primary emphasis will be placed on locating explosive devices, instruments of espionage, unauthorized individuals and other objects of a suspicious nature. The Contractor shall store tools and cargo that are not required for the job in his/her own facility that will be located in a designated area.

1.13.4.5 Internal Controls

The boundaries of the designated work areas will be under surveillance of armed guards. Contractor personnel must remain within the boundaries of the designated area and shall enter or depart the work areas only through the designated Exit / Entry Point. The Contractor shall insure all persons are aware of the boundaries, and that they are to remain within the work zone.

1.13.4.6 Security Manager

The Contractor shall designate a representative as Security Manager to coordinate security matters. At least 48 hours in advance of a change in work hours, the Security Manager shall notify the Contracting Officer or his/her designated representative, who will notify the Security Police.

1.13.4.7 Housekeeping

The Contractor shall keep the work area neat and tidy. Clean up shall be accomplished daily, and all piles of materials, equipment and debris that could afford cover or concealment for unauthorized persons shall be removed from the area. Storage areas will be designated and the Contractor shall not store anything within thirty feet of the boundary fence.

1.13.4.8 Power Interruptions

Power interruptions necessary as a part of the construction project shall be coordinated with the Contracting Officer or his/her designated representative who will, in turn, notify the Base Civil Engineer, Central Security Control and (the area occupants). The request for interruptions shall include reason, date, time, area affected and duration, and shall be submitted to allow notification at least two days in advance of the interruptions.

1.13.4.9 Repair Responsibilities

Any damages or alteration to any security facility, i.e., fence, lighting, communication cables, will be repaired, replaced, or suitable substitute provided by the Contractor prior to night fall of the day such action occurred or was detected.

1.13.4.10 Overnight Storage of Construction Machinery

All construction machinery that is self-propelled (tractors, back hoes, dozers, trucks, etc.) will not be allowed to remain within the Restricted Area overnight. Such vehicles must be parked in a designated area 30 feet beyond the boundary fence, locked, and keys removed.

1.13.4.11 Mission Operation

Occupant, Munitions, and Security Operations will be continuous throughout the contract period and will necessitate nominal constraints on Contractor operations. Planning between the Contracting Officer or his/her designated representative and mission units can eliminate most constraints except those caused by unforeseen events. During any movements of security re-sources into or from the Restricted Area, construction will be halted prior to the movement and the construction crew will be relocated to an area away from the convoy route and / or destination. Under no circumstance will the reason for this relocation be announced to the Contractor. The Site Supervisor will be responsible for insuring all Contractor personnel are positioned away from the convoy routes and destination. Contractor personnel shall obey all instructions of Security Police that pertain to their movement and activity. However, Security Police will not interfere or halt any affect on rate of work or quality of work; their interference will pertain only to that necessary to protect security resources, if pre-sent.

1.13.4.12 Delays In Entering And Leaving Work Area

The Contractor may experience delays due to compliance with entrance/exit requirements of restricted/controlled areas. The Contractor shall not be compensated for reasonable delays in accessing the site. Also, due to the nature of restricted areas, the Contractor may be requested to leave the restricted area at any given time. The Contracting Officer may extend the contract performance time when area designations change while the Contractor is working.

1.13.4.13 Safety

Flame and spark producing equipment (i.e., matches, lighters, vehicle cigarette lighters) shall be surrendered at the Entry Control Point prior to entry to the area. Smoking within the area is prohibited except in Contractor provided approved smoking areas. The use of flame and spark producing equipment within the area is discouraged; however, in the event that it is necessary to use electric welders, oxygen-acetylene torches or other spark producing devices, the Contractor shall notify the Contracting Officer or his/her designated representative. Should a hazardous condition arise during the use of such devices, contact the Fire Department (Main Base: 911; Bethel Manor Housing: 865-1042). All Contractor personnel are subject to base safety and traffic regulations and may be barred from motor vehicle operation for cause.

1.13.5 Airfield Requirements

1.13.5.1 Contact Base Operations

Contractor shall contact LAFB Base Operations (764-4292, 764-2508), for construction restrictions involving the flightline, taxiway and runway areas and shall comply with Air Force Instruction AFI 13-213.

1.13.5.2 Radio Communication with Tower

Two-way radio contact on VHF Radio capable of communication with the Air Traffic Control Tower on the ramp net (163.4625 MHz) is required at all times for all personnel and groups of personnel working on the flightline, taxiways and runways. Contractor shall coordinate radio issuance with the project inspector.

1.14 HISTORIC DISTRICT/ARCHITECTURAL COMPATIBILITY

Due to the distinct historic architecture and the high visitor traffic LAFB receives, several special actions are required during construction and are listed herein.

1.14.1 Newly Placed Concrete

When placing concrete adjacent to existing concrete, all newly placed concrete curbs, gutters and sidewalks shall match existing adjacent concrete in color and texture. Miami Buff is the predominate color used on LAFB. All concrete that is newly placed by the Contractor shall be Miami Buff in color unless specifically noted otherwise in the contract documents or instructed otherwise by the Contracting Officer or his/her designated representative.

1.14.2 Unprimed or Factory Finished Equipment

Unprimed or factory-finished equipment installed on the exterior of facilities shall be painted with two coats of brown paint to match existing equipment.

1.14.3 Patching

All holes in walls or other parts of the structure where material or equipment is removed or replaced shall be sealed, painted, caulked or plugged neatly with original type of materials to match the existing part of the structure so involved. The Contracting Officer or his/her designated representative shall approve all above work and materials.

1.14.4 Pavement Repairs

Replace or restore all pavement, curb and gutter, and sidewalk disturbed by operations under this contract to the original condition, including any markings or striping, except where shown or specified otherwise. Compact Backfill in pavement repairs with mechanical tampers to affect a density that is equal to adjacent subgrade. Replace pavement with equal materials and equal thickness to that removed, unless indicated otherwise. Each pavement area shall be replaced immediately after the work operation for that area is completed. At the Contractor's option, a temporary repair with a surface of bituminous concrete may be made immediately and removed and the permanent repair made before completion of the contract.

1.14.5 Marking Restrictions

Contractor shall not mark any curb or pavement with paint unless directed by the Contracting Officer or his/her designated representative.

1.15 RECORDING AND PRESERVING HISTORICAL AND ARCHAEOLOGICAL FINDS

1.15.1 Preservation

All items having any apparent historical or archeological interest, which are discovered in the course of any construction activities shall be carefully preserved. The Contractor shall leave the archeological find undisturbed and shall immediately report the find to the Contracting Officer or his/her designated representative so that the proper authorities may be notified.

1.15.2 Rehabilitation

All repair, maintenance, and construction must be completed in a manner that is consistent with the Secretary of the Interior's "Standards for Historic Preservation Projects" and the Secretary's "Illustrated Guidelines for Rehabilitating Historic Buildings".

1.16 EXCAVATION REQUIREMENTS

The Government will furnish the Contractor with an approved AF Form 103, BCE Work Clearance Request, indicating any special precautions and/or areas that will be marked (for utilities). The contract drawings, AF Form 103 and marking will indicate all information the Government has knowledge of, but

will not indicate all conditions that may occur in the field. The Contractor shall not begin (work) excavation until the Clearance Request is issued. The Contractor shall be responsible for removing all markings made for his benefit as soon as the need for an individual mark is passed. The Government will mark utilities one time only. Maintaining these marks or additional marking is the responsibility of the Contractor.

1.16.1 Acquiring a Work Clearance Request (Air Force Form 103)

A coordinated and approved Work Clearance Request is required prior to any excavation activities. The Contractor shall submit a request to the Project Inspector 14 days prior to the start of excavation work. All requests must be initiated not later than Thursday of any week to be inserted into the Work Clearance approval process for the following week. The Contractor will be notified to attend a Work Clearance scheduling meeting. At the Work Clearance meeting, the Contractor will receive an AF Form 103, instructions for completing the form, and a date and time for utilities to be marked. **The Contractor shall not commence excavation prior to obtaining an approved AF Form 103.** After all respective utilities have been marked and verified by the Project Inspector, the Contractor shall return the original AF Form 103 to his/her respective Project Inspector for coordination and signature by the Chief of Engineering. No digging or excavation shall begin before the Chief of Engineering signs the AF Form 103. After the Chief of Engineering signs the AF Form 103, the Project Inspector will return it to the Contractor. Then, and only then, shall the Contractor commence excavation. The Contractor shall maintain all utility markings for the duration of the contract. Contractor shall maintain original version of the AF Form 103 for the duration of excavation work at the particular site. Ensure all applicable parties have coordinated on the form prior to excavation. For Miss Utility, use the Ticket Information Exchange (TIE) number or actual technician signature as evidence of coordination. The AF Form 103 clearance shall not be allowed to expire. The Contractor shall revalidate/resubmit the AF Form 103 within seven days prior to the expiration date if it is anticipated or known that the duration of excavation will exceed the 30-day limitation.

1.16.2 Miss Utility

Contractor shall contact Miss Utility (1-800-552-7001) at least 48 hours prior to excavation to identify non-Air Force-owned underground utilities (cable TV, Bell Atlantic and Virginia Power, etc.). Notices to Miss Utility are good for 15 working days; after that period, Contractor shall renew the notice. Indicate renewals on the AF Form 103 as applicable. Miss Utility is open 24 hours, seven days a week. Calls after 1700, before 0700, on weekends and on holidays are accepted for emergencies only. Holidays include: New Year's Day, Martin Luther King Day, President's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, Day after Thanksgiving and Christmas Day. After 48 hours, Contractor should contact Miss Utility to confirm that clearance/markings operations have been completed. The Contractor must wait an additional 24 hours if any operators or contract locators have not responded to the Ticket Information Exchange (TIE) system request within the first 48 hours.

1.16.3 Markings

1.16.3.1 General Requirements for Marking Utilities

a. Prior to commencing any excavation, the Contractor must inspect the site for clear evidence of unmarked facilities. If evidence of such facilities is present, the excavator must notify the notification center and wait an additional three hours for the facilities to be marked.

b. The Contractor may choose to wait 72 hours and begin work after that time if there is no evidence that any underground facilities remain unmarked. However, it is recommended that Contractors contact the TIE system and confirm the status of underground facilities before they commence work.

c. After the markings have been made, Contractors are required to maintain a minimum clearance of two feet between a marked, underground utility line and the cutting edge of any power-operated excavating equipment. If excavation is required within two feet of any marking, it shall be performed very carefully with hand tools in accordance with Virginia Code Section 56-265.24.

d. If, during the course of excavation, a utility line has been exposed, before backfilling, the Contractor must inspect these facilities to ascertain if the facilities have been damaged. If damage of any kind is discovered or suspected, it is the Contractor's responsibility to immediately notify the utility owner directly. The Contractor must NOT attempt to repair damaged facilities.

e. Maintain any paint marks or stakes indicating underground utilities/lines as required during the duration of work or thirty calendar days from date of approved AF Form 103 (whichever is earlier). Note that Miss Utility clearance expires after fifteen working days.

1.17 OCCUPANCY AND SERVICES TO EXISTING FACILITIES

a. The airfield will be active during the course of the contract. The Contractor shall sequence and arrange his work to minimize disruptions of the airfield operations. Time and duration for interruption of utility services shall be approved by the Contracting Officer, or his/her designated representative. Work within or affecting the AOA shall be consolidated for each work area and through the Contracting Officer or his/her designated representative, a minimum of 24 hours in advance of construction work.

1.18 UTILITIES

All reasonable amounts of water and electricity required for this work will be made available to the Contractor if such utilities exist at the project site. Temporary lines, connections, installation, maintenance and removal shall be the Contractor's responsibility. The Contracting Officer, or the Contracting Officer's designated representative, shall approve any temporary lines and connections. All services are subject to discontinuance without notice to the Contractor in an emergency. Three-phase power may not be available. **The Contractor shall provide his/her own necessary utilities when such utilities are not available at the project site.**

1.19 UTILITY OUTAGES AND TRAFFIC

Contractor shall request utility/power outages and/or changes to normal traffic flow pattern 14 calendar days in advance of disruption or change to either.

1.20 CONVENIENCE FACILITIES

Existing restroom facilities may not be used by construction personnel. The Contractor shall maintain, in a neat and sanitary condition, such accommodations for the use of his employees. Temporary restroom facilities shall be white in color.

1.21 SUPERVISION

1.21.2 Superintendent

The Contractor shall employ a construction superintendent to oversee all work under this contract. The superintendent shall remain at the project site at all times when work is in progress except for such incidental errands required by his/her duties. The superintendent is responsible for the proper coordination and timeliness of the work, and for proper workmanship of all trades; therefore, his/her absence from the project site without a suitable substitute representative of the Contractor shall be considered as damaging to the Government. The ability of the superintendent, based on his/her knowledge and experience, are essential to the proper execution of the work, as is his/her ability to communicate and direct the efforts of those performing the work.

1.23 RECORD DRAWINGS

1.23.1 Record of Work Progress

During the progress of the work, the Contractor shall keep a careful record at the job site of all changes, corrections and deviations from the layouts and details shown on the drawings to include all contract modifications. The Contractor shall enter such changes on project drawings promptly, but not later than on a weekly basis. Such revised drawings shall be considered "redline" as-built drawings.

1.23.2 Record of Underground Utilities

Where underground utilities are installed, note the elevation of the utility installed every thirty feet. Where new utilities cross existing utilities, note the elevation of the new and existing utility and the vertical and/or horizontal separation. Where new utilities run parallel to new and existing utilities, note the elevation at which installed and the horizontal and/or vertical separation between utilities.

1.24 DELIVERABLES AND FINAL AS-BUILTS

1.24.1 Geodetic Control Surveys

The Contractor shall provide horizontal and vertical control surveys for the precise location of primary survey points for planning, engineering, construction, real estate projects, GIS applications or facility management.

1.24.1.1 DELIVERABLE REQUIREMENTS

All locational base map (point, line, and polygon feature(s)) data collected shall be delivered in **ESRI ArcGIS 9.x** digital format along with the original source files. The geospatial files shall have an external spatial reference (.prj) file attached specifying the parameters of the coordinate system used (as provided by the government). All topologically correct geospatial data shall overlay on the installations latest orthorectified imagery provided by the government, using the same coordinate and projection system of the imagery (WGS84). All accuracy errors shall be reported to the contract program manager.

- All Architectural/Engineering data (building components, plans, designs, etc.) shall be in a **digital** (electronic information) **format** AutoCAD 2005 or higher. Drawings will be delivered in the AutoCAD ".DWG" file format. The Contractor shall use the A-E/C CADD Standard 4.0 (or latest version) when creating or revising any CADD data deliverables.
- All graphic and non-graphic data will be collected in the format defined by the *Spatial Data Standards Facilities, Infrastructure, and Environmental (SDSFIE) release 2.60* (or the most current version available), except where modified by the Government. This standard can be found at: <https://www.sdsfie.org>
- The contractor shall provide a quality control (QC) report that must state whether all inconsistencies in the data generated were corrected, or it must detail the remaining errors by case. The contractor shall utilize a topology build and clean routine to assure that there are no overshoots or undershoots in the line work, slivers or dangles in polygons, and that there is complete closure of polygons with a maximum fuzzy tolerance value of 10^{-9} . The quality report must identify the software (name and version) and satisfy these conditions:
 - a. The edges of all digitized vector data or raster imagery must exactly match digitally with those of all adjacent maps.
 - b. The digital representation of the common boundaries for all graphic features must be exactly the same, regardless of feature layer. Each feature within a layer must be represented by a single graphic element (e.g., polygon, line, or line string).
 - c. Lines and line strings which represent the same graphic element must be continuous (i.e., not broken or segmented), unless that segmentation reflects a specific visual line type. Lines or line strings representing the same type of data must not cross except at intersections.
 - d. Polygons must be closed (i.e., the first x- and y-coordinates must *exactly match* the last x- and y-coordinates). Each polygon must have a single unique centroid to which attributes (i.e., an attribute table) can be attached. Polygons of the same coverage must not overlap and must cover the area of interest completely (i.e., have no gaps in coverage).

e. All graphic elements that connect must exactly connect digitally, without overlaps or gaps.

f. Straight lines must be represented by only the beginning and ending x- and y-coordinate points. Line strings must not cross back on themselves or be of zero length.

- Feature Attributes: The contractor shall identify the classification, type, size, location, ID number, and any other necessary attributes (specified by the Government) for all surveyed, mapped, designed, or proposed features.
- All symbol libraries, font libraries, text size, text format, and text placement shall be prepared in accordance with and conform to the Spatial Data Standards (SDS).
- The contractor shall not develop new libraries without prior written approval from the Government.
- The contractor shall provide metadata files for all locational data produced under this contract. The metadata file shall conform to the Federal Geographic Data Committee's "Content Standard for Digital Geospatial Metadata, Version 2.0" (or latest version) found at: http://www.fgdc.gov/standards/standards_publications/index.html. The output from the **ESRI ArcCatalog metadata generator software (or compatible software)** shall be the standard format for all metadata files created under this contract. In addition, the metadata data shall be provided in **ASCII text** format. The digital metadata files shall be provided to the Government along with each final product deliverable, unless otherwise approved in writing by the Government.

1.24.1.2 SURVEY DATA

- The contractor shall use conventional surveying and other methods, such as a total station or Global Positioning Systems (GPS) for field data collection at an accuracy level in accordance with "Geospatial Positioning Accuracy Standards, Part 3: National Standard for Spatial Data Accuracy," published by the Federal Geographic Data Committee (FGDC), dated July 1998. This standards document can be found at: http://www.fgdc.gov/standards/standards_publications/index.html .
- All Survey data collected shall be provided to the Government in a digital format with an attached Survey Report identifying survey method, equipment list, calibration documentation, survey layout, description of control points, control diagrams, and field survey data.
- Data on the location of utility lines shall be captured at a minimum every 50 feet and each turn or bend in a utility line must be captured.
- A Survey Control Database (consisting of a survey marker database and a survey traverse database) will be produced for all survey control points established under this contract, and delivered in a .dbf or ASCII comma-delimited format.

- If GPS is used, the contractor shall use *survey grade* GPS, at an accuracy level of +/- 2 cm., when appropriate, to collect data to be overlaid onto the installation's orthophotograph and/or base map.

1.24.1.3 DELIVERY FORMAT

Note: No deviations from the Government's established standards will be permitted unless prior written approval of such deviation has been issued by the Government. All linkages of non-graphical data with graphic elements, relationships between data objects and attributes, and report formats shall be maintained.

These deliverables include, but are not limited to:

- Site plans
- As-built drawings
- Engineering designs, plans or surveys
- Topographic surveys or studies
- Boundary or Cadastral surveys
- Master Plan drawings
- Utility (water, sewer, power, storm, etc.) designs, plans, surveys and studies
- Pavement, Grading, or Excavation plans
- Soil/Geology studies or surveys
- Environmental assessments, surveys, studies, or plans
- Historical or Archaeological surveys, studies, or plans

All data deliverables shall be in a **digital** (electronic information) **format** and shall be delivered in a format that conforms to the **Spatial Data Standards Facilities, Infrastructure, and Environmental (SDSFIE) release 2.60 (or latest version available)** at <http://www.sdsfie.org> and **A/E/C CAD Standards version 4.0 (or latest version available)** at <https://cadbim.usace.army.mil/CAD> .

The following procedures must be performed before a file is placed on the delivery media:

1. Include all files, both graphic and non-graphic, required for the project. Make sure all files are in the same directory, and that references to those files do not include device or directory specifications.
2. Ensure all reference (external reference) files are attached and without device or directory specifications.
3. Remove all extraneous graphics/text outside the project border area, and set the active parameters to a standard setting (or the setting contained in the seed or prototype file).
4. Include any standards sheets (abbreviations, symbols libraries, font libraries, color tables, pen tables, plot configuration files, user command files, etc.) necessary for a complete project.
5. Compress and/or reduce all files using the appropriate utilities. A digital media copy of the decompression utility should be provided with the delivered data, if necessary.

Note: Using the eTransmit command on newer versions of AutoCad will satisfy some or all of the items listed in 1, 2, 4 and 5 listed above.

1.24.1.4 DELIVERY MEDIA

*CD-ROM

Digital Media must have an external label listing the project title, project number and BCE drawing number in large, bold font. Format and version of the operating system on which the media was created (e.g. Windows XP), utility/command used for writing the files to the media, a short description of contents, a sequence number if there are multiple volumes, and the date of CD creation must also be printed on the label.

A transmittal sheet must accompany the media containing the information included on the external labels, total number of volumes being delivered, and a list of file names and file descriptions on each volume. The transmittal sheet must also include instructions for reading, restoring, or transferring the files from the media, and *certification that all delivery media is free of known computer viruses* - including the name(s) of the virus scanning software and the date the virus scan was performed.

1.24.1.5 GOVERNMENT FURNISHED MATERIAL

The Government will provide the contractor with data and information concerning all necessary and pertinent functions and principal features of the identified project. These items will include:

- The installation's latest georeferenced digital planimetric data and/or base map in ESRI Arc/Info 9.x format, or best format available, with associated data files.
- The installation's latest orthorectified imagery and specified geospatial parameters (coordinate system, datum, projection, distance units).
- Installation standard AutoCAD drawing sheet template.
- Any pertinent and necessary prototype or seed files.
- Frequency settings for the Real-Time Kinematic (RTK) GPS Base Station and the preferred GPS receiver specifications if required.
- Any other data or schematics deemed necessary for project completion, pending approval from the Government.

1.24.2 GOVERNMENT REVIEW

The Government shall review the submitted data and documentation upon completion of all stated work. Missing or incomplete items will be documented and forwarded to the Contractor for completion. Upon receipt of a complete submittal, the Government will conduct a quality review and notify the Contractor within 14 days of acceptance (along with any stipulations this includes) or rejection of the deliverables described herein. Failure to adhere to any of the stated delivery specifications could result in rejection of deliverables and nonpayment. Contractors should, at a minimum, submit data and documentation samples at 25% and 75% project completion to avoid the rejection of final deliverables.

Any questions regarding data collection efforts, deliverable formats or deliverable specifications should be addressed to the Geo Integration Office, contact information:

633d Civil Engineer Squadron - MSgt Robert Gracey, 633 CES/CEPT
37 Sweeney Blvd; Room 224
Langley AFB, VA 23665
757.764.1164

1.25 WARRANTY OF CONSTRUCTION

a. In addition to any other warranties in this contract, the Contractor warrants that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material or design furnished, or workmanship performed by the Contractor or any subcontractor or supplier at any tier. This warranty shall not limit the Government's rights under the Inspection and Acceptance clause of this contract with respect to latent defects, gross mistakes or fraud.

b. This warranty shall continue for a period of one year from the date of final acceptance of the work. If the Government takes possession of any part of the work before final acceptance, this warranty shall continue for a period of one year from the date the Government takes possession. In the event the Contractor's warranty of this clause has expired, the Government may sue, at its expense, to enforce a subcontractor's, manufacturer's or supplier's warranty.

c. The Contractor shall remedy, at the Contractor's expense, any failure to conform or any defect. In addition, the Contractor shall remedy, at the Contractor's expense, any damage to Government-owned or controlled real or personal property when that damage is the result of:

1. The Contractor's failure to conform to contract requirements, or
2. Any defect of equipment, material, workmanship or design furnished.

d. The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for one year from the date of repair or replacement.

e. The Contracting Officer shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect or damage.

f. If the Contractor fails to remedy any failure, defect or damage within a reasonable time after receipt of notice, the Government shall have the right to replace, repair or otherwise remedy the failure, defect or damage at the Contractor's expense.

g. With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall:

1. Obtain all warranties that would be given in normal commercial practice, and
2. Require all warranties to be executed, in writing, for the benefit of the Government if directed by the Contracting Officer, and
3. Enforce all warranties for the benefit of the Government if directed by the Contracting Officer.

h. Unless a defect is caused by the negligence of the Contractor, subcontractor or suppliers at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the Government or for the repair of any damage that results from any defect in Government-furnished material or design.

i. Defects in design or manufacture of equipment specified by the Government on a "brand name and model" basis shall not be included in this warranty. In this event, the Contractor shall require any subcontractors, manufacturers or suppliers thereof to execute their warranties, in writing, directly to the Government.

j. The warranty enumerated herein does not preclude any manufacturer warranties in excess of one year as noted in the individual specifications sections. The Contractor should read each section carefully to ensure that he/she is aware of all warranties called for in this project.

1.26 WARRANTY/GUARANTEE RECORDS

1.26.1 Certification of Equipment

The Contractor shall prepare Optional Form(s) (OF) 274, Equipment Warranty Certificate, and affix the certificate(s) to all warranted components of the equipment installed during the project. When a complete mechanical system has been installed, affix the OF(s) 274 to the Mechanical Room door also. If the warranted items are in a new facility, Optional Form(s) 274 shall be placed as mentioned above. The Construction Inspector will distribute the OF 274 to the Contractor during the Pre-Construction Conference. The Contractor shall place all OF(s) 274 on the appropriate equipment prior to final acceptance of the project by the Government.

1.26.2 Listing of Equipment

The Contractor is required, prior to the final inspection to provide a listing of all equipment or material carrying a manufacturer's warranty or as indicated in the specifications. Use the following Equipment Warranty/Guarantee Record for each item and attach manufacturer's certificate as appropriate.

Equipment

Warranty / Guarantee Record

Facility No: _____ Project No: MUHJ _____

Project Title: _____ Work Order: _____ Shop Code: _____

Item: _____ Location: _____ Contractor: _____

Prefix: _____ Suffix: _____ Serial No: _____ Model No: _____

Style: _____ HZ: _____ Volts: _____ HP: _____ Size: _____ Frame: _____

Purchase Cost: _____ Replacement Cost: _____ Manufacturer: _____

Date Purchased: _____ Date Installed: _____

Effective Date: _____ Expiration Date: _____

Replacement, New or Other: _____ Purchase Number: _____

GSA Contract Number: _____

Contract Inspector: _____ Phone: _____

Remarks: _____

Evaluator: _____ Grade: _____ Title: _____ Orgn: _____

1.27 SEASONAL HVAC REQUIREMENTS

Air conditioning systems are required to be operational from 15 May through 15 September and the heating systems are required to be operational from 15 October through 1 May. Provide temporary heating or cooling during these periods if the air conditioning system or heating system is shut down to perform any work. Submit shop drawings for approval of proposed method for providing temporary heating or cooling.

1.28 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER

This provision specifies the procedure for the determination of time extensions for unusually severe weather. The listing below defines the adverse weather days that are anticipated monthly. The listing is based upon data from the National Oceanographic & Atmospheric Administration (NOAA) or similar data.

MONTHLY ANTICIPATED ADVERSE WEATHER CALENDAR DAYS

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
13	12	12	9	10	9	10	10	7	8	10	12

1.28.1 Base Line

The above schedule of anticipated adverse weather will constitute the base line for monthly (or portion thereof) weather time evaluations. Upon acknowledgment of the Notice To Proceed and continuing throughout the contract on a monthly basis, actual adverse weather days will be recorded on a calendar day basis (include weekends and holidays) and compared to the monthly anticipated adverse weather in the schedule above. The term "actual adverse weather days" shall include days impacted by actual adverse weather days.

1.28.2 Calculation of Adverse Days

The number of actual adverse weather days shall be calculated chronologically from the first to the last day in each month. Once the number of actual adverse weather days anticipated in the schedule above have occurred, the Contracting Officer, or his/her designated representative, upon the Contractor's written request, will examine any subsequently occurring adverse weather days to determine whether the Contractor is entitled to a time extension. Before adverse weather entitlement is granted, the Contractor must demonstrate that fifty percent or more of his/her workdays were affected by the subsequent adverse weather. The adverse weather must also delay work critical to the timely completion of the project. The Contracting Officer, or his/her designated representative, will convert any delays meeting the above requirements to calendar days and issue a modification.

Note: For all weather dependent activities, the Contractor's schedule must reflect the anticipated adverse weather delays that are noted above.

1.28.3 Examples of Adverse Weather

The following is considered as adverse weather: Weather of a nature that workers cannot perform work as scheduled or get to work site (i.e. hurricane, tornado, high winds, floods, extremely cold weather, ice storm, sleet, heavy snow storm, et cetera).

1.29 FINAL INSPECTION AND ACCEPTANCE STANDARDS

1.29.1 Seeding

Within seven workdays of actual completion of work at contract site, the Contractor shall grade, rake, and seed (or sod), or prepare for seeding (or sodding). New turf and turf restoration shall be established or accomplished by hydroseeding or sodding in accordance with Section 02921 TURF. When areas of the site are raked prior to seeding (or sodding) or for leveling of topsoil to rid the site of mounds, clods and / or ruts, the Contractor shall ensure that no clods larger than 1" are left on the site. Contractor shall restore the site to a condition and appearance similar or equal to existing before the damages occurred. Such restoration work will not be considered complete until approved by the CO or his/her designated

representative. The Government will not accept sites that have not been raked and restored to this standard. **Straw shall not be used as a cover for newly sown seeds or freshly seeded areas.**

1.29.2 Removal of Signs and Barriers

All Contractors' stakes, traffic/safety cones and barriers, warning tape, erosion control fences, et cetera, that are erected during construction, shall be removed entirely prior to Government final acceptance of project.

1.29.3 Removal of Trailers and Storage Units

All trailers, equipment/storage units, residual construction materials shall be removed from construction site within five workdays after completion of work at that job site.

1.30 CONSTRUCTION DATA WORKSHEET

The Contractor is required, prior to the final inspection, to submit a completed copy of the following Construction Data Worksheet. This worksheet is used by the Air Force to inventory and capitalize new work. The Contractor shall complete only those areas of the form that are applicable to the work included in this project.

-- End of Section --

ASSET MANAGEMENT SPECIAL CONDITIONS

REVISED MARCH 2011

PART 1 GENERAL

1. ASSET MANAGEMENT: All work is to be performed in a manner that prevents pollution, protects the environment and conserves natural resources.

CONTRACTOR ENVIRONMENTAL DELIVERABLES:

The following contract deliverables are due to the LAFB project manager and Contracting representative who will in turn provide them to the Environmental Element (633 CES/CEAN).

Before Contract Start (30 days)

- Asbestos Abatement Plan (if applicable)
- Lead-Based Paint Abatement Plan (if applicable)
- Hazardous Material Usage Request Forms
- Green Procurement Planning Use Forms
- Environmental Management System (EMS) training certifications
- Stormwater Permit (if applicable)
- Stormwater Pollution Prevention Plan (if applicable)
- Clean Soil Certifications
- Wetland Permits if applicable (submitted to and approved by the Virginia Marine Resources Commission *Allow 60 days for this*)

During Contract

- Monthly Hazardous Materials Usage Report
- Quarterly Refuse/Recycling Reports
- Generator permit information
- Hazardous Waste/Lead/Asbestos Manifests (to be signed by LAFB Environmental Reps)

End of Contract before contract close

- Green Procurement Exemption Form (if applicable)
- Green Procurement Final Usage Report
- All return Asbestos Manifest (signed by receiving landfill)

1.1 WASTE DISPOSAL:

1.1.1. SOLID WASTE DISPOSAL.

1.1.1.1. Compliance With Regulations All waste materials generated by any work under this contract performed on a Government installation shall be handled, transported, stored, recycled, and disposed of by the Contractor and by his/her subcontractors at any time in accordance with these specifications, all applicable Federal, state, or local laws, ordinances, regulations, court orders, or other types of rules or rulings having the same effect of law. These include but are not limited to the Resource Conservation and Recovery Act (RCRA) (40 CFR 260-270); Federal Water Pollution Control Act, as amended (33 USC Sec 1251 ET SEQ); The Clean Air Act, as amended (42 USC Sec 1857 ET SEQ); The Endangered Species Act, as amended (16 USC Sec 1531, ET SEQ); The Toxic Substances Control Act, as amended (15 USC Sec 2601, ET SEQ); The Solid Waste Disposal Act, as amended (42 USC 6901 ET SEQ); the Archaeological and

Historic Preservation Act, as amended (16 USC Sec 469, ET SEQ), and the Virginia Solid Waste Management Regulations (9VAC 20-80).

The Contractor shall collect all solid wastes generated during the performance of the contract in a container/area provided by the Contractor and approved by the Contracting Officer. The Contractor shall provide appropriate containers for the collection and segregation of solid wastes, recyclables, and C&D debris generated directly and indirectly by work under this Contract. The Contractor is prohibited from using base dumpsters or other government owned/leased waste receptacles for the disposal of any solid wastes. All solid wastes shall be reclaimed, recycled, or disposed of prior to completion of work on LAFB.

As proof of proper disposition of solid wastes, the Contractor shall provide legible weight receipts for solid waste disposed and materials recycled bearing the name, address, and phone number of the receiving facilities for every load of materials delivered. The weight ticket shall detail the type of material, weight of the material in pounds or tons, the date of the transaction, and a signature from a representative of the receiving facility. Receipts shall be submitted to the Contracting Officer within ten calendar days after the transaction.

Under no circumstances will any solid waste or hazardous materials be left at LAFB at the end of the project. Before the project is turned over to the government, the Contractor will remove all solid wastes and hazardous materials from the installation. Those items include but are not limited to dirt piles, concrete piles, asphalt piles, and rubbish piles. No materials will be left for the future use of the government UNLESS instructed to do so in writing by the government. This is to include the before mentioned items and also regular or touch-up paint, plaster, solvents, etc. If it is determined that the Contractor left materials behind, services may be terminated and/or a penalty payment to include the cost of disposal of the material by the government may be withheld from the project payment.

NOTE: Hazardous materials are different from hazardous wastes so be careful not to confuse the two. For hazardous wastes, they will not be removed from the installation without the 633 CES Hazardous Waste Managers signing the Hazardous Waste Manifest. The LAFB Hazardous Waste Managers can be contacted at 757-764-1132/1133 if needed.

1.1.1.2. CONSTRUCTION/DEMOLITION DEBRIS DIVERSION:

As good stewards of the environment, the government is committed to diverting its waste away from landfills to the greatest extent possible. This can be done through recycling, reusing (when directed by the government), and donating construction and demolition debris materials. The Contractor shall recycle all construction/demolition debris to the maximum extent possible. The Contractor shall make every effort to recycle materials such as but not limited to concrete (including concrete with rebar), brick, asphalt, all metals, wood, roofing materials, wallboard, ceiling tiles, etc. With prior coordination through the CO and 633 CES/CEAN, the Contractor may take scrap metals to the Langley AFB scrap metal yard for recycling. The following are some suggested local sites for recycling construction and demolition debris:

Local Sources of Recycling				
Company	Address	City	Phone	Acceptable Items
Tidewater Fibre	5602 Chestnut Ave	Newport News	247-5766	paper, cardboard, plastics, aluminum, glass, tin cans
Old Dominion Recycling	1618 W. Pembroke Ave.	Hampton	723-2942	Aluminum, copper, steel, iron, metals, paper, tires
Butler Paper	324 Newport St	Suffolk	539-2351	Industrial & Commercial Paper Recycling
Dubin Metals	2409 Bowdens Ferry Rd	Norfolk	622-3970	Scrap Metals, Copper, Brass, Batteries, Radiators, Aluminum
Gutterman Iron & Metal	1206 E. Brambleton Ave.	Norfolk	627-1095	Scrap Brass, Copper & Aluminum
Sims Metal	2116 George Washington Memorial Hwy	Tabb	599-4940	Steel, aluminum, brass, copper, stainless steel, radiators
Waterway Marine Terminal	1401 Precon Drive	Chesapeake	333-3427	all C & D materials i.e. concrete, concrete w/rebar, lumber, asphalt
Waterway Materials Corp	1401 Precon Drive	Chesapeake	545-0004	Concrete, concrete w/rebar, brick, block, asphalt
K. F. Wilson	2972 N. Armistead Ave	Hampton	865-7182	all C & D materials i.e. concrete, concrete w/rebar, lumber, asphalt
CrushCon Aggregates	100 North Park Lane	Hampton	723-1131	Concrete, concrete w/rebar

1.1.1.2.1 RECYCLING AND DISPOSAL REPORTING: The Contractor shall report on a quarterly basis the tonnage of the items recycled and the amounts disposed of by landfill and amounts disposed of by regular or waste-to-energy incineration to the Project Manager, the Contracting Officer, and 633 CES Environmental Element (633 CES/CEAN) by the 5th day of each quarter (Jan, Apr, Jul, Oct) during the period of performance. This report will be for the previous quarter. The report shall list the title of the project, the project number, the Contractor's company name and point of contact, phone number, the type items (i.e. concrete, concrete with rebar, asphalt, brick, scrap metals, wood, wallboard, etc) and the tonnage of those items recycled. For all items that could not be recycled, the Contractor will provide a brief reason as to why the items could not be recycled.

For items disposed of, one total tonnage can be given for items landfilled and one total tonnage for items incinerated (specify waste incinerator or waste-to-energy incinerator) instead of reporting disposal figures for the various items. For items that cannot be accurately measured, estimates will be sufficient. Use the form at Attachment 1 (Construction/Demolition Debris Recycling and Reporting) to report this information to the Contracting Officer, Project Manager, and to 633 CES/CEAN.

To send it to 633 CES/CEAN, email it to 633ces.cea@langley.af.mil or mail it

to:

633 CES/CEAN
Attn: Pollution Prevention Mgr
Bldg 328, Room 253
37 Sweeney Boulevard
Langley AFB, VA 23665

1.1.1.3 Contain Loose Debris. Loose debris on trucks leaving the site shall be loaded in a manner that shall prevent dropping/releasing of materials on streets and conform to local ordinances/laws. Fasten a suitable cover, such as a tarpaulin, over the load before entering surrounding streets.

1.1.1.4 Trip Tickets. Contractor shall submit all trip tickets from the landfill facility, incinerators, and recycling companies to show all debris is being landfilled, incinerated, or recycled in accordance with all Federal requirements and in an approved location. These trip tickets will be submitted to the Contracting Officer who will in turn give them to the Project Manager.

1.1.2. SOIL AND PETROLEUM CONTAMINATED WASTE:

1.1.2.1. Contaminated Absorbents. All petroleum spills/releases must be cleaned up using absorbent materials. Spills caused by the Contractor will be the Contractor's responsibility to containerize and dispose of the contaminated absorbent material. Spills caused by the government will be the responsibility of the government. Contact the base hazardous waste Contractor, Chugach at 225-5808 or 225-5809 to arrange for pick-up.

1.1.2.2. Soil. ALL soil must be tested to determine if it contains any contaminants prior to relocating it on base or disposing of it off-base. Testing and disposal of soil shall follow Virginia Solid Waste Management Regulations 9VAC-20-80-700 (soil contaminated with petroleum products). Testing shall include: Total Petroleum Hydrocarbon (TPH), Total Organic Halogens (TOX), Benzene, Toluene, Ethyl Benzene, and Xylene (BTEX), and Toxicity Characteristic Leaching Procedures (TCLP). If test results determine "other than clean", the material will have to be transported to an appropriate landfill or processing center based on the contaminants identified. Contaminated soils, in sludge or slurry form, shall be containerized and managed as either hazardous waste or non-regulated waste, depending on what contaminate was spilled. The containerized contaminated soil shall be the responsibility of the Contractor to dispose of such. CEA must review the sample results and sign all hazardous/non hazardous waste manifests prior to disposal. Contact 633 CES/CEANC Hazardous Waste Program Managers for additional information.

NOTE: UNDER NO CIRCUMSTANCES will soil, clean or contaminated, from Langley AFB be delivered to or donated to off-base sources (other than an appropriate landfill or processing center based on the contaminants identified) for use. Soils donated to off-base entities for use will be the sole liability and responsibility of the Contractor.

1.1.3. UNIVERSAL WASTE:

1.1.3.1. Fluorescent Lamps. The Contractor shall use environmentally-friendly green tip fluorescent lamps during lamp replacement. Upon removal of old Sylvania lamps and high intensity bulbs, the Contractor will box the lamps and manage them as universal waste. Other lamps (i.e. GE and Phillips) may be disposed directly in to regular trash. Contact the base hazardous

waste Contractor at 225-5808 or 225-5809 to arrange for pick-up, except in cases where lamp replacement is part of the contract. Lamps will be properly disposed of by the Contractor with waste manifest being signed by 633 CES/CEANC Hazardous Waste Program Managers.

NOTE: UNDER NO CIRCUMSTANCES will bulb/ lamps be crushed on Langley AFB.

1.1.4. HAZARDOUS WASTE.

1.1.4.1. SITE MANAGEMENT. All material containers must be closed when not in use. Materials are to be covered as protection from weather. Each container is to be properly labeled. Do not store hazardous materials near storm drains. Upon completion of this project, the Contractor shall remove all hazardous materials and hazardous waste (for associated manifest requirements see paragraph 1.1.4.3.)

1.1.4.2 Waste Characterization Samples for Floor Renovation: Waste characterization samples must be collected to determine if its meets the RCRA definition of a hazardous waste. It is the responsibility of the contractor to take and provide the sample analysis to 633 CES/CEAN. Waste debris from floor stripping or floor blasting performed on Langley AFB must be sampled for TCLP Metals for solid debris and must add corrosivity test for liquid stripping. Additionally, it is the contractor's responsibility to dispose of the waste generated on this project. See manifest requirement in 1.1.4.3

1.1.4.3. MANIFESTS. 633 CES/CEANC will review all lab analysis or MSDS of wastes prior to signing manifests. All hazardous waste manifests must be signed by 633 CES/CEANC prior to removal of such waste from the base. The generator copy of the manifest must be returned to 633 CES/CEANC, 37 Sweeney Boulevard, Langley AFB, VA 23665.

1.2 FUEL, SEWAGE AND OTHER SPILLS: In the event of a fuel, sewage, and other toxic spillage during the performance of this contract, the Contractor shall be responsible for its containment, clean up, and related disposal costs and will notify 633 CES/CEANC immediately. The operator shall have sufficient spill response supplies readily available on the pumping vehicle and/or at the site to contain any spillage. In the event of a Contractor-related release, the Contractor shall immediately notify the Asset Management Office and the Contracting Officer and take appropriate actions to correct its cause and prevent future occurrences. If the federal, state, or local authorities assess any monetary fine, penalty, or assessment related to the release of any substance by the Contractor, his/her employees, or agents during the performance of this contract, the Contractor shall be solely liable for its payment, authorizes the United States Air Force to withhold such from payment and otherwise indemnify and hold the United States Air Force harmless.

1.3 ASBESTOS OR LEAD BASED PAINT

1.3.1. ASBESTOS PRESENCE: If asbestos not previously known to exist is exposed, the Contractor shall cease work in the affected area and notify the Contracting Officer.

1.3.2. LEAD BASED PAINT PRESENCE: If lead based paint not previously known to exist is exposed, the Contractor shall cease work in the affected area and notify the Contracting Officer.

1.4 AIR QUALITY

1.4.1. VOLATILE ORGANIC COMPOUNDS: All coatings and solvents used in the performance of this contract shall meet the required performance specifications and shall not exceed the volatile organic compound limits of the Air Pollution Control Districts where they are used.

1.4.2. DUST: Mitigation of fugitive dust emissions shall be accomplished in accordance with 9 VAC5-40-90, Standards for Fugitive Dust/Emissions.

1.4.3. OZONE DEPLETING SUBSTANCES (ODS)

Contracts may not include any specification, standard, drawing, or other document that requires the use of a Class I ODS in the design, manufacture, test, operation or maintenance of any system, subsystem, item, component, or process. Contracts may not require the delivery of any items of supply that contains a Class I ODS or any service that includes the use of a Class I ODS.

1.5 WATER QUALITY:

1.5.1. EROSION AND SEDIMENT CONTROL: All construction operations shall comply with the requirements of the Virginia Erosion and Sediment Control Act. An Erosion and Sediment Control Plan shall be prepared prior to initiating groundbreaking activities. A copy of the E&SC Plan shall be forwarded to 633 CES/CEANC (Water Program Manager). Hay bales shall not be used for erosion control and inlet protection from storm water run-off. The Contractor shall submit alternate methods of protection to the Contracting Officer at the preconstruction conference for review and approval. The Contracting Officer will notify the Contractor of his/her decision prior to issuance of Notice to Proceed (NTP).

1.5.2. STORMWATER PERMIT. If >2,500 sq ft is to be disturbed as part of the project, the contractor shall obtain a Stormwater General Construction Permit from the Virginia Department of Conservation and Recreation (VDCR). A stormwater pollution prevention plan (SWPPP) shall be prepared to support the stormwater permit; a copy of the SWPPP shall also be forwarded to 633 CES/CEANC (Water Program Manager). The Contractor is solely responsible for obtaining, funding and complying with the terms of the permit. A copy of the permit shall be forwarded to 633 CES/CEANC (Water Program Manager).

1.6. HAZARDOUS MATERIALS MANAGEMENT

1.6.1. Hazardous Materials Usage and Reporting: In compliance with AFI 32-7086 dated 1 Nov 2004 and AFI 32-7086 ACC Sup 1, all Contractors are required to report the usage of all hazardous materials to the government for all projects and contracts including service contracts executed on LAFB. In accordance with FAR Clause 52.223-3, each offeror (Contractor) must provide the Contracting Office with a list of proposed HAZMAT that it plans to use on the installation during the performance of the contract. In accordance with AF-FARS Clause 5352.223-9303, Contractors must obtain Air Force authorization prior to using HAZMAT on an Air Force installation, and must report usage data to the HAZMART.

Hazardous materials are any substance defined by OSHA as a hazardous substance requiring a Material Safety Data Sheet (MSDS). Hazardous materials that need to be reported include but are not limited to chemicals, paints, thinners, sealing compounds, strippers, glues, solvents, all petroleum products including oils, hydraulic fluids, and fuels stored on-site (fuels in ve-

hicles are exempt), pesticides, adhesives, acids, flammables, corrosives, oxidizers, compressed gases (such as but not limited to oxygen, acetylene, propane, flammable and non-flammable gases), all aerosols, and all materials containing hazardous substances.

The Contractor shall request the proposed usage of all Hazardous Materials by completing the "Contractor Hazardous Material Worksheet" at Attachment 2 (Contractor Hazardous Material Worksheet) for each hazardous material and shall submit a copy of the Material Safety Data Sheet (MSDS) for each item to the Contracting Officer (CO) prior to bringing the items on the installation. The Contractor shall submit to the CO the information for each item within 10 days after award of the contract or project and/or not less than fourteen calendar days prior to bringing the items on the installation. For short notice contracts or projects, the Contractor will submit this information to the CO as soon as possible. An electronic version of the Contractor Hazardous Material Worksheet can be obtained through the Project Manager or 633 CES/CEAN.

The CO will immediately provide this information to the Project Manager who will in turn provide it to 633 CES/CEAN immediately.

After the project starts, monthly usage information will be provided to the CO who will in turn provide this information to the Project Manager who will in turn provide it to 633 CES/CEAN. Attachment 3 (Monthly Report for HAZMAT) of this section will be used to report monthly usage. For contracts/projects exceeding six months, this form is required to be filled out on a monthly basis. For contracts less than six months, this form is required at the beginning and at the completion of work.

If there are any questions on how to fill out the Contractor Hazardous Material Worksheet or the monthly report, contact the LAFB HAZMART at 757-764-3837 Monday thru Friday between the hours of 0730-1630 or visit them at:

633 LRS/HAZMART
Bldg 330
23 Sweeney Blvd
Langley AFB VA 23665

1.6.2. Hazardous Materials Management Process (HMMP): The LAFB HMMP team will meet on a weekly basis or an as-needed basis to review the Contractor Hazardous Material Worksheets and MSDSs to ensure there are no concerns with the chemicals being used and/or stored on the installation. If there are concerns about any chemicals and if it is determined that the Contractor plans to use an extremely hazardous chemical on LAFB, the HMMP team will notify the Project Manager and the Contracting Officer (CO) who will in-turn notify the Contractor of LAFB's concern. The Contractor will not bring any extremely hazardous chemicals on LAFB or any other chemicals that the HMMP team determines cannot be used on Langley. The HMMP team will also notify the Project Manager if all hazardous materials are authorized for use.

If the Contractor requires additional hazardous materials not previously submitted for approval, they shall submit the request as stated above seven days prior to bringing the item on the base.

NOTE: If it is determined at any time that hazardous materials are on site that were not reported in advance, the CO will be notified and the project can be stopped until the materials are submitted as stated above.

1.6.3. Hazardous Material Storage: Hazardous materials will be managed properly at all times while on LAFB. This means containers will be in good condition and will be properly labeled with the contents and hazard class (flammable, corrosive, oxidizer, etc) at all times. Containers will be closed at all times when not in use, hazardous materials will be kept under cover to protect them from the elements and to prevent stormwater runoff contamination, and tanks and 55-gallon liquid drums will have secondary containment. Gas cylinders will be maintained in the upright position with caps on and will be secured with chains and locks to prevent tampering and to prevent them from falling over. Gas storage areas will have signs indicating what type gases are stored in the area (i.e. flammable, oxidizer, non-flammable, etc). NO SMOKING signs will be posted in all hazardous materials storage areas. In addition, all hazardous materials will be segregated in storage according to compatibility (i.e. flammables will not be stored with corrosives, corrosives will not be stored with oxidizers, flammable gases will not be stored with flammable liquids, etc). LAFB is subject to inspections at any time from outside agencies (EPA, Virginia Dept of Asset Management Quality and OSHA) and any violations by the Contractor will be the responsibility of the Contractor and any fines associated with the violations will be resolved at the Contractor's expense.

1.7 USE OF RECYCLED-CONTENT PRODUCTS: (GREEN PROCUREMENT) :

Whenever the potential for use of non-recycled content products exists during the construction stage of the project, the Contractor shall incorporate in this project, as a substitute, recycled-content products that are listed and identified in the Asset Management Protection Agency (EPA) Comprehensive Procurement Guidelines (CPG) for recycled-content products. The Contractor shall use recycled-content products as required by EPA and other governmental agencies and Federal Acquisition Regulation (FAR) clauses.

It is mandated by Executive Order 13423, (Strengthening Federal Environmental, Energy, and Transportation Management) and Section 6002 of the Resource Conservation and Recovery Act (RCRA) that the Federal Government use recycled-content products in the construction and/or renovation of facilities. It is the intent of the Government to comply with the Environmental Protection Agency (EPA) requirement 100% of the time and use as many of the applicable listed recycled-content products as feasible and economically practical. The Contractor shall consider this a standard requirement for all aspects of the project construction.

The recycled-content products listed in the CPG can be found in the EPA website at www.epa.gov/cpg/products.htm. These products are also listed at Attachment 4 (Contract Submittal and Contractor Reporting Form). This list is subject to change at any time so it is the Contractor's responsibility to be aware of any updates or additions.

Such products shall also comply with the requirements of the EPA Recovered Materials Advisory Notice (RMAN). The RMANs recommend recycled-content ranges for CPG products based on current information on commercially available recycled-content products. The recommended recovered materials content percentage can be obtained by clicking on the product on the website.

1.7.1. Green Procurement Forms Before starting the project, the Contractor shall complete Attachment 4 indicating the items he plans to use. The Contractor will provide this to the Contracting Officer and the Project Manager. Then during the accomplishment of the project construction, the Contractor

shall complete the form again. At this time, the Contractor shall indicate the use and non-use of products that are contained in the CPG and will list the recycled-content percentage for the applicable item. In each instance where a recycled-content construction product is not used, the Contractor shall provide to the Contracting Officer (or his/her designated representative) and the Project Manager a completed Exemption Form, Attachment 5 (Recovered Materials Determination Form).

The Contractor shall complete this form for all items for which he or she desires an exemption from the Green Procurement Program for Recovered Materials that are being procured. Exemptions can only be taken if (1) the item is not available within a reasonable period of time (2) item fails to meet a performance standard in the specifications and (3) the item was only available at an unreasonable price i.e., the recycled-content product costs more than the non-recycled content product. The fourth reason on the Recovered Materials Determination Form, (4) the item is not available from 2 or more sources, does not apply to construction/renovation Contractors as the Government will not specify where you can get your materials from. Specific reasons why an exemption is taken will be specified on the form and documentation supporting this reason will be provided and attached.

The Contractor will sign the form as the "Procurement Originator" and the completed form will be signed by the 633 CES Programs Flight Chief or Deputy Flight Chief, 633 CES/CEP. These forms will be kept in the project folder indefinitely.

1.8 SOIL SUPPORT PROGRAM (SSP) ACCEPTABILITY

The soils obtained from off-base sources shall meet the criteria outlined below. The soils generated during construction project excavation will be collectively referred to as project (soil) media. Soil media is not inherently waste-like, but it may contain waste-like materials, including contaminants associated with the site. Given the base history of operations, the Contractor must make a determination of whether the soil is contaminated. If the media is determined to be contaminated, then a hazardous waste determination must be made. Standards for testing are described below. The contaminated media will be managed as a solid waste and removed from base. If the media is determined to be uncontaminated and not waste-like, then it may be disposed on site in an environmentally sound manner.

1.8.1. Clean Soil. Projects requiring clean soil, including but not limited to top soil and backfill materials, to be brought onto Langley AFB or relocated within base property must meet minimum standards based on results of physical (geotechnical) and chemical testing. All materials will meet physical (geotechnical) specifications appropriate for the type of project being accomplished and are typically identified elsewhere in the project specifications. The intent of this section is to prevent contamination from borrowed sources (i.e. planned excavation) and define clean soil based on chemical specifications. Levels of chemical contamination will be determined to ensure borrow soils may be used for the current and future use of the project location. The Contractor shall implement a plan and confirm the proposed borrow soils meet clean soil requirements. The plan should incorporate borrow source information, sampling data, and testing results. As a minimum, the Contractor shall meet the following standards:

1.8.2. Borrow Source. The Contractor shall provide detailed borrow source information (e.g., location, owner, operator, past and current land use, pre-

vious chemical testing results) at the point of planned excavation to 633 CES/CEAN to determine chemical testing requirements. The Contractor shall also submit a certification stating the materials contain no asbestos, no gross contamination have been discerned by visual or olfactory observations, and no spills of a listed hazardous waste (40 CFR 261) have occurred at the borrow site. If previous chemical testing results exist and are provided, 633 CES/CEAN will evaluate those results to determine if they are sufficient and the proposed borrow soils meet clean soil requirements. If testing is incomplete, 633 CES/CEAN will review borrow source information to determine chemical sample requirements.

1.8.2.1. On-base Soil Sources. Unless otherwise provided in the contract, the Contractor shall bear all expenses of developing the source. For the site where soil is reclaimed from government land, the Contractor may be required to perform final grade and seeding according to project requirements.

1.8.2.2. Excess Soil Work. Acceptable excess soil shall be delivered to the designated location(s) following approved haul routes. For the site where excess soil is deposited on government land, the Contractor may be required to perform final grade and seeding according to project requirements.

1.8.3. Sample Plan. At least one composite sample (6 - 8 grabs) for each undisturbed borrow source would be taken from the original point of excavation and required for each 5,000 CY of soil. For soil taken from disturbed borrow sources, samples are required for each 1,000 CY of soil. The nature of the borrow source is to be considered when determining the quantity and depth of the samples. Additional samples may be required to adequately characterize the proposed borrow source (i.e. laterally and vertically). The Contractor shall submit a Sample Plan (to include site map, excavation area, location and depth of samples) for 633 CES/CEAN review and approval.

1.8.4. Chemical Testing Standards. The analysis must be performed by a laboratory approved by the U. S. Environmental Protection Agency. Submit a copy of the chain of custody and complete validated report of analysis to 633 CES/CEA for review and approval 30 days prior to use of any borrow soils. Chemical testing of any borrow source will include sampling for the following suite of contaminants (test requirements may be reduced based on borrow source information):

- Total Petroleum Hydrocarbons (TPH) to include Gasoline Range Organics (GRO) and Diesel Range Organics (DRO);
- Volatile Organic Compounds (VOCs) [EPA method 8260B] to include Benzene, Toluene, Ethylbenzene, and Xylene (BTEX);

The soil support test suite shall also include unless generator knowledge suggests otherwise:

- Semi-volatile Organic Compounds (SVOCs) [EPA method 8270];
- Pesticides [EPA method 8081A];
- Polychlorinated Biphenyls (PCBs) [EPA method 8082]; and
- Target Analyte List (TAL) metals (including Mercury) [EPA method 6010B/7470A]
- Volatile Organic Compounds (VOCs) [EPA Method 8260] other than BTEX compound reference in the preceding paragraph.

1.8.5. Clean Soil Determination. Soils testing under the EPA screening levels and/or base "background" levels will be considered acceptable "clean" soil. Generally, acceptable clean soil must not exceed EPA Region III "Resi-

dential" Risk Based Concentrations (RBC) and the LAFB Upper Tolerance Limit (UTL) background soil concentrations. For use in current and future industrial areas, EPA Region III "Industrial" RBCs may be considered but shall not exceed UTL background levels.

1.8.6. Excavation and Delivery Screening. Common to any multiple point sampling, composite testing may not accurately characterize the entire site. Should contamination be detected (e.g. free product, stained soils, chemical odors) during excavation or delivery, soil operations shall be immediately discontinued pending 633 CES/CEAN notification and resolution. Additional soil testing and screening may be required to determine if continued use of the borrow site is acceptable.

1.8.7. Material Physical Characteristics. All soil obtained from sources within or outside the limits of government-controlled land shall meet the physical characteristics as defined in project specifications.

1.9 Conformance with Environmental Management Systems

The Contractor shall perform work under this contract consistent with the relevant policy and objectives identified in Langley AFB's Environmental Management System (EMS). The Contractor shall perform work in a manner that conforms to all appropriate Environmental Management Programs and Operational Controls identified by the Langley AFB EMS. In the case of a noncompliance, the Contractor shall respond and take corrective action immediately. In the case of a nonconformance, the Contractor shall respond and take corrective action based on the time schedule established by the EMS Site Coordinator. In addition, the Contractor shall ensure that their employees are aware of the roles and responsibilities identified by the EMS and how these requirements affect their work performed under this contract.

All on-site contractor personnel shall complete yearly EPA sponsored environmental training specified for the type of work conducted on-site. Upon inclusion in the contract Statement of Work, the Contracting Officer's Representative will verify that all contractor personnel have acquired EMS Awareness Training at their appropriate site or location. Training is provided at www.esohtn.com.

1.10 Discrepancies: In case of a conflict or discrepancy between Asset Management regulations or laws and the contract specifications, the Contractor shall immediately submit the matter in writing to the Contracting Officer for a determination. Without such determination, any actions taken shall be at the Contractor's own risk and expense.

References:

1. EPA Region III Risk Based Concentration (RBC) table. As this table is updated every 6 months, analysis is to be determined by the table current at the time of testing. This table can be found at <http://www.epa.gov/reg3hwmd/risk/human>.
2. Background Chemical Data Document for Langley AFB, 21 Oct 97, Table 7-1. The UTL (Upper Tolerance Limit) Summary Table outlines the Langley AFB's background data set. This table can be requested through 633 CES/CEA.

ATTACHMENT 1

CONSTRUCTION/DEMOLITION DEBRIS RECYCLING AND REPORTING

As stewards of the environment and because of the Air Force goals of diverting greater than 40% of its waste away from landfills, Contractors shall recycle C&D debris to the maximum extent possible. There are many sources in the local area that can recycle C&D. A list of sources can be found in the "Special Conditions" portion of Langley construction contracts. If you need further assistance finding sources, contact the 633 CES/CEAN Pollution Prevention Manager at 757-764-3987. Langley AFB must report recycling metrics to higher Headquarters quarterly. Therefore, complete the form below for each project on Langley AFB and submit a copy to the 633 CONS Contracting officer, the 633 CES/CEP Project Manager, and 633 CES/CEAN (Pollution Prevention Program Manager), by the 5th day of each quarter (5 Apr, 5 July, 5 Oct, and 5 Jan) for the previous three month period for the duration of the project.

PROJECT NUMBER AND TITLE: _____

PROJECT LOCATION (BLDG # AND STREET ADDRESS): _____

CONTRACTOR NAME: _____

CONTRACTOR ADDRESS/PHONE NUMBER: _____

TYPE ITEMS RECYCLED:

- | | |
|------------------------------|---------------------------|
| _____ Concrete without rebar | _____ Concrete with rebar |
| _____ Scrap Metals | _____ Wood |
| _____ Roofing Materials | _____ Brick |
| _____ Asphalt | |
| _____ Other: Specify _____ | |

TONNAGE OF ITEMS RECYCLED: _____ TONS

TYPE ITEMS NOT RECYCLED:

- | | |
|------------------------------|---------------------------|
| _____ Concrete without rebar | _____ Concrete with rebar |
| _____ Scrap Metals | _____ Wood |
| _____ Roofing Materials | _____ Brick |
| _____ Asphalt | |
| _____ Other: Specify _____ | |

CONTINUED ON THE BACK

C&D DEBRIS RECYCLING AND REPORTING FORM (CONT'D)

REASONS ITEMS WERE NOT RECYCLED:

- _____ No market for the items
- _____ No local vendors to recycle the materials
- _____ Not economically feasible: Specify: _____
- _____ Other: Specify: _____

PROVIDE NAME OF COMPANY, POINT-OF-CONTACT AND PHONE NUMBER OF SOURCE BY WHICH RECYCLING AN ITEM(S) WERE ATTEMPTED:

Company Name: _____
Point of Contact: _____
Phone Number: _____

C&D ITEMS DISPOSED OF BY LANDFILL: _____ TONS

C&D ITEMS DISPOSED OF THROUGH REGULAR INCINERATION: _____ TONS

ITEMS DISPOSED OF BY WASTE-TO-ENERGY INCINERATION: _____ TONS

CONTRACTOR SIGNATURE **DATE** _____

NOTE: ELECTRONIC SIGNATURE ACCEPTABLE

To Be Completed by USAF Personnel Only

EMIS Shop Code: _____

BEE: ____ Recommend Approval ____ Recommend Disapproval: Comments:

SE: ____ Recommend Approval ____ Recommend Disapproval Comments:

CEAN: ____ Approve ____ Disapprove Comments:

HAZMART: ____ Concur ____ Nonconcur Comments:

ATTACHMENT 4

CONTRACT SUBMITTAL AND CONTRACTOR REPORTING FORM

Comprehensive Procurement Guidelines

(This chart is not intended to replace the EPA guidelines found at <http://www.epa.gov/cpg/products.htm>). It is the Contractor's responsibility to stay apprised of any new additions to these guidelines.)

Categories and Designated Items (Note: This table includes proposed CPG items as well as items designated final.)	If marked w/ an "X", item is applicable	Purchased with no re- cycled con- tent	Purchased with recycled content	Percent of recycled content
<u>VEHICULAR PRODUCTS</u>				
Engine coolants - antifreeze				
Rebuilt vehicular parts				
Re-refined lubricating oils - including motor oil				
Retread tires				
<u>CONSTRUCTION PRODUCTS</u>				
Building insulation products				
Carpet (Polyester)				
Carpet cushion				
Cement and concrete containing coal fly ash, ground granulated blast furnace slag, cenospheres, or silica fume				
Consolidated and reprocessed latex paint				
Floor tiles				
Flowable fill				

Categories and Designated Items (Note: This table includes proposed CPG items as well as items designated final.)	If marked w/ an "X", item is applicable	Purchased with no re- cycled con- tent	Purchased with recycled content	Percent of recycled content
Laminated paperboard				
Modular threshold ramps				
Nonpressure pipe				
Patio blocks				
Railroad grade crossing surfaces				
Roofing materials				
Shower and restroom dividers and partitions				
Structural fiberboard				
<u>LANDSCAPING PRODUCTS</u>				
Compost made from yard trimmings or food waste				
Garden and soaker hoses				
Hydraulic mulch				
Lawn and garden edging				
Plastic lumber landscaping timbers and posts				
<u>NON-PAPER OFFICE PRODUCTS</u>				
Binders				

Categories and Designated Items (Note: This table includes proposed CPG items as well as items designated final.)	If marked w/ an "X", item is applicable	Purchased with no re- cycled con- tent	Purchased with recycled content	Percent of recycled content
<u>NON-PAPER-OFFICE PRODUCTS</u> (cont)				
Clipboards				
Clip Portfolios				
File folders				
Presentation Folders				
Office Furniture				
Office recycling containers				
Office waste receptacles				
Plastic desktop accessories				
Plastic envelopes				
Plastic trash bags				
Printer ribbons				
Toner cartridges				
<u>PAPER AND PAPER PRODUCTS</u>				
Commercial/industrial sanitary tissue products				
Miscellaneous papers				

Categories and Designated Items (Note: This table includes proposed CPG items as well as items designated final.)	If marked w/ an "X", item is applicable	Purchased with no re- cycled con- tent	Purchased with recycled content	Percent of recycled content
Newsprint				
Paperboard and packaging products				
Printing and writing papers				
<u>PARK and RECREATION PRODUCTS</u>				
Park benches and picnic tables				
Plastic fencing				
Playground equipment				
Playground surfaces				
Running tracks				
<u>TRANSPORTATION PRODUCTS</u>				
Channelizers				
Delineators				
Flexible delineators				
Parking stops				
Traffic barricades				
Traffic cones				

Categories and Designated Items (Note: This table includes proposed CPG items as well as items designated final.)	If marked w/ an "X", item is applicable	Purchased with no re- cycled con- tent	Purchased with recycled content	Percent of recycled content
<u>MISCELLANEOUS PRODUCTS</u>				
Awards and plaques				
Bike Racks				
Blasting grit				
Industrial drums				
Manual-grade strapping				
Mats				
Pallets				
Signage				
Sorbents				

ATTACHMENT 5

RECOVERED MATERIALS DETERMINATION FORM

This form is to be completed by the procurement originator for all purchases requesting an exemption from the Affirmative Procurement Program for Recovered Materials being procured. For questions on whether the product is "EPA designated" or what the required recycled content is, refer to the product descriptions on EPA's website at http://www.epa.gov/cpg/products.htm. This form is not required for construction item purchases less than \$2,000, or for other purchases less than \$3,000.

Procurement Request/Project No. _____

EPA Designated Eight Product Category Items

Category 1 Paper and Paper Products

- Commercial/industrial sanitary tissue products, Paperboard/packing products, Printing and writing papers, Miscellaneous papers, Newsprint

Category 2 Non-Paper Office Products

- Binders, Plastic envelopes, Office recycling containers, Office furniture, Plastic trash bags, Office waste receptacles, File folders, Plastic desktop accessories, Clipboards, Presentation folders, Clip portfolios, Printer ribbons, Toner Cartridges

Category 3 Park and Recreation Products

- Park benches and picnic tables, Running tracks, Playground equipment, Playground surfaces, Plastic fencing

Category 4 Transportation Products

- Traffic barricades, Parking Stops, Delineators, Flexible delineators, Traffic Cones, Channelizers

Category 5 Vehicular Products

- Engine Coolants, Retread tires, Re-refined lubricating oils, Rebuilt vehicular parts

Category 6 Landscaping Products

- Garden and soaker hoses, Compost and fertilizer made from recovered organic materials, Hydraulic mulch, Lawn and garden edging, Plastic Lumber Landscaping timbers and posts, Food waste compost

Category 7 Construction Products

- Consolidated and reprocessed latex paint, Cement and concrete containing coal fly ash, ground granulated blast furnace slag, cenospheres, or silica fume, Roofing materials, Railroad grade crossing and surfaces, Building insulation, Shower and restroom dividers, Laminated paperboard, Modular threshold ramps, Nonpressure pipe, Structural fiberboard, Carpet (polyester), Carpet cushion, Floor tiles, Patio blocks, Flowable fill

Category 8 Miscellaneous Products

- Manual-grade strapping, Mats, Pallets, Awards and plaques, Sorbents, Industrial drums, Signage, Bike racks, Blasting grit

EXEMPTION CERTIFICATION

___ The following EPA designated guideline item is included in the specifications for the project however, compliance with EPA standards is not attainable.

Item: _____

I have determined that the EPA guidelines were considered and determined inapplicable, based on the following:

___ Item is not available within a reasonable period of time.

(Need date: _____ Date available: _____)

___ Item fails to meet a performance standard in the specifications.
Specifically, _____

___ Item was only available at an unreasonable price (i.e., recycled item cost more than non-recycled item).

Price of recycled item: _____

Price of non-recycled item: _____

___ Item is not available from 2 or more sources.

**Market research was performed by calling ___ (insert number)
vendors, but only _____ (enter name) was able to supply the item.**

This determination is made in accordance with FAR 23.405(c).

Procurement Originator/Contractor

Date

Signature of GPC Approving Official (if GPC used)
or Project Manager/Supervisor/Flight Chief or Deputy for all other type purchases

Date

-- End of Section --

SECTION 01 42 00

SOURCES FOR REFERENCE PUBLICATIONS

11/08

PART 1 GENERAL

1.1 REFERENCES

Various publications are referenced in other sections of the specifications to establish requirements for the work. These references are identified in each section by document number, date and title. The document number used in the citation is the number assigned by the standards producing organization, (e.g. ASTM B 564 Nickel Alloy Forgings). However, when the standards producing organization has not assigned a number to a document, an identifying number has been assigned for reference purposes.

1.2 ORDERING INFORMATION

The addresses of the standards publishing organizations whose documents are referenced in other sections of these specifications are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided. Documents listed in the specifications with numbers which were not assigned by the standards producing organization should be ordered from the source by title rather than by number.

ACI INTERNATIONAL (ACI)
38800 Country Club Drive
Farmington Hills, MI 48331
Ph: 248-848-3700
Fax: 248-848-3701
E-mail: bkstore@concrete.org
Internet: <http://www.concrete.org>

AMERICAN WATER WORKS ASSOCIATION (AWWA)
6666 West Quincy Avenue
Denver, CO 80235
Ph: 800-926-7337
Fax: 303-347-0804
Internet: <http://www.awwa.org>

ASTM INTERNATIONAL (ASTM)
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959
Ph: 610-832-9500
Fax: 610-832-9555
E-mail: service@astm.org
Internet: <http://www.astm.org>

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)
445 Hoes Lane
Piscataway, NJ 08855-1331
Ph: 732-981-0060
Fax: 732-981-1712
E-mail: customer-services@ieee.org
Internet: <http://www.ieee.org>

INTERNATIONAL ELECTRICAL TESTING ASSOCIATION (NETA)
P.O. Box 687
106 Stone Street
Morrison, CO 80465
Ph: 303-697-8441
Fax: 303-697-8431
E-mail: neta@netaworld.org
Internet: <http://www.netaworld.org>

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
1300 North 17th Street, Suite 1752
Rosslyn, VA 22209
Ph: 703-841-3200
Fax: 703-841-5900
E-mail: webmaster@nema.org
Internet: <http://www.nema.org/>

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
1 Batterymarch Park
Quincy, MA 02169-7471
Ph: 617-770-3000
Fax: 617-770-0700
E-mail: webmaster@nfpa.org
Internet: <http://www.nfpa.org>

UNDERWRITERS LABORATORIES (UL)
333 Pfingsten Road
Northbrook, IL 60062-2096
Ph: 847-272-8800
Fax: 847-272-8129
E-mail: customerexperiencecenter@us.ul.com
Internet: <http://www.ul.com/>

U.S. ARMY CORPS OF ENGINEERS (USACE)
Order CRD-C DOCUMENTS from:
U.S. Army Engineer Waterways Experiment Station
ATTN: Technical Report Distribution Section, Services
Branch, TIC
3909 Halls Ferry Road
Vicksburg, MS 39180-6199
Ph: 601-634-2664
Fax: 601-634-2388
E-mail: mtc-info@erdc.usace.army.mil
Internet: <http://www.wes.army.mil/SL/MTC/handbook.htm>
Order Other Documents from:
USACE Publications Depot
Attn: CEHEC-IM-PD
2803 52nd Avenue
Hyattsville, MD 20781-1102
Ph: 301-394-0081
Fax: 301-394-0084
E-mail: pubs-army@usace.army.mil
Internet: <http://www.usace.army.mil/publications>
or <http://www.hnd.usace.army.mil/techinfo/engpubs.htm>

U.S. FEDERAL AVIATION ADMINISTRATION (FAA)

Order for sale documents from:
Superintendent of Documents
U.S. Government Printing Office (GPO)
732 North Capitol Street, NW
Washington, DC 20401
Ph: 202-512-1800
Fax: 202-512-2104
E-mail: contactcenter@gpo.gov
Internet: <http://www.gpoaccess.gov>

Order free documents from:
Federal Aviation Administration
Department of Transportation
800 Independence Avenue, SW
Washington, DC 20591
Ph: 1-866-835-5322
Internet: <http://www.faa.gov>

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

General Services Administration
1800 F Street, NW
Washington, DC 20405
Ph: 202-501-1021
Internet: www.GSA.gov
Order from:
General Services Administration
Federal Supply Service Bureau
1941 Jefferson Davis Highway
Arlington, VA 22202
Ph: 703-605-5400
Internet: <http://apps.fss.gsa.gov/pub/fedspecs/index.cfm>

- - - - - Commercial Item Description Documents - - - - -

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

8601 Adelphi Road
College Park, MD 20740-6001
Ph: 866-272-6272
Fax: 301-837-0483
Internet: <http://www.archives.gov>
Order documents from:
Superintendent of Documents
U.S. Government Printing Office (GPO)
732 North Capitol Street, NW
Washington, DC 20401
Ph: 202-512-1800
Fax: 202-512-2104
E-mail: contactcenter@gpo.gov
Internet: <http://www.gpoaccess.gov>

-- End of Section --

SECTION 03 11 14.00 10

FORMWORK FOR CONCRETE
04/06

PART 1 GENERAL

1.1 REFERENCES

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

ACI INTERNATIONAL (ACI)

ACI 347 (2004) Guide to Formwork for Concrete

1.2 DESIGN REQUIREMENTS

The design, engineering, and construction of the formwork shall be the responsibility of the Contractor. The formwork shall be designed for anticipated live and dead loads and shall comply with the tolerances specified in Section 03 30 53 MISCELLANEOUS CAST-IN-PLACE CONCRETE, paragraph CONSTRUCTION TOLERANCES. However, for surfaces with an ACI Class A surface designation, the allowable deflection for facing material between studs, for studs between walers and walers between bracing shall be limited to 0.0025 times the span. The formwork shall be designed as a complete system with consideration given to the effects of cementitious materials and mixture additives such as fly ash, cement type, plasticizers, accelerators, retarders, air entrainment, and others. The adequacy of formwork design and construction shall be monitored prior to and during concrete placement as part of the Contractor's approved Quality Control Plan.

1.3 SUBMITTALS

The following shall be in accordance with Section 01 11 00 SPECIAL CONDITIONS, paragraph SUBMITTAL PROCEDURES :

SD-02 Shop Drawings

Shop Drawings

Drawings for all formwork required shall be submitted at least 7 days either before fabrication on site or before delivery of prefabricated forms. If reshoring is permitted, the method, including location, order, and time of erection and removal shall also be submitted for review.

SD-03 Product Data

Materials

Manufacturer's literature shall be submitted for plywood, concrete form hard board, form accessories, prefabricated forms, and form coating.

SD-06 Test Reports

Inspection

The Contractor shall submit field inspection reports for concrete forms and embedded items.

Formwork Not Supporting Weight of Concrete; G.

If forms are to be removed in less than 24 hours on formwork not supporting the weight of concrete, the evaluation and results of the control cylinder tests shall be submitted to and approved before the forms are removed.

1.4 SHOP DRAWINGS

The shop drawings and data submitted shall include the type, size, and quantity of all materials of which the forms are made .

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Forms and Form Liners

Forms and form liners shall be fabricated with facing materials that will produce a finish meeting the specified irregularities in formed surface requirements as defined in ACI 347. Forms and form liners shall be fabricated with facing materials as specified below.

2.1.1.1 Class "D" Finish

This class of finish shall apply to all sign foundations. . The form facing may be of wood or steel and is only required for the uppermost 6 inches. The top of foundation shall be broom finished..

2.1.2 Form Coating

Form coating shall be commercial formulation that will not bond with, stain, cause deterioration, or any other damage to concrete surfaces. The coating shall not impair subsequent treatment of concrete surfaces depending upon bond or adhesion nor impede the wetting of surfaces to be cured with water or curing compounds. If special form liners are to be used, the Contractor shall follow the recommendation of the form coating manufacturer.

2.2 ACCESSORIES

Ties and other similar form accessories to be partially or wholly embedded in the concrete shall be of a commercially manufactured type. After the ends or end fasteners have been removed, the embedded portion of metal ties shall terminate not less than 2 inches from any concrete surface either exposed to view or exposed to water. Plastic snap ties may be used in locations where the surface will not be exposed to view. Form ties shall be constructed so that the ends or end fasteners can be removed without spalling the concrete.

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 Form Construction

Forms shall be constructed true to the structural design and required alignment. The form surface and joints shall be mortar tight and supported to achieve safe performance during construction, concrete placement, and form removal. The Contractor shall continuously monitor the alignment and stability of the forms during all phases to assure the finished product will meet the required surface class specified in paragraph FORMS AND FORM LINERS and tolerances specified in paragraph DESIGN REQUIREMENTS. Failure of any supporting surface either due to surface texture, deflection or form collapse shall be the responsibility of the Contractor as will the replacement or correction of unsatisfactory surfaces. When forms for continuous surfaces are placed in successive units, care shall be taken to fit the forms over the completed surface to obtain accurate alignment of the surface and to prevent leakage of mortar. Forms shall not be re-used if there is any evidence of defects which would impair the quality of the resulting concrete surface. All surfaces of used forms shall be cleaned of mortar and any other foreign material before reuse.

3.1.2 Chamfering

All exposed joints, edges and external corners shall be chamfered by molding placed in the forms unless the drawings specifically state that chamfering is to be omitted or as otherwise specified. Chamfered joints shall not be permitted where earth or rockfill is placed in contact with concrete surfaces. Chamfered joints shall be terminated twelve inches outside the limit of the earth or rockfill so that the end of the chamfers will be clearly visible.

3.1.3 Coating

Forms for exposed or painted surfaces shall be coated with form oil or a form-release agent before the form or reinforcement is placed in final position. The coating shall be used as recommended in the manufacturer's instructions. Forms for unexposed surfaces may be wet with water in lieu of coating immediately before placing concrete, except that, in cold weather when freezing temperatures are anticipated, coating shall be mandatory. Surplus coating on form surfaces and coating on reinforcing steel and construction joints shall be removed before placing concrete.

3.2 FORM REMOVAL

3.2.1 Formwork Not Supporting Weight of Concrete

Formwork for walls, columns, sides of beams, gravity structures, and other vertical type formwork not supporting the weight of concrete shall not be removed in less than 24 hours after concrete placement is completed. Form removal before 24 hours will be allowed for simple floor slab, sidewalks, and driveways provided the ambient temperature during this period has not fallen below 50 degrees F at any time since placement and evidence from compressive tests on field-cured concrete control cylinders indicates that the concrete has attained a compressive strength of at least 500 psi. Control cylinders shall be prepared for each set of forms to be removed

before 24 hours. The stability of the concrete shall be evaluated by a structural engineer prior to removal of the forms.

3.3 INSPECTION

Forms and embedded items shall be inspected in sufficient time prior to each concrete placement by the Contractor in order to certify to the Contracting Officer that they are ready to receive concrete. The results of each inspection shall be reported in writing.

-- End of Section --

SECTION 03 30 53

MISCELLANEOUS CAST-IN-PLACE CONCRETE

04/08

PART 1 GENERAL

1.1 SUMMARY

Perform all work in accordance with **ACI MCP SET** Parts 2 and 3.

1.2 UNIT PRICES

1.2.1 Concrete Payment

Payment will cover all costs associated with manufacturing, furnishing, delivering, placing, finishing, and curing of concrete for the various items of the schedule, including the cost of all formwork. Payment for concrete, for which payment is made as a lump sum, is to be included in the unit price payment item for which it is required. Payment for grout, preformed expansion joints, field-molded sealants, waterstops, reinforcing steel bars or wire reinforcement is to be included in the unit price payment item for which it is required.

1.2.2 Measurement

Concrete will not be measured for payment. 1.3 REFERENCES

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

ACI INTERNATIONAL (ACI)

ACI MCP SET (2008) Manual of Concrete Practice

ASTM INTERNATIONAL (ASTM)

ASTM A 185/A 185M (2007) Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete

ASTM A 615/A 615M (2008b) Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

ASTM C 1064/C 1064M (2008) Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete

ASTM C 1260 (2007) Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)

ASTM C 143/C 143M (2008) Standard Test Method for Slump of Hydraulic-Cement Concrete

ASTM C 150 (2007) Standard Specification for Portland Cement

ASTM C 1567	(2008) Standard Test Method for Potential Alkali-Silica Reactivity of Combinations of Cementitious Materials and Aggregate (Accelerated Mortar-Bar Method)
ASTM C 171	(2007) Standard Specification for Sheet Materials for Curing Concrete
ASTM C 172	(2008) Standard Practice for Sampling Freshly Mixed Concrete
ASTM C 173/C 173M	(2008) Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
ASTM C 231	(2008c) Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C 260	(2006) Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C 309	(2007) Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C 31/C 31M	(2008a) Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C 33	(2007) Standard Specification for Concrete Aggregates
ASTM C 39/C 39M	(2005e1e2) Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C 494/C 494M	(2008a) Standard Specification for Chemical Admixtures for Concrete
ASTM C 595	(2008) Standard Specification for Blended Hydraulic Cements
ASTM C 618	(2008a) Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C 685/C 685M	(2007) Concrete Made by Volumetric Batching and Continuous Mixing
ASTM C 920	(2008) Standard Specification for Elastomeric Joint Sealants
ASTM C 94/C 94M	(2007) Standard Specification for Ready-Mixed Concrete

- ASTM C 989 (2006) Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars
- ASTM C 990 (2008) Standard Specification for Joints for Concrete Pipe, Manholes and Precast Box Sections Using Preformed Flexible Joint Sealants
- ASTM D 1752 (2004a; R 2008) Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion
- ASTM D 75 (2003) Standard Practice for Sampling Aggregates
- ASTM E 96/E 96M (2005) Standard Test Methods for Water Vapor Transmission of Materials

U.S. ARMY CORPS OF ENGINEERS (USACE)

- COE CRD-C 400 (1963) Requirements for Water for Use in Mixing or Curing Concrete
- COE CRD-C 572 (1974) Specifications for Polyvinylchloride Waterstops

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

- 40 CFR 247 Comprehensive Procurement Guideline for Products Containing Recovered Materials

1.4 SYSTEM DESCRIPTION

The Government retains the option to sample and test joint sealer, joint filler material, waterstop, aggregates and concrete to determine compliance with the specifications. Provide facilities and labor as may be necessary to assist the Government in procurement of representative test samples. Obtain samples of aggregates at the point of batching in accordance with ASTM D 75. Sample concrete in accordance with ASTM C 172. Determine slump and air content in accordance with ASTM C 143/C 143M and ASTM C 231, respectively, when cylinders are molded. Prepare, cure, and transport compression test specimens in accordance with ASTM C 31/C 31M. Test compression test specimens in accordance with ASTM C 39/C 39M. Take samples for strength tests not less than once each shift in which concrete is produced from each class of concrete required. Provide a minimum of three specimens from each sample; two to be tested at 28 days (90 days if pozzolan is used) for acceptance, and one will be tested at 7 days for information.

1.4.1 Strength

Acceptance test results are the average strengths of two specimens tested at 28 days (90 days if pozzolan is used). The strength of the concrete is considered satisfactory so long as the average of three consecutive acceptance test results equal or exceed the specified compressive strength, f'c, and no individual acceptance test result falls below f'c by more than 500 psi.

1.4.2 Construction Tolerances

Apply a Class "C" finish to all surfaces except those specified to receive a Class "D" finish. Apply a Class "D" finish to all post-construction surfaces which will be permanently concealed. Surface requirements for the classes of finish required are as specified in Part 4 of [ACI MCP SET](#).

1.4.3 Concrete Mixture Proportions

Concrete mixture proportions are the responsibility of the Contractor. Mixture proportions shall include the dry weights of cementitious material(s); the nominal maximum size of the coarse aggregate; the specific gravities, absorptions, and saturated surface-dry weights of fine and coarse aggregates; the quantities, types, and names of admixtures; and quantity of water per cubic yard of concrete. Provide materials included in the mixture proportions of the same type and from the same source as will be used on the project. Specified compressive strength f'c shall be 4,000 psi at 28 days (90 days if pozzolan is used). The maximum nominal size coarse aggregate is 1 inch, in accordance with [ACI MCP SET](#) Part 3. The air content shall be between 4.5 and 7.5 percent with a slump between 2 and 5 inches. The maximum water cement ratio is 0.50.

1.5 SUBMITTALS

The following shall be in accordance with Section [01 11 00 SPECIAL CONDITIONS](#), paragraph SUBMITTAL PROCEDURES :

SD-03 Product Data

- Air-Entraining Admixture
- Accelerating Admixture
- Water-Reducing or Retarding Admixture
- Curing Materials
- Reinforcing Steel
- Expansion Joint Filler Strips, Premolded
- Joint Sealants - Field Molded Sealants
- Waterstops

Manufacturer's literature from suppliers which demonstrates compliance with applicable specifications for the above materials.

Conveying and Placing Concrete

Methods and equipment for transporting, handling, depositing, and consolidating the concrete prior to the first concrete placement.

Formwork

Formwork design prior to the first concrete placement.

- Forms
- Installation Drawings
- Ready-Mix Concrete
- Mix Design Data
- Air-Entraining Admixtures
- Fly Ash

Steel Reinforcement
Accessories
Curing Compound
Concrete

SD-06 Test Reports

Aggregates

Test reports for aggregates showing the material(s) meets the quality and grading requirements of the specifications.

Concrete Mixture Proportions

The mixture proportions that will produce concrete of the quality required, ten days prior to placement of concrete. Applicable test reports to verify that the concrete mixture proportions selected will produce concrete of the quality specified.

Compressive Strength Testing Slump

SD-07 Certificates

Cementitious Materials CPG for recycled materials or appropriate Waiver Form

Manufacturer's certificates of compliance, accompanied by mill test reports, attesting that the concrete materials meet the requirements of the specifications in accordance with the Special Clause "CERTIFICATES OF COMPLIANCE". Certificates for all material conforming to EPA's Comprehensive Procurement Guidelines (CPG), in accordance with 40 CFR 247.

Aggregates

Certificates of compliance stating that the material(s) meet the quality and grading requirements of the specifications under which it is furnished.

Bill of Lading

1.6 QUALITY ASSURANCE

Indicate specific locations of Steel Reinforcement, Accessories Expansion Joints, Construction Joints, Contraction Joints, and Control Joints on installation drawings and include, but not be limited to, square feet of concrete placements, thicknesses and widths, plan dimensions, and arrangement of cast-in-place concrete section.

1.6.1 Regulatory Requirements

The state statutory and regulatory requirements form a part of this specification to the extent referenced. Submit CPG for recycled materials or appropriate Waiver Form.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Cementitious Materials

Provide cementitious materials that conform to the appropriate specifications listed:

2.1.1.1 Portland Cement

ASTM C 150, Type I, IA, or II.

2.1.1.2 Blended Hydraulic Cement

ASTM C 595, Type IS-A, IP-A.

2.1.1.3 Pozzolan

Provide pozzolan that conforms to ASTM C 618, Class C or F, including requirements of Tables 1A and 2A.

2.1.2 Aggregates

Fine and coarse aggregates shall meet the quality and grading requirements of ASTM C 33 Class Designations 4M or better "be tested and evaluated for alkali-aggregate reactivity in accordance with ASTM C 1260. Perform evaluation of fine and coarse aggregates separately and in combination, matching the proposed mix design proportioning. All results of the separate and combination testing shall have a measured expansion less than 0.10 (0.08) percent at 16 days after casting. If the test data indicates an expansion of 0.10 (0.08) percent or greater, reject the aggregate(s) or perform additional testing using ASTM C 1260 and ASTM C 1567. Perform the additional testing using ASTM C 1260 and ASTM C 1567 using the low alkali portland cement in combination with ground granulated blast furnace (GGBF) slag, or Class F fly ash. Use GGBF slag in the range of 40 to 50 percent of the total cementitious material by mass. Use Class F fly ash in the range of 25 to 40 percent of the total cementitious material by mass".

2.1.3 Admixtures

Admixtures to be used, when required or approved, shall comply with the appropriate specification listed. Retest chemical admixtures that have been in storage at the project site, for longer than 6 months or that have been subjected to freezing, at the expense of the Contractor at the request of the Contracting Officer and will be rejected if test results are not satisfactory.

2.1.3.1 Air-Entraining Admixture

Provide air-entraining admixture that meets the requirements of ASTM C 260.

2.1.3.2 Accelerating Admixture

Accelerators shall meet the requirements of ASTM C 494/C 494M, Type C or E.

2.1.3.3 Water-Reducing or Retarding Admixture

Provide water-reducing or retarding admixture meeting the requirements of [ASTM C 494/C 494M](#), Type A, B, or D. High-range water reducing admixture Type F or G may be used only when approved, approval being contingent upon particular placement requirements as described in the Contractor's Quality Control Plan.

2.1.4 Water

Use fresh, clean, potable water for mixing and curing, free from injurious amounts of oil, acid, salt, or alkali, except that unpotable water may be used if it meets the requirements of [COE CRD-C 400](#).

2.1.5 Reinforcing Steel

Provide reinforcing bars conforming to the requirements of [ASTM A 615/A 615M](#), Grade 60. Welded steel wire fabric shall conform to the requirements of [ASTM A 185/A 185M](#). Details of reinforcement not shown shall be in accordance with [ACI MCP SET](#) Part 3, Chapters 7 and 12.

2.1.6 Expansion Joint Filler Strips, Premolded

Expansion joint filler strips, premolded shall be sponge rubber conforming to [ASTM D 1752](#), Type I.

2.1.7 Joint Sealants - Field Molded Sealants

Joint sealants - field molded sealants shall conform to [ASTM C 920](#), Type M, Grade NS, Class 25, use NT for vertical joints and Type M, Grade P, Class 25, use T for horizontal joints. Provide polyethylene tape, coated paper, metal foil, or similar type bond breaker materials. The backup material needs to be compressible, nonshrink, nonreactive with the sealant, and a nonabsorptive material such as extruded butyl or polychloroprene foam rubber. Immediately prior to installation of field-molded sealants, clean the joint of all debris and further cleaned using water, chemical solvents, or other means as recommended by the sealant manufacturer or directed.

2.1.8 Waterstops

Waterstops shall conform to [COE CRD-C 572](#).

2.1.9 Formwork

The design and engineering of the formwork as well as its construction, will be the responsibility of the Contractor.

2.1.10 Form Coatings

Coat forms, for exposed surfaces, with a nonstaining form oil to be applied shortly before concrete is placed.

2.1.11 Vapor Barrier

Provide polyethylene vapor barrier sheeting with a minimum thickness of 6 mils or other equivalent material having a vapor permeance rating not exceeding 0.5 perms as determined in accordance with [ASTM E 96/E 96M](#).

2.1.12 Curing Materials

Provide curing materials conforming to the following requirements.

2.1.12.1 Impervious Sheet Materials

Impervious sheet materials, [ASTM C 171](#), type optional, except polyethylene film, if used, shall be white opaque.

2.1.12.2 Membrane-Forming Curing Compound

[ASTM C 309](#), Type 1-D or 2, Class A B.

2.2 READY-MIX CONCRETE

- a. Concrete shall be ready-mix concrete with [mix design data](#) conforming to [ACI MCP SET](#) Part 2
- b. Non-exposed concrete elements: 4000 psi minimum compressive strength.
- c. Direct-exposed concrete elements (including air-conditioned rooms): 4000 psi minimum compressive strength as determined in 28 calendar days.
- d. Slump: 1 to 4 inch according to [ASTM C 143/C 143M](#) and [ACI MCP SET](#) Part 1.
- e. Portland Cement conforming to [ASTM C 150](#), Type I, IA, II
- f. Use one brand and type of cement for formed concrete having exposed-to-view finished surfaces.
- g. [Air-Entraining Admixtures](#) conforming to [ASTM C 260](#). Exterior concrete exposed to freezing needs to be air-entrained 5 to 6 percent by volume. Nonair-entrained interior concrete shall have a total air content of 2 to 4 percent by volume.
- h. Water-reducing admixtures, retarding admixtures, accelerating admixtures, water-reducing and accelerating admixtures, and water-reducing and retarding admixtures shall conform to [ASTM C 494/C 494M](#).
- i. [Fly Ash](#) used as an admixture shall conform to [ASTM C 618](#), Class C or F with 4 percent maximum loss on ignition and 35 percent maximum cement replacement by weight. Submit documentation in compliance with [40 CFR 247](#).
- j. Ground granulated blast furnace slag used as an admixture shall conform to [ASTM C 989](#), Grade 120 with between 25 to 50 percent maximum cement replacement by weight. Submit documentation in compliance with [40 CFR 247](#).

2.3 STEEL REINFORCEMENT

2.3.1 Deformed Steel Bars

Provide steel bars conforming to ASTM A 615/A 615M, Grade .60 ksi ACI MCP SET Parts 2 and 3.

2.3.2 Welded Wire Fabric

Provide welded wire fabric conforming to ASTM A 185/A 185M.

2.4 FORMS

Forms shall be of wood, steel, or other approved material and conform to ACI MCP SET, Parts 2 and 3.

Provide form release conforming to ACI MCP SET, Part 4.

2.5 ACCESSORIES

2.5.1 Waterstops

a. Provide waterstops of the flat dumbbell type not less than 3/16-inch thick for widths up to 5 inches and not less than 3/8-inch thick for widths 5 inches and over.

b. Provide waterstops made of polyvinylchloride (PVC) and conforming to ASTM C 990

2.5.2 Curing Compound

Provide curing compound conforming to ASTM C 309.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 General

Prepare construction joints to expose coarse aggregate. The surface shall be clean, damp, and free of laitance. Construct ramps and walkways, as necessary, to allow safe and expeditious access for concrete and workmen. Remove snow, ice, standing or flowing water, loose particles, debris, and foreign matter. Earth foundations shall be satisfactorily compacted. Ensure spare vibrators are available. The entire preparation shall be accepted by the Government prior to placing.

3.1.2 Embedded Items

Secure reinforcement in place after joints, anchors, and other embedded items have been positioned. Arrange internal ties so that when the forms are removed the metal part of the tie is not less than 2 inches from concrete surfaces permanently exposed to view or exposed to water on the finished structures. Embedded items shall be free of oil and other foreign matters such as loose coatings or rust, paint, and scale. The embedding of wood in concrete is permitted only when specifically authorized or directed. All equipment needed to place, consolidate, protect, and cure the concrete shall be at the placement site and in good operating condition.

3.1.3 Formwork Installation

Forms shall be properly aligned, adequately supported, and mortar-tight. Provide smooth form surfaces, free from irregularities, dents, sags, or holes when used for permanently exposed faces. Chamfer all exposed joints and edges , unless otherwise indicated.

3.1.4 Vapor Barrier Installation

Apply vapor barriers over gravel fill. Lap edges not less than 6 inches. Seal all joints with pressure-sensitive adhesive not less than 2 inches wide. Protect the vapor barrier at all times to prevent injury or displacement prior to and during concrete placement.

3.1.5 Production of Concrete

3.1.5.1 Ready-Mixed Concrete

Provide ready-mixed concrete conforming to **ASTM C 94/C 94M** except as otherwise specified.

3.1.5.2 Concrete Made by Volumetric Batching and Continuous Mixing

Concrete made by volumetric batching and continuous mixing shall conform to **ASTM C 685/C 685M**.

3.1.6 Waterstops

Install and splice waterstops as directed by the manufacturer.

3.2 CONVEYING AND PLACING CONCRETE

Perform conveying and placing concrete in conformance with the following requirements.

3.2.1 General

Concrete placement is not permitted when weather conditions prevent proper placement and consolidation without approval. When concrete is mixed and/or transported by a truck mixer, deliver the concrete to the site of the work completing the discharge within 1-1/2 hours or 45 minutes when the placing temperature is 86 degrees F or greater unless a retarding admixture is used. Convey concrete from the mixer to the forms as rapidly as practicable by methods which prevent segregation or loss of ingredients. Concrete shall be in place and consolidated within 15 minutes after discharge from the mixer. Deposit concrete as close as possible to its final position in the forms and regulate it so that it may be effectively consolidated in horizontal layers 18 inches or less in thickness with a minimum of lateral movement. Carry on the placement at such a rate that the formation of cold joints will be prevented.

3.2.2 Consolidation

Consolidate each layer of concrete by internal vibrating equipment. Systematically accomplish internal vibration by inserting the vibrator through the fresh concrete in the layer below at a uniform spacing over the entire area of placement. The distance between insertions shall be approximately 1.5 times the radius of action of the vibrator and overlay the adjacent, just-vibrated area by approximately 4 inches. Ensure that the vibrator penetrates rapidly to the bottom of the layer and at least 6 inches

into the layer below, if such a layer exists. Hold vibrator stationary until the concrete is consolidated and then withdraw it slowly at the rate of about 3 inches per second.

3.2.3 Cold-Weather Requirements

No concrete is to be mixed or placed when the ambient temperature is below 36 degrees F or if the ambient temperature is below 41 degrees F and falling. Provide suitable covering and other means as approved for maintaining the concrete at a temperature of at least 50 degrees F for not less than 72 hours after placing and at a temperature above freezing for the remainder of the curing period. Do not mix salt, chemicals, or other foreign materials with the concrete to prevent freezing. Remove and replace concrete damaged by freezing at the expense of the Contractor.

3.2.4 Hot-Weather Requirements

When the rate of evaporation of surface moisture, as determined by use of Figure 1 of **ACI MCP SET** Part 2, is expected to exceed 0.2 psf per hour, provisions for windbreaks, shading, fog spraying, or covering with a light-colored material shall be made in advance of placement, and such protective measures taken as quickly as finishing operations will allow.

3.2.5 Lifts in Concrete

Deposit concrete in horizontal layers not to exceed 18 inches in thickness. Carry on placement at a rate that prevents the formation of cold joints. Place slabs in one lift.

3.3 FORM REMOVAL

Do not remove forms before 24 hours after concrete placement, except as otherwise specifically authorized. Do not remove supporting forms and shoring until the concrete has cured for at least 5 days. When conditions require longer curing periods, forms shall remain in place.

3.4 FINISHING

3.4.1 General

Do not finish or repair concrete when either the concrete or the ambient temperature is below 50 degrees F.

3.4.2 Finishing Formed Surfaces

Remove all fins and loose materials, and surface defects including filling of tie holes. Repair all honeycomb areas and other defects. Remove all unsound concrete from areas to be repaired. Surface defects greater than 1/2 inch in diameter and holes left by removal of tie rods in all surfaces not to receive additional concrete shall be reamed or chipped and filled with dry-pack mortar. Brush-coat the prepared area with an approved epoxy resin or latex bonding compound or with a neat cement grout after dampening and filling with mortar or concrete. The cement used in mortar or concrete for repairs to all surfaces permanently exposed to view shall be a blend of portland cement and white cement so that the final color when cured is the same as adjacent concrete.

3.4.3 Finishing Unformed Surfaces

Float finish all unformed surfaces, that are not to be covered by additional concrete or backfill, to elevations shown, unless otherwise specified. Surfaces to receive additional concrete or backfill shall be brought to the elevations shown and left as a true and regular surface. Slope exterior surfaces for drainage unless otherwise shown. Carefully make joints with a jointing tool. Finish unformed surfaces to a tolerance of 3/8 inch for a float finish and 5/16 inch for a trowel finish as determined by a 10 foot straightedge placed on surfaces shown on the drawings to be level or having a constant slope. Do not perform finishing while there is excess moisture or bleeding water on the surface. No water or cement is to be added to the surface during finishing.

3.4.3.1 Float Finish

Provide float finished surfaces, screeded and darbied or bullfloated to eliminate the ridges and to fill in the voids left by the screed. In addition, the darby or bullfloat shall fill all surface voids and only slightly embed the coarse aggregate below the surface of the fresh concrete. When the water sheen disappears and the concrete supports a person's weight without deep imprint, complete floating. Floating shall embed large aggregates just beneath the surface, remove slight imperfections, humps, and voids to produce a plane surface, compact the concrete, and consolidate mortar at the surface.

3.4.3.2 Expansion and Contraction Joints

Make expansion and contraction joints in accordance with the details shown or as otherwise specified. Provide 1/2 inch thick transverse expansion joints where new work abuts an existing concrete. Provide expansion joints at a maximum spacing of 30 feet on center in sidewalks and at a maximum spacing of 25 feet in slabs, unless otherwise indicated. Provide contraction joints at a maximum spacing of 10 linear feet in sidewalks and at a maximum spacing of 15 feet in slabs, unless otherwise indicated. Cut contraction joints at a minimum of 1 inch deep with a jointing tool after the surface has been finished.

3.5 CURING AND PROTECTION

Beginning immediately after placement, and continuing for at least 7 days, except for concrete made with Type III cement, at least 3 days, cure and protect all concrete from premature drying, extremes in temperature, rapid temperature change, freezing, mechanical damage, and exposure to rain or flowing water. Provide all materials and equipment needed for adequate curing and protection at the site of the placement prior to the start of concrete placement. Accomplish moisture preservation of moisture for concrete surfaces not in contact with forms by one of the following methods:

- a. Continuous sprinkling or ponding.
- b. Application of absorptive mats or fabrics kept continuously wet.
- c. Application of sand kept continuously wet.
- d. Application of impervious sheet material conforming to [ASTM C 171](#).

- e. Application of membrane-forming curing compound conforming to [ASTM C 309](#), Type 1-D, on surfaces permanently exposed to view. Accomplish Type 2 on other surfaces in accordance with manufacturer's instructions.

Accomplish the preservation of moisture for concrete surfaces placed against wooden forms by keeping the forms continuously wet for 7 days, except for concrete made with Type III cement, for 3 days. If forms are removed prior to end of the required curing period, use other curing methods for the balance of the curing period. Do not perform protection removal if the temperature of the air in contact with the concrete may drop more than 60 degrees F within a 24 hour period.

3.6 TESTS AND INSPECTIONS

3.6.1 General

The individuals who sample and test concrete, as required in this specification, must have demonstrated a knowledge and ability to perform the necessary test procedures equivalent to the ACI minimum guidelines for certification of Concrete Field Testing Technicians, Grade I.

3.6.2 Inspection Details and Frequency of Testing

3.6.2.1 Preparations for Placing

Inspect foundation or construction joints, forms, and embedded items in sufficient time prior to each concrete placement by the Contractor to certify that it is ready to receive concrete.

3.6.2.2 Air Content

Check air content at least twice during each shift that concrete is placed for each class of concrete required. Obtain samples in accordance with [ASTM C 172](#) and tested in accordance with [ASTM C 231](#).

3.6.2.3 Slump

Check slump twice during each shift that concrete is produced for each class of concrete required. Obtain samples in accordance with [ASTM C 172](#) and tested in accordance with [ASTM C 143/C 143M](#).

3.6.2.4 Consolidation and Protection

Ensure that the concrete is properly consolidated, finished, protected, and cured.

3.6.3 Action Required

3.6.3.1 Placing

Do not permit placing to begin until the availability of an adequate number of acceptable vibrators, which are in working order and have competent operators, has been verified. Do not continue placing if any pile is inadequately consolidated.

3.6.3.2 Air Content

Whenever an air content test result is outside the specification limits, adjust the dosage of the air-entrainment admixture prior to delivery of concrete to forms.

3.6.3.3 Slump

Whenever a slump test result is outside the specification limits, adjust the batch weights of water and fine aggregate prior to delivery of concrete to the forms. The adjustments are to be made so that the water-cement ratio does not exceed that specified in the submitted concrete mixture proportion.

3.6.4 Reports

Report the results of all tests and inspections conducted at the project site informally at the end of each shift. Submit written reports weekly. Deliver within 3 days after the end of each weekly reporting period. See Section 01 11 00 SPECIAL CONDITIONS .

3.7 FORM WORK

Form work shall conform to ACI MCP SET Parts 2 through 5.

3.7.1 Preparation of Form Surfaces

Forms shall be true to line and grade, mortar-tight, and sufficiently rigid to prevent objectionable deformation under load. Form surfaces for permanently exposed faces shall be smooth, free from irregularities, dents, sags, or holes. Chamfer exposed joints and exposed edges. Arrange internal ties so that when the forms are removed, the form ties are not less than 2 inches from concrete surfaces permanently exposed to view or exposed to water on the finished structure.

3.7.2 Form Coating

Coat forms, for exposed surfaces, with a nonstaining form release coating applied before the steel case is added to avoid contaminating the reinforcing steel. Forms for unexposed surfaces may be wetted in lieu of coating immediately before the placing of concrete, except that in freezing weather form release coating shall be used.

3.7.3 Removal of Forms

Remove forms carefully to prevent damage to the concrete. Do not remove forms before the expiration of the minimum time indicated below:

Arches, beams and deck-type slabs	144 hours
Columns and walls (lifts 15 feet and under)	24 hours
Columns and walls (lifts over 15 feet)	48 hours

3.8 STEEL REINFORCING

3.8.1 General

Reinforcement shall be free from loose, flaky rust and scale, and free from oil, grease, or other coating which might destroy or reduce the reinforcement's bond with the concrete.

3.8.2 Fabrication

Shop fabricate steel reinforcement in accordance with ACI MCP SET Parts 2 and 3. Shop details and bending shall be in accordance with ACI MCP SET Parts 2 and 3.

3.8.3 Splicing

Perform splices in accordance with ACI MCP SET Parts 2 and 3.

3.8.4 Supports

Secure reinforcement in place by the use of metal or concrete supports, spacers, or ties.

3.9 EMBEDDED ITEMS

Before placing concrete, take care to determine that all embedded items are firmly and securely fastened in place. Provide embedded items free of oil and other foreign matter, such as loose coatings of rust, paint and scale. Embedding of wood in concrete is permitted only when specifically authorized or directed.

3.10 BILL OF LADING

Bill of Lading for each ready-mix concrete delivery shall be in accordance with ASTM C 94/C 94M.

3.11 FIELD TESTING

- a. Provide samples and test concrete for quality control during placement. Sampling of fresh concrete for testing shall be in accordance with ASTM C 172.
- b. Test concrete for compressive strength at 7 and 28 days for each design mix. Concrete test specimens shall conform to ASTM C 31/C 31M. Perform Compressive strength testing conforming to ASTM C 39/C 39M.
- c. Test Slump at the site of discharge for each design mix in accordance with ASTM C 143/C 143M.
- d. Test air content for air-entrained concrete in accordance with ASTM C 231. Test concrete using lightweight or test extremely porous aggregates in accordance with ASTM C 173/C 173M.
- e. Determine temperature of concrete at time of placement in accordance with ASTM C 1064/C 1064M.

-- End of Section --

SECTION 26 08 00

APPARATUS INSPECTION AND TESTING

08/08

PART 1 GENERAL

1.1 REFERENCES

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

INTERNATIONAL ELECTRICAL TESTING ASSOCIATION (NETA)

NETA ATS (2003) Acceptance Testing Specifications

1.2 SUBMITTALS

The following shall be in accordance with Section 01 11 00 SPECIAL CONDITIONS, paragraph SUBMITTAL PROCEDURES :

SD-06 Test Reports

Acceptance tests and inspections; G

SD-07 Certificates

Qualifications of test technician; G

Acceptance test and inspections procedure; G

1.3 QUALITY ASSURANCE

1.3.1 Qualifications

Contractor shall employ a qualified testing technician to perform the required testing services. Include a list of three comparable jobs performed by the technician with specific names and telephone numbers for reference. Testing, inspection, calibration, and adjustments shall be performed by an engineering technician, certified by NETA or the National Institute for Certification in Engineering Technologies (NICET) with a minimum of 5 years' experience inspecting, testing, and calibrating electrical distribution and generation equipment, systems, and devices.

1.3.2 Acceptance Tests and Inspections Reports

Submit certified copies of inspection reports and test reports. Reports shall include certification of compliance with specified requirements, identify deficiencies, and recommend corrective action when appropriate. Type and neatly bind test reports to form a part of the final record. Submit test reports documenting the results of each test not more than 10 days after test is completed.

1.3.3 Acceptance Test and Inspections Procedure

Submit test procedure reports for each item of equipment to be field tested at least 45 days prior to planned testing date. Do not perform testing until after test procedure has been approved.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 ACCEPTANCE TESTS AND INSPECTIONS

Test technician shall perform acceptance tests and inspections. Test methods, procedures, and test values shall be performed and evaluated in accordance with **NETA ATS**, the manufacturer's recommendations, and paragraph entitled "Field Quality Control" of each applicable specification section. Tests identified as optional in **NETA ATS** are not required unless otherwise specified. Equipment shall be placed in service only after completion of required tests and evaluation of the test results have been completed. Contracting Officer shall be notified at least 14 days in advance of when tests will be conducted by the testing organization. Perform acceptance tests and inspections on all airfield lighting circuits worked on.

3.2 SYSTEM ACCEPTANCE

Final acceptance of the system is contingent upon satisfactory completion of acceptance tests and inspections.

3.3 PLACING EQUIPMENT IN SERVICE

A testing technician shall be present when equipment tested by the organization is initially energized and placed in service.

-- End of Section --

SECTION 26 56 20.00 10

AIRFIELD AND HELIPORT LIGHTING AND VISUAL NAVIGATION AIDS

10/07

PART 1 GENERAL

1.1 REFERENCES

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

ASTM INTERNATIONAL (ASTM)

ASTM A 123/A 123M (2008) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

ASTM A 153/A 153M (2005) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

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

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA TC 2 (2003) Standard for Electrical Polyvinyl Chloride (PVC) Tubing and Conduit

NEMA TC 3 (2004) Standard for Polyvinyl Chloride PVC Fittings for Use With Rigid PVC Conduit and Tubing

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 (2007; AMD 1 2008) National Electrical Code - 2008 Edition

U.S. FEDERAL AVIATION ADMINISTRATION (FAA)

FAA 6850.19 (1978) Frangible Coupling

FAA AC 150/5345-26 (Rev C) L-823 Plug and Receptacle, Cable Connectors

FAA AC 150/5345-42 (Rev F) Airport Light Bases, Transformer Houses, Junction Boxes and Accessories

FAA AC 150/5345-44 (Rev G) Taxiway and Runway Signs

FAA AC 150/5345-47 (Rev B) Isolation Transformers for Airport Lighting Systems

FAA AC 150/5345-7 (Rev E) L-824 Underground Electrical Cable for Airport Lighting Circuits

FAA E-2519

(Rev A) Types I and II

UNDERWRITERS LABORATORIES (UL)

UL 1242

(2006; Rev thru Jul 2007) Standard for Electrical Intermediate Metal Conduit -- Steel

UL 360

(2003; Rev thru Jul 2007) Liquid-Tight Flexible Steel Conduit

UL 486A-486B

(2003; Rev thru Aug 2006) Standard for Wire Connectors

UL 510

(2005; Rev thru Aug 2005) Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape

UL 6

(2007) Standard for Electrical Rigid Metal Conduit-Steel

UL 797

(2007) Standard for Electrical Metallic Tubing -- Steel

1.2 SYSTEM DESCRIPTION

- a. Provide airfield and heliport lighting and visual navigation aids consisting of taxiway signs and the lighting power supply and control.

1.3 SUBMITTALS

The following shall be in accordance with Section 01 11 00 SPECIAL CONDITIONS, paragraph SUBMITTAL PROCEDURES :

SD-02 Shop Drawings

Lighting and Visual Navigation Aids

Composite drawings showing coordination of work of one trade with that of other trades and with the structural and architectural elements of the work. Drawings shall be in sufficient detail to show overall dimensions of related items, clearances, and relative locations of work in allotted spaces. Drawings shall indicate where conflicts or clearance problems exist between the various trades.

As-Built Drawings

Drawings, as specified.

SD-03 Product Data

Materials and Equipment

- 1) A complete itemized listing of equipment and materials proposed for incorporation into the work. Each itemization shall

include an item number, the quantity of items proposed, and the name of the manufacturer.

2) Data composed of catalog cuts, brochures, circulars, specifications and product data, and printed information in sufficient detail and scope to verify compliance with requirements of the contract documents shall be included.

Training

Requirements of training shall be provided 3 weeks before training is scheduled to begin.

Special Tools

List of special tools and test equipment required for maintenance and testing of the products supplied by the Contractor.

List of Parts

A list of parts and components for the system by manufacturer's name, part number, nomenclature, and stock level required for maintenance and repair necessary to ensure continued operation with minimal delays.

Maintenance and Repair

Instructions necessary to check out, troubleshoot, repair, and replace components of the systems, as specified.

SD-06 Test Reports

Field Quality Control

Performance test reports, upon completion and testing of the installed system, in booklet form showing all field tests performed to adjust each component and all field tests performed to provide compliance with the specified performance criteria. Each test shall indicate the final position of controls.

Visual Inspection

Inspection reports prepared and provided as each stage of installation is completed. These reports shall identify the activity by contract number, location, quantity of material placed, and compliance with requirements.

SD-07 Certificates

Qualifications

Certified documentation of qualifications, as specified.

Materials and Equipment

When equipment or materials are specified to conform to the standards or publications and requirements of NEMA, NFPA, or UL,

or to an FAA Advisory Circular , proof that the items furnished under this section conform to the specified requirements shall be included. The label or listing in UL Electrical Construction or the manufacturer's certification or published catalog specification data statement that the items comply with applicable specifications, standards, or publications and with the manufacturer's standards will be acceptable evidence of such compliance. Certificates shall be prepared by the manufacturer when the manufacturer's published data or drawings do not indicate conformance with other requirements of these specifications.

SD-10 Operation and Maintenance Data

Operation and Maintenance Procedures

Six copies of operation and maintenance manuals for the equipment furnished. Maintenance manuals shall list special tools, repair/replacement parts, routine maintenance procedures, possible breakdowns and repairs, and troubleshooting guides. Maintenance manuals shall include conduit and equipment layout and simplified wiring and control diagrams of the system as installed.

1.4 QUALITY ASSURANCE

1.4.1 Code Compliance

The installation shall comply with the requirements and recommendations of **NFPA 70** and **IEEE C2** and local codes where required.

1.4.2 Qualifications

a. Submit certification containing the names and the qualifications of persons recommended to perform the splicing and termination of medium-voltage cables approved for installation under this contract. The certification shall indicate that any person recommended to perform actual splicing and termination has been adequately trained in the proper techniques and has had at least 3 recent years of experience in splicing and terminating the same or similar types of cables approved for installation. Any person recommended by the Contractor may be required to perform a dummy or practice splice and termination, in the presence of the Contracting Officer, before being approved as a qualified installer of medium-voltage cables. If that additional requirement is imposed, provide short sections of the approved types of cables with the approved type of splice and termination kits, and detailed manufacturer's instruction for the proper splicing and termination of the approved cable types.

1.4.3 Prevention of Corrosion

1.4.3.1 Metallic Materials

Protect metallic materials against corrosion as specified. Aluminum shall not be used in contact with earth or concrete. Where aluminum conductors are connected to dissimilar metal, use fittings conforming to **UL 486A-486B**.

1.4.3.2 Ferrous Metal Hardware

Ferrous metal hardware shall be hot-dip galvanized in accordance with ASTM A 123/A 123M and ASTM A 153/A 153M.

1.4.4 As-Built Drawings

Submit as-built drawings that provide current factual information including deviations from, and amendments to the drawings and changes in the work, concealed and visible, as instructed. The as-built drawings shall show installations with respect to fixed installations not associated with the systems specified herein. Cable and wire shall be accurately identified as to direct-burial or in conduit and shall locate the connection and routing to and away from bases, housings, and boxes.

1.5 PROJECT/SITE CONDITIONS

Items furnished under this section installed underground; in handholes, manholes, or underground vaults; or in light bases, shall be suitable for submerged operation.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

Provide materials and equipment which are the standard product of a manufacturer regularly engaged in the manufacture of the product and /or are FAA approved lighting equipment .

2.2 GENERAL REQUIREMENTS

EQUIPMENT AND MATERIALS SHALL BE NEW UNLESS INDICATED OR SPECIFIED OTHERWISE. MATERIALS AND EQUIPMENT SHALL BE LABELLED WHEN APPROVED BY UNDERWRITERS LABORATORIES (UL). ASKAREL AND INSULATING LIQUIDS CONTAINING POLYCHLORINATED BIPHENYLS (PCB'S) WILL NOT BE ALLOWED IN ANY EQUIPMENT. EQUIPMENT INSTALLED BELOW GRADE IN VAULTS, MANHOLES, AND HANDHOLES SHALL BE THE SUBMERSIBLE TYPE.

2.3 ELECTRICAL TAPE

Electrical tape shall be UL 510 plastic insulating tape.

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[00.doc\\lfi-cs-fas01\sharedlces\\$\SISGML\JOBS\087027\prntdata\32 17 24.00](#)
[10.doc2.4 RIGID STEEL OR INTERMEDIATE METAL CONDUIT \(IMC\) AND FITTINGS](#)

The metal conduit and fittings shall be **UL 6** and **UL 1242**, respectively.

2.5 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

UL 360 liquid-tight flexible metal conduit shall be used

2.6 PLASTIC CONDUIT FOR CONCRETE ENCASED OR DIRECT BURIAL

This plastic conduit shall be PVC conforming to **NEMA TC 2** (conduit) and **NEMA TC 3** (fittings) Type EPC-40 PVC

2.7 FRANGIBLE COUPLINGS AND ADAPTERS

These frangible couplings shall be in accordance with **FAA 6850.19** and **FAA E-2519**. Provide upper section of frangible coupling with one of the following:

- a. Unthreaded for slip-fitter connections.
- b. 2-13/32 inch 16N-1A modified thread for nut and compression ring to secure 2 inch EMT.
- c. 2 inch 11-1/2-N.P.T. (tapered) with 7/32 inch nominal wall thickness to accept rigid conduit coupling.
- d. Frangible Couplings for specialized applications as approved.
- e. Electrical Metallic Tubing **UL 797**, where indicated for use with frangible couplings and adapters.

2.8 WIRE AND CABLE FOR AIRFIELD AND HELIPORTS

- a. Airfield and heliport lighting cable shall be **FAA AC 150/5345-7**, Type L-824 for crosslinked polyethylene Type C 5000-volt cable. Series airfield and heliport lighting cable shall be unshielded.
- b. Counterpoise Wire. No. 4 AWG bare stranded copper, annealed or soft drawn.

2.9 CABLE TAGS

Install cable tags for each cable or wire at duct entrances entering or leaving manholes, handholes, and at each terminal within the lighting vault. Cable tags shall be stainless steel or brass per detail.

2.10 GROUND RODS

Ground rods shall be sectional copper-clad steel with diameter adequate to permit driving to full length of the rod, but not less than 3/4 inch in diameter and not more than 10 feet long, unless indicated otherwise.

2.11 CABLE CONNECTORS AND SPLICE

Cable connectors in accordance with FAA AC 150/5345-26, Item L-823 shall be used for connections and splices appropriate for the type of cable. For FAA Type L-824 lighting cable, connectors shall be FAA AC 150/5345-26, Type L-823.

2.12 ENCAPSULATED ISOLATION TRANSFORMERS

These transformers shall be FAA AC 150/5345-47, Type L-830. Each transformer shall be provided with rating to accommodate guidance sign loads or as shown on the contract drawings

2.13 LIGHT BASES

Light bases shall be FAA AC 150/5345-42 Type L-867 or as shown on the plans. Steel bases, Class 1, Size B shall be provided as indicated or as required to accommodate the fixture or device installed thereon if diameter is not shown. Base plates, cover plates, and adapter plates shall be provided to accommodate various sizes of fixtures. Bolts shall be stainless steel.

2.14 TAXIWAY GUIDANCE SIGNS

The taxiway guidance signs shall meet the requirements of FAA AC 150/5345-44, Type L-858Y for information and Type L-858R for mandatory signs. The size and information on the signs shall be as shown on contract drawings. The power supply to connect to series circuits shall be as approved by the manufacturer.

Signs shall be FAA type L-858, Size 3, Class 2, Style 2 or 3, 2.8 to 6.6 amps or 8.5 to 20 amps as required and as shown on the plans. The overall length and number of modules shall be determined by the manufacturer. Signs shall be low power LED or florescent type.

2.15 GUIDANCE SIGN BIRD DETERRENT STRIPS

Bird deterrent spike strips shall be installed on top of all guidance signs. The strips shall be all high grade stainless steel wire and strip barriers. The base of the strips shall have full anneal for flexibility, easy strip cutting and surface shape memory. Strips shall be sized to cover the complete top of each sign and extend a minimum of 1/2-inch over each edge of the sign. The strips shall be provided with a minimum 90-degree of wire coverage and have a minimum of 40 wire points per foot. Strips shall have a natural stainless steel finish. Stainless steel mounting hardware shall be provided to allow for strip removal and reinstallation without causing damage to the installation surface to allow for maintenance of the signs.

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PART 3 EXECUTION

3.1 EXAMINATION

After becoming familiar with details of the work, verify dimensions in the field, and advise the Contracting Officer of any discrepancy before performing any work.

3.2 GENERAL INSTALLATION REQUIREMENTS

Circuits installed underground shall conform to the requirements of [\\lfi-cs-fas01\sharedlces\\$\SISGML\JOBS\087027\prntdata\33 70 02.00 10.doc](#) this specification , except as required herein. [\\lfi-cs-fas01\sharedlces\\$\SISGML\JOBS\087027\prntdata\26 20 00.doc](#) E xcavation, trenching, and backfilling shall conform to the requirements of Section [31 23 00.00 20](#) EXCAVATION AND FILL . Concrete work shall conform to the requirements of Section [03 30 53](#) MISCELLANEOUS CAST-IN-PLACE CONCRETE.

3.3 CABLES, GENERAL REQUIREMENTS

The type of installation, size and number of cables shall be as indicated. Maximum length of cable pull and cable pulling tensions shall not exceed the cable manufacturer's recommendations.

3.3.1 Duct Line Installation

Cable splices shall be made in manholes, handholes, and junction/base cans only, except as otherwise noted. Counterpoise cable shall be installed direct-burial only .

[\\lfi-cs-fas01\sharedlces\\$\SISGML\JOBS\087027\prntdata\26 20 00.doc](#) 3.4 DUCT LINES

Duct lines shall be non-encased direct-burial, thick-wall type.

3.4.1 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 manhole, a handhold, or between manholes or handholes. Both curved and straight sections may be used to form long sweep bends as required, but the maximum curve shall be 30 degrees and manufactured bends shall be used. Ducts shall be provided with end bells when duct lines terminate in manholes or handholes. Duct line markers shall be provided as indicated at the ends of long duct line stubouts or for other ducts whose locations are indeterminate because of duct curvature or terminations at completely below-grade structures. A 5 mil brightly colored plastic tape not less than 3 inches in width and suitably inscribed at not more than 10 feet on centers with a continuous metallic backing and a corrosion-resistant 1 mil metallic foil

core to permit easy location of the duct line, shall be placed below finished grade levels of all duct lines.

3.4.2 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. After a duct line is completed, a standard flexible mandrel shall be used for cleaning followed by a brush with stiff bristles. Mandrels shall have diameters 1/4 inch less than the inside diameter of the duct being cleaned. Pneumatic rodding may be used to draw in lead wires. A coupling recommended by the duct manufacturer shall be used when an existing duct is connected to a duct of different material or shape. Ducts shall be stored to avoid warping and deterioration with ends sufficiently plugged to prevent entry of 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.

3.4.3 Concrete Encasement

Each single duct shall be completely encased in concrete with a minimum of 3 inches of concrete around each duct. Duct line encasements shall be monolithic construction. Where a connection is made to a previously poured encasement, the new encasement shall be well bonded or doweled to the existing encasement. Separators or spacing blocks shall be made of plastic, placed not further apart than 4 feet on centers. Ducts shall be securely anchored to prevent movement during the placement of concrete and joints shall be staggered at least 6 inches vertically.

3.4.4 Non-encased Direct-Burial

Bottoms of trenches shall be graded toward manholes or handholes and shall be smooth and free of stones, soft spots, and sharp objects. Where bottoms of trenches comprise materials other than sand or stone-free earth, 3 inch layers of sand or stone-free earth shall be laid first and compacted to approximate densities of surrounding firm soil before installing ducts in direct-contact tiered fashion. Joints in adjacent tiers of duct shall be vertically staggered at least 6 inches. The first 4 inch layer of backfill cover shall be sand or stone-free earth compacted as previously specified. Duct banks may be held in alignment with earth. Selected earth at duct banks shall be thoroughly tamped in 4 to 6 inch layers.

3.4.5 Installation of Couplings

Joints in each type of duct shall be made up in accordance with the manufacturer's recommendations for the particular type of duct and coupling selected and as approved. In the absence of specific recommendations, various types of duct joint couplings shall be made watertight as specified.

3.4.5.1 Plastic Duct

Duct joints shall be made by brushing a plastic solvent cement on insides of plastic coupling fittings and on outsides of duct ends. Each duct and fitting shall then be slipped together with a quick one-quarter-turn twist to set the joint tightly.

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10.doc3.5 CABLE MARKERS](#)

Provide cable markers or tags for each cable at duct entrances entering or leaving manholes or handholes and at each termination within the lighting vault. Cables in each manhole or handhole shall have not less than two tags per cable, one near each duct entrance hole. Immediately after cable installation, tags shall be permanently attached to cables and wires so that they cannot be accidentally detached.

3.6 FRANGIBLE REQUIREMENTS

All signs and fixtures must be provided with breakaway cable connectors installed within frangible couplings at the mounting portion of the fixture .

3.7 FIXTURES AND WIRES INSTALLATION

3.7.1 General

A jig or holding device shall be used when installing each light base or fixture to ensure positioning to the proper elevation, alignment, level control, and azimuth control. Light fixture shall be oriented with the light beams parallel to the runway or taxiway centerline and facing in the required direction. Outermost edge of fixture shall be level with the surrounding pavement.

The contractor shall verify all constant current regulator nameplates for each circuit before making final connections to that circuit. Signs shall be installed on concrete foundations at the approximate locations shown on the plans. Any obstructions preventing the installation at recommended locations shall be brought to the attention of the engineer immediately.

All signs shall have a bird deterrent system installed. For installation of the bird deterrent, visually inspect all installation surfaces. Make sure all surfaces are clean, dry and free from debris or other conditions. Verify dimensions of each installation surface.

All equipment shall be installed in strict accordance with manufacturer's installation guidelines. Lights and signs items shall include new L-867 base cans, L-830 isolation transformers, foundations, frangible coupling, wiring, grounding and all incidentals required to provide a complete installation. Bird deterrents shall be incidental to the sign installation.

3.8 SPLICES FOR AIRFIELD AND HELIPORT LIGHTING CABLE

3.8.1 Connectors

Kit type connectors shall be used to splice 5 kV single-conductor series lighting cables. During installation and prior to covering with earth, mating surfaces of connectors shall be covered until connected and clean when plugged together. At joint where connectors come together, heat shrinkable tubing shall be installed with waterproof sealant . Joint shall prevent entrapment of air which might subsequently loosen the joint.

3.9 GROUNDING SYSTEMS

3.9.1 Counterpoise Installation

Counterpoise wire shall be laid for entire length of circuits supplying airfield lighting. Where trenches or duct lines intersect, counterpoise wires shall be electrically interconnected by exothermic welding or brazing. Counterpoise to earth ground shall be connected at every 500 feet of cable run, at lighting vault, at guidance sig, only when backfilling areas to be paved, n, at connections of new counterpoise wire to existing, and at feeder connection to light circuit by means of ground rods as specified.

3.9.2 Fixture Grounding

Each fixture shall be grounded as shown in the drawings .

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ISOLATION TRANSFORMERS

Transformer lead connections shall conform to [FAA AC 150/5345-26](#). Transformer secondary connectors shall plug directly into a mating connector on the transformer secondary leads. During installation, mating surfaces of connectors shall be covered until connected and clean when plugged together. At joint where connectors come together, heat shrinkable tubing shall be installed with waterproof sealant or with two half-lapped layers of tape over the entire joint. Joint shall prevent entrapment of air which might subsequently loosen the joint.

3.11 FIELD QUALITY CONTROL

Notify the Contracting Officer five working days prior to each test. Deficiencies found shall be corrected and tests repeated. Field test reports shall be written, signed and provided as each circuit or installation item is completed. Field tests shall include resistance-to-ground and resistance between conductors, and continuity measurements for each circuit. The output current of the constant current regulator at each intensity shall be recorded; measure if no fixed meter is intalled . A visual inspection of the sign or light's operation shall be reported.

3.11.1 Operating Test

Test each completed circuit installation for operation. For every working day, the equipment shall be demonstrated to operate in accordance with the requirements of this Section prior to the Contractor leaving the site for the day . One day and one night test shall be conducted for the Contracting Officer.

3.11.2 Counterpoise System Test and Inspection

Continuity of counterpoise system shall be checked by [visual inspection](#) at accessible locations. Continuity of counterpoise system to the vault grounding system shall be tested in manhole closest to the vault.

3.11.3 Progress Testing for Series Lighting Circuits

A megger test shall be conducted on each section of circuit or progressive combinations of sections prior to the modification of the circuit .

After installation of new cables, each section or progressive combination of sections shall be re tested. Test with a megohmmeter providing a voltage of approximately 1000 volts, directly reading resistance. Results shall be documented. Faults indicated by these tests shall be eliminated before proceeding .

3.11.4 Electrical Acceptance Tests

Acceptance tests shall be performed for series lighting circuits only on complete lighting circuits.

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TRAINING

Provide training on the proper **operation and maintenance procedures** for the system. Submit information describing training to be provided, training aids to be used, samples of training materials, and schedules. Training shall include a list of **special tools** and test equipment required for maintenance and testing of the products supplied by the Contractor; a **list of parts** and components for the system by manufacturer's name, part number, nomenclature, and stock level required for **maintenance and repair** necessary to ensure continued operation with minimal delays; instructions necessary to checkout, troubleshoot, repair, and replace components of the systems, including integrated electrical and mechanical schematics and diagrams and diagnostic techniques necessary to enable operation and troubleshooting after acceptance of the system.

3.13 FINAL OPERATING TESTS

After completion of installations and the above tests, circuits, control equipment, and lights covered by the contract shall be demonstrated to be in acceptable operating condition. Each switch in the control tower lighting panels shall be operated so that each switch position is engaged at least twice. During this process, lights and associated equipment shall be observed to determine that each switch properly controls the corresponding circuit. Telephone or radio communication shall be provided between the operator and the observer. Tests shall be repeated from the alternate control station, from the remote control points, and again from the local control switches on the regulators. Each lighting circuit shall be tested by operating the lamps at maximum brightness for not less than 30 minutes. At the beginning and at the end of this test the correct number of lights shall be observed to be burning at full brightness. One day and one night operating test shall be conducted for the Contracting Officer.

-- End of Section --