**6. ENGINEERING SYSTEMS REQUIREMENTS**

**D50 ELECTRICAL**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
SYSTEMS REQUIREMENTS  
ELECTRICAL TEMPLATE 06/23  
  
Instructions for using this template: There are template files for each UNIFORMAT Level 2 Group Elements. This template is for Group Element D50-ELECTRICAL. Text such as this is hidden text that will not print when the hidden text box in "Print/Options" is un-checked.  
  
Edit this template for the requirements of the project and wherever brackets [ ] appear. Use UFC 3-501-01 when determining electrical system requirements.   
  
It is acceptable to place all required information in the main element (such as D5010) and delete the sub-elements provided in this template.  
  
The SYSTEMS REQUIREMENTS are intended to define items that are required throughout the facility or on a system wide basis that is common to several rooms. Room-specific requirements are defined in the ROOM REQUIREMENTS section. Coordinate with the lead programmer for ROOM REQUIREMENTS. Delete all building elements that are not required for the project. If additional elements or sub-elements are required for the project that do not appear in the template, refer to the NIST UNIFORMAT II publication for additional building element numbers and descriptions. The Uniformat II Work Breakdown Structure can be found at** [**www.wbdg.org/ndbm/**](http://www.wbdg.org/ndbm/) **. Coordinate with the PERFORMANCE TECHNICAL SPECIFICATION SECTION D50 (Section D50) to ensure that performance requirements are provided for all of the Building Elements listed here and that paragraph numbering matches.  
  
There may be rare occasions when prescriptive specifications may either be edited and included in Part 5 of the RFP or required in Section D50 to be edited by the Contractor's Designer of Record. In both cases, the Engineering Systems Requirements (ESR) must include references to these documents.  
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NOTE: Consider each electrical system component relative to Part 2 UFGS Section 01 33 29, *Sustainability Requirements and Reporting* and UFC 1-200-02, *High Performance and Sustainable Building Requirements* and minimize energy costs.  
\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

**SYSTEM DESCRIPTION**  
**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: This ESR is written for Entry Control Facilities; and relies on UFC 04-022-01, *Security Engineering: Entry Control Facilities/Control Access Points*.  
  
Address scope and ensure the system description clearly describes the existing systems and designated connection points as applicable, and any other information needed for the contractor to understand the existing system and how the new project will connect to it.  
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This project includes the construction of buildings and structures as listed below. Refer to site plans for building locations.

[ ]

[Demolish the existing [ ] system [and provide new [ ].]

Provide an interior electrical system consisting of [Service Entrance Wiring and Equipment,] [Distribution and Lighting Panelboards,] [Dry Type Transformers,] [Conduits,] [Feeder and Branch Circuits,] [Motor Control Equipment,] [Lighting and Branch Wiring,] [Communications, Security and Alarm Systems,] [Emergency Generator], [Emergency Lighting and Power,] [Grounding,] [Lightning Protection,] [Photovoltaic Energy System,] [UPS,] [ ] including accessories and devices as necessary and required for a complete and usable system. This section covers installations out to the building 5 foot (1.5 meter) line.

Provide each building with a [single] [ ] utility service with radial power distribution.

Select electrical characteristics of the power system to provide a safe, efficient and economical distribution of power based upon the size and types of electrical loads to be served. Use distribution and utilization voltages of the highest level that is practical for the load to be served.

Provide a minimum of [20][ ] percent spare circuit and load capacity at all levels of the power distribution system including any stand-by power systems.

Provide an interior distribution system consisting of insulated conductors in conduit.

**GENERAL SYSTEM REQUIREMENTS**  
Provide an Electrical System complete in place, tested and approved, as specified throughout this RFP, as needed for a complete, usable and proper installation. Install all equipment in accordance with the criteria of PTS Section D50 and the manufacturer’s recommendations. Where the word "should" is used in the manufacturer’s recommendations, substitute the word "must".

This section of the RFP includes all electrical work on or within the building out to the five (5) foot line. Electrical site work outside the five (5) foot line is covered in section G40.

SUSTAINABILITY  
Provide electrical systems and components that support project sustainability and energy goals.

ANTITERRORISM  
Provide bracing of electrical equipment which is suspended and weighs more than 31 pounds.

SEISMIC BRACING  
Bracing of electrical equipment to resist seismic events [is] [is not] required based on site seismic design criteria and building importance factor.

ELECTRICAL TESTING  
Test new electrical equipment in accordance with NETA acceptance testing specifications. Test existing electrical equipment remaining in service in accordance with NETA maintenance testing specifications.

COMMISSIONING  
Commission all systems in accordance with RFP Part 3 Chapter 2; UFGS Section 01 33 29, *Sustainability Requirements and Reporting*, UFGS Section 01 91 00.15 *Building Commissioning* and UFC 1-200-02, *High Performance and Sustainable Building Requirements*.

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NOTE: Requirements for Government Furnished Equipment (GFE) are provided in ESR E10, *Equipment*.  
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**D5010 ELECTRICAL SERVICE AND DISTRIBUTION**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Typically, the scope of design build projects covered by this specification will limit the voltage in a facility to 480 volts maximum. All medium voltage work will generally be exterior to the facility and will be covered in ESR G40.  
\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

**D501001 MAIN TRANSFORMERS**

Main transformer(s) are defined in Section G40, *Site Electrical Utilities*.

**D501002 SERVICE ENTRANCE EQUIPMENT**

Provide underground service into the facility.

[Provide a [switchgear] [switchboard] [main distribution panel] as service equipment. [Provide each [switchgear] [switchboard] with digital metering.]

[Provide energy usage monitoring by using digital metering with current transformers on the incoming service equipment. Monitor the total power usage at the service entrance. Monitored output must report to and be compatible with the Direct Digital Controls (DDC) system.]

**D501003 INTERIOR DISTRIBUTION TRANSFORMERS**

[Provide dry type transformers to step down secondary voltages for general purpose outlets and other low voltage equipment.]

**D501004 PANELBOARDS**

[Provide distribution and branch circuit panelboards to serve loads as required.]

**D501005 ENCLOSED CIRCUIT BREAKERS**

[Provide enclosed circuit breakers for [ ]].

**D501090 OTHER SERVICE AND DISTRIBUTION**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Determine if surge protective devices (SPD) are required for switchgear, switchboards, or panelboards.  
\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

[Provide transient voltage surge protective devices (SPD) at the following locations [service entrance] [ ]].

**D5020 LIGHTING AND BRANCH WIRING**

Provide electrical connections for all systems requiring electrical service.

Provide lighting and general purpose receptacles throughout all spaces as required.

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NOTE: Edit to identify project specific special outlets required. Include amp and voltage requirements as appropriate.  
\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

Provide dedicated circuits and connections for the following special outlets: [ ].

**D502001 BRANCH WIRING**

Provide [insulated conductors in conduit] [non-metallic sheathed cable] branch wiring.

**D502002 LIGHTING EQUIPMENT**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Editor fill out room data sheets with lighting requirements for each area.  
\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

[Provide a complete lighting system including exit and emergency lighting and area lighting consisting of [LED][fluorescent] lighting including switches, and automatic controls including [occupancy sensors,][vacancy sensors,][daylighting controls,] [automatic lighting shutoff systems] and [specialty lighting].]

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: For a Gatehouse, Sentry/Guard Booth and Overwatch Position, specialized interior lighting is required per UFC 4-022-01 *Security Engineering: Entry Control Facilities/Access Control Po*ints.  
\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

[Provide dimmable lighting systems for the [Sentry/Guard Booth[s]] [Overwatch Position] [and] [Gatehouse] to aid with night vision.]

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Based on typical restart or restrike time of 15 or 20 minutes for metal halide lighting, consider using fluorescent or electrodeless fluorescent (induction) lighting for use with Overhead Canopies.  
\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

[Provide [LED][metal halide] [fluorescent] [electrodeless fluorescent (induction)] lighting for the Overhead Canopy.

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: When vehicle lanes are designed for reversed traffic flow, include the bracketed option.  
\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

[Provide red and green LED signal lights to indicate whether vehicle lane is open or closed. Mount signal lights over each lane on the Access Control Zone canopy facing the Approach Zone [and facing the Response Zone].]

**D5030 COMMUNICATIONS AND SECURITY**

The Room Requirements Section identifies locations for communications and security systems and equipment, unless noted otherwise in the following sub-elements.

**D503001 TELECOMMUNICATIONS SYSTEMS**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Edit the following to meet the base and or activity requirements. Include Category 6 cable requirement here. This coordinates with the latest guidance indicated in UFC 3-580-01 and will override the conflict in UFC 3-580-10 that required Category 5E cable.  
\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

Provide a complete building entrance facility, backbone distribution system, and horizontal distribution system including, but not necessarily limited to, all [wiring,] [pathway systems,] [grounding,] [backboards,] [connector blocks,] [protectors for all copper service entrance pairs,] [patch panels,] [fiber optic distribution panels,] [terminators for all fiber optic cables,] [outlet boxes,] [telephone jacks,] [data jacks] [cover plates] and [ ].

Provide Category 6 Unshielded Twisted Pair (UTP) copper cable for horizontal voice and data cables.

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Secret Internet Protocol Router Network (SIPRNET) and other protocols are used to transmit unencrypted classified information. SIPRNET outlets can only be provided in controlled access areas (CAA) as defined by IA PUB-5239-22, Information Assurance Protected Distribution System (PDS) Guidebook, which is issued "For Official Use Only".  
  
Guidance for designing a Protected Distribution System (PDS) is described in UFC 3-580-10, Appendix E. The PDS is used to protect the media transporting the unencrypted classified information, and is required for any media transporting unencrypted classified information that leaves the perimeter of the CAA. Determine if a PDS is required for the project and indicate SIPRNET outlet requirements either in the Room Requirements section of the RFP or in the paragraph below, but not in both locations.  
\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

[Secret Internet Protocol Router Network (SIPRNET) is a project requirement. Provide a Protected Distribution System (PDS) as required. Provide outlets in accordance with [the Room Requirements.][in the following rooms:

[\_\_\_\_]

[\_\_\_\_].]

**D503003 INTERCOMMUNICATIONS SYSTEMS**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: The Public Address System and the Intercommunications system may generally be combined into one and utilize the telephone system and desktop phones for all communications. Coordinate and verify with user if this is a suitable system for mission accomplishment.   
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[Provide an Intercommunication System to allow two-way communications between the Sentry/Guard Booth, [Gatehouse,] [Overwatch Position,] [Visitors Center,] [Large Commercial Vehicle/Truck Inspection Facilities, ][Vehicle ID Stations,] [Pedestrian ID Stations,] [and] [ ].]

**D503004 TELEVISION SYSTEMS**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Community Antenna Television Systems (CATV) are generally referred to as Cable TV. Determine if there will be a CATV system that is not owned and maintained by the Government.  
  
If the system will not be owned by the government, specify the requirements for empty raceways and outlet boxes to enable system installation by the commercial CATV supplier.  
  
If the system will be owned by the government, specify a complete system. Include backbone consisting of backboards/cabinets, wire, conduit, outlets and jacks in all offices. Include jacks in other locations as required by the user.  
  
NOTE: Cable TV system only applicable if project includes a Visitors Center.   
\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

[Provide a CATV system in the Visitors Center consisting of empty raceways and outlet boxes to enable system installation by the commercial CATV supplier.]

[Provide a complete CATV system in the Visitors Center to be owned and maintained by the Government including all interior equipment required to provide high quality TV signals to all outlets with a return path for interactive television and cable modem access. System must include, but is not necessarily limited to, [headend amplifier,] amplifiers, splitters, combiners, line taps, cables, outlets, tilt compensators and all other parts, components, and equipment necessary to provide a complete and usable system. ]

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Coordinate locations with the using activity and edit accordingly.   
\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/**

[Provide CATV outlets in the [Waiting Area] [ ].]

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Specify CATV testing method to ensure that the RFP is complete.   
\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

Conduct CATV testing at each of the following points in the system:

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Use option for testing at each outlet instead of random sampling and at the furthest outlet when project includes only a small number of outlets.  
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Furthest outlet from [each communications closet] [service entrance point of connection]

A random sampling of 25 percent of the [outlets [from each communication closet] [housing units] as designated by the Contracting Officer.

[At each outlet.]

[Head end] and [Distribution amplifier inputs and outputs.]

**D503005 SECURITY SYSTEMS**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: NAVFAC's goal, is to fully integrate the design, procurement, installation and testing of ESS into Navy MCON design and construction contracts. Include ESS supporting infrastructure in the base construction contract and include the procurement, installation, and testing as an option.  
  
ESS requirements for ECF vary from project to project and may differ at each activity but in general, most ECF will include the following: gate automation system (access control system for pedestrians/vehicles), duress alarms, wrong way/over speed detection, and CCTV systems for archiving vehicular traffic and surveillance of the access and response zones. Installation of an ESS including designating protected areas/zones must be indicated in the Project Program. Coordinate requirements with Project Manager and Base and Regional Security Personnel.  
  
The following is provided for guidance only and must be edited accordingly to suit each project. ESS must be fully coordinated and defined by the RFP writer and not left up to the design builder.  
  
Communications connectivity for the Entry Control Facilities must be coordinated with Base security, Base Communications Officers (BCO), and facility operations personnel at the RFP development meeting. Coordinate connectivity requirements with Section G40.  
  
For Navy projects, provide central duress alarm and infrastructure for all ESS systems with project funds. Provide equipment for CCTV system as a contract option. Access control (gate automation) system and wrong way/over speed detection systems to be provided by others.  
  
For Marine Corps projects, provide central duress alarm with project funds and infrastructure support only for all other systems to be provided by others. Coordination with Commandant Marine Corps (CMC) is required.  
\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

For entry control facilities, Electronic Security System (ESS) is the integrated electronic system that encompasses one or more of the following subsystems; access control system (ACS) for pedestrians/vehicles (gate automation), duress alarms, wrong way/over speed detection, and closed circuit television (CCTV) system.

Provide a Central Duress Alarm at all guard positions in [Sentry/Guard Booth,] [Gatehouse,] [Overwatch Position,] [and] [Truck Inspection Office] [ ]. The duress alarm must be a [push button][ring down telephone]. Activation of alarm must initiate an alarm signal at the installation emergency control center, dispatch center, or similar designated location; and be silent in the ECF to avoid alerting aggressors of its activation.

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: If the system will be provided under this contract, specify a complete system that includes equipment and supporting infrastructure as required  
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[Provide a CCTV system including equipment and supporting infrastructure complete, tested, and operational. CCTV system must be compatible with the Installation's central monitoring system and monitored [Sentry/Guard Booth,] [Gatehouse,] [and] [at the Installation central monitoring station].

CCTV system consists of devices to provide visual imagery and digital archiving of ECF transactions including driver, pedestrian, vehicle, front/rear license plates, and wide area situational awareness (SA) of the ECF access and response zones. Features must include interface to ESS for control of camera call up to video displays [, pan-tilt-zoom camera control for SA cameras,] and digital video archiving based on alarm event triggers. Video archiving capacity must be a minimum of [30] [ ] days. [Integration must provide means to associate archived alarm events with recorded video at the [ ] location(s).

Closed Circuit Television (CCTV) System workstation must be located in the [Sentry/Guard Booth] [Gatehouse]. The system must consist of a Digital Video Recorder (DVR), keyboard, and video display. DVR must have [30 day] [ ] archive capability.]

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: If the equipment will be provided by others, specify the requirements for empty raceways and outlet boxes to enable system installation by the ESS supplier.  
\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

[Closed Circuit Television (CCTV) System workstation must be located in the [Sentry/Guard Booth] [Gatehouse]. The CCTV system must consist of empty raceways with pull strings, outlet boxes, cover plates, and associated power outlets to enable system installation by the CCTV supplier.]

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Specific camera locations should be identified in section Section G40 of the RFP. Locations must be confirmed with Base security and facility operations personnel at the RFP development meeting.  
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[Cameras for CCTV System are defined in Section G40, Site Electrical Utilities.]

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Use the following section for gate automation system as discussed with Base security and facility operations personnel at the RFP Development meeting.  
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[Provide Gate Automation System infrastructure including all equipment racks, conduit, wiring, fittings, boxes, and power connections to enable system installation by the equipment supplier.]

The Gate Automation System consists of the following components:

[In the Gatehouse:

• Telecommunication backboard and 19-inch equipment rack.

• Access Control Client Workstation - Including supporting keyboard, mouse, and video display.

• [Overspeed and direction detection system workstation (may be integrated into Access Control Client workstation)]

• [Identity Management Guard Workstation][, including encryption equipment] [and pathway for roof-mounted antenna]

• [Exterior component requirements are defined in Section G40, Site Electrical Utilities.]]

[In the Visitors Center:

• ID and RFID Management system with enrollment workstations.]

**D503006 INDUSTRIAL CONTROL SYSTEMS (ICS)**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Edit the following to meet the base and activity requirements.  
\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

[Provide an Industrial Control System (ICS) distribution system, and horizontal distribution system including, but not necessarily limited to, equipment racks, all [wiring,] [pathway systems,] [grounding,] [backboards,] [connector blocks,] [protectors for all copper service entrance pairs,] [patch panels,] [fiber optic distribution panels,] [terminators for all fiber optic cables,] [outlet boxes,] [data jacks] [cover plates] and [ ].

[The ICS Equipment Rack must be 84-inches (2100mm) [ ]high[, double compartment with two doors, separately keyed with vertical locking mechanism].]

Provide [Category 6 Unshielded Twisted Pair (UTP) copper cable] [[ ] strand single mode fiber optic cable] for horizontal ICS distribution system data cables.

Provide horizontal distribution system from the Telecommunications Room to the following facility control systems[, through the patch panel in the Mechanical Room]:

[HVAC Direct Digital Controls (DDC)]

[Lighting Control System]

[\_\_\_\_]

**D503090 OTHER COMMUNICATIONS AND ALARM SYSTEMS**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Mass Notification Systems are included in D40, *Fire Protection*.  
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**D5090 OTHER ELECTRICAL SERVICES**

**D509001 GENERAL CONSTRUCTION ITEMS (ELECTRICAL)**

Provide General Construction Items (Electrical) including, but not necessarily limited to, all connections, fittings, boxes and associated equipment needed by this and other sections of this RFP as required for a complete and usable system.

Provide firestopping for conduits, cable trays and busways that penetrate fire-rated walls, fire-rated partitions, or fire-rated floors in accordance with Section C10, Interior Construction.

**D509002 EMERGENCY LIGHTING AND POWER**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  
NOTE: An emergency generator is required for providing backup power at all Entry Control Facilities. Emergency generator design and duration of backup power supply should be discussed with Base security and facility operations personnel at the RFP Development meeting. Specify air pollution permitting requirements if applicable. Do not size the generator but rather provide loads and voltages of dedicated equipment or circuits.  
\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

Provide an emergency generator for power for the following loads and equipment at the Entry Control Facility:

Gatehouse interior and exterior lighting,  
Exterior lighting in the Access Control Zone,  
Roadway lighting within 100ft (30.3m) on both sides of the Access Control Zone,  
Canopy lighting,  
[Active Vehicle Barrier charging motors,]  
[Exterior lighting at the inspection areas(s),]  
[Roadway lighting at the Active Vehicle Barrier location(s),]  
[Traffic Control Arms,]  
[Gate Automation Systems,] [and]  
Uninterruptible power supply (UPS).

The generator must provide [12] [ ] hours of emergency power.

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: For projects in California requiring emergency diesel generators add the following.  
\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

[Diesel fuel engines greater than 50 break horsepower (bhp) must comply with the requirements of the Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition (CI) Engines (17CCR 93115) adopted by the California Air Resource Board (CARB). For additional information go to <http://www.arb.ca.gov/toxics/atcm/atcm.htm> .]

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NOTE: UPS is required for entry control facilities for critical loads only and be limited to small (15-50 kVA) stand alone units based on scope of design build facilities addressed by this RFP. Large systems, paralleling schemes, redundant systems etc. typically do not fall under the scope of the Design Build scenario. Small, individual, under desk type units are typically provided by the Government as collateral equipment and are not part of construction dollars. RFP writer must determine when and if UPS power is required and edit accordingly. When complex systems are required, this section will require extensive modifications. Coordinate this section with the emergency generator section when both are required. Delete when not applicable.  
  
Due to the power requirements and nonlinear nature of lighting, avoid placing lighting loads on the UPS. Provide limited lighting at the control consoles in the gatehouse, inspection office, and overwatch position with stand-alone emergency lights. To avoid restrike concerns, provide induction or fluorescent lighting fixtures in lieu of high intensity discharge.  
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Provide UPS for the following critical loads and equipment:

Primary communication system,  
Computer workstations,  
[Electronic Security Systems, including CCTV and duress alarms,]  
[Gate Automation System, including control consoles, workstations, gate arms, over speed, wrong-way, traffic signals, sensors, detectors, warning signals, and gate arms,]  
[Active Vehicle Barrier console and control subsystems, including all controls for active barriers, traffic signals, gate arms, and warning signals,] [and]  
[Active Vehicle Barrier activation systems for one complete operation cycle (open to close and close to open).]

UPS must provide [5] [ ] minutes of emergency power to allow emergency generator to starting and load transfer.

**D509003 GROUNDING SYSTEMS**

Provide a complete grounding system for the facility electrical and telecommunications systems.

**D509004 LIGHTNING PROTECTION**

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NOTE: RFP writer must make preliminary determination if a lightning protection system is required in accordance with UFC 3-575-01, *Lightning and Static Electricity Protection*. A "UL Lightning Protection Inspection Certificate certified to NFPA 780" is now required in lieu of a “UL Master Label” when a system is provided.   
   
Include the bracketed option(s) when additional buildings or systems will require work in order to qualify for the Certificate. Delete when not required.  
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[Design and install a complete lightning protection system in accordance with UFC 3-575-01, *Lightning and Static Electricity Protection System*, with a UL Lightning Protection Inspection Certificate certified to NFPA 780, including, but not necessarily limited to, strike termination devices, conductors, ground terminals, interconnecting conductors, surge protective devices, and other connectors and fittings required for a complete and usable system.]

[Work includes necessary modifications to the existing lightning protection system on [ ] such that the entire system meets the UL Lightning Protection Inspection Certificate certified to NFPA 780.] [Work includes installation of a complete lightning protection system on [ ] such that the entire system meets the UL Lightning Protection Inspection Certificate certified to NFPA 780.]

[Lightning Protection Systems must not void the roof warranty.]

**D509005 ELECTRIC HEATING**

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NOTE: Electric heating systems are generally sized and rated by the mechanical designers. Coordinate with mechanical and specifically point out any proposed large electric heating loads.  
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[Provide power wiring and connections as required for all electric heating systems and equipment.]

**D509006 ENERGY MANAGEMENT CONTROL SYSTEM**

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NOTE: Energy management typically is covered in detail in the mechanical sections. Coordinate with mechanical and ensure that all power requirements are accounted for.  
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[Provide power wiring and connections as required for all systems and equipment including [ ]. Coordinate connection requirements with service entrance energy monitoring equipment.]

**D509007 PHOTOVOLTAIC ENERGY SYSTEM**

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NOTE: Consider roof mounted crystalline panel Photovoltaic Energy Systems for all buildings with clearance from shading, appropriate roof orientation, and roof area availability. Roof availability must consider other roof mounted systems which could include Solar Domestic Hot Water System (SDHWS), HVAC equipment, personnel access paths, and standoffs from the roof edge. Roof availability may be less than 80 percent. Consider electrical room space for inverters, and other equipment.  
  
Verify building and roof structural capacity to support crystalline panels for existing buildings. Coordinate crystalline panel support with structural engineering for new construction. Coordinate with roofing requirements covered in Section B30 and UFC 3-110-03 Roofing.  
  
Verify that a life cycle cost analysis (LCCA) has been performed per UFC 1-200-02, by planning or otherwise perform a LCCA before design start. Perform an analysis for your project using "PVWatts" at** [**http://rredc.nrel.gov/solar/codes algs/PVWATTS/version2/**](http://rredc.nrel.gov/solar/codes%20algs/PVWATTS/version2/) **. Locally verify and apply for incentives, where applicable. Incentives may be found at** [**www.dsireusa.org**](http://www.dsireusa.org/) **. Purchased electrical utility rates may be found at** [**https://navyenergy.navfac.navy.mil/duers/index.html**](https://navyenergy.navfac.navy.mil/duers/index.html) **. EAR 16 Activity Detail Report contains the blended purchase price.   
  
Coordinate special requirements for metering with Activity and add appropriate information on existing and planned systems.  
  
Size Photovoltaic System, verify size specified will physically fit available space.  
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[Provide a roof mounted, grid connected, photovoltaic energy system including crystalline photovoltaic panels, inverters, combiner boxes, and support systems. System inverters must have an output of [480Y/277v] [208Y/120v] [240/120v] [ ] and a minimum aggregate capacity of [ ]kw.

Provide KWH meters that are compatible to [the existing base AMI system].