MS ANG CRTC Base Camera System

1. Cameras

The MS ANG CRTC physical security infrastructure requires the deployment of fifty-four (54) high-definition, government-approved cameras.

Camera Type	Quantity	Deployment & Mounting Specifications
Bullet Style	44	Fixed-mount installation on exterior building envelopes or prescribed structural infrastructure.
Pan-Tilt-Zoom (PTZ)	9	High-range exterior mounts with automated tracking capabilities for wide-area coverage.
360-Degree Dome	1	Pendant-mounted configuration to provide unobstructed, omnidirectional hemispherical coverage.

2. Mandatory System Features

2.1 Camera Selection and Government Approval

To ensure compliance with federal physical security standards and optimize resource allocation, the contractor must adhere to a strict selection, design, and approval workflow:

- **Engineering and Selection:** The contractor shall select all camera models, lens types, focal lengths, and megapixel ratings required to meet the operational goals of each zone. Equipment must adhere strictly to the Approved Equipment List (Attachment A) where applicable.
- **Performance Metrics:** All designs must achieve the specified Pixels-Per-Foot (PPF) targets defined by the operational goals in UFC 4-021-02 (e.g., Detect, Classify, Recognize, Identify).
- **Strict Resolution Tiering:** To prevent over-engineering, camera resolutions shall be tiered based on location:
    - **Installation Access Control Points (IACPs):** High-resolution sensors and narrow focal lengths must be used to achieve a minimum of 150 PPF (Identification level) at the designated capture zone.
    - **General Assessment Zones:** Lower resolution tiers shall be used to meet Detection (20 PPF) or Recognition (80 PPF) requirements as defined by the zone's operational intent.

- **Government Approval:** The contractor shall submit a comprehensive Camera Design and PPF Layout Plan to the government for review. This plan must detail the proposed camera models, locations, calculated field of view (FOV), and projected PPF. No equipment procurement or installation shall begin until the Security Forces (the Requester) and the Contracting Officer (KO) have provided formal written approval of this design layout.

2.2 Advanced PTZ & Environmental Protections

- **Automated Flight Line Tracking:** Pan-tilt-zoom cameras deployed along the Flight Line must feature an optional automated panning capability that targets, locks onto, and tracks detected movement within the restricted zone.
- **Vandal-Proof Cameras:** All deployed cameras must feature high-impact, vandal-resistant housings to ensure continuous operational durability in harsh or hostile environments.

3. Storage & Recording Architecture

The backend storage architecture is designed for high availability, fault tolerance, and optimized data retention. The system must support the initial 54-camera load with built-in headroom for future expansion.

- **System Capacity:** The Digital Video Recorder (DVR) and Video Management System (VMS) must support 54 active channels with a mandatory 10% expansion overhead (supporting up to 60 channels minimum).
- **Retention Period:** The Network Video Recorder (NVR) storage array must provide a minimum of 30 days of continuous or event-triggered video storage for all integrated cameras.
- **Frame Rate Optimization:** To balance storage consumption and forensic utility, cameras at Installation Access Control Points (IACPs) shall record at 15 frames per second (fps). Standard facility cameras shall record at 4 fps.
- **Baseline Resolution:** All cameras across the entire system must maintain a minimum resolution of 2.1 Megapixels (1080p Full HD).
- **Storage Redundancy:** The storage subsystem must utilize a Redundant Array of Independent Disks (RAID) 5 configuration, ensuring complete data preservation and uninterrupted operation in the event of a single hard-drive failure.

4. Control Station & Video Monitoring

- **Primary Control Stations:** Three (3) fully featured video monitoring stations equipped with precision PTZ joysticks and high-quality multi-feed monitors for simultaneous real-time viewing.
- **Dedicated Munitions Monitoring:** One (1) dedicated, read-only video monitoring station restricted to the Munitions Storage Area (MSA) to ensure localized oversight.
- **Intelligent Alerting:** The VMS must support real-time, rules-based motion and behavioral alerts to immediately notify control room personnel of suspicious activities in designated zones.

5. Conduit & Pathway Requirements

All physical pathways must be engineered to withstand environmental stressors, prevent physical tampering, and comply with Unified Facilities Guide Specifications (UFGS).

Pathway Type	Material & Installation Specification	UFGS Reference
Underground / Buried Runs	Schedule 40 PVC or High-Density Polyethylene (HDPE).	UFGS 26 05 41
Exposed / Exterior Runs	Galvanized Rigid Steel (GRS) or Intermediate Metal Conduit (IMC). Coastal Protection Rule: PVC-Coated GRS (e.g., Plasti-Bond) is mandatory to prevent salt-air corrosion.	UFGS 26 05 33
Ground-to-Wall Risers	Must transition from underground PVC to Schedule 80 PVC or GRS before exiting the dirt to protect against physical impact (e.g., lawnmowers, weed-whackers).	UFGS 26 05 33 / 26 05 41
Turns, Angles, & Connections	Threaded, cast-metal weatherproof conduit bodies (condulets) with neoprene rubber gaskets. Sharp 90-degree elbows are prohibited; sweeping bends only.	UFGS 26 05 33

6. Network & Cabling Infrastructure

- **Short-Range Runs (< 300 ft / 90 m):** Category 6A (Cat6A) Shielded Twisted Pair (STP) with overall foil shield (F/UTP). Cable must be Outside Plant (OSP) and wet-location rated. (Ref: UFC 3-580-01).
- **Long-Range Runs (> 300 ft / 90 m):** Single-Mode Fiber Optic Cable must be utilized for all runs exceeding standard copper distance limitations. (Ref: UFC 3-580-01).
- **Separation of Services:** CCTV and network data cables shall not share the same conduit, junction boxes, or pathways with high-voltage electrical power lines to prevent electromagnetic interference. (Ref: UFC 3-580-01 & UFC 4-021-02).
- **Power over Ethernet (PoE):** All IP cameras shall be powered directly via the Cat6A network infrastructure utilizing IEEE 802.3af/at/bt PoE standards from the network switch. (Ref: UFC 4-021-02).

7. Uninterruptible Power Supply (UPS)

To guarantee continuous, uninterrupted security operations during localized power grid failures, four (4) dedicated UPS systems must be integrated into the system architecture. See attachment C for specific requirements

Target System	Runtime Requirement
Main Server	15 to 30 Minutes
BDOC & Alternate BDOC (2 Units)	15 Minutes
Main Gate Cameras (1 Unit)	4 Hours

8. Training & Site Location

Project Location: All physical installations, testing, and training operations shall take place at the MS ANG Combat Readiness Training Center (CRTC) in Gulfport, Mississippi.

Operational Training: The contractor is required to deliver comprehensive training to designated security personnel. Training must cover live monitoring, PTZ joystick control, playback retrieval, system configuration, and basic troubleshooting of the VMS and NVR platforms.

9. Project Deliverables

The contractor must submit the following technical packages at specified milestones to ensure quality control and accurate system documentation:

- **Product Data (Pre-Installation):** Manufacturer cut sheets, technical specifications, and part numbers for all proposed cameras to verify strict compliance with the Approved Equipment List (Attachment A).
- **Configuration Matrix (Post-Installation):** A comprehensive data sheet detailing each camera's configuration, including: Camera ID, MAC address, assigned IP address, physical location, camera type, and programmed frame rate/resolution.
- **As-Built Drawings:** Updated site plans and system diagrams reflecting final physical installation locations, routing, and calibrated Field of View (FOV) for all 54 cameras, aligning with Attachment D.
- **O&M Manuals and Warranties:** Digital and hard copies of Operations and Maintenance (O&M) manuals, configuration software guides, and active manufacturer warranties for all installed hardware.

10. Attachments & References

The following documents and standards form a part of this specification to the extent referenced herein:

- **Attachment A:** Approved Equipment List (Camera Models and Specifications)
- **Attachment B:** Project References (UFC 4-021-02, UFC 3-580-01, UFGS 26 05 33, UFGS 26 05 41)
- **Attachment C:** UPS Requirements and Runtime Specifications
- **Attachment D:** Location Planning, Site Maps, and Camera Layout Details