

SECTION 01 32 36 4K PTZ STREAMING CONSTRUCTION CAMERA SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: A 4K pan-tilt-zoom (PTZ) streaming construction camera system providing remotely controllable live streaming video, automatically archived jobsite photographs of multiple project views, on-demand time-lapse videos, and an edited project-end time-lapse video for the duration of construction.
- B. Products and services furnished by the System Vendor and installed under this Section:
 - 1. 4K PTZ Streaming Construction Camera System, including camera in all-weather enclosure with defogging, communication box with cellular modem and power supply, and mounting brackets.
 - 2. Cellular data service for the duration of the camera term.
 - 3. Hosting services, including:
 - a. Live video stream viewable and remotely controllable from Internet-connected devices.
 - b. Automatic capture and cloud storage of jobsite photographs viewable from Internet-connected devices.
 - c. Unlimited on-demand, user-configurable time-lapse videos.
 - d. Edited, post-processed project-end time-lapse video.
- C. Products and work furnished and installed by the Contractor:
 - 1. 120V AC power at each camera mounting location, or a System Vendor-approved solar power kit.
 - 2. Poles, foundation systems, guy systems, wall substrates, and other structural supports required for camera mounting.
 - 3. Permits, licenses, and inspections required for installation.
- D. Related Requirements:
 - 1. Section 01 31 00 – Project Management and Coordination: Administrative requirements for coordination and project meetings.
 - 2. Section 01 32 00 – Construction Progress Documentation: Progress reports and schedules.
 - 3. Section 01 40 00 – Quality Requirements: Special inspections.
 - 4. Section 01 50 00 – Temporary Facilities and Controls: Temporary telecommunications, broadband service, and site security.
 - 5. Division 26 – Electrical: 120V AC power to camera mounting locations.
 - 6. Division 27 – Communications: Network connectivity, where a hardwired connection is elected in place of cellular service.
- E. All camera system equipment shall be covered under the Owner's and Contractor's project insurance policies for the duration of the Project.

1.2 REFERENCES

- A. NEMA 250 – Enclosures for Electrical Equipment (1000 Volts Maximum).
- B. IEC 60529 – Degrees of Protection Provided by Enclosures (IP Code).
- C. IEC 62262 – Degrees of Protection Provided by Enclosures for Electrical Equipment Against External Mechanical Impacts (IK Code).
- D. ISO/IEC 10918 – Digital Compression and Coding of Continuous-Tone Still Images (JPEG).
- E. ISO/IEC 14496-10 – Advanced Video Coding (H.264 / MPEG-4 Part 10 AVC).
- F. ISO/IEC 14496-14 – MP4 File Format.

1.3 SUBMITTALS

- A. Comply with Section 01 33 00 – Submittal Procedures for the following:
 - 1. Product Data: System Vendor shall submit manufacturer's product data for the 4K PTZ streaming construction camera system and for the associated hosting services, including sensor specifications, pan, tilt, and zoom ranges, field of view data, enclosure ratings, power requirements, and operating temperature range.
 - 2. Shop Drawings: Mounting details, bracket configuration, and power and communications connection diagrams.
 - 3. Site Plan: Architect shall provide a project site plan indicating the proposed camera mounting location and the primary views to be documented.
 - 4. Field Reports: Startup and commissioning test results confirming image quality, stream availability, PTZ control, and connectivity.
 - 5. Closeout Submittals: Operation and maintenance data, warranty documentation, and written confirmation of camera removal and shipment at Project closeout.

1.4 QUALITY ASSURANCE

- A. Overall Standards: Contractor shall maintain a quality control program covering all camera system equipment installed under this Section.
- B. System Vendor Qualifications: System Vendor shall be a firm with demonstrated experience producing, hosting, and supporting construction camera systems of the type specified, and shall furnish evidence of comparable installations upon request.
- C. Single-Source Responsibility: Camera hardware, cellular data service, and hosting services shall be furnished by a single System Vendor.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle all components in accordance with the System Vendor's written instructions.
- B. Store equipment in a dry, secure location protected from weather, impact, and construction traffic until installation.
- C. All freight charges shall be included in the Contract Price.

1.6 WARRANTY

- A. Time Period: System Vendor's lifetime warranty on camera system hardware.
- B. Conditions: System Vendor's standard published warranty terms and conditions shall apply.

1.7 CONTRACTOR'S INSTRUCTIONS

- A. Maintenance and Testing:
 - 1. Clean the camera enclosure dome as required to maintain optical clarity.

2. Power cycle the communications modem or router as required to restore connectivity.
 3. Verify that the camera field of view remains unobstructed as construction progresses, and coordinate relocation with the System Vendor when required.
- B. Project Closeout:
1. Contractor shall notify the System Vendor not less than 14 days prior to Project completion.
 2. Contractor shall remove the camera system, carefully package all components, and ship them to the destination directed by the Owner if the system was purchased, or to the System Vendor if the system was rented.
 3. All freight charges shall be included in the Contract Price.

PART 2 - PRODUCTS

2.1 SYSTEM VENDOR

- A. Basis-of-Design Vendor:
1. iBEAM Construction Cameras
5320 W Morris Hill Rd
Boise, Idaho 83706
Tel: (800) 403-0688 / (208) 344-8002
Email: sales@ibeamsystems.com
Web: www.ibeamsystems.com
- B. Substitutions: Approved equal, as determined by the Architect, in accordance with Section 01 25 00 – Substitution Procedures.

2.2 PERFORMANCE REQUIREMENTS

- A. 4K PTZ Streaming Construction Camera:
1. Type: Remotely controllable 4K live streaming pan-tilt-zoom camera.
 2. Enclosure: IP66/IP67-, NEMA 4X-, and IK10-rated aluminum casing with polycarbonate hard-coated dome and defogging.
 3. Image Sensor: 1/2" progressive scan RGB CMOS.
 4. Lens: 6.64 – 225.5 mm, providing a 60.8° horizontal and 36.5° vertical field of view at the wide setting.
 5. User Controls: Pan: 360° endless, Tilt: 0° to -90°, Zoom: 34x optical zoom. Up to 300 preset positions.
 6. Automatic Functions: Auto focus, auto white balance, automatic day/night mode, and electronic image stabilization.
 7. Infrared: Infrared sensor and infrared cut filter.
 8. Minimum Illumination: 0.2 lux color; 0.08 lux black and white.
 9. Video Compression: H.264 (MPEG-4 Part 10/AVC), at rates up to 60 frames per second.
 10. Security: Camera access restrictions with password-protected administration.
 11. Mounting: Wall mount, with pole mount adapter for poles 1.50" to 16.00" in diameter.
 12. Power: 120 VAC, 28W power consumption.
 13. Operating Temperature Range: -4°F to 131°F.

14. Physical: 10.40" x 11.00", 9.00 lbs.

B. Communications:

1. Modem: 4G LTE or 5G cellular modem with high-gain antenna, housed with the power supply in an all-weather communication box.
2. Communications Box Dimensions: 10.8 inches by 13.6 inches by 5.1 inches.
3. Network: AT&T 4G LTE cellular service, 5 GB per month [Verizon cellular service, unlimited data per month].
4. Alternate Connection: Camera shall be capable of connecting to the jobsite network where a non-cellular connection is preferred.

C. Hosting Services – Live Streaming Video and Camera Control:

1. Web-based access to the live video stream from Internet-connected devices.
2. Stream Resolution: Up to 3840 x 2160 pixels over network connection; up to 1080p HD over cellular connection.
3. Capacity: Not less than 20 simultaneous viewers.
4. Camera Control: Authorized users shall be able to remotely control camera pan, tilt, and zoom from Internet-connected devices.
5. Control Restrictions: Separate viewing and PTZ control restrictions shall be configurable by user.

D. Hosting Services – Archived Photographs:

1. Capture Frequency: Project photographs shall be captured at 10-minute [5-minute] increments from 6:00 a.m. to 6:00 p.m. [24 hours a day] [custom schedule].
2. Image Resolution: 3840 x 2160 pixels (8.3 megapixels), 16:9 widescreen aspect ratio.
3. File Format: JPEG.
4. Annotation: Each photograph shall bear a date and time stamp.
5. Multiple Views: Photographs shall be captured of multiple preset camera views as required to adequately document construction.
6. Storage: Photographs shall be uploaded to and stored on a distributed cloud server with automatic backup.
7. Web-Based Camera Console shall include:
 - a. Password-protected access.
 - b. Online photo archive with digital pan, tilt, and zoom.
 - c. Search by date and time.
 - d. Download, print, and email capability.
 - e. Embeddable most-recent-photo URL for the Owner's website.
 - f. Direct link to the live camera stream.

E. Hosting Services – Time-Lapse Videos:

1. Web-based access to unlimited on-demand time-lapse videos.
2. User shall be able to specify the date and time range, resolution, playback speed, and time stamps.
3. Available Resolutions: 4K Ultra HD, 1080p HD, and 720p HD.

4. Videos shall be downloadable in .mp4 format.
 5. Multiple Views: Time-lapse videos shall be available from multiple preset camera views.
 6. Project-End Video: System Vendor shall provide a custom-edited and post-processed 4K Ultra HD time-lapse video in .mp4 format at the end of the Project.
- F. Access Control and Compatibility:
1. Access shall be restricted to authorized users or configured for open access at the Owner's direction.
 2. Unlimited user accounts.
 3. Separate access restrictions for live video and time-lapse video.
 4. Supported Operating Systems: Windows, macOS, Android, and iOS.
 5. Supported Browsers: Chrome, Edge, Firefox, Safari, and Internet Explorer 9 or later.
- G. Ownership: The Owner shall retain all copyrights to project photographs and time-lapse videos produced under this Section.

2.3 OPTIONAL COMPONENTS

- A. Video Recording Drive: Local video recording drive. Infrared features are enabled when the video recording drive is in use; otherwise, infrared settings are disabled by default to optimize time-lapse image quality and may be adjusted by the System Vendor upon request.
- B. Solar Power Kit.
- C. Non-Penetrating Roof Mount.

2.4 COMPONENTS

- A. 4K PTZ Streaming Construction Camera: iBEAM PTZ 4K Construction Camera, or approved equal.
- B. Hosting Services: iBEAM Camera Console hosting service as developed by iBEAM Construction Cameras, or approved equal.
- C. Mounting Hardware: System Vendor's standard wall and pole mounting brackets and hardware, or approved equal, suitable for the mounting substrate and site wind loads.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that the proposed mounting location provides an unobstructed view of the Project, accounting for terrain, vegetation, adjacent structures, and anticipated construction phasing.
- B. Verify that the mounting location provides adequate coverage of the Project based on the camera's pan/tilt/zoom range and field of view.
- C. Verify that 120V AC power, or an approved solar power kit, is available at the camera mounting location before installation.
- D. Verify adequate cellular signal strength at the mounting location. Report unsatisfactory conditions to the System Vendor and do not proceed until they are corrected.

3.2 INSTALLATION

- A. Contractor shall install the construction camera system in accordance with the System Vendor's written installation instructions.

- B. Position the camera system for the optimal view of the Project, accounting for terrain, vegetation, and successive construction phases.
- C. Mount the camera on a structurally adequate wall, pole, foundation, and guy system furnished by the Contractor, capable of resisting site wind loads without vibration or deflection that would degrade image quality or PTZ positioning accuracy.
- D. Contractor shall obtain and pay for all necessary permits, licenses, and inspections.

3.3 FIELD QUALITY CONTROL

- A. Contractor shall test the camera system in accordance with the System Vendor's startup test procedures.
- B. Verify live stream availability, remote pan, tilt, and zoom control, preset view accuracy, image capture and upload, date and time stamp accuracy, and web portal access prior to Substantial Completion of the installation.
- C. Contractor shall maintain all components in good working condition for the duration of the Project.
- D. Contractor shall troubleshoot the camera system with the System Vendor's support representatives as needed.

3.4 CLEANING AND MAINTENANCE

- A. Periodically examine the camera enclosure dome to ensure optical clarity.
- B. Clean the enclosure dome in accordance with the System Vendor's written cleaning recommendations. Do not use abrasive cleaners, solvents, or pressure washing on the hard-coated polycarbonate dome.

3.5 PROTECTION

- A. Protect the installed camera system from damage by construction operations, vandalism, and theft for the duration of the Project.
- B. Promptly report damaged, inoperable, or obstructed equipment to the System Vendor.

END OF SECTION 01 32 36