SECTION 28 21 13

IP Cameras

1. GENERAL
   1. Section Includes
      1. Fixed Focal Mini Micro Dome Type IP Cameras for video surveillance.
      2. Varifocal Turret IP Cameras for video surveillance.
      3. Varifocal Value Mini Dome IP Cameras for video surveillance.
      4. Bullet Camera IP Cameras for video surveillance.
      5. Fixed Turret IP Cameras for video surveillance.
   2. Related Sections

[Specifier Notes]: Remove sections not required under project scope of work.

Sarix Value Series cameras seamlessly connect to VideoXpert, Pelco's video management system as well as other leading Video Management Systems via the ONVIF Profile S, T, and G Profiles.

* + 1. Section 28 23 11 - Video Management System Analytics.
    2. Section 28 23 13 - Video Management System Interfaces.
    3. Section 28 25 00 - Video Surveillance Positioning Equipment.
  1. Administrative Requirements
     1. Coordination:
        1. Coordinate with Owner or Owner’s representative regarding camera network configuration and estimated bandwidth utilization prior to performing network connections.
     2. Sequencing / Scheduling: Provide to Owner or Owner’s representative a schedule and list of participants required to attend coordination and progress update meetings.

[Specifier Notes] – Retain only those individuals required to be in attendance for progress meetings. Delete the entire following sub-paragraph if not required.

* + - 1. Owner representative(s) for Facilities Management, Information Technology (IT) Services, and Security Management.
      2. General Contractor.
      3. Project Manager.
      4. Manufacturer’s Representative.
      5. Project Architect.
      6. Project Engineer.
      7. Security Consultant.
  1. Informational SUBMITTALS
     1. Submit under provisions of Section 01 30 00.
     2. Product Data: Manufacturer's product information and data sheets for each product specified in this section, including:
        1. Substrate preparation instructions and recommendations
        2. Installation means and methods.
        3. Recommendations and requirements for proper storage and handling.
     3. Shop Drawings:
        1. Submit Manufacturer’s approved shop drawings detailing the section and elevation views of each product to be installed.
        2. Coordinate with locations listed on Contract Drawings.
     4. Warranty Information:
        1. Submit confirmation and details of manufacturer’s warranty, extended warranty, and replacement policies.
     5. System Support Resources:
        1. Submit a list of available manufacturers providing fee based professional services available to the Contractor or Owner, including but not limited to the following:
           1. Training.
           2. Installation.
           3. Commissioning.
           4. Remote diagnostics and integration with 3rd party software and hardware systems.
  2. Closeout SUBMITTALS
     1. Supply licensing and registration information for all software, hardware, firmware, operational, and administrative licenses.
     2. Supply network configuration backup files, restoration application and instructions.
  3. Maintenance SUBMITTALS
     1. Spare Parts: All Spare Parts must be delivered to the owner in their original sealed packaging. Clearly label with “SPARE: DO NOT REMOVE”, and include manufacturer part numbers, and date of delivery to Owner. Store all spare parts in an environment and condition recommended by the manufacturer.

[Specifier Notes] – Retain one of the next two paragraphs based upon project requirements for spare components.

* + - 1. One spare for each \_\_\_\_\_\_\_ devices.
      2. Provide spare components as noted in the coordinating schedule for work listed in this section.
  1. QUALITY ASSURANCE
     1. Qualifications - Manufacturers: Manufacturer(s) suppling products noted in this section must have a minimum of 5 years in business.
     2. Qualifications - Installers:
        1. Installer must be licensed to install video surveillance and security equipment as required by authority having jurisdiction.
        2. Installer must be capable of providing references that will attest to successful completion of projects of similar scope as the work noted in this section.
        3. Installer must be certified by the manufacturer and be up to date with all training required to maintain good standing.
     3. Mock-Ups: Provide a mock-up for evaluation of installer’s workmanship.
        1. Do not proceed with remaining Work until workmanship is approved by Architect.
        2. Refinish mock-up area as required to produce acceptable work.
  2. WARRANTY
     1. Manufacturer Warranty: Provide manufacturer’s warranty covering parts and labor costs to repair or replace part that fail to perform.
        1. Warranty Period: Parts and labor warranty for 36 months from date of Substantial Completion or date of purchase, whichever comes first.
        2. Service During Warranty: Provide direct support to Owner via phone and email, including access to training and education in the form of documents, videos and other materials via the internet.

1. PRODUCTS
   1. MANUFACTURERS

[Specifier Notes] – Retain the following Paragraph if this document is a PROPRIETARY Specification, with Pelco’s products listed as the Basis of Design. Delete if not required.

* + 1. Basis of Design Manufacturer: Pelco, Inc.
       1. Address: 625 W. Alluvial Ave., Fresno, California 93711 United States
       2. Phone: (800) 289-9100.
       3. Website: [www.pelco.com](http://www.pelco.com).

[Specifier Notes] – Retain the following Paragraph if this document is written as a PERFORMANCE specification, without listing a manufacturer as a basis of design. Insert manufacturers that sell products comparable to those specified in this section. Delete if not required.

* + 1. Manufacturer List:
       1. Manufacturer:
    2. Substitution Limitations:
       1. Submit substitution requests in accordance with provisions of Section 01 60 00.
       2. Single manufacturer will provide, from a single source, a fully integrated surveillance system consisting of network cameras and the following components:

[Specifier Notes] – From the following paragraphs, retain only those defined under the scope of work for this project.

Sarix Value Series cameras seamlessly connect to VideoXpert, Pelco's video management system as well as other leading Video Management Systems via the ONVIF Profile S, T, and G Profiles.

* + - 1. Video Management System Analytics.
      2. Video Management System Interfaces.
      3. Video Surveillance Positioning Equipment.
      4. Video Surveillance Sensors.
  1. DESIGN CRITERIA
     1. System Design:
        1. Video monitoring system must be tightly integrated using application programming interfaces and software development kits.
        2. All systems must be capable of functioning autonomously during a failure of one or more of the related sections.
        3. Cameras in this section must be capable of bi-directional communication.
        4. Video monitoring system to be interfaced through digital communication protocols including but not limited to ASCII or Hexadecimal Data Transmissions.

[Specifier Notes] – In the following four paragraphs, retain only those certifications and standards which apply to the jurisdiction in which the project resides or are otherwise applicable to Work performed in this section. Delete the entire paragraph if not required.

* + 1. System Certifications:
       1. UL and cUL certification marks for Canada/USA.
       2. CE, RoHS and Reach (SVHC) certification marks for European Union.
       3. RCM certification mark for Australia.
       4. EAC certification mark for Russia.
       5. BIS certification mark for India.
       6. KC certification mark for Korea.
       7. NOM certification mark for Mexico.
       8. UKCA certification mark for United Kingdom
    2. Safety Standards:
       1. UL/CSA/IEC/EN 62368-1.
       2. With IR: IEC/EN 62471.
    3. Electromagnetic Emissions Standards:
       1. FCC Part 15 Subpart B Class B.
       2. ICES-003 Class B.
       3. VCCI Class B.
       4. EN 55032 Class B.
       5. EN 61000-6-3.
       6. EN 61000-3-2.
       7. EN 61000-3-3.
    4. Electromagnetic Immunity Standards:
       1. EN 55024.
    5. Environmental Standards:
       1. UL/CSA/IEC 60950-22.
       2. IEC 60529 IP66 Weather Rating.
       3. Mini Dome Cameras: IEC 62262 IK10 Impact Rating.
  1. Performance requirements
     1. Standards:
        1. Video Standards: H.265 / H.264 / MJPEG / HDSM SmartCodec technology.
        2. Image Standards: MPEG-4 - ISO/IEC 14496-10 AVC (H.264).
        3. Networking Standards:
           1. IEEE 802.3af (Power over Ethernet).
           2. IEEE 802.1X (Authentication).
           3. IPv4 (RFC 791).
           4. IPv6.
        4. Interoperability Standards:
           1. ONVIF Profile S.
           2. ONVIF Profile T.
           3. ONVIF Profile G.
     2. Video Requirements:
        1. Provide cameras capable of simultaneously delivering at least three individual video streams, for use when connecting to the Video Management Software for recording and live viewing.
        2. Provide cameras with a primary stream capable of supporting the video resolution and aspect ratio and capable of generating the image framerates noted in this section.
     3. Encoding Requirements:
        1. Support compression and image quality settings from 1 to 20 to configure bandwidth utilized by the camera and desired image response. Provide user configuration of compression quality and image rate per camera.
        2. Provide independently configured simultaneous H.265, H.264 and Motion JPEG streams (multi-stream).
        3. Support Motion JPEG encoding in a selectable range from 1 up to 30 frames per second based on resolution configured.
        4. Support H.264 encoding in a selectable range from 1 up to 30 frames per second based on resolution configured.
        5. Support H.265 encoding in a selectable range from 1 up to 30 frames per second based on resolution configured.
        6. Support Variable Bit Rate (VBR) in H.264 with a configurable maximum bit rate threshold.
        7. Support Variable Bit Rate (VBR) in H.265 with a configurable maximum bit rate threshold.
        8. Provide user configuration of compression format, compression quality, maximum bit rate, key frame interval, and image rate per camera.
        9. Support G.711 PCM 8kHz audio compression.
     4. Provide cameras that allow video and audio signals to be transported over:

[Specifier Notes] – Retain only those paragraphs applicable to the requirements of this project.

* + - 1. HTTP (Unicast).
      2. HTTPS (Unicast).
      3. RTP (Unicast & Multicast).
      4. RTP over RTSP (Unicast).
      5. RTP over RTSP over HTTP (Unicast).
      6. RTP over RTSP over HTTPS (Unicast).
    1. Image Control Requirements:
       1. User Configurations Supported:
          1. Automatic and manual white balance control.
          2. Automatic and manually defined exposure zones operating in the range 1/7 to 1/8196 sec second.
          3. Flicker control (50 Hz, 60 Hz).
          4. Automatic and manual iris control.
          5. Color saturation and sharpening.
          6. Motion detection sensitivity and threshold.
          7. Digital rotation of the image when used with control center software.
    2. Network Requirements: Provide video cameras that have the following network capabilities:
       1. Supports both fixed (static) IP addresses and dynamically assigned IP addresses provided by a Dynamic Host Control Protocol (DHCP) server.
       2. Supports user configuration of network parameters including:

[Specifier Notes] – Retain only those paragraphs applicable to the requirements of this project.

* + - * 1. Fixed (static) IP address.
        2. Subnet mask.
        3. Gateway.
        4. Control port.
      1. Are automatically detected when using a Video Management Application (VMA) or Network Video Recorder (NVR) supporting this feature.
      2. Provides support for both IPv4 and IPv6 Networks.
    1. Video Motion Detection Functionality Requirements: Provide video cameras capable of detecting motion based on:
       1. Motion Detection Mask: Defined areas within the camera’s field of view for the camera to detect motion.
       2. Sensitivity: How much each pixel within the masked areas must change before it is considered in motion.
       3. Threshold: Percentage of pixels that must detect change.
    2. Event Functionality Requirements: Equip cameras with an integrated event functionality, which may be triggered by:

[Specifier Notes] – Retain only those paragraphs applicable to the products specified in this section.

* + - 1. Alarm input terminal.
      2. Video motion detection.
      3. Camera temperature outside operative range.
    1. Protocol Support Requirements: Provide video cameras that incorporate support for at least the following:

[Specifier Notes] – Retain only those paragraphs applicable to the products specified in this section.

* + - 1. IPv4.
      2. IPv6.
      3. HTTP.
      4. HTTPS.
      5. SOAP.
      6. DNS.
      7. NTP.
      8. RSTP.
      9. RTCP.
      10. RTP.
      11. TCP.
      12. UDP.
      13. IGMP.
      14. ICMP.
      15. DHCP.
      16. ARP.
      17. SNMP v2c.
      18. SNMP v3.
    1. Streaming Support Requirements: Provide video cameras that incorporate support for at least the following:

[Specifier Notes] – Retain only those paragraphs applicable to the products specified in this section.

* + - 1. RTP/UDP.
      2. RTP/UDP multicast.
      3. RTP/RTSP/TCP.
      4. RTP/RTSP/HTTP/TCP.
      5. RTP/RTSP/HTTPS/TCP.
      6. HTTP.
    1. Security Requirements: Provide video cameras with the following security requirements:
       1. Support the use of the following:

[Specifier Notes] – Retain only those paragraphs applicable to the products specified in this section.

* + - * 1. Password protection.
        2. HTTPS Encryption.
        3. Digest authentication.
        4. WS authentication.
        5. User access Log.
        6. SSL encryption.
      1. Restrict access to the built-in internet server by usernames and passwords at three different user group levels.
    1. Electrical Power: Cameras capable of being powered by the following power sources:
       1. Bullet, Varifocal Mini Dome, and Varifocal Turret: IEEE 802.3af Class 3 PoE Compliant.
       2. Fixed Turret and Fixed Focal Mini Dome: IEEE 802.3af Class 2 PoE Compliant.
    2. Installation and Maintenance Requirements: Provide video cameras with the following installation and maintenance requirements:
       1. Allow firmware updates via network.
       2. Store customer-specific settings in a non-volatile memory which cannot be lost during power cuts or soft reset.
       3. Provide Microsoft Windows based management software, allowing camera configuration, upgrade of firmware, and backup of individual camera configurations.
    3. Diagnostics:
       1. Equipped with LEDs, indicating the camera’s functional status, which may be user enabled or disabled.
       2. Monitored by functionality which automatically reinitiates processes or restarts the unit if a malfunction is detected.
    4. Connectivity:
       1. 100BASE-TX Fast Ethernet-port with RJ-45 socket, auto negotiation of network speed and transfer mode.
       2. Terminal for receiving line level analog audio from an external microphone.
       3. Terminal for providing line level analog audio for connection to an external speaker.
    5. Operational Range:
       1. Starting Temperature: -10 degrees C to +60 degrees C (14 F to 140 F).
       2. Working Temperatures:
          1. Bullet, Mini Dome, and Turret: -30 to +60 degrees C (-22 F to 140 F).
          2. Fixed Turret: -20 to +60 degrees C (-4 F to 140 F).
       3. Relative Humidity: 0–90 percent (non-condensing).

[Specifier Notes] – Retain only those products applicable to the work the specified in this section.

* 1. Fixed Focal Mini Dome Type IP Cameras
     1. 2.0 MP Infrared Environmental Mini Dome-Type Camera with 3.6mm lens.

[Specifier Notes] – Retain the following Paragraph if this document is a PROPRIETARY Specification, with Pelco’s products listed as the Basis of Design.

* + - 1. Basis of Design Product: IJV223-1ERS, by Pelco.
      2. Performance:
         1. Image Sensor: 1/2.9 inch progressive scan CMOS.
         2. Maximum Resolution:

Aspect Ratio: 16:9: 1920 x 1080.

* + - * 1. Imaging Rate: (50 Hz/60 Hz): 30 fps.
        2. Dynamic Range:

WDR On: Up to 120 dB. 100dB per IEC62676-5.

* + - * 1. Minimum Illumination:

Color: 0.07 lux.

IR On: 0.00 lux at 30 meters (98 feet).

* + - * 1. Field of View:

Horizontal angle: 16:9: 81 degrees.

* + - * 1. Vertical angle: 16:9: 44 degrees.
        2. Power Consumption:

IR On: 6.49 W.

IR Off: 3.69 W.

* + 1. 5 MP Infrared Environmental Mini Dome-Type Camera with 2.8mm lens.

[Specifier Notes] – Retain the following Paragraph if this document is a PROPRIETARY Specification, with Pelco’s products listed as the Basis of Design.

* + - 1. Basis of Design Product: IJV522-1ERS, by Pelco.
      2. Performance:
         1. Image Sensor: 1/2.7 inch progressive scan CMOS.
         2. Maximum Resolution:

Aspect Ratio: 4:3: 2560 x 1920.

* + - * 1. Imaging Rate: (50 Hz/60 Hz): 20 fps.
        2. Dynamic Range:

WDR On: 96 dB.

* + - * 1. Minimum Illumination:

Color: 0.2 lux.

IR On: 0.00 lux at 30 meters (98 feet).

* + - * 1. Field of View:

Horizontal angle: 4:3: 103 degrees.

Vertical angle: 4:3: 76 degrees.

* + - * 1. Power Consumption:

IR On: 6.49 W.

IR Off: 3.69 W.

* 1. Varifocal Turret IP Cameras
     1. 5.0 MP Infrared Environmental Turret-Type Camera with 3 - 9mm lens.

[Specifier Notes] – Retain the following Paragraph if this document is a PROPRIETARY Specification, with Pelco’s products listed as the Basis of Design.

* + - 1. Basis of Design Product: ITV529-1ERS, by Pelco.
      2. Performance:
         1. Image Sensor: 1/2.7 inch progressive scan CMOS.
         2. Maximum Resolution:

Aspect Ratio: 4:3: 2560 x 1920.

* + - * 1. Imaging Rate: (50 Hz/60 Hz): 20 fps.
        2. Dynamic Range:

WDR On: Up to 120 dB. 100dB per IEC62676-5.

* + - * 1. Minimum Illumination:

Color: 0.2 lux.

IR On: 0.00 lux at 30 meters (98 feet).

* + - * 1. Field of View:

Horizontal angle: 4:3: 30 degrees to 88 degrees.

Vertical angle: 4:3: 23 degrees to 65 degrees.

* + - * 1. Power Consumption:

IR On: 9.8 W.

IR Off: 6.29 W.

* 1. Varifocal MINI Dome IP Cameras
     1. 2.0 MP Infrared Environmental Mini Dome-Type Camera with 3 - 9mm lens.

[Specifier Notes] – Retain the following Paragraph if this document is a PROPRIETARY Specification, with Pelco’s products listed as the Basis of Design.

* + - 1. Basis of Design Product: IMV229-1ERS, by Pelco.
      2. Performance:
         1. Image Sensor: 1/2.9 inch progressive scan CMOS.
         2. Maximum Resolution:

Aspect Ratio: 16:9: 1920 x 1080.

* + - * 1. Imaging Rate: (50 Hz/60 Hz): 30 fps.
        2. Dynamic Range:

WDR On: Up to 120 dB. 100dB per IEC62676-5.

* + - * 1. Minimum Illumination:

Color: 0.07 lux.

IR On: 0.00 lux at 30 meters (98 feet).

* + - * 1. Field of View:

Horizontal angle: 16:9: 32 degrees to 93 degrees.

Vertical angle: 16:9: 18 degrees to 50 degrees.

* + - * 1. Power Consumption:

IR On: 12.95 W.

IR Off: 9.0 W.

* + 1. 5 MP Infrared Environmental Mini Dome-Type Camera with 3 - 9mm lens.

[Specifier Notes] – Retain the following Paragraph if this document is a PROPRIETARY Specification, with Pelco’s products listed as the Basis of Design.

* + - 1. Basis of Design Product: IJV522-1ERS, by Pelco.
      2. Performance:
         1. Image Sensor: 1/2.7 inch progressive scan CMOS.
         2. Maximum Resolution:

Aspect Ratio: 4:3: 2560 x 1920.

* + - * 1. Imaging Rate: (50 Hz/60 Hz): 20 fps.
        2. Dynamic Range:

WDR On: Up to 120 dB. 100dB per IEC62676-5.

* + - * 1. Minimum Illumination:

Color: 0.2 lux.

IR On: 0.00 lux at 30 meters (98 feet).

* + - * 1. Field of View:

Horizontal angle: 4:3: 30 degrees to 90 degrees.

Vertical angle: 4:3: 23 degrees to 65 degrees.

* + - * 1. Power Consumption:

IR On: 12.95 W.

IR Off: 9.0 W.

* 1. BUllet IP Cameras
     1. 2.0 MP Infrared Environmental Bullet-Type Camera with 3 - 9mm lens.

[Specifier Notes] – Retain the following Paragraph if this document is a PROPRIETARY Specification, with Pelco’s products listed as the Basis of Design.

* + - 1. Basis of Design Product: IBV229-1ER, by Pelco.
      2. Performance:
         1. Image Sensor: 1/2.9 inch progressive scan CMOS.
         2. Maximum Resolution:

Aspect Ratio: 16:9: 1920 x 1080.

* + - * 1. Imaging Rate: (50 Hz/60 Hz): 30 fps.
        2. Dynamic Range:

WDR On: Up to 120 dB. 100dB per IEC62676-5.

* + - * 1. Minimum Illumination:

Color: 0.06 lux.

IR On: 0.00 lux at 30 meters (98 feet).

* + - * 1. Field of View:

Horizontal angle: 16:9: 32 degrees to 93 degrees.

* + - * 1. Vertical angle: 16:9: 18 degrees to 50 degrees.
        2. Power Consumption:

IR On: 12.95 W.

IR Off: 9.0 W.

* + 1. 5.0 MP Infrared Environmental Bullet-Type Camera with 3 - 9mm lens.

[Specifier Notes] – Retain the following Paragraph if this document is a PROPRIETARY Specification, with Pelco’s products listed as the Basis of Design.

* + - 1. Basis of Design Product: IBV529-1ERS, by Pelco.
      2. Performance:
         1. Image Sensor: 1/2.7 inch progressive scan CMOS.
         2. Maximum Resolution:

Aspect Ratio: 4:3: 2560 x 1920.

* + - * 1. Imaging Rate: (50 Hz/60 Hz): 20 fps.
        2. Dynamic Range:

WDR On: Up to 120 dB. 100dB per IEC62676-5.

* + - * 1. Minimum Illumination:

Color: 0.2 lux.

IR On: 0.00 lux at 30 meters (98 feet).

* + - * 1. Field of View:

Horizontal angle: 4:3: 30 degrees to 88 degrees.

Vertical angle: 4:3: 23 degrees to 65 degrees.

* + - * 1. Power Consumption:

IR On: 12.95 W.

IR Off: 9.0 W.

* 1. Fixed Turret IP CameraS
     1. 2.0 MP Infrared Environmental Fixed Turret-Type Camera with 2.8mm lens.

[Specifier Notes] – Retain the following Paragraph if this document is a PROPRIETARY Specification, with Pelco’s products listed as the Basis of Design.

* + - 1. Basis of Design Product: IFV222-1ERs, by Pelco.
      2. Performance:
         1. Image Sensor: 1/2.9 inch progressive scan CMOS.
         2. Maximum Resolution:

Aspect Ratio: 16:9: 1920 x 1080.

* + - * 1. Imaging Rate: (50 Hz/60 Hz): 30 fps.
        2. Dynamic Range:

WDR On: Up to 120 dB. 100dB per IEC62676-5.

* + - * 1. Minimum Illumination:

Color: 0.07 lux.

IR On: 0.00 lux at 30 meters (98 feet).

* + - * 1. Field of View:

Horizontal angle: 16:9: 109 degrees.

Vertical angle: 16:9: 59 degrees.

* + - * 1. Power Consumption:

IR On: 6.0 W.

IR Off: 3.31 W.

* + 1. 5.0 MP Infrared Environmental Fixed Turret-Type Camera with 3.6mm lens.

[Specifier Notes] – Retain the following Paragraph if this document is a PROPRIETARY Specification, with Pelco’s products listed as the Basis of Design.

* + - 1. Basis of Design Product: IFV523-1ERS, by Pelco.
      2. Performance:
         1. Image Sensor: 1/2.7 inch progressive scan CMOS.
         2. Maximum Resolution:

Aspect Ratio: 4:3: 2560 x 1920.

* + - * 1. Imaging Rate: (50 Hz/60 Hz): 20 fps.
        2. Dynamic Range:

WDR On: Up to 120 dB. 100dB per IEC62676-5.

* + - * 1. Minimum Illumination:

Color: 0.2 lux.

IR On: 0.00 lux at 30 meters (98 feet).

* + - * 1. Field of View:

Horizontal angle: 4:3: 76 degrees.

Vertical angle: 4:3: 59 degrees.

* + - * 1. Power Consumption:

IR On: 6.0 W.

IR Off: 3.31 W.

* 1. Accessories:
     1. Brackets and Mounts:
        1. IJTFV-PA: Pendant mounting adapter for turret, fixed turret, and fixed focal mini dome cameras.
        2. IMV-PA: Pendant mounting adapter for varifocal mini dome cameras.
        3. SRXV-CM: Corner mount for turret, fixed turret, bullet, and mini dome cameras.
        4. SRXV-PCF: Pendant ceiling flange for turret, fixed turret, and mini dome cameras.
        5. SRXV-PLM: Pole mount for turret, fixed turret, bullet, and mini dome cameras
        6. SRXV-PP: Pendant extension pipe for turret, fixed turret, and mini dome cameras.
        7. SRXV-WMP: Pendant wall mount for turret, fixed turret, and mini dome cameras.
        8. SRXV-WMS: L-Shaped wall mount for turret, fixed turret, and mini dome cameras.
     2. Other:
        1. IBV-A4S: Electrical box adapter plate for bullet cameras.
        2. IFBV-JB: Outdoor junction box for fixed turret and bullet cameras.
        3. IJTV-AP: Electrical box adapter plate for fixed focal mini dome cameras.
        4. IMJTV-JB: Environmental conduit box for turret, and mini dome cameras.
        5. IMV-AP: Electrical box adapter plate for varifocal mini dome cameras.
        6. IMV-WMJB: Wall arm junction box for turret, fixed turret, and mini dome cameras.

1. EXECUTION
   1. EXAMINATION
      1. Verification of Conditions: Do not begin installation until substrates have been properly prepared.
      2. Evaluation and Assessment: If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
   2. PREPARATION
      1. Surface Preparation: Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
   3. INSTALLATION
      1. Install all products in this section following the product manufacturer’s published installation and application manuals and guidelines.
   4. System Startup
      1. Test equipment and configure system in accordance with instructions provided by the manufacturer prior to installation.
      2. Review configurable features of the device with the Owner’s Representative and establish a punch list for standard, device specific, location specific and VMA/NVR specific configuration of device(s).
         1. Program and configure devices in accordance with this punch list so no additional programming is required for operation by the user.
      3. Configure equipment requiring users to log on using a password with user/site-specific credentials. Default passwords are not acceptable and must be configured prior to project closeout.
      4. Provide products with the latest and most up-to-date firmware by the manufacturer or provide firmware of a version specified by the provider of the Video Management Application (VMA) or Network Video Recorder (NVR).
   5. Adjusting
      1. Fine Tuning: Perform field software changes after initial programming session to “fine tune” operating parameters and sequence of operations based on any revisions to Owner’s operating requirements.
   6. Closeout
      1. Demonstration:
         1. Demonstrate administration and operation of devices described by this section.
         2. Demonstrate how to authorize users and applications to operate and configure installed devices.
         3. Demonstrate how an authorized user can gain access to and make changes to configuration.
         4. Demonstrate how to operate functionality configured for this project as defined by configuration punch list.
      2. License Assignment:
         1. Register software, hardware, firmware, operational or administrative licenses necessary for to operate or administer devices to Owner.
         2. Deliver to Owner’s Representative proof of license registration from product manufacturer.
      3. Device Configuration Backup:
         1. Using manufacturer’s backup software tool or VMA/NVR, perform a full system back-up at completion of initial programming.
         2. Deliver configuration backup files, restoration application and instructions detailing for restoration of back-up configuration.

END OF SECTION