SECTION 28 23 00
VIDEO SURVEILLANCE SYSTEM

DISCLAIMER FOR VIDEO SURVEILLANCE SPECIFICATIONS

The following is a recommended form of disclaimer with respect to the illustrative specifications for the Video System Surveillance System using the Canon NVS camera systems. The disclaimer presumes that the technical details in each of the illustrations, as set forth under Section 2.02 System Specifications, have been reviewed and confirmed by Canon as meeting the technical specifications for each of the relative product models as of the date hereof. Further, it is recommended that the examples to be delivered include an embedded "watermark" or other reference on each page indicating that they are "For Illustration Only".

DISCLAIMER: These "Section 28 23 00 Video Surveillance System" specifications (the "Form Specifications") are general in nature and solely for illustration. The Form Specifications are not intended for any specific application or use and project specific considerations must be taken into account in the architect's or engineer's preparation of actual system specifications. Canon makes no representation or warranty with respect to these Form Specifications and nothing contained herein shall create, or be inferred to create, any express or implied warranty by Canon. These Form Specifications are intended solely to for the purpose of reflecting general guidelines for video surveillance system specifications, taking into account the features of the Canon model VB-S800D in production as of the date hereof, as set forth under Sections 2.02 B through 2.02 P herein. Canon reserves the right to change the features or specifications of the aforementioned model at any time, without notice. The architect or engineer preparing the actual video surveillance specifications should therefore refer to and confirm specifications for such model as of the date of use. Canon makes nor representation or warranty about fitness of purpose of the above referenced model for any intended application, which determination shall be the sole responsibility of others. Canon assumes no liability with respect to, arising from, or arising out of the Form Specifications or any use thereof.

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Camera Assembly (camera, lens, housing, mount, etc.)

B. Contractor's Responsibility

The Contractor shall provide and pay for all labor, materials, equipment, tools, utilities, construction equipment and machinery, transportation and other facilities and services necessary for the proper execution, operation and completion of the Work.

C. Specification Language

Specifications and notes are written in imperative and abbreviated form. Imperative language of the technical specifications is directed at the Contractor, unless specifically noted otherwise. Incomplete sentences shall be completed by inserting "shall", "shall be", "the Contractor shall", and similar mandatory phrases by inference. The words "shall be" shall be supplied by inference where a colon (:) is used within product specifications.

D. Drawings And Specifications

1. Contractor shall be provided three (3) sets of the Drawings and Specifications for his use. Additional sets, if requested by Contractor, shall be furnished to the Contractor for the actual cost of reproduction.
2. Contractor shall carefully study the Drawings and Specifications, and shall at once report any error, unforeseen circumstances, inconsistency or omission he may discover.

3. The OWNER Project Manager shall be the interpreter of the requirements of the Drawings and Specifications, subject to the final approval of OWNER. All interpretations and opinions of the Security Consultant shall be made in writing or in the form of drawings.

E. Intent And Correlation

1. The intent of the Project Drawings and Specifications is to include all items necessary for the proper execution and completion of the Work.
2. The Project Drawings and Specifications are complementary, and what is required by any one shall be as binding as if required by both.

1.02 REFERENCES

A. NFPA 70 – Current version.

B. NFPA 731 – Security System Installation.

C. IEEE Standards on Networks.

D. All power supplies shall be UL listed and have a UL label on them.

1.03 DEFINITIONS

A. Words that are in common use are used throughout the Drawings and Specifications, except:

Words which have well-known technical or trade meanings are used in accordance with such recognized meanings.

B. Whenever the following listed words and phrases are used, they shall be mutually understood to have the following respective meanings:

1. The words “as indicated.” means: as shown on the Drawings, and in accordance with the Specifications.
2. The words “as required.” means: as required to provide a complete and satisfactory Work in full conformance with the Drawings and Specifications.
3. The word “New” means: new Work to be provided by Contractor.
4. The word “Provide” means: furnish, install, connect, test and make ready for use.
5. The words “Relocate Existing” means: remove existing item from present location. Reinstall, re-connect, and test existing item and make ready for use at new location as shown on the Drawings.
6. The words “Remove Existing” means: remove existing item and return item to OWNER.
7. The word “Replace” means: remove existing item and return item to OWNER. Provide new item as indicated.
8. The word “Work”: The Work is the completed construction required by the Drawings and Specifications, and includes all labor necessary to produce such construction, and all materials and equipment incorporated or to be incorporated in such construction.
9. The word “Furnish” means: supply item as specified. Item to be installed by others.

1.04 SYSTEM DESCRIPTION

A. General Description

The video surveillance system shall consist of only four types of cameras—existing analog fixed positioned domed cameras, existing analog domed PTZ cameras, new IP fixed position domed cameras with varifocal lenses with views as shown on the drawings, and new IP PTZ domed

cameras. Existing analog cameras shall use their existing coaxial cables which home run to the security control room on the second level. The analog camera viewing the parking ramp in the basement shall continue to loop through the analog monitor in the Cashier's Office. Where analog cameras are being replaced with IP cameras, the IP cameras shall use the existing coaxial cables via IP over Coax media converters at both ends of the coaxial cables. Up to four IP cameras may share a single coaxial cable. IP cameras remote from the converters shall use CAT-5e or better for interconnection. Signals from analog cameras shall be converted to digital via encoders..The encoders shall also include an RS-485 connector for controlling PTZ cameras. IP signals from all cameras shall be connected to a patch panels in the security control room, then connected to network switches, then connected to the video servers in the MDF room via optical cables. The network shall support three hard workstations--two in the security control center and one at the security desk in the main lobby near the Fourth Avenue entrance.

1.05 CONTRACTOR DESIGN REQUIREMENTS

A. The Project Drawings represent the level of system design to be provided by OWNER. Contractor shall provide all additional system design work required, including:

1. Conduit layout and sizing.
2. Wire and cable layout and sizing.
3. Point-to-point wiring and equipment hook-up information.
4. Equipment mounting details.
5. Design of equipment cabinets.
6. Other detailed design work required.

B. Contractor’s design shall conform to all applicable codes and ordinances. All electrical design, including the sizing and placement of conduit, raceways and conductors, shall be in accordance with the current version of NFPA 70: National Electrical Code, unless local codes establish more stringent requirements.

C. Contractor’s design work is subject to review and approval by OWNER’s Project Manager.

D. Miscellaneous

1. The addition of all wire, cable, conduit, connectors and junction boxes required for system operation.
2. Complete “as-built” documentation of all security systems, including documentation of existing equipment, wiring, conduits, and raceways.

1.06 SUBMITTALS

A. Product Data

Product Data submittal shall only be required if the Contractor requests a substitution or a particular brand product is not specified or recommended.

B. Procedures

1. Provide submittals to OWNER’s Project Manager.
2. Submit two (2) copies of each submittal.

C. Shop Drawings

1. General Shop Drawings for the project as described elsewhere.
2. Provide other Shop Drawings only if specifically requested by OWNER’s Project Manager.

D. Manufacturers Installation And Programming Instructions

Provide Manufacturers Installation and Programming Instructions as requested in the various Specification Sections.

E. Project Record Drawings

1. Definition: Project Record Drawings are drawings that completely record and document all aspects and features of the Work. (Also known as “as-built” drawings.)
2. The purpose of Project Record Drawings is to provide factual information regarding all aspects of the Work, to enable future service, modifications, and additions to the Work.
3. Project Record Drawings are an important element of this Work. Contractor shall accurately maintain Project Record Drawings throughout the course of this project. Project Record Drawings shall include documentation of all Work, including the documentation of existing equipment, wiring, conduits, and raceways that are to be reused in the Work.
4. OWNER Project Manager shall furnish Contractor with two (2) sets of site plans for Contractor’s use in preparing Project Record Drawings. One set shall be used as a working set, the other shall be used to prepare the final record set.
5. Contractor shall maintain the working set of Project Record Drawings at the project site throughout the course of the Work. The working set shall be updated on a daily basis as the Work progresses.
6. Project Record Drawings shall accurately show the physical placement of the following:
   a. Equipment and devices.
   b. Conduit, wiring and raceways.
   c. Junction, splice and pull box locations.
   d. Interfaces to external equipment.
   e. Connections to power, networks and other communications circuits.
7. Project Record Drawings shall show the physical placement of each device and conduit or aerial centerline, to be accurate to within one foot (1') of the nearest landmark. Where the site plan furnished by Puyallup School District conflicts with actual conditions, Contractor shall amend site plan as required. Indicate exact description of conduit runs (above ground, two-foot trench, along outside wall of building, etc.).
8. Project Record Drawings shall show wire and cable runs, zone numbers, tamper circuit configuration, panel/circuit breaker numbers from which equipment is powered, and splice points. This information shall be shown on the floor and site plans.
9. Project Record Drawings shall be available for inspection by OWNER Project Manager on a daily basis. Incomplete or inaccurate Project Record Drawings may be cause for delay of Contractor’s payment.
10. Upon completion of Work, and prior to Final Acceptance, Contractor shall prepare and submit to OWNER Project Manager a final record set of Project Record Drawings. This set shall consist of all data transferred from the working set, supplemented by Riser Diagrams and other information. The final record set of Project Record Drawings shall be drafted by a skilled draftsperson, under the supervision of Contractor. All final Project Record Drawings shall be provided to OWNER.

F. System Documentation

1. Definition: System Documentation is a complete collection of all installation, programming, operation, and maintenance manuals and work sheets relating to the equipment provided as part of the Work.
2. Contractor shall maintain a file of System Documentation at the project site throughout the course of the Work. Such file shall be updated with new information as equipment is

received and installed. System Documentation shall be available for inspection by OWNER Project Manager on a daily basis.

3. Upon completion of Work, and prior to final Acceptance, Contractor shall prepare and submit to OWNER Project Manager two (2) sets of System Documentation.

G. Closeout Submittals

1. Provide a set of as -built drawings and manuals to the OWNER Project Manager
   a. As-Built Drawings
   b. Mounting Details
   c. Product Data
   d. Installation Manuals
   e. Operating Manuals
   f. Maintenance/Service Manuals with scheduled times for service/maintenance.
2. Provide the OWNER Project Manager- with all programming sheets, keys to the equipment cabinets, as-built drawings, operating manuals, maintenance/repair manuals, spare fuses, all programming sheets and keys to the equipment cabinets, tools for tamper-resistant enclosures and tools for manual resetting devices.

1.07 QUALITY ASSURANCE

A. Qualifications

1. Qualifications of Contractor
   a. Contractor shall be an installation and service contractor regularly engaged in the sale, installation, maintenance and service of video surveillance systems.
   b. Contractor shall have five (5) years experience with the installation, start-up and programming of systems of a similar size and complexity to the one proposed.
   c. Contractor shall be a factory authorized dealer of the system proposed for at least two (2) years.
   d. Contractor shall submit the names and phone numbers of customers for at least three (3) other projects of similar size and complexity using similar technologies.
2. Supervision of Work
   a. Contractor shall employ a competent Foreman to be in responsible charge of the Work. Foreman shall be on the project site daily during the execution of the Work.
   b. Contractor's Foreman shall be a regular employee, principle, or officer of Contractor, who is thoroughly experienced in projects of a similar size and type. Contractor shall not use contract employees or Subcontractors as Foremen.
3. Qualifications of Technicians
   a. All electronic systems Work shall be performed by electronic technicians thoroughly trained in the installation and service of specialty low-voltage electronic systems.
   b. Journeyman Wireman electrical workers may be used to install conduit, raceways, wiring, and the like, provided that final termination, hook-up, programming, and testing is performed by a qualified electronic technician, and that all such Work is supervised by the Contractor's Foreman.
   c. All incidental Work, such as cutting and patching, lock hardware installation, painting, carpentry, and the like, shall be accomplished by skilled craftspersons regularly engaged in such type of work. All such Work shall comply with the highest standards applicable to that respective industry or craft.
   d. All 120 VAC power wiring and connections are to be performed by a qualified Journeyman Wireman, licensed to perform such Work in the local of OWNER.
4. Qualifications of Subcontractors

a. Definition: A Subcontractor is a person or entity who has a direct contract with the Contractor to perform any of the Work at the site.

b. Use of any Subcontractor is subject to the approval of OWNER. The Contractor shall identify all Subcontractors on the Bid Form. The Contractor shall make no substitution for any Subcontractor previously selected without approval from OWNER.

c. Contractor's Foreman shall be on the project site daily during all periods when Subcontractors are performing any of the Work. Contractor's Foreman shall be in responsible charge of all Work, including any Work being performed by Subcontractors.

d. By an appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by the terms of the Drawings and Specifications, and to assume toward the Contractor all the obligations and responsibilities which the Contractor, by these documents, assumes toward OWNER.

B. Supervision And Construction Procedures

1. The Contractor shall supervise and direct the Work, using his best skill and attention. Contractor is solely responsible for all construction means, methods, and techniques.
2. The Contractor shall employ a competent foreman who shall be in attendance at the project site during the progress of the Work. The foreman shall represent the Contractor and all communications given to the foreman shall be as binding as if given to the Contractor.

C. Regulatory Requirements

1. All Work is to conform to all building, fire, and electrical codes and ordinances applicable in the OWNER. In case of conflict between the Drawings/Specifications and codes, the codes shall govern. Notify OWNER Project Manager of any such conflicts.
2. Contractor shall secure and pay for all licenses, permits, plan reviews, engineering certifications, and inspections required by regulatory agencies. Contractor shall prepare, at Contractor's expense, any documents, including drawings, that may be required by regulatory agencies.

D. Permits

The Contractor shall make application for and obtain any and all permits required by federal, state, county, city, or other authority having jurisdiction over the work.

E. Certifications

The system shall use U.L. Listed power supplies and lightning protection.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Delivery To Job Site

Contractor shall have total responsibility for safe and secure delivery of security equipment and tools to the job site. Arrange deliveries of Products in accord with construction schedules to avoid conflict.

B. Storage And Protection

OWNER is not responsible for the care, storage or security of any of the Contractor's tools or equipment.

1.08 PROJECT/SITE CONDITIONS

A. Environmental Conditions

1. Facilities
   a. Power: Electrical power will be supplied by OWNER to the extent that the usage is compatible with available facilities in the vicinity of the work.
   b. Telephone: Contractor may use a telephone designated by OWNER for local and toll-free calls. The costs of long distance calls are the responsibility of the Contractor and shall not be charged to OWNER.
   c. Rest room Facilities: Contractor may use existing Rest room facilities designated by OWNER.
   d. Parking: OWNER reserves the right to limit or restrict Contractor parking based upon the daily requirements of the other contractors on site.
   e. Dust Control: Make provisions to control all dust, dirt, and foreign material caused by the performance of the Work.
   f. Use of explosive type fastening equipment is prohibited.
   g. Notify OWNER immediately of any damage or possible damage to any other equipment.
2. Clean-Up
   a. Contractor shall clean up, on a daily basis as the Work progresses, all dirt, dust and debris caused by Contractor's operations. Clean up shall be completed by the end of each workday to the satisfaction of OWNER's on-site representative.
   b. In the event that Contractor fails to clean up, OWNER may elect to have clean up performed by others, with the costs of such clean-up being charged to the Contractor.
3. Construction Aids
   a. Definition: Construction Aids are facilities and equipment required by personnel to facilitate the execution of the Work. Construction Aids include scaffolds, staging, ladders, platforms, hoists, cranes, lifts, trenchers, core drillers, protective equipment, and other such facilities and equipment.
   b. Contractor shall provide all Construction Aids required in the execution of the Work. Construction Aids that are the property of OWNER or other contractors shall not be used without permission.
   c. Storage of Construction Aids shall be coordinated with OWNER's on-site representative.
4. Safety
   a. The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work.
   b. Contractor shall comply with all local, state, and federal regulations and laws for the safety of the work place.
5. Accident Reports
   Serious or fatal accidents shall be reported immediately by telephone or radio to the OWNER's Project Manager.

B. Existing Conditions

Existing Wiring, Conduits, and Raceways

1. OWNER does not warrant the condition of any portion of the existing wiring, conduit or raceway systems. Prior to submitting his proposal, Contractor shall examine all existing conditions and determine to what extent the existing wiring, conduit, and raceway systems may be reused.

2. Contractor's proposal price shall include the cost of replacing existing wiring, conduit, and raceways as required.

1.09 SEQUENCING

A. Description

This implementation plan describes the general approach that shall be followed in order to minimize the time for the access control systems to be operational.

B. Approach

Contractor shall plan and schedule all work in such a sequence as to minimize the time before the system is operational. The following is a suggested work sequence:

1. Order all equipment needed and notify any subcontractors to schedule their participation.
2. Perform all system layout work.
3. Insure there are an adequate number of power receptacles available to operate all security equipment and coordinate with OWNER as to where power is available.
4. Provide shop drawings to verify location of all equipment, conduit runs, power connections, etc. Submit shop drawings to OWNER Project Manager.
5. Coordinate with OWNER to provide space for the placement of all monitoring, control and recording equipment.
6. Prepare and pre-test all equipment to the greatest extent possible.
7. Install all equipment.
8. Test and inspect all systems.
9. Perform all other Work as required.
10. Provide as-built drawings.
11. Perform the Acceptance Test.
12. Provide training.

1.10 SCHEDULING

The Contractor, within five (5) days after being awarded the contract, shall prepare and submit for OWNER's information, an estimated progress schedule for the Work. The progress schedule shall be related to the entire project, and shall indicate start and completion dates.

1.11 WARRANTY

A. Contractor warrants that all Work furnished (material and labor) under this Contract will be of good quality, free from faults and defects, and in conformance with the Project Drawings and Specifications.

B. Contractor shall provide parts and labor guarantee on all Work. Unless otherwise specified herein, Contractor's guarantee shall be for a period of one (1) year from date of Acceptance, except where any specific guarantees from a supplier or equipment manufacturer extends for a longer time.

C. Contractor's guarantee shall cover all costs associated with troubleshooting, repair, and replacement of defective Work, including costs of labor, transportation, lodging, materials, and equipment.

D. Guarantee shall not cover any damage to material or equipment caused by accident, misuse, unauthorized modification or repair by OWNER, or acts of god.

E. Contractor shall promptly respond to OWNER's requests for service during the guarantee period. Contractor shall provide repair service as soon as reasonably possible upon request from OWNER, but in no case shall service response exceed 8 hours from time of request.

1.12 SYSTEM STARTUP

Power shall only be applied to the system after re-checking for proper grounding of the system and measuring all loops for lack of shorts, grounds, and open circuits.

1.13 OWNER'S INSTRUCTIONS

A. Coordination With OWNER
   1. Contractor shall closely schedule and coordinate his activities with designated OWNER representatives.
   2. Contractor shall provide OWNER's Project Manager with a work plan on a weekly basis. Such work plan will describe locations of intended activities, types of activities, and potential conflicts to facility operations.

B. Coordination With Manufacturer
   1. Contractor shall perform Work in accordance with manufacturer's instructions. Do no omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.
   2. Contractor shall maintain one set of complete instructions at the job site during installation and until completion.

1.14 COMMISSIONING

A. After all Work is completed, and prior to requesting the Acceptance Testing & Inspection, Contractor shall conduct a final inspection, and pre-test all equipment and system features. Contractor shall correct any deficiencies discovered as the result of the inspection and pre-test.

B. Contractor shall submit a request for the Acceptance Test & Inspection in writing to the OWNER Project Manager, no less than fourteen days prior to the requested test date. The request for Acceptance test shall be accompanied by a certification from Contractor that all Work is complete and has been pre-tested, and that all corrections have been made.

C. During Acceptance Test & Inspection, Contractor shall demonstrate all equipment and system features to OWNER. Contractor shall remove covers, open wiring connections, operate equipment, and perform other reasonable work as requested by OWNER.

D. Any portions of the Work found to be deficient or not in compliance with the Project Drawing and Specifications will be rejected. OWNER Project Manager will prepare a list of any such deficiencies observed during the Acceptance Test & Inspection. Contractor shall promptly correct all deficiencies. Upon correction of deficiencies, Contractor shall submit a request in writing to OWNER Project Manager for another Acceptance Test & Inspection.

E. If, at the conclusion of the Acceptance Test & Inspection, all Work is found to be acceptable and in compliance with the Project Drawings and Specifications, OWNER Project Manager will issue a letter of Acceptance to Contractor and OWNER.

PART 2 PRODUCTS

2.01 GENERAL

A. Contractor Responsibility

1. All products not provided by OWNER shall be new and unused, and shall be of manufacturer's current and standard production.
2. Where two or more equipment items of the same kind are provided, all shall be identical and provided by the same manufacturer.
3. Drawings and Specifications indicate major system components, and may not show every component, connector, module, or accessory that may be required to support the operation specified. Contractor shall provide all components needed for complete and satisfactory operation.

B. Product Availability

1. Contractor, prior to submitting a proposal, shall determine product availability and delivery time, and shall include such considerations into his proposed Contract Time.
2. Certain products specified may only be available through factory-authorized dealers and distributors. Contractor shall verify his ability to procure the products specified prior to submitting a proposal.

C. Wire And Cable

3. General: Provide all wire and cable required to install all systems and components. Wire and cable shall be sized to provide minimum voltage drop and minimum resistance to the devices being supplied.
4. All cables shall be specifically designed for their intended use (direct burial, aerial, etc.).
5. Comply with equipment manufacturers' recommendations for wire and cable.
6. Color codes shall be consistent in cables used for the same purpose.
7. Comply with all applicable codes and ordinances.

D. Conduit And Raceway Systems

1. General: OWNER shall approve The placing of surface mounted conduit on the exterior of any building prior to its installation.
2. Interior Conduit:
   a. Electrical Metallic Tubing (EMT)
   b. Flexible Metal Conduit
   c. Provide fittings and connectors as required for installation of EMT or flexible conduit.
3. Surface Raceways:
   a. Sheet metal channel with fitted cover, suitable for use as surface metal raceway, WIREMOLD or approved equal.
   b. Provide fittings, elbows, connectors and covers designed for use with each raceway system.
4. Exterior Conduit: (any of the following as determined by local code requirements):
   a. Rigid Steel Conduit
   b. Rigid Aluminum Conduit
   c. Rigid Nonmetallic Conduit (only if buried 18" below ground surface).
   d. Intermediate Metal Conduit
   e. Provide rain-tight fittings and connectors as required for installation of exterior conduit.
5. Exterior Flexible Conduit:
   a. Liquidtight Flexible Conduit: Flexible metal conduit with PVC jacket.

b. Provide rain-tight fittings and connectors as required for installation of Liquidtight Flexible Conduit.

F. Junctions And Pull Boxes

1. Interior Boxes: Sheet Metal Outlet Boxes: Sizes to be determined in accordance with code requirements for conductor fill. No box shall be smaller than a single gang 1-1/2 deep. Provide box covers.
2. Exterior Boxes: All exterior boxes shall NEMA 4 or NEMA 3R, watertight and dust-tight
3. All interior and exterior boxes shall have their covers fastened using security screws.

F. Lightning Protection

1. The Contractor shall provide adequate lightning protection for all cameras.
2. All lightning protection equipment shall be UL listed.

G. Surge Protection

The Contractor shall provide suitable surge protection for all cameras.

2.02 CAMERA REQUIREMENTS

A. Image Sensor – 1/3 type CMOS (primary color filter)

B. Number of Effective Pixels - Approximately 1.3 million pixels

C. Scanning Method - Progressive

D. Lens – Fixed Focal Length lens (4x digital zoom)

E. Focal Length – 2.7mm

F. F-number - F1.6

G. Viewing Angle - Horizontal: 95°; Vertical: 60°

H. Day/Night Switch - Auto/Manual

I. Min. Subject Illumination

1. Day Mode (color):
   0.45 lux (F1.6, shutter speed 1/30 sec., when smart shade control is off, 50IRE)
   0.03 lux (F1.6, shutter speed 1/2 sec., when smart shade control is off, 50IRE)
   0.01 lux (F1.6, shutter speed 1/2 sec., when smart shade control is on, 50IRE)
2. Night Mode (monochrome):
   0.25 lux (F1.6, shutter speed 1/30 sec., when smart shade control is off, 50IRE)
   0.02 lux (F1.6, shutter speed 1/2 sec., when smart shade control is off, 50IRE)
   0.007 lux (F1.6, shutter speed 1/2 sec., when smart shade control is on, 50IRE)

J. Focus - Auto/One-shot AF/Manual/Fixed at infinity

K. Shooting Distance (from front of lens)

0.5m (1.6 ft.) – infinity (W)

L. Shutter Speed - 1, ½, ¼, 1/8, 1/15, 1/30, 1/60, 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000, 1/10000, 1/16000 sec.

M. Exposure - Auto/Auto (Flickerless)/Auto (Shutter-priority AE)/Manual (Shutter Speed, Gain)

N. White Balance - Auto/Light Source (Daylight Fluorescent/White Fluorescent/Warm Fluorescent/Mercury Lamp/Sodium Lamp/Halogen Lamp)/Manual (One-shot WB / R Gain/ B Gain)

O. Metering Mode - Center-Weighted/Average/Spot

P. Exposure Compensation - 9 levels

Q. Smart Shade Control – Auto (3 Levels)/ Manual (7 Levels) / Disable

R. AGC Limit - 5 levels

S. Pan Angle Range - 350° (±175°)

T. Tilt Angle Range - 90° (ceiling-mounted position: -90° – +0°)

U. Rotation Range- 180° (±90°)

2.03 CAMERA SERVER REQUIREMENTS

A. Video Compression Method JPEG, H.264

B. Video Size JPEG, H.264: 1280x720, 640x360, 320x180
1280x960, 640x480, 320x240

C. Video Quality JPEG, H.264: 5 levels

D. Frame Rate JPEG: 0.1 – 30 fps; H.264: 1/2/3/5/6/10/15/30 fps

E. Max. Frame Rate 1280x960: 30 fps

F. I-Frame Interval 0.5/1/1.5/2/3/4/5 sec.

G. Simultaneous Client Access Max. 30 Clients + 1 Admin Client – H.264: Max. 10 Clients

H. Camera Control Administrator, Authorized user, Guest user. Max. 50 user names and passwords registered for authorized users.

I. Access Control User authority (user name and password), Host Access Restrictions (IPv4, IPv6)

J. Encrypted Communications SSL/TLS, IPsec (Auto Key Exchange/Manual)

K. IEEE 802.1x – EAP-MD5, EAP-TLS, EAP-TTLS, EAP-PEAP

L. Protocol IPv4: TCP/IP, UDP, HTTP, FTP, SNMP (MIB2), SMTP (Client), DHCP (Client), DNS (Client), ARP, ICMP, POP3, NTP, SMTP authentication, RTSP, WV-HTTP (Canon proprietary), ONVIF IPv6: TCP/IP, UDP, HTTP, FTP, SMTP (Client), DHCPv6 (Client), DNS (Client), ICMPv6, POP3, NTP, SMTP authentication, RTSP, WV-HTTP (Canon proprietary), ONVIF

M. AutoIP: Available

N. Audio Compression Method G.711 μ-law (64 kbps)

O. Audio Communication Method – Sound Transfer Protocol by Canon

P. Privacy Mask Number of registration: Max. 8 places, Number of mask colors: 1 (select from 9 colors)

Q. View Restriction Available

R. Preset Max. 20 positions (Preset Tour capable)

S. Intelligent Function

1. Video:
   a. Detection Types: moving object detection, abandoned object detection, removed object detection, camera tampering detection, and passing detection
   b. Detection Settings: Max. 15
2. Volume: Volume Detection

T. Event Trigger Type External Device Input, Intelligent Function (Video), Intelligent Function (Volume)

U. Image Upload FTP/HTTP/SMTP (e-mail)

V. Temporary storage memory in camera: Max. approx. 5 MB, Frame Rate: Max. 10 fps (JPEG), 30fps (H.264)

W. Event Notification HTTP/SMTP (e-mail)

X. Digital PTZ Cropping Sizes: 640x360, 512x288, 384x216, 256x144, 128x72
640x480, 512x384, 384x288, 256x192, 128x96

Y. On-Screen Display Available

Z. Daylight Saving Time Available

AA. Custom Settings – Number of Registers: 4. Items to Register: Exposure, Smart Shade Control, White Balance, Image Quality Adjustment, Day/Night.

2.04 CAMERA APPLICATIONS

A. Viewer Camera-side: Admin Viewer, VB Viewer Client-side: RM-Lite Viewer

B. Admin Tools Privacy Mask Setting Tool; Panorama Creation Tool; View Restriction Setting Tool; Preset Setting Tool; Intelligent Function Setting Tool; Log Viewer; Recorded Video Utility

C. Included Software VB Initial Setting Tool; Backup Tool; Restore Tool; Memory Card Unmount Tool; RM-Lite; Proxy Authentication Admin Viewer/Admin Tools

D. Language English/German/French/Italian/Spanish/Japanese

E. Operating Environment (PC specifications and OS)

1. CPU: Intel Core i7-2600

2. Graphics Board: Not Specified

3. Memory: 2GB or more

4. Viewer Display: 1920 x 1080 or more

5. OS:

1. Windows Vista Ultimate/Business/Enterprise/Home Premium SP2 32/64-bit
2. Windows 7 Ultimate/Business/Enterprise/Home Premium SP2 32/64-bit
3. Windows 8/ Windows 8 Pro/ Windows 8 Enterprise 32/64-bit
4. Windows 8.1/ Windows 8.1 Pro/ Windows 8.1 Enterprise 32/64-bit
5. Windows Server 2012 Standard 64-bit
6. Windows Server 2012 R2 Standard 64-bit
7. Windows Server 2008 Standard SP2 32/64-bit
8. Windows Server 2008 R2 Standard SP1 64-bit
9. Web Browser: Internet Explorer 8/9/10/11
10. Runtime Libraries: .NET Framework 3.5 SP1 (IE 8/9), 4.5 (IE10/11)

2.05 CAMERA INTERFACE

A. Network Terminal LAN x 1 (RJ45, 100Base-TX (auto/full-duplex/half-duplex))

B. Audio Input Terminal (common for LINE IN & MIC IN)

1. Φ3.5mm (Φ0.14 in.) mini-jack connector (monaural)
2. Switch LINE IN/MIC IN in the setting page.
3. LINE IN x 1 (connect to an amplifier microphone) or MIC IN x 1 (connect to a microphone w/o amplifier)

C. External Device I/O Terminal

Input x 1, Output x 1

D. Memory Card Micro SD Memory Card, Micro SDHC Memory Card, Micro SDXC Memory Card Compatible. Frame Rate: Max. 1 fps (JPEG), 30fps (H.264)

2.06 CAMERA ENVIRONMENT

Operating Environment Temperature: -10°C – +50°C (+14°F – +122°F) Humidity: 5% – 85% (without condensation)

2.07 CAMERA POWER

A. Power Supply PoE: PoE power supply via LAN connector (IEEE802.3af compliant)

B. Power Consumption: Max. approx. 4.1 W

2.08 CAMERA DIMENSIONS: 4.72 x 2.13 in

2.09 CAMERA WEIGHT: .53 lb.

PART 3 EXECUTION

3.01 PREPARATION

A. The Contractor shall order all required parts and equipment upon notification of award of the Work.

B. The Contractor shall bench test all equipment prior to delivery to the job site.

C. The Contractor shall verify the availability of power where required. If a new source of power is required, a licensed electrician shall be used to install it.

D. The Contractor shall arrange for obtaining all programming information including access times, free access times, door groups, operator levels, etc.

3.02 INSTALLATION

A. General

1. The Contractor shall coordinate with the OWNER's Project Manager for storage of the equipment in a secured location prior to installation.
2. The Contractor shall carefully follow the instructions in the manufacturers' Installation Manual to insure all steps have been taken to provide a reliable, easy to operate system.
3. The Contractor shall coordinate with the OWNER's facilities coordinator to insure the proper location to tap into electrical power.
4. Perform all Work as indicated in the Drawings and Specifications.
5. The Contractor shall install the appropriate cables from the cameras to the network equipment.
6. The Contractor shall coordinate with the OWNER's ITC Department for interface with the network.
7. All communications cables shall be kept away from power circuits.
8. The Contractor shall also execute adequate testing of the system to insure proper operation.
9. The Contractor shall provide adequate training of the system users to insure adequate understanding to prevent operating errors.

B. Workmanship

1. Comply with highest industry standards, except when specified requirements indicate more rigid standards or more precise workmanship.
2. Perform Work with persons experienced and qualified to produce workmanship specified.
3. Maintain quality control over suppliers and Subcontractors.
4. Quality of workmanship is considered important. OWNER Project Manager shall have the authority to reject Work that does not conform to the Drawings and Specifications.

C. Equipment Pre-Test

All equipment shall be bench tested prior to delivery to job site and prior to installation. Bench test per manufacturers' installation instructions.

D. Wire And Cable

1. Design, layout, size, and plan new wire and cable runs as required.
2. All wire and cable from the processors to all devices at each door shall be "home-run" unless otherwise specified.
3. All wire and cable, including any wire and cable that is existing and will be reused in the Work, shall be installed in conduit or surface metal raceway, except as follows:

Wire or cable, in lengths of less than ten (10) feet, that is "fished" within walls, ceilings, and door frames.

4. All wire and cable passing through metalwork shall be sleeved by an approved grommet or bushing.
5. Avoid Ownericing conductors. All Ownerices shall be made in junction boxes (except at equipment). Ownerices shall be made with an approved crimp connection. Wire nuts shall not be used on any low-voltage wiring.
6. Identify all wire and cable at terminations and at every junction box. Identification shall be made with an approved permanent label, Brady or equal.

E. Wire And Cable Terminations

1. Identify all inputs and outputs on terminal strips with permanent marking labels.
2. Neatly dress and tie all wiring. The length of conductors within enclosures shall be sufficient to neatly train the conductor to the terminal point with no excess. Run all wire and cable parallel or normal to walls, floors and ground.
3. Install connectors as required by equipment manufacturers.
4. Terminations shall be made so that there is no bare conductor at the terminal. The conductor insulation shall bear against the terminal or connector shoulder.
5. Do not obstruct equipment controls or indicators with wire or cable. Route wire and cable away from heat producing components such as resistors, regulators, and the like.

F. Conduit And Raceway Installation

1. Design, lay-out, size and plan new conduit and raceway systems as required.
2. Indoor Requirements:
   a. Route exposed conduit and raceway parallel and perpendicular to walls and adjacent piping.
   b. Maintain minimum a six (6) inch clearance between conduit and piping.
   c. Group conduit in parallel runs where practical and use conduit rack constructed of steel channel with conduit straps or clamps.
   d. Use conduit bodies to make sharp changes in direction, as around beams. Fasten conduits and raceways to structural steel using approved spring clips or clamps.
   e. Where conduit penetrates fire-rated walls and floors, seal opening with UL listed fire rated sealer or other methods as approved by codes.
   f. No exposed conduit, raceway, or junction box shall be installed within any office area.
   g. Install all boxes straight and plumb.
   h. Do not support conduit from mechanical, plumbing, or fire sprinkler systems.
   i. Drill or core drill all holes in walls, ceilings, or floors where required for new conduits. Do not cause damage to any structural steel or other structural support member by drilling or cutting.
   j. Do not use flexible conduit in lengths longer than six (6) feet.

1. Outdoor Requirements:
   a. Where conduit penetrates exterior walls, seal opening around conduit in an approved manner to make watertight.
   b. Use galvanized straps and fasteners on all exterior conduit.
   c. All exterior boxes will only be used to aid in pulling the cable between points.

G. Penetrations

Do not penetrate any roof, flashing, exterior wall, or parapet without prior approval from OWNER's designated Construction Project representative.

I. Grounding

Provide earth grounding of equipment as required by equipment manufacturer. Earth ground shall be connected to ground rod or approved cold water pipe. Electrical or telephone ground connections shall not be used as earth grounds. Connections to mounting posts or building structural steel shall not be used as earth grounds.

J. Power To Security Equipment

1. Power all equipment from 120 VAC circuit dedicated for security use, except as noted. Mark all panel circuit breakers with labels worded "Security Equipment - Do Not Operate", or equivalent.
2. All plug-in transformers shall be located at the security control panels. Secure all low-voltage plug-in transformers to outlet with screw or strap. Clearly label all transformers to identify purpose and use.

K. Cutting And Patching

The Contractor shall be responsible for all cutting, fitting or patching that may be required to complete the Work.

L. Painting

All conduit, fittings, and junction boxes shall be painted to match the existing surfaces they are mounted on. This work may be performed after the system is fully operational.

3.03 FIELD QUALITY CONTROL

A. Final Tests & Inspection

The Contractor shall coordinate with the OWNER's Project Manager for final tests and inspections in the presence of the Project Manager, System Designer/Consultant, and a factory support person from the manufacturer.

B. Training

1. The training of all personnel shall be performed on-site by the Contractor and a factory trainer provided by the manufacturers.
2. The manufacturer shall provide a training tutorial and all handout material.
3. The manufacturer shall also supply video recording of either the actual on-site training or a copy of in-house training at the manufacturer's office.

END OF SECTION