CITY OF RALEIGH

ENGINEERING SERVICES DEPARTMENT FACILITIES AND OPERATIONS DIVISION

Raleigh Municipal Building
222 West Hargett Street, Suite 605
Raleigh, NC 27601

INFORMAL BID DOCUMENTS FOR

Keeter Training Center – Security Additions

Date of Issue: June 4, 2024

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CITY OF RALEIGH – ADVERTISEMENT FOR BID (INFORMAL BID)

PROJECT: Keeter Training Center – Security Additions

PROJECT LOCATION: 105 Keeter Center Drive, Raleigh, NC 27603

Informal Bid #: **274-ES-FO-FY24-KeeterSecurity**

Owner and Contact: City of Raleigh, Facilities and Operations Division
Raleigh Municipal Building
222 West Hargett Street, Suite 605, Raleigh, North Carolina 27601

Project Manager Contact: Steven Chelini
e-mail: Steven.Chelini@raleighnc.gov

Additional Contact: Susan Barrameda
e-mail: Susan.Barrameda@raleighnc.gov

NOTE: Do not refer or use previously published bid documents.

Pursuant to the General Statutes of North Carolina, Section 143-128 et. seq, contractors are invited to submit Sealed Single Prime Construction bids providing labor, material, and equipment for entering into a Single Prime Contract. The scope of work includes but is not limited to the following:

This project includes the new installation of a badge reader system and video surveillance system to various locations throughout the Keeter Training Center main facility located at 105 Keeter Center Dr. Raleigh, NC 27603.

Cost Specifications:

Total cost of this project will be included within the bid package. All labor, materials, equipment and permitting fees in relation to the purpose of this project are to be included. Bid proposals shall be for a single lump sum.

Under no circumstances, will any additional overtime, truck charge, travel time, mileage, fuel surcharges, or expenses be paid by the City of Raleigh under this contract.

Project Scope:

1. ELECTRONIC ACCESS CONTROL AND INSTRUSION SYSTEM (EACIS) SCOPE OF WORK

The Electronic Access Control and Intrusion system work for this project will consist of the following (the contractor shall provide any items not expressly noted as supplied by the City):

1. The Contractor shall use a Vykon JACE (SEC-J-8000) controller based on the Tridium Niagara Framework. Systems that are not developed on the Niagara Framework platform are unacceptable.
2. The Contractor shall configure the JACE security controller to control access, maintain historical records (Audit History, Log History, Badge Swipe Record, and Security History).

3. The Contractor shall configure each JACE controller to communicate to door controllers, gate controllers, and other monitoring alarm input/output devices provided under Division 281000.
4. Each JACE shall communicate to door controllers and other monitoring alarm input/output devices provided under Division 281000 – Electronic Access Control and Intrusion System Specification.
5. The Door Control Module (DCM) shall be a Vykon model SEC-R2R. The DCM shall provide a physical interface for Electronic Access Control Systems (EACS) door peripherals such as card readers, door positions switches, request to exit devices, and output to control the door locking mechanism. The DCM shall communicate directly to the JACE through an RS485 interface. For details information, refer to section 2.5 in the Division 281000 – Electronic Access Control and Intrusion System Specification.
6. The Supervised Alarm Input/Output Module (IOM) shall be a Vykon model SEC-RIO. A Supervised Alarm IOM shall provide a physical interface for EACS alarm inputs such as motion detectors, glass break sensors, etc., and monitor outputs to control lighting panels, horns, etc. The IOM shall communicate directly to the JACE through an RS485 protocol. For detailed information, refer to section 2.6 in the Division 281000 – Electronic Access Control and Intrusion System Specification.
7. The Contractor shall integrate the JACE controller station with the City of Raleigh Security Web Supervisor Station. The Contractor shall bring Schedules, People, Badges, Access Rights, and Tenants from the JACE controller station to the Security Web Supervisor station. The Contractor shall configure the Niagara Network between the JACE controller and Security. Web Supervisor stations using Niagara FOXS protocol. The Contractor shall ensure the JACE controller station alarms are routed to the Security Web Supervisor Station Alarm Console. The Contractor shall ensure the JACE controller station Activity Monitor events are routed to the Security Supervisor Activity Monitor.
8. The Card Reader shall be 12 VDC, Wiegand interface Card Reader. The reader shall be HID Multi-Class SE RP40. For detailed information, refer to Section 2.7 in the Division 281000 – Electronic Access Control and Intrusion System Specification.
9. The credentials shall be key-fob style credentials, which shall be HID ProxKey II or equal. Credentials shall be a minimum of 37 bits Wiegand protocol. Credentials shall be compatible with a 125 kHz Operating Frequency Reader. For detailed information, refer to Section 2.8 in the Division 281000 – Electronic Access Control and Intrusion System Specification.
10. The software shall allow for various door relock configurations. For detailed information, refer to Section 2.8 in the Division 281000 – Electronic Access Control and Intrusion System Specification.
11. The Contractor shall implement the following list of alarms based on door activity, Access Right, Schedule, and credential status. The alarms shall be routed to the Alarm Console or Activity Monitor located on the Security Supervisor Station. For detailed information, refer to Section 2.12 in the Division 281000 – Electronic Access Control and Intrusion System Specification.

    a) Door Forced Open
    b) Door Held Open
    c) Badge Does Not Exist
    d) Badge is Lost
    e) Bade is Disabled
    f) No Active Schedule
    g) No Access Right
    h) Granted but Not Used
    i) Door Position Switch Supervision

j) Request to Exit Supervision

12. The Contractor shall submit (8) eight copies of the entire Electronic Access System shop drawings and a completed list of equipment and materials, including manufacturer catalog data sheets and installation instructions. The shop drawings shall contain complete wiring and schematic diagrams, software, descriptions, calculations, and any other details required to demonstrate the system will properly function as a system. The shop drawings shall include terminal identification for control wiring.
13. The Contractor shall coordinate with the Owner for all specific network standards and local area network (LAN) connections.
14. The Contractor shall coordinate with the Owner for the name convention for the Remote Reader Modules, Doors, and Readers.
15. The Contractor shall configure Time Sync using Niagara NtpPlatformServiceQnx. The Contractor shall coordinate with the owner for the NTP server IP address.
16. The new upgrades must be compatible with the current City of Raleigh software. The Electronic Security Access must use Niagara version N4.10.1.36.
17. The Contractor shall install the security camera system and provide onsite professional services to assist in all systems' initial setup and programming to bring components up to fully functioning status for Owner acceptance. This shall include, but not be limited to the following:

    a) The Contractor shall perform all work during regular business hours, Monday through Friday, 8:00 AM to 5:00 PM.
    b) All work under this contract must conform to all applicable codes within the jurisdiction where it will be performed. The Contractor is responsible for gathering all appropriate permits for this work, including all fees.
    c) The Contractor shall follow all requirements identified in the Division 281000 – Electronic Access and Intrusion System Specification, including, but not limited to, equipment selection, installation, integration, camera licenses, submittals, warranty information, acceptance testing, and operation.
    d) All existing equipment removed by the Contractor shall be returned to the City of Raleigh.
    e) All equipment, parts, and supplies used, shall be new and supplied by the original equipment manufacturer or the OEM's designated vendor(s).
    f) The Contractor shall patch and paint the work area for a professional finish.
    g) The Contractor shall clean areas disturbed during construction and restore them to their original condition.
    h) The contractor shall provide end-user training to be coordinated with appropriate City of Raleigh staff.
    i) Any new switches and/or routers, must be leased through the City of Raleigh IT department.
    j) New server specifications must be approved by the Project Manager from Integrated Facility Services and leased through the City of Raleigh IT department.

2. VIDEO SURVEILLANCE SCOPE OF WORK

The digital video surveillance system work for this project will consist of the following (the contractor shall provide any items not expressly noted as supplied by the City of Raleigh):

1. The Contractor shall coordinate with the Owner for all specific network standards and local area network (LAN) connections.
2. The Video Monitoring System (VMS) consists of a Milestone Video Live and Archiver

Video Server provided by the City of Raleigh's IT Department. The VMS solution shall be Milestone. The Contractor shall install and configure the following Milestone components:

a) Management Server or connect the Video Recording Server to the existing City of Raleigh Milestone Management Server
b) Recording Server
c) Event Server
d) Log Server
e) SQL Server
f) Mobile Server
g) Xprotect Client

3. The Contractor shall provide the following recording server cabinet enclosures:

   a) VWMSD-8RU-42-B 8RU Vertical Cabinet with a fan kit (Qty. 1) VWMFK-115 or Owner approved equivalent for City of Raleigh leased Dell recording server.
   b) VWMSD-4RU-42-B 4RU Vertical Cabinet with a fan kit (Qty. 1) VWMFK-115 or Owner approved equivalent for City of Raleigh leased R240 recording server.

4. The Contractor shall provide an IP security camera system, associated power supplies, and media converters as required.
5. The Contractor shall follow the camera requirements identified in the 28 20 00 Video Surveillance System Specification, Section 16.
6. All cameras and devices shall be time-synced to the Owner's NTP server. Coordination with the Owner to acquire the appropriate NTP address to use.
7. The Contractor shall select the appropriate mounting hardware for the situation and confirm with the Owner before installation.
8. All cameras shall have remote autofocus or auto-back focus, except 180/360-degree and encoded analog cameras.
   All cameras shall be vandal-proof and appropriate for the environment in which they are installed. All exterior cameras shall be waterproof.
9. The Contractor shall ensure all cameras have the latest VMS-recommended firmware installed, and all cameras of the same model shall have matching firmware versions. The Contractor shall provide all necessary firmware upgrades to keep the Owner on the latest version throughout the project. After the project, the Owner shall have the option to receive a final firmware update to the latest version before the project is paid in full. The Contractor shall provide the Owner with a firmware report for all cameras before the project is paid in full.
10. The Contractor shall be responsible for all necessary wiring, cabling, conduit, raceways, data communication circuits, cable trays, fire-stopping, labor, tools, equipment, licenses, ancillary materials, and travel required to furnish and install new security cameras.
11. The Contractor shall supply miscellaneous terminations, programming, licenses, and updates to extend to the Owner's final acceptance of the installed security system.
12. The Contractor shall coordinate any network, software, and hardware equipment needed to connect any device or server to the Owner's network. For any device not meeting the Owner's network requirement specification, the Contractor shall bring the delinquent device up to the Owner's required specification before connecting the device to the Owner's network.
13. The Contractor shall not provide a cellular camera solution that uses a cellular dialer because a cellular camera solution with a cellular dialer is not included in the City of Raleigh 28 20 00 Video Surveillance Specification.
14. The Contractor shall not use cellular connections for IP cameras. All IP cameras shall be

connected to the City of Raleigh Network using Ethernet CAT 6 cables or wireless connections. The wireless specifications are detailed in the Video Surveillance specification.

15. The Contractor shall not add City of Raleigh (COR) Users/Roles with playback or export capability to the COR Management Server.
16. The Contractor shall configure GPS Coordinates in the Management Server for all cameras. Milestone stores GPS coordinates as X and Y on a standard coordinate plane. For example, the coordinates 47.25726 and -122.51608 are represented in Milestone as "POINT (-122.51608 47.25726)," where the latitude and longitude are reversed.
17. The Contractor shall coordinate, configure, and connect all cameras, video archiver, and video monitoring workstations to the Owner's network and testing cameras and associated equipment to ensure a fully functioning security system integrated with the Owner's existing Milestone Video Management System.
18. The Contractor shall install surge and lightning protection for pole-mounted cameras and use a 10' grounding rod.
19. The Contractor shall ensure cables are labeled.
20. Milestone exterior and interior maps shall provide a physical overview of the surveillance system. The contractor shall create maps to show the direction where the cameras are pointing, and the maps shall be geographical. The contractor shall configure each camera on the map to pop out a live view of the camera when clicked on by a user.
21. The new upgrade must be compatible with the current City of Raleigh software. The Milestone Video Management System should be version 22.2a build 39.
22. The Contractor shall install the security camera system and provide onsite professional services to assist in all systems' initial setup and programming to bring components up to fully functioning status for Owner acceptance. This shall include but not be limited to the following:

    a) The Contractor shall perform all work during regular business hours, Monday through Friday, 8:00 AM to 5:00 PM.
    b) All work under this contract must conform to all applicable codes within the jurisdiction where it will be performed. The Contractor is responsible for gathering all appropriate permits for this work, including all fees.
    c) The Contractor shall follow all requirements identified in the 28 20 00 video surveillance system specification, including but not limited to equipment selection, installation integration, camera licenses, submittals, warranty information, acceptance testing, and operation.
    d) The Contractor shall determine hardware, software, and operations requirements for implementation.
    e) The Contractor shall set up and configure parameters on each camera for recording on the Video Recording Server.
    f) The Contractor shall set up optimum recording parameters on each Video Recording Server.
    g) All existing equipment removed by the Contractor shall be returned to the City of Raleigh as attic stock.
    h) All equipment, parts, and supplies used shall be new and supplied by the OEM or the OEM's designated vendor(s).
    i) The Contractor shall first attempt to mount alternative cameras on the building. If mounting a camera on the building degrades the camera view, the Contractor shall erect a pole to mount the camera instead. Cameras shall not be mounted on utility company poles.
    j) All exterior camera installations must include equipment rated for external use.
    k) The Contractor shall patch and paint the work area for a professional finish.
    l) The Contractor shall clean areas disturbed during construction and restore them to their original condition.

m) The Contractor shall provide a complete and fully functional system, as-built drawings to include all device locations for existing and new cameras, and a device configuration sheet to include IP, hostname, and Mac addresses. As-builts shall include new and pre-existing equipment.
n) The Contractor shall deliver three (3) hard copies of as-built drawings to the Owner on 24" X 36" paper, including an electronic copy.
o) The Contractor shall provide end-user training to be coordinated with appropriate City of Raleigh staff.
p) Any new switches and/or routers, must be leased through the City of Raleigh IT department.
q) New server specifications must be approved by the Project Manager from Integrated Facility Services and leased through the City of Raleigh IT department.

3. CRENDENTIALS

a) Security Contractor must have a Supply System Low Voltage (SPVL) alarm license. This must be posted on the outside of the bid package.
b) Security Contractor must be a Niagara 4 Enterprise Security certified.
c) Security Contractor must be a Milestone Premier Partner.

Sealed bids: Bidders are responsible for ensuring delivery of bids before the deadline. (No faxed or emailed bids accepted) Bids will be received by:

Time:	**4:00pm**
Date:	**Thursday, July 18th, 2024**
Mail Delivery:	City of Raleigh, Engineering Services Dept. Attn: Steven Chelini P.O. Box 590 Raleigh, NC 27602
Drop off Times:	**9:00 am – 4:00 pm** Raleigh Municipal Building, 222 W. Hargett St. **Deliver to the 6th Floor, Suite 605** Raleigh, NC 27601

Pre-Bid meeting will be held at each project site. Attendance is encouraged but is not mandatory. Pre-bid attendance may be used to validate bid submissions. Attendance to the pre-bid will be documented by the City.

Date: Thursday, June 20th, 2024

Time: 2:00pm

Location: 105 Keeter Center Drive, Raleigh, NC 27603

Questions Deadline: Friday, June 28th, 2024 by 4:00pm

Paper hard copy sealed bids are required and digital submissions are not allowed. Bidders have two (2) options for delivery of their bid documents:

- Early delivery via in person/hand delivery on the day of the bid opening during the time shown above. The City of Raleigh, Facilities and Operations Division project manager or representative will be onsite at that time to receive bids. Envelopes must be addressed and sealed and will be securely held.
- Mail-in / drop-off bids in accordance with the address and times shown above.

No public opening will be held in accordance with informal bidding rules.

Contractors are responsible for distributing documents to all sub-contractors.

Information related to this solicitation, including any addenda, will be posted to the Vendor Portal (https://evp.nc.gov/).

Pursuant to North Carolina General Statutes §143-128.2 et seq. and §143-131, and in accordance with City policy, the City of Raleigh encourages and provides equal opportunity for certified Minority and Women-Owned Business Enterprise (MWBE) businesses to participate in all aspects of the City's contracting and procurement programs to include: Professional Services, Goods and Other Services, and Construction. The prime contractor will be required to identify participation of MWBE businesses in their proposal and demonstrate how that participation will be achieved.

The City's goal is to contract and sub-contract fifteen percent (15%) of the total contract amount to Certified MWBEs on construction projects of $300,000 or more, or contracts of $100,000 or more that include any State funding.

No Bid may be withdrawn for Forty-Five (45) days after opening time.

The City reserves the right to reject any or all bids and to waive informalities.

END OF ADVERTISEMENT FOR BID

INSTRUCTIONS TO BIDDERS

GENERAL

This project includes the new installation of a badge reader system and video surveillance system to various locations throughout the Keeter Training Center main facility This includes all inspection/permitting fees. All bid proposals shall be for a single lump sum.

PROJECT LOCATION

Keeter Training Center
105 Keeter Center Drive
Raleigh, NC 27603

BID SCHEDULE

Bid Deadline: Thursday, July 18th, 2024 by 4:00pm

Pre-Bid Conference: Thursday, June 20th, 2024 at 2:00pm

Questions Deadline: Friday, June 28th, 2024 by 4:00pm

BID DOCUMENTS

Project Manager Contact: Steven Chelini
e-mail: Steven.Chelini@raleighnc.gov
phone: (919)996-3420
City of Raleigh, Facilities and Operations Division
222 West Hargett Street, Suite 605, Raleigh, North Carolina 27601

Additional Contact: Susan Barrameda
e-mail: Susan.Barrameda@raleighnc.gov
phone: (919) 996-3420

Vendor Portal website will post all addenda. The City of Raleigh is not responsible for the accuracy of documents anyone may obtain from any other source.

BID SUBMISSIONS

The submission of a bid will assume that the Contractor has fully examined the site and knows the existing conditions and has made every provision for operating under the existing conditions, and has included all necessary items, and has read and understands the Bidding Documents. No consideration shall be given to any claim for extra compensation or extension of contract time because of failure to comply with this provision.

Bids must be made in strict accordance with the "Bid Form" provided hereto and all blank spaces for Unit Prices shall be properly filled in. If no price increase, assign "$0". When requested alternates (if applicable) or Unit Prices have no entry, the bid may be considered incomplete and the bid may be rejected as non-responsive. All bids must be submitted on the BID PROPOSAL FORM included herein. Prices given shall be both in writing and figures and the complete form shall be without any lineation, alterations, or erasures. In case of conflicting prices, the written prices shall govern. Submit one (1) set of bid forms enclosed.

Bids shall be received in strict accordance with all requirements of the General Statutes of North Carolina. **The bid shall be submitted in sealed envelope(s) as noted on the Bid Proposal Form, with the bidder's name, project number, SPVL License Number, and project name written on the exterior.**

One (1) copy shall be submitted to City of Raleigh's Facilities and Operation Division.

The Contractor shall fill in the Form of Bid as follows:

A. All bids must be signed by an authorized official of the firm.

B. Each proposal shall include the full name and address, phone number, and e-mail contact of the bidder.

C. All signatures shall be properly witnessed.

D. Enclose required MWBE forms 1) Acknowledgement of MWBE Policy 2) Identification of MWBE Participation for Informal Project Bids

E. It shall be the specific responsibility of the Bidder to deliver this bid to: **City of Raleigh Facilities and Operations Division** prior to the date and time specified in the invitation to bidders for opening of the Bids. Bidders are encouraged to be prompt as later delivery of a Bid for any reason, including delivery by the United States Postal Service, shall disqualify the Bid.

F. Modifications of previously deposited bids will be acceptable only if delivered to the place of the bid by the specified time.

The City of Raleigh shall not be held responsible for late deliveries. Faxed and/or email submissions will not be accepted. Proposals not received by the designated time will not be accepted.

The bidder shall fill in and sign the bid form correctly. Bids that show any omission, alterations of form, additions not called for, conditional bids, or any irregularities of any kind may be rejected. Except to the extent allowed by statute, bids shall not be withdrawn and bids shall remain subject

to acceptance by the City for a period of Forty-Five (45) days.

The bids will be evaluated, and the contract awarded in accordance with statutory public contract requirements as supplemented by the City of Raleigh's MWBE information supplied with the bid documents.

It is the City's intention to award a contract for work under this project to the lowest responsive, responsible bidder. The City reserves the right to reject any and all bids and to waive without informalities, including without limitation, nonconforming, non-responsive, unbalanced, or conditional bids. The City of Raleigh further reserves the right to reject the bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to not be responsible. The City of Raleigh may also reject the bid of any bidder if the City believes that it would not be in the best interest of the Project to make an award to that bidder. The City of Raleigh also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate terms with the successful bidder.

Upon request, bidders must present satisfactory evidence that they have been regularly engaged in the business of constructing such work, such as company work history and references from similar construction projects. And upon request, bidders must show that they are fully prepared with the necessary capital, equipment, etc., to begin the work promptly, and complete the same in accordance with specifications.

The bidder to whom the award is made shall be required to furnish work crews of adequate number, size, and experience to properly perform the work. The Project Manager responsible for the project is required to be on-site during construction. The interpretation of the number of crews, size, and experience will be determined by the City of Raleigh as to their adequacy.

The Contractor will furnish all materials, labor, equipment, supervision, tools, machinery, etc. for complete construction of projects in accordance with plans and specifications of the City of Raleigh.

The City reserves the right to extend the work in this Contract upon the same terms, provided that such extensions shall not exceed in cost fifty per cent (50%) of the original Contract price of the Contract being extended.

The contractor(s) to whom the award is made must carry insurance in the amounts and types outlined in the Insurance Requirements below.

1. Insurance

Contractor agrees to purchase at its own expense insurance coverages to satisfy the following minimum requirements. A certificate reflecting the following minimum coverages shall accompany this Contract:

1.1. Workers' Compensation Insurance:

Limits:

Workers Compensation:	Statutory for the State of North Carolina
Employers Liability:	Bodily Injury by Accident $1,000,000 each accident
Bodily Injury by Disease	$1,000,000 policy limit
Bodily Injury by Disease	$1,000,000 each employee

1.2. Commercial General Liability:

Limits:

Each Occurrence:	$1,000,000
Personal and Advertising Injury	$1,000,000
General Aggregate Limit	$2,000,000
Products and Completed Operations Aggregate	$2,000,000

The aggregate limit must apply per project. The form of coverage must be the ISO CG 00 01 policy as approved by the State of North Carolina Department of Insurance. If a form of coverage other than the CG 00 01 is used it must be approved by the City's risk manager. Any endorsed exclusions or limitations from the standard policy must be clearly stated in writing and attached to the Certificate of Insurance. Completed Operations coverage must be maintained for the period of the applicable statute of limitations.

1.3. Commercial Automobile Liability:

Limits:
$1,000,000 combined single limit.

1.4. Additional Insured:

Contractor agrees to endorse the City as an Additional insured on the Commercial General Liability, Auto Liability and Umbrella Liability if being used to meet the minimum liability limits for General Liability and Automobile Liability.

The Additional Insured shall read 'City of Raleigh is named additional insured as their interest may appear'.

The Certificate Holder address should read:
City of Raleigh
Post Office Box 590
Raleigh, NC 27602-0590

1.5. Builders Risk Coverage:

Limits:
Minimum limit in the amount of total bid price. The Builder Risk policy must be endorsed to increase the limit of insurance for all change orders.

1.6. Policy Form:

Builder Risk coverage must be on a direct physical loss basis and contain no exclusion for theft, collapse or damage to foundations or underground structures, pipes or conduits.

1.7. Named Insured:

The Named Insured shall be The City of Raleigh, the Contractor, and all sub-contractors with a contractual assumption of responsibility for damage to the project.

All insurance companies must be admitted to do business in North Carolina and be acceptable to the City's risk manager. If the insurance company(s) is a permitted surplus lines insurer, the insurance company name, and NAIC number must be submitted to the City's risk manager for approval before commencing work. Contractor shall be required to provide the City no less than

thirty (30) days' notice of cancellation, or any material change, to any insurance coverage required by this Contract.

A Certificate of Insurance (COI) must be issued by an authorized representative of the insurance carrier(s). Certificates of Insurance must have the insurance company name and NAIC number clearly identified. The acceptance of or the review of Certificates of Insurance by the City does not relieve Contractor of any requirements in the Contract to provide specific insurance coverage required by the Contract, nor does the acceptance of or review of Certificates of Insurance covenant all insurance requirements have been met.

SITE INVESTIGATION

All bidders may examine the site before submitting a proposal in order to determine the extent of work involved, size of work, etc., and the conditions under which the work must be staged and performed.

NON-COLLUSION IN BIDDING

The Bidder specifically agrees to abide by all applicable provisions of Article 3 of Chapter 133 of the North Carolina General Statutes. By submission of this Bid, each Bidder and each person signing on behalf of any Bidder certifies, and in case of a joint Bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:

(1) The prices in this Bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other Bidder or with any competitor.

(2) Unless otherwise required by Law, the prices quoted in the Bid have not been knowingly disclosed by the Bidder and will not knowingly be disclosed by the Bidder prior to opening, directly or indirectly, to any other Bidder or to any competitor; and

(3) No attempt has been made or will be made by the Bidder to induce any other person, partnership, or corporation to submit or not to submit a Bid for the purpose of restricting competition.

FORM OF AGREEMENT

The form of agreement to be entered into shall be the contract included within these specifications.

E-VERIFY COMPLIANCE UNDER G.S. 143-133.3.

The contract will require that the selected Firm/Team and any subcontractors comply with the requirements of Article 2 of Chapter 64 of the North Carolina General Statutes (NCGS) consistent with state law requirements for municipal contracts.

IRAN DIVESTMENT ACT CERTIFICATION.

The Contractor certifies that, if it submitted a successful bid for this contract, then as of the date it submitted the bid, the Contractor was not identified on the Iran List. If it did not submit a bid for this contract, the Contractor certifies that as of the date that this contract is entered into, the Contractor is not identified on the Iran List. It is a material breach of contract for the Contractor to be identified on the Iran List during the term of this contract or to utilize on this contract any subcontractor that is identified on the Iran List. In this Iran Divestment Act Certification section --

"Contractor" means the person entering into this contract with the City of Raleigh; and "Iran List" means the Final Divestment List – Iran, the Parent and Subsidiary Guidance List – Iran, and all other lists issued from time to time by the N.C. State Treasurer to comply with G. S. 143C-6A-4 of the N.C. Iran Divestment Act.

*** End of Instructions to Bidders ***

CITY OF RALEIGH – INFORMAL BID PROPOSAL FORM

Keeter Training Center – Security Additions

City of Raleigh
Engineering Services Department
Raleigh Municipal Building
222 West Hargett Street, Room 605
Raleigh, North Carolina 27601

Date: _____

The undersigned bidder has carefully examined the Form of Contract, the General Conditions, the Supplemental Conditions and Specifications, all of which are acknowledged to be part of the proposal and the Proposal Form, and the Bidder has also examined the site of the proposed work. Bidder agrees to perform all the work included in the Contract as indicated in the Contract Documents within the Keeter Training Center – Security Additions scope as it is specified within the bid documents. It is the City's intention to award a contract for all work under this project to the lowest responsive, responsible bidder. The City reserves the right to reject any or all bids and to waive informalities.

The undersigned further agrees to sign a Contract for the work, if offered within ninety (90) days after receipt of Bids, and to furnish surety as specified. The Bidder further agrees to provide and furnish all necessary materials, equipment, machinery, and labor necessary to complete the demolition of the work in full, in complete accordance with the plans and specifications and the contract documents to the full and entire satisfaction of the City of Raleigh and in accordance with these documents within the time limit specified below.

In addition to all other agreements and assurances, the undersigned Bidder understands and hereby agrees as follows:

1. The Bidder represents and agrees to complete the entire project in the following number of Consecutive Calendar Days: Two-Hundred and Sixty (260) days from the date on the Notice to Proceed.
2. The Bidder agrees to comply with the City's policy to encourage bidders to use Certified MWBE businesses as specified in Division 00 MWBE Requirements.

Base Bid:

_____Dollars ($) (In Words)

_____Dollars ($) (In Figures)

Owner's Site Conditions Allowance: Five Thousand Dollars and zero cents ($5,000.00)
(Note that the Owner's Site Conditions Allowance shall only be used when pre-authorized in writing by the City.)

Total Bid:
(Including Base bid and Owner's Site Conditions Allowance):

_____Dollars ($) (In Words)

_____Dollars ($) (In Figures)

SPVL License #: _____

ACKNOWLEDGMENT OF RECEIPT OF ADDENDA

The undersigned Bidder hereby acknowledges receipt of the following Addenda:

Dated		Acknowledge Receipt (initial)
_____	_____	_____
_____	_____	_____
_____	_____	_____

Please check here if no addenda were received: _____

PROPOSAL SIGNATURE PAGE

Respectfully submitted this day of _____

By: _____
(Name of firm or corporation making bid)

WITNESS:

_____
(Proprietorship or Partnership)

By: _____
Signature

Name: _____
Print or type

Title _____
(Owner/Partner/Pres./V.Pres)

Address _____

_____

ATTEST:

By: _____

Title: _____
(Corp. Sec. or Asst. Sec. only)

License No. _____

Federal I.D. No. _____

Email Address: _____

Office Phone Number: _____

(CORPORATE SEAL)

***** END OF CITY OF RALEIGH – BID PROPOSAL FORM***

PROCEDURE FOR REPORTING NORTH CAROLINA SALES TAX EXPENDITURES ON CITY OF RALEIGH CONTRACTS

1. The following procedure in handling the North Carolina Sales Tax is applicable to this project. Contractors shall comply fully with the requirements outlined hereinafter, in order that the owner may recover the amount of the tax permitted under the law.

2. (a) It shall be the general contractor's responsibility to furnish the owner documentary evidence showing the materials used and sales tax paid by the general contractor and each of his subcontractors. Any county sales tax included in the contractor's statements must be shown separately from the state sales tax. If more than one county is shown, each county shall be listed separately.

(b) The documentary evidence shall consist of a certified statement, by the general contractor and each of his subcontractors individually, showing total purchases of materials from each separate vendor and total sales taxes by each county paid each vendor. The certified statement must show the invoice number (s) covered and inclusive dates of such invoices. State sales tax shall be listed separately from county sales tax. If more than one county is shown, each county shall be listed separately.

(c) Materials used from general contractor's or subcontractor's warehouse stock shall be shown in a certified statement at warehouse stock prices.

(d) The general contractor shall not be required to certify the subcontractor's statements.

(e) The documentary evidence to be furnished to owners eligible for sales or use tax refunds covers sales and/or use taxes paid on building materials used by contractors and subcontractors in the performance of contracts with churches, orphanages, hospitals not for profit, educational institutions not operated for profit and other charitable or religious institutions or organizations not operated for profit and incorporated cities, towns and counties in this State. The documentary evidence is to be submitted to the above-named institutions, organizations and governmental units to be included in claims for refunds to be prepared and submitted by them to obtain refunds provided by G.S. 105-164.14 and is to include the purchase of building materials, supplies, fixtures and equipment which become a part of or annexed to buildings or structures being erected, altered or repaired under contracts with such institutions, organizations or governmental units.

3. The contractor or contractors to whom an award is made on this project will be required to follow the procedure outlined above.

4. The contractor is advised that all requests for payment, partial or final, for work completed under this contract must include a sales tax report submitted in accordance with the procedures outlined above.

North Carolina Sales Tax

(Paid During This Estimate Period)

Project_____ Project Location_____ County Estimate No._____

Contractor_____ Period Ending _____

Date	Vendor	Invoice Number	Invoice Amount	State Tax	County Tax	Transit Tax	Total Tax	County
TOTALS								

I certify that the above listed vendors were paid sales tax upon purchases of building materials during the period covered by the construction estimate, and the property upon which such taxes were paid with or will be used in the performance of this contract. No tax on purchases or rentals of tools and/or equipment is included in the above list. All of the material above became a part of or is annexed to the building or structure being erected, altered or repaired.

_____ County, North Carolina

Signed and sworn to (or affirmed) before this day by _____ _____
(name of principal) (signature of principal)

Date: _____ _____
Notary Public's Signature

_____
(Notary's printed or typed name, Notary Public) (Official Seal) My commission expires: _____

MINORITY AND WOMEN-OWNED BUSINESS ENTERPRISE PROGRAM (MWBE)

CONTRACTOR BID AND REPORTING INSTRUCTIONS (PROJECTS $30,000 - $299,999)

Bidders are required to include the following MWBE forms within the sealed bid documents as instructed below:

Use of Certified MWBE Business Form **Pg. 22-25**
Note: The additional requirements beyond identification of MWBE participants on page 23 through page 25 are NOT applicable to bids $30,000 - $299,999.
Bidder is required to read and sign the following:
Acknowledgement of MWBE Policy (pg. 26)

Identification of Certified MWBE Participation Form **Pg. 27**
Bidder is required to list all MWBE business sub-contractors

Lekesha R. Shaw
MWBE Program Manager
lekesha.shaw@raleighnc.gov
919-996-6958

Maria A. Torres
MWBE Coordinator
maria.a.torres@raleighnc.gov
919-996-4271

Pam Adderley
MWBE Coordinator
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919-996-5716

INFORMATION FOR BIDDERS REGARDING COMPLIANCE WITH THE CITY OF RALEIGH'S MINORITY AND WOMEN-OWNED BUSINESS ENTERPRISE (MWBE) PROGRAM

Policy

In accordance with North Carolina law, the City of Raleigh encourages and provides an equal opportunity for Certified Minority and Women-Owned Business Enterprises (MWBE) to participate in all aspects of the City's contracting and procurement programs.[1] The prime contractor or a first-tier subcontractor on a construction manager at risk (CMAR) project (collectively, "Bidder") shall be required to identify participation of MWBE businesses in its proposal, and document how that participation will be achieved. Bidders are subject to the City's MWBE subcontracting requirements (including good faith efforts as applicable), regardless if a Bidder is itself a Certified MWBE.[2]

The City has an aspirational goal of 15% of the total contract amount to be performed by MWBE businesses in contracts awarded by the City on (i) construction and building projects of $300,000 or more; and (ii) construction and building projects of $100,000 or more that have any state funding.

Definitions

Certified Minority Business (MWBE)

A business which:

a. At least fifty-one percent (51%) is owned by one or more Minority Persons or Socially and Economically Disadvantaged Individuals; or in the case of a corporation, in which at least fifty-one percent (51%) of the stock is owned by one or more Minority Persons or Socially and Economically Disadvantaged Individuals;
b. The management and daily business operations are controlled by one or more Minority Persons or Socially and Economically Disadvantaged Individuals; and
c. Is certified in one of the MWBE categories as defined by the NC Department of Administration/Historically Underutilized Business (HUB) and the NC Department of Transportation/Disadvantaged Business Enterprise (DBE).

Minority Person

A person who is a citizen or lawful permanent resident of the United States and who is:

a. Black, that is, a person having origins in any of the black racial groups in Africa;
b. Hispanic, that is, a person of Spanish or Portuguese culture with origins in Mexico, South or Central America, or the Caribbean Islands, regardless of race;
c. Asian American, that is, a person having origins in any of the original peoples of the Far East, Southeast Asia, Asia, the Indian subcontinent, or the Pacific Islands;
d. American Indian, that is, a person having origins in any of the original peoples of North America; or
e. Non-minority Female.

Socially and Economically Disadvantaged Individual

Socially disadvantaged individuals are those who have been subjected to racial or ethnic prejudice or cultural bias because of their identity as a member of a group without regard to their individual qualities. Economically disadvantaged individuals are those socially disadvantaged individuals whose ability to compete in the free enterprise system has been impaired due to diminished capital and credit opportunities as compared to others in the same business area who are not socially disadvantaged.[3]

[1] See, N.C.G.S. §§ 143-128.2, 143-128.4, 143-129, and 143-131.
[2] See, City of Raleigh SOP 505-2.
[3] See, 15 U.S.C. 637.

Bidder Responsibilities

Bidders agree to comply with all the terms and conditions of the City of Raleigh's Minority and Women-Owned Business Enterprise (MWBE) Program. Bidders must use good faith efforts (if applicable) to meet participation goals through the award of subcontracts to certified MWBE businesses consistent with City policy and North Carolina law.

Pre-Bid Opening

The City's Solicitation Documents include forms that: (a) capture information about MWBEs and any other subcontractors or suppliers that a Bidder intends to use on a contract ("Identification of MWBE Participation") and (b) affidavits to be completed by the Bidder.

Identification of MWBE Participation

The "Identification of MWBE Participation" must be completed by the Bidder on the City's form and submitted with its bid. If the project work is to be self-performed by the Bidder, the Bidder must so designate by checking the appropriate box on the form. For all Bidders which will not be self-performing the project work, the "Identification of MWBE Participation" form must be completed in its entirety. The Bidder must list on the City's form all MWBE businesses which will be construction subcontractors, vendors, or suppliers (collectively, "Subcontractors") on the project, and the total dollar value of its bid that will be performed by MWBEs. The failure to complete the ‘‘Identification of MWBE Participation" form in its entirety, or the failure to submit a completed "Identification of MWBE Participation" form with its bid, will render the bid non-responsive and the Bidder's bid will not be considered for award. The City will only credit MWBE participation for those Subcontractors listed on the "Identification of MWBE Participation" form.

Affidavit A: Listing of Good Faith Efforts

If the Bidder intends to subcontract any portion of the project work on a contract, an Affidavit A must be properly executed and submitted with its bid, listing the good faith efforts the Bidder made to achieve MWBE subcontracting goals for the contract prior to submitting its bid. The Affidavit A must be completed using the City's form. A minimum of fifty (50) good faith efforts points is required, the failure to achieve at least 50 points is grounds for rejection of a bid.

Affidavit B: Intent to Perform Contract with Own Workforce

In lieu of an Affidavit A, a Bidder that intends to perform 100% of the project work on a contract with its own current workforce may submit an Affidavit B with its bid. In submitting an Affidavit B, a Bidder certifies that the Bidder does not customarily subcontract elements of this type of project, and normally performs, has the capability to perform, and will perform all elements of the project work on the contract with its own current workforce. The Affidavit B must be completed using the City's form.

The failure to submit a properly executed Affidavit A or Affidavit B with a bid will render the bid non-responsive and the bid will not be considered for award.

Bid Opening

At the project bid opening, the total MWBE participation for each bid will be recorded. Upon being named the apparent low bidder, the Bidder must comply with the following:

a. If the Bidder submitted an Affidavit B with its bid indicating its intent to perform 100% of the project work on the contract with its own current workforce, then the Bidder is not required to resubmit its Affidavit B or to submit any additional affidavits (i.e., Affidavit C or Affidavit D). The City, in its discretion, may request that the Bidder submit additional information or documentation, including, but not limited to, information relating to the Bidder's subcontracting history and its ability to perform all elements of the project work on the contract with its own current workforce.

b. If the Bidder submitted an Affidavit A with its bid and the amount of MWBE participation as a percentage of the total contract price meets or exceeds the applicable goal, then the Bidder must submit to the City an Affidavit C within three (3) business days after being notified by City Staff that it is the apparent low bidder. The Bidder must complete the Affidavit C in its entirety using the City's form.

c. If the Bidder submitted an Affidavit A with its bid and the amount of MWBE participation as a percentage of the total contract price does not meet the applicable goal, then the Bidder must submit an Affidavit D to the City within three (3) business days after being notified by City Staff that it is the apparent low bidder. The Bidder must complete Affidavit D in its entirety on the City's form. In conjunction with the Affidavit D, the Bidder must include supplemental documentation of the good faith efforts made to meet the applicable goal. The City, in its discretion, may request that the Bidder submit additional information or documentation, including, but not limited to, information or documentation relating to any good faith efforts claimed by the Bidder, and completion of the City's Good Faith Negotiation Form and Solicitation Form. Good faith efforts can be demonstrated using, among other factors, the following:

    i. Attending pre-solicitation or pre-bid meetings that are scheduled by the City to inform MWBE firms of contracting, subcontracting, and supply opportunities.

    ii. Advertising in general circulation, trade association, or minority-focus media concerning subcontracting opportunities.

    iii. Providing written notice, to a reasonable number of specific MWBE firms that their interest in the contract is being solicited, at least 10 days before bids are due, to allow MWBE firms time to participate.

    iv. Following up initial solicitation of interest by contacting MWBE firms to determine with certainty whether the MWBE firms are interested.

    v. Identifying and selecting portions of the work to be performed by MWBE firms in order to increase the likelihood of MWBE participation (including where appropriate, breaking down contracts into economically feasible units to facilitate MWBE participation).

    vi. Providing interested MWBE firms with equal access to plans, specifications, and requirements of the contract.

    vii. Negotiating fairly with interested MWBE firms, not rejecting MWBE firms as unqualified without sound reasons based on a thorough investigation of their capabilities.

    viii. Using the services of the City's MWBE office; available minority community organizations; minority contractors' groups; local, state, and federal minority business offices; and other organizations that provide assistance in the recruitment and placement of MWBE firms.

    ix. Assisting interested MWBE firms in need of equipment, loan capital, lines of credit or joint pay agreements to secure loans, supplies or letters of credit, including waiving credit that is ordinarily required.

    x. Assisting interested MWBE firms in obtaining bonding, insurance, or providing alternatives to bonding or insurance for Subcontractors.

    xi. Negotiating joint venture and partnership arrangements with minority businesses to increase the opportunities for minority participation when possible.

    xii. Provide for quick pay agreements and policies to enable minority contractors and suppliers to meet cash flow demands.

For each unmet MWBE participation goal, for which an Affidavit D is submitted, a Bidder must earn at least fifty (50) good faith efforts points. The failure to achieve at least fifty (50) points is grounds for rejection of a bid. All

actions necessary to earn good faith efforts points must occur prior to bid opening. In determining whether a Bidder has made good faith efforts, the City will evaluate the efforts made by the Bidder and will determine compliance with regard to quantity, intensity, and results of these efforts prior to recommendation of award.

Post-Award

Payment

For purposes of this section the word "Contractor" means both the prime contractor and the CMAR for CMAR projects. The Contractor must submit a completed **Payment Affidavit - Subcontractor / Supplier Utilization Form** with each payment application, including periodic payments and final payment. Payment applications will not be processed by the City until a completed Payment Affidavit – Subcontractor/ Supplier Utilization Form is submitted. Within seven (7) days of receipt by the Contractor of a periodic or final payment from the City, the Contractor must pay each first-tier Subcontractor based on work completed or services provided under each subcontract. If the Contractor has made a quick pay commitment with any MWBE Subcontractor, they must comply with the provisions of their quick pay commitment.

Changing a Certified MWBE Subcontractor

If the situation arises that it becomes necessary to terminate, replace, or reduce the work of a MWBE Subcontractor counted toward a committed MWBE subcontracting goal, the Contractor must submit a completed **Request to Change MWBE Subcontractor** form to the applicable department project manager and the City's MWBE Program Manager. Any change in the work of a MWBE Subcontractor, including its termination and/or replacement, must first be approved by the City based upon good cause shown. Any further explanation or detail to the City in addition to what is identified in the Request to Change MWBE Subcontractor form must be on company letterhead. Good faith efforts shall apply to the selection of any substitute Subcontractor.

ACKNOWLEDGMENT OF MWBE POLICY

The City's policy is to encourage bidders in the participation of MWBE businesses. A presentation of that policy has been made at the pre-bid or pre-proposal conference. By submission of a bid or proposal in response to this solicitation, the Bidder acknowledges consents to all the terms and conditions of the City of Raleigh Minority and Women-Owned Business Enterprise (MWBE) Policy. A copy of the policy may be provided upon request by the MWBE Program Office or online at www.raleighnc.gov.

Bidder recognizes that the City of Raleigh encourages and provides equal opportunity for MWBE businesses to participate in all aspects of the City's contracting and procurement. The City's MWBE participation aspirational goal is at least fifteen percent (15%) of the total contract amount to MWBEs on construction projects of $300,000 or more and building related contracts of $100,000 or more that include any State funding. The Bidder on the subject Contract/Proposal must document good faith efforts to provide meaningful participation by MWBEs in the performance of the Contract. Bidder agrees that the City may reject a bid for MWBE Policy violations, including but not limited to, providing inaccurate information or for failure to provide required MWBE documentation.

The Prime Contractor will be required to identify participation of MWBE businesses and how that participation will be achieved. Bidder must identify anticipated subcontractors, including any Minority & Women-Owned Businesses, intended to be used. Bidder further agrees, if awarded a Contract, it will, upon request, submit to the City, the proper affidavit identifying the workforce actually utilized on the Contract. All MWBE related bid documents have been provided to the Bidder. MWBE information provided by the Bidder is subject to the NC Public Records Act. Bidder acknowledges that the City must be notified of any change of subcontractors, suppliers, or subconsultants.

To the extent permitted by North Carolina law, the Bidder, their agents, officials, contractors, employees and servants agree not to discriminate in any manner on the basis of race, color, creed, national origin, sex, age, handicap, or sexual orientation with reference to the subject matter of this Contract/Proposal.The Bidder further agree, to the extent permitted by law, to conform with the provisions and intent of City of Raleigh Ordinance 1969-889, as amended. This provision is hereby incorporated herein for thebenefit of the City of Raleigh and its residents, and may be enforced by action for specific performance, injunctive relief, or other remedy as provided by law. This provision shall be binding on the successors andassigns of the parties with reference to the subject matter of the Contract/Proposal.

I have read and understand the City of Raleigh's MWBE policy.

_____
Signature

_____
Printed Name and Title

_____
Company

_____
Date

IDENTIFICATION OF MWBE PARTICIPATION FOR INFORMAL PROJECT BIDS

Projects $30,000 - $299.999.99

This Identification of MWBE Participation Form is for the purpose of capturing information regarding the utilization of MWBEs and other subcontractors and suppliers on Informally Bid City Projects and Contracts. MWBE participation is encouraged for all City of Raleigh contracting opportunities. Please refer to the City's MWBE Policy for any contract specific requirements. *Copy this Form as needed*.

BIDDER NAME			
PROJECT NAME			
PROJECT NUMBER		**CITY DEPARTMENT**	
CONTRACT TYPE	☐ Construction ☐ Services ☐ Other _____*		
☐ **PRIME IS MWBE**	Classification: _____ ☐ Certified with NCHUB ☐ Certified with NCDOT-DBE	**BID SUBMITTAL DATE**	

MWBE Classifications: American Indian (AI), Asian American (AA), Black/African-American (B), Hispanic (H), Non-Minority Female (NMF), Socially/Economic Disadvantaged (D)
*For Professional Services Contracts, please use the Identification of MWBE Participation for Professional Services Form

☐ **WORK TO BE SELF-PERFORMED**

Check this box **only** if you intend to perform 100% of the work on this Project/Contract with your own current work forces, and you normally perform and have the capability to perform all elements of this work on this Project/Contract with your own current work forces.

MWBE SUBCONTRACTORS

Complete the chart below for all MWBE subcontractors that you intend to use on this Project/Contract regardless of dollar amount.

Company Name	MWBE Classification	Description of Services	Percentage of Total Contract*	Total Projected Utilization ($)*

*MWBE Classifications: American Indian (AI), Asian American (AA), Black/African-American (B), Hispanic (H), Non-Minority Female (NMF), Socially/Economic Disadvantaged (D)
*If the proposal is subject to an RFQ process, you may enter "N/A".

Total Estimated MWBE Utilization* $_____

Total Proposal Amount* $_____

Percent Estimated MWBE Utilization* _____%

(Total Estimated MWBE Utilization divided by Total Bid Amount)

*If the proposal is subject to an RFQ process, you may enter "N/A".

Updated 11.23.21

SECTION 281000
ELECTRONIC ACCESS CONTROL AND INSTRUSION SYSTEM (EACIS)

1. PART 1 GENERAL

1.1 SUMMARY

A. This section describes the Electronic Access Control and Intrusion System scope of work for the project. This section also references the responsibilities of the Systems Integration and Electrical trade contractors pertaining to products or systems, furnished by each trade, that affect this Division.

B. It is the owner's goal to implement a card access system that will allow products from various suppliers to be integrated into a unified system. Allowing various EACIS Contractors the ability to maintain, service and preform work on the system in order to provide flexibility and expansion of the system. The Owner shall be the named license holder of all software associated with any and all incremental work on the project(s).

1.2 SYSTEM DESCRIPTION

A. The Electronic Access Control and Intrusion System (EACIS) as provided in this Division shall be the Vykon JACE and Web Supervisor based on the Niagara Framework (or "Niagara"), a Java-based framework developed by Tridium. Vykon provides an open automation infrastructure, an open license, and is available from multiple systems integrators. Vykon integrates diverse systems and devices (regardless of manufacturer, communication standard or software) into a unified platform that can be easily managed in real time over a secure network using a standard Web browser. Systems not developed on the Niagara Framework platform are unacceptable.

B. The EACIS shall be an integrated, web-based access control and alarm monitoring system that shall be accessed through a standard Web browser. The EACIS shall consist of a JACE, Gate or Door Control Modules, Supervised Alarm Input / Output Modules, access and intrusion system peripheral devices and a standard web browser.

1. A JACE Security Controller within each facility shall regulate access, maintain historical records and alarm security personnel. The JACE shall connect to the owner's local or wide area network, as shown on plans and described elsewhere in this document. Secure access to the system, either locally in each building, or remotely from a central site or sites, shall be accomplished through standard Web browsers, via the Internet and/or local area network. Each JACE shall communicate to door controllers and other monitoring alarm input/output devices provided under Division 281000.
2. A Door Control Module (DCM) shall provide a physical interface for EACIS door peripherals such as card readers, door position switches, request to exit devices and output to control the door locking mechanism. The DCM shall communicate directly to the JACE through a RS485 protocol.
3. A Supervised Alarm Input / Output Module (IOM) shall provide a physical interface for EACIS alarm inputs such as motion detectors, glass break sensors, etc. and monitor outputs to control

lighting panels, horns, etc. The IOM shall communicate directly to the JACE through a RS485 protocol.

C. The EACIS work provided in this specification shall be performed by two entities. The EACIS Contractor shall have overall responsibility for the Division work. The Enterprise level work will be performed by the Enterprise Developer by a separate owner managed contract.

Acceptable EACIS Contractors of the hardware and software components as specified herein are as follows:

1. Premier Commercial Security
2. Envirocon
3. Strategic Connections
4. Owner Approved Equal Alternate

1.3 SUBMITTAL

A. Eight copies of shop drawings of the entire EACIS shall be submitted and shall consist of a complete list of equipment and materials, including manufacturers catalog data sheets and installation instructions. Shop drawings shall also contain complete wiring and schematic diagrams, software descriptions, calculations, and any other details required to demonstrate that the system has been coordinated and will properly function as a system. Terminal identification for all control wiring shall be shown on the shop drawings.

a. Submittal shall also include a trunk cable schematic diagram depicting operator workstations, JACE locations, Door Control Modules, Alarm Input / Output Modules, Card Readers and a description of the communication type, media and protocol.

B. Submittal shall also include a complete point list of all input and output points connected to the EACIS. EACIS contractor shall provide necessary point lists, protocol documentation, and factory support information for systems provided in this division.

C. Submittal shall also include a copy of each of the graphics developed for the EACIS Graphic User Interface including a flowchart (site map) indicating how the graphics are to be linked to one another for system navigation. The graphics are intended to be 80% - 90% complete at this stage with the only remaining changes to be based on review comments from the A/E design team and/or Owner.

D. Upon completion of the work, provide a complete set of ‘as-built’ drawings and application software on compact disk. Drawings shall be provided as AutoCAD™ or Visio™ compatible files. Eight copies of the ‘as-built’ drawings shall be provided in addition to the documents on compact disk. Division 281000 contractor shall provide as-builts for their portions of work.

E. Division 281000 contractors supplying products and systems, as part of their packages shall provide catalog data sheets, wiring diagrams and point lists to the Division 230000 contractor (when integrating with a Facility Management and Control System) for proper coordination of work. EACIS contractor shall also include a complete point list of all points available to be integrated into the FMCS. The Division 230000 contractor shall be responsible for as-builts

pertaining to overall FCMS architecture and network diagrams. All as built drawings shall also be installed into the FCMS server in a dedicated directory.

1.4 DEFINITIONS

A. Acronyms used in this specification are as follows:

EACIS	Electronic Access Control and Intrusion System
DCM	Door Control Module
FMCS	Facility Management and Control System
IOM	Input/Output Module
LAN	Local Area Network
JACE	JACE Security Controller
PICS	Product Interoperability Compliance Statement
WAN	Wide Area Network

1.5 DIVISION OF WORK

A. For reasons of security and consistency, it is the owner's intention to divide the work defined in this section into two sections. Work performed at the JACE level and below shall be performed by a qualified EACIS contractor. All work provided at the Enterprise Server and between the server and other systems shall be provided by a single Enterprise Developer. The cost for the Enterprise Developer shall be carried by the owner managed in a separate contract.

B. The Division 281000 contractor shall be responsible for all EACIS work provided at the local site or buildings including but not limited to: JACE, Digital Video Recorder (when provided, Cameras, local Alarms and Display Workstations (when provided), Door Control Modules, Card Readers, Remote Input/Output Devices, controller or DVR programming, controller or DVR programming software, BACNet zone/point information, power wiring and Controller, Module, Reader and I/O wiring.

C. The Enterprise Developer shall be responsible for the "joining" of the JACE and any DVR/Video (if applicable) to the Enterprise FMCS. The Enterprise Developer shall also provide the configuration of the Periscope Dashboard software and the global integration strategies across Division 230000 NACs, Division 281000 JACEs and DVRs, Lighting Controls and other intelligent building systems. The Enterprise Developer shall be responsible for all Security integration at the Datacenter Server level. The Enterprise Developer shall be responsible for the integrating JACE data and alarms into an existing FMCS via the local or wide area network.

1.6 RELATED WORK SPECIFIED ELSEWHERE

A. Division 08, Openings

B. Division 23, Mechanical:

1. Provide AHU control devices and systems
2. Provide fans, dampers and other control devices

C. Division 23, Facility Management and Control:

1. Provide Network Area Controllers (NAC)
2. Provide FCMS Server hardware and software

D. Division 281000 Electrical:

1. Provide disconnect switches (unless otherwise noted)
2. Power wiring and conduit (unless otherwise noted)
3. Other equipment and wiring as specified in Division 281000

1.7 AGENCY AND CODE APPROVALS

A. All products of the EACIS shall be provided with the following agency approvals. Verification that the approvals exist for all submitted products shall be provided with the submittal package. Systems or products not currently offering the following approvals are not acceptable.

1. FCC, Part 15, Subpart J, Class A Computing Devices

1.8 SOFTWARE LICENSE AGREEMENT

A. It is the owners express goal to implement an EACIS system that will allow access and occupancy data to integrated into an existing FMCS in order to provide improved energy management and security. The Owner shall be the named license holder of all software associated with any and all incremental work on the project(s). In addition, the Owner shall receive use of all job specific configuration documentation, data files, and application-level software developed for the project. This shall include all custom, job specific software code and documentation for all configuration and programming that is generated for a given project and/or configured for use with the JACE and any related LAN / WAN / Intranet and Internet connected routers and devices. Any and all required IDs and passwords for access to any component or software program shall be provided to the owner.

1.9 DELIVERY, STORAGE AND HANDLING

A. Provide factory-shipping cartons for each piece of equipment and control device. Maintain cartons through shipping, storage, and handling as required to prevent equipment damage. Store equipment and materials inside and protected from weather.

1.10 JOB CONDITIONS

A. Cooperation with Other Trades: Coordinate the Work of this section with that of other sections to ensure that the Work will be carried out in an orderly fashion. It shall be this Contractor's responsibility to check the Contract Documents for possible conflicts between his Work and that of other crafts.

2. PART 2 PRODUCTS

2.1 GENERAL

A. The Electronic Access Control and Intrusion System shall be comprised of a stand-alone security controller, a graphical user interface, door control modules, card readers, and other remote input and output devices as specified herein.

B. Some components of the EACIS, i.e. door locks, etc. are provided by other Sections.

2.2 OPEN, INTEROPERABLE, INTEGRATED ARCHITECTURES

A. The intent of this specification is to provide a stand-alone card access and intrusion system in the building with the capability to integrate to the existing FMCS via Ethernet. Integration with the FMCS shall be provided by the Enterprise Developer.

B. The supplied JACE shall employ component-oriented technology (COT) for representation of all data and control devices within the system. In addition, adherence to industry standards is required to assure interoperability between all system components. For each BACnet ANSI / ASHRAE™ Standard 135-2004, system, the system supplier must provide a PICS document showing the installed systems compliance level. Physical connection of BACnet devices shall be via Ethernet using BACnet/IP. BACNet MSTP shall not be acceptable as a means to integrate the EACIS with a FMCS.

C. The EACIS shall not require a dedicated PC to host the security application or system database. The supplied system must incorporate the ability to access all data using standard Web browsers for operator interface and configuration. An embedded database shall be provided at the JACE and connectivity is required for all system database parameter storage.

2.3 NETWORKS (PROVIDED BY OTHERS, DIVISION 27)

A. The Local Area Network (LAN) shall be a 100 Megabits/sec Ethernet network supporting BACnet, Java, XML, HTTP, and oBIX for maximum flexibility for integration of EACIS with enterprise information systems and providing support for the JACE.

B. Local area network minimum physical and media access requirements:

1. Ethernet; IEEE standard 802.3
2. Cable; 100 Base-T, UTP-8 wire, category 5
3. Minimum throughput;100 Mbps.

C. The electrical contractor shall provide all required network products (hubs, switches, cables, etc.) for a physical connection to the LAN at the JACE.

2.4 SECURITY JACE

A. The JACE shall be a Vykon Model SEC-J-8000 equal and shall be sized according to the number of readers and I/O points provided in this section.

B. The EACIS contractor shall supply JACEs as part of this contract.

C. The JACE shall provide the interface between the LAN or WAN and the door control modules (DCM) and remote input/output devices, and provide global supervisory access control functions

over the all devices connected to the JACE. The JACE shall provide multiple user access to the system. The JACE shall support standard Web browser access via the Intranet/Internet.

D. The JACE shall be capable of executing common application control programs to provide:

1. Calendar functions
2. Scheduling
3. Event and Credential database Reporting
4. Alarm monitoring and routing
5. Time synchronization
6. Integration via BACnet, Niagara^{AX} Fox, or oBIX

E. The JACE must provide the following hardware features as a minimum:

1. Smaller Facility JACE - SEC-J-8000
   a. TI AM3352: 1000MHz ARM Cortex-A8 or equal with secure boot
   b. 1GB DDR3 SDRAM
   c. Two (2) Ethernet ports – 10/100 Mbps
   d. Two isolated RS-485 ports with selectable bias and termination
   e. Batteryless system with Backup Service and RTC
   f. The JACE must be capable of operation over a temperature range of -4F to +140F (-20C to +60C) and a humidity range of 0 to 95% RH, non-condensing.
   g. The JACE shall support USB Backup and Restore
   h. The JACE shall have a removable Micro-SD card with 4GB flash total storage and 2GB user storage.
   i. The JACE shall support eight (8) additional Door Control Modules (DCM) and up to (8) Input/Output Modules (IOM).
   j. Real time clock
   k. Battery less
   l. Supports SSL and TLS encryption
   m. N4 security jace shall be sized appropriately for number of reader modules with allowance for 20% expansion.
   n. Contractor shall include SMA-8xxx-1yr (or 3yr or 5yr) in project bid.

2. Larger Facility JACE - SEC-J-8000
   a. TI AM3352: 1000MHz ARM Cortex-A8 or equal with secure boot
   b. 1GB DDR3 SDRAM
   c. Two (2) Ethernet ports – 10/100 Mbps
   d. Two isolated RS-485 ports with selectable bias and termination
   e. Batteryless system with Backup Service and RTC
   f. The JACE must be capable of operation over a temperature range of -4F to +140F (-20C to +60C) and a humidity range of 0 to 95% RH, non-condensing.
   g. The JACE shall support USB Backup and Restore
   h. The JACE shall have a removable Micro-SD card with 4GB flash total storage and 2GB user storage.
   i. The JACE shall support sixteen (16) additional remote modules, mix and match any combination of Door Control Modules (DCM) and Input/Output Modules (IOM).
   j. Real time clock
   k. Battery less
   l. Supports SSL and TLS encryption
   m. N4 security jace shall be sized appropriately for number of reader modules with allowance for 20% expansion.
   n. Contractor shall include SMA-8xxx-1yr (or 3yr or 5yr) in project bid.

F. The JACE shall provide an integrated battery backup to provide sufficient time for an orderly system shutdown in the event of a power failure. The JACE shall provide a minimum 4 hours backup operation to the EACIS while operating on battery backed power.

G. The JACE shall be mounted in a key locked, tamper switch protected metal enclosure with the following requirements:

1. The cabinet shall be suitable for wall mounting and contain a removable door for ease of installation.

2. The cabinet shall be suitably sized to allow installation of the controller and additional expansion modules if required.

3. A single tamper switch shall be incorporated into the door.

4. The enclosure shall include 4 mounting holes and sufficient knockouts on the top, bottom and sides.

2.5 DOOR CONTROL MODULE (DCM)

A. The DCM shall be Vykon model SEC-R2R.

B. The DCM shall support 2 access control reader ports, 4 supervised inputs, 2 digital output relays, 1 unsupervised input for cabinet tamper detection and 1 unsupervised input for external power source AC fail / battery low detection.

C. The DCM shall communicate with the JACE via a RS-485 connection.

D. The DCM shall provide a one wire chip for unique module address to identify installed remote modules.

E. The DCM shall be capable of operation over a temperature range of +35F to +122F (+2C to +50C) and a humidity range of 0 to 95% RH, non-condensing.

F. The DCM shall be mounted in a key locked, tamper switch protected metal enclosure with the following requirements:

1. The cabinet shall be suitable for wall mounting and contain a removable door for ease of installation.
2. The cabinet shall be suitably sized to allow installation of the controller and additional expansion modules if required.
3. A single tamper switch shall be incorporated into the door.
4. The enclosure shall include 4 mounting holes and sufficient knockouts on the top, bottom and sides.
5. The DCM shall be capable of controlling the Card Reader to provide different audible beeps for indication of either "Access granted” or “Access denied”. The Card Reader red LED shall flash

red for access denied. The Card Reader green LED shall flash green for access granted and shall show solid green when there is free access.

2.6 SUPERVISED ALARM INPUT/OUTPUT MODULE (IOM)

A. The IOM shall be Vykon model SEC-RIO or equal.

B. IOM modules shall provide inputs and outputs to monitor and control non-reader-based system points, such as door contacts, motion sensors, gate actuators, etc.

C. The IOM will support 8 supervised four-state inputs (open, closed, short and cut), 8 digital output Form C relays, 1 alarm input point for cabinet tamper detection and 1 alarm input point for external power source AC fail / battery low detection.

D. The IOM shall communicate with the JACE via the RS-485 interface.

E. The IOM shall provide 2 diagnostic LEDs for power and communication.

F. The IOM shall provide a one wire chip for unique module address to identify installed remote modules.

G. The IOM must be capable of operation over a temperature range of +35F to +122F (+2C to +50C) and a humidity range of 0 to 95% RH, non-condensing.

2.7 CARD READER

A. Card Reader shall be 12 VDC, Wiegand interface Card Reader or an approved equal. Each reader shall offer a low profile, rugged, weatherized polycarbonate sealed enclosure. Each shall be mountable indoor or outdoor.

B. The Card only reader option shall include audible “beeps” and visual “red and green LED” indication, to provide feedback to users.

C. Reader technologies shall include a Wiegand interface and shall support the following access methods:

1. Card only reader
2. Card plus Keypad reader
3. Card or Keypad reader

D. Keypad Readers (where specified in sequence or on drawings) shall be HID Keypad Reader or approved equal. Keypads shall contain 3 columns by 4 rows containing the characters 0 through

9, the pound (#) and the star (*) sign. The keypads shall be suitable for either indoor or outdoor use.

E. The EACIS contractor shall provide readers with the following minimum requirements:

1. The reader shall be HID Multi-Class SE RP40
2. The reader shall support standard Wiegand protocol for communication to the DCM
3. The reader supply voltage must be 12 VDC with average current draw of 25 mA
4. The reader housing shall be weatherproof with fully potted electronics
5. The reader must be capable of operation over a temperature range of -22F to +150F (-30C to +65C) and a humidity range of 0 to 95% RH, non-condensing

2.8 CREDENTIALS

A. Keyfob style Credentials shall be HID ProxKey II or equal.

B. Credentials shall be a minimum of 37 bit Wiegand protocol.

C. Credentials shall be compatible with a 125 Khz Operating Frequency Reader.

2.9 WEB BROWSER CLIENTS

A. The system shall be capable of supporting up to twenty five (25) simultaneous clients using a standard Web browser such as Internet Explorer™, Mozilla Firefox™, or equivalent.

B. The Web browser user interface shall support at a minimum, the following functions:

1. User log-on identification and password shall be required. If an unauthorized user attempts access, a login failed message shall be displayed. Security using authentication and encryption techniques to prevent unauthorized access shall be implemented.
2. Graphical screens shall be in the JACE , without requiring any graphics to be stored on the client machine. Systems that require graphics storage on each client PC are not acceptable.
3. Real-time values displayed on a Web page shall update automatically without requiring a manual “refresh” of the Web page.
4. The JACE shall allow Users to have administrator-defined access privileges. Depending on the access privileges assigned, the user shall be able to perform the following:
   a. Modify, Input, Delete or Override common access control objects, such as doors, credentials, interlocks, schedules, and calendars.
   b. View and acknowledge alarms.
   c. Setup and execute queries on credential and event archive information.
   d. The system shall provide the capability to specify a user’s (as determined by the log-on user identification) home page. Provide the ability to limit a specific user to just their defined home page. From the home page, links to other views, or pages in the system shall be possible, if allowed by the system administrator.
   e. Graphic screens on the Web Browser user interface shall support hypertext links to other locations on the Internet or on Intranet sites, by specifying the Uniform Resource Locator (URL) for the desired link.

2.10 INTEGRATION TO EXISTING VYKON FMCS SERVER

A. An existing Vykon Enterprise server is located at the City of Raleigh Data Center .The server shall support all JACEs and DVRs (when required) connected to the customer's network whether local or remote.

B. Local or Remote connections shall be via an Ethernet LAN/WAN. Provide a Vykon JACE and NICS statement shall be as follows

1. accept.station.in="*"
2. accept.station.out="*"
3. accept.wb.in="*"
4. accept.wb.out="*"

2.11 SYSTEM CAPACITIES

A. The EACIS system software shall support the following features and be configured for a minimum of the following:

1. 40,000 Personnel Records
2. 50,000 Buffered Transactions of System Events
3. 16 Programmable Wiegand Card Formats
4. 250 Access Levels
5. 250 Weekly Schedules
6. 32 Holidays
7. 32 Special Holidays

2.12 ACCESS CONTROL

A. Each door shall be comprised of one (1) or two (2) card readers, a door position status point, a request to exit device, and a door lock control output point designator. One or both readers may be substituted with a keypad or keypad/reader combination. The use of a second card reader and

a request to exit device should be mutually exclusive in the system, such that a door cannot be configured with both objects.

B. The EACIS software system shall support the following modes of access:

1. Card Reader – Requires card presentation only to gain access.
2. Card Plus Keypad – Requires card presentation and entry of personal identification number to gain access. *Keypads will not be not be used in City installations*.
3. Card Or Keypad – Requires either card presentation OR manual entry of card number to gain access.
4. Free Access – Does not require credential to gain access through reader. Free access will be controlled through reader assigned system schedule.
5. Manual Control - It shall be possible to control access through the door by either manual (operator) command, upon event activation or based upon time specification.

C. The system shall allow a reader to operate using the following functions:

1. Readers shall read cards while the door is in the open position.
2. The software shall allow the following door relock configurations:
   a. Unlock the door for a user definable period of time. Valid range for access unlock time shall be from 0 seconds to 1 hour.
   b. Relock the door on door open. If the door is never opened after a valid request, the system shall relock the door when the access unlock time expires.
   c. Relock the door on door closed. If the door is never closed after a valid request, the system shall relock the door when the access unlock timer expires. The system shall report a door held open alarm, if the door remains open after the access unlock and alarm sense timer expires.
3. There shall be separate timers for the operation of the door lock and the software shunting of the door switch monitor alarm point. The shunting of the door contact following the presentation of a valid access card or activation of the request to exit device shall be accomplished by software control. The use of a hardware shunt shall not be accepted. The system shall operate according to the following with the door shunt time:
   a. Door Held Open - If the door fails to close prior to the expiration of the shunt period, a "door held open" alarm shall occur at the JACE.
   b. Door Forced Open – If door position switch is armed and an intrusion occurs (door open without authorization), a “door forced open” alarm shall be annunciated.

D. The system shall allow each door to be configured to cause a variety of alarms to occur based upon activity at that door. These shall include as a minimum:

1. Door forced open
2. Door held open
3. Badge does not exist
4. Badge is lost
5. Badge is disabled
6. No active schedule
7. No access right
8. Granted but not used
9. Invalid PIN number
10. Anti Pass back violation
11. Door position switch supervision
12. Request to exit supervision

E. The system shall provide the ability for the user to configure a global offset to the system badge holder's PIN number. The system shall allow a person at a keypad reader to signal the system operator that they are entering the area under duress using the PIN duress value. This duress alarm should not be evident at the card reader. The access controls normally executed by the system, person is authorized for that door, at that time and that day of the week, shall still be enforced for a duress access event.

F. The system shall provide configuration options to control the card reader's Red LED, Green LED and Beeper functions during both a valid and invalid access request. The minimum configurations for these auxiliary reader outputs shall include:

1. Use access unlock time
2. Define custom time
3. Pulse output on and off for a definable period of bursts

G. Area Control Strategies

1. Manual Control – With the appropriate password level, a user shall be able to manually control all doors and control points via the browser based user interface. Control points are defined as any door strike or any other relay output point of a JACE, DCM or I/O module. All system outputs shall be overridden by initiating a mouse "right click" and selecting the command action from a list. All manual control commands shall be recorded into the Event log for viewing by any user given proper privileges to do so. Manual control for doors, or any relay output, shall allow the user to:

    a. Unlock the door/output (leaving the door strike unlocked)

    b. Pulse the output open

    c. Return the door/output to a pre-defined automatic setting.

    d. The Timed Anti-Pass back feature shall enable a software timer that prevents a second access at the same reader for an adjustable period of time after a cardholder has already

gained access. This helps prevent multiple swipes by an individual to allow access to others through turnstile doors.

H. The system shall support time and attendance based functionality. The software shall provide the ability to designate a card reader to be used as a “clock in” or “clock out” reader. The resulting access traffic through the time and attendance reader shall be logged in a separate report. The system should allow the OWNER to manually insert records into the log to capture missed user transactions (i.e., the user forgot to swipe their badge to either clock in or clock out).

2.13 CREDENTIAL MANAGEMENT

A. It shall be the responsibility of the Owner to enroll all personnel and badge records. The EACIS shall consist of equipment and devices placed at predetermined locations to ensure that only cardholders who are authorized to enter secured areas through certain doors or gates can do so.

B. The JACE shall generate and store up to 10,000 personnel records, and monitor badge/credential use throughout the facility. The credentials database shall be populated by the user, based on data that is input and captured at the time of enrollment.

C. The user shall be able to create personnel records either through the use of direct input into the personnel record or via an import feature. Each personnel record shall be tabular in design for easy navigation through the fields. The credential data screen shall allow for multiple credentials to be enrolled in an efficient manner. The user shall have the ability from the personnel record to easily:

1. Add, delete, or modify personnel data and shall consist of a minimum of the following data fields:
   a. Record ID Number (System Defined)
   b. Last Name
   c. First Name
   d. Middle Name
   e. Employee ID
   f. Tenant Designation
   g. Department Type
   h. Person Type
   i. Personal Identification Number (PIN)

2. Add, delete, or modify personnel data in up to 10 custom defined data fields.
3. Assign and manage the cardholder's facility access rights.
4. Assign badges to personnel records by selecting badges from the un-assigned list, input new badge, or enroll new badge from system reader.
5. Enable or disable the cards - the user shall be able to mark the card as enabled or disabled by selecting that control button.
6. Define expiration date - the expiration date shall be determined by date. It shall be possible to program future start and end dates for a new cardholder's access or any specific part of their access.
7. Define the card number and facility code.
8. Mark the card as lost - the user shall be able to mark the card as lost by selecting that control button. This shall disable the card, create a stored record with the associated card number and cardholder and generate an alarm on future access attempts.

D. The user shall be able to create badge records either through the use of direct input into the badge record, mass creation through badge enrollment, bulk badge creation by defining credential number range, or via an import feature. Each badge record shall be tabular in design for easy navigation through the fields. The OWNER shall have the ability from the badge record to easily:

1. Add, delete, or modify personnel data and shall consist of a minimum of the following data fields:
   a. Record ID Number (System Defined)
   b. Credential Number
   c. Facility Code
   d. Wiegand Format
   e. Status
   f. Tenant Designation
   g. Description
   h. Activation Date
   i. Expiration Date
   j. Owner
2. Remove badge from personnel record

E. In addition to manual input of credential information, the EACIS shall allow operator to input credential records from a properly structured CSV file. The import data screen shall allow for multiple credentials to be enrolled and edited in an efficient manner.

F. After a badge is created it shall be possible to assign access privileges to the personnel record. If a user also has proper authorization, access privileges can be overwritten. When an individual's access privileges are modified that change shall be effective immediately upon completion of the change. Changes of access privileges shall affect only the modified record, and shall not require a download of the entire cardholder database.

G. The user with proper authorization shall be able to initiate the call-up of a cardholder record. This feature shall be provided via browser to assist the user in determining access rights for an

employee who may have forgotten his or her badge. Utilizing a database search via the input of the cardholder's name, or other key search fields, the EACIS shall access the employee's personnel file, and containing pertinent information for identification by the user. This operation shall not restrict the operation of monitoring alarms.

2.14 ACCESS RIGHTS

A. Access Privileges - All cardholders shall have facility access based on privileges assigned by controlled area, time and date. For example, some badges shall only allow access to the facility on weekdays between 8:00 a.m. and 5:00 p.m., while others allow access on weekends between 1 p.m. to 5 p.m. and so on. These time zones for each day are to be pre-defined by user and shall be able to be modified quickly by authorized employees without vendor intervention. The systems shall provide the following minimum user-definable features for access privileges.

1. Description
2. Schedule
3. Tenant
4. Collection of Readers

2.15 TENANTS

A. The EACIS software shall support logical database filtering based on tenant record designations. The system shall support the creation of multiple tenant types; EACIS accesses based on users with specific tenant designations, and provide ability to assign tenants to personnel records, badge records, and access rights. For example, EACIS users assigned to tenant A shall only have access to personnel, badges, access rights, reports and alarms designated as tenant A data. While employing tenant methodology, the user shall have the ability to do the following:

1. Distribute credential management responsibilities to building tenants.
2. Display data based on EACIS user assigned tenant designation.
3. Add, delete, and modify personnel records, badges and access rights of same tenant data.

2.16 SYSTEM DATE / TIME

A. Time / Date - The time and date of the system shall be set by the JACE. Dates for Daylight Savings Time shall automatically take effect. Holiday schedules input by OWNER shall be capable of overriding normal schedules in effect. The system shall support current daylight savings rules.

2.17 ALARM MANAGEMENT

A. Alarm Notification and Actions

1. The JACE shall be capable of displaying and routing alarms directly from Door Controller Modules, or from Input/Output Modules. Any alarm (regardless of its origination) shall be integrated into the overall alarm management system and shall appear in all standard alarm reports, be available for user acknowledgment.
2. Alarm generation shall be selectable for annunciation type and acknowledgement requirements including but limited to:
   a. To alarm
   b. Return to normal
   c. To fault

3. Provide for the creation of a minimum of 255 alarm priorities to be assigned to individual alarms.
4. JACE equipment external power fail/low battery detection and network failures shall be treated as alarms and annunciated. Door Control Module (DCM-R2R), cabinet tamper and external power fail/low battery detection shall be treated as alarms and annunciated.

B. Alarms Annunciation

1. Alarm Console message
   a. The alarm Console manages alarms on a per-point basis. Each row in the alarm console is the most recent alarm from a point. To view all the current alarms from a particular security point, the user shall double click the row.
   b. To acknowledge an alarm, the owner shall select the desired alarm and click the Acknowledge button. An alarm is cleared from the alarm console when both of the following conditions exist:
      1. Alarm is acknowledged
      2. The point is in a "normal" state
   c. The user shall also be able to add notes to the alarm record using the notes dialog box.
2. Email of the complete alarm message to up to eight (8) recipients. Provide the ability to route and email alarms based on:
   a. Individual Day of week
   b. Time of day range
   c. Recipient – include the ability to cc and bcc others in the organization
   d. Type of alarm – systems shall allow user to individually assign types of alarms to go to a particular recipient including:
      1. To Off Normal
      2. To Normal
      3. To Alert
      4. To Fault
   e. Graphic with flashing alarm object(s). The background color for each alarm notification level shall be customizable to allow easy identification of certain alarm types or alarm states.
   f. Sounding of an audible beep or playing an audio file on alarm initiation or return to normal.
3. The following shall be recorded by the JACE for each alarm (at a minimum):
   a. Time and date
   b. Location (building, floor, zone, office number, etc.)
   c. Equipment (reader #, IOM point #, etc.)
   d. Acknowledge time, date, and user who issued acknowledgement.
   e. A log of all alarms shall be maintained by the JACE and/or a EACIS server (if configured in the system) and shall be available for review by the user.

2.18 EVENT NOTIFICATIONS AND ACTIONS LOG

A. A separate log for System Event Transactions shall be provided and available for review by the user.

B. Every System Event shall be time stamped with the time of occurrence and shall be recorded in the Event Log. Time stamping shall include the date, and be to the nearest second

C. All operator initiated actions shall be recorded in the Event Log. Each operator action event logged to Event Log shall be stamped with time of day and operator ID. The Event Log shall include all details of any change that an operator has carried out.

D. Provide and maintain an Event Log that tracks all activities performed on the JACE. Provide the ability to specify a buffer size for the log and support a minimum of 50,000 transactional system events.

2.19 APPLICATION HELP

A. The system software shall have on-line help available at any point requiring operator input. The help screen shall be accessible by clicking on the Help button located on the page in view. This

help screen shall provide detailed information about every property on the screen. Examples and screen captures will be available to assist in operator comprehension.

B. The on line help shall be context sensitive and automatically direct the user to the appropriate help section based on current location within the application software.

2.20 APPLICATION USER PROFILES

A. Each operator shall be given a profile as part of the operator definition. Profiles consist of a group of web pages that determine the look and feel of the user interface and the functionality that is to be assigned to each operator. Standard profiles shall include as a minimum:

1. System Administrator – Shall have full control to entire application.
2. Maintenance User – Shall have access to all sections of the application but cannot access or make changes to the system administrator account.
3. Badge Operator – Shall have access to the reports and personnel sections of the application.
4. Console Operator – Shall have access to the alarm console and reports sections of the application.

B. When an operator logs out of a workstation and a new operator logs on, the profile displayed on the workstation screen shall be automatically updated to the setting for that new operator.

C. Each profile shall provide operators with the ability to perform manual operations consistent with their area (s) of responsibilities. Manual operations available to profiles shall include as a minimum:

1. Running or printing reports
2. Locking/unlocking of doors
3. Adjusting time schedules
4. Setting / resetting control outputs
5. Creating system objects including cardholders, doors, and monitoring points

D. For each manual operation by the operator, the Activity Log will automatically record the action for display by the System Administrator or other authorized user.

2.21 DATABASE BACKUP AND STORAGE

A. The JACE shall have the ability to backup its database.

B. Copies of the current database and, at the most recently saved database shall be stored in the JACE or on designated network server. The age of the most recently saved database is dependent on the user-defined database save interval.

C. The JACE database shall be stored in XML format to allow for user viewing and editing, if desired. Other formats are acceptable as well, as long as XML format is also supported.

2.22 SYSTEM INTEGRATION

A. The EACIS shall include objects to support the integration of EACIS data to the existing FMCS. At a minimum, define the following data points and strategies as part of the standard EACIS:

1. Door or Gate Status:
   a. Door Open and Door Closed
2. IOM data Status:
   a. Status of all Inputs

b. Status of all Outputs

3. Location ID property assigned to the cardholder

a. The EACIS shall provide the Enterprise Developer with two pieces of information with respect to each individual reader that provides access to a physical space: Valid Access and Location ID.

1. The valid access property will tell the FMCS that someone has been authenticated and entered the physical space (i.e. building or parking lot). The location ID property assigned to the cardholder, via the access right, provides the FMCS a zone identifier integer value, which represents the physical location of this individual's work area within this space. As a result, during unoccupied periods, the FMCS shall turn on only the HVAC and lighting servicing needed to bring the individual's work area to occupied conditions.

2. The location ID is created under the Tenant. Create a unique integer value for each location in the building. Then when you create access rights, you can make one for each location you want to assign the cardholders.

2.23 SEQUENCE OF OPERATION

A. The EACIS shall be installed to provide for the Sequence of Operation indicated.

1. Upon presentation of a Credential at a card reader the system shall:

a. Verify the Credential is in the Credential database and active

b. Verify the Credential has the appropriate Access Right for the reader

c. Verify that the Credential has appropriate Schedule Date/Time for access

d. If any of the criteria are not met, the Credential shall be rejected with an audible and visual indication and the event annunciated in the Alarm Console with the appropriate alarm message.

e. Alarm message conditions to include: "Badge Does Not Exist", "Badge is Lost", "Badge is Disabled", "No Active Schedule", and "No Access Right",

2. Upon successful authentication of the Credential by the EACIS the system shall:

a. Trigger the appropriate relay for door/gate access

b. Log the event in the Alarm Console with the "Access Granted" descriptor along with a Date Stamp, Credential owner, and Location (building, floor, office number, etc.)

c. Output the Location ID and Valid Badge property associated with the Credential as defined in Section 2.22

3. PART 3 EXECUTION

3.1 INSTALLATION (BY OTHERS)

A. All work described in this section shall be performed by system integrators or contractors that have a successful history in the design and installation of integrated security and control systems. The installing office shall have a minimum of five years of integration experience and shall provide documentation in the submittal package verifying the company's experience.

B. Install system and materials in accordance with manufacturer's instructions, and as detailed on the project drawing set.

C. Drawings of EACIS network are diagrammatic only and any apparatus not shown, but required to make the system operative to the complete satisfaction of the Architect shall be furnished and installed without additional cost.

D. Line and low voltage electrical connections to control equipment shown specified or shown on the control diagrams shall be furnished and installed by the Electrical contractor in accordance with the specifications in Division 28.

3.2 WIRING

A. All electrical control wiring to the NAC, computers and network components shall be the responsibility of the Division 28 Contractor.

B. All wiring shall be in accordance with the Project Electrical Specifications (Division 28), the National Electrical Code and any applicable local codes. All EACIS wiring shall be installed in the conduit types specified in the Project Electrical Specifications (Division 28) unless otherwise allowed by the National Electrical Code or applicable local codes. Where EACIS plenum rated cable wiring is allowed it shall be run parallel to or at right angles to the structure, properly supported and installed in a neat and workmanlike manner.

3.3 WARRANTY

A. Equipment, materials and workmanship incorporated into the work shall be warranted for a period of one year from the time of system acceptance.

B. Within this period, upon notice by the Owner, any defects in the work provided under this section due to faulty materials, methods of installation or workmanship shall be promptly (within 48 hours after receipt of notice) repaired or replaced by the Division 281000 contractor at no expense to the Owner

3.4 WARRANTY ACCESS

A. The Owner shall grant to the EACIS contractor, reasonable access to the system during the warranty period.

3.5 ACCEPTANCE TESTING

A. Upon completion of the installation, the EACIS contractor shall load all system software and start-up the system. The EACIS contractor shall perform all necessary calibration, testing and de-bugging and perform all required operational checks to insure that the system is functioning in full accordance with these specifications. When appropriate, Division 23 and 28 contractors are to coordinate the checkout of the system when interlocks between systems are present.

Ensure that each Division has a representative present during the portion of system checkout that affects them.

B. The EACIS contractor shall perform tests to verify proper performance of card access and intrusion alarm strategies. Repeat tests until proper performance results. This testing shall include a point-by-point check out to validate 100% of the input and output points and each of the card access strategies, area groupings and reporting/logging.

C. Upon completion of the performance tests described above, repeat these tests, point by point in presence of Owner's Representative, as required. Properly schedule these tests so testing is complete at a time directed by the Owner's Representative. Do not delay tests so as to prevent delay of occupancy permits or building occupancy.

D. System Acceptance: Satisfactory completion is when the Division 28 contractor has performed successfully all the required testing to show performance compliance with the requirements of the Contract Documents to the satisfaction of the Owner’s Representative. System acceptance shall be contingent upon completion and review of all corrected deficiencies.

3.6 OPERATOR INSTRUCTION, TRAINING

A. During system commissioning and at such time acceptable performance of the EACIS hardware and software has been established the Temperature Control sub-contractor shall provide on-site operator instruction to the owner's operating personnel. Operator instruction shall be done during normal working hours and shall be performed by a competent representative familiar with the system hardware, software and accessories.

B. The Division281000 contractor shall provide 8 hours of instruction to the owner's designated personnel on the operation of the EACIS and describe its intended use with respect to the programmed functions specified. Operator orientation of the EACIS shall include, but not be limited to; the overall operation program, credential management, alarm management, interlocking, area control, systems integration, card access strategies, reporting and appropriate operator intervention required in responding to the System's operation.

C. The training shall be a one day session (or as specified) after system is started up and at least one week before first acceptance test. Manual shall have been submitted at least two weeks prior to training so that the owners' personnel can start to familiarize themselves with the system before classroom instruction begins.

END OF SECTION

Section 28 20 00 – Video Surveillance System

Part 1 - General

1. Scope

   A. Refer to Section 27 00 00 for additional project scope information.

   B. This section describes the general product and execution requirements related to furnishing and installing the project's Video Surveillance System. Requirements shall be understood to be the City of Raleigh's minimum and shall be expanded as necessary to ensure quality.

   C. Contractor shall be responsible for providing complete and fully functional system as described in this specification and project drawings.

   D. The digital video surveillance system for this project will consist of the following and shall be covered under the Base Bid:

      1. IP security camera system (and associated power supplies and media convertors if required)
      2. Video Monitoring System (VMS) consisting of Milestone Video Archiver(s) and Milestone Video Monitoring Workstation (City of Raleigh standard)
      3. Miscellaneous terminations, programming, licenses and updates to extend up to the Owner's final acceptance of the installed security system.
      4. All necessary wiring, cabling, conduit, raceways, data communication circuits, cable trays, firestopping, labor, tools, equipment, licenses and ancillary materials required to furnish and install new security cameras, video archiver and video monitoring workstation and recording system.
      5. Coordinating, configuring, connecting all cameras, video archiver and video monitoring workstations to Owner's network and testing cameras and associated equipment to ensure fully functioning security system integrated with the Owner's existing Milestone Video Management System.
      6. Contractor shall coordinate with the Owner for all specific network standards and for local area network (LAN) connections.
      7. Contractor shall provide all Milestone and camera integration licenses necessary to integrate the Milestone Video Management System into the Owner's Vykon Access Control System.
      8. Contractor shall be responsible for coordinating any network, software and hardware equipment needed to connect any device or server to the Owner's network. If any device or server does not meet the Owner's network requirement specification, the Contractor shall be responsible to bring the delinquent device up to the Owner's required specification before connecting the device to the Owner's network.

9. Installation of the security camera system and providing onsite professional services to assist in the initial setup and programming of all systems to bring components up to fully functioning operational status for acceptance. This shall include but not be limited to the following:
    a. Determine hardware, software and operations requirements for implementation.
    b. Set up and configure parameters on each camera for recording on the Video Archivers.
    c. Set-up optimum recording parameters on each Video Archiver.
    d. Test video system operations based on a camera by camera walkthrough.
    e. Perform end-user training.

2. Related Work

A. Section 27 00 00 – General Technology Requirements

B. Section 27 05 00 – Communications General Requirements

C. Section 27 05 23 – Pathways for Technology Systems

D. Section 27 11 00 – Communications Equipment Rooms

E. Section 27 15 00 – Communications Horizontal Cabling

F. Section 27 16 00 – Communications Connecting Cords

G. Section 27 18 00 – Communications Labeling and Identification

3. Definitions

A. Refer to Section 27 00 00 for additional definitions.

4. Reference Standards and Codes

A. Refer to Section 27 00 00 for additional standards, codes and requirements.

5. Qualifications

A. The Contractor shall be Milestone system Certified and shall submit evidence of their certification with their bid.
    1. If the Contractor is not properly qualified and certified in a particular system stated in this specification or shown in the project drawings, the Contractor is allowed to sub-contract the work performed on the particular system to a properly qualified and certified sub-Contractor. This Sub-Contractor shall meet the same Contractor requirements as stated elsewhere in this section.

B. Contractor shall supply information attesting to the fact their firm is an authorized product installer / integrator for the proposed system.

C. Contractor shall supply information attesting to the fact that their installation and service technicians are competent factory trained personnel capable of maintaining the video security system and providing reasonable service time.

D. Due to the nature of work involved and the interconnectedness to the City's existing Security Management System, Contractors planning to bid shall have been regularly engaged in the installation and maintenance of IP-based CCTV video, similar in size and scope that outlined herein for a period of no less than five years.

E. Contractor shall provide a minimum of three references whose systems' experience are of similar complexity and have been installed and maintained by the security system integrator in the last five (5) years.

F. The video camera system provided per this section shall be based on Niagara Framework (or "Niagara") a Java-based framework developed by Tridium Inc. Surveillance software and components without a Niagara Framework platform driver are unacceptable.

G. Contractors desiring to bid shall provide the following:

1. Descriptive statement identifying that the Contractor has participated in a prequalification process conducted by the Owner and has been deemed qualified to perform work on any City of Raleigh owned property at the time of bidding.
2. Niagara Compability Statement (NiCS) describing various levels and types of building systems controls interoperability for proposed equipment to meet the specification and Owner's goal of an open system. This NiCS statement is to include:
    a. Station Compatibility In
    b. Station Compatibility Out
    c. Tool Compatibility In
    d. Tool Compatibility Out
2. Include an overview of all system components and devices including network communication devices. Provide the manufacturer specifications for each system component to include any applicable software applications required.

H. At the time of bidding, Contractors shall be licensed by all appropriate authorities (state, municipal and local) for the type of work to be performed. Contractors who have licenses or permits pending, relevant to this project, shall not be considered acceptable for bidding on this project.

I. Acceptable Contractors / Camera Systems Integrators qualified to bid on the video security system hardware and software components and installation are as follows:

1. Envirocon
2. Strategic Connections
3. Premier Commercial Security

4. Approved Equivalent Firms with staff that have passed a formal training program prior to being certified to sell and install the system and that possess certification that requires annual re-qualification.
5. Interested firms should contact the City of Raleigh Integrated Facilities Services Department to submit their materials to become prequalified:

   Echo.Swanzey@raleighnc.gov

J. Refer to Section 27 00 00 for additional requirements.

6. Pre-Construction Submittals

A. Submittals shall be as follows:

1. The contractor shall submit shop drawings for the project. Shop drawings shall include:
   a. Point-to-point wiring diagrams for the entire system and detailing of each device location and all associated wire runs.
   b. Provide a separate layout drawing for each equipment room / Drop location. The equipment room layout drawings shall show each component and detail the wiring for all devices connected to all components within the equipment rack.
   c. Drawings shall also show the labeling of each cable connection point, each wire connected to the connection point and each cable leaving the rack or panel. The layout drawings shall indicate in detail the labeling of each component within the rack or associated panel including, but not limited to, power supplies, terminal strips, switches and Video Archivers.

B. Product data including manufacturer's technical data sheets on each product proposed.

C. Contractor shall submit detailed description of all equipment locations and mounting particulars. The Contractor shall describe coordination efforts that have been made or need to be made by the Contractor and the Owner for the installation to proceed on schedule in the manner described.

D. Contractor shall submit complete and detailed programming parameters of all video surveillance equipment to the Owner a minimum of 30 days prior to the development and implementation of the programming.

E. Contractor shall provide evidence that the power capacity is sufficient for the proper operation of the powered devices under maximum load where AC or DC power supplies are used for Class 1, 2, or 3 Power-Limited Circuits. Detailed calculations of the power requirements shall be acceptable for this purpose.

F. Manufacturer's User's manuals for operations, administration installation and maintenance.

G. Refer to Section 27 00 00 for additional requirements.

7. Construction Progress Submittals

A. Refer to Section 27 00 00 for additional requirements.

8. Closeout Submittals

A. Refer to Section 27 00 00 for additional requirements.
B. As-built drawings
C. Training course materials.
D. Commissioning Test Plan and Check-off List.
E. As-built Drawings – kept up to date throughout system installation and reflecting all changes and additions made to the security systems.

9. General Summary

A. System shall include installation, configuration and integration of IP cameras into a server based NVR with client stations and storage as described in this section and on the drawings.

B. The Category 6 cabling to each camera shall be provided by the structured cabling Contractor. Patch cords for the IP cameras to the network switches and from the IP cameras to the data jack shall all be furnished and installed by this Contractor.

C. System installation shall include, but not be limited to, installation, programming, and configuration of system components as well as all associated software upgrades, patches, and maintenance for the first year.

D. Contractor is responsible for meeting with Owner's representative at time of camera installation to verify exact placement and view of each camera to ensure coverage area is as intended.

10. Drawing Sheets

A. All cameras are designated with a CAM symbol on the project drawings. Each camera has a corresponding label of the format "*#-##".

B. New Category 6 cabling shall be provided at each camera location.

11. Mounting and Installation

A. Contractor shall provide the appropriate mounting hardware for all ceiling types and wall types where cameras shall be located.

B. Wall mounted 180/360 degree or multi-sensor cameras shall be mounted horizontally on a wall arm, gooseneck, parapet, pendant or other similar method.

C. Exterior building mounted cameras shall be mounted on a wall arm/gooseneck if surface mounting is not possible.

D. Cameras mounted in lay-in tile or drop ceiling shall have a tile support bridge with a steel support cable connected to structure to prevent tile sagging, theft

and vandalism.

12. Code and Standard Requirements

A. All work and materials shall conform in every detail to the rules and requirements of the National Fire Protection Association, National Electric Code and any other codes as required by the Authority Having Jurisdiction.

B. All materials shall be listed by UL and shall bear the UL label. If UL has no published standards for a particular item, then other national independent testing standards shall apply and such items shall bear those labels. Where UL has an applicable system listing and label, the entire system shall be so labeled.

C. Cameras shall meet the following standards:

1. MPEG-4:
   a. ISO/IEC 14496-10 AVC (H.264)
2. Networking:
   a. IEEE 802.3af (Power over Ethernet)
3. Network Video:
   a. ONVIF Profile S or better

Part 2 - Products

2.1 Quality Assurance

A. All product materials and equipment shall conform to grade, quality and standards specified. Materials, equipment and software shall be of the most recent version or production design available at the time of installation.

2.2 Approved Manufacturers:

The following manufacturers produce equipment or components which are included in this specification or which are approved for use by the City of Raleigh: (Inclusion on the list below does not imply that all products produced by the manufacturer are acceptable for use in the systems described within this specification.)

1. Altronix
   140 58th Street
   Brooklyn, NY 11220

2. Arecont Vision
   425 East Colorado Street 7th Floor
   Glendale, CA 91205

3. AXIS Communication Inc.
   300 Apollo Drive

Chelmsford, MA 01824

4. Dell Inc.
   1 Dell Way
   Round Rock, Texas 78682

5. Hanwha Techwin America (Samsung)
   50 Frank W. Burr Blvd. Suite 43
   Teaneck, NJ 07666

6. HP Inc.
   1501 Page Mill Road
   Palo Alto CA 94304

7. Life Safety Power
   750 Tower Road, Unit B
   Mundelein, IL 60060

8. Milestone Systems Inc
   8905 SW Nimbus Avenue Suite 400
   Beaverton, OR 97008

9. Panasonic Corporation
   Two Riverfront Plaza
   828 McCarter Hwy.
   Newark, NJ 07102

10. Seneca
    6040 Tarbell Rd
    Syracuse, NY 13206

11. Transition Networks
    10900 Red Circle Drive
    Minnetonka, MN 55343

12. Veracity USA Inc.
    17000 Preston Road, Suite 120
    Dallas, TX 75248

13. Ditek Surge Protection
    One Ditek Center
    1720 Starkey Road
    Largo, FL 33771

14. Victron Energy (Solar Equipment)

15. Cambium Networks
    3800 Golf Rd, Rolling Meadows, IL 60008

2.3 Video Monitoring System (VMS) General Requirements

A. The VMS shall support video encoded in MJPEG and H.264 compression formats.

B. The VMS shall synchronize to a common NTP server as the cameras and other security systems.

C. The VMS shall synchronize with the Owner's Active Directory system and existing Milestone XProtect Corporate VMS.

D. The VMS shall synchronize with the Owner's Niagara Framework based FMCS or to other existing FCMS via Ethernet using the BACnetIP protocol.

E. The VMS shall synchronize with the Owner's Milestone XProtect Corporate management server located in the City's data center.

F. The VMS system shall support all camera system components connected to the Owner's network whether local or remote and integrate with the existing Niagara based server located in the Engineering Services, Facilities and Operations Management office.

G. The VMS shall be connected to the Owner's Exchange system for email based notifications.

H. The Owner shall be able to receive all major and minor software updates at no additional cost for the duration of the project. At the completion of the project the Owner shall have the option to receive a final software update to the latest version before the project is paid in full. All NVRs shall be on a consistent version enterprise wide.

I. The system shall be licensed for Enterprise installation.

J. The system shall log all actions on a per user basis, all alarms and notifications on a per device basis and all errors and failures on a per device basis. These logs shall have the ability to be extracted to a document that can be emailed to an administrator.

K. The NVR software shall launch automatically when operating system is booted and run in the background regardless if a user is logged on.

L. The administrator shall be able to perform the following actions from the interface:

1. Manage the system licenses.

2. Define the client-to-server communications security settings.

3. Configure the network communications hardware, including connection addresses and ports.
4. Configure mail server SMTP settings and port. The Contractor shall coordinate with the Owner on email accounts to be added.
5. Configure event and alarm history storage options.

M. The software shall support the configuration and management of users and user groups. An administrator shall be able to add, delete, or modify a user or user group.

N. The software shall support partitions and limit what users can view in the configuration database. The administrator shall be allowed to segment a system into multiple security partitions. The Contractor shall coordinate with the Owner on required partitions.

1. A user who is given access to a specific partition shall only be able to view component within that partition.
2. A user or user group can be assigned administrator rights over the partition.
3. It shall be possible to specify user and user group privileges on a per partition basis.

O. The software shall provide the ability to configure key frame (I-Frame) interval.

P. The software shall have the ability to assign independent pre- and post-alarm recording on a per camera basis.

Q. The software shall support the configuration of motion detection from the software platform and not through the cameras web interface.

R. The software shall have the ability to assign motion detection zones on a per camera basis.

S. The Archiver Recording Server shall have the ability to redirect audio/video streams to active viewing clients on the network using UDP or TCP.

T. Manufacturer:

1. Milestone: Video Archiver(s) and Milestone Video Monitoring Workstation (City of Raleigh's Standard). **No substitutions**

2.4 Network Video Recorder (NVR)

A. Server NVR's shall be leased through city of Raleigh provider for five years. Include a three-month lead time for lease process to take place for equipment procurement.

B. The NVR shall be purpose built for surveillance, video optimized storage and management. The manufacturer shall guarantee performance with the system design at the time of lease.

C. The NVR shall have a dedicated SSD drive for the operating system and software and an additional spinning drive(s) for video recording. The failure of a recording drive shall not affect the operating system drive.

D. The NVR shall have an integrated DVD-RW drive and digital video output to connect to a KVM.

E. Each NVR shall synchronize to the City's Active Directory system for user management. The Contractor shall connect this unit directly to the Owner supplied secure network and coordinate with the City's IT Department for connection and IP information.

F. Contractor shall coordinate with the Owner for the connection of the Milestone equipment into the Owners Vykon system for any remote monitoring and managing. This unit shall be installed, configured, programmed and attached to the network by the Contractor.

G. The NVR shall be rack mount unless noted otherwise. The contractor shall provide with a 4-post to 2-post converter when installed on a 2-post rack.

H. The Contractor shall provide a monitor, keyboard and mouse with each NVR. Provide a KVM when the NVR is rack mounted.

I. Video recording system shall meet the following minimum parameters:

Integrated facility services reserve the right to utilize Milestone Husky product line where we deem appropriate.

Small Site

Disk Config Type	***# of Cameras 12 (Includes 1 POS)***
Live DB Config	800 GB
Archive DB Config	10TB
OS and Application Volume - Disk Config	2 x 300 GB (600 GB)
Server Config	
Processor	Intel Xeon Silver
RAM	16 GB
NIC	2 10 GB NICs
IDRAC	IDRAC Enterprise
OS	Windows Server 2019 x64 Standard/Datacenter

Medium Site

Disk Config Type	***# of Cameras 20 + (Includes 2 POS)***
Live DB Config	1 TB - RAID 1
Archive DB Config	40 TB - RAID 5
OS and Application Volume - Disk Config	2 x 300 GB (600 GB) - RAID 1
Server Config	
Processor	Intel Xeon Silver
RAM	16 GB
NIC	2 10 GB NICs
IDRAC	IDRAC Enterprise
OS	Windows Server 2019 x64 Standard/Datacenter

Large Site

Disk Config Type	***# of cameras 40 + (Includes 4 POS)***
Live DB Config	2 TB RAID 1
Archive DB Config	70 TB RAID 5
OS and Application Volume - Disk Config	2 x 300 GB (600 GB) - RAID 1
Server Config	
Processor	2x Intel Xeon Silver
RAM	16 GB
NIC	2 10 GB NICs
IDRAC	IDRAC Enterprise
OS	Windows Server 2019 x64 Standard/Datacenter

Extra Large Site

Disk Config Type	***# of cameras 60 + (Includes 6 POS)***
Live DB Config	4 TB RAID 1
Archive DB Config	80 TB RAID 5
OS and Application Volume - Disk Config	2 x 300 GB (600 GB) - RAID 1
Server Config	
Processor	2 x Intel Xeon Silver
IDRAC	IDRAC Enterprise
RAM	16 GB
NIC	2 10 GB NICs
OS	Windows Server 2019 x64 Standard/Datacenter

A. The Milestone Video Archiver shall be configured with the latest version of XProtect Professional + Software.

B. The NVR shall not be manufactured by the Contractor or a company the Contractor owns.

C. The Contractor shall verify all server calculations with the criteria identified within these specifications. The Contractor shall also verify existing site conditions and provide the appropriate hardware to mount the NVRs in a secured, professional and workmanship like manner.

2.5 Video Workstation

A. System overview

1. If workstation is called for machine will be on city lease.

2. Contractor shall provide, configure and install a video monitoring workstation within the facility as indicated on the drawings.

B. Workstation shall consist of the following:

1. The workstations shall be a PC computer with Microsoft Windows 10 64-bit operating system minimum by the factory and with a 64-bit processor. The workstations shall require an external monitor, keyboard and mouse for operation.
2. Provide and install the latest version of Milestone XProtect software on the workstation.
3. As a minimum, the workstation shall have at a minimum 500-watt power supply using an 4th Generation Intel i7-4770 processor. Each workstation shall have 16 GB of RAM memory, a 16x DVD +/- RW drive, 6 USB 2.0 ports, a LAN connection 10/100/1000 MB Ethernet card., an onboard VGA Adapter with 128 MB of RAM

and additional case fan cooling. The workstations shall be equipped with a PS-2 or USB wheel mouse and 101-key keyboard or shall meet the manufacturers minimum standard.

4. The workstations shall be housed in a mid-height tower. It shall be constructed of steel and plastic materials. It shall also be operated indoors in a temperature range not to exceed 32 to 104° F (0 to 40° C) and a humidity range not to exceed 0 to 95% relative, in a non-condensing atmosphere. The workstations shall employ a Universal Voltage Power Supply requiring 105 - 240 VAC @ 50 - 60 Hz.
5. The workstations shall have a minimum of internal solid-state hard-drive storage of 1TB.
6. The workstation shall have Dual (2) NVIDIA GTX 970 PCI Express 3.0 graphics cards. These graphic cards shall have 4 GB of on board memory and shall support Microsoft Direct X Level 12_1.

C. Environmental Specifications
   1. Operating Temperature Range: 32 to 104ºF (0 to 40ºC).
      a. Operating Humidity Range: 0 to 95%, non-condensing.

D. Certifications
   1. CE
   2. UL Listed

E. Monitor
   1. Provide one (1) 23” LCD monitor with the workstation.

F. The LCD monitor shall be a desktop monitor with optimum resolution of 1366 x 768. The viewing area shall be 508mm x 286 mm. The panel aspect ratio shall be 16:9 and support up to 1080i video format.

G. The monitor shall have front panel controls for power on/off, source/enter, menu/exit, up, down.

H. An LED indicator shall be located on the front of the monitor for power indication.
   1. Minimum Monitor Electrical Specifications
      i. Input Voltage: 100 to 240 VAC, 50/60Hz
      ii. Input Interfaces: S-Video looping, RGB, Component, DVI and HDMI
      iii. Power Consumption: 110 Watts
      iv. Viewing Area: 508mm x 286mm.
      v. Resolution: 1366 x 768.
      vi. Brightness: 500cd/m2.
      vii. Contrast Ratio: 700:1.
      viii. Backlight Type: 6 CCFL.
      ix. Viewing Angle: 160°/160°.
      x. Response Time: 8ms
      xi. Operating Temperature: 32° to 104°F
      xii. Certifications: CE Class A, FCC Class A, TUV Listed, and C-Tick.

13. Mapping Software

A. The VMS software shall be provided with native integrated mapping software.

B. The mapping software shall be compatible with PDF, JPEG and PNG.

C. The Contractor shall provide a satellite level map showing all applicable City buildings. This map shall include drill down links to access the interior building floor plans where all interior and exterior devices are shown. There shall be links to jump back to the satellite view from each floor plan.

D. The Contractor shall setup all interior maps to include all devices within the system.

E. The Contractor shall be responsible to provide all the labor to setup these maps and place all the devices.

F. The Contractor shall get sign-off from the Owner and Consultant on the finished maps.

G. The Contractor shall obtain the building plans from the Owner or Design Consultant for their use.

14. Enterprise System Monitor (ESM)

A. The Contractor shall provide and install ESM software to enable remote management of all NVRs.

B. The ESM server shall be virtualized on the Owners new virtual machine. Coordinate with the IT department the exact system requirements, virtual machine setup and remote access.

C. Provide with SQL Express if capable or a full version of SQL Server Standard if the manufacturer requires it.

15. VMS Video Storage

A. Provide a minimum of thirty-one (31) days and ninety (90) days at point of sale of storage calculated at the following resolution and rates. Provide all hardware, software and configuration needed to accomplish this.

1. The system shall be enabled for an automatic video cleanup at 31 days.

B. Record stream using Unicast RTP/TCP on stream 1.

C. Pre- and post-record buffer of 5 seconds.

1. Interior Cameras:

a. 15 fps

b. 1 keyframe (I-Frame) per second

c. Max resolution

d. 100% full time recording with motion metadata

e. VBR or framerate priority with cap appropriate to resolution and quality

f. H.264 Main Profile compression

g. Smart codec enabled at a medium setting with a dynamic GoP of up to 8 seconds.

h. 1024 Mbps per mega pixel data rates (ie 2048 Mbps for a 2mp camera). No bitrate cap when smart codecs are enabled or 8Mbps when no cap is not possible.

i. Audio encoding (for cameras with microphones connected or built into them).

2. Exterior Cameras:

a. 15 fps

b. 1 keyframe (I-Frame) per second

c. Max resolution

d. 100% full time recording with motion metadata

e. VBR or framerate priority with cap appropriate to resolution and quality

f. H.264 Main Profile compression

g. Smart codec enabled at a medium setting with a dynamic GoP of up to 4 seconds.

h. 1024 Mbps per mega pixel data rates (ie 2048 Mbps for a 2mp camera). No bitrate cap when smart codecs are enabled or 8Mbps when no cap is not possible.

16. Cameras and Devices

A. General:

1. All cameras and devices shall be time synced to the Owner's NTP server. Coordinate with the Owner to acquire the appropriate NTP address to use.

2. The contractor shall coordinate with the owner for IP addressing, network configuration, QoS and multicast network configuration.

3. The Contractor shall enable QoS on all cameras and intercoms for the video stream, audio stream, event/alarm data, management and metadata at the Owners request.

4. The system shall be configured for multicast. All cameras shall have a multicast Time To Live (TTL) setting of at least 64.
5. The Contractor shall select the appropriate mounting hardware for the situation and confirm with consultant and Owner prior to installation.
6. The Contractor shall select the appropriate mounting hardware for the situation and confirm with consultant and Owner prior to installation.
7. All cameras shall be equipped with remote autofocus or autoback focus with the exception of 180/360 degree cameras and encoded analog cameras.
8. Multi-sensor 180 and 360 cameras shall have each sensor optimally calibrated independently to the conditions.
9. All cameras shall be vandal proof and appropriate for the environment in which it is being installed.
10. All cameras shall have the latest VMS recommended firmware installed and all cameras of the same model shall have matching firmware versions. The Contractor shall provide all necessary firmware upgrades to keep the Owner on the latest version throughout the duration of the project. At the completion of the project the Owner shall have the option to receive a final firmware update the latest version before the project is paid in full. All cameras of the same make and model shall be on the same firmware version.
11. The contractor shall coordinate with the Owner for IP addressing, network configuration and multicast network configuration.
12. All cameras regardless of manufacturer/model shall have a consistent username and non-standard password set. This shall be documented and provided to the Owner and consultant prior to inspections.
13. The camera requirements below represent general performance criteria. Approved equals will have slight differences in specifications. The Owner and Consultant have complete discretion to reject approved equals that stray too far from the minimum requirements.

B. Camera TYPE-1 CAM – Interior/Exterior Overview Low Light / WDR 5MP Vandal Dome IP camera shall be:
   1. GENERAL DESCRIPTION
      a. Video Compression and Transmission – The camera shall have the following properties relating to the video signals it produces.
         - H.265, H.264 and MJPEG compression, each derived from a dedicated encoder and capable of being streamed independently and simultaneously
            - H.265 and H.264 – frame rates to maximum 30 fps at all resolution
            - MJPEG – frame rates to maximum 30 fps Maximum frame rates are available at selected resolutions:H.265 and H.264: 30 fps is available

at all resolutions. MJPEG: 30 fps is available

- The camera shall be able to configure up to 10 independent video stream profiles with differing encoding, quality, frame rate, resolution, and bit rate settings.
- The camera shall be able to configure various resolution selections
  - 16:9 aspect ratio: 2560 x 1440, 1920 x 1080, 1280 x 720, 800 x 448, 640 x 360
  - 4:3 aspect ratio: 2560 x 1920, 1600 x 1200, 1280 x 960, 1024 x 768, 800 x 600, 640 x 480, 320 x 240,
  - 5:4 aspect ratio: 1280 x 1024, 720 x 576,
  - 3:2 aspect ratio: 720 x 480,
- The camera shall be able to stream at least 10 independent video stream type using unicast protocol
- The camera shall support multicast and unicast video streaming
- The camera shall be able to configure Dynamic DNS (DDNS).
- Smart Codec, Dynamic GOV, and Dynamic fps to efficiently manage bitrate of the video stream.

b. Camera – The camera device shall have the following physical and performance properties:
   - Dustproof, waterproof, and IP67 rated.
   - IK10 rated for protection against impacts.
   - True day/night operation with removable IR cut filter
   - Lens: 3.9 - 9.4 mm (2.4x) motorized varifocal lens
     - Low light level operation to 0.07 lux at F1.3 in color mode and 0 lux in black and white mode with IR LED on.
   - The camera shall support digital noise reduction using both 2D and 3D noise reduction technology
   - Integral IR illumination, providing effective visibility of 50m(164.04ft) at 0 Lux when activated in Black & White mode.
   - Configurable a privacy masking regions utilizing a 4 point polygon
   - The camera shall provide video display on smart phone (iPhone, Android) to adjust viewing angle, rotation and focus using a direct USB connection and/or Wi-Fi dongle.

c. Intelligence and Analytics – The camera shall have a suite of integral intelligent operations and analytic functions to include:
   - Motion detection with eight definable detection areas with 8 point polygonal zones, minimum / maximum object size.
   - Detection of logical events of specified conditions from the camera's video input
     - camera tamper (scene change)
     - defocus detection
     - fog detection
     - motion detection with metadata
     - face detection
     - virtual area-based event (intrusion, enter/exit, appear/disappear, loitering)

- virtual line-based event (directional detection, crossing)
- Detection of logical events of specified conditions from the camera's audio input
- sound classification (scream, gunshot, explosion, crashing glass)
- Interoperability – The camera shall be ONVIF Profile S and G compliant.
- The camera shall possess the following further characteristics:
  - Built-in web server, accessed via standard browsers including Internet Explorer, Firefox, Chrome & Safari
  - Dual edge recording slot like Micro SD/SDHC/SDXC memory card with configurable pre-alarm and post-alarm recording intervals
  - NAS recording option with configurable pre-alarm and post-alarm recording intervals
  - bi-directional audio
  - Alarms and notifications
    - alarm notification triggers:
    - motion detection
    - tampering detection
    - alarm input
    - defocus detection
    - fog detection
    - face detection
    - audio detection
    - video & audio analytics
    - network disconnection
    - available notification means upon trigger:
    - file upload via FTP and e-mail
    - notification via e-mail
    - record to local storage (SD card) or NAS storage
    - external output
    - move to DPTZ preset
  - Pixel Counter available in the web viewer.
  - PoE capable including heater by PoE

2. RECORDING PROFILE: 30day Archive, 15fps @Full Resolution, 35% Motion Events per 24hrs

3. Basis of Design: Hanwha-Techwin XNV-8080R

4. Provide flush mount kit and any additional mounting hardware as required for each camera. Mounting hardware shall be approved for plenum ceiling and shall have knock outs for conduit connectivity with no exposed wiring. Provide additional mounting equipment as necessary.

C. Camera TYPE-2 – Interior Overview 5MP Vandal Dome IP camera shall be:
1. GENERAL DESCRIPTION
a. Video Compression and Transmission – The camera shall have the following properties relating to the video signals it produces.
- H.265, H.264 and MJPEG compression, each derived from a dedicated encoder and capable of being streamed independently and simultaneously.
  - H.265 and H.264 – maximum of 30fps at all resolution
  - MJPEG – maximum of 15fps
- The camera shall be able to configure up to 10 independent video stream profiles with differing encoding, quality, frame rate, resolution, and bit rate settings.
- The camera shall be able to configure various resolution selections.
  - 16:9+ aspect ratio: 2592 x 1464, 800 x 448
  - 16:9 aspect ratio: 1920 x 1080, 1280 x 720, 640 x 360
  - 4:3 aspect ratio: 1280 x 960, 800 x 600, 640 x 480
  - 5:4 aspect ratio: 720 x 576
  - 3:2 aspect ratio: 720 x 480
- The camera shall support unicast video streaming up to 6 users.
- The camera shall support multicast video streaming
- The camera shall be able to configure Dynamic DNS (DDNS). DDNS shall be provided with no additional cost by the manufacturer.
- The camera shall provide WiseStream Ⅱ, Dynamic GOV and Dynamic fps to efficiently manage bit rate of the video stream and reduce storage.

b. Camera – The camera device shall have the following physical and performance properties:
- Dustproof, waterproof, and IP66 rated.
- IK10+ rated for protection against impacts.
- True day/night operation with removable IR cut filter
- Lens: 3.2 - 10.0mm Motorized Vari-focal
  - Low light level operation to 0.15 lux at F1.6 in color mode and 0 lux in black and white mode with IR LED on.
- The camera shall be able to produce clear images in highly contrast scenes with multi-exposure wide dynamic range up to 120dB.
- The camera shall support digital noise reduction using both 2D and 3D noise reduction technology.
- The camera shall be able to configure 6 privacy masking areas with rectangles.
- The camera shall provide video display on smart phone (iPhone, Android) to adjust viewing angle, rotation and focus.

c. Intelligence and Analytics – The camera shall have a suite of intelligent analytic functions.
- Motion detection with 4 definable detection areas with 4 point polygonal zones, and minimum/maximum object size.
- Detection of logical events of specified conditions from the camera's video
  - Tampering, Directional Detection, Virtual Line, Enter/Exit
  - Defocus Detection

- Motion Detection

d. Interoperability – The camera shall be ONVIF Profile S, G and T compliant.
e. The camera shall possess the following further characteristics:
   - Built-in web server accessed via non-plugin browsers including Google Chrome, IE11, MS Edge, Mozilla Firefox and Apple Safari.
   - Micro SD/SDHC/SDXC memory card with configurable pre-alarm and post-alarm recording intervals
   - NAS recording option with configurable pre-alarm and post-alarm recording intervals
   - Alarms and notifications
     - alarm notification triggers:
       - Alarm input
       - Motion detection
       - Video analytics
       - Network disconnect
     - available notification means upon trigger:
       - File Upload via FTP and E-mail
       - Notification via E-mail
       - Local storage (SD / SDHC / SDXC) or NAS recording at event triggers
       - External output
   - Pixel Counter available in the web viewer.
   - PoE capable including heater by PoE

2. RECORDING PROFILE: 30day Archive, 15fps @Full Resolution, 35% Motion Events per 24hrs

3. Basis of Design: Hanwha-Techwin QNV-8080R

4. Provide flush mount kit and any additional mounting hardware as required for each camera. Mounting hardware shall be approved for plenum ceiling and shall have knock outs for conduit connectivity with no exposed wiring. Provide additional mounting equipment as necessary.

D. Camera TYPE-3 – Interior Transaction Area 5MP Vandal Dome IP camera shall be:
1. GENERAL DESCRIPTION
   a. Video Compression and Transmission – The camera shall have the following properties relating to the video signals it produces.
      - H.265, H.264 and MJPEG compression, each derived from a dedicated encoder and capable of being streamed independently and simultaneously.
        - H.265 and H.264 – maximum of 30fps at all resolution
        - MJPEG – maximum of 15fps
      - The camera shall be able to configure up to 10 independent video stream profiles with differing encoding, quality, frame rate, resolution, and bit rate settings.
      - The camera shall be able to configure various resolution selections.
        - 16:9+ aspect ratio: 2592 x 1464, 800 x 448
        - 16:9 aspect ratio: 1920 x 1080, 1280 x 720, 640 x 360

- 4:3 aspect ratio: 1280 x 960, 800 x 600, 640 x 480
- 5:4 aspect ratio: 720 x 576
- 3:2 aspect ratio: 720 x 480

- The camera shall support unicast video streaming up to 6 users.
- The camera shall support multicast video streaming
- The camera shall be able to configure Dynamic DNS (DDNS). DDNS shall be provided with no additional cost by the manufacturer.
- The camera shall provide WiseStream Ⅱ, Dynamic GOV and Dynamic fps to efficiently manage bit rate of the video stream and reduce storage.

b. Camera – The camera device shall have the following physical and performance properties:
   - Dustproof, waterproof, and IP66 rated.
   - IK10+ rated for protection against impacts.
   - True day/night operation with removable IR cut filter
   - Lens: 3.2 - 10.0mm Motorized Vari-focal
     - Low light level operation to 0.15 lux at F1.6 in color mode and 0 lux in black and white mode with IR LED on.
   - The camera shall be able to produce clear images in highly contrast scenes with multi-exposure wide dynamic range up to 120dB.
   - The camera shall support digital noise reduction using both 2D and 3D noise reduction technology.
   - The camera shall be able to configure 6 privacy masking areas with rectangles.
   - The camera shall provide video display on smart phone (iPhone, Android) to adjust viewing angle, rotation and focus.
c. Intelligence and Analytics – The camera shall have a suite of intelligent analytic functions.
   - Motion detection with 4 definable detection areas with 4 point polygonal zones, and minimum/maximum object size.
   - Detection of logical events of specified conditions from the camera's video
     - Tampering, Directional Detection, Virtual Line, Enter/Exit
     - Defocus Detection
     - Motion Detection
d. Interoperability – The camera shall be ONVIF Profile S, G and T compliant.
e. The camera shall possess the following further characteristics:
   - Built-in web server accessed via non-plugin browsers including Google Chrome, IE11, MS Edge, Mozilla Firefox and Apple Safari.
   - Micro SD/SDHC/SDXC memory card with configurable pre-alarm and post-alarm recording intervals
   - NAS recording option with configurable pre-alarm and post-alarm recording intervals
   - Alarms and notifications
     - alarm notification triggers:
       - Alarm input
       - Motion detection
       - Video analytics

- Network disconnect
- available notification means upon trigger:
  - File Upload via FTP and E-mail
  - Notification via E-mail
  - Local storage (SD / SDHC / SDXC) or NAS recording at event triggers
  - External output
- Pixel Counter available in the web viewer.
- PoE capable including heater by PoE

2. RECORDING PROFILE: 90day Archive, 15fps @Full Resolution, 35% Motion Events per 24hrs

3. Basis of Design: Hanwha-Techwin QNV-8080R

4. Provide flush mount kit and any additional mounting hardware as required for each camera. Mounting hardware shall be approved for plenum ceiling and shall have knock outs for conduit connectivity with no exposed wiring. Provide additional mounting equipment as necessary.

E. Camera TYPE-4 – Exterior Multi-Sensor 20MP Vandal Dome IP camera shall be:
1. GENERAL DESCRIPTION
   a. The camera shall provide multi directional view and produce video in various view mode.
   b. The lenses(2M/5M) shall be selectable depending on customer's requirement at site.
   c. Hallway view is available on CH1/2/3/4.
   d. Each Channels support SD Card
   e. It provides one single power supply for all of multi-channels
   f. Video Compression and Transmission – The multi-directional camera shall have the following properties relating to the video signals it produces.
      - H.265, H.264 and MJPEG compression, each derived from a dedicated encoder and capable of being streamed independently and simultaneously
        - H.265 and H.264 [5MP] frame rates to max 30fps (60Hz) / 25fps(50Hz) at all resolution[2MP] frame rates to max 60fps (60Hz) / 50fps(50Hz) at all resolution
        - MJPEG – frame rates to maximum 30fps (60Hz) / 25fps (50Hz) at all resolution
      - The multi-directional camera shall be able to configure up to 10 independent video stream profiles with differing encoding, quality, frame rate, resolution, bit rate, and other video settings.
      - The multi-directional camera shall have four lenses and each lens shall provide the following resolutions.
        - [5MP] 2560x1920, 2560x1440, 1920x1080, 1600x1200, 1280x1024, 1280x960,1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 320x240
      - The camera shall support unicast video streaming up to 20 users.

- The camera shall support multicast video streaming up to 10 profiles.
- The camera shall be able to configure Dynamic DNS (DDNS). DDNS shall be provided with no additional cost by the manufacturer.
- The camera shall provide WiseStream Ⅱ, Dynamic GOV and Dynamic fps to efficiently manage bit rate of the video stream and reduce storage.

g. Camera – The multi-directional camera device shall have the following physical and performance properties:
   - IK10 rated for protection against impacts.
   - Lens model:
   - SLA-5M3700Q(3.7mm Zoom Ratio)
   - SLA-5M4600Q(4.6mm Zoom Ratio)
   - SLA-5M7000Q(7.0mm Zoom Ratio)
   - IP66 for protection against dust and water.
   - The multi-directional camera shall be able to capture high contrast scenes with 150 dB for 2MP and 120dB for 5MP multi-exposure wide dynamic range.
   - The camera shall support digital noise reduction using both 2D and 3D noise reduction technology.
   - 32 privacy masking regions utilizing polygons
   - Supporting digital image stabilization the camera shall be able to measure movements in three axes and accurately enhance images from distortions caused by instability.
h. Intelligence and Analytics – The multi-directional camera shall have a suite of integral intelligent operations and analytic functions to include:
   - Motion detection with 8 definable detection areas with 8 point polygonal zones, and minimum/maximum object size.
   - Detection of logical events of specified conditions from the camera's video
     - Defocus detection
     - Fog detection
     - Directional detection
     - Motion detection
     - Appear/Disappear
     - Enter/Exit
     - Loitering
     - Tampering
     - Virtual line
     - Face detection
i. Interoperability – The camera shall be ONVIF Profile S and T compliant.
j. The multi-directional camera shall possess the following further characteristics:
   - Built-in web server, accessed via standard browsers including Internet Explorer, Firefox, Chrome & Safari
   - Micro SD/SDHC/SDXC memory card options, with configurable pre-alarm and post-alarm recording intervals
   - Alarms and notifications
     - alarm notification triggers:

- Analytics
- Network disconnect
- available notification means upon trigger:
  - File Upload via FTP and E-mail
  - Notification via E-mail
  - Local storage (SD / SDHC / SDXC) or NAS recording at event triggers
- Pixel Counter available in the web viewer.
- PoE+ capable
- This device has been verified using STP cable. The use of appropriate GND grounding and STP cable is recommended to effectively protect your product and property from transient voltage, thunderstroke, communication interruption.

2. RECORDING PROFILE: 30day Archive, 15fps @Full Resolution, 35% Motion Events per 24hrs

3. Basis of Design: Hanwha-Techwin PNM-9002VQ

4. Provide wall mount and/or corner mount kit and any additional mounting hardware as required for each camera. Mounting hardware shall have knock outs for conduit connectivity with no exposed wiring. Provide additional mounting equipment as necessary.

F. Camera TYPE-5 – Interior/Exterior Overview 4K Vandal Dome IP camera shall be:
   1. GENERAL DESCRIPTION
      a. Video Compression and Transmission – The camera shall have the following properties relating to the video signals it produces.
         - H.265, H.264 and MJPEG compression, each derived from a dedicated encoder and capable of being streamed independently and simultaneously.
           - H.265 and H.264 – maximum of 30/25fps(60Hz/50Hz) at all resolution
           - MJPEG – maximum of 15/12fps(60Hz/50Hz)
         - The camera shall be able to configure up to 10 independent video stream profiles with differing encoding, quality, frame rate, resolution, and bit rate settings.
         - The camera shall be able to configure various resolution selections.
           - 16:9 aspect ratio: 3840x2160, 3328x1872, 3072x1728, 2688x1520, 1920x1080,1280x720, 800x448, 640x360
           - 4:3 aspect ratio: 2592x1944, 1600x1200, 1280x960, 1024x768, 800x600, 640x480, 320x240
           - 5:4 aspect ratio: 1280x1024, 720x576
           - 3:2 aspect ratio: 720x480
         - The camera shall support unicast video streaming up to 20 users.
         - The camera shall support multicast video streaming up to 10 profiles.
         - The camera shall be able to configure Dynamic DNS (DDNS). DDNS shall be provided with no additional cost by the manufacturer.

- The camera shall provide WiseStream Ⅱ, Dynamic GOV and Dynamic fps to efficiently manage bit rate of the video stream and reduce storage.

b. Camera – The camera device shall have the following physical and performance properties:
   - IK10+ rated for protection against impacts.
   - True day/night operation with scheduling and options for external devices.
   - Lens: 2.8-8.4mm motorized varifocal
     - Low light level operation to 0.05 lux at F1.2 in color mode and 0 lux in IR mode.
   - The camera shall be able to produce clear images in highly contrast scenes with multi-exposure wide dynamic range.
   - The camera shall support digital noise reduction using both 2D and 3D noise reduction technology.
   - The camera shall be able to configure 32 privacy masking areas with polygonal zones.
   - The camera shall have the defog feature to remove fogginess of scene which can be triggered automatically from the fog detection event.
   - The camera shall provide video display on smart phone (iPhone, Android) to adjust viewing angle, rotation and focus.
c. Intelligence and Analytics – The camera shall have a suite of intelligent analytic functions.
   - Motion detection with 8 definable detection areas with 8 point polygonal zones, and minimum/maximum object size.
   - Motion detection hand-over to PTZ cameras. The camera shall be able to call a preset of PTZ camera when motion event is triggered.
   - Detection of logical events of specified conditions from the camera's video
     - Defocus detection
     - Directional detection
     - Motion detection
     - Digital auto tracking
     - Appear/Disappear
     - Enter/Exit
     - Loitering
     - Tampering
     - Virtual line
     - Audio detection
     - Sound classification
     - Shock detection
     - Face/upper body detection
     - Fog detection
   - Business Intelligence features
     - People counting
     - Queue management
     - Heatmap
   - Detection and classification of the following sound.
     - Scream

        - Gunshot
        - Explosion
        - Crashing glass
    - Interoperability – The camera shall be ONVIF Profile S / G and T compliant.
    - The camera shall possess the following further characteristics:
        - Built-in web server, accessed via non-plugin browsers including Google Chrome, MS Edge, Mozilla Firefox and Apple Safari.
        - The camera shall provide streaming to multiple smart phones with DDNS provided freely from the manufacturer. In addition, the application shall be available for both iOS and Adroid, free of charge with search keyword, 'Wisenet Mobile'.
        - Micro SD/SDHC/SDXC memory card with configurable pre-alarm and post-alarm recording intervals
        - NAS recording option with configurable pre-alarm and post-alarm recording intervals
        - Alarms and notifications
            - alarm notification triggers:
            - Analytics
            - Network disconnect
            - Alarm input
            - available notification means upon trigger:
            - File Upload via FTP and E-mail
            - Notification via E-mail
            - Local storage (SD / SDHC / SDXC) or NAS recording at event triggers
            - Alarm output
            - PTZ preset
            - Handover
            - Audio playback
        - Pixel Counter available in the web viewer.
        - PoE capable
        - IP66/IP67/IP6K9K, IK10+, NEMA4X
        - This device has been verified using STP cable. The use of appropriate GND grounding and STP cable is recommended to effectively protect your product and property from transient voltage, thunderstrike, communication interruption.

2. RECORDING PROFILE: 30day Archive, 15fps @ Full Resolution, 35% Motion Events per 24hrs

3. Basis of design: Hanwha-Techwin XNV-9082R

4. Provide wall mount and any additional mounting hardware as required for each camera. Mounting hardware shall have knock outs for conduit connectivity with no exposed wiring. Provide additional mounting equipment as necessary.

G. Camera TYPE-6 – Exterior Overview 4K Bullet IP camera shall be:

1. GENERAL DESCRIPTION

a. Video Compression and Transmission – The camera shall have the following properties relating to the video signals it produces.

- H.265, H.264 and MJPEG compression, each derived from a dedicated encoder and capable of being streamed independently and simultaneously.
  - H.265 and H.264 – maximum of 30/25fps(60Hz/50Hz) at all resolution
  - MJPEG – maximum of 15/12fps(60Hz/50Hz)
- The camera shall be able to configure up to 10 independent video stream profiles with differing encoding, quality, frame rate, resolution, and bit rate settings.
-
- The camera shall be able to configure various resolution selections.

  16:9 aspect ratio:3840x2160, 3328x1872, 3072x1728, 2688x1520, 1920x1080, 1280x720, 800x448, 640x360
  - 4:3 aspect ratio: 2592x1944, 1600x1200, 1280x960, 1024x768, 800x600, 640x480, 320x240
  - 5:4 aspect ratio: 1280x1024, 720x576
  - 3:2 aspect ratio: 720x480
- The camera shall support unicast video streaming up to 20 users.
- The camera shall support multicast video streaming up to 10 profiles.
- The camera shall be able to configure Dynamic DNS (DDNS). DDNS shall be provided with no additional cost by the manufacturer.
- The camera shall provide WiseStream Ⅱ, Dynamic GOV and Dynamic fps to efficiently manage bit rate of the video stream and reduce storage.

b. Camera – The camera device shall have the following physical and performance properties:

- IK10 rated for protection against impacts.
- True day/night operation with scheduling and options for external devices.
  - Low light level operation to 0.05 lux at F1.2 in color mode and 0 lux in IR mode.
  - Lens: 2.8~8.4mm(3x) motorized varifocal
- The camera shall be able to produce clear images in highly contrast scenes with multi-exposure wide dynamic range.
- The camera shall support digital noise reduction using both 2D and 3D noise reduction technology.

- The camera shall be able to configure 32 privacy masking areas with polygonal zones.
- The camera shall have the defog feature to remove fogginess of scene which can be triggered automatically from the fog detection event.
- The camera shall provide video display on smart phone (iPhone, Android) to adjust viewing angle, rotation and focus.

c. Intelligence and Analytics – The camera shall have a suite of intelligent analytic functions.

- Motion detection with 8 definable detection areas with 8 point polygonal zones, and minimum/maximum object size.
- Motion detection hand-over to PTZ cameras. The camera shall be able to call a preset of PTZ camera when motion event is triggered.
- Detection of logical events of specified conditions from the camera's video
    - Defocus detection
    - Directional detection
    - Motion detection
    - Digital auto tracking
    - Appear/Disappear
    - Enter/Exit
    - Loitering
    - Tampering
    - Virtual line
    - Audio detection
    - Sound classification
    - Shock detection
    - Face/upper body detection
    - Fog detection
- Business Intelligence features
    - People counting
    - Queue management
    - Heatmap
- Detection and classification of the following sound.
    - Scream
    - Gunshot

- Explosion
- Crashing glass

d. Interoperability – The camera shall be ONVIF Profile S / G and T compliant.

e. The camera shall possess the following further characteristics:

- Built-in web server accessed via non-plugin browsers including Google Chrome, MS Edge, Mozilla Firefox and Apple Safari.
- The camera shall provide streaming to multiple smart phones with DDNS provided freely from the manufacturer. In addition, the application shall be available for both iOS and Adroid, free of charge with search keyword, 'Wisenet Mobile'.
- Micro SD/SDHC/SDXC memory card with configurable pre-alarm and post-alarm recording intervals
- NAS recording option with configurable pre-alarm and post-alarm recording intervals
- Alarms and notifications
  - alarm notification triggers:
    - Analytics
    - Network disconnect
    - Alarm input
  - available notification means upon trigger:
    - File Upload via FTP and E-mail
    - Notification via E-mail
    - Local storage (SD / SDHC / SDXC) or NAS recording at event triggers
    - Alarm output
    - PTZ preset
    - Handover
    - Audio playback
- Pixel Counter available in the web viewer.
- PoE capable
- IP66/IP67, IK10, NEMA4X

2. RECORDING PROFILE: 30day Archive, 15fps @ Full Resolution, 35% Motion Events per 24hrs

3. Basis of design: Hanwha-Techwin XNO-9082R

4. Provide wall mount and any additional mounting hardware as required for each camera. Mounting hardware shall have knock outs for conduit connectivity with no exposed wiring. Provide additional mounting equipment as necessary

17. Ethernet with PoE Over 75 Ohm Coaxial Cable

A. The contractor shall provide an Ethernet over coaxial cable converter for any camera mounted in an area without local power supply availability or at other locations as required.

B. Each camera shall receive its own dedicated transmitter and receiver unit. Splitting multiple cameras through a single Tx/Rx pair is not allowed.

C. The Contractor shall coordinate with the Elevator Contractor for installation as required.

D. Shall support multi-cast networks.

E. Provide full duplex 10/100Base-T.

F. Shall support IEEE 802.3af (PoE) and IEEE 802.3at (PoE+) on input and output.

G. Can support 802.3at at 20 watts at a minimum of 1,000 feet of 20awg RG-59.

H. Provide with optional power supply when PoE switch is not available.

I. Provide with wall mount or rack mount bracket as required.

J. Manufacturer:

1. Veracity Highwire Powerstar

a. Provide with dedicated power supply as required.

2. Or approved equal

18. Ethernet with Power over Ethernet (PoE) UTP Surge Suppressor

A. The Contractor shall provide and install a surge protector for all exterior mounted cameras. Cameras that are not attached to the building or reach above the building roof line shall have a surge protector at the camera side and interior termination side.

B. There shall be a minimum of a 36” shielded patch cable from the surge protector to the device to allow for adequate clamping time.

C. When protector is mounted in interior, dry or weather sealed enclosure:

1. Shielded RJ-45 jacks and ground stud

a. Connect ground directly to ground bar (TMGB/TGB) or ground.

b. Do not use shielded cable on the output.

2. Maximum supported data rate: 10,000Mb/s (10 Gigabit)
3. Supports IEEE 802.3af (PoE)
4. Max current rating of 30A per pair.
5. UL 497B listed
6. 110 punch down in and 110 punch down out.
   a. 110 punch down in and RJ-45 out may be used when output is connected directly to a switch only when approved in specific situations.
7. Manufacturer:
   a. Ditek DTK-110C6APOE
   b. Or approved equal

D. When protector is exposed to weather or moisture:

1. Shielded RJ-45 jacks and ground connection.
   a. Connected ground connection directly to ground.
   b. Do not use shielded cable on the output.
2. Outdoor-rated NEMA 4X enclosure
3. Maximum supported data rate: 1,000Mb/s (1 Gigabit)
4. Supports IEEE 802.3af, 802.3at (PoE) and PoE+ up to 144 watts per port.
5. Max current rating of 20,000A per pair.
6. UL 497B listed
7. RG-45 in and RJ-45 out.
8. Provide with appropriate mounting kit.
9. Manufacturer:
   a. Ditek DTK-MRJPOEX
   b. Or approved equal

19. Ethernet UTP Surge Suppressor (No PoE)

A. The Contractor shall provide and install a surge protector for all exterior mounted cameras. Cameras that are not attached to the building or reach above the building
roof line shall have a surge protector at the camera side and interior termination

side.

B. There shall be a minimum of a 36" shielded patch cable from the surge protector to the device to allow for adequate clamping time.

C. When protector is mounted in interior, dry or weather sealed enclosure:

1. Shielded RJ-45 jacks and ground stud
    a. Connect ground directly to ground bar (TMGB/TGB) or ground.
    b. Do not use shielded cable on the output.
2. Maximum supported data rate: 10,000Mb/s (10 Gigabit)
3. Max current rating of 100A per pair.
4. UL 497B listed
5. 110 punch down in and 110 punch down out.
    a. 110 punch down in and RJ-45 out may be used when output is connected directly to a switch only when approved in specific situations.
6. Manufacturer:
    a. Ditek DTK-110C6A
    b. Or approved equal

20. Surge Protection for Low Voltage AC/DC power

A. The Contractor shall provide a surge protector for all exterior devices being supplied by low voltage power. This does not include devices directly connected to a building where the risks of surges are negligible.

B. There shall be a minimum of a 36" shielded cable from the surge protector to the device to allow for adequate clamping time.

C. When protector is mounted in interior, dry or weather sealed enclosure:

1. Nominal voltage rating of 24V AC/DC. Provide correct module per required voltage level if different from 24V.
2. 20,000A surge current rating.
3. Protects 2-pair per module.
4. Accepts up to 10AWG cable
5. Connect directly to ground.
6. UL 497B listed

7. Provide quantity of modules as required for the application.
8. Provide base mounting plate as required for the application.
9. Manufacturer:
    a. Ditek DTK-2MB Mounting Base
    b. Ditek DTK-2MHLP24B Surge Module
    c. Or approved equal

21. Surge Protection for 120 VAC power

A. The Contractor shall provide a surge protector for all 120VAC supplied power supplies.

B. There shall be a minimum of a 36" of cable from the surge protector to the load to allow for adequate clamping time.

C. When the protector is mount in an interior or exterior location:

1. Nominal voltage rating of 120VAC, single-phase, 20A continuous load.
2. Series connected.
3. 54,000 A surge current rating.
4. 35db of EMI/RFI filtering.
5. UL 1449 Type 2 SPD listed
6. UL 1289 EMI/RFI Noise Filtering listed.
7. LED indicator.
8. Form C dry contacts for monitoring.
9. Include with NEMA 4X enclosure.
10. Maintain a minimum of 3' of cable from the surge protector to the load.
11. Manufacturer:
    a. Ditek DTK-TSS4D
    b. Or approved equal

22. Managed Power Supplies

A. The Contractor shall provide and install a power supply for exterior cameras, fiber optic media converters and other devices which require a dedicated power supply capable of outputting 24VAC and 28VAC.

B. The Contractor shall connect each device to an output according to the voltage drop

to stay as close to 24VAC at the end point as possible based on actual field measurements.

C. The power supply shall have network modules capable of controlling each individual output via a web interface. Each power distribution module shall be clearly labeled as a 24VAC output or 28VAC output.

D. The power supply shall be grounded with a 6awg cable.

E. The Contractor shall provide (1) Altronix BC300 enclosure, (1) T2428300 transformers and (1) LinQ8PD networked power distribution modules. Alternate Altronix configurations may be submitted.

23. Fiber Optic Media Converters

A. The contractor shall provide fiber optic media converters for locations that require fiber optic cable due to distances that exceed copper cable distance limitation or as identified on the drawings. Provide a rack mount chassis when multiple outputs are required.

B. Single port, industrial interior/exterior

1. 10/100 Ethernet full duplex
2. Operating temperature of -40 - 167 degrees F
3. 1300 multimode ST fiber connectors
4. Link budget of 12.0 dB
5. DIN Rail mountable, provide with appropriate brackets as required
6. AC version requires 22-36 VAC. Provide with power supply where required.
7. Mount in NEMA rated enclosure when installed in the exterior
8. Manufacturer:
    a. Transition Networks (AC version) M/E-ISW-FX-01AC(ST)
    b. Or approved equal

C. Rack mount multi-port, card based headend

1. 10/100 Ethernet, Class A, full duplex
2. 1300 multimode ST fiber connectors
3. Link budget of 11.0 dB
4. Provide slot quantity as required

5. 120VAC power connection
6. Manufacturer:
    a. Slide in module - Transition Networks C2210-1011
    b. Chassis - Transition Networks ION219A series
    c. Or approved equal.

24. Solar Equipment/Devices

The Contractor shall use Victron Energy for solar equipment and devices unless COR-IFS approves another manufacturer.

25. Wireless Transmitters/Receivers

A. The Contractor shall provide a wireless point-to-point or point to multi-point system where required.

B. The system shall use unlicensed frequencies.

C. The units shall be managed with a web interface for configuration and must support both http (Hypertext Transfer Protocol) and https (Hypertext Transfer Protocol Secure)

D. The units shall support Network Time Protocol and the contractor must configure the units using a COR NTP Server.

E. The units shall support Dynamic Host Configuration Protocol (DHCP). The contractor shall configure the units to use DHCP reservation. The contractor shall coordinate with COR-IFS and COR-IT to configure DHCP reservation.

F. The units shall support Simple Network Management Protocol (SNMP).

G. The Contractor shall provide the appropriate throughput licensing based on the camera streaming bandwidth requirements noted within these specifications.

H. The Contractor shall provide the appropriate mounting hardware rated for the appropriate wind, snow and ice loading.

I. All hardware shall be grounded.

J. When point to multi-point is required the Contractor shall utilize a base station with a 120-degree horizontal beamwidth. Point to point may utilize edge units with a 33-degree horizontal beamwidth.

K. Manufacturer:

1. Cambium Networks cnVision for Wireless Video Surveillance
    a. Primary Use:
        - An omnidirectional Hub to connect many cameras in any direction.

- A hub that is compatible with many kinds of antennas.
- High gain client useful for tough climates, longer distances, or industrial sites.
- High gain client that can directly power up to three IP cameras or devices.
- Standard client suitable for most conditions.
- Small form factor client for shorter distances.

Part 3 - Execution

3.1 Security Cameras and Video Monitoring System

1. Contractor shall provide all necessary wiring, cabling, conduit, labor, tools, equipment, licenses and ancillary materials required to furnish and install new security cameras and video monitoring system (Milestone Video Archiver(s) and Milestone Video Monitoring Workstation) as indicated on the drawings and in these specifications. Contractor shall also connect new cameras to video monitoring system and City's existing security network and coordinate testing and final system configuration.

3.2 Requirements are indicated elsewhere in this specification for work including, but not limited to:

1. Cameras, associated power supplies, media convertors and data cabling and equipment to be provided and installed by the Contractor.
    a. Connection by the Contractor of the new Video Archiver(s), Video Monitoring Workstation and security cameras to the Owner's security network.
        i. The Contractor shall coordinate with the Owner for specific network standards and for local area network (LAN) connections.
2. All cameras shall be connected to the facility's new Milestone Video Archiver(s) for local monitoring and recording. The Contractor shall be responsible for connecting all cameras to the Owner's network and for coordinating and configuring the cameras to be viewable through the Milestone Video Monitoring Workstations.
    a. The new Milestone Video Archiver(s) shall be an extension of the Owner's existing Milestone Video Management System.
    b. The Contractor shall provide all Milestone and camera integration licenses necessary to integrate the Milestone Video Management System into the Owner's Vykon Access Control System.
    c. It is the Contractor's responsibility to coordinate any network, software and hardware requirement(s) needed to connect any device or server to the Owner's network. If any device or server does not meet the Owner's network requirement specification, the Contractor shall be responsible to provide an adequate replacement or bring the delinquent device up to the Owner's required specification before connecting the device to the Owner's network.

3.3 The extent of security system work for the project includes, but is not limited to, the following under the Base Bid:

a. Installation of new digital video surveillance system cameras, media converters, Milestone Video Archivers, Milestone Workstations and associated equipment and hardware to provide a fully functioning video surveillance system.

b. Miscellaneous terminations, programming, licenses and updates to extend up to the Owner's final acceptance of the installed system.

3.4 The Milestone Video Archivers shall provide management, control, recording and monitoring of all new facility video surveillance system cameras.

3.5 The Contractor shall not have a password to access the Enterprise server. The Contractor shall only have local restricted access.

3.6 Camera installation and work required to bring new security equipment up to operational status for final acceptance by the Owner shall include but not be limited to the following:

a. Determination of hardware, software, and operations requirements for implementation.

b. Set up and configuration of parameters on each camera for recording on the Video Archivers

c. Set-up of optimum recording parameters on each Video Archiver.

d. Testing of video systems operations based on a camera by camera walkthrough.

e. Organizing and conducting end-user training.

3.7 The Contractor shall provide onsite professional services to assist in the initial setup and programming of all systems specified within this specification.

3.8 The Contractor shall coordinate conduit routes and locations with the Electrical Contractor before conduits are to be installed.

1. The Contractor shall coordinate any and all concrete and anchoring information with the General Contractor before the installation of concrete footers for any planned exterior pole supports for cameras.
2. All cabling shall be provided by the Contractor.
3. Contract close out submittals to include:
4. Training course materials – as described in related Section 27 00 00
5. Commissioning Test Plan and Check-Off List
6. As-built drawings to include elementary and wiring diagrams of the security systems to be used for record drawings.

3.9 Testing

A. Refer to Section 27 00 00 for additional requirements.

B. Site tests shall be performed with a representative of the Owner in attendance.

C. Tests shall be performed on each major component of the Video Management System.

D. Prior to energizing or testing the system, ensure the following:

1. All products are installed in a proper and safe manner per the manufacturer's instructions.

2. Dust, debris, solder, splatter, etc., is removed.

3. Cable is dressed, routed, and labeled; connections are consistent with regard to polarity.

4. All products are neat, clean, and unmarred, and parts are securely attached.

E. Contractor shall ensure that each device in the security system is functioning normally and in such a manner as to meet the functional and performance requirements in this specification.

3.10 Training

A. Refer to Section 27 00 00 for additional requirements and information related to the following:

B. Provide system operations, administration, and maintenance training by factory-trained personnel qualified to instruct.

1. The Contractor shall provide scheduled and dedicated training time for administration and investigation for the project site.

2. The Contractor shall provide an allotment of training hours per Section 27 00 00 for the administration and use of the security system and VMS platform.

3. Provide printed training materials for each trainee, including product manuals, course outline, workbook or student guides, and written examinations for certification.

4. Provide hands-on training with operational equipment.

5. Training shall be oriented to the specific system being installed under this contract as designed and specified.

6. Contractor shall provide all necessary documentation of system operating parameters prior to scheduled training sessions.

3.11 Warranty

A. Refer to Section 27 00 00 for additional requirements.

3.12 Installation Practices

A. All services provided shall be professional and conform to the highest standards for safety and industry practices. The Owner reserves the right to halt any installation due to poor workmanship. All work shall be defect free, and the installer shall replace, at their expense, any work found to be defective.

B. The Owner reserves the right to halt any installation due to failure of Contractor to observe installation-free periods due to instructional or administrative requirements. To the maximum extent possible, the Owner will provide advance notice of such periods.

C. Contractor is responsible for providing a complete and functional video surveillance system.

D. All manufactured items, materials, and equipment shall be applied, installed, connected, erected, used, and adjusted as recommended by the manufacturers, or as indicated in their published literature, unless specifically noted herein to the contrary.

E. Contractor shall follow these standards and approved submittals for locations of power supplies. The Owner intends to limit the number and location of power supplies to facilitate more effective long-term support and maintenance of the system.

3.13 Coordination

A. Contractor shall provide up to 12 hours of scheduled and dedicated coordination time to assist Owner with camera positioning and coordination as requested by Owner or Consultant.

3.14 Installation Appearance and Equipment Organization

A. All cables and equipment terminating at panels frames shall be vertically straight, with no cables crossing each other, from twelve inches inside the ceiling area to the termination block.

B. All cable bundles shall be combed and bundled to accommodate individual termination block rows and panels.

C. For any given telecom room, a horizontal and vertical alignment for all mounting hardware will be maintained to provide a symmetrical and uniform appearance to the distribution frame.

D. All surface-mounted devices shall be firmly secured level and plumb

E. All rack mount equipment shall be securely installed.

3.15 Hardware Layout

A. Hardware positioning and layout shall be reviewed and approved by the Owner prior to construction. The review does not exempt Contractor from meeting any of the requirements stated in this document.

3.16 VMS Installation Practices

A. Verify that the manufacturer approved server hardware, OS meets the Owner's IT standards prior to ordering.

B. Coordinate server power, cooling, and mounting requirements with Owner prior to installation.

C. Coordinate virus scan/security software requirements with Owner and manufacturer prior to installation.

3.17 Device Cabling/Wiring Installation Practices

A. All external wire and cables shall be supported at least every five feet from the structure or as required to maintain not more than 12" cable sag between supports and without over tensioning the cables. Provide j-hooks as needed where cable tray or raceway is not available.

B. This Contractor shall coordinate installation with Division 27 05 00. Cabling Contractor to ensure there is at least 2-inches of physical separation between security cabling and voice/data cabling throughout cable path. Voice/data cabling Contractor has first claim to cable tray.

C. All cables, regardless of length, shall be labeled within 18" of both ends with an identifier that is keyed to the door, room, or corridor number as identified.

D. All cables shall have 6-foot service loops neatly coiled in the equipment room. During initial cable rough-in, this Contractor shall have sufficient slack to route anywhere within the equipment room.

E. Cabling shall be adequately supported with Velcro wire wraps and horizontal support cable managers fastened to rack frame. Cables shall be dressed in a neat and orderly fashion. Any cabling or equipment installation that is deemed unacceptable by the Owner or Consultant shall be replaced or corrected by the Contractor at no additional cost. **Plastic zip ties are not allowed.**

F. All cables are to run at right angles to the structure, placed above the ceiling in halls or corridors.

G. Cables shall not run above red iron joist.

H. Contractor shall make every effort to conceal wiring and other apparatus into walls, floors, and ceilings, assuming code and good engineering practice allows and suggests.

I. Ties and straps shall be installed snugly without deforming cable insulation. Ties shall be spaced at uneven intervals not to exceed four feet. No sharp burrs shall remain where excess length of the cable tie has been cut.

J. Contractor shall notify Owner immediately if obstruction or hazard is discovered in a pathway provided by others.

K. Cable shall be stored and handled to assure that it is not stretched, kinked, crushed, or abraded in any way. Bend radiuses shall meet manufacturer specifications and/or recommendations. Cable shall not be installed in ambient temperatures or moisture conditions above or below the manufacturer's rating.

L. No splices shall be installed in any cable.

3.18 Cable Termination

A. Termination hardware (blocks and patch panels) positioning and layout shall be reviewed and approved by the Owner prior to construction. The review does not exempt Contractor from meeting any of the requirements stated in this document.

3.19 Fire Stopping

A. Fire stopping of openings between floors, fire-rated walls, and smoke-rated walls, created by others for this Contractor to pass cable through, shall be the responsibility of this Contractor. Sealing material and application of this material shall be accomplished in such a manner that is acceptable to the local fire and building authorities having jurisdiction over this work.

B. Any openings created by or for this Contractor and left unused shall be sealed up by this Contractor.

C. This Contractor shall be responsible for creating a waterproof seal in and around any openings that this Contractor creates from the structure to the outside environment.

3.20 System Inspection

A. Contractor shall coordinate with project representative for inspection after Contractor has completed testing of entire system.

B. Contractor shall have trained Contractor representative and testing equipment on site during inspection to assist with spot verification of tests.

C. Contactor shall verify with Project Representative the precise positioning of camera

aim and shall make fine adjustments as requested.

3.21 Labeling

A. Contractor shall neatly label all security devices and cabling at both ends. All labels shall be on Project as-built drawings. Coordinate with the Owner to verify preferred camera housing labelling location prior to final label installation.

3.22 Camera Installation

A. Contractor shall field verify all camera locations and positioning with Owner prior to installation.

3.23 Documentation

A. Upon completion of the installation, Contractor shall provide full documentation sets to the Consultant for approval as described in section 27 60 00. All documentation shall become the property of the Owner.

B. Documentation shall include the additional specific items detailed in the subsections below:

1. Contractor shall provide hard copy and electronic forms of the final test results.
2. Contractor shall provide milestone configuration back up for system installed.
3. Contractor shall provide a completed configuration report from installed Milestone system. Provide report electronically.
4. Contractor shall provide wireless Transmitters/Receivers configuration backup to owner.
5. Contractor shall provide final “As-Built “construction documentation including the following:

a. The contractor shall contact the COR-IFS representative for an updated COR As-Built Template for construction documentation.

b. Camera label/identifier

c. Location of each drop by orientation/permanent landmark in the room

d. Wireless Transmitters/Receivers manufacturer, type, MAC address, IP Address, hostname, Radio mode: Client or Hub, Operating Frequency, operating channel bandwidth, transmitter output power, downlink RSSI (Received Signal Strength Indicator), downlink SNR (Signal to Noise ratio).

e. The Contractor shall include solar drawings in the As-Built construction document per the COR-IFS template when solar equipment is part of the VMS solution. Solar System data includes Solar Panel Wattage, Solar Panel amperage, battery Ah, battery standard voltage, solar system voltage, charging time at peak sunlight, and functional time off sunlight.

f. Contractor shall provide accurate as-built Construction Drawings. The drawings are to include cable routes and device locations.

3.24 Pre-Checkout

A. The Contractor shall demonstrate the following to Owner during system demonstration.

1. The cameras are fully installed and functional.
2. Camera adjustments are complete to the Owner's satisfaction including.
   a. Aim/Zoom
   b. Focus/Back Focus
   c. Masking Zones
   d. Motion Detection Zones
   e. Pre-Sets/Tours

3.25 Final Acceptance

A. In addition to closeout and final testing requirements in sections 27 00 00 and 27 60 00, This Contractor shall demonstrate the following before final approval.

1. Owner training is complete.
2. Punch list items are complete.
3. As-built documentation is complete and submitted to Owner/Consultant.

3.26 Final Procedures

A. Perform final procedures in accordance with section 27 60 00.

End of Section 28 20 00