



## REQUEST FOR PROPOSALS

PROPOSAL NO. 24000536

Sheldon Neeley  
Mayor

### SCOPE OF WORK:

The City of Flint, Finance Department of Purchases & Supplies, is soliciting sealed bids for providing:

### **SURVEILLANCE SYSTEM IMPROVEMENTS**

Per the attached additional requirements.

If your firm is interested in providing the requested services, please submit:

Submit to City:

1 original, printed, signed, original proposals and signed addenda

2 additional copies unbound

1 electronic copy

Please follow the following bid timeline.

### Questions

All written questions shall be directed to Lauren Rowley, Purchasing Manager by **Thursday, March 28, 2024, by 10am EST** to [lrowley@cityofflint.com](mailto:lrowley@cityofflint.com).

### Mandatory Pre-Bid Meeting

A **mandatory** pre-bid meeting will take place **Wednesday, March 27, 2024, at 10am EST starting at the Flint Water Plant, 4500 Dort Hwy, Flint, MI, 48506, finishing at the Flint Water Service Center Facility, 3310 E. Court St, Flint, MI, 48506.** Please submit a letter of intent to attend to Lauren Rowley, Purchasing Manager at [lrowley@cityofflint.com](mailto:lrowley@cityofflint.com) by **Tuesday, March 26, 2024, at 2pm**. Failure to participate in this meeting may result in the disqualification of your bid.

### Bid Submission Requirements

1. The mail in **HARD COPY** with the original signature (signed documents) must be received by **Wednesday, April 3, 2024, by 11:00 A.M. (EST), City of Flint, Finance Department - Division of Purchases and Supplies, 1101 S. Saginaw St., Room 203, Flint, MI, 48502.** Bids must be in a sealed envelope clearly identifying the proposal name and proposal number.
2. **Electronic Copy**, please email to [PurchasingBids@cityofflint.com](mailto:PurchasingBids@cityofflint.com) by **Wednesday, April 3, 2024, by 11:00 A.M. (EST).** Please note that in the subject line of the email, type in the proposal name and number.
3. Faxed bids are not accepted.
4. Both mail in proposal and electronic submittal must be received by due date and time.

### Bid Opening

Bids will be opened publicly at the McKenzie Conference Room on the 2<sup>nd</sup> floor of Flint City Hall. The public is welcome to join in person or via Google Meet.

**Bid Opening - Surveillance Camera Improvements**

**Wednesday, April 3 · 11:00am – 12:00pm**

**Time zone: America/New\_York**

**Google Meet joining info**

**Video call link: <https://meet.google.com/vgq-soqm-ngy>**

Or dial: (US) +1 504-613-6735 PIN: 314 717 623#

More phone numbers: <https://tel.meet/vgq-soqm-ngy?pin=4055016820070> Or dial: (US) +1 754-202-2916 PIN: 984 933 355#

More phone numbers: <https://tel.meet/dgc-wrfy-nib?pin=6850744302304>

**PLEASE NOTE: When dropping off a bid, please do not put bids in drop boxes on the outside of City Hall. Please call if you have any questions and need to drop off a bid.**

All additional proposal documents, requirements, addendums, specifications, and plans/drawings (if utilized) are available on the Purchasing page of the City of Flint's web site at <https://www.cityofflint.com/purchasing/>.

Effective immediately upon release of these Bidding Documents, and until notice of contract award, all official communications from proposers regarding the requirements of this Bid shall be directed to:

Lauren Rowley

810-766-7340

[lrowley@cityofflint.com](mailto:lrowley@cityofflint.com)

The City, or designee, shall distribute all official changes, modifications, responses to questions or notices relating to the requirements of this Bid. Addendum to this Bid may be developed and shared with all Vendors. Any other information of any kind from any other source shall not be considered official, and proposers relying on other information do so at their own risk.

**NOTICE TO VENDOR** Offers, subject to the conditions made a part hereof, will be received at this office, ***1101 S. Saginaw St., Flint, MI 48502 for the following:***

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City of Flint has partnered with BidNet as part of the [MITN Purchasing Group](#) (branded page link) to post bid opportunities to this site. As a vendor, you can register with the [MITN Purchasing Group](#) and be sure that you see all available bids and opportunities. By selecting automatic bid notification, your company will receive emails once the City of Flint has a bid opportunity that matches your company's business. In addition, the site handles bid opportunities, RFPs, and RFQs for other member governmental agencies throughout Michigan. City of Flint looks forward to providing you with more bid information and simplifying the entire bid, proposal, and quote processes for everyone involved. We appreciate your cooperation and welcome your participation. If you need help registering, please call the MITN Purchasing Group support department toll free 1-800-835-4603 option #2.

Link to City of Flint open solicitations:

[MITN Purchasing Group](#) (branded page link)

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#### INSTRUCTIONS TO VENDORS

- 1) **PRE-BID INFORMATION AND QUESTIONS:** Each bid that is timely received will be evaluated on its merit and completeness of all requested information. In preparing bids, Bidders are advised to rely only upon the contents of this Request for Proposals (RFP) and accompanying documents and any written clarifications or addenda issued by the City of Flint. If a Bidder finds a discrepancy, error or omission in the RFP package, or requires any written addendum thereto, the Bidder is requested to notify the Purchasing contact noted on the cover of this RFP, so that written clarification may be sent to all prospective Bidders. **THE CITY OF FLINT IS NOT RESPONSIBLE FOR ANY ORAL INSTRUCTIONS.** All questions must be submitted in writing to the Finance Department of Purchases and Supplies before any pre-bid deadline (if specified) or at least one (1) week prior to the proposal opening date indicated on the front of this document.
- 2) **RFP MODIFICATIONS:** The City of Flint has the right to correct, modify or cancel the RFP, in whole or in part, or

to reject any Bid, in whole or in part, within the discretion of the City of Flint, or their designee. If any such changes are made, all known recipients of the RFP will be sent a copy of such changes. If any changes are made to this RFP document by any party other than the City of Flint, the original document in the City of Flint's files takes precedence.

**3) PROPOSAL SUBMISSION:**

a) The Bidder must include the following items, or the proposal may be deemed non-responsive:

i) All forms contained in this RFP, fully completed.

b) Bids must be submitted to the Finance Department of Purchases and Supplies, City of Flint, 1101 S. Saginaw Street, Room 203, Flint, Michigan 48502 by the date and time indicated as the deadline. The Purchasing Department time stamp will determine the official receipt time. It is each Bidder's responsibility to insure that their proposal is time stamped by the Purchasing Department by the deadline. This responsibility rests entirely with the Bidder, regardless of delays resulting from postal handling or for any other reasons. Proposals will be accepted at any time during the normal course of business only, said hours being 8:00 a.m. to 5:00 p.m. local time, Monday through Friday, legal holidays as exception.

c) Bids must be enclosed in a sealed, non-transparent envelope, box or package, and clearly marked on the outside with the following: RFP Title, RFP Number, Deadline and Bidder's name.

d) Submission of a bid establishes a conclusive presumption that the Bidder is thoroughly familiar with the Request for Proposals (RFP), and that the Contractor understands and agrees to abide by each and all of the stipulations and requirements contained therein.

e) All prices and notations must be typed or printed in ink. No erasures are permitted. Mistakes may be crossed out and corrections must be initialed in ink by the person(s) signing the bid.

f) Proposals sent by email, facsimile, or other electronic means will not be considered unless specifically authorized in this RFP.

g) All costs incurred in the preparation and presentation of the bid are the Bidder's sole responsibility; no pre-bid costs will be reimbursed to any Bidder. All documentation submitted with the proposal will become the property of the City of Flint.

h) Proposals must be held firm for a minimum of 120 days.

4) **EXCEPTIONS:** Bidder shall clearly identify any proposed deviations from the Terms or Scope in the Request for Proposals. Each exception must be clearly defined and referenced to the proper paragraph in this RFP. The exception shall include, at a minimum, the proposed substitute language and opinion as to why the suggested substitution will provide equivalent or better service and performance. If no exceptions are noted in the bid, the City of Flint will assume complete conformance with this specification and the successful Bidder will be required to perform accordingly. Bids not meeting all requirements may be rejected.

5) **DUPLICATE BIDS:** No more than one (1) bid from any Bidder including its subsidiaries, affiliated companies and franchises will be considered by the City of Flint. In the event multiple proposals are submitted in violation of this provision, the City will have the right to determine which bid will be considered or, at its sole option, reject all such multiple proposals.

6) **WITHDRAWAL:** Bids may only be withdrawn by written notice prior to the date and time set for the opening of bids. No bid may be withdrawn after the deadline for submission.

7) **REJECTION/GOOD STANDING:** The City of Flint reserves the right to reject any or all bids, or to accept or reject any bid in part, and to waive any minor informality or irregularity in bids received if it is determined by the City of Flint, or their designee, that the best interest of the City will be served by doing so. No bid will be considered

from any person, firm or corporation in arrears or in default to the City on any contract, debt, taxes or other obligation, or if the Bidder is debarred by the City of Flint from consideration for a contract award pursuant to Section 18-21.5 (d) of Article IV of the "Purchasing Ordinance of the City of Flint".

- 8) **PROCUREMENT POLICY:** Procurement for the City of Flint will be handled in a manner providing fair opportunity to all businesses. This will be accomplished without abrogation or sacrifice of quality and as determined to be in the best interest of the City. The City of Flint and their officials have the vested authority to execute a contract, subject to City Council and Mayoral approval where required.
- 9) **BID SIGNATURES:** Bids must be signed by an authorized official of the Bidder. Each signature represents binding commitment upon the Bidder to provide the goods and/or services offered to the City of Flint if the Bidder is determined to be the lowest Responsive and Responsible Bidder.
- 10) **CONTRACT AWARD/SPLIT AWARDS:** The City of Flint reserves the right to award by item and/or group of items. The Bidder to whom the award is made will be notified at the earliest possible date. Tentative acceptance of the bid, intent to recommend award of a contract and actual award of the contract will be provided by written notice sent to the Bidder at the address designated in the bid if a separate Agreement is required to be executed. After a final award of the Agreement by the City of Flint, the Contractor/Vendor must execute and perform said Agreement. All proposals must be firm for at least 120 days from the due date of the proposal. If, for any reason, a contract is not executed with the selected Bidder within 14 days after notice of recommendation for award, then the City may recommend the next lowest responsive and responsible Bidder.
- 11) **NO RFP RESPONSE:** Bidders who receive this RFP but who do not submit a bid should return this RFP package stating "No Bid" and are encouraged to list the reason(s) for not responding. Failure to return this form may result in removal of the Bidder's name from all future lists.
- 12) **FREEDOM OF INFORMATION ACT (FOIA) REQUIREMENTS:** Bids are subject to public disclosure after the deadline for submission in accordance with state law.
- 13) **ARBITRATION:** Contractor/Vendor agrees to submit to arbitration all claims, counterclaims, disputes and other matters in question arising out of or relating to this agreement or the breach thereof. The Contractor's/Vendor's agreement to arbitrate shall be specifically enforceable under the prevailing law of any court having jurisdiction to hear such matters. Contractor's/Vendor's obligation to submit to arbitration shall be subject to the following provisions:
  - a) Notice of demand for arbitration must be submitted to the City in writing within a reasonable time after the claim, dispute or other matter in question has arisen. A reasonable time is hereby determined to be fourteen (14) days from the date the party demanding the arbitration knows or should have known the facts giving rise to their claim, dispute or question. In no event may the demand for arbitration be made after the time when institution of legal or equitable proceedings based on such claim dispute or other matters in question would be barred by the applicable statute of limitation.
  - b) Within fourteen (14) days from the date that demand for arbitration is received by the City, each party shall submit to the other the name of one person to serve as an arbitrator. The two arbitrators together shall then select a third person, the three together shall then serve as a panel in all proceedings. Any decision concurred in by a majority of the three shall be a final binding decision.
  - c) The final decision rendered by said arbitrators shall be binding and conclusive and shall be subject to specific enforcement by a court of competent jurisdiction.
  - d) The costs of the arbitration shall be split and borne equally between the parties and such costs are not subject to shifting by the arbitrator.

e) This provision shall survive the expiration or termination of this Agreement in perpetuity.

- 14) **BID HOLD:** The City of Flint may hold bids for a period of one hundred twenty (120) days from opening, for the purpose of reviewing the results and investigating the qualifications of bidders prior to making an award.
- 15) **NONCOMPLIANCE:** Failure to deliver in accordance with specifications will be cause for the City of Flint and they may cancel the contract or any part thereof and purchase on the open market, charging any additional cost to the Contractor/Vendor.
- 16) **DISCLAIMER OF CONTRACTUAL RELATIONSHIP:** Nothing contained in these documents shall create any contractual relationship between the City and any Subcontractor or Sub-subcontractor.
- 17) **ERRORS AND OMISSIONS:** Bidder is not permitted to take advantage of any obvious errors or omissions in specifications.
- 18) **INTERPRETATION:** In the event that any provision contained herein shall be determined by a court of competent jurisdiction or an appropriate administrative tribunal to be contrary to the provision of law or to be unenforceable for any reason, then, to the extent necessary and possible to render the remainder of this Agreement enforceable, such provision may be modified or severed by such court or administrative tribunal having jurisdiction over this Agreement and the interpretation thereof, or the parties hereto, so as to, as nearly as possible, carry out the intention of the parties hereto, considering the purpose of the entire Agreement in relation to such provision.
- 19) **LAWS AND ORDINANCES:** The Bidder shall obey and abide by all of the laws, rules and regulations of the Federal Government, State of Michigan, Genesee County and the City of Flint, applicable to the performance of this Agreement, including, but not limited to, labor laws, and laws regulating or applying to public improvement, local government, and its operational requirements.
- 20) **LOCAL PREFERENCE:** Contractors/bidders located within the corporate city limits of Flint, Michigan may be given a seven percent (7%) competitive price advantage. Additionally, if the lowest responsible bidder is not located within the limits of the City of Flint, but is located within the County of Genesee, and said bidder does not exceed the bid of the lowest non-local bidder by more than three and one-half percent (3-1/2%), then said lowest Genesee County bidder may be determined to be the lowest responsible bidder, and make the award to such Genesee County bidder accordingly, subject to the approval of the City Council. If the lowest non-local bidder does not exceed that of any Proposers/bidders by (7%) inside the City of Flint or (3-1/2%) inside the County of Genesee, then the Purchasing Director shall be allowed to request that the lowest local vendor match the price offered by the lowest non-local vendor.
- 21) **MATERIAL WORKMANSHIP AND STANDARDS OF PERFORMANCE:** The Bidder agrees to exercise independent judgment and to complete performance under this Agreement in accordance with sound professional practices. In entering into this Agreement, the City is relying upon the professional reputation, experience, certification and ability of the Bidder by her/him/themselves or by others employed by her/him/them and working under their direction and control. The continued effectiveness of this Agreement during its term or any renewal term shall be contingent, in part, upon the Bidder maintaining her/his/their operating qualifications in accordance with the requirements of federal, state and local laws. All materials furnished must be new, of latest model and standard first grade quality, or best workmanship and design, unless otherwise expressly specified. Bidder, if required, must furnish satisfactory evidence of quality materials; offers of experimental or unproven equipment may be disregarded.
- 22) **MODIFICATIONS/CHANGES:** Any modification to this agreement must be in writing and signed by the authorized employee, officer, board or council representative authorized to make such modifications pursuant

to the State law and local ordinances.

- 23) **NON-COLLUSION:** The Bidder acknowledges that by signing this document that she/he/they is/are duly authorized to make said offer on behalf of the company she/he/they represent(s) and that said bid is genuine and not sham or collusive and not made in the interests or on behalf of any person not therein named, and that she/he/they and said bidder have not directly induced or solicited any other person(s) or corporation to refrain from responding to this solicitation and that she/he/they and said bidder have not in any manner sought by collusion to secure to themselves and said bidder any advantage over any other bidder.
- 24) **NON-DISCRIMINATION:** Pursuant to the requirements of 1976 P.A. 453 (Michigan Civil Rights Act) and 1976 P.A. 220 (Michigan Handicapped Rights Act), the local unit and its agent agree not to discriminate against any employee or applicant for employment with respect to hire, tenure, terms, conditions, or privileges of employment or a matter directly or indirectly related to employment because of race, color, religion, national origin, age, sex, height, weight, marital status or because of a handicap that is unrelated to the person's ability to perform the duties of nondiscrimination provision identical to this provision and binding upon any and all contractors and subcontractors. A breach of this covenant shall be regarded as a material breach of this contract.
- 25) **SUBCONTRACTING:** No subcontract work shall be started prior to the written approval of the subcontractor by the City. The City reserves the right to accept or reject any subcontractor.
- 26) **UNION COMPLIANCE:** Bidder agrees to comply with all regulations and requirements of any national or local union(s) that may have jurisdiction over any of the materials, facilities, services or personnel to be furnished by the City.
- 27) **WAIVER:** Failure of the City to insist upon strict compliance with any of the terms, covenants or conditions of this Agreement shall not be deemed a waiver of that term, covenant or condition or of any other term, covenant or condition. Any waiver or relinquishment of any right or power hereunder at any one or more times shall not be deemed a waiver or relinquishment of that right or power at any other time.
- 28) **CITY INCOME TAX WITHHOLDING:** Contractor and any subcontractor engaged in this contract shall withhold from each payment to his employees the City income tax on all of their compensation subject to tax, after giving effect to exemptions, as follows:
- a) Residents of the City:  
At a rate equal to 1% of all compensation paid to the employee who is a resident of the City of Flint.
  - b) Non-residents:  
At a rate equal to 1/2% of the compensation paid to the employee for work done or services performed in the City of Flint.
- These taxes shall be held in trust and paid over to the City of Flint in accordance with City ordinances and State law. Any failure to do so shall constitute a substantial and material breach of this contract.
- 29) **CONTRACT DOCUMENTS:** The invitation for proposal, instructions to proposal, proposal, affidavit, addenda (if any), statement of Bidder's qualifications (when required), general conditions, special conditions, performance bond, labor and material payment bond, insurance certificates, technical specifications, and drawings, together with this agreement, form the contract, and they are as fully a part of the contract as if attached hereto or repeated herein.
- 30) **DISCLAIMER OF CONTRACTUAL RELATIONSHIP WITH SUBCONTRACTORS:** Nothing contained in the Contract Documents shall create any contractual relationship between the City and any Subcontractor or Sub-subcontractor.
- 31) **EFFECTIVE DATE:** Any agreement between the City and the Bidder shall be effective upon the date that it is

executed by all parties hereto.

- 32) **FORCE MAJURE:** Neither party shall be responsible for damages or delays caused by Force Majeure nor other events beyond the control of the other party and which could not reasonably have anticipated the control of the other party and which could not reasonably have been anticipated or prevented. For purposes of this Agreement, Force Majeure includes, but is not limited to, adverse weather conditions, floods, epidemics, war, riot, strikes, lockouts, and other industrial disturbances; unknown site conditions, accidents, sabotage, fire, and acts of God. Should Force Majeure occur, the parties shall mutually agree on the terms and conditions upon which the services may continue.
- 33) **INDEMNIFICATION:** To the fullest extent permitted by law, Bidder agrees to defend, pay on behalf of, indemnify, and hold harmless the City of Flint, its elected and appointed officials, employees and volunteers and others working on behalf of the City of Flint, including the Project Manager, against any and all claims, demands, suits, or losses, including all costs connected therewith, and for any damages which may be asserted, claimed, or recovered against or from the City of Flint, its elected and appointed officials, employees, volunteers or others working on behalf of the City of Flint, by reason of personal injury, including bodily injury or death and/or property damage, including loss of use thereof, which may arise as a result of Bidder's acts, omissions, faults, and negligence or that of any of his employees, agents, and representatives in connection with the performance of this contract. Should the Bidder fail to indemnify the City in the above-mentioned circumstances, the City may exercise its option to deduct the cost that it incurs from the contract price forthwith. These provisions shall survive the termination or expiration of any agreement entered into as a result of this request.
- 34) **INDEPENDENT CONTRACTOR:** No provision of this contract shall be construed as creating an employer-employee relationship. It is hereby expressly understood and agreed that Bidder is an "independent contractor" as that phrase has been defined and interpreted by the courts of the State of Michigan and, as such, Bidder is not entitled to any benefits not otherwise specified herein.
- 35) **NO THIRD-PARTY BENEFICIARY:** No contractor, subcontractor, mechanic, material man, laborer, vendor, or other person dealing with the principal Contractor shall be, nor shall any of them be deemed to be, third-party beneficiaries of this contract, but each such person shall be deemed to have agreed (a) that they shall look to the principal Contractor as their sole source of recovery if not paid, and (b) except as otherwise agreed to by the principal Contractor and any such person in writing, they may not enter any claim or bring any such action against the City under any circumstances. Except as provided by law, or as otherwise agreed to in writing between the City and such person, each such person shall be deemed to have waived in writing all rights to seek redress from the City under any circumstances whatsoever.
- 36) **NON-ASSIGNABILITY:** Contractor shall not assign or transfer any interest in this contract without the prior written consent of the City provided, however, that claims for money due or to become due to Contractor from the City under this contract may be assigned to a bank, trust company, or other financial institution without such approval. Notice of any such assignment or transfer shall be furnished promptly to the City.
- 37) **NON-DISCLOSURE/CONFIDENTIALITY:** Contractor agrees that the documents identified herein as the contract documents are confidential information intended for the sole use of the City and that Contractor will not disclose any such information, or in any other way make such documents public, without the express written approval of the City or the order of the court of appropriate jurisdiction or as required by the laws of the State of Michigan.
- 38) **RECORDS PROPERTY OF CITY:** All documents, information, reports and the like prepared or generated by Contractor as a result of this contract shall become the sole property of the City of Flint.
- 39) **SEVERABILITY:** In the event that any provision contained herein shall be determined by a court or administrative tribunal to be contrary to a provision of state or federal law or to be unenforceable for any

reason, then, to the extent necessary and possible to render the remainder of this Agreement enforceable, such provision may be modified or severed by such court or administrative tribunal so as to, as nearly as possible, carry out the intention of the parties hereto, considering the purpose of the entire Agreement in relation to such provision. The invalidation of one or more terms of this contract shall not affect the validity of the remaining terms.

- 40) **TERMINATION:** This contract may be terminated by either party hereto by submitting a notice of termination to the other party. Such notice shall be in writing and shall be effective 30 days from the date it is submitted unless otherwise agreed to by the parties hereto. Contractor, upon receiving such notice and prorated payment upon termination of this contract shall give to the City all pertinent records, data, and information created up to the date of termination to which the City, under the terms of this contract, is entitled.
- 41) **TIME PERFORMANCE:** Contractor's services shall commence immediately upon receipt of the notice to proceed and shall be carried out forthwith and without reasonable delay.
- 42) **EVALUATION OF PROPOSAL:** In the City's evaluation of proposals, at minimum: cost, serviceability, financial stability, and all requirements set forth in this document shall be considered as selection and award criteria unless otherwise specified.
- 43) **PREVAILING WAGE:** When applicable, all work for this project, including that of any subcontractor or sub-subcontractor, must meet Davis-Bacon Act requirements and full prevailing wage. Information on Davis-Bacon reporting and requirements, including payroll reporting, can be found at: <https://www.dol.gov/whd/govcontracts/dbra.htm>
- 44) **INSURANCE & BONDS:** The bidder whose proposal is accepted will be required to furnish bonds and evidence of insurance within five days from date of Notice of Award. In case of failure or refusal on the part of the bidder to furnish bonds, if required, within the set period, the amount of deposit may be forfeited to the county and the contract may be awarded to the next lowest responsible bidder. Upon the notification of award and approval of the bond, the deposit will be returned to the proposer. The deposit of persons other than the one to whom and award is made will be returned to the person or persons making the proposal immediately after the contract and bonds have been executed.
- 45) **PROPOSAL SUBMISSION:** Proposals and all information requested of the vendor shall be entered in the appropriate spaces. Failure to do so may disqualify the vendor's offer. An authorized officer or employee of the bidder shall submit the proposal.
- 46) **PRICES:** Prices proposed shall be for new products in current production unless otherwise specified. Where refurbished or discontinued items are offered they must be clearly identified as such. Prices proposed shall be exclusive of any rebates due the City. Any rebates the City may be entitled to should be shown as a separate line item and include expiration date. Corrections and/or modifications received after the bid closing time specified will not be accepted. Unit prices prevail. All prices will be bid F.O.B. DESTINATION, INCLUDE ALL DELIVERY AND ANY ADDITIONAL CHARGES, and remain in effect as specified in the quotation.
- 47) **AWARD:** Unless otherwise stated in the proposal documents, the City cannot guarantee exclusivity of the contract for the proposed products or services. Award of the proposal shall be based upon a combination of factors, including but not limited to, adherence to proposal requirements, references and any other factors that may be in the City's best interest. The City reserves the right to reject any and all bids, and to waive any defect or irregularity in bids. The City reserves the right to accept and separate items in the bid; and to accept the proposal that in the opinion of the City is to the best advantage and interest of the



public we serve. The City also has the right to re-solicit bids if it is deemed to be in the best interest of the City. The City reserves the right to reject low bids which have major deviations from our specification; to accept a higher quotation which has only minor deviations. By signing the bid, the vendor agrees to accept a split award unless the awarded vendor clearly indicates that it takes exception. The bid will be awarded to that responsible, responsive bidder whose proposal conforms to this solicitation, and will be most advantageous to the City, with regard not only to price, but also to availability of product, location and quality of product considered.

The City reserves the right to award all line items, to make no award or to award on an individual line item basis, whichever is deemed to be in the best interest of the City.

Time of delivery may be a consideration in the award.

- 48) **ETHICS IN PURCHASING:** Bidders and proposers are required to comply with Flint City Ordinance 3865 in its entirety. It is incumbent upon and the responsibility of the bidder to become familiar with and comply with the Purchasing ordinances as outlined in 3865 covering chapter 18 of the Flint City Ordinances. Bidder/Proposer acknowledges in accordance with Flint City Ordinance Section 18-21.19 Ethics in Purchasing, any and all communication about the bid selection process should be directed to those City employees delegated with the authority with respect to all purchases of goods and services.

Bidder/Proposer acknowledges and agrees that while a procurement is pending, bidders and proposers shall not communicate about the solicitation with any City employee, agent, or elected official, other than the purchasing director or other City personnel identify in the solicitation. This means that bidder and proposer are prohibited from communicating orally or by written communications, including but not limited to voicemail messages, social media, email, in person, among any other form of communication while the award is pending, to the aforementioned, with the exception to those employees designated by the City. If you are unclear about the process, it is your duty and obligation to contact the designated employee(s) for clarification.

Violations of the ethics provision of the ordinance, without regard to if the violation rises to the level of a criminal violation, may subject the bidder or proposer to debarment.

- 49) **BID PROTESTS:** If Bidder/Proposal believe that they are aggrieved in connection with the solicitation or award of the purchase order or contract, they may protest the action to the City as outlined in Flint City Charter Section 18-21.15.

**THE FOLLOWING PAGES MUST BE COMPLETED AND INCLUDED WITH SUBMITTAL IN THE FOLLOWING ORDER.**

**Purchasing Checklist:**

- Exhibit A - Complete Proposal Submittal with detailed Summary of Pricing
- Exhibit B –Qualifications and Licenses Requirements
- Exhibit C – Disclosure of Supplier Responsibility Statement
- Exhibit D - List of References
- Exhibit E - Certificate of Insurance
- Exhibit F – Non-Bidder’s Response
- Exhibit G – City of Flint Affidavit



**❖ EXHIBIT A - SUBMITTAL WITH DETAILED SUMMARY OF PRICING**

**SCOPE OF WORK ATTACHED BELOW.**

## **EXHIBIT B - QUALIFICATIONS AND LICENSES REQUIREMENTS**

**Please give a synopsis of your qualifications and experience with this service:**

**Please list Licenses:**

**How long have you been in business?**

**Have you done business with the City of Flint?**

**If yes, please state the project name.**

## EXHIBIT C – DISCLOSURE OF SUPPLIER RESPONSIBILITY STATEMENT

1. List any convictions of any person, subsidiary, or affiliate of the company, arising out of obtaining, or attempting to obtain a public or private contract, or subcontract, or in the performance of such contract or subcontract.

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2. List any convictions of any person, subsidiary, or affiliate of this company for offenses such as embezzlement, theft, fraudulent schemes, etc. or any other offense indicating a lack of business integrity or business honesty which affect the responsibility of the contractor.

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3. List any convictions or civil judgments under state or federal antitrust statutes.

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4. List any violations of contract provisions such as knowingly (without good cause) to perform, or unsatisfactory performance, in accordance with the specifications of a contract.

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5. List any prior suspensions or debarments by any government agency.

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6. List any contracts not completed on time.

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7. List any documented violations of federal or state labor laws, regulations or standards, or occupational safety and health rules.

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**❖ EXHIBIT D – LIST OF REFERENCES: (3) SIMILAR SCOPE OF WORK FROM  
THE LAST 5 YEARS**

Providing the following contact information enables the City of Flint to contact those accounts as references.

**Reference #1:**

Company/Municipality: \_\_\_\_\_

Contact Person: \_\_\_\_\_ Title: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_

Email: \_\_\_\_\_

Type of Project: \_\_\_\_\_

Project Timeline (Dates): \_\_\_\_\_ Budget: \_\_\_\_\_

**Reference #2:**

Company/Municipality: \_\_\_\_\_

Contact Person: \_\_\_\_\_ Title: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_

Email: \_\_\_\_\_

Type of Project: \_\_\_\_\_

Project Timeline (Dates): \_\_\_\_\_ Budget: \_\_\_\_\_

**❖ EXHIBIT D – LIST OF REFERENCES: (3) SIMILAR SCOPE OF WORK FROM  
THE LAST 5 YEARS (CONTINUES)**

**Reference #3:**

Company/Municipality: \_\_\_\_\_

Contact Person: \_\_\_\_\_ Title: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_

Email: \_\_\_\_\_

Type of Project: \_\_\_\_\_

\_\_\_\_\_

Project Timeline (Dates): \_\_\_\_\_ Budget: \_\_\_\_\_

## ❖ EXHIBIT E – CERTIFICATE OF INSURANCE

### INSURANCE REQUIREMENTS

The Contractor shall notify all insurance agents and companies retained by the Contractor that these insurance requirements shall be included in any Agreement between the Contractor and the City of Flint.

The Contractor shall purchase and maintain, at its sole expense and as long as it is providing services to the City, the following insurance coverage:

Commercial General Liability - Occurrence form, including coverage for bodily injury, personal injury, property damage (broad form), premises/operations, blanket contractual, and products/completed operations. Coverage shall be endorsed to include the City as an additional insured for work performed by the Contractor in accordance with the Agreement.

Minimum Limits:

- \$1,000,000 per occurrence/\$2,000,000 general aggregate
- \$2,000,000 aggregate for products and completed operations
- \$1,000,000 personal and advertising injury

Automobile - Michigan "no-fault" coverage, and residual automobile liability, comprehensive form, covering owned, hired, and non-owned automobiles. Coverage shall be endorsed to include the City as an additional insured for work performed by the Contractor in accordance with the Agreement.

Minimum Limits:

- No-fault coverages - statutory
- \$500,000 per person/\$1,000,000 per accident - bodily injury
- \$500,000 per occurrence - property damage
- A combined single limit of \$1,000,000 per occurrence

Workers' Compensation and Employer's Liability- Statutory coverage or proof acceptable to the City of approval as a self-insurer by the State of Michigan.



## ❖ EXHIBIT E – CERTIFICATE OF INSURANCE (CONTINUES)

Minimum Limits:

- Workers' Compensation - statutory
- Employer's Liability - \$100,000 each accident/\$100,000 disease - each employee
- \$500,000 disease - policy limit

Professional Liability – Covering acts, errors or omissions of a professional nature committed or alleged to have been committed by the Contractor or any of its subcontractors. Coverage shall be effective upon the date of the Agreement and shall remain effective for a period of three (3) years after the date of final payment thereunder. Such coverage shall be endorsed to include any subcontractors hired by the City.

Minimum Limits:

- \$1,000,000 per occurrence, \$1,000,000 annual aggregate

Insurance coverage shall cover all claims against the City of Flint, its officials and employees, arising out of the work performed by the Contractor or any subcontractors under the Agreement. Should any work be subcontracted, it shall be the responsibility of the Contractor to maintain Independent Contractor's Protective Liability Insurance with limits equal to those specified above for Commercial General Liability Insurance. In addition, the Contractor shall provide proof of Workers' Compensation Insurance for all subcontractors in compliance with the required statutory limits of the State of Michigan.

Said policies of insurance shall be with companies licensed to do business in the State of Michigan and in a form satisfactory to the City. All insurance companies must maintain a rating of B+, VIII or better from AM. Best Company. Certificates of insurance with a thirty-(30) day cancellation clause shall be filed with and approved by the City at least five (5) days in advance of commencing work under the Agreement. Cancellation, material restriction, non-renewal or lapse of any of the required policies shall be grounds for immediate termination of the Agreement by the City.

The City reserves the right to request a complete certified copy of the policies for the above coverage's.

Any reduction or exhaustion in the limits of required insurance coverage shall not be deemed to limit the indemnification afforded in accordance with the Agreement or any amendments thereto.

Depending on the subject matter of the transaction, the City may require other insurance coverage in addition to the coverage's contained herein.

***THE BID NUMBER IS TO APPEAR ON ALL INSURANCE CERTIFICATES***

❖ EXHIBIT F – NON-BIDDER'S RESPONSE

VENDOR'S NAME: \_\_\_\_\_

**NON-BIDDER'S RESPONSE**

For the purpose of facilitating your firm's response to our invitation to bid, the City of Flint is interested in ascertaining reasons for prospective bidder's failure to respond to "Invitations to Bid". If your firm is not responding to this bid, please indicate the reason(s) by checking any appropriate item(s) below and return this form to the above address.

We are **not** responding to this "Invitation to Bid" for the following reason(s):

\_\_\_\_\_ Items or materials requested not manufactured by us or not available to our company.

\_\_\_\_\_ Our items and/or materials do not meet specifications.

\_\_\_\_\_ Specifications not clearly understood or applicable (too vague, too rigid, etc.).

\_\_\_\_\_ Quantities too Small.

\_\_\_\_\_ Insufficient time allowed for preparation of bid.

\_\_\_\_\_ Incorrect address used. Our correct mailing address is:

\_\_\_\_\_

\_\_\_\_\_ Our branch / division handles this type of bid. We have forwarded this bid on to them but for the future the correct name and mailing address is: \_\_\_\_\_

\_\_\_\_\_ **OTHER:** \_\_\_\_\_

\_\_\_\_\_

**Thank you for your participation in this bid.**

**AFFIDAVIT FOR INDIVIDUAL**

STATE OF \_\_\_\_\_

S.S.

COUNTY OF \_\_\_\_\_

\_\_\_\_\_ being duly sworn,  
deposes and says that they are the person making the above bid; and that said bid is genuine and not sham or collusive, and is not made in the interest of or on behalf of any person not therein named, and that they have not directly or indirectly induced or solicited any bidder to put in a sham bid; that they have not directly or indirectly induced or solicited any other person or corporation to refrain from bidding, and that they have not in any manner sought by collusion to secure themselves any advantage over other bidders.

Subscribed and sworn to before me at \_\_\_\_\_, in said County and State,

this \_\_\_\_\_ day of \_\_\_\_\_, A.D. 20\_\_\_\_\_,

\_\_\_\_\_

\*Notary Public, \_\_\_\_\_ County, \_\_\_\_\_

My Commission expires \_\_\_\_\_, 20\_\_\_\_\_

❖ EXHIBIT G – CITY OF FLINT AFFADAVIT

FOR CORPORATION

STATE OF \_\_\_\_\_

S.S.

COUNTY OF \_\_\_\_\_

\_\_\_\_\_ being duly sworn, deposes and says that she/he/they  
is \_\_\_\_\_ of \_\_\_\_\_

(Official Title)

(Name of Corporation)

a corporation duly organized and doing business under the laws of the State of \_\_\_\_\_  
the corporation making the within and foregoing bid; that they executed said bid in behalf of said corporation by  
authority of its Board of Directors; that said bid is genuine and not sham or collusive and is not made in the  
interests of or on behalf of any person not herein named, and that they have not and said bidder has not directly  
or indirectly induced or solicited any other person or corporation to refrain from bidding; that they have not and  
said bidder has not in any manner sought by collusion to secure to themselves or to said corporation an advantage  
over other bidders.

Subscribed and sworn to before me at \_\_\_\_\_, in said County and State,  
this \_\_\_\_\_ day of \_\_\_\_\_, A.D. 20 \_\_\_\_\_,

\_\_\_\_\_

\*Notary Public, \_\_\_\_\_ County, \_\_\_\_\_

My Commission expires \_\_\_\_\_, 20 \_\_\_\_\_

**CITY OF FLINT**  
**UTILITIES DIVISION**  
**SURVEILLANCE IMPROVEMENTS**

The City of Flint Utilities Division is seeking qualified surveillance system integrators and installers to procure, install and commission new surveillance systems, networking, cabling and appurtenances at its Water Plant and Water Service Center and their associated remote locations.

**1.0 PROJECT OVERVIEW**

1.1 The project encompasses 2 “phases” that may be worked on concurrently.

The phases are:

1.1.1 Water Service Center campus

1.1.2 Water Plant campus & associated remote locations

1.2 A proposed equipment listing is found in Appendix A. The integrator, in conjunction with the installation contractor, are responsible for procuring and installing the listed equipment or its current version if the listed item is discontinued, and providing all other necessary equipment, parts, cables and appurtenances (e.g. PoE injectors, switches, conduits) necessary for complete and functional surveillance systems.

1.3 The new surveillance system shall be capable of integrating with current and future access control systems such as, but not limited to, Intelli-M, and Premisys.

1.4 The installation contractor shall assist the manufacturer’s representative(s) and the integrator in commissioning and programming the new surveillance systems.

1.5 Upon receipt of bid, the manufacturer, integrator, installation contractor and all subcontractors or consultants agree that they will not disclose any details of it, nor any security related information regarding any of the sites, to unauthorized parties. Authorization to disclose any such information to persons outside of those performing the work must be requested in writing from the City and be granted in writing prior to disclosure.

1.6 The manufacturer and integrator shall warranty all their parts and services provided for a period of no less than 60 months from the date of final payment. The installation contractor shall warranty their labor and parts for a period of no less than 12 months from the date of final payment.

**2.0 MANUFACTURER, INTEGRATOR and CONTRACTOR REQUIREMENTS AND SUBMITTALS**

- 2.1 Qualified manufacturers, integrators and contracted installers shall each have a minimum of five (5) years of experience in providing surveillance equipment to municipalities and/or State or Federal agencies. Contracted installers shall be licensed for the installation by the State of Michigan.
- 2.2 Qualified manufacturers, integrators and installers shall coordinate with the City of Flint representatives regarding camera network configuration and estimated bandwidth utilization prior to performing any network connections.
- 2.3 Qualified manufacturers and installers shall provide to the City of Flint representatives a proposed schedule of coordination and progress update meetings. Meetings shall be held, at a minimum, monthly. Updated Gant charts shall be included.
- 2.4 Informational Submittals:
  - 2.4.1 Product Data: Manufacturer's product information and data sheets for each product in this specification, including but not limited to:
    - 2.4.1.1 Substrate preparation instructions and recommendations.
    - 2.4.1.2 Installation means and methods.
    - 2.4.1.3 Recommendations and requirements for proper storage and handling.
  - 2.4.2 Shop Drawings:
    - 2.4.2.1 Submit manufacturer's approved shop drawings detailing the location and elevation of each product to be installed.
    - 2.4.2.2 Coordinate with locations listed on Contract Drawings.
  - 2.4.3 Warranty Information:
    - 2.4.3.1 Submit confirmation and details of manufacturer's, integrator's and installation contractor warranty, extended warranty, and replacement policies.
  - 2.4.4 System Support Resources:
    - 2.4.4.1 Submit a list of available manufacturers providing future fee-based professional services available to the Installation Contractor and City of Flint, including but not limited to, the following:
      - 2.4.4.1.1 Training (see section 10.6.1).
      - 2.4.4.1.2 Installation.
      - 2.4.4.1.3 Commissioning.
      - 2.4.4.1.4 Remote diagnostics and integration with 3<sup>rd</sup> party software and hardware systems.
  - 2.4.5 A Gant chart showing estimated timelines for significant milestones and hard deadlines shall be included in the submittals.
- 2.5 Closeout Submittals:
  - 2.5.1 Supply licensing and registration information for all software, hardware, firmware, operational, and administrative licenses.

- 2.5.2 Supply network configuration backup files, restoration application and instructions.
- 2.6 Document Submittals:
  - 2.6.1 Provide one (1) hard copy of all manuals (e.g. operating instructions, device user manuals, etc.) per department and one (1) extra set (3 total) in 3-ring binders, or in book form.
  - 2.6.2 Provide one (1) CD or one (1) flash drive containing copies of all manuals (e.g. operating instructions, device user manuals, etc.) per department and one extra (3 total).
  - 2.6.3 Provide copies of all training materials in both hard copy and electronic format per Section 10.
- 2.7 Maintenance Submittals:
  - 2.7.1 Spare Parts: All Spare Parts shall be delivered to the City of Flint in the original, sealed packaging. Each department shall receive their own, unique spare parts shipment. Clearly label with “SPARE. DO NOT REMOVE”, and include manufacturer part numbers, and date of delivery to the City of Flint. Store all spare parts in an environment and condition recommended by the manufacturer.
    - 2.7.1.1 One spare for each 5 devices (such as PoE injectors), excepting cameras, workstations and servers.
    - 2.7.1.2 Provide spare components as noted in any coordinating schedules for work listed in this specification or otherwise noted.
  - 2.7.2 The City reserves the right to withdraw section 2.7 from consideration.
- 2.8 Quality Assurance.
  - 2.8.1 Qualifications: Manufacturers supplying products in this specification shall have a minimum of 5 years of experience providing equipment to municipalities, or State or Federal agencies. At least three (3) completed installations shall be provided in the submittals.
  - 2.8.2 Qualifications: Integrators shall have a minimum of 5 years of experience integrating and commissioning Avigilon equipment to municipalities, or State or Federal agencies. At least three (3) completed installations shall be provided in the submittals.
  - 2.8.2 Qualifications: Installers shall have a minimum of 5 years of experience in installing Avigilon or similar surveillance systems for municipalities, or State or Federal agencies. At least three (3) completed installations shall be provided in the submittals.
- 2.9 Warranty.
  - 2.9.1 Manufacturers shall provide a warranty covering parts and associated labor costs to replace or repair parts that fail to perform.
    - 2.9.1.1 Warranty period: Parts shall be warrantied for a period of no less than 60 months from the date of final payment.
    - 2.9.1.2 Service During Warranty: provide direct support to the City of Flint via phone and email including access to training and

education in the form of documents, videos and other materials.

2.9.2 Installers shall warranty all work and related parts and labor for a period of not less than 12 months from the date of final payment.

2.10 Pre-Bid Meeting.

There shall be a mandatory pre-bid meeting. Failure to attend this meeting shall result in bid disqualification.

### 3.0 GENERAL PRODUCT REQUIREMENTS

3.1 Products shall meet the requirements in this section and all other relevant sections to be qualified for use in this project.

3.2 Product Manufacturer:

3.2.1 Approved manufacturers for this project shall include the following:

3.2.1.1 Avigilon

3.2.1.2 Any other manufacturer that can provide written and tested equivalence to the specifications listed in this document.

3.3 Products shall be single-sourced, insofar as possible. The manufacturer shall provide a fully integrated surveillance system consisting of fixed position and moveable network cameras and provide all hardware and software necessary for fully functional systems including but not limited to:

3.3.1 Video Management System Analytics.

3.3.2 Video Management System Interfaces.

3.3.3 Video Surveillance Positioning Equipment.

3.3.4 Video Surveillance sensors.

3.3.5 Storage Appliances for Electronic Safety and Security.

3.3.6 Access Control Software and Database Management.

3.3.7 IP Video Cameras.

3.4 The video monitoring system shall be tightly integrated using application programming interfaces and software development kits.

3.5 All systems shall be capable of functioning autonomously during a failure of one or more of the related sections.

3.6 Cameras shall be capable of bi-directional communication.

3.7 Video monitoring systems shall be interfaced through digital communication protocols including but not limited to ASCII or Hexadecimal Data Transmissions.

3.8 System Certifications:

3.8.1 UL and cUL certification marks for Canada/US.

3.9 System Safety Standards.

3.9.1 UL/CSA/IEC/EN 62368-1.

3.9.2 With IR: IEC 62471.

3.10 Electromagnetic Emissions Standards:

3.10.1 FCC Part 15 Subpart B Class B.



- 3.10.2 ICES-003 Class B.
- 3.10.3 EN 55032 Class B.
- 3.10.4 EN 61000-6-3.
- 3.10.5 EN 61000-3-2.
- 3.10.6 EN 61000-3-3.
- 3.11 Electromagnetic Immunity Standards:
  - 3.11.1 EN 55024.
  - 3.11.2 EN 61000-6-1.
- 3.12 Environmental Standards:
  - 3.12.1 Bullet Cameras:
    - 3.12.1.1 UL/CSA/IEC 60950-22.
    - 3.12.1.2 IEC 60529 IP66 and IP67 Weather Rating.
    - 3.12.1.3 IEC 62292 IK10 Impact Rating.
  - 3.12.2 Outdoor Dome Cameras:
    - 3.12.2.1 UL/CSA/IEC 60950-22.
    - 3.12.2.2 IEC 60529 IP 66 and IP67 Weather Rating.
    - 3.12.2.3 IEC 62262 IK10 Impact Rating.
  - 3.12.3 Indoor Dome Cameras:
    - 3.12.3.1 IEC 62262 IK10 Impact Rating.
- 3.13 Performance Requirements.
  - 3.13.1 Standards:
    - 3.13.1.1 Video Standards: H.265/H/264/MJPEG/HDSM SmartCodec technology.
    - 3.13.1.2 Image Standards: MPEG-4-ISO/IEC 14496-10 AVC (H.264)
    - 3.13.1.3 Networking Standards:
      - 3.13.1.3.1 IEEE 802.3af (Power over Ethernet)
      - 3.13.1.3.2 IEEE 802.1X (Authentication)
      - 3.13.1.3.3 IPv4 (RFC 791).
      - 3.13.1.3.4 IPv6.
    - 3.13.1.4 Inter-operabilty Standards:
      - 3.13.1.4.1 ONVIF Profile S.
      - 3.13.1.4.2 ONVIF Profile T.
      - 3.13.1.4.3 ONVIF Profile G.
  - 3.13.2 Video Requirements:
    - 3.13.2.1 Provide cameras capable of simultaneously delivering at least three individual video streams, for use when connecting to the Video Management Software for recording and live viewing.
    - 3.13.2.2 Provide cameras with a primary stream capable of supporting the video resolution and aspect ratio and capable of generating the image framerates noted in this bid.

3.13.2.3 By generating a secondary stream at fractional resolutions of the primary stream, video devices shall support HDSM-High Definition Stream Management and/or Dynamic Bandwidth Management.

3.13.3 Encoding Requirements:

3.13.3.1 Support compression and image quality setting from 1 to 20 to configure bandwidth utilized by the camera and desired image response. Provide user configuration of compression quality and image rate per camera.

3.13.3.2 Provide independently configured simultaneous H.265, H.264 and Motion JPEG streams (multi-stream).

3.13.3.3 Support Motion JPEG encoding in a selectable range from 1 up to 30 framers per second based on resolution configured.

3.13.3.4 Support H.264 encoding in a selectable range 1 up to 40 frames per second based on resolution configured.

3.13.3.5 Support H.265 encoding in a selectable range 1 up to 40 frames per second based on resolution configured.

3.13.3.6 Support Variable Bit Rate (VBR) in H.264 with a configurable maximum bit rate threshold.

3.13.3.7 Support Variable Bit Rate (VBR) in H.265 with a configurable maximum bit rate threshold.

3.13.3.8 Provide user configuration of compression format, compression quality, maximum bit rate, key frame interval, and image rate per camera.

3.13.3.9 Support motion compensation and motion vector during motion estimation in H.264, able to maintain frame rate, regardless of scene complexity, when bandwidth is capped at 12 mbps at 30 FPS for 1-3 MP and 20 mbps at 30 FPS for 5-8 MP.

3.13.3.10 Support G.711 PCM 8kHz audio compression.

3.13.4 Provide cameras that allow video and audio signals to be transported over:

3.13.4.1 HTTP (Unicast).

3.13.4.2 HTTPS (Unicast).

3.13.4.3 RTP (Unicast & Multicast).

3.13.4.4 RTP over RTSP (Unicast).

3.13.4.5 RTP over RTSP over HTTP (Unicast).

3.13.4.6 RTP over RTSP over HTTPS (Unicast).

3.13.5 Image Control Requirements:

3.13.5.1 User Configurations Supported:

3.13.5.1.1 Automatic and manual white balance control.

- 3.13.5.1.2 Automatic and manually defined exposure zones operating in the range 1/7 to 1/8196 sec second.
- 3.13.5.1.3 Flicker control (50Hz, 60Hz).
- 3.13.5.1.4 Automatic and manual iris control.
- 3.13.5.1.5 Color saturation and sharpening.
- 3.13.5.1.6 Motion detection sensitivity and threshold.
- 3.13.5.1.7 Digital rotation of the image when used with control center software.
- 3.13.5.1.8 Minimum Dynamic Range:
  - 3.13.5.1.8.1 83 dB for 2-5 MP and 85 dB for 6-8 MP. Dynamic Range shall not change based on configured encoding resolution.

3.13.6 Adaptive Vide Analytics Specifications:

- 3.13.6.1 Configured Behaviors: Unlimited number of configured behaviors per video source supported.
- 3.13.6.2 Automatic Analytic set up and tuning of behavior identification:
  - 3.13.6.2.1 Upon selection of analytic and Region of Interest (ROI), the device shall automatically configure behavior identification.
  - 3.13.6.2.2 The device shall constantly monitor changes in the scene and perform a tuning of the behavior identification parameters as the scene environment changes.
- 3.13.6.3 Include detection of the following behaviors:
  - 3.13.6.3.1 Object present in ROI.
  - 3.13.6.3.2 Object enters ROI.
  - 3.13.6.3.3 Object leaves ROI.
  - 3.13.6.3.4 Object appeared.
  - 3.13.6.3.5 Object disappeared.
  - 3.13.6.3.6 Object crosses a line of interest or beam.
  - 3.13.6.3.7 Object Movement Direction.
  - 3.13.6.3.8 Object loitering.
  - 3.13.6.3.9 Multiple objects in ROI over specified dwell time.
  - 3.13.6.3.10 Dwell Time.
  - 3.13.6.3.11 Number of objects exceeds limit in ROI.
  - 3.13.6.3.12 Number of objects below limit in ROI.

3.13.6.3.13 Camera tampering.

3.13.7 Network Requirements: Provide video cameras that have the following network capabilities:

- 3.13.7.1 Supports both fixed (static) IP addresses and dynamically assigned IP addresses provided by a Dynamic Host Control Protocol (DHCP) server.
- 3.13.7.2 Supports user configuration of network parameters including but limited to:
  - 3.13.7.2.1 Fixed (static) IP address.
  - 3.13.7.2.2 Subnet mask.
  - 3.13.7.2.3 Gateway.
  - 3.13.7.2.4 Control port.
- 3.13.7.3 Are automatically detected when using a Video Management Application (VMA) or Network Video Recorder (NVR) supporting this feature.
- 3.13.7.4 Provides support for both IPv4 and IPv6 networks.

3.13.8 Video Motion Detection Functionality Requirements: Provide video cameras capable of detecting motion based on:

- 3.13.3.1 Motion Detection Mask: Defined areas within the camera's field of view for the camera to detect motion.
- 3.13.3.2 Sensitivity: How much each pixel within the masked area must change before it is considered in motion.
- 3.13.3.3 Threshold: Percentage of pixels that must detect change.

3.13.9 Event Functionality Requirements: Equip cameras with an integrated event functionality which may be triggered by:

- 3.13.9.1 Alarm input terminal.
- 3.13.9.2 Video motion detection.
- 3.13.9.3 Camera temperature outside operating range.

3.13.10 Protocol Support Requirements: Provide video cameras that incorporate support for at least the following:

- 3.13.10.1 IPv4.
- 3.13.10.2 IPv6.
- 3.13.10.3 HTTP.
- 3.13.10.4 HTTPS.
- 3.13.10.5 SOAP.
- 3.13.10.6 DNS.
- 3.13.10.7 NTP.
- 3.13.10.8 RSTP.
- 3.13.10.9 RTCP.
- 3.13.10.10 RTP.
- 3.13.10.11 TCP.
- 3.13.10.12 UDP.
- 3.13.10.13 IGMP.

- 3.13.10.14 ICMP.
- 3.13.10.15 DHCP.
- 3.13.10.16 Zeroconf.
- 3.13.10.17 ARP.
- 3.13.10.18 SNMP v2c.
- 3.13.10.19 SNMP v3.
- 3.13.11 Streaming Support Requirements: Provide video cameras that incorporate support for at least the following:
  - 3.13.11.1 RTP/UCP.
  - 3.13.11.2 RTP/UDP multicast.
  - 3.13.11.3 RTP/RTSP/TCP.
  - 3.13.11.4 RTP/RTSP/HTTP/TCP.
  - 3.13.11.5 RTP/RTSP/HTTPS/TCP.
  - 3.13.11.6 HTTP.
- 3.13.12 Video Overlay requirements: Provide video cameras with the following overlay requirements:
  - 3.13.12.1 Sixty-four (64) individually configurable privacy zones to conceal defined areas in image as non-viewable. Masks required to be dynamically adjusted based on current zoom-factor, without capability of operator bypass.
  - 3.13.12.2 Video masked by privacy zones must be obscured prior to streaming.
- 3.13.13 Security Requirements: Provide video cameras with the following security requirements:
  - 3.13.13.1 Support the use of the following:
    - 3.13.13.1.1 Password protection.
    - 3.13.13.1.2 HTTPS Encryption.
    - 3.13.13.1.3 Digest Authentication.
    - 3.13.13.1.4 WS Authentication.
    - 3.13.13.1.5 User Access Log.
    - 3.13.13.1.6 SSL Encryption.
  - 3.13.13.2 Restrict access to the built-in internet server by usernames and password by a minimum of three different user group levels.
- 3.13.14 Electrical Power: Provide cameras capable of being powered by the following power sources:
  - 3.13.14.1 PoE: IEEE 802.3af Class 3 PoE Compliant.
  - 3.13.14.2 AC Power: 24V +/- 10%, 15VA minimum for bullet-type, 24V +/- 10%, 13VA minimum for dome-type, and 24V +/- 10% 9VA minimum for box-type.
  - 3.13.14.3 DC Power: 12V +/- 10%, 13W minimum for bullet-type, 12V +/-, 12W minimum for dome-type and 12V +/- 10%, 7W minimum for box-type.

- 3.13.14.4 Battery Backup: 3V manganese lithium.
- 3.13.15 Installation and Maintenance Requirements: provide video cameras with the following installation and maintenance requirements:
  - 3.13.15.1 Allow firmware updates via network.
  - 3.13.15.2 Store City of Flint-specific settings in a non-volatile memory which cannot be lost during power outages or soft resets.
  - 3.13.15.3 Provide Microsoft Windows-based management software, allowing camera configuration, upgrade of firmware, and backup of individual camera configurations.
- 3.13.16 Diagnostics:
  - 3.13.16.1 Equipped with LEDs, indicating the camera's functional status, which may be user enabled or disabled.
  - 3.13.16.2 Monitored by functionality which automatically reinitiates processes or restarts the unit if a malfunction is detected.
- 3.13.17 Connectivity:
  - 3.13.17.1 100BASE-TX Fast Ethernet-port with RJ-45 socket, auto negotiation of network speed and transfer mode.
  - 3.13.17.2 Terminal for receiving line level analog audio from an external microphone.
  - 3.13.17.3 Terminal for providing line level analog audio for connection to an external speaker.
- 3.13.18 Operating Range:
  - 3.13.18.1 Operating temperatures:
    - 3.13.18.1.1 Box-type: -10 degrees C to + 60 degrees C (14 F to 140F).
    - 3.13.18.1.2 Bullet-type in enclosed space: -40 degrees C to +60 degrees C (-40F to 140F).
    - 3.13.18.1.3 Bullet-type with ambient convection: -40 degrees C to +65 degrees C (-40F to 149F).
    - 3.13.18.1.4 Dome-type: -40 degrees C to +65 degrees C (-40F to 149F)
  - 3.13.18.2 IR Illumination Operating Temperatures:
    - 3.13.18.2.1 Bullet-type: Up to +61 degrees C (141F), 50% power from +55 degrees C to +61 degrees C (131F to 141F).
    - 3.13.18.2.2 Indoor Dome-type: Up to +55 degrees C (131F), 50% power from +44 degrees C to +55 degrees C (111F to 131F)
    - 3.13.18.2.3 Outdoor Dome-type: Up to +57 degrees C (135F), 50% power from +49 degrees C to +57 degrees C (120F to 135F).

- 3.13.18.3 IR Illumination Hysteresis:
  - 3.13.18.3.1 Bullet-type: +5 degrees C (9F).
  - 3.13.18.3.2 Indoor Dome-type: +2 degrees C (3.6F).
  - 3.13.18.3.3 Outdoor Dome-type: +2 degrees C (3.6F).
- 3.13.18.4 Relative Humidity: 0-95 percent (non-condensing).

#### 4.0 SPECIFIC PRODUCT REQUIREMENTS AND FEATURES.

##### 4.1 2.0 Megapixel IP Cameras

##### 4.1.1 2.0MP Indoor Dome-type Camera with 3.3-9 mm lens.

##### 4.1.1.1 Base Design: Avigilon 2.0C-HAS-D1.

##### 4.1.1.2 Performance:

4.1.1.2.1 Image Sensor: ½.8 inch progressive scan CMOS.

4.1.1.2.2 Maximum Resolution:

4.1.1.2.2.1 Aspect Ratio: 16:9 1920 x 1080.

4.1.1.2.3 Imaging Rate: (50Hz/60Hz) 25 fps/30fps.

4.1.1.2.4 Dynamic Range:

4.1.1.2.4.1 WDR Off: 83 dB.

4.1.1.2.4.2 WDR On: 126 dB, dual exposure (30 fps).

4.1.1.2.4.3 WDR On: 132 dB, triple exposure (20 fps or less).

4.1.1.2.5 Minimum Illumination:

4.1.1.2.5.1 Color: 0.027 lux.

4.1.1.2.5.2 Monochromatic: 0.014 lux.

4.1.1.2.6 Field of View:

4.1.1.2.6.1 Horizontal Angle: 16:9, 34 degrees to 99 degrees.

4.1.1.2.6.2 Vertical Angle: 16:9, 18 degrees to 53 degrees.

##### 4.1.2 2MP Infrared Indoor Dome-Type Camera with 3.3 – 9mm lens.

##### 4.1.2.1 Base Design: 2.0C-HAS-D1-IR by Avigilon.

##### 4.1.2.2 Performance:

4.1.2.2.1 Image Sensor: ½.8 inch progressive scan CMOS.

4.1.2.2.2 Maximum Resolution:

4.1.2.2.2.1 Aspect Ratio: 16:9, 1920 x 1080.

4.1.2.2.3 Imaging Rate: (50Hz/60Hz) 20 fps/30 fps.

4.1.2.2.4 Dynamic Range:

4.1.2.2.4.1 WDR Off: 83 dB.

4.1.2.2.4.2 WDR On: 126 dB, dual exposure (30 fps).

4.1.2.2.4.3 WDR On: 132 dB, triple exposure (20 fps or less).

4.1.2.2.5 Minimum Illumination:

- 4.1.2.2.5.1 Color: 0.027 lux.
- 4.1.2.2.5.2 Monochromatic: 0.014 lux.
- 4.1.2.2.5.3 IR: 0.0 lux.
- 4.1.2.2.6 Field of View:
  - 4.1.2.2.6.1 Horizontal Angle: 16:9, 34 degrees to 99 degrees.
  - 4.1.2.2.6.2 Vertical Angle: 16:9, 18 degrees to 53 degrees.
- 4.2 5.0 MP Infrared Outdoor Bullet-Type Camera with 9-22 mm lens.
  - 4.2.1 Base Design: 5.0C-HAS-BO2-IR by Avigilon.
  - 4.2.2 Performance:
    - 4.2.2.1 Image Sensor: 1/2.8 inch progressive scan CMOS.
    - 4.2.2.2 Maximum Resolution:
      - 4.2.2.2.1 Aspect Ratio: 4:3, 2592 x 1944.
      - 4.2.2.2.2 Aspect Ratio: 16:9, 2560 x 1440.
    - 4.2.2.3 Imaging Rate:
      - 4.2.2.3.1 WDR Off: (50Hz/60Hz) 25 fps/30fps.
      - 4.2.2.3.2 WDR On: (50Hz/60Hz) 20 fps/20fps.
    - 4.2.2.4 Dynamic Range:
      - 4.2.2.4.1 WDR Off: 83 dB.
      - 4.2.2.4.2 WDR On: 126 dB.
    - 4.2.2.5 Minimum Illumination:
      - 4.2.2.5.1 Color: 0.058 lux.
      - 4.2.2.5.2 Monochrome: 0.029 lux.
      - 4.2.2.5.3 With IR: 0 lux.
    - 4.2.2.6 Field of View:
      - 4.2.2.6.1 Horizontal Angle: 16:9, 14 degrees to 31 degrees.
      - 4.2.2.6.2 Horizontal Angle: 4:3, 14 degrees to 31 degrees.
      - 4.2.2.6.3 Vertical Angle: 16:9, 8.1 degrees to 17.4 degrees.
      - 4.2.2.6.4 Vertical Angle: 4:3, 11 degrees to 23 degrees.
- 4.3 Multisensor IP Cameras.
  - 4.3.1 9MP HD Multisensor Camera: three (3) 3MP sensors, wide dynamic range (WDR) and a 4mm lens:
    - 4.3.1.1 Basis of Design Product: 9C-H4A-3MH-180-H4 Multisensor by Avigilon.
    - 4.3.1.2 Performance:
      - 4.3.1.2.1 Image Sensors: 1/2.8 inch progressive scan CMOS.
      - 4.3.1.2.2 Aspect Ratio: 4:3.
      - 4.3.1.2.3 Active Pixels (H x V): 2048 x 1536 per sensor.
      - 4.3.1.2.4 Imaging Area (H x V): 5.18mm x 3.89mm (0.204 inches x 0.153 inches).
      - 4.3.1.2.5 Imaging Rate: 24 fps at 60Hz and 25 fps at 50 Hz.
      - 4.3.1.2.6 IR Illumination:



- 4.3.1.2.6.1 Color Mode: 0.05 lux (F1.6).
- 4.3.1.2.6.2 Mono Mode: 0.01 lux (F1.6).
- 4.3.1.2.6.3 With IR Illuminator Active: 0 lux.
- 4.3.1.2.7 Dynamic Range: 100 dB with WDR active.
- 4.3.1.2.8 Resolution Scaling: Down to 640 x 480.
- 4.3.1.2.9 Angle of View: 72 degrees.
- 4.3.1.2.10 Mounting
  - 4.3.1.2.10.1 Indoor Ceiling Mount.
  - 4.3.1.2.10.2 Indoor/Outdoor Pendant Mount.
  - 4.3.1.2.10.3 Indoor/Outdoor Surface Mount.
- 4.3.2 15MP HD Multisensor Camera: three (3) 5MP sensors, wide dynamic range (WDR) and a 2.8mm lens:
  - 4.3.2.1 Basis of Design Product: 15C-H4A-3MH-270-H4 Multisensor by Avigilon.
  - 4.3.2.2 Performance:
    - 4.3.2.2.1 Image Sensors: 1/2.8 inch progressive scan CMOS.
    - 4.3.2.2.2 Aspect Ratio: 4:3.
    - 4.3.2.2.3 Active Pixels (H x V): 2592 x 1944 per sensor.
    - 4.3.2.2.4 Imaging Area (H x V): 5.18mm x 3.89 mm (0.204 inches x 0.153 inches).
    - 4.3.2.2.5 Imaging Rate: 15 fps at 60Hz and 17 fps at 50 Hz.
    - 4.3.2.2.6 IR Illumination:
      - 4.3.2.2.6.1 Color Mode: 0.025 lux (F1.2).
      - 4.3.2.2.6.2 Mono Mode: 0.005 lux (F1.2).
      - 4.3.2.2.6.3 With Illuminator active: 0 lux.
    - 4.3.2.2.7 Dynamic Range: 100 dB with WDR active.
    - 4.3.2.2.8 Resolution Scaling: Down to 640 x 480.
    - 4.3.2.2.9 Angle of View: 103 degrees.
    - 4.3.2.2.10 Mounting:
      - 4.3.2.2.10.1 Indoor Ceiling Mount.
      - 4.3.2.2.10.2 Indoor/Outdoor Pendant Mount.
      - 4.3.2.2.10.3 Indoor/Outdoor Surface Mount.
- 4.3.3 20MP HD Multisensor Camera: four 5MP sensors, wide dynamic range (WDR) and a 2.8mm lens.
  - 4.3.3.1 Basis of Design Product: 20C-H4A-4MH-360-H4 Multisensor by Avigilon.
  - 4.3.3.2 Performance:
    - 4.3.3.2.1 Image Sensors: 1/2.8 inch progressive scan CMOS.
    - 4.3.3.2.2 Aspect Ratio: 4:3
    - 4.3.3.2.3 Active Pixels (H x V): 2592 x 1944 per sensor.
    - 4.3.3.2.4 Imaging Area (H x V): 5.18mm x 3.89mm (0.204 inches x 0.153 inches).

- 4.3.3.2.5 Imaging Rate: 13 fps at 60Hz and 13 fps at 50 Hz.
- 4.3.3.2.6 IR Illumination:
  - 4.3.3.2.6.1 Color Mode: 0.025 lux (F1.2).
  - 4.3.3.2.6.2 Mono Mode: 0.005 lux (F1.2).
  - 4.3.3.2.6.3 With IR Illuminator active: 0 lux.
- 4.3.3.2.7 Dynamic Range: 100 dB with WDR active.
- 4.3.3.2.8 Resolution Scaling: Down to 640 x 480.
- 4.3.3.2.9 Angle of View: 103 degrees.
- 4.3.3.2.10 Mounting:
  - 4.3.3.2.10.1 Indoor Ceiling Mount.
  - 4.3.3.2.10.2 Indoor/Outdoor Pendant Mount.
  - 4.3.3.2.10.3 Indoor/Outdoor Surface Mount.
- 4.4 Network Video Management Software (NVMS)
  - 4.4.1 Description: Provide workstations with a simplified screen layout, intuitive controls, and customizable features that improve multi-person interactions and include at least the following features:
    - 4.4.1.1 Video analytics and artificial intelligence (AI) capabilities, including appearance search, analytic event rule triggers, and unusual motion detection technology.
    - 4.4.1.2 Forensic search capabilities with bookmark, event, alarm, and thumbnail search options.
    - 4.4.1.3 Easy integration with leading camera and hardware manufacturers.
    - 4.4.1.4 Allows monitoring of the live and recorded video over wireless IP networks from Apple or Android mobile devices.
    - 4.4.1.5 License Plate Recognition (LPR) analytics with multiple watchlists.
    - 4.4.1.6 Receives and acts on access control systems door events, hardware input events, and access grants.
    - 4.4.1.7 Enables unlocking doors and activating digital outputs directly from a camera view.
    - 4.4.1.8 Identity search and identity verification using access control credentials to compare against record and live video respectively.
  - 4.4.2 System: Provide a scalable NVMS solution with at least the following capabilities:
    - 4.4.2.1 100 servers per site.
    - 4.4.2.2 300 cameras per server.
    - 4.4.2.3 10,000 cameras per site.
    - 4.4.2.4 Unlimited client licenses.
  - 4.4.3 Basis of Design Product: Subject to compliance with requirements, provide Avigilon Control Center Enterprise – minimum version 7.0, by Avigilon.
- 4.5 Network Video Management Software (NVMS).

- 4.5.1 Description: Provide workstations with a simplified screen layout, intuitive controls, and customizable features that improve multi-person interactions, and include at least the following features:
    - 4.5.1.1 Video analytics capabilities, including event rule triggers and unusual motion direction technology.
    - 4.5.1.2 Forensic search capabilities with bookmark, event, and thumbnail search options.
    - 4.5.1.3 Easy integration with leading camera and hardware manufacturers.
    - 4.5.1.4 Allows monitoring of live and recorded video over wireless IP networks from Apple or Android mobile devices.
    - 4.5.1.5 Receives and acts on access control system door events, hardware input events, and access grants.
    - 4.5.1.6 Enables unlocking door and activating digital outputs directly from a camera view.
    - 4.5.1.7 Identify search and identity verification using access control credentials to compare against recorded and live video respectively.
  - 4.5.2 Provides a scalable NVMS system solution with the following capabilities:
    - 4.5.2.1 One (1) server per site.
    - 4.5.2.2 75 cameras per server.
    - 4.5.2.3 75 cameras per site.
    - 4.5.2.4 10 concurrent client-to-site connections.
  - 4.5.3 Basis of Design Product: Subject to compliance with requirements, provide Avigilon Control Center Standard – at least version 7.0, by Avigilon.
- 4.6 Network Video Management Software (NVMS).
- 4.6.1 Description: Provide workstations with a simplified screen layout, intuitive control, and customizable features that improve multi-person interactions, and include at least the following features:
    - 4.6.1.1 Video analytics capabilities include unusual motion detection technology.
    - 4.6.1.2 Forensic search capabilities with bookmark, event, and thumbnail search options.
    - 4.6.1.3 Easy integration with leading camera and hardware manufacturers.
    - 4.6.1.4 Allows monitoring of live and recorded video over wireless IP networks from Apple or Android mobile devices.
  - 4.6.2 Provide a scalable NVMS system solution with at least the following capabilities:
    - 4.6.2.1 One (1) server per site.
    - 4.6.2.2 Twenty-four (24) cameras per server.
    - 4.6.2.3 Twenty-four (24) cameras per site.

- 4.6.2.4 Two (2) concurrent client-to-site connections.
- 4.6.3 Basis of Design Product: Subject to compliance with requirements, provide Avigilon Control Center Core – at least Version 7.0, by Avigilon.
- 4.7 Network Video management Software (NVMS) Functionality.
  - 4.7.1 General: Provide an NVMS software application that can be installed on any open platform hardware and does not require hardware multiplexer or time-division technology for video or audio.
    - 4.7.1.1 Recording Storage Capacity: Expandable with additional licenses.
    - 4.7.1.2 Video Decompression: Decompress H.264 video through City supplied graphics processing unit (GPU).
    - 4.7.1.3 The NVMS server and client software applications can be installed and run on the same computer or on separate computers.
    - 4.7.1.4 Languages: Provide software with versions for the following languages:
      - 4.7.1.4.1 Arabic.
      - 4.7.1.4.2 English.
      - 4.7.1.4.3 French.
      - 4.7.1.4.4 German.
      - 4.7.1.4.5 Italian.
      - 4.7.1.4.6 Japanese.
      - 4.7.1.4.7 Korean.
      - 4.7.1.4.8 Spanish.
      - 4.7.1.4.9 Dutch.
    - 4.7.1.5 Secure Transmission: The systems shall securely send video and audio data by transmitting commands and control data via TCP/IP using cryptographic keys based on SSL/TLS to prevent eavesdropping or tampering.
    - 4.7.1.6 Device Connections: Support the record and management of video and audio sources through use of industry standard protocols, including but not limited to the following:
      - 4.7.1.6.1 ONVIF Profile S and/or Profile T.
      - 4.7.1.6.2 Select Third-Party proprietary device APIs that shall be detailed in the bid submittal.
    - 4.7.1.7 De-warping: Supports de-warping of live and recorded video from the following devices:
      - 4.7.1.7.1 Avigilon H4 Fisheye cameras.
      - 4.7.1.7.2 Support cameras fitted with an Immervision Panomorph lens.
      - 4.7.1.7.3 From cameras with a fixed fisheye lens, including but not limited to the Oncam Grandeye Evolution line of cameras.

- 4.7.2 Alarms and Events: The systems shall provide the ability to configure and manage alarms and events with the following capabilities:
  - 4.7.2.1 Defines event triggers that are configured to result in an alarm.
  - 4.7.2.2 Generates alarms based on the following even types:
    - 4.7.2.2.1 Detect events that occur within a camera's field of view.
    - 4.7.2.2.2 Detect presence of persons within a sensor's range.
    - 4.7.2.2.3 Detect if video or audio signal is lost and alert system administrator.
    - 4.7.2.2.4 Door activity detected by an access control application.
    - 4.7.2.2.5 Notify users of system errors.
    - 4.7.2.2.6 Receive alarms from third party systems (access control, etc.) and configured to be monitored.
    - 4.7.2.2.7 Support receiving digital input triggers and triggering digital outputs from:
      - 4.7.2.2.7.1 An input/output board.
      - 4.7.2.2.7.2 Supported IP camera, encoder or sensor.
      - 4.7.2.2.7.3 Integrated systems, including POS.
  - 4.7.2.3 Receives event from devices through the ONVIF driver.
  - 4.7.2.4 Configure rules to trigger specific video operations.
  - 4.7.2.5 Supports receiving Simple Network Management Protocol (SNMP) messages from servers and alert users.
  - 4.7.2.6 Customizes and forwards alarm and event notifications to at least the following:
    - 4.7.2.6.1 Users logged into client application.
    - 4.7.2.6.2 Users logged into mobile application.
    - 4.7.2.6.3 Configured email addresses.
    - 4.7.2.6.4 External entities and third-party software, such as central monitoring stations and call centers.
  - 4.7.2.7 Escalates alarms from one user or group to another if alarm is unacknowledged for a preset duration.
  - 4.7.2.8 Configures email notifications to the following:
    - 4.7.2.8.1 Notify users and system administrators when an event or system health error occurs.
    - 4.7.2.8.2 Schedule when email notifications are sent.
    - 4.7.2.8.3 Include camera images in email notifications.
  - 4.7.2.9 Configures Central Station Notifications to the following:
    - 4.7.2.9.1 Notify a central station monitoring service when an event or system health error occurs.

- 4.7.2.9.2 Include video clips and/or camera images with camera motion, analytic or digital input events.
- 4.7.2.9.3 Optionally use ANSI/SIA DC-09-2014 or latest standard event notification format.
- 4.7.2.10 Provides ability to send central monitoring stations periodic heartbeat messages, or regular notification to confirm system connection and that there are no events of note.
- 4.7.2.11 Arms or Disarms events and alarms based on a user configurable schedule or specific digital input state.
- 4.7.3 Event Triggers: Assign actions in response to specific event triggers. Response actions shall include but are not limited to the following:
  - 4.7.3.1 User Notification Actions:
    - 4.7.3.1.1 Display on-screen message.
    - 4.7.3.1.2 Send an email.
    - 4.7.3.1.3 Send notification to central monitoring station.
    - 4.7.3.1.4 Play a sound.
  - 4.7.3.2 Monitoring Actions:
    - 4.7.3.2.1 Start live streaming video.
    - 4.7.3.2.2 Create bookmark.
    - 4.7.3.2.3 Open a saved view.
    - 4.7.3.2.4 Start live streaming on a virtual matrix monitor.
    - 4.7.3.2.5 Open a map on a virtual matrix monitor.
    - 4.7.3.2.6 Open a web page on a virtual matrix monitor.
  - 4.7.3.3 Device Actions:
    - 4.7.3.3.1 Reboot camera.
    - 4.7.3.3.2 Activate digital output.
    - 4.7.3.3.3 Deactivate digital output.
  - 4.7.3.4 PTZ Actions:
    - 4.7.3.4.1 Go to Preset.
    - 4.7.3.4.2 Go to Home Preset.
    - 4.7.3.4.3 Run a Pattern.
    - 4.7.3.4.4 Set Auxiliary.
    - 4.7.3.4.5 Clear Auxiliary.
  - 4.7.3.5 Alarm Actions:
    - 4.7.3.5.1 Trigger an alarm.
    - 4.7.3.5.2 Acknowledge an alarm.
  - 4.7.3.6 Supports conditional event triggers on selected digital input status.
  - 4.7.3.7 Manually triggers digital output through at least the following:
    - 4.7.3.7.1 A pre-configured software control.
    - 4.7.3.7.2 A physical trigger that is connected to a supported input/output device.
- 4.7.4 Video Analytics: provide configurable classified object detection for each device with self-learning video analytics capabilities.

- 4.7.4.1 Allows users to connect individual video sources to analytics appliance channels.
- 4.7.4.2 Allows users to configure events based on classified object motion detection.
- 4.7.4.3 Allows configured video analytics events to be used as alarm and rule triggers.
- 4.7.4.4 Allows users to mark classified objects as a true or false detection.
  - 4.7.4.4.1 Transmits collected data to video source to improve accuracy of video analytics device.
- 4.7.4.5 Support the following analytic event types when captured by supported cameras:
  - 4.7.4.5.1 Objects in area.
  - 4.7.4.5.2 Object loitering.
  - 4.7.4.5.3 Objects crossing defined line.
  - 4.7.4.5.4 Object appears or enters area.
  - 4.7.4.5.5 Object not present in area.
  - 4.7.4.5.6 Objects enter area.
  - 4.7.4.5.7 Objects leave area.
  - 4.7.4.5.8 Object stops in area.
  - 4.7.5.6.9 Anticipated direction of travel is violated.
  - 4.7.5.6.10 Tampering & Scene dramatically changes in an unexpected fashion.
- 4.7.6 Focus of Attention: Provide functionality which automatically focuses the operator's attention during critical events.
  - 4.7.6.1 Event Handling:
    - 4.7.6.1.1 Classified object motion detection.
    - 4.7.6.1.2 Unusual motion.
    - 4.7.6.1.3 Rule vased video analytic events.
    - 4.7.6.1.4 Alarm events.
  - 4.7.6.2 Filtering:
    - 4.7.6.2.1 Event types: Provide a user interface which allows for inclusion or exclusion of unnecessary event types.
    - 4.7.6.2.2 Frequent event handling: Support the identification and exclusion of frequently recurring events on a per-camera and per-event basis.
- 4.7.7 License Plate Recognition (LPR): Support operation of a license plate recognition system that shall include but not be limited to:
  - 4.7.7.1 Defines region of an image where license plate detection is performed.
  - 4.7.7.2 Stores detected license plates with video data.

- 4.7.7.3 Support multiple watch lists that are used to create events or alarms when specific license plates are detected.
- 4.7.7.4 Defines the longest retention period for license plate detections for privacy compliance.
- 4.7.8 Signal Processing and Compression: Supports storage and processing of video and audio as follows:
  - 4.7.8.1 Natively records camera signals with no transcoding.
  - 4.7.8.2 Support industry standard video compression formats, including, but not limited to, the following:
    - 4.7.8.2.1 JPEG2000.
    - 4.7.8.2.2 MJPEG.
    - 4.7.8.2.3 MPEG-4.
    - 4.7.8.2.4 H.264.
    - 4.7.8.2.5 H.265.
  - 4.7.8.3 Synchronizes audio and video regardless of frame rate, resolution or bitrate.
- 4.7.9 Dynamic Video Stream Management: Performs Dynamic video stream management as follows:
  - 4.7.9.1 Provide Avigilon High Definition Stream Management (HDSM)<sup>™</sup>.
  - 4.7.9.2 Reduces system bandwidth and storage usage by only transmitting video to client as determined by the City.
  - 4.7.9.3 The client communicates the maximum monitor resolution to the server and the server acts as a video proxy and stream the required video resolution.
  - 4.7.9.4 Tile multi-megapixel videos streams and only transmit requested portion of video stream to the client.
  - 4.7.9.5 Extend recorded video storage by dynamically reducing quality of recorded video over time so video is still viable and clear by uses less storage.
    - 4.7.9.5.1 Reduces JPEG and JPEG2000 video image rate to one half of original image rate.
    - 4.7.9.5.2 Record both a high-quality stream and a low-quality stream, discarding the high-quality streams after a set amount of time determined by the City.
  - 4.7.9.6 Allow availability of dynamic video stream management to local users, remote users and mobile devices.
- 4.7.10 Event Logging: Maintain an event log and allow users to use log events as triggers for specific event action. Logged events shall include, but are not limited to, the following:
  - 4.7.10.1 Server events:
    - 4.7.10.1.1 Server application starting up.
    - 4.7.10.1.2 Server application shutting down.



- 4.7.10.1.3 Server application terminated unexpectedly.
- 4.7.10.1.4 Server application low on resources.
- 4.7.10.1.5 Server application installation error.
- 4.7.10.1.6 License expires soon.
- 4.7.10.1.7 License expired.
- 4.7.10.1.8 Database error.
- 4.7.10.1.9 Data initialization error.
- 4.7.10.1.10 Data volume failed.
- 4.7.10.1.11 Data volume recovered.
- 4.7.10.1.12 Data volume size reduced.
- 4.7.10.1.13 Data write error.
- 4.7.10.1.14 Data upgrade started.
- 4.7.10.1.15 Data upgrade completed.
- 4.7.10.1.16 Data upgrade failed.
- 4.7.10.1.17 Data recovery started.
- 4.7.10.1.18 Data recovery completed.
- 4.7.10.1.19 Data recovery failed.
- 4.7.10.1.20 Bookmark save failed.
- 4.7.10.1.21 Network connection found.
- 4.7.10.1.22 Network connection lost.
- 4.7.10.1.23 Email send error.
- 4.7.10.1.24 Server hardware event.
- 4.7.10.1.25 Archiving started.
- 4.7.10.1.26 Archiving completed.
- 4.7.10.1.27 Archiving interrupted.
- 4.7.10.1.28 Server connection lost.
- 4.7.10.1.29 Analytics server queue full.
- 4.7.10.1.30 Analytics server connection lost.
- 4.7.10.1.31 LPR service restarted.
- 4.7.10.1.32 LPR service terminated unexpectedly.

#### 4.7.10.2 Device Events:

- 4.7.10.2.1 Connection created.
- 4.7.10.2.2 Connection removed.
- 4.7.10.2.3 Connection created to standby server.
- 4.7.10.2.4 Connection removed from standby server.
- 4.7.10.2.5 Connection failure.
- 4.7.10.2.6 Device failed.
- 4.7.10.2.7 Connection restored.
- 4.7.10.2.8 Network packet loss unacceptable.
- 4.7.10.2.9 Network pack loss acceptable.
- 4.7.10.2.10 Motion detection started.
- 4.7.10.2.11 Motion detection ended.
- 4.7.10.2.12 Video analytics event started.
- 4.7.10.2.13 Video analytics event ended.

- 4.7.10.2.14 Tampering detected.
- 4.7.10.2.15 Recording started.
- 4.7.10.2.16 Recording ended.
- 4.7.10.2.17 Recording interrupted.
- 4.7.10.2.18 Recording resumed.
- 4.7.10.2.19 Digital input activated.
- 4.7.10.2.20 Digital input deactivated.
- 4.7.10.2.21 Firmware upgrade started.
- 4.7.10.2.22 Firmware upgrade completed.
- 4.7.10.2.23 Firmware upgrade failed.
- 4.7.10.2.24 Obsolete firmware detected.
- 4.7.10.2.25 City-defined event started.
- 4.7.10.2.26 City-defined event ended.
- 4.7.10.2.27 Presence detected.
- 4.7.10.2.28 Presence ended.
- 4.7.10.2.29 Presence dwell time exceeded.
- 4.7.10.2.39 Presence dwell time ended.

#### 4.7.10.3 User events:

- 4.7.10.3.1 User login.
- 4.7.10.3.2 User logout.
- 4.7.10.3.3 Server setting changed.
- 4.7.10.3.4 Site setting changed.
- 4.7.10.3.5 Device setting changed.
- 4.7.10.3.6 Device connected.
- 4.7.10.3.7 Device disconnected.
- 4.7.10.3.8 Digital output triggered.
- 4.7.10.3.9 Bookmark added.
- 4.7.10.3.10 Bookmark updated.
- 4.7.10.3.11 Bookmark deleted.
- 4.7.10.3.12 PTZ moved.
- 4.7.10.3.13 PTZ idle.
- 4.7.10.3.14 Export performed.
- 4.7.10.3.15 Speaker activated.
- 4.7.10.3.16 Speaker deactivated.
- 4.7.10.3.17 Virtual matrix monitor opened.
- 4.7.10.3.18 Map added.
- 4.7.10.3.19 Map updated.
- 4.7.10.3.20 Map deleted.
- 4.7.10.3.21 View added.
- 4.7.10.3.22 View updated.
- 4.7.10.3.23 View deleted.
- 4.7.10.3.24 Web page added.
- 4.7.10.3.25 Web page updated.
- 4.7.10.3.26 Web page deleted.

- 4.7.10.3.27 Site View updated.
- 4.7.10.3.28 Custom keyboard command triggered.
- 4.7.10.4 Alarm Events:
  - 4.7.10.4.1 Alarm acknowledged.
  - 4.7.10.4.2 Alarm auto acknowledged.
  - 4.7.10.4.3 Alarm triggered.
  - 4.7.10.4.4 Alarm assigned.
  - 4.7.10.4.5 Alarm unassigned.
  - 4.7.10.4.6 Alarm purged.
- 4.7.10.5 POS Transaction Events:
  - 4.7.10.5.1 POS transaction started.
  - 4.7.10.5.2 POS transaction ended.
  - 4.7.10.5.3 POS transaction exception.
- 4.7.10.6 License Plate Recognition Events:
  - 4.7.10.6.1 License plate detection started.
  - 4.7.10.6.2 License plate detection ended.
  - 4.7.10.6.3 License plate watchlist match.
- 4.7.10.7 Access Control Events:
  - 4.7.10.7.1 Door access denied.
  - 4.7.10.7.2 Door access granted.
  - 4.7.10.7.3 Door closed.
  - 4.7.10.7.4 Door forced.
  - 4.7.10.7.5 Forced door closed.
  - 4.7.10.7.6 Door held open.
  - 4.7.10.7.7 Held door closed.
  - 4.7.10.7.8 Door opened.
  - 4.7.10.7.9 Door duress.
  - 4.7.10.7.10 Door request to exit.
  - 4.7.10.7.11 Certification validation failed.
  - 4.7.10.7.12 Input activated.
  - 4.7.10.7.13 Input deactivated.
  - 4.7.10.7.14 Input fault detected.
  - 4.7.10.7.15 Input fault cleared.
- 4.7.11 Storage Management: Allow management of recorded content with at least the following capabilities:
  - 4.7.11.1 Multiple levels of video storage management:
    - 4.7.11.1.1 Tier 1: Video recorded directly on local server.
    - 4.7.11.1.2 Tier 2: Recorded video continuously archived to long term storage.
    - 4.7.11.1.3 Ad Hoc: recorded video on local server can be archived on-demand to administrator-defined storage location.
  - 4.7.11.2 Support for at least the following video and audio recording options:

- 4.7.11.2.1 Manually triggered recording.
- 4.7.11.2.2 Pre-event and post-event recording options.
- 4.7.11.2.3 Reference frame recording option in absence of event.
- 4.7.11.2.4 Recording scheduled that can be defined individually for each video source, including, but not limited to continuous recording.
- 4.7.11.2.5 Event based recording that is triggered by at least the following;
  - 4.7.11.2.5.1 Pixel or classified object motion.
  - 4.7.11.2.5.2 Digital inputs.
  - 4.7.11.2.5.3 POS transactions.
  - 4.7.11.2.5.4 Alarms.
  - 4.7.11.2.5.5 License plate recognition.
- 4.7.11.2.6 Customized daily and weekly schedule.
- 4.7.12 Backup and Archiving:
  - 4.7.12.1 Schedules archive of recorded video with associated events to a local folder or mapped network drive.
  - 4.7.12.2 Backs-up settings and configurations for each server, including at least the following:
    - 4.7.12.2.1 Site settings such as users/groups, maps and web pages.
    - 4.7.12.2.2 Server settings including at least device connections.
    - 4.7.12.2.3 Encrypts backup to maintain security of information.
  - 4.7.12.3 Restores backed-up settings and configurations to a new or replacement server in a site.
- 4.8 Network Video Management Software (NVMS) Credentials and Security.
  - 4.8.1 Authentication: System shall require users to be authenticated prior to granting access to the NVMS.
  - 4.8.2 Customization: Provide access rights that can be tailored to each user or group of users. Access rights shall include at least the following:
    - 4.8.2.1 View Live Images:
      - 4.8.2.1.1 Use PTZ controls.
      - 4.8.2.1.2 Lock PTZ controls.
      - 4.8.2.1.3 Trigger manual recording.
      - 4.8.2.1.4 Trigger digital outputs.
      - 4.8.2.1.5 Broadcast to speakers.
    - 4.8.2.2 View recorded images:
      - 4.8.2.2.1 Export images.
      - 4.8.2.2.2 Archive images.
      - 4.8.2.2.3 Create teach markers.

- 4.8.2.3 Manage saved views:
- 4.8.2.4 Manage maps.
- 4.8.2.5 Manage web pages.
- 4.8.2.6 Manage virtual matrix monitors.
- 4.8.2.7 Initiate collaboration sessions.
- 4.8.2.8 Manage user sessions.
- 4.8.2.9 Listen to microphones.
- 4.8.2.10 Set up cameras:
  - 4.8.2.10.1 Setup general settings.
  - 4.8.2.10.2 Setup network settings.
  - 4.8.2.10.3 Setup image and display settings.
  - 4.8.2.10.4 Setup compression and image rate settings.
  - 4.8.2.10.5 Setup image dimension settings.
  - 4.8.2.10.6 Setup motion detection settings.
  - 4.8.2.10.7 Setup privacy zone settings.
  - 4.8.2.10.8 Setup manual recording settings.
  - 4.8.2.10.9 Setup digital input & output settings.
  - 4.8.2.10.10 Setup microphone settings.
  - 4.8.2.10.11 Setup speaker settings.
  - 4.8.2.10.12 Setup analytics settings.
  - 4.8.2.10.13 Setup teach by example.
- 4.8.2.11 Setup sites:
  - 4.8.2.11.1 Setup name.
  - 4.8.2.11.2 Manage site.
  - 4.8.2.11.3 Setup site view.
  - 4.8.2.11.4 Setup user and group settings.
  - 4.8.2.11.5 Setup Active Directory Synchronization.
  - 4.8.2.11.6 Setup Corporate Hierarchy.
  - 4.8.2.11.7 Setup alarm management settings.
  - 4.8.2.11.8 Setup POS transaction settings.
  - 4.8.2.11.9 Setup LPR settings.
  - 4.8.2.11.10 Setup email settings.
  - 4.8.2.11.11 Setup rule engine settings.
  - 4.8.2.11.12 View site logs.
  - 4.8.2.11.13 Connect and disconnect devices.
  - 4.8.2.11.14 View Site health.
- 4.8.2.12 Setup servers:
  - 4.8.2.12.1 Manage servers.
  - 4.8.2.12.2 Setup schedule settings.
  - 4.8.2.12.3 Setup recording and bandwidth settings.
  - 4.8.2.12.4 Setup Storage Management.
  - 4.8.2.12.5 Backup settings.
  - 4.8.2.12.6 Setup server analytics.

- 4.8.3 Access Ranking: Provide the ability to rank access rights based on a user's position within a configured hierarchy.
  - 4.8.3.1 Ranked users may only administer changed to users and groups that are subordinate in rank.
  - 4.8.3.2 Corporate hierarchy can be used to enforce authority of a parent site over user and group settings of one or more child sites.
- 4.8.4 Hierarchical Site Families: Allow for the creation and management of parent-child relationships among sites.
  - 4.8.4.1 Child sites may be connected to an appropriately licensed parent site.
  - 4.8.4.2 Parent site will have control over use permission and information of a child site.
  - 4.8.4.3 If a user has access to a parent site, child site are automatically discovered.
- 4.8.5 Credentials: Allow multiple credentials for system access, including, but not limited to:
  - 4.8.5.1 Validation of user credentials and passwords entered into NVMS user database where user passwords meet a configurable strength requirement.
  - 4.8.5.2 Two-factor authentication of users in the NVMS using ti base One-Time Password (TOTP) and a supported mobile authenticator application used to generate a code on Apple and Android mobile devices.
  - 4.8.5.3 Importing members of the Active Directory Groups as users in the NVMS.
    - 4.8.5.3.1 Automatically synchronizes changes made to members in Active Directory with NVMS.
    - 4.8.5.3.2 Directly adds users imported from Active Directory to existing permission groups.
  - 4.8.5.4 Importing roles from Access Control Manager application.
    - 4.8.5.4.1 Automatically synchronizes changes made to roles in the access control application with NVMS.
    - 4.8.5.4.2 Directly adds user imported from the access control application to existing permission groups.
    - 4.8.5.4.3 Imported user with appropriate privileges will be able to control doors within NVMS.
  - 4.8.5.5 Windows credentials.
- 4.8.6 Security: manage and personalize user access as follows:
  - 4.8.6.1 Allow administrators to override user access to a NVR if there are insufficient licenses.

- 4.8.6.2 Allow administrators to restrict user access to any video recorded earlier than the current login session.
  - 4.8.6.3 Allow administrators to restrict user access to high resolution recorded video for privacy compliance.
  - 4.8.6.4 Allow administrators to restrict specific user's access to search features that use what is considered personally identifiable information (PII) for privacy compliance such as license plates and physical appearance.
  - 4.8.6.5 Allow administrators to define rules that disable video or audio streams from specific devices for privacy compliance.
  - 4.8.6.6 Set client software to automatically log in to multiple sites.
  - 4.8.6.7 Set client software to automatically log out of all sites when application is left idle.
  - 4.8.6.8 Set client software to automatically save and restore last window layout.
  - 4.8.6.9 Set maximum bandwidth of streamed video data from server to client application.
  - 4.8.6.10 Record and permit reporting on user activity including log-in, log-out events, video export requests, live video viewing by camera, access to record video by camera.
- 4.9 Network Video Management Software (NVMS) Compatibility.
- 4.9.1 Server Application Compatibility: Provide software compatible with at least the following server applications:
    - 4.9.1.1 Avigilon Control Center Server.
    - 4.9.1.2 ACC Analytics Service.
    - 4.9.1.3 ACC Web Endpoint.
    - 4.9.1.4 ACC LPR plug-in (V2).
  - 4.9.2 Desktop Client Software Compatibility: Provide software compatible with at least the following client applications:
    - 4.9.2.1 ACC Client.
    - 4.9.2.2 ACC Virtual Matrix.
    - 4.9.2.3 Avigilon Player.
  - 4.9.3 Mobile Client Software Compatibility: Provide software compatible with at least the following mobile device applications:
    - 4.9.3.1 ACC Mobile 3.x
      - 4.9.3.1.1 Android version 5.x or later.
      - 4.9.3.1.2 iPad, iPhone and iPod touch with iOS 10 or later.
  - 4.9.4 Monitoring Sources: Monitors video and audio sources from at least the following sources:
    - 4.9.4.1 Avigilon H4 Pro H.264 cameras.
    - 4.9.1.2 Avigilon H4 HD cameras with Self-Learning Video Analytics.
    - 4.9.1.3 Avigilon H4 Multi-sensor cameras.
    - 4.9.1.4 Avigilon H4 Thermal cameras.
    - 4.9.1.5 Avigilon H4 Video Intercom cameras.

- 4.9.1.6 Avigilon H4 Fisheye cameras.
- 4.9.1.7 Avigilon H4 SL cameras.
- 4.9.1.8 Avigilon H4 Mini Dome cameras.
- 4.9.1.9 Avigilon H4 PTZ/IR PTZ cameras.
- 4.9.1.10 Avigilon Presence Detector sensor.
- 4.9.1.11 Avigilon HD cameras with Self-Learning Viddo Analytics.
- 4.9.1.12 Avigilon IP H.264/JPEG2000 cameras and encoders.
- 4.9.1.13 Avigilon HD Pro cameras.
- 4.9.2 ACTi cameras/encoders.
- 4.9.3 Arecont cameras.
- 4.9.4 Axis cameras/encoders.
- 4.9.5 Bosch cameras/encoders.
- 4.9.6 iQInvision cameras.
- 4.9.7 Mobotix cameras.
- 4.9.8 ONVIF Profile S and/or Profile T conformant cameras and encoders.
- 4.9.9 Panasonic cameras/encoders.
- 4.9.10 Pelco cameras.
- 4.9.11 Rialto Video Analytics Appliances.
- 4.9.12 Samsung cameras/encoders.
- 4.9.13 Samsung Techwin cameras.
- 4.9.14 Sony cameras.
- 4.9.15 VideolQ cameras/encoders.
- 4.10 Device Discovery and Identification: Detects and systems on network by the following methods:
  - 4.10.1 Automatic: Servers, video and audio sources that are connected to the same network as client are automatically discovered.
  - 4.10.2 Search: Servers, video and audio sources running on a different network segment than client can be discovered by searching for device's IP address or hostname.
  - 4.10.3 Parent to Child: By logging into a parent site automatically discovers configured children sites.
  - 4.10.4 Manual Detection: Allows manually discovered server instances, video and audio sources, and access control appliances to be visible to users of a single client network.
  - 4.10.5 Network Settings: Identical for all users of a single client workstation.
- 4.11 Integration with Other Systems and Products:
  - 4.11.1 Avigilon Access Control Manager (ACM) Application:
    - 4.11.1.1 Supports configurable network connections to an ACM appliance.
    - 4.11.1.2 Creates link between cameras and doors.
    - 4.11.1.3 Creates rules triggered by door actions that result in actions performed on NVMS.
    - 4.11.1.4 Synchronizes users and user privileges from ACM to provide access to doors.



- 4.11.1.5 Supports identify verification using access control credentials to compare access token images against live video.
- 4.11.1.6 Supports identity search using access control credentials to review door access activity in recorded video.
- 4.11.1.7 Supports using identity search results to initiate an appearance search across camera in the current or alternative sites.
- 4.11.1.8 Provides door grant access while monitoring video.
- 4.11.2 Point of Sale (POS) Integration:
  - 4.11.2.1 Support the operation of a point of sale (POS) system that includes, but is not limited to:
    - 4.11.2.1.1 Receiving of transaction information from POS sources.
    - 4.11.2.1.2 Support multiple encoding formats from POS sources.
    - 4.11.2.1.3 Monitors live and recorded transactions from POS sources with linked video.
    - 4.11.2.1.4 Generates events based on POS transaction exceptions.
- 4.11.3 Third-Party Integration Requirements: Support software level integration with third-party applications using NVMS software development kit (SDK) or Application Programming Interface (API) and provide at least the following features to the third party software:
  - 4.11.3.1 Connection: Auto-discover servers, login and authentication.
  - 4.11.3.2 Video Streaming: Auto-discover connected cameras, live and recorded video (RAW or MJEG format; N.264 only to Windows applications).
  - 4.11.3.3 Video Overlays: Display overlays over streaming video (classified object bounding boxes, motion detection, camera name/location, timestamp).
  - 4.11.3.4 PTZ Control: Control PTZ cameras (pan/tilt, zoom, presets, patterns, iris and lock PTZ).
  - 4.11.3.5 Audio Streaming: Stream audio from third-party systems to a NVMS camera (camera to third-party system only to Windows applications).
  - 4.11.3.6 Alarm Management: List, query, trigger, assign, acknowledge & purge alarms.
  - 4.11.3.7 Event Management: List, query, subscribe for notification on events (camera, server, administrative, digital I/O, video analytics, license plate recognition, point of sale).

- 4.11.3.8 Bookmark Management: List, query, create, delete.
- 4.11.3.9 Digital Output: Trigger digital outputs.
- 4.11.3.10 Archive/Export: Trigger archive or export in NVMS native export video format or generic video/image formats including but not limited to, AVI, PNG, TIFF, and JPEG.
- 4.11.4 Support integration with at least the following systems:
  - 4.11.4.1 Avigilon Access Control Manager.
  - 4.11.4.2 DSX Access systems WinDSX.
  - 4.11.4.3 RS2 AccessIT! Universal.NET.
  - 4.11.4.4 Avigilon Control Center License Plate Recognition (V@LPR plug-in).
  - 4.11.4.5 AMAG Symmetry.
  - 4.11.4.6 Gallagher Command Centre.
  - 4.11.4.7 Jacques IP Intercom.
  - 4.11.4.8 Lenel OnGuard.
  - 4.11.4.9 Paxton Net2.
  - 4.11.4.10 S2 Netbox.
  - 4.11.4.11 Software House CCure 9000.
  - 4.11.4.12 Vingtor-Stentofon AlphaCom.
- 4.12 Pan-Tilt-Zoom Configuration and Control Enables and configures PTZ control on RS-485 interface of a video source.
  - 4.12.1 Supports at least the following PTZ protocols:
    - 4.12.1.1 American Dynamics Sensormatic.
    - 4.12.1.2 AXSYS.
    - 4.12.1.3 AXSYS DCU.
    - 4.12.1.4 Ernitec ERNA.
    - 4.12.1.5 Honeywell Diamond.
    - 4.12.1.6 Kalatel ASCII.
    - 4.12.1.7 Pelco D.
    - 4.12.1.8 Pelco P.
    - 4.12.1.9 TEB Ligne.
    - 4.12.1.10 Vicon extended.
    - 4.12.1.11 Vicon normal.
    - 4.12.1.12 Videotec Legacy.
    - 4.12.1.13 Videotech MACRO.
  - 12.12.2 Support pan-tilt-zoom (PTZ) cameras and provides at least the following:
    - 4.12.2.1 Support controlling mechanical PTZ iris and focus as well as setting presets and patterns.
    - 4.12.2.2 Provides ability to name PTZ presets.
    - 4.12.2.3 Supports ability to create PTZ guard tours by combining a set number of presets that are run in order or random sequence.

- 4.12.2.4 Supports ability to center a PTZ camera's field of view by clicking anywhere on video image.
  - 4.12.2.5 Supports ability to click and drag to define an area for PTZ camera to mechanically zoom and center on.
  - 4.12.2.6 Supports controlling mechanical PTZ camera on-screen display and auxiliary controls.
  - 4.12.2.7 Supports selecting digital image defog levels where supported.
  - 4.12.2.8 Supports selecting camera day/night operation mode where supported.
  - 4.12.2.9 Supports locking PTZ controls.
  - 4.12.2.10 Permits a user with a higher rank to override PTZ control lock.
  - 4.12.2.11 Supports using a USB joystick to control PTZ functions.
- 4.13 Network Video Management Software (NVMS) User Interface.
- 4.13.1 General: Provide a graphic user interface with at least the following functionality:
    - 4.13.1.1 A system tree of video sources in video monitoring tab.
      - 4.13.1.1.1 The system tree display can be configured.
      - 4.13.1.1.2 The system tree can be organized into virtual folders that are represented as branches within the site.
      - 4.13.1.1.3 User can be granted access to individual items or entire folders within system tree.
      - 4.13.1.1.4 Maps, saved views and web pages may be viewed.
    - 4.13.1.2 Client adjustable light and dark theming with settings specific to each application and workstation.
    - 4.13.1.3 Support for collaborative application window sharing within a joint session among multiple users.
    - 4.13.1.4 Support for an unlimited number of monitors used for monitoring video and audio streams connected to a single workstation.
      - 4.13.1.4.1 Displays all video sources connected to systems.
      - 4.13.1.4.2 Support ability to drag and drop items from system tree into video monitoring area.
      - 4.13.1.4.3 Support monitoring live and recorded video and audio streams simultaneously on same monitor.

- 4.13.1.4.4 Support viewing same live or recorded video stream at different zoom levels and areas of interest.
- 4.13.1.4.5 Support ability to switch from live to recorded video on demand for an instant replay of recently recorded video.
- 4.13.1.4.6 Support creation of unlimited views with unique layouts of video streams.
- 4.13.1.4.7 Support ability to toggle between tiled and full-screen view.
- 4.13.1.4.8 Support ability to save configured display settings.
- 4.13.1.4.9 Support ability to cycle through views (guard tour) based on a specified interval.
- 4.13.1.4.10 Supports live or recorded video monitoring or 1 to 64 video streams simultaneously on a single monitor.
- 4.13.1.4.11 Supports displaying video streams in at least the following standard layouts:
  - 4.13.1.4.11.1 Full Screen.
  - 4.13.1.4.11.2 2 x 2.
  - 4.13.1.4.11.3 3 x 3.
  - 4.13.1.4.11.4 4 x 4.
  - 4.13.1.4.11.5 5 x 5.
  - 4.13.1.4.11.6 6 x 6.
  - 4.13.1.4.11.7 8 x 8.
  - 4.13.1.4.11.8 1 + 5.
  - 4.13.1.4.11.9 1 + 7.
  - 4.13.1.4.11.10 1 + 12.
  - 4.13.1.4.11.11 2 + 8.
- 4.13.1.4.12 Provides tools to build custom video monitoring layouts.

4.13.2 Video Parameter Controls: Support modifications to at least the following image quality and image rate parameters for each individual video source:

- 4.13.2.1 Video streaming format.
- 4.13.2.2 System optimized recording profile or manual configuration.
- 4.13.2.3 Keyframe interval.
- 4.13.2.4 Secondary stream for live viewing.
- 4.13.2.5 Configure video streaming at a lower image rate when scene is idle.
- 4.13.2.6 Customie primary and secondar stream on supported camera.

- 4.13.3 Camera Controls: Provide the ability to change the following supported video options at the client or video source:
  - 4.13.3.1 Encrypt camera configuration data if supported by camera.
  - 4.13.3.2 Camera passwords from client application.
  - 4.13.3.3 Exposure, iris, IR filter, backlight compensation, gain, priority, sharpening, saturation, focus, and white balance settings for a video source.
  - 4.13.3.4 Image dimensions for a video source.
  - 4.13.3.5 Rotate image 90, 180, or 270 degrees withing a video source.
  - 4.13.3.6 Addition of multiple privacy zones within a video source to block areas from being viewed or recorded in image field of view.
  - 4.13.3.7 Set a maximum duration for manually triggered recording within a video source.
- 4.14 Audio Controls:
  - 4.14.1 Provides ability to change input, output, gain and volume for an audio source.
  - 4.14.2 Supports use of uni-directional and bi-directional audio.
  - 4.14.3 provides ability to link an audio source to any video source.
    - 4.14.3.1 Able to link multiple audio sources to a single video source.
    - 4.14.3.2 Able to link an audio source to many video sources.
  - 4.14.4 Provides ability to synchronize audio and video on playback.
  - 4.14.5 Supports ability to bias displayed video to a lower frame rate or lower image resolution if there is insufficient network bandwidth or processing power.
    - 4.14.5.1 Bias shall not affect video recording.
    - 4.14.5.2 Bias shall not affect video exports.
  - 4.14.6 Supports ability to independently control if audio source is enabled for the user to monitor and if audio source is recorded with the video source.
  - 4.14.7 Provides a Virtual Matrix application module supporting remote control of multiple monitor displays, including video walls. Displays simultaneous video streams on connected monitor displays from multiple sites.
  - 4.14.8 Displays overlays on top of video images.
    - 4.14.8.1 Auto-hiding functional overlays that changes depending on video streaming mode and device support. Functional overlays include, but are not limited to, the following:
      - 4.14.8.1.1 Button to manually trigger video recording/video recording indicator.

- 4.14.8.1.2 Button to trigger digital output.
- 4.14.8.1.3 Button to capture video snapshot.
- 4.14.8.1.4 Button to close video stream.
- 4.14.8.1.5 Button to reserve a portion of screen for alarm video.
- 4.14.8.1.6 Button to enable audio.
- 4.14.8.1.7 Button to display POS transactions.
- 4.14.8.1.8 Button to maximize video display.
- 4.14.8.1.9 Button to trigger single-camera search.
- 4.14.8.1.10 Button to grant door access.
- 4.14.8.1.11 Click classified object bounding box to initiated Appearance Search.
- 4.14.8.1.12 PTZ Controls.
- 4.14.8.2 Information overlays that include, but are not limited to, the following:
  - 4.14.8.2.1 Camera name.
  - 4.14.8.2.2 Camera location.
  - 4.14.8.2.3 Playback timestamp with option of displaying device time or local time.
  - 4.14.8.2.4 Live timestamp with option of displaying device time or local time.
  - 4.14.8.2.5 Recording indicator.
  - 4.14.8.2.6 Motion activity.
  - 4.14.8.2.7 Video analytics object detection activity with colored bounding boxes around moving objects classified as humans or vehicles.
  - 4.14.8.2.8 Video analytics unusual motion anomaly detection with colored bounding boxes indicating area of motion.
  - 4.14.8.2.9 Detected license plate.
- 4.14.9 Supports alarm management operations through video monitoring interface, including but not limited to:
  - 4.14.9.1 Designated tab for reviewing alarms.
  - 4.14.9.2 Interface supports sequential viewing of alarms.
  - 4.14.9.3 Interface supports sorting of alarm by at least the following:
    - 4.14.9.3.1 Priority.
    - 4.14.9.3.2 Activation time.
    - 4.14.9.3.3 Status.
  - 4.14.9.4 Interface supports filtering alarms by status in the following priority:
    - 4.14.9.4.1 Assigned to me.
    - 4.14.9.4.2 Active alarms (unassigned).

- 4.14.9.4.3 Alarms assigned to others.
    - 4.14.9.4.4 Acknowledged alarms.
  - 4.14.9.5 Supports ability to assign alarms to users.
  - 4.14.9.6 Supports ability to acknowledge alarms.
  - 4.14.9.7 Supports ability to bookmark alarms.
  - 4.14.9.8 Designate one or more regions in video display area for displaying video directly like to triggered alarms or rules.
    - 4.14.9.8.1 Supports ability to acknowledge alarms from designated video display area.
- 4.15 Site Mapping: Support mapping of the physical location of cameras and other devices throughout the surveillance systems.
  - 4.15.1 Provide maps with the ability to do at least the following:
    - 4.15.1.1 Create a hierarchy of interlinked maps.
    - 4.15.1.2 Drag and drop objects in system tree onto map.
    - 4.15.1.3 Click and display object from map.
    - 4.15.1.4 Drag and drop a video source from map into video viewing area.
    - 4.15.1.5 Display a preset area of selected video source.
    - 4.15.1.6 Provide customizable map icons.
    - 4.15.1.7 Highlight specific cameras when an alarm linked to camera is triggered.
  - 4.15.2 Image Size: 3000px by 3000 px, or 9 MP, maximum.
  - 4.15.3 File Formats: Maps may be created from at least the following file formats:
    - 4.15.3.1 JPEG/JPG.
    - 4.15.3.2 BMP.
    - 4.15.3.3 PNG.
    - 4.15.3.4 GIF.
- 4.16 Playback of Recorded Video and Audio: Support playback of recorded video and audio with at least the following features:
  - 4.16.1 Forward and reverse playback of recorded content at variable speeds.
  - 4.16.2 Recorded content plays back synchronously when signal sources are linked.
  - 4.16.3 Playback of recorded video from archived long-term storage.
  - 4.16.4 The ability to require dual authorization to access features and require specific user groups to request a second user authentication before recorded video may be displayed.
  - 4.16.5 Provide at least the following methods for navigating recorded video:
    - 4.16.5.1 Selectable calendar.
    - 4.16.5.2 Horizontal scrollable timeline:
      - 4.16.5.2.1 Timeline lists all displayed video sources.
      - 4.16.5.2.2 Timeline highlights motion and events in recorded video.

- 4.16.5.2.3 Video archived to long-term storage shall be identified on timeline.
  - 4.16.5.2.4 Supports a timeline that can display down to quarter-second increments.
  - 4.16.5.2.5 Supports a timeline that can synchronize video displayed on multiple tabs to same point in time.
  - 4.16.5.2.6 Interface supports filtering unusual motion anomaly events on the timeline by rarity, duration, and type.
- 4.17 Search of Recorded Video and Audio: Allow for searching of recorded content with at least the following functionality:
- 4.17.1 Support recorded video search with at least the following selectable parameters:
    - 4.17.1.1 Time.
    - 4.17.1.2 Date.
    - 4.17.1.3 Event type.
    - 4.17.1.4 Visual search based on a pre-defined image area, or image thumbnail:
      - 4.17.1.4.1 Thumbnails can be based on entire image region or a pre-selected area.
      - 4.17.1.4.2 Thumbnails can be stacked to support an automatic secondary search when looking at a large timespan of video.
    - 4.17.1.5 Pixel motion in user defined areas.
    - 4.17.1.6 Classified object motion detection in user defined areas on supported video analytics sources.
    - 4.17.1.7 Bookmarks.
    - 4.17.1.8 Video Source.
    - 4.17.1.9 Point of sale transactions.
    - 4.17.1.10 Alarm.
    - 4.17.1.11 License plate detection events.
  - 4.17.2 Support object appearance search across multiple cameras:
    - 4.17.2.1 Ability to search for a person or vehicle of interest in recorded video from multiple cameras in the current or alternative site to return possible matches.
      - 4.17.2.1.1 Automatically enhance person search by utilizing face characteristics to match similar people from supported cameras.
      - 4.17.2.1.2 Supported cameras with self-learning video analytics capabilities that are connect to a NVR with a supported GPU accessory should be able to return possible matches for search.



- 4.17.2.2 Ability to initiate an appearance search of recorded video for similar persons or similar vehicles based on a specific user selected object in a video scene
- 4.17.2.3 Ability to initiate an appearance search of recorded video by description:
  - 4.17.2.3.1 Using one or more personal characteristics: sex, age category (child or adult), hair color, upper body color, lower body color.
- 4.17.2.4 Ability to initiate search from recorded video in Client application or dedicated player.
- 4.17.2.5 Supports reviewing search results and confirmation of correct matches.
- 4.17.2.6 Supports editing search parameters including:
  - 4.17.2.6.1 Cameras included in search.
  - 4.17.2.6.2 Time range for search.
- 4.17.2.7 Supports playback of search results, including, but not limited to, the following:
  - 4.17.2.7.1 Recorded video associated with individual results.
  - 4.17.2.7.2 Sequential playback of recorded video associated with confirmed to correct matches.
- 4.17.2.8 Supports exporting video associated with results, including, but not limited to:
  - 4.17.2.8.1 Recorded video associated with one or more selected results.
  - 4.17.2.8.2 Recorded video associated with confirmed to be correct matches.
  - 4.17.2.8.3 Redacting video for privacy to blur the resulting video except for the objects selected in the results.
- 4.17.2.9 Supports creation of bookmarks for results, including, but not limited to:
  - 4.17.2.9.1 One or more selected results.
  - 4.17.2.9.2 Confirmed to be correct matches.
- 4.18 Bookmarking.
  - 4.18.1 Supports creating bookmarks for recorded video and audio.
    - Bookmarks can be:
      - 4.18.1.1 Viewed from multiple sources.
      - 4.18.1.2 Displayed on timeline during playback.
      - 4.18.1.3 Used as a search criteria for recorded video and audio.
        - Search criteria can include, but are not limited to:
          - 4.18.1.3.1 Name.

- 4.18.1.3.2 Description.
- 4.18.1.3.3 Bookmark creator.
- 4.18.1.3.4 Supports protecting a book so associated video and audio data is never overwritten.
- 4.18.1.3.5 Supports private bookmarks that are only visible to the user who designated the bookmark as private, and system administrators.

4.19 Media Exporting: Support the ability to export media and provide at least the following options:

4.19.1 Exports recorded video in at least the following formats:

- 4.19.1.1 Native (AVE).
- 4.19.1.2 JPEG.
- 4.19.1.3 PNG.
- 4.19.1.4 TIFF.
- 4.19.1.5 AVI.
- 4.19.1.6 Print.

4.19.2 Exports recorded audio in at least the following formats:

- 4.19.2.1 WAV.
- 4.19.2.2 Native (AVE).
- 4.19.2.3 AVI.

4.19.3 Exports a still frame of video as displayed in video preview area in at least the following formats:

- 4.19.3.1 Native (AVE).
- 4.19.3.2 JPEG.
- 4.19.3.3 PNG.
- 4.19.3.4 TIFF.

4.19.4 Native (AVE) format exported as follows:

- 4.19.4.1 Digitally sign recorded video and audio using 256-bit encryption so video can be authenticated for evidentiary purposes.
- 4.19.4.2 Protect exported video with a password meeting configurable strength requirements.
- 4.19.4.3 Ability to export video from one or multiple cameras simultaneously.
- 4.19.4.4 Supports exporting multiple video segments from different spans of time.
- 4.19.4.5 Supports reviewing of exported or backed-up video and audio in a dedicated player.
- 4.19.4.6 Supports playback of exported clips in synchronized, sequential time.
- 4.19.4.7 Supports playback of multiple clips in continuous, sequential order.

- 4.19.4.8 Supports exporting of video in lower frame-rates than originally recorded.
- 4.19.4.9 Support exporting of a designated area from camera's recorded field of view.
- 4.19.4.10 Supports re-export into Native or other supported formats.
- 4.19.4.11 Provides a record of video source with at least the following metadata:
  - 4.19.4.11.1 Camera model.
  - 4.19.4.11.2 Firmware version.
  - 4.19.4.11.3 Location.
  - 4.19.4.11.4 MAC address.
  - 4.19.4.11.5 Serial number.
  - 4.19.4.11.6 Resolution.
- 4.20 Version Upgrade: Provide a process for upgrading versions:
  - 4.20.1 Upgrading server software shall not require physical access to servers.
    - 4.20.1.1 Launch upgrades from client software.
    - 4.20.1.2 All connected servers and clients shall receive a distribution of new version upgrade.
      - 4.20.1.2.1 The administrators can manually trigger upgrade of each server.
    - 4.20.1.3 Users shall be able to monitor upgrade process from client interface.
  - 4.20.2 Upgrading number of connected devices or upgrading to enterprise version only requires a change in license key.
  - 4.20.3 Upgrade from one version to another occurs without having to uninstall application and previous version.
  - 4.20.4 Automatically upgrade connected video or audio source device firmware if applicable.
  - 4.20.5 Automatically prompt user to upgrade client application if it is out of date with respect to server software.
- 4.21 Network Video Recorders
  - 4.21.1 Basis of Design Product:
    - 4.21.1.1 Avigilon AI NVR Standard.
    - 4.21.1.2 Avigilon AI NVR Value
  - 4.21.2 Throughput: NVR System shall be capable of managing at least a combined 1700 Mbps or total throughput with handling for simultaneous recording, playback and live streaming.
    - 4.21.2.1 Recording: 900 Mbps.
    - 4.21.2.2 Playback: 800 Mbps.
  - 4.21.3 Camera Support: Provide devices capable of supporting at least the following number of cameras for each analytic feature where applicable:

- 4.21.3.1 Classified Object Detection: 5 non-analytics enabled cameras.
- 4.21.3.2 Appearance Search: 200 cameras.
- 4.21.3.3 Face Recognition and Appearance Search: 50 cameras.
- 4.21.3.4 Face Mask Detection and Appearance Search: 200 cameras.
- 4.21.4 Camera Support: Provide devices capable of supporting at least the following number of cameras for each analytic feature where applicable:
  - 4.21.4.1 Classified Object Detection: 10 non-analytics enabled cameras.
  - 4.21.4.2 Appearance Search: 200 cameras.
  - 4.21.4.3 Face Recognition and Appearance Search: 100 cameras.
  - 4.21.4.4 Face Mask Detection and Appearance Search: 200 cameras.
- 4.21.5 System Certifications:
  - 4.21.5.1 UL and cUL certification marks for Canada/USA.
  - 4.21.5.2 NRCS certification for USA.
  - 4.21.5.3 TAA and NDAA for US Federal procurement Compliances.
  - 4.21.5.4 Electromagnetic Emissions Certifications:
    - 4.21.5.4.1 CFR Title 47, FCC Part 2, 15 Class A.
    - 4.21.5.4.2 ICES-003 Class A.
    - 4.21.5.4.3 EN 55032 Class A.
    - 4.21.5.4.4 EN61000-3-2.
    - 4.21.5.4.5 EN61000-3-3.
  - 4.21.5.5 Electromagnetic Immunity Standards:
    - 4.21.5.5.1 EN 55024.
  - 4.21.5.6 Safety standards:
    - 4.21.5.6.1 UL/CSA/IEC/EN 60950-1.
- 4.21.6 System Design:
  - 4.21.6.1 Operating System: Avigilon Hardened OS.
  - 4.21.6.2 Processor: Intel Xeon or better.
  - 4.21.6.3 RAM: 16GB (2x 8GB) DDR4 or better.
- 4.21.7 Operating System Storage:
  - 4.21.7.1 Two (2) M.2 SSD drives configured with subsequent write capability, data mirroring, and redundancy such that one (1) drive may be removed, replaced or fail without system compromise. (RAID 1).
- 4.21.8 Video Data Storage Capacity: Provide system with at least the following configurations:
  - 4.21.8.1 Default Effective Storage Capacity: 48TB.
  - 4.21.8.2 Maximum Drive Count: Four (4) 3.5-inch drives.

- 4.21.8.3 Maximum Data Capacity: 16TB raw (12 TB effective).
- 4.21.8.4 Data Storage Virtualization: Provide drive array capable of subsequent read and write, with data mirroring, and redundancy, such that up to one (1) drive may be removed, replaced, or fail without system compromise (RAID 5).
- 4.21.8.5 Maximum Drive Count: Eight (8) 3.5-inch drives.
- 4.21.8.6 Maximum Drive Capacity: 64TB raw (48TB effective).
- 4.21.8.7 Data Storage Virtualization: Provide drive array capable of subsequent read and write, with data mirroring, and redundancy, such that up to two (2) drives may be removed, replaced, or fail without system compromise (RAID 6).
- 4.21.9 Mounting: Standard server enclosure (rack) mounting, requiring no more than a 2U configuration.
- 4.21.10 Network: Provide a minimum of four (4) 1GB Ethernet RJ-45 ports (1000Base-T).
- 4.21.11 Remote Access: Provide hardware-integrated support for remote access control.
  - 4.21.11.1 Basis of Design: iDRAC 9 Express by Dell Technologies.
- 4.21.12 Electrical Power:
  - 4.21.12.1 Input: 100 to 240VAC, 50/60Hz, auto-switching.
  - 4.21.12.2 Power Supply: Provide at least one (1) power supply rated for at least 125% of calculated load.
  - 4.21.12.3 Redundant Power Supply: Appliance shall be configurable for dual power supplies that can be replaced without the need to power down (hot-swappable).
  - 4.21.12.4 Power Consumption Maximum: 750W.
- 4.21.13 Operating Ranges:
  - 4.21.13.1 Temperature: 10 to 25 degrees C (50F to 95F).
  - 4.21.13.2 Relative Humidity: 10-90 percent (non-condensing).
  - 4.21.13.3 Altitude: 3048 meters (10,000 ft).
  - 4.21.13.4 Vibration: 0.26 Grms at 5 Hz to 350 Hz.
  - 4.21.13.5 Shock: One (1) pulse on each side of the system of 71 G for up to 2 ms.
- 4.21.14 Accessories: At a minimum, provide at least the following:
  - 4.21.14.1 Power Supplies:
    - 4.21.14.1.1 AINVR-VAL-2NDPS: Redundant, hot-swappable power supply for AINVR-VAL.
    - 4.21.14.1.2 AINVR-STD-2NDPS: Redundant, hot-swappable power supply for AINVR-STD.
  - 4.21.14.2 Software:

- 4.21.14.2.1 IDRAC-ENT-UPG: iDRAC Enterprise Upgrade.
- 4.21.14.3 Warranty Upgrade:
  - 4.21.14.3.1 AINVR-VAL-WARR-SY4HMC: 4-hour mission critical response service-level agreement upgrade.
  - 4.21.14.3.2 AINVR-STD-WARR-SY4HMC: 4-hour mission critical response service-level agreement upgrade.
- 4.21.14.4 Hard Drives:
  - 4.21.14.4.1 NVR4-HDDS-HOT-2TB: Spare hard drive, 2TB
  - 4.21.14.4.2 NVR4-HDDS-HOT-4TB: Spare hard drive, 4TB
  - 4.21.14.4.3 NVR4-HDDS-HOT-8TB: Spare hard drive, 8TB

## 5.0 CAMERA ACCESSORIES

### 5.1 Brackets and Mounts:

- 5.1.1 H4A-MT-NPTA1: Indoor/Outdoor pendant NPT mount.
- 5.1.2 H4A-MT-WALL1: Indoor/Outdoor pendant wall arm mount.
- 5.1.3 H4-MT-CRNR1: Aluminum corner mounting bracket for pendant dome cameras.
- 5.1.4 H4-MT-CRNR1: Aluminum corner mounting bracket for bullet cameras.
- 5.1.5 H4-MT-POLE1: Aluminum pole mounting bracket for pendant dome cameras.
- 5.1.6 H4-MT-POLE1: Aluminum pole mounting bracket for bullet cameras.

### 5.2 Camera Covers:

- 5.2.1 H4A-SC-CLER1: In-ceiling dome camera cover with clear bubble.
- 5.2.2 H4A-SC-CLER1-BL: Black in-ceiling dome camera cover with clear bubble.
- 5.2.3 H4A-DC-SMOK1: In-ceiling dome camera cover with smoked bubble.
- 5.2.4 H4A-DC-SMOK1-BL: Black in-ceiling dome camera cover with smoked bubble.
- 5.2.5 h4A-DD-CLER1: Indoor dome camera cover with clear bubble.
- 5.2.6 H4A-DD-CLER1-BL: Black indoor dome camera cover with clear bubble.
- 5.2.7 H4A-DO-CLER1: Outdoor dome camera cover with clear bubble.
- 5.2.8 H4A-DO-SMOK1: Outdoor dome camera cover with smoked bubble.
- 5.2.9 H4A-DP-CLER1: Pendant dome camera cover with clear bubble.
- 5.2.10 H4A-DP-SMOK1: Pendant dome camera cover with smoked bubble.
- 5.2.11 H4A-DD-SMOK1: Indoor dome camera cover with smoked bubble.

- 5.2.12 H4A-DD-SMOK1-BL: Black indoor camera cover with smoked bubble.
- 5.3 Other:
  - 5.3.1 CM-AC-GROM1: Pipe grommets.
  - 5.3.2 H4A-AC-GROM1: Camera sealing grommets.
  - 5.3.3 H4A-DD-SDWL1: Indoor dome camera sidewall knockout plugs.
  - 5.3.4 H4A-DD-SDWL1-BL: Black indoor dome camera sidewall knockout plugs.
  - 5.3.5 H4-BO-JBOX1: Junction box for bullet cameras.
  - 5.3.6 H4-DC-CPNL1: Metal ceiling panel.

## 6.0 DESIGN CRITERIA.

- 6.1 System Design:
  - 6.1.1 All cameras shall be designed in a modular fashion such the mounts, mounting components and hardware are universal and not integrated directly with the camera itself.
  - 6.1.2 The video monitoring system shall be tightly integrated using application programming interfaces and software development kits.
  - 6.1.3 All systems shall be capable of functioning autonomously during a failure of one or more of the related sections.
  - 6.1.4 Camera shall be capable of bi-directional communication.
  - 6.1.5 The video monitoring system shall be interfaced through digital communication protocols including but not limited to ASCII or Hexadecimal Data Transmissions.
- 6.2 System Certifications:
  - 6.2.1 UL and cUL certification marks for Canada/USA.
- 6.3 Safety Standards:
  - 6.3.1 UL/CSA/IEC/EN 60950-1.
- 6.4 Electromagnetic Emissions Standards:
  - 6.4.1 FCC Part 15 Subpart B Class B.
  - 6.4.2 ICES-003 Class B.
  - 6.4.3 EN 55032 Class B.
  - 6.4.4 EN 61000-6-3.
  - 6.4.5 EN 61000-3-2.
  - 6.4.6 EN 61000-3-3.
  - 6.4.7 EN 55024.
  - 6.4.8 EN 61000-6-1.

## 7.0 PERFORMANCE REQUIREMENTS.

- 7.1 Standards:
  - 7.1.1 Video Standards: H.264/H.265/MJPEG/HDSM SmartCodex technology.
  - 7.1.2 Image Standards: MPEG-4-ISO/IEC 14496-10 AVC (H.264).

- 7.1.3 Networking Standards:
  - 7.1.3.1 IEEE 802.3af (Power over Ethernet).
  - 7.1.3.2 IEEE 802.1X (Authentication).
  - 7.1.3.3 IPv4 (RFC 791).
  - 7.1.3.4 IPv6.
- 7.2 Video Requirements:
  - 7.2.1 Provide cameras capable of simultaneously delivering at least two (2) individual video streams, for use when connecting to the Video Management Software for recording and live viewing.
  - 7.2.2 Provide cameras with a primary stream capable of supporting the video resolution and aspect ratio and capable of generating the image framerates noted in these specifications.
  - 7.2.3 By generating a secondary and/or tertiary stream at fractional resolutions of the primary stream, the video devices shall support HDSM-High Definition Stream Management and/or Dynamic Bandwidth Management.
- 7.3 Encoding Requirements:
  - 7.3.1 Support compression and image quality setting from 1 to 20 to configure bandwidth utilized by the camera and esired image response. Provide user configuration of compression quality and image rate per camera.
  - 7.3.2 Provide independently configured simultaneous H.264, H.265 and Motion JPEG streams (multi-stream).
  - 7.3.3 Support Motion JPEG encoding in a selectable range from 1 up to 12 frames per second based on resolution configured.
  - 7.3.4 Support H.265 encoding in a selectable range from 1 up to 12 frames per second based on resolution configured.
  - 7.3.5 Support Variable Bit Rate (VBR) in H.265 with a configurable maximum bit rate threshold.
  - 7.3.6 Provide user configuration of compression format, compression quality, maximum bit rate, key frame interval and image rate per camera.
  - 7.3.7 Support motion compensation and motion vector during motion estimation in H.264 and H.265, able to maintain frame rate, regardless of scene complexity, when bandwidth is capped at 17 mbps at 12 FPS.
  - 7.3.8 Support G.711 PCM 8kHz audio compression.
- 7.4 Transmission Requirements:
  - 7.4.1 Provide cameras that support the following when connecting to a VMS:
    - 7.4.1.1 Dynamic Bandwidth Management.
    - 7.4.1.2 High Definition Stream Management.
  - 7.4.2 Cameras shall transmit two distinct video streams:



- 7.4.2.1 Primary Stream: Supports up to full resolution and prescribed frame rate.
- 7.4.2.2 Secondary Stream: Supports fractional resolution and mirrors the frame rate and aspect ratio of the primary stream at a maximum of 0.3MP – 640x48 (4:3)/768/432 (16:9).
- 7.4.3 Cameras shall transmit three distinct video streams:
  - 7.4.3.1 Primary Stream: Supports up to full resolution and prescribed frame rate.
  - 7.4.3.2 Second Stream: Supports fractional resolution and mirrors the frame rate and aspect ratio of the primary stream at a maximum of 1.3MP – 1280x960 (4:3)/1536x432 (16:0).
  - 7.4.3.3 Third Stream: Supports fractional resolution and mirrors the frame rate and aspect ratio of the primary stream at a maximum of 0.3MP – 640x480(4:3)/768x432 (16:9).
- 7.5 Provide cameras that allow video and audio signals to be transported over:
  - 7.5.1 HTTP (Unicast).
  - 7.5.2 HTTPS (Unicast).
  - 7.5.3 RTP (Unicast & Multicast).
  - 7.5.4 RTP over RTSP (Unicast).
  - 7.5.5 RTP over RTSP over HTTP (Unicast).
  - 7.5.6 RTP over RTSP over HTTPS (Unicast).
- 7.6 Image Control Requirements:
  - 7.6.1 User Configurations Supported:
    - 7.6.1.1 Automatic and manual white balance control.
    - 7.6.1.2 Automatic and manual defined exposure zones operating in the range 1 and 1/8000 second.
    - 7.6.1.3 Flicker control (50Hz, 60Hz).
    - 7.6.1.4 Automatic and manual iris control.
    - 7.6.1.5 Color saturation and sharpening.
    - 7.6.1.6 Motion detection sensitivity and threshold.
    - 7.6.1.7 Digital rotation of the image.
    - 7.6.1.8 Minimum Dynamic Range:
      - 7.6.1.8.1 100 dB.
      - 7.6.1.8.2 Dynamic Range shall not change based on configured encoding resolution.
  - 7.6.2 Adaptive Video Analytics Specifications:
    - 7.6.2.1 Configured Behaviors: Unlimited number of configured behaviors per video source supplied.
    - 7.6.2.2 Automatic Analytic set up and tuning of behavior identification:
      - 7.6.2.2.1 Upon selection of analytic and Region of Interest (ROI), the device shall automatically configure behavior identification.

- 7.6.2.2.2 The device shall constantly monitor changes in the scene and perform a tuning of the behavior identification parameters as the scene environment changes.
  - 7.6.3 Include detection of the following behaviors:
    - 7.6.3.1 Object present in ROI.
    - 7.6.3.2 Object enters ROI.
    - 7.6.3.3 Object leaves ROI.
    - 7.6.3.4 Object appeared.
    - 7.6.3.5 Object disappeared.
    - 7.6.3.6 Object crosses a line of interest or beam.
    - 7.6.3.7 Object Movement Direction.
    - 7.6.3.8 Object loitering.
    - 7.6.3.9 Multiple objects in ROI over a specified dwell time.
    - 7.6.3.10 Dwell time.
    - 7.6.3.11 Number of objects exceeds limit in ROI.
    - 7.6.3.12 Number of objects below limit in ROI.
    - 7.6.3.13 Camera tampering.
- 7.7 Network requirements: Provide video cameras that have the following network capabilities:
  - 7.7.1 Supports both fixed (static) IP addresses and dynamically assigned IP addresses provided by a Dynamic Host Control Protocol (DHCP) server.
  - 7.7.2 Supports user configuration of network parameters including but not limited to:
    - 7.7.2.1 Fixed (static) IP address.
    - 7.7.2.2 Subnet mask.
    - 7.7.2.3 Gateway.
    - 7.7.2.4 Control port.
  - 7.7.3 Are automatically detected when using a Video Management Application (VMA) or Network Video Recorder (NVR) supporting this feature.
  - 7.7.4 Provides support for both IPv4 and IPv6 networks.
- 7.8 Video Motion Detection Functionality Requirements: Provide video cameras capable of detecting motion based on:
  - 7.8.1 Motion Detection Mask: Defined areas within the camera's field of view for the camera to detect motion.
  - 7.8.2 Sensitivity: How much each pixel within the masked areas must change before it is considered in motion.
  - 7.8.3 Threshold: Percentage of pixels that must detect change.
- 7.9 Event Functionality Requirements: Equip cameras with an integrated event functionality which may be triggered by:
  - 7.9.1 Alarm input terminal.
  - 7.9.2 Video motion detection.

- 7.9.3 Camera temperature outside operative range.
- 7.10 Protocol Support Requirements: Provide video cameras that incorporate support for at least the following:
  - 7.10.1 IPv4.
  - 7.10.2 IPv6.
  - 7.10.3 HTTP.
  - 7.10.4 HTTPS.
  - 7.10.5 SOAP.
  - 7.10.6 DNS.
  - 7.10.7 NTP.
  - 7.10.8 RSTP.
  - 7.10.9 RTCP.
  - 7.10.10 RTP.
  - 7.10.11 TCP.
  - 7.10.12 CDP.
  - 7.10.13 IGMP.
  - 7.10.14 ICMP.
  - 7.10.15 DHCP.
  - 7.10.16 ZeroConf.
  - 7.10.17 ARP.
  - 7.10.18 SNMP v2c.
  - 7.10.19 SNMP v3.
- 7.11 Streaming Support Requirements: Provide video cameras that incorporate support for at least the following:
  - 7.11.1 RTP/UDP.
  - 7.11.2 RTP/UDP multicast.
  - 7.11.3 RTP/RTSP/TCP.
  - 7.11.4 RTP/RTSP/HTTP/TCP.
  - 7.11.5 RTP/RTSP/HTTPS/TCP.
  - 7.11.6 HTTP.
- 7.12 Video Overlay Requirements: Provide video cameras with the following overlay requirements:
  - 7.12.1 Sixty-four (64) individually configurable privacy zones to conceal defined areas in image as non-viewable. Masks required shall be dynamically adjusted based on current zoom-factor, without capability of operator bypass.
  - 7.12.2 Video masked by privacy zones shall be obscured prior to streaming.
- 7.13 Security Requirements: provide video cameras with the following security requirements:
  - 7.13.1 Support the use of the following:
    - 7.13.1.1 Password protection.
    - 7.13.1.2 HTTPS Encryption.
    - 7.13.1.3 Digest authentication.
    - 7.13.1.4 WS authentication.

- 7.13.1.5 User access log.
    - 7.13.1.6 SSL encryption.
  - 7.13.2 Restrict access to the built-in internet server by usernames and passwords at three different user group levels.
- 7.14 Electrical Power: Cameras shall be capable of being powered by the following power sources:
  - 7.14.1 PoE: up to IEEE 802.3af Class 3 PoE Compliant.
  - 7.14.2 AC Power: 24V +/- 10%, 10 VA minimum (13VA minimum with -IR option).
  - 7.14.3 DC Power: 12V +/- 10%, 7 W minimum (9 W minimum with -IR option).
  - 7.14.4 Battery Backup: 3V manganese lithium.
- 7.15 Functionality: Cameras shall have the following:
  - 7.15.1 Alarm input and output terminals.
  - 7.15.2 Line audio input (for external microphone) and audio output (for external speaker) connections.
  - 7.15.3 Firmware reset button to reset cameras to factory default settings.
  - 7.15.4 Enhanced Framerate Mode: Enhanced framerate mode allowing for higher framerates when analytics are disabled on all camera heads within the system.
- 7.16 Diagnostics:
  - 7.16.1 Cameras shall be equipped with LEDs, indicating the camera's functional status, which may be user enabled or disabled.
  - 7.16.2 Cameras shall monitor their functionality and shall automatically reinitiate processes or restart the unit if a malfunction is detected.
- 7.17 Connectivity:
  - 7.17.1 Cameras shall have a gigabit ethernet-port with RJ-45 sockets and shall auto negotiate network speed and transfer mode.
  - 7.17.2 Cameras shall have a terminal for receiving line level analog audit from an external microphone.
  - 7.17.3 Cameras shall have a terminal for providing line level analog audio for connection to an external speaker.
- 7.18 Installation and Maintenance Requirements: Provide video cameras with the following installation and maintenance requirements:
  - 7.18.1 Allow firmware updates via network.
  - 7.18.2 Store customer-specific settings in a non-volatile memory which cannot be lost during power cuts or soft reset.
  - 7.18.3 Provide Microsoft Windows-based management software, allowing camera configuration, upgrade of firmware, and backup of individual camera configurations.
- 7.19 Operational Range:
  - 7.19.1 Temperature:
    - 7.19.1.1 Ceiling Mount: -10 degrees C to +50 degrees C (14 F to 122 F).

- 7.19.1.2 Pendant and Surface Mount: -40 degrees C to +60 degrees C (-40 F to 140F).
- 7.19.2 Relative Humidity: 0-95 percent (non-condensing).
- 7.20 Access Systems Integration.
  - 7.20.1 The new surveillance systems shall be integrated with existing access control systems, which include but are not limited to:
    - 7.20.1.1 Premisys.
    - 7.20.1.2 Intelli-M.
    - 7.20.1.3 KeyScan
  - 7.20.2 The new surveillance systems shall have the capability to integrate with any future access control systems, or access control shall be integral to the surveillance system.
  - 7.20.3 If integration is not possible, the integrator shall submit recommendations for future access control solutions.
  - 7.20.4 The City reserves the right to withdraw Section 7.20 from consideration.

## 8.0 HARDWARE.

- 8.1 Supported Applications:
  - 8.1.1 Summary: Preload NVMS applications on the following Avigilon hardware:
    - 8.1.1.1 ACC Edge Solution (ES) HD Recorder.
    - 8.1.1.2 ACC ES Analytics Application.
    - 8.1.1.3 ACC ES 8-port Appliance.
    - 8.1.1.4 Avigilon HD Video Appliance.
    - 8.1.1.5 Avigilon HD Network Video Recorder.
    - 8.1.1.6 Avigilon HD Network Video Recorder Workstation.
- 8.2 Owner Furnished, Contractor Installed (OFCl) Hardware:
  - 8.2.1 Configure NVMS to run as a service to automatically start when server or workstation is powered on.
  - 8.2.2 The NVMS allows user to monitor and administer system from:
    - 8.2.2.1 A single client application for monitoring live and recorded video and audio.
    - 8.2.2.2 A single window for administering all system connections.
    - 8.2.2.3 A single tab for monitoring overall system health including but not limited to:
      - 8.2.2.3.1 All sites connected in parent-child relationships.
      - 8.2.2.3.2 Any connected analytic appliances in the site.
      - 8.2.2.3.3 Any connected Access Control systems.
      - 8.2.2.3.4 Server-side License Plate Recognition processes.
      - 8.2.2.3.5 Server-side Analytic Service processes with peak-load information.

- 8.2.2.3.6 Ability to export health reports to Portable Document File (PDF).
- 8.2.3 The NVMS provides a maintenance log and audit trail of all system errors and events.
- 8.2.4 The NVMS provides multiple levels of system redundancy:
  - 8.2.4.1 Cluster and synchronize at least 100 servers into a unified site.
    - 8.2.4.1.1 In the event of a server failure, system can continue running and allow other servers to take over failed server's tasks.
  - 8.2.4.2 Centralized system administration:
    - 8.2.4.2.1 Site and server configuration details are replicated to each server in the site.
    - 8.2.4.2.2 Site can be organized in a hierarchical parent-child relationship where parent can always control child site settings.
  - 8.2.4.3 Connect a video or audio source to multiple servers to achieve redundant recording.
  - 8.2.4.4 Create a failover connection for a video or audio source between servers in a site.
- 8.2.5 The NVMS provides the capability to replace malfunctioning video or audio sources with a new device and associate old recorded video with the new device.
- 8.2.6 The NVMS provides capability to rename all sites, servers, and video and audio sources.
- 8.3 Peripherals:
  - 8.3.1 The NVMS provides the ability to control client applications usings at least the following types of peripherals:
    - 8.3.1.1 A USB keyboard and/or mouse.
    - 8.3.1.2 A USB joystick.
    - 8.3.1.3 A PTZ controller keyboard.

## 9.0 ACCESSORIES.

- 9.1 HD NVR Analytics Kit:
  - 9.1.1 NVIDIA Quadro P1000 GPU or better:
    - 9.1.1.1 Support a minimum of 4 GB of on-board GPU memory.
    - 9.1.1.2 Support NVIDIA Pascal™ or NVIDIA Maxwell™ architecture.
    - 9.1.1.3 Support a NVIDIA CUDA Compute Capability 5.2 or 6.1.
    - 9.1.1.4 Support Windows x86\_64 Driver Version 410.48 or above.
- 9.2 ACC\_USB-JOY-PRO – Avigilon USB professions Joystick Keyboard.

## 10.0 EXECUTION.

- 10.1 Examination.
  - 10.1.1 Verification of Conditions: Do not begin installation until substrates and mounting surfaces have been properly prepared.
  - 10.1.2 Evaluation and Assessment: Notify the installation contractor and the City of Flint if the substrates and mounting surfaces are not properly prepared for installation. Coordinate with the installation contractor and the City of Flint to properly prepare the substrates and mounting surfaces.
- 10.2 Preparation.
  - 10.2.1 Surface Preparation: Coordinate with installation contractor and the City of Flint to properly prepare surfaces to provide the best result for the installation.
- 10.3 Installation.
  - 10.3.1 Assist as needed during the installation to provide the City of Flint with the best surveillance solutions.
  - 10.3.2 The manufacturer, integrator and installation contractor shall comply with the National Electrical Code, 2023 edition or later, State of Michigan Electrical Code, and all relevant standards and industry practices.
    - 10.3.2.1 Wherever possible, cabling shall be installed in raceways approved for the relevant locations. Electrical Metallic Tubing (EMT) is not approved.
    - 10.3.2.2 AutoCAD diagrams of cabling pathways, labeling, location of PoE injectors, and all other pertinent information shall be provided in the aforementioned 3-ring binders and flash drives.
  - 10.3.3 Power over Ethernet (PoE) equipment, switches, cabling, fiber optics and all other necessary appurtenances to provide complete and fully functional surveillance systems shall be included and mounted in appropriately-sized NEMA 12/13 enclosures where applicable. A diagram showing proposed locations of equipment and appurtenances (such as PoE injectors and their power sources) shall be provided with the submittals.
- 10.4 System Startup.
  - 10.4.1 Test equipment and configure systems in accordance with project requirements and manufacturer's instructions prior to installation.
  - 10.4.2 Review configurable features of the devices with City representatives for each location and establish a punch list for standard, device-specific, location-specific, and VMA/NVR-specific configurations of devices.
    - 10.4.2.1 Program and configure devices in accordance with the punch lists so no additional programming is required for operation by the City.

- 10.4.3 Configure equipment requiring user to log on using a password with user/site-specific credentials. Default passwords are not acceptable and shall be configured prior to final payment.
- 10.4.4 Provide products with the latest and most up-to-date firmware by the manufacturer(s) or as specified by the provider of the Video Management Application (VMA) or Network Video Recorder (NVR).
- 10.5 Adjusting.
  - 10.5.1 Fine Tuning: Perform field software changes after initial programming session to “fine tune” operating parameters and sequence of operations based on any revisions to the City’s operating requirements.
- 10.6 Closeout.
  - 10.6.1 Demonstration/Training:
    - 10.6.1.1 Provide separate training sessions for different user groups. Each session shall be customized for its user group. Due to facility operating conditions, multiple sessions may be required for each user group.
    - 10.6.1.2 According to the user group permissions, demonstrate and teach administration and operation of all relevant devices.
    - 10.6.1.3 According to the user group permissions, demonstrate and teach how to authorize users and applications to operate and configure installed devices.
    - 10.6.1.4 According to the user group permissions, demonstrate and teach how an authorized user can gain access to and make changes to configurations.
    - 10.6.1.5 According to the user group permissions, demonstrate and teach how to operate functionality configured for the City of Flint’s specific locations and departments.
    - 10.6.1.6 For each department, provide training documentation for each user group summarizing operation and configuring instructions. Copies shall be provided for each person attending a training session, one (1) additional hard copy for records and one (1) copy on a flash drive.
  - 10.6.2 License Agreement.
    - 10.6.2.1 Register software, hardware, firmware, operational or administrative licenses necessary to operate and/or administer all devices to the City of Flint.
    - 10.6.2.2 Deliver to City’s representatives proof of license registration from product manufacturers.
  - 10.6.3 Device Configuration Backup.
    - 10.6.3.1 Using manufacturer’s backup software tool or VMA/NVR, perform a full system back-up at completion



of initial programming. Demonstrate and teach appropriate user groups how to backup the system.

10.6.3.2 Deliver configuration backup files, restoration application and instructions detailing for restoration of back-up configuration.

CITY OF FLINT  
 UTILITIES DIVISION  
 SURVEILLANCE IMPROVEMENTS EQUIPMENT

Department/Location(s)	Price
City of Flint Water Plant & Remote locations	
City of Flint Water Plant Installation	
City of Flint Water Service Center	
City of Flint WSC Installation	
<b>Total:</b>	

1. Failure to use this bid form may result in bid disqualification.
2. List value-added considerations on a separate sheet of paper.

Terms: \_\_\_\_\_ Dest: \_\_\_\_\_ Fed. ID#: \_\_\_\_\_

FIRM NAME: \_\_\_\_\_

CONTACT: \_\_\_\_\_

ADDRESS: \_\_\_\_\_ CITY/STATE/ZIP \_\_\_\_\_

PHONE: \_\_\_\_\_ FAX: \_\_\_\_\_

SIGNED: \_\_\_\_\_ DATE: \_\_\_\_\_

CITY OF FLINT  
UTILITIES DIVISION  
SURVEILLANCE IMPROVEMENTS EQUIPMENT

APPENDIX A

PROPOSED EQUIPMENT LISTS

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## HD NVRs

Name	Model	Expansions	Storage	Total Data	Storage Time	Status
Water Service Center	AINVR-STD-48TB-NA	-	45.6 TB	132.86 Mbps	135 days 23 hours	Valid
Water Plant	AINVR-PRM-64TB-- NA	-	60.8 TB	194.25 Mbps	137 days 19 hours	Valid

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## Smart Codec Cameras

Name	Model	Storage	Qty	Lens	FL. (mm)	Image Rate	Daily Recording Cycle	Image Quality	Max Bandwidth	HDSM Smartcodec		
										Enabled	Strength	Min Image Rate
Front Desk	2.0C-H5A--D1	Water Service Center	1	Built-In Lens, 3.3-9mm, f/1.3, P-Iris, Vari Focal	5.7	10	4	Quality 6	3.49 Mbps	×		×
Hallway	2.0C-H5A--D1	Water Service Center	1	Built-In Lens, 3.3-9mm, f/1.3, P-Iris, Vari Focal	> max	10	4	Quality 6	3.49 Mbps	×		×
Break Room	2.0C-H5A--D1	Water Service Center	1	Built-In Lens, 3.3-9mm, f/1.3, P-Iris, Vari Focal	8.8	10	4	Quality 6	3.49 Mbps	×		×
West Garage (1)	2.0C-H5A--D1-IR	Water Service Center	1	Built-In Lens, 3.3-9mm, f/1.3, P-Iris, Vari Focal	3.3	10	24	Quality 6	2.72 Mbps	✓	Medium (Default)	1
West Garage (2)	2.0C-H5A--D1-IR	Water Service Center	1	Built-In Lens, 3.3-9mm, f/1.3,	5.7	10	4	Quality 6	3.49 Mbps	×		×

				P-Iris, Vari Focal								
West Garage (3)	2.0C-H5A--D1-IR	Water Service Center	1	Built-In Lens, 3.3-9mm, f/1.3, P-Iris, Vari Focal	3.3	10	4	Quality 6	3.49 Mbps	×		×
East Garage (1)	9C-H4A--3MH-180 (EOL)	Water Service Center	1	Built-In Lens, 4mm, f/1.6				Quality 6	12.48 Mbps	×		×
Head 1					4.0	8	6	Quality 6		×		×
Head 2					4.0	8	6	Quality 6		×		×
Head 3					4.0	8	6	Quality 6		×		×
East Garage (2)	9C-H4A--3MH-180 (EOL)	Water Service Center	1	Built-In Lens, 4mm, f/1.6				Quality 6	12.48 Mbps	×		×
Head 2					4.0	8	6	Quality 6		×		×
Head 1					4.0	8	6	Quality 6		×		×
Head 3					4.0	8	6	Quality 6		×		×
S Exterior	15C-H4A--3MH-270 (EOL)	Water Service Center	1	Built-In Lens, 2.8mm, f/1.2				Quality 6	18.42 Mbps	×		×
Head 1					2.8	8	24	Quality 6		✓	Medium (Default)	1
Head 2					2.8	8	24	Quality 6		✓	Medium (Default)	1

Head 3					2.8	8	24	Quality 6		✓	Medium (Default)	1
W Exterior	15C-H4A-- 3MH-270 (EOL)	Water Service Center	1	Built-In Lens, 2.8mm, f/1.2				Quality 6	18.42 Mbps	×		×
Head 1					2.8	8	24	Quality 6		✓	Medium (Default)	1
Head 2					2.8	8	24	Quality 6		✓	Medium (Default)	1
Head 3					2.8	8	24	Quality 6		✓	Medium (Default)	1
West Lot	5.0C-H5A-- BO2-IR	Water Service Center	1	Built-In Lens, 9-22mm, f/1.6, P-Iris, Vari Focal	9.0	10	24	Quality 6	5.87 Mbps	✓	Medium (Default)	1
N Exterior	15C-H4A-- 3MH-270 (EOL)	Water Service Center	1	Built-In Lens, 2.8mm, f/1.2				Quality 6	12.08 Mbps	×		×
Head 1					2.8	4	24	Quality 6		✓	Medium (Default)	1
Head 2					2.8	4	24	Quality 6		✓	Medium (Default)	1
Head 3					2.8	4	24	Quality 6		✓	Medium (Default)	1
WSC - SW Lot	20C-H4A-- 4MH-360 (EOL)	Water Service Center	1	Built-In Lens, 2.8mm, f/1.2				Quality 6	32.92 Mbps	×		×

Head 1					2.8	7	8	Quality 6		×		×
Head 2					2.8	7	8	Quality 6		×		×
Head 3					2.8	7	8	Quality 6		×		×
Head 4					2.8	7	8	Quality 6		×		×
Holloway Dam	8.0C-H5A-- BO1-IR	Water Plant	1	Built-In Lens, 4.9-8mm, f/1.8, P-Iris, Vari Focal	7.5	15	24	Quality 6	7.28 Mbps	✓	Medium (Default)	1
WTP - Front Gate	5.0C-H5A-- BO2-IR	Water Plant	1	Built-In Lens, 9-22mm, f/1.6, P-Iris, Vari Focal	22.0	15	24	Quality 6	6.78 Mbps	✓	Medium (Default)	1
WTP - PS4	15C-H4A-- 3MH-270 (EOL)	Water Plant	1	Built-In Lens, 2.8mm, f/1.2				Quality 6	16.07 Mbps	×		×
Head 1					2.8	8	24	Quality 6		✓	Medium (Default)	1
Head 2					2.8	8	24	Quality 6		✓	Medium (Default)	1
Head 3					2.8	8	24	Quality 6		✓	Medium (Default)	1
WTP - East Lot (1)	2.0C-H5A-- BO1-IR	Water Plant	1	Built-In Lens, 3.3-9mm, f/1.3,	5.5	15	24	Quality 6	3.35 Mbps	✓	Medium (Default)	1



				P-Iris, Vari Focal								
WTP - South Lot	6.0C-H5A-- BO1-IR	Water Plant	1	Built-In Lens, 4.9-8mm, f/1.8, P-Iris, Vari Focal	4.9	15	6	Quality 6	5.69 Mbps	×		×
WTP - East Lot (2)	9C-H4A-- 3MH-180 (EOL)	Water Plant	1	Built-In Lens, 4mm, f/1.6				Quality 6	14.48 Mbps	×		×
Head 1					4.0	8	6	Quality 6		✓	Medium (Default)	×
Head 2					4.0	8	6	Quality 6		✓	Medium (Default)	×
Head 3					4.0	8	6	Quality 6		✓	Medium (Default)	×
WTP - Chemical Feed Plant	2.0C-H5A-- D1	Water Plant	4	Built-In Lens, 3.3-9mm, f/1.3, P-Iris, Vari Focal	5.8	15	24	Quality 6	2.82 Mbps	✓	Medium (Default)	1
WTP - CS2	15C-H4A-- 3MH-270 (EOL)	Water Plant	1	Built-In Lens, 2.8mm, f/1.2				Quality 6	16.07 Mbps	×		×
Head 1					2.8	8	24	Quality 6		✓	Medium (Default)	1
Head 2					2.8	8	24	Quality 6		✓	Medium (Default)	1
Head 3					2.8	8	24	Quality 6		✓		1

											Medium (Default)	
Cedar - Pump Room	12.0W-- H5A-FE-- DO1	Water Plant	1	Built-In Lens, 1.6mm, f/2.0, Fish Eye	1.6	15	24	Quality 6	4.63 Mbps	✓	Medium (Default)	1
Cedar - Front	4.0C-H5A-- BO1-IR	Water Plant	1	Built-In Lens, 3.3-9mm, f/1.3, P-Iris, Vari Focal	3.3	15	24	Quality 6	5.73 Mbps	✓	Medium (Default)	1
Cedar - Back Camera	6.0C-- H5DH-- DO1-IR	Water Plant	1	Built-In Lens, 3.35-- 7mm, f/1.93-- f/2.90				Quality 6	16.01 Mbps	×		×
Head 1					5.3	24	6	Quality 6		×		×
Head 2					5.3	24	6	Quality 6		×		×
Cedar - Top of Well	24C-H4A-- 3MH-180 (EOL)	Water Plant	1	Built-In Lens, 5.2mm, f/1.8				Quality 6	16.97 Mbps	×		×
Head 1					5.2	6	24	Quality 6		✓	Medium (Default)	1
Head 2					5.2	6	24	Quality 6		✓	Medium (Default)	1
Head 3					5.2	6	24	Quality 6		✓	Medium (Default)	1
			1		4.9	15	24	Quality 6	7.28 Mbps	✓		1

Kearsley Dam	8.0C-H5A--BO1-IR	Water Plant		Built-In Lens, 4.9-8mm, f/1.8, P-Iris, Vari Focal							Medium (Default)	
West - Exterior	9C-H4A--3MH-180 (EOL)	Water Plant	1	Built-In Lens, 4mm, f/1.6				Quality 6	14.48 Mbps	×		×
Head 1					4.0	8	24	Quality 6		✓	Medium (Default)	1
Head 2					4.0	8	24	Quality 6		✓	Medium (Default)	1
Head 3					4.0	8	24	Quality 6		✓	Medium (Default)	1
West - Main Pump Room (2)	12.0W--H5A-FE--DO1	Water Plant	1	Built-In Lens, 1.6mm, f/2.0, Fish Eye	1.6	10	24	Quality 6	3.70 Mbps	✓	Medium (Default)	1
Torrey Rd	8.0C-H5A--FE-DO1--IR	Water Plant	1	Built-In Lens, 1.4mm, f/2.0, Fish Eye	1.4	30	6	Quality 6	8.86 Mbps	×		×
West - Main Pump Room (1)	12.0W--H5A-FE--DO1	Water Plant	1	Built-In Lens, 1.6mm, f/2.0, Fish Eye	1.6	10	24	Quality 6	3.70 Mbps	✓	Medium (Default)	1
Westside, Holloway, Thread	8.0C-H5A--BO1-IR	Water Plant	3	Built-In Lens, 4.9-8mm, f/1.8,	4.9	10	24	Quality 6	5.80 Mbps	✓	Medium (Default)	1

				P-Iris, Vari Focal							
Torrey Rd Exterior	9C-H4A--3MH-270 (EOL)	Water Plant	1	Built-In Lens, 2.8mm, f/1.2	Quality 6	14.48 Mbps	×			×	
Head 1					2.8	8	24	Quality 6	✓	Medium (Default)	1
Head 2					2.8	8	24	Quality 6	✓	Medium (Default)	1
Head 3					2.8	8	24	Quality 6	✓	Medium (Default)	1

## Scene Details

Name	Mounting Height (ft)	Target Height (ft)	Target Distance (ft)	Scene Width (ft)	Mounting Angle	Maximum Distance (ft)	px/ft
Front Desk	8.5	6	29.7	30.4	68.6	101.1	63.2
Hallway	8.5	6	61	36.8	77.9	207.3	52.2
Break Room	8.5	6	54.2	33.4	77.4	184.3	57.5
West Garage (1)	8.5	6	60.5	118.4	54.3	205.8	16.2
West Garage (2)	8.5	6	57.5	58.7	70.8	195.5	32.7
West Garage (3)	8.5	6	50.3	98.4	53.8	171.1	19.5
East Garage (1)		0	0	0	0	0	0
Head 1	8.5	6	60.1	76.8	59	204.4	26.7
Head 2	8.5	6	60.2	76.8	59	204.5	26.7

Head 3	8.5	6	60.4	77.2	59	205.4	26.5
East Garage (2)		0	0	0	0	0	0
Head 2	8.5	6	60.2	76.8	59	204.5	26.7
Head 1	8.5	6	60.1	76.8	59	204.4	26.7
Head 3	8.5	6	60.4	77.2	59	205.4	26.5
S Exterior		0	0	0	0	0	0
Head 1	8.5	6	129	236.1	45.6	438.7	11
Head 2	8.5	6	129.7	237.3	45.6	440.9	10.9
Head 3	8.5	6	87.5	160.2	45	297.6	16.2
W Exterior		0	0	0	0	0	0
Head 1	8.5	6	86.6	158.6	45	294.6	16.3
Head 2	8.5	6	129.7	237.3	45.6	440.9	10.9
Head 3	8.5	6	131.2	240	45.6	446	10.8
West Lot	8.5	6	328.3	178.3	77.8	1116.2	14.5
N Exterior		0	0	0	0	0	0
Head 1	8.5	6	52.2	95.6	43.9	177.5	27.1
Head 2	8.5	6	139.1	254.5	45.7	472.9	10.2
Head 3	8.5	6	88.3	161.7	45.1	300.4	16
WSC - SW Lot		0	0	0	0	0	0
Head 1	8.5	6	164.2	300.4	45.8	558.3	8.6
Head 2	8.5	6	143.3	262.1	45.7	487.1	9.9
Head 3	8.5	6	147.9	270.6	45.7	502.9	9.6

Head 4	8.5	6	150.9	276.2	45.7	513.2	9.4
Holloway Dam	8.5	6	289.9	295.8	72.8	985.5	13
WTP - Front Gate	8.5	6	445.7	109	84.4	1515.2	23.8
WTP - PS4		0	0	0	0	0	0
Head 1	8.5	6	102	186.7	45.3	346.9	13.9
Head 2	8.5	6	132.7	242.8	45.6	451.1	10.7
Head 3	8.5	6	130	237.8	45.6	441.9	10.9
WTP - East Lot (1)	8.5	6	60.9	64.5	70.3	206.9	29.8
WTP - South Lot	8.5	6	254.9	338.3	63.2	866.7	9.1
WTP - East Lot (2)		0	0	0	0	0	0
Head 1	8.5	6	136.5	174.2	60.4	464.2	11.8
Head 2	8.5	6	136.7	174.5	60.4	464.9	11.7
Head 3	8.5	6	136.9	174.7	60.4	465.3	11.7
WTP - Chemical Feed Plant	8.5	6	16.5	16.8	64.9	56.1	114
WTP - CS2		0	0	0	0	0	0
Head 1	8.5	6	102	186.7	45.3	346.9	13.9
Head 2	8.5	6	132.7	242.8	45.6	451.1	10.7
Head 3	8.5	6	130	237.8	45.6	441.9	10.9
Cedar - Pump Room	8.5	6	20.6	41.1	0	69.9	28.3
Cedar - Front	8.5	6	125	204.5	51	425	11.3

Cedar - Back Camera		0	0	0	0	0	0
Head 1	8.5	6	20.5	21	60.7	69.8	97.7
Head 2	8.5	6	35.2	35.9	63.5	119.7	57
Cedar - Top of Well		0	0	0	0	0	0
Head 1	8.5	6	347	452.1	68.1	1179.7	8.5
Head 2	8.5	6	345.5	450.2	68.1	1174.8	8.5
Head 3	8.5	6	343.8	448	68.1	1169	8.6
Kearsley Dam	8.5	6	92.3	165.2	58.2	313.8	23.2
West - Exterior		0	0	0	0	0	0
Head 1	8.5	6	81.3	103.8	59.7	276.5	19.7
Head 2	8.5	6	81.8	104.5	59.7	278.3	19.6
Head 3	8.5	6	83	105.9	59.7	282	19.3
West - Main Pump Room (2)	8.5	6	16.5	33	0	56.1	35.8
Torrey Rd	8.5	6	16.5	33	0	56.1	24.3
West - Main Pump Room (1)	8.5	6	16.5	33	0	56.1	35.8
Westside, Holloway, Thread	8.5	6	64.8	115.9	57.6	220.2	33.1
Torrey Rd Exterior		0	0	0	0	0	0
Head 1	8.5	6	88.7	162.3	45.1	301.5	12.6
Head 2	8.5	6	89.5	163.9	45.1	304.4	12.5

Head 3	8.5	6	92	168.4	45.1	312.8	12.2
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## Water Service Center

Model: AINVR-STD-48TB-NA

Record Times

Model	Qty	Total Days	Full Days	Half Days	Quarter Days	Low Res. Days
2.0C-H5A-D1	1	135 days 23 hours	135 days 23 hours			0 days 0 hours
2.0C-H5A-D1	1	135 days 23 hours	135 days 23 hours			0 days 0 hours
2.0C-H5A-D1	1	135 days 23 hours	135 days 23 hours			0 days 0 hours
2.0C-H5A-D1-IR	1	135 days 23 hours	135 days 23 hours			0 days 0 hours
2.0C-H5A-D1-IR	1	135 days 23 hours	135 days 23 hours			0 days 0 hours
2.0C-H5A-D1-IR	1	135 days 23 hours	135 days 23 hours			0 days 0 hours
9C-H4A-3MH-180 (EOL)	1	135 days 23 hours	135 days 23 hours			0 days 0 hours
9C-H4A-3MH-180 (EOL)	1	135 days 23 hours	135 days 23 hours			0 days 0 hours
15C-H4A-3MH-270 (EOL)	1	135 days 23 hours	135 days 23 hours			0 days 0 hours
15C-H4A-3MH-270 (EOL)	1	135 days 23 hours	135 days 23 hours			0 days 0 hours
5.0C-H5A-BO2-IR	1	135 days 23 hours	135 days 23 hours			0 days 0 hours
15C-H4A-3MH-270 (EOL)	1	135 days 23 hours	135 days 23 hours			0 days 0 hours



20C-H4A-4MH-360 (EOL)	1	135 days 23 hours	135 days 23 hours	0 days 0 hours
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## Water Plant

Model: AINVR-PRM-64TB-NA

Record Times

Model	Qty	Total Days	Full Days	Half Days	Quarter Days	Low Res. Days
8.0C-H5A-BO1-IR	1	137 days 19 hours	137 days 19 hours			0 days 0 hours
5.0C-H5A-BO2-IR	1	137 days 19 hours	137 days 19 hours			0 days 0 hours
15C-H4A-3MH-270 (EOL)	1	137 days 19 hours	137 days 19 hours			0 days 0 hours
2.0C-H5A-BO1-IR	1	137 days 19 hours	137 days 19 hours			0 days 0 hours
6.0C-H5A-BO1-IR	1	137 days 19 hours	137 days 19 hours			0 days 0 hours
9C-H4A-3MH-180 (EOL)	1	137 days 19 hours	137 days 19 hours			0 days 0 hours
2.0C-H5A-D1	4	137 days 19 hours	137 days 19 hours			0 days 0 hours
15C-H4A-3MH-270 (EOL)	1	137 days 19 hours	137 days 19 hours			0 days 0 hours
12.0W-H5A-FE-DO1	1	137 days 19 hours	137 days 19 hours			0 days 0 hours
4.0C-H5A-BO1-IR	1	137 days 19 hours	137 days 19 hours			0 days 0 hours
6.0C-H5DH-DO1-IR	1	137 days 19 hours	137 days 19 hours			0 days 0 hours
24C-H4A-3MH-180 (EOL)	1	137 days 19 hours	137 days 19 hours			0 days 0 hours
8.0C-H5A-BO1-IR	1	137 days 19 hours	137 days 19 hours			0 days 0 hours

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9C-H4A-3MH-180 (EOL)	1	137 days 19 hours	137 days 19 hours	0 days 0 hours
<hr/>				
12.0W-H5A-FE-DO1	1	137 days 19 hours	137 days 19 hours	0 days 0 hours
8.0C-H5A-FE-DO1-IR	1	137 days 19 hours	137 days 19 hours	0 days 0 hours
<hr/>				
12.0W-H5A-FE-DO1	1	137 days 19 hours	137 days 19 hours	0 days 0 hours
8.0C-H5A-BO1-IR	3	137 days 19 hours	137 days 19 hours	0 days 0 hours
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9C-H4A-3MH-270 (EOL)	1	137 days 19 hours	137 days 19 hours	0 days 0 hours
<hr/>				

CITY OF FLINT  
UTILITIES DIVISION  
SURVEILLANCE IMPROVEMENTS EQUIPMENT

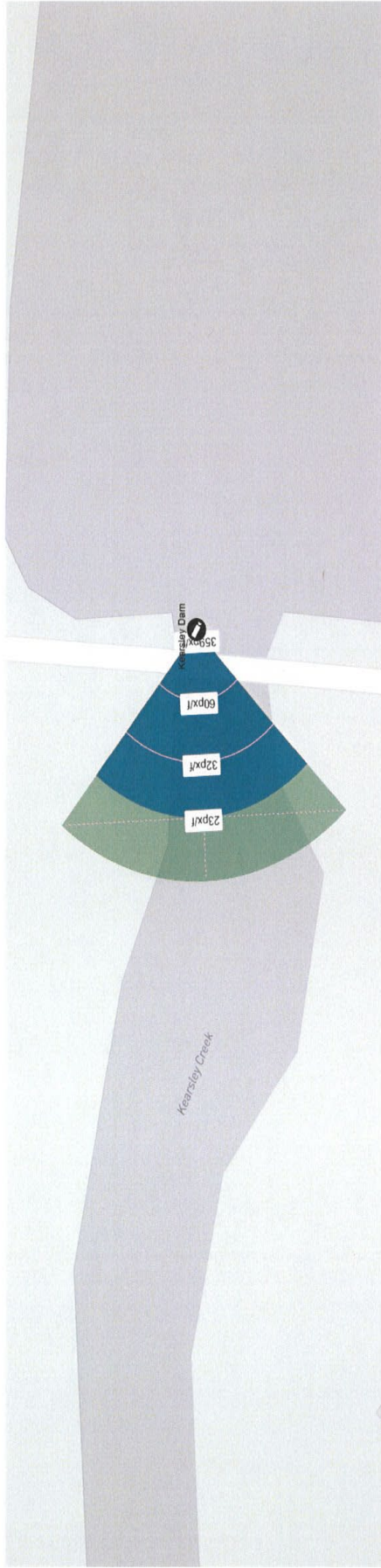
APPENDIX B

PROPOSED LOCATIONS

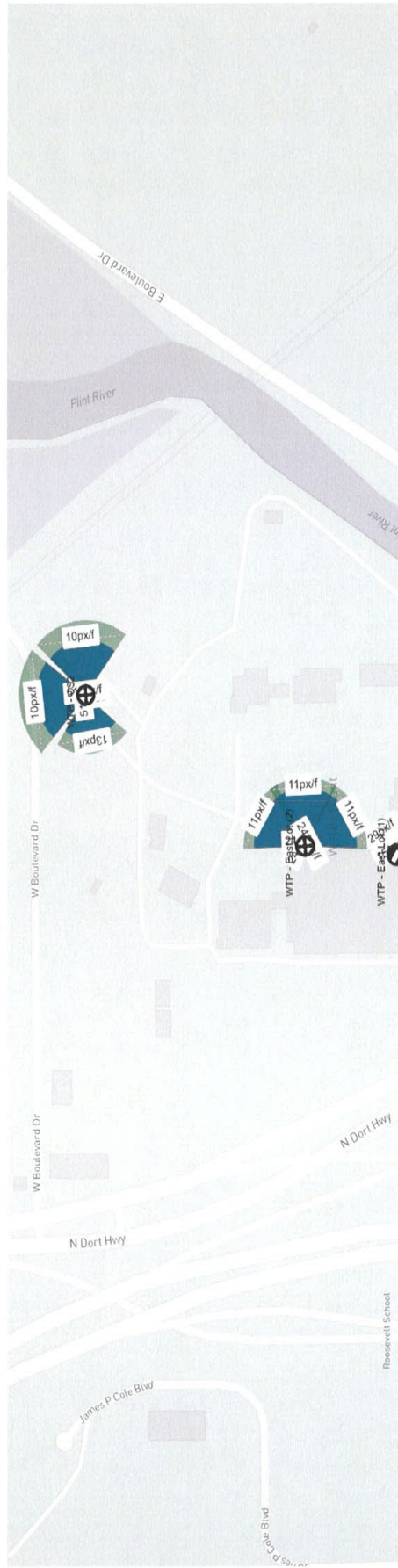


600 Years - Cap Dam

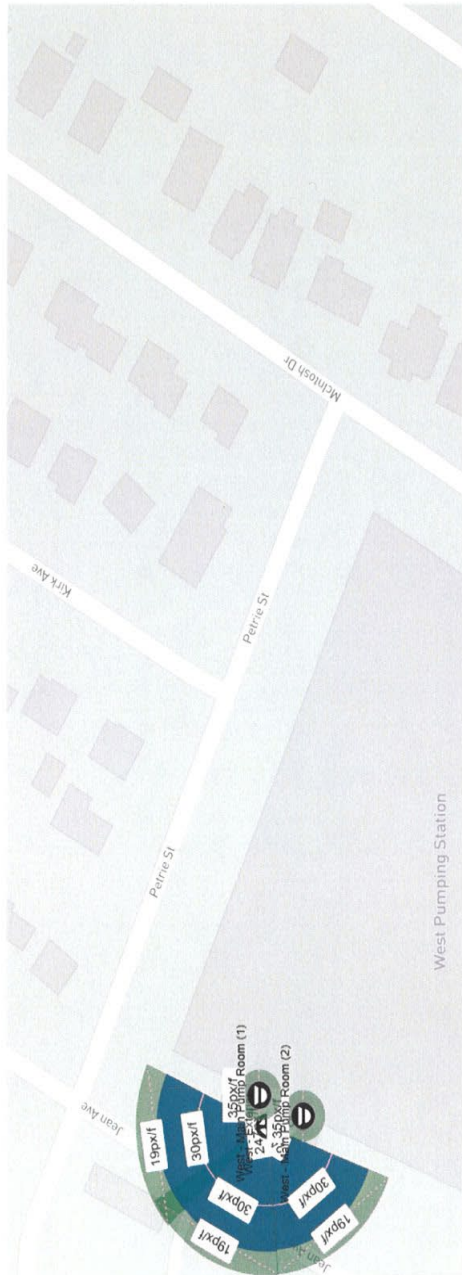
2013







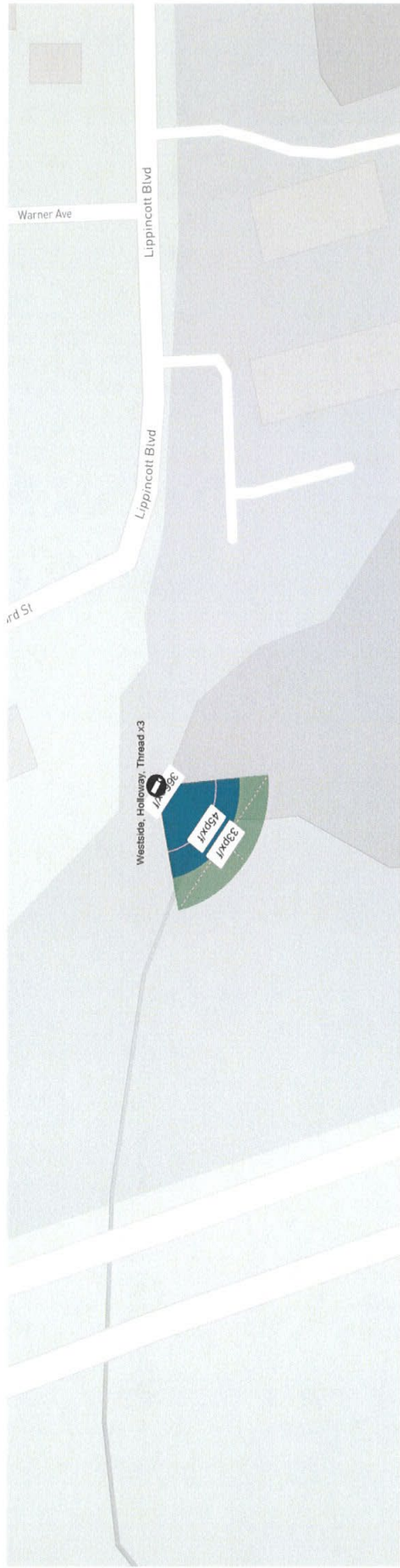




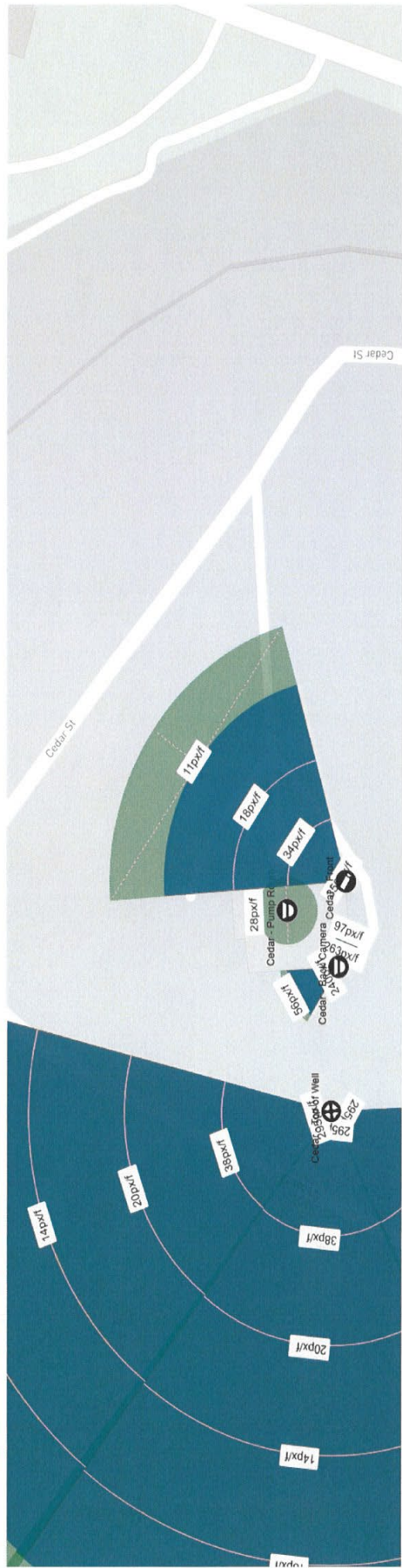


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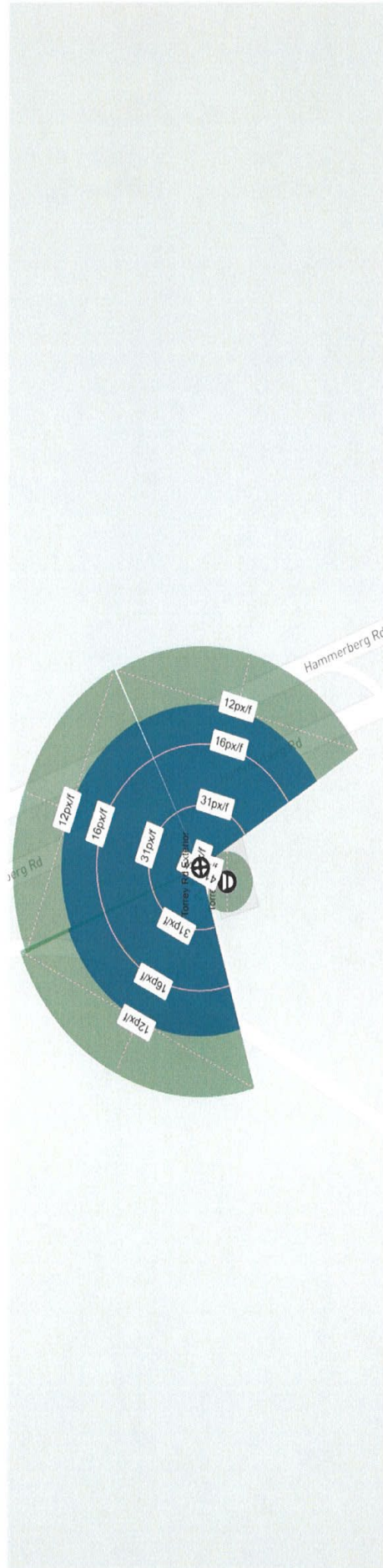
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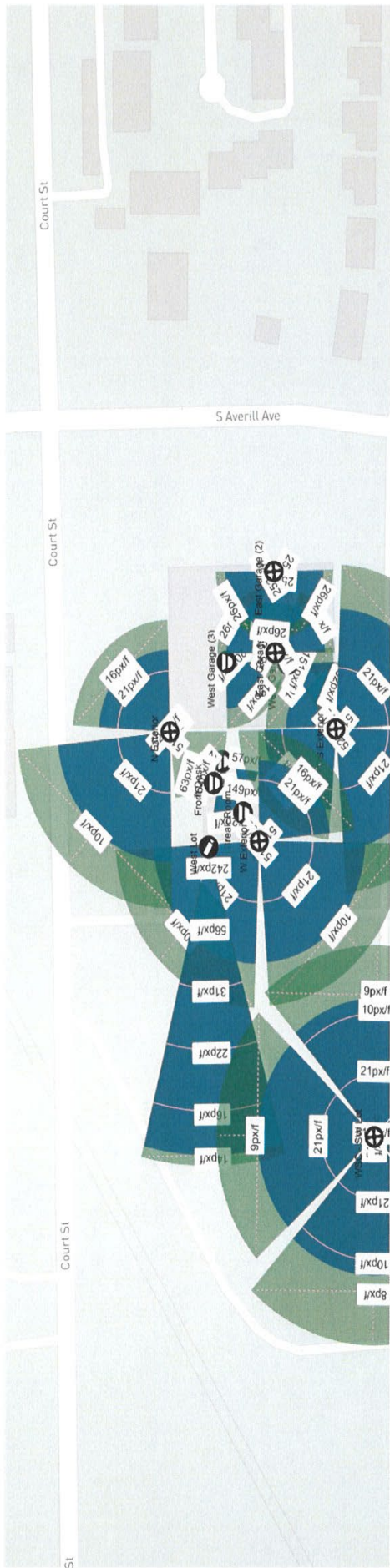








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