Bid Documents
For

CENTRAL MIDDLE SCHOOL
VIDEO SECURITY

Portage Public Schools
8107 Mustang Drive
Portage, MI 49002

Distributed by:

Contact Bret Emerson
616-863-8132
emersonb@commtechdesign.com

October 25, 2019

SECTION 28 0500 – FRONT END

PART 1 - GENERAL

1.01 INTRODUCTION

A. Portage Public Schools invites qualified contractors to provide proposals for a VIDEO SECURITY SYSTEM AT CENTRAL MIDDLE SCHOOL. This work includes:

1. Base Bid
   a. The base bid is the cost for the installation of all the video security cameras and patch cables including all equipment, labor, installation, configuration and testing.
   b. Servers are existing at the data center.
   c. Provide all licensing. Owner will install licenses and software on the servers.

B. The Contractor shall pay all costs of the Work including, but not limited to, labor, materials, equipment, tools, transportation, freight, taxes, royalties, patent fees, support facilities, construction equipment, water, heat, utilities, supervision, overhead, and all other items necessary for the proper execution and completion of the Work.

1.02 CONTACTS

A. The contact for all questions and any addendums during bidding shall be:

Commtech Design
Bret Emerson
616-863-8132
emersonb@commtechdesign.com

B. The owner as referred to in this bid is:

Portage Public Schools
8107 Mustang Drive
Portage, MI 49002

1.03 DUE DATES

A. Bids are due at December 3rd, 2019 at 2:00 PM at

Portage Public Schools
8107 Mustang Drive
Portage, MI 49002

B. A pre-bid meeting will be held on November 12th, 2019 at 10:00 AM. Meet at:

Portage Public Schools
8107 Mustang Drive
Portage, MI 49002

C. All questions shall be submitted to the owner no later than November 20th, 2019 at 2:00PM. All questions shall be sent via email to Bret Emerson of Commtech Design.

Bret Emerson Emersonb@Commtechdesign.com 616-863-8132

1.04 BUILDING SITES

A. Work to be completed as part of this bid will be done at the sites as detailed in the drawings and specifications:

B. Access to the sites shall be from 7:30 AM to 5:00 PM Monday thru Friday.

1. Arrangements can be made for additional time on site during each day as scheduled with the owner.
2. The building is under construction so work can be coordinated with the Construction Manager

1.05 OWNERS RIGHTS

A. The owner reserves the right to waive any formalities to bid, to reject any or all bids and to accept the bid that is most favorable to the Owner.
B. The owner does not incur any responsibility for Bidder's costs in preparing the bid proposal.
C. Bidder recognizes that the owner is subject to the Freedom of Information Act. Per formal request the owner will make bid documents available for public review following contract with a successful bidder.

1.06 BID RESPONSE FORMAT

A. The owner requires that all responses include the information listed below.
B. All bid responses shall be submitted in a three-ring binder or bound folder
   1. Provide three (3) copies of the bid response. One shall be marked as the ORIGINAL. The ORIGINAL shall be signed by a duly designated officer of the company.
C. Bid responses shall be provided in the following format with section dividers.
   1. Bid Form –See Bid Documents
   2. Description of the bidder's company
   3. Description of the bidder's response and the services they will provide.
      a. Include information about any manufacturer required on-going maintenance costs for software or hardware or upgrades.
   4. Spreadsheet detailing all equipment being submitted per building.
   5. Any information the bidder wishes to include that was not specifically required.

1.07 DOCUMENTS

A. The following drawings are part of the bid package.

DWG.	Drawing Name
TC501	Security Legend, Schedules & Details
TC502	Security Camera One-Diagram
TC503	Security Camera One-Diagram
TC601A	Central Middle School First Floor Security Plan – Area A
TC601B	Central Middle School First Floor Security Plan – Area B
TC601C	Central Middle School First Floor Security Plan – Area C
TC602A	Central Middle School Second Floor Security Plan – Area A
TC602B	Central Middle School Second Floor Security Plan – Area B
TC602C	Central Middle School Second Floor Security Plan – Area C
TC603A	Central Middle School Third Floor Security Plan – Area A
TC603B	Central Middle School Third Floor Security Plan – Area B
TC603C	Central Middle School Third Floor Security Plan – Area C
TC604C	Central Middle School Penthouse Floor Security Plan – Area C

B. The following specifications are part of the bid package.

Specification	
28 0000	Coversheet
28 0500	Front End
	Bid Form
	Familial Disclosure
	Iran Form
28 1000	Communications Overview
28 3600	Security Recording
28 3700	Security Cameras
28 7200	Technology Submittals
28 7600	Technology Labeling
28 7700	Technology Testing
28 7750	Technology Training
28 7800	Technology Warranty

PART 2 - PERSONNEL

2.01 BIDDER

A. Minimum Bidder Qualifications:
   1. Bidder must be fully licensed and insured.
   2. Bidder must be fully authorized by the manufacturer being proposed to install and configure the equipment.
   3. Shall have technicians that are fully certified to install and configure the equipment being provided as part of the bid.

B. Bidder shall address each item in this package as specified. All required labor and equipment must be quoted. Any exception must be noted and explained. All bids must include the entire section bid to be considered.

C. The Contractor can withdraw their bid at any time prior to opening the bids.

D. Work shall be coordinated with the owner's technology coordinator, architect, construction manager and the technology designer

2.02 PERSONNEL

A. All personnel working on the project shall be certified by the manufacturer to install, configure and connect the equipment as per the owner's requirements and the manufacturer's specifications.

B. The contractor shall assign a Project Manager to the project who will have ultimate authority to make decisions, schedule work and fix or repair any non-conforming equipment.
   1. Provide a list of the projects of similar size and scope to the work they will be doing as part of this project. Include examples of three projects with similar scope that the PM has worked on in the last three years.
   2. The project manager will be the primary contact for this project
   3. The project manager shall attend all project meetings and be fully aware of all work going on as part of the project.

2.03 BACKGROUND CHECKS

A. Contractor's staff may be required to pass a security clearance check conducted by the Owner.

B. The Contractor shall authorize the investigation of its personnel proposed to have access to facilities and systems on a case-by-case basis.
   1. The scope of the background check is at the discretion of the owner and the results will be used to determine Contractor's personnel eligibility for working within the facilities and systems.
   2. Such investigations will include Michigan State Police Background checks (ICHAT) and may include the National Crime Information Center (NCIC) Finger Prints.
   3. Proposed Contractor personnel may be required to complete and submit an RI-8 Fingerprint Card for the NCIC Finger Print Check.
   4. Any request for background checks will be initiated by the owner or construction manager and will be reasonably related to the type of work requested.

PART 3 - WORK REQUIREMENTS

3.01 DOCUMENTS

A. The contractor shall review all bid documents including specifications and the drawings. The specifications and documents and any addenda detail the requirements of the chosen contractor.

B. It is mandatory that items of material and equipment conform to the Contract Documents and meet the quality standards in every respect.

C. Where any specifications or drawings are not in agreement the higher value or more stringent requirement shall apply, and shall be included in the bid pricing.

3.02 PRODUCTS

A. All products shall be of the latest manufacture. No remanufactured or used equipment shall be provided as part of the bid.

B. All equipment shall be provided in the manufacturers shipping container. Provide copy of the shipping lists as part of the project documentation.

3.03 PRODUCT DELIVERY AND LIABILITY

A. The contractor shall be responsible for the complete installation of new and un-damaged products.

B. The contractor shall be liable for all equipment until it is formally accepted by the owner in writing. This shall include the equipment when it is in the contractor's facility and when it is in the owner's facility until it is formally accepted.

3.04 DAMAGE

A. The contractor shall be responsible for all damage made to the building or any of the buildings contents during their work as part of this project.

B. The contractor shall not disturb any hazardous material or materials that they are not authorized to work with.

3.05 INCIDENTAL WORK AND PERMITS

A. The contractor shall be responsible for requesting, obtaining and paying for any and all permits required for their work by the local, county, state and federal authorities having jurisdiction (AHJ) over the work being performed.

B. Provide any and all work or equipment required by the Authority Having Jurisdiction (AHJ) that may or may not be specifically noted in these documents.

3.06 INSPECTION OF THE WORK

A. The contractor shall keep up to date as-builts on site for the duration of the project. The engineer may request to see the as-built documents at any time.

B. The Contractor shall promptly facilitate inspection and testing of the Work regardless of expense as necessary or as requested by the Owner, regardless of whether or not the Work in question is his own or that of a subcontractor.

C. If such tests or inspections reveal deficiencies as measured by Construction documents or an independent consultant/testing agency or the owner/engineer, the Contractor shall bear all costs incurred to correct such deficiencies, and the cost to reconstruct any work to meet the contract documents.

3.07 PROJECT MEETINGS

A. The contractor shall attend project meeting as designated by the owner or engineer. Attendance is mandatory.

PART 4 - WORK SCHEDULES

4.01 PROJECT SCHEDULE

A. It is the intention of the owner to take possession of the Work by the established completion date or earlier, within the shortest time possible consistent with good construction practices.

B. The Completion Date Shall be July 1, 2020. May be later based on construction schedule

C. Upon award of the contract the contractor shall provide a complete schedule for their work. This shall reference dates in the document and be coordinated with the schedule of any other contractors.
   1. Include start date
   2. Products installed
   3. Punch list work complete
   4. Substantial Completion
   5. Final Completion after system has been working for 30 days with no outages or failures

D. If the work is delayed through the fault of the owner (or of any separate contractor employed by the owner)
   1. The Contractor shall notify the owner, in writing, of any condition or situation that in the Contractor's opinion warrants an extension of Contract Time.
   2. The Contractor shall not be entitled to additional compensation or damages due to delays, interference's or interruptions to the Work or the Project, but shall be entitled

only to an appropriate extension of time in accord with the General Conditions of the Contract for Construction.

PART 5 - DEFICIENT WORK

5.01 PRODUCT AND INSTALLATION DEFICIENCIES

A. The Contractor shall expediently correct all deficiencies brought to his attention in writing or verbally by the owner. If, in the opinion of the owner and the technology design or construction manager, the Contractor fails to correct deficiencies, or fails to act expeditiously to correct deficiencies, the owner may:

1. Accept the deficiencies in the Work, and reduce the Contract Sum of the Contractor at fault by a unilateral Change Order issued and signed by the ownert in an amount to be determined by the owner.
2. Have the deficiencies removed in any reasonable manner available to the Owner, and charge the Contractor at fault for the costs incurred, or reduce that Contractor's Contract Sum by a unilateral Change Order issued by the Owner for the costs incurred.

B. The Contractor shall pay all costs of the Work including, but not limited to, labor, materials, equipment, tools, transportation, freight, taxes, royalties, patent fees, support facilities, construction equipment, water, heat, utilities, supervision, overhead, and all other items necessary for the proper execution and completion of the Work.

PART 6 - GENERAL

6.01 LEGAL REQUIREMENTS

A. The Contractor shall comply fully with all laws, statutes, ordinances, rules, regulations, codes, and lawful orders applicable to their work, including employment regulations, unless specifically exempted from compliance by the Contract Documents. Where local codes differ from codes of broader jurisdictions, the more stringent code shall apply. The Contractor shall promptly notify the Owner in writing of items in the plans or specifications for this project that violate any applicable codes.

6.02 CLEAN SITE

A. The contractor shall clean the site daily.
B. The contractor shall be responsible for disposal and removal from the site any and all waste and debris generated from their work.
C. All dust or ceiling debris generated as part of the work shall be cleaned each day.

6.03 PREVAILING WAGE

~~A.~~ This project is not subject to the Prevailing Wage Law; Michigan Public Act 166 of 1965.

6.04 TAXES

A. The bidder is responsible to apply all tax information within their proposal. Contractor is responsible for applying such tax with each request for payment and complying with Federal, State and local laws.
B. All tax costs shall be included in the base bid price.

6.05 PAYMENTS

A. The contractor shall submit an invoice on the AIA form G702/G703 each month. The invoice shall include only work completed at the time of submission.
B. The contractor can be paid for equipment in storage at the owner’s site as long as the owner is provided with proof of insurance for the equipment.
C. The owner will provide payment on the invoice within 21 days of a signed invoice by the engineer and contractor.
D. The owner will retain 10% of the total cost of the project until the system is considered finally complete as detailed in the project documents.

PART 7 - REVIEW OF BIDS

7.01 OWNER REVIEW

A. The Owner reserves the right to waive any formalities to bid, to reject any or all bids, or to accept the bid that is most favorable to the Owner. The Owner does not incur any responsibility for Bidder's costs in preparing the bid proposal.

7.02 BID BOND

A. Provide with the bid response a 5% Bid Bond which is required for all proposals. The bond must be in the form of a certified check or a bond executed by a surety company authorized by the State of Michigan. The amount of the bond shall be forfeited if the Contractor, after being awarded the bid, fails to enter into an appropriate contract with the Owner within (30) days.

7.03 PERFORMANCE BOND

A. Successful bidders, for work valued at $50,000 or more, will be required to secure Performance, Labor and Material Bonds issued for the full amount (100% value) of the contract by a company licensed to do business in the State of Michigan and having an A.M. Best rating of A- or better. The cost of these bonds is to be included in the proposal amount.

7.04 INSURANCE

A. Contractors must have the proper insurance forms submitted prior to start of their Work. The required insurance shall be written for not less than the limits shown below, or greater if required by law. Contractors will require all subcontractors to maintain similar coverage limits. The Contractor shall name the Owner as additional insured.
   1. Standard Workers Compensation and Employers Liability Employers Liability
      a. $500,000 Bodily Injury by Accident—each accident
      b. $500,000 Bodily Injury by Disease—each employee
      c. $500,000 Bodily Injury by Disease—policy limit
   2. General Liability Combined Single Limit Liability
      a. $1,000,000 each occurrence
      b. Or Split Limit Liability
      c. $500,000 Bodily Injury—each occurrence
      d. $500,000 Property Damage—each occurrence
   3. Aggregates
      a. $1,000,000 General Aggregate
      b. $1,000,000 Products-completed operations
      c. Automobile Liability Combined Single Limit Liability
      d. $500,000 each accident

      Or

      e. Split Income Liability
      f. $500,000 Bodily injury—each person
      g. $500,000 Bodily injury—each accident
      h. $500,000 Property Damage—each accident
   4. Umbrella Insurance
      a. $2,000,000 Limit over primary insurance

7.05 REVIEW OF BIDS

A. Bids will be reviewed based on the following criteria:
   1. Compliance with bidding documents
   2. Price
   3. Responsiveness to owner's requirements
   4. Experience and references with similar projects
   5. Manufacturers relationships and personnel that are certified in the manufacturer's equipment.
   6. Any on-going costs associated with the equipment or installation.
   7. The owner reserves the right to make any decision which they deem to be in their best interest regardless of price or experience of the bidders.

END OF SECTION 28 0500

BID FORM

Portage Public Schools
Central MS Video Security Upgrade

Central Midddle School
Video Security System

TO: Portage Public Schools
8107 Mustang Drive
Portage, MI 49002
Project 1253_02

Company Name: _____

hereinafter called "Contractor", does agree to provide equipment and labor as described in the specifications and drawings.

A Corporation organized and existing under the laws of the State of :

_____

PORTAGE AFFILIATION (If it pertains):

Do you maintain a permanent office, factory, or other facility in Allegan, Barry, Branch, Calhoun, Cass, Kalamazoo, St. Joseph, or Van Buren counties with employees working in any of these counties? If yes, please provide the address:

Yes: _____ No: _____

Have you paid real or personal property taxes relating to said business in the previous tax year?

Yes: _____ No: _____

Base Bid $ _____ (in numbers)
The base bid is the cost for the installation of all the video security cameras software and patch cables.
Work shall include all equipment, licenses, labor, installation, configuration and testing.

BID FORM

Portage Public Schools
Central MS Video Security Upgrade

LEGAL STATUS OF BIDDER

CERTIFICATION REGARDING DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS. The Vendor and/or Bidder certifies to the best of its knowledge and belief that it and its principals: Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency; Have not within a three-year period preceding this agreement been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of federal or state antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property; Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State, or local) with commission of any of the offences enumerated above in this certification; and Have not within a three-year period preceding this agreement had one or more public transactions (Federal, State, or local) terminated for cause or default; is not now or has been, within a three-year period preceding this date, been listed on the Excluded Parties List System website (EPLS).

Authorized Signature: _____

Name (printed): _____

Title _____

Date: _____

Email: _____

Telephone: _____

Addenda

The Contractor acknowledges receipt of the following addenda and has included their costs in the Total Base Bid price shown above.

Addendum # _____ Dated: _____ Addendum # _____ Dated: _____

Contractor Address: _____ Phone: _____

_____ Fax: _____

_____ E-mail: _____

Voluntary Alternates:

BID FORM

Portage Public Schools
Central MS Video Security Upgrade

Voluntary alternates are allowed and may be considered at the discretion of the owner. For each voluntary alternate, provide a brief written description and attach additional information as requried to fully describe intent. All alternates shall be completely inclusive and shall not require any additional work by other trades.

1. _____
Descripton

Add / Deduct (circle one) $ _____

2. _____
Descripton

Add / Deduct (circle one) $ _____

Unit Costs:
Provide pricing for the described work or the described product as a single unit cost. The unit cost shall include any travel, equipment labor, overhead and tax required for purchase and installation of the product or service.

1 Provide and Install one type "SB" Camera equipped with licensing.

Unit Cost: $ _____

2 Provide and Install one type "SC" Camera equipped with licensing.

Unit Cost: $ _____

3 Provide and Install one type "SD" Camera equipped with licensing.

Unit Cost: $ _____

4 Provide and Install one type "SE" Camera equipped with licensing.

Unit Cost: $ _____

5 Provide and Install one type "SF" Camera equipped with licensing.

Unit Cost: $ _____

6 Provide and Install one type "SG" Camera equipped with licensing.

Unit Cost: $ _____

7 Provide and Install one type "Sh" Camera equipped with licensing.

Unit Cost: $ _____

STATEMENT REGARDING FAMILIAL RELATIONSHIP

AFFIDAVIT OF _____
(name of affiant)

STATE OF MICHIGAN

COUNTY OF _____

_____makes this Affidavit under oath and states as follows:

1. I am a/the
   - ☐ President
   - ☐ Vice-President
   - ☐ Chief Executive Officer
   - ☐ Member
   - ☐ Partner
   - ☐ Owner
   - ☐ Other (please specify) _____

Of _____, a bidder on a construction project for
(insert name of contractor)

_____ that involves, at least in part, construction
(insert name of school district)

of a new school building or an addition to or repair or renovation of an existing school building.

2. I have personal knowledge and/or I have personally verified that the following are all of the familial relationships existing between the owner(s) and employees(s) of the aforementioned contractor and the school district's superintendent and/or board members

_____

_____

_____

3. I have authority to bind the aforementioned contractor with the representations contained herein, and I am fully aware that the school district will rely on my representations in evaluating bids for the construction project.

4. I declare the above information to be true to the best of my knowledge, information and belief. I could completely and accurately testify regarding the information contained in this affidavit if requested to do so.

_____
(signature of affiant)

Dated _____

Subscribed and sworn before me in _____County,

Michigan, on the _____day of _____, 200__

_____(signature)

_____(printed)

Notary public, State of Michigan, County of _____

My commission expires on _____

Acting in the County of _____

Iran Economic Sanctions Act Certification

I am the _____ of _____, or I
(title) (Bidder Company)
am bidding in my individual capacity ("Bidder"), with authority to submit a binding bid for the North Middle School Video Security at Portage Public Schools. I have personal knowledge of the matters described in this Certification, and I am familiar with the Iran Economic Sanctions Act, MCL 129.311, *et seq.* ("Act"). I am fully aware that the school district will rely on my representations in evaluating bids.

I certify that Bidder is not an Iran-linked business, as that term is defined in the Act. I understand that submission of a false certification may result in contract termination, ineligibility to bid for three (3) years, and a civil penalty of $250,000 or twice the bid amount, whichever is greater, plus related investigation and legal costs.

_____
(signature)

_____
(printed)

_____
(date)

SECTION 28 1000 – COMMUNICATIONS OVERVIEW

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This section provides a project overview and general project and Contractor requirements for technology work.

B. The “Contractor” as referred to in these specifications, shall be the bidder whose bid is eventually chosen as the winner.

C. The “Engineer” as referred to in these specifications, shall be Commtech Design and its representative on this project.

D. The “Owner” as referred to in these specifications, shall be Portage Public Schools and its representatives.

E. In the detailed specifications and on the contract drawings, the phrases “or equivalent,” “approved equivalent,” “approved equal,” “or equal” and “engineer approved equivalent” shall be used interchangeably and shall mean the same thing.

F. All equals, equivalents, or alternates shall be approved by the Engineer prior to ordering or installation. Without approval, deviation from the products listed in the specifications and on the drawings, shall be presumed to be nonconforming and shall be removed and replaced at the direction of the Engineer and at the Contractor’s expense.

1.02 DESCRIPTION OF PROJECT

A. Base Bid

1. Camera cables are installed by others and are not part of this bid. All cables are CAT-6 cables and are terminated and tested
2. Provide and install all cameras at all locations noted
   a. Provide patch cables at the camera and at the comm room.
   b. Match color of cables.
3. Servers and storage is existing at the Board Offices and will be online at time of installation
4. Provide all camera licensing for all cameras. Install on the servers.
5. Owner will configure software on the servers
6. The extent of the work shall be as shown on the drawing and detailed in these specifications

B. Post installation documentation

1. Each contractor shall provide post installation documentation as per the specifications. Shall include but not be limited to:
   a. Red-lined as-built drawings
   b. As-built detailed connectivity of AV and Network Systems
   c. As-built cable locations and cable labels at each location.
   d. Mark all splice locations
   e. Update of all access control locations and equipment at each door
   f. Camera locations and camera numbers.
   g. Spreadsheet (hard copy and Excel file) for all network, Wireless, telephones and cameras detailing:
      A) Mfg. Part number
      B) IP Address
      C) MAC Address
      D) Device number (Camera #, Telephone # etc)

1.03 STORAGE OF MATERIALS

A. All materials shall be secured when not in use by the Contractor.

B. It shall be the Contractor’s responsibility to secure all equipment including all material to be installed as part of the contract. No changes shall be made to the contract due to loss or theft of equipment and materials not officially accepted by the Owner.

1.04 REFERENCE SPECIFICATIONS-CABLING

A. All work applicable shall conform to the following standards:
B. ANSI/TIA-568-C.0, "*Generic Telecommunications* Cabling *for Customer Premises*",
C. ANSI/TIA-568-C.1, "*Commercial Building Telecommunications Cabling Standard*",
D. ANSI/TIA-568-C.2, "*Balanced Twisted-Pair Telecommunication Cabling and Components Standard*", ANSI/TIA-568-C.3, "*Optical Fiber Cabling Components Standard*",
E. ANSI/TIA-568-C.4, "*Broadband Coaxial Cabling and Components Standard*",
F. ANSI/TIA/EIA-569-B Commercial Building Standard for Telecommunications Pathways and Spaces
G. IA-606-B: Administration Standard for the Telecommunications Infrastructure of Commercial Buildings including all Updates and Addenda.
H. TIA-607-C: Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises.
I. EIA-472 General Specification for Fiber Optic Cable
J. EIA-472A Sectional Specification for Fiber Optic Communication Cables for Outside Aerial
K. EIA-472B Sectional Specification for Fiber Optic Communication Cables for Underground and Buried Use
L. EIA-472C Sectional Specification for Fiber Optic Communication Cables for Indoor Use
M. EIA-472D Sectional Specification for Fiber Optic Communication Cables for Outside Telephone Plant Use
N. NEC, 2015, or latest edition available
O. IEEE 802.3af PoE • Ratified in 2003 • 15.4W at the PSE, with min of 12.95W available to the PD
P. IEEE 802.3at PoE+ • Ratified in 2009 • 34.2W at the PSE, with min of 25.5W available to the PD
Q. Pending (higher power) PoE standards Projected to be Ratified by IEEE in 2017 powering all 4 pairs:
    1. Proposed IEEE 802.3bt PoE Type 3 • 60W at PSE • with 49 watts at the PD
    2. Proposed IEEE 802.3bt PoE Type 4 • 100W at PSE •with 96 watts at the PD

1.05 REERECNE STANDARDS NETWORKING
A. EE 802.3™: Ethernet
B. IEEE 802.11™: Wireless Lans
C. IEEE 802.22™: Wireless Regional Area Networks
D. TIA/EIA-526-7 Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant.
E. IEEE 802.3af PoE • Ratified in 2003 • 15.4W at the PSE, with min of 12.95W available to the PD
F. IEEE 802.3at PoE+ • Ratified in 2009 • 34.2W at the PSE, with min of 25.5W available to the PD
G. Pending (higher power) PoE standards Projected to be Ratified by IEEE in 2017 powering all 4 pairs:
    1. Proposed IEEE 802.3bt PoE Type 3 • 60W at PSE • with 49 watts at the PD
    2. Proposed IEEE 802.3bt PoE Type 4 • 100W at PSE •with 96 watts at the PD

1.06 CONTRACTOR-ALL
A. Each contractor shall be responsible for inspecting their own work and ensuring it meets the project requirements.
B. Contractor shall have a project manager who will be responsible for all work, workers, equipment, cabling and project management for their work. The project manager shall have the authority to make decisions for the contractor and schedule all workers.
C. Contractor shall attend all project meetings throughout the project.
D. All work on the project shall meet all applicable state, federal, local and industry codes and be installed according to the requirements of he Authority Having Jurisdiction (AHJ).

1.07 CONTRACTOR –SECURITY
A. The Contractor shall show proof of an existing contractual relationship with the approved equipment manufacturer of the video security system and access control system and shall pass through the manufacturer's certification to purchaser.

B. All hardware shall be sourced from the certifying manufacturer to assure quality control and validity of the manufacturer's warranty.
C. The Contractor shall accept complete responsibility for the installation, certification, and support of the security system. Contractor must show proof that he has the certifying manufacturer's support on all of these issues.
D. All work shall be performed and supervised by security technicians and project managers who are qualified to install security systems, and to perform related tests as required by the manufacturer in accordance with the manufacturer's methods.
E. The security technicians employed shall be fully trained and qualified by the manufacturer on the installation and testing of the equipment to be installed. Evidence that the vendor is a current certified installer of the manufacturer must be provided in writing prior to work commencing on the video security system.
F. The Contractor (including Subcontractor(s) if any) shall have a proven track record in security projects. This must be shown by the inclusion of details of at least 3 projects similar in scope and requirements which have been completed by the vendor in the last 2 years. Names, addresses, and phone numbers of references for the 3 projects shall be included.

PART 2 - PRODUCTS

2.01 FIRESTOPPING
A. Each contractor shall be responsible for firestopping around their cables and the raceways.
B. Shall be completed inside and around all conduits after cable installation.
C. Firestop for the area between the cable and the edge of the conduit shall be Nelson No. FSP, CLK or LBS+. Contractor shall install the best firestop for each individual installation.
    1. Firestop shall be installed with regard to local and national building codes.
    2. The firestop shall be a putty like substance that expands under heat and will not allow flame to pass for a designated period of time.
    3. Firestop shall conform to all NEC, NFPA, and UL requirements.
    4. Some wall pass-thru' s are shown on the drawings. The Contractor shall utilize these where possible.
    5. Where the contractor must install cables through a wall where there is no pass-thru already provided, the Contractor shall be responsible for installing a fire-rated pass-thru and fire-stopping the conduit after cable installation.
D. Firestopping is required at all riser conduits and all pass thru's.
    1. Each cable tray penetration of a wall shall be firestopped after cable installation. Use pillow type firestop to allow additional cables to be installed in the future.
    2. Where riser conduits pass through floors, the area between the concrete and the conduit shall be firestopped. This shall be completed with a putty or liquid firestop product. Fill in the space with mineral wool, and then install the firestop on top. All firestop shall be of sufficient thickness to secure the rating required by code.
    3. After final cable installation, install a putty firestop around all cables where they enter and exit conduit pass thru's and conduit risers.
    4. All firestop shall be installed to provide the fire rating as described by local fire code.
    5. It shall be the responsibility of the Contractor to verify that all conduits, walls, and raceways required to be firestopped have been firestopped.

PART 3 - EXECUTION

3.01 INSTALLATION
A. Contractor shall be familiar with the location(s) where the work will be done. No additional compensation will be made for items the Contractor claims he was not aware of during bidding.
B. Work Area:
    1. All work areas shall be cleaned at the end of each day. All debris shall be cleaned and removed from the site and disposed of in the approved container for the site.
    2. All equipment shall be moved out of common areas and stored in the Contractor's lay down area, or in other approved storage locations on site.

3. Any work that is low hanging, or may otherwise impede the general use of the space, and cannot be removed, shall be flagged and cordoned off by the Contractor.

C. All equipment and parts shall be installed in a neat and workmanlike manner. Good installation principles shall be used throughout the project.

D. All cables routed above the drop ceiling or in the ceiling area shall be installed square to the building. Diagonal cable runs are not permissible.

E. All cut edges of conduits, boxes, raceway, etc., shall be trimmed and filed so that no burrs or rough edges will damage cable as it is installed.

F. All surface raceways, including conduits in exposed areas shall be painted to match the existing colors of the surrounding area.

G. If, in the course of the work, the Contractor damages, marks, or misplaces any ceiling tiles, the Contractor shall repair, and/or replace the ceiling tile to the original condition.

1. The Engineer shall decide if ceiling tiles have been damaged. Based on the Contractors proposed fixes, the Engineer shall decide the best course of action to repair any damage done by the Contractor to the ceiling tiles.

H. It shall be the responsibility of the Contractor to repair any damage done to the structure or finishes in the building by the Contractor. The building shall be returned to its original condition prior to final sign off of the project.

I. Firestop shall be installed to meet national and local codes.

3.02 DOCUMENTS

A. The Contractor shall fully read the contract documents including the detailed specifications, and the detailed drawings.

B. No additional compensation shall be made for any portion of the project which the Contractor did not know of or understand prior to providing the bid response.

C. In the case of any discrepancies between the detailed drawings and the detailed specifications, the Contractor shall provide the higher quality or more stringent requirement.

3.03 WORK PLAN-POST BID (CHOSEN CONTRACTOR ONLY)

A. Along with the submittals the Contractor shall provide a work plan for the implementation of the telephone switch and data/wireless network. The plan shall include scheduled dates for major milestones, and all phases required for completion prior to final cutover.

B. The work plan shall list all items that must be completed by the Contractor or Owner to provide a smooth install of the telephone system and data network. The Contractor shall be responsible for all costs associated with the planning and cutover. The Owners only responsibility is to act as a liaison between the Contractor and the users.

C. The work plans shall include a time line and a cutover date for the systems within each building. Contractor shall be responsible for all aspects of scheduling the work, including notification of the users, the administration, and the telephone service provider.

D. The work shall commence within 10 days of award of the contract. The Contractor shall be responsible for attending weekly project meetings at the Owner's site to report on progress and keep the project team informed of the work being done

E. The work plan will be reviewed at each weekly meeting for compliance and updates.

F. Work shall immediately begin on site surveys to determine the existing infrastructure and determining placement of new system electronics. The Contractor shall be responsible for moving, relocating, and reconnecting any and all existing equipment required for the installation of the new systems.

G. After work plan and system approval by the Engineer the Contractor can begin work on infrastructure work that does not impede users.

H. The Contractor shall be responsible for working with the Owner's Information Technology staff and administrators.

END OF SECTION 28 1000

SECTION 28 3600 – SECURITY RECORDING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This section includes parts and equipment required for installation and configuration of a video security system. This system shall be referred to as the "security system" throughout these specifications.

1.02 SYSTEM DESCRIPTION

A. The security system shall be supplied and installed by a Contractor able to show examples of similar projects and installations within the last 3 years.
B. The video security system shall serve the building(s) shown and be able to be expanded to support other buildings attached to the data network
C. New cameras shall be IP cameras with direct connection to Ethernet Switches.
D. Software and hardware shall allow for monitoring from any PC attached to the data network.
E. Software and hardware shall allow for monitoring from any Smartphone or Wireless tablet device. Provide hardware and software to accomplish this.

1.03 COORDINATION

A. Coordinate with the network contractor. Provide IP addresses and ports the cameras are connected to in an excel spreadsheet to the network contractor for VLAN configuration
B. Coordinate with data cabling contractor. Walk the site and identify all camera locations and make the cabling contractor aware of all camera locations.

1.04 PROJECT PLAN

A. The contractor shall provide a project plan to the owner and contractor that describes the system and its capabilities and the possible configurations.
B. Provide a project approach which describes the installation and implementation plan and schedule and all sequencing.
C. Meet with the owner numerous times to determine how the system should work and how it should be monitored. Configure the system prior to installation to meet these requirements. Demonstrate the system use to the owner prior to installation and obtain approval to move forward with the installation.
D. Provide shop drawings showing all configuration and connectivity of the system.
E. Generate a testing plan and have that plan approved by the owner and engineer prior to installing the system.

1.05 RELATED STANDARDS

A. The security system shall conform to the following international and national standards:
    1. FCC Rules and Regulations
    2. UL 294 Access Control Systems
    3. UL 1076 Line Supervision
    4. 21 CFR part 11
    5. Part 15, Radio Frequency Devices
    6. National Electrical Manufacturers Association (NEMA)
    7. Applicable Federal, State and Local laws, regulations, codes
    8. Americans with Disabilities Act (ADA)
    9. National Electrical Code (NEC)

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Approved vendor for video security camera recording software is:
   1. Avigilon
   2. No others shall be acceptable as the existing system is an Avigilon system.

2.02 VIDEO SECURITY HARDWARE

A. Network Video Recorder (NVR):
   1. NVR and all storage is existing
   2. Apply all licenses required to connect the

2.03 VIDEO MANAGEMENT SOFTWARE (VMS)

A. The VMS shall be Avigilon. Latest release
   1. Provide all licenses as required for connection of all the cameras installed as part of this project.
   2. Match existing Avigilon software for all new cameras. Existing software is Avigilon Enterprise

2.04 COORDINATION WITH THE OWNER.

A. Contractor shall be onsite and work directly with the owner to ensure that all cameras are on the network and all are being viewed thru the VMS system.
B. Schedule an onsite meeting and work session to test and aim all cameras.
C. Contractor shall be responsible for connecting the cameras to the switches and verifying connectivity.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Review site and note locations of cameras, conduits and cables prior to installation.
B. Review all ceiling styles on the reflected ceiling plans. Provide mounts as required based on the ceiling style.

3.02 INSTALLATION

A. The Network Video Recorder (NVR) is existing and located at the Portage Board of Education office.
   1. Owner will install an configure the Video Security system software on the servers

END OF SECTION 28 3600

SECTION 28 3700 – SECURITY CAMERAS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This section includes parts, equipment and cabling required for installation of the video surveillance cameras.

B. This shall include new IP video cameras and their cabling/termination equipment as shown on the drawings and detailed in the specifications.

1.02 COORDINATION

A. All cables shall be coordinated with the installation of the cameras.

B. All cameras shall be installed in the ceilings in relation to the lights and other obstructions.

1.03 DESCRIPTON

A. Provide new IP cameras for video surveillance. See the detailed security drawings for location and quantities.

B. Cameras shall be pure IP cameras without the use of external encoders/decoders where possible.

C. Power for interior and exterior cameras shall be provided via the POE switch or via a centralized power supply in the communications room.

1. The switches installed provide standard Type 3 PoE (15.4 watts) on each port. If a camera requires additional power above Type 3 PoE then the contractor shall provide that power supply and any additional required power cables.

D. PTZ cameras that require additional power above that provided from a Type 3 PoE connections shall be provided with a power supply.

1. Provide any and all camera, power and control cables required for complete system connectivity and functionality.

E. It shall be the Contractor's responsibility to provide all power to cameras based on the above methods. Take into account the Manufacturers recommendations.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Approved Manufacturers for IP cameras:

1. Avigilon
2. See drawings for part numbers.

2.02 CAMERAS GENERAL REQUIREMENTS

A. Cameras shall provide full color images and shall change to black and white in low light.

B. Cameras shall support text overlay of image in viewing to allow naming/numbering of each camera on the screen and when video is offloaded.

C. The Contractor shall review the site with the Owner prior to ordering the lens for each camera.

1. Finalize the needs of the Owner with the camera position to ensure that the correct lens is purchased for the camera.

D. Where noted on the drawings, provide a vandal resistant dome to the camera.

E. Where cameras require more power than PoE 802.af then the contractor shall provide power to the camera from a centralized power supply in the comm. room.

F. External Cameras

1. Each exterior camera shall be equipped with a heater/blower or other device to keep camera functional and keep lens/casing from fogging or condensation from forming.
2. Provide mounts for exterior cameras based on their installation location. Provide fully enclosed mounts. See drawings and conduct a field survey prior to ordering to ensure that he correct mounts are provided.
    a. Exterior mounts shall allow cable entry to the dome via the support. No cables shall be exterior to the mount or dome.

2.03 CAMERAS

A. See drawings for camera part numbers. Provide the corresponding cameras at the locations noted on the one-line diagrams
B. Provide specific mount type as require based on the location.
C. Review the ceiling types and wall mount locations and provide the correct camera mounts.

2.04 CAMERA ACCESSORIES

A. Camera Mounts:
    1. The Contractor shall provide all appropriate camera mounts. Refer to the drawings and conduct a site survey to determine each camera mounting type required.
        a. Complete this prior to ordering cameras.
    2. Exterior cameras will be mounted to the wall of the building in most cases.
        a. Where the camera is to look along the wall of a building the contractor shall provide a pendant mount that mounts the camera parallel to the ground.
        b. Mount shall extend the camera out from the building a few inches to allow viewing in 360 horizontal degrees
    3. The security cameras shall be mounted to building structure where shown on the drawings.
        a. Contractor shall provide a mount that best corresponds to the structure and can be securely mounted.
        b. Mount the camera at a height as shown on the drawings or at the optimum height to allow the best field of view and future service via extension ladder.
            1) Unless specified the cameras on the exterior of a building should not be installed more than 15’ above grade.
        c. When mounting the cameras, take into account the light and mount the camera so that it does not block light.
        d. The camera mount shall provide a route for cables extending from the raceway to the camera. Cables shall not be installed outside the camera dome or camera mount.
        e. The Contractor shall install a conduit to allow cable installation to the camera.
            1) This shall include installing conduits from the inside of the building to the outside of the building to support exterior cameras.
            2) Core through the outside of the building. Coordinate location with owner and architect prior to drilling.
            3) Install ¾ conduit or sized as per the mount.
            4) Except for corner and parapet mounts no conduits shall be visible after installation.
            5) At no time shall a cable be visible. Install flexible conduit and seal appropriately around holes made in the building
            6) Repair wall after installation.
            7) No cable shall be visible after camera installation.
    4. Dome-type cameras interior to a building may be installed in the lay-in ceiling.
        a. Provide supports so that the camera’s weight is supported from the “T” bars of the drop ceiling.
        b. Provide a backbox and escutcheon to make a tight fit from the dome to the drop ceiling tile.
        c. Locate the cameras to cover the area required by the Owner. Work with the Owner prior to installation.
    5. Dome-type cameras interior to a building may be installed as a pendant mount from the building structure.
        a. Provide a backbox at the building structure. Install a down pipe and camera mount to attach the camera to the downpipe. Size the pipe as required.
        b. The camera mount shall keep the camera level and shall extend down to a level of no more than 11’ AFF.
        c. Locate the cameras to cover the area required by the Owner. Work with the Owner prior to installation.
    6. Dome-type cameras interior to the building may be required to be mounted to a wall.

a. Where there is a wall mount requirement, the Contractor shall install a wall-mount. Ensure that it is securely mounted.
b. Route the cable through the wall and through the mount to connect to the camera.

2.05 CAMERA INSTALLATION ACCESSORIES

A. Firestopping shall be completed inside and around all conduits after cable installation. Contractor shall install the best firestop for each individual installation.
1. Firestop shall be installed with regard to local and national building codes.
2. The firestop shall be a putty-like substance that expands under heat and will not allow flame to pass for a designated period of time.
3. Firestop shall conform to all NEC, NFPA, and UL requirements.
4. Some wall pass-thru's are shown on the drawings. The Contractor shall utilize these where possible.
5. Where the contractor must install cables through a wall where there is no pass-thru already provided, the Contractor shall be responsible for installing a fire-rated pass-thru and fire-stopping the conduit after cable installation.

B. Weatherproofing shall be completed inside and around all conduits supporting exterior cameras after cable installation. Contractor shall install the best weatherproof for each individual installation.
1. Weatherproof around all conduits that extend through the building to the cameras on the exterior wall or soffit.
2. Seal all cameras so that all camera housing does not allow water into the conduit or into the building.
3. Seal so there is no infiltration of water or condensate.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine all pathways prior to installation of all cables.
B. Identify locations of all user conduits and backboxes prior to cable installation.
C. Review site and note locations of cameras and conduits prior to installation.

3.02 PREPARATION

A. Visit each camera installation location to verify the type of mount prior to ordering the cameras.
B. If another contractor is installing the CAT-6 cabling then the contractor shall coordinate cable location with that contractor.
C. Green Tape walk thru.
1. Contractor shall walk the entire site with the owner and identify each camera location with the owner prior to installation.
2. Discuss the type of camera and its proposed field of view.
3. Make adjustments as required by the owner and by the building structure to minimize interference and blocking of the camera image.
4. Install a piece of green tape on the wall or ceiling at each camera location after agreement on the location is reached.
5. Remove green tape after installation of cameras

D. Camera naming spreadsheet.
1. Create an Excel spreadsheet showing the following:
a. Camera number
b. Camera part number
c. IP address
d. MAC address
e. Owners chosen camera name
f. Provide to the owner and designer.

3.03 INSTALLATION

A. Each camera shall be installed to provide maximum field of view and security.
B. Exterior cameras shall be mounted securely to the structure and shall be sealed to prevent water or any other environmental condition to enter the camera.
    1. Provide the correct mount for the location of each exterior camera.
    2. Where the mount is to the outside of a building then the contractor shall install a conduit from the exterior camera to the inside of the building for the camera cable(s).
    3. Review mounting location to determine optimum height of camera to cover all areas and provide the clearest pictures. Mount at appropriate height.
    4. Work with the Owner to focus and align all cameras for maximum coverage.
    5. Contractor shall change lenses for different focal lengths based on the actual installation location of the cameras and the requirements of the Owner.
    6. Seal around all conduit openings and the camera mount to seal from water and air infiltration.
    7. Install patch cable through the conduit and connect to the CAT-6 cable on the interior of the building.
C. Interior cameras shall be mounted in the lay-in ceiling, supported from the open ceiling or to the wall with a structural mount.
    1. The Contractor shall work with the Owner to determine the location of all the cameras.
    2. Work with the Owner to determine the direction of the lens and its focal length.
    3. Ensure that the camera is mounted securely to the drop ceiling and is supported from the T-bar.
    4. Contractor shall change lenses for different focal lengths based on the actual installation location of the cameras and the requirements of the Owner.
    5. Where interior cameras are mounted to the wall, the Contractor shall provide a mount that will allow all cables to route through the mount. Cables shall not be “free-floating” from the wall to the camera.
    6. When a camera is pendant mounted, the contractor shall install a down-pipe and conduit support to mount the camera at the correct height as determined by the owner.
D. Contractor shall focus and aim all cameras
    1. Camera aiming and focusing shall be a process where the owner has input at each stage.
    2. The process for aiming and focusing shall be as follows:
        a. Meet with the owner and determine the desired view of each camera. Determine where images shall overlap and what they are focusing etc.
            1) Add this information to the camera naming spreadsheet.
        b. Install the cameras and aim as per the meeting notes.
        c. Meet with the owner and review each camera view on the monitor. Make notes of any changes required.
        d. Schedule a time to make all changes.
            1) Changes shall be made while the owner is reviewing the live image through the VMS Software. The contractor shall have a person at the camera that can aim and focus the camera.
            2) Once the owner agrees on the image aim and focus generate a still picture of that image and keep it in a file.
            3) Print the aimed view and provide as part of the submittal at project substantial completion.
E. Camera naming
    1. The contractor shall work with the owner and engineer to determine the naming and numbering convention for the cameras.
    2. Determine the naming and then apply that to each camera. Enter the designation of the camera into the video security system.
    3. On all cameras, the contractor shall affix a label with the camera number to the exterior case of the camera. This shall be visible when standing near the camera.
F. Encoders shall be installed and connected to all existing analog coax cables.

END OF SECTION 28 3700

SECTION 28 7200 – TECHNOLOGY SUBMITTALS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This section provides the Contractor with requirements regarding Product Data Sheets, Shop Drawings and Product Samples collectively referred to as “Submittals”.

B. This section provides the Contractor requirements regarding As-Built Documentation after installation and prior to Final Completion and Final Payment

C. The requirements of this section deal only with those submittals that are required to be provided by the chosen contractor after bid award. No submittals in this section are required to be provided with the Bid Response.

D. The requirements contained herein should be considered bound and apply to all technology and security specification sections per this contract.

1.02 PRE-INSTALLATION SUBMITTALS

A. The contractor shall provide material submittals to the Construction Manager or directly to the designer, whichever is managing the project.

B. Prior to beginning work, the chosen Contractor shall provide PDF files of all material submittals.

1. Highlight the part number of each item specifically. Submittals that are not highlighted will be rejected and sent back immediately.
2. Include an Excel spreadsheet in .xls format to the designer for use in reviewing the submittals. Shall include all part numbers and manufacturers. Match camera submittals with the camera type on the drawings
3. Provide an Excel Spreadsheet listing the following:

Description	Manufacturer	Part Number	Mark
Enet Switch	Rainbos	XR-243T	Cam type “CA”

4. Provide the PDF with the following file names
   a. Site - Spec Section - Description
   b. In Example: K**ent City 28 1600: Data Cabling submittal**

1.03 AS-BUILT DOCUMENTATION

A. The contractor shall provide As-Built documentation to the Construction Manager or directly to the designer, whichever is managing the project.

B. Provide the As-Builts in hard and soft copy

1. Hard Copy shall include one or more three-ring binders that include all documents listed below. Include a cover page on the front of the binder(s) detailing the client, the project, date of submission and project name/number
2. Soft copy on USB Drives (PDF or Microsoft Word or Excel) shall include all documents provided in the hard copy plus any configuration or data files. Include XLS files for all spreadsheets.

PART 2 - PRE-INSTALLATION SUBMITTALS

2.01 PRODUCT DATA SHEETS

A. Product data sheets shall consist of the manufacturers detailed specification sheets or “cut-sheets” for each product that is to be installed by the contractor or any subcontractors.

B. Product data sheets shall minimally include, but shall not be limited to:

1. Part Number
2. Manufacturer
3. Description of the product
4. Physical dimensions and characteristics of the product
5. Picture or manufacturers drawing of the item, where applicable
6. Electrical characteristics of the product including heat-load for active electronics.

7. Optical characteristics of the product for Fiber-Optic equipment and cable.

C. Provide product data sheets for all equipment and cabling that is to be installed by the contractor

2.02 SHOP DRAWINGS

A. Shop Drawings shall consist of detailed drawings showing actual connectivity and cable types for the systems noted below:
   1. None

B. Shop drawings shall also be provided for systems that the contractor intends to connect differently than what is shown on the contract drawings or where no connectivity is shown.

2.03 PRODUCT SAMPLES

A. Product Samples shall consist of a sample of the actual product that is to be installed.

B. Samples shall be tagged with the part number and specification section to which it pertains.

C. Product Samples shall be provided for the following:
   1. None

2.04 SUBMITTAL DOCUMENTS

A. The Contractor shall provide all Submittals to the Construction Manager or the designer

B. The Contractor shall provide PDF and Excel Files for all Product Data Sheets.
   1. All Product Data sheets shall be PDF files grouped via specification section or drawings number
   2. The data sheets in the file shall be segmented to match the specification section and page number they pertain.
   3. The Contractor shall highlight the actual part number on the sheet of the component that they are submitting.
   4. If no part number is highlighted or marked with an arrow, then the entire submittal package will be rejected and sent back for re-submission.
   5. Contractor shall submit an electronic copy of the Excel spreadsheet with their data sheets that details the manufacturer, part number and common name of the products that they are submitting.

C. The Contractor shall provide 1 set of PDF Shop Drawings.
   1. Shop drawings shall be marked for the specification section of the bid documents to which they pertain.
   2. All shop drawings that are required to be drawn on the building background shall be provided on full-size drawings the same scale as those in the bid documents.
   3. All lines on the shop drawings shall be highlighted or completed in ink that is not the same color as that provided in the bid documents.
   4. The contractor shall provide a drawing legend detailing all symbols used in creation of the shop drawings.

D. The Contractor shall provide one of each product sample required to be submitted.
   1. Provide a cutsheet with each product sample detailing the specifics of the product and what it is proposed to be used for.

2.05 SUBMITTAL REQUIREMENTS

A. Submittals shall be provided for approval prior to installation of the work.

B. Any equipment installed that does not have an approved submittal associated with it can and will be removed from the project and replaced with other equipment as defined by the Designer. All replacement costs shall be the responsibility of the Contractor.

C. It shall be the responsibility of the Contractor to provide the submittals for review in sufficient time to not delay the installation. Work with the Construction manager on the schedule.

D. It shall be the responsibility of the contractor to ensure they have provided and have on hand “Reviewed” or “Furnish as Corrected” submittals for all equipment they install.

PART 3 - AS-BUILT DOCUMENTATION

3.01 MATERIALS

A. The Contractor shall provide the following to the Designer prior to the issuance of the final payment.
   1. Approved submittals and equipment user manuals.
   2. As-Built Documentation as detailed below.
   3. All spare parts and cover plates for all components of the systems
   4. Manufacturer warranty cards for all components.
   5. (2) spare of each kind of audio and video patch cable installed as part of the project.

3.02 AS-BUILT PROCESS

A. The Contractor shall provide all project as-builts to the designer at substantial completion.
   1. Provide them to the designer for review
   2. Make any required changes the designer requests
   3. Re-submit at the time of Final Completion / final payment. Final Payment is not possible without a complete post installation deliverable package

3.03 PREPARATION

A. All binders for As-Builts and test results shall be neat and clearly labeled with listing of the project and documents included in each binder.
B. Quantity:
   1. Submit one (1) set of three-ring binder(s) with hard paper copies of project closeout submittals.
      a. Provide a clear label or cover sheet with the following information:
         A) Client name.
         B) Project name.
         C) Manual title (e.g., “Project Close-out Manual for security system upgrade”).
         D) Date; date format: <month> <day>, <year> (e.g., “January 1, 20xx”).
         E) Installer and General Contractor names and contact information
   2. Submit (2) USB Drives with all As-Built documentation and software configurations.
      a. Software configurations shall be provided for:
         A) Video security NVR and camera/user database

3.04 PROJECT DELIVERABLES

A. Provide a copy of all submittals and manuals and pamphlets. Shall be separated by equipment type with dividers in the binders.
B. All spare parts shall be provided in a box. The Contractor shall detail which component each spare part is for.
C. The contractor shall provide one set of full sized as-built prints. Provide a PDF of the as-built prints on the USB drives.
   1. Provide a clean set of the latest drawings with red lines marked for all field changes or bulletins.
   2. Provide an AutoCAD file of the latest drawings that have been updated with ass as-built information. These drawings shall be generated from an AutoCAD file that is provided by the designer.
D. The As-Built drawings shall include:
   1. Changes to be reflected on the drawings for Video Security Systems shall include:
      a. Camera locations
      b. Camera numbers
      c. Comm room where camera connects to.
      d. .
E. Documentation for the specific systems shall include. Provide the following for each system:
   1. Contractor warranty dates based on Substantial completion date and contact information for warranty work.
   2. Video Security

a. Picture of focused and approved camera image labeled with the camera number and IP address
b. Master user password list
c. Spreadsheet of each camera that shall include:
    A) Camera Part number
    B) Firmware revision
    C) IP address
    D) MAC Address
    E) Camera Name
    F) Building where it is located
d. Training “Cheat Sheet”
e. Manufacturers Camera Warranty
f. Server/NVR Warranty
g. Manufacturer contact information for warranty work
h. Software Upgrade Protection (SUP) warranty including end date
i. Warranty certificate for all PC’s

END OF SECTION 28 7200

SECTION 28 7600 – TECHNOLOGY LABELING

PART 1 - GENERAL

1.01 WORK INCLUDED
- A. This section provides direction on labeling of cables and devices.

PART 2 - PRODUCTS

2.01 SECURTY CAMERA LABELING
- A. Laser-printed, labels shall be used to label all Security Cameras
  1. Label the camera with a White or Clear label with black lettering.
  2. Label shall include the camera number.
  3. May include the IP address. Consult with owner to determine if this is required
  4. Label shall be a minimum of 3/4 inch tall and legible when standing beneath or near the camera as long as camera is not above 15; AFF

PART 3 - EXECUTION

3.01 PREPARATION
- A. Terminate all cables in proper color code sequence.
- B. Clean any surfaces where an adhesive label is to be installed.
- C. Prior to beginning the work, the contractor shall submit to the engineer a plan for labeling all the cables. This shall take into account to what components each cable is connected.

3.02 GENERAL LABELING
- A. Everything shall be labeled as per the specs and drawings.
- B. All labels shall be installed to more easily identify the cables and ports on all panels. If there are any questions regarding labeling, contact the Engineer prior to installation.
- C. Engraved lamacoid labels shall be provided and installed whenever there is no location for paper inserts on faceplates, power poles, poke thru's, floor boxes, modular furniture and surface raceway.
  1. Engraved lamacoid labels shall provide the same labeling as the paper inserts, but they shall be self-adhesive.
  2. These labels shall be adhered to the location closest to the modular jack.
  3. Individual letters shall be provided for each cable. An overall location identifier can be provided for all the cables at that faceplate or floor box.
  4. Engraved labels for rack shall be at least 1-1/2 inch high with letters 1 inch high.
  5. These labels shall be affixed to the top and front of each rack or cabinet. Verify that the label will fit the rack or cabinet prior to purchasing.

3.03 VIDEO SECURITY LABELING
- A. Cameras shall be labeled with the camera number in a visible location.
  1. Affix a label to the camera housing that details the camera number
  2. Shall be in a location that is visible from a standing position.
  3. Shall be laser printed.
  4. Label the camera cable patch panel to include the number of each camera connected to that cable. This camera cable label at the patch panel shall be by video security contractor
     a. Install an adhesive sticker below the cable in the patch panel as the factory number (1-24) is most likely on top of the panel.
- B. Label the CAT-6 Patch Panel for security Cameras in each comm room
  1. Install an adhesive label on each port on the patch panel that attached so the security camera cable.

DDD = the camera number within that building

C. CAT-6 Patch panels for security cameras shall be labeled for the camera number
   1. See below diagram:
      a. Install labels at each end detailing the panel number.

Panel A	01	02	03	04	05	06	07	08	09	10	11	Panel A
	101	102	107	108	201	105	208	145	146	147	174	

D. All labels shall be installed to more easily identify the cables and ports on all panels. If there are any questions regarding labeling, contact the Engineer prior to installation.

END OF SECTION 28 7600

SECTION 28 7700 – TECHNOLOGY TESTING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. This section provides direction on
   1. Testing of copper and fiber cable,
   2. Testing and commissioning of the technology systems

PART 2 - PRODUCTS

2.01 PUNCHLIST PROCESS

A. The contractor shall be required to go through a punchlist process prior to substantial completion and final completion/payment of each project

B. Contractor shall be responsible for reviewing their own work and checking to ensure it has met the project requirements.

C. The contractor shall:
   1. Review your work in each room
   2. Review the specifications and drawing and review their work to ensure it meets requirements
   3. Create a punchlist document showing what work is not yet done and what as-builts are yet to be completed. Send document to designer.
      a. Provide a date when contractor punchlist work will be completed.
   4. Schedule a punchlist and substantial completion meeting with designer.
   5. Present updated punchlist document to the owner
   6. Walk the site with the contractor and demonstrate all systems and review the work completed. Demonstrate how all work is completed

D. Designer will create an “Owner Punchlist” document
   1. This will be provided to the contractor
   2. Contractor shall review the list, fix/upgrade/replace all equipment and cabling and finish work on the punchlist
   3. Return punchlist to the designer showing when the work was fixed/completed and a signature on the sheet showing that the contractor has reviewed each item.

E. Meet onsite with the designer to review the finished work.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Testing shall be completed after fiber is installed inside the fiber patch panel and the fiber panel has been put together.

B. All cables and panels where cables terminate shall be labeled with the cable label or name of each individual cable. Identify how each cable and panel will be labeled.

3.02 SECURITY SYSTEM COMMISSIONING

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

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

C. During Acceptance test, Contractor shall demonstrate all equipment and system features to the owner. Contractor shall remove covers, open wiring connections, operate equipment, and perform other reasonable work as requested by the owner.

D. If the contractor has submitted all necessary paperwork and the system seems to be in working order according to the engineer then the system can be considered Substantially Complete after the engineer puts that in writing.

E. Security System Substantial Completion.
   1. The video security system shall be considered substantially complete as soon as:
      a. All cameras are connected and functional.
      b. The system is fully configured and recording images as required.
      c. User accounts are setup
      d. As-built drawings have been updated to reflect any changes in the connectivity.
      e. All manufacturer literature has been turned over to the Owner.
      f. Maps are setup and populated in the system.
      g. Training has been completed.
   2. The contractor shall schedule a substantial completion meeting where all security systems shall be demonstrated and shown to be in working order and configured as per the specs and the owner's requirements.
      a. If the system is deemed to be in working order then the engineer shall sign a letter stating that the systems are Substantially Complete. The system is not Substantially Complete until a letter is provided to the contractor and owner.
   3. After substantial completion the systems shall be in good working order for a period of 30 days.
      a. In the event that the system or systems should fail or not work as required during the 30-day period, the Contractor shall be on site the same day to fix and configure the system to make it work as designed.
      b. A new 30-day period will begin as soon as the system has been demonstrated to be in good working order and the engineer acknowledges in writing that the system has been fixed and is again considered substantially complete.
   4. Once the system has been considered Substantially Complete and has been working for 30 consecutive days with no interruption in service, the system shall be thought of as "Finally Complete."
   5. Warranty shall begin immediately after the system is deemed Finally Complete.

END OF SECTION 28 7700

SECTION 28 7800 – TECHNOLOGY WARRANTY

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This section includes directions for the Contractor regarding system and equipment warranties.

1.02 SYSTEM DESCRIPTION

A. The project is not complete until all paperwork has been provided.

B. The Contractor shall warranty his work and all the products installed for a minimum of 1 year from day of Substantial Completion.

1.03 COORDINATION

A. Coordinate as-built drawings and records with the Engineer and Owner.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Provide manufacturers warranty for all equipment installed

B. Provide contractor warranty for workmanship and equipment

C. Provide software upgrade protection (SUP) warranty as detailed in the specifications.

2.02 MATERIALS

A. The Contractor shall provide the following to the designer at Substantial Completion and any updates prior to the issuance of the final payment

1. Manuals and pamphlets on all electronic equipment.
2. All spare parts and cover plates for all components of the network.
3. Red lined set of as-built drawings for the entire project.

B. Updated hard copy and soft copy of the As-Built Documentation. See associated spec section.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Contractor shall fully examine all components of the system to make sure that all manuals and paperwork are included in the final submittal.

3.02 GENERAL WARRANTY

A. The Contractor shall warranty the installation and all the parts contained therein for a period of not less than 1 year after receipt of a completely signed copy of the Notice of Substantial Completion.

B. This shall include each and every part, cable or software system provided as part of this project. This includes Video Security systems.

1. If any part is broken due to a manufacturing defect or installation defect, the Contractor shall fix and/or replace the broken item at their own expense.
2. If any equipment loses connectivity or fails for any reason the contractor shall be onsite to diagnose and fix or replace equipment and upgrades software.
3. The Contractor shall also supply all configuration and programming necessary to keep all electronic equipment to the latest revision of software during the year.

4. If the “system” goes down, and needs configuration to be brought back up, the Contractor shall be liable for any programming or reconfiguration.
5. During the year, the Contractor shall make the Owner aware of any software upgrades that are available.
6. Contractor shall install all software upgrades for that year or as detailed below for specific systems.
7. If the system does not run well during the year the contractor shall be onsite to diagnose and fix the system.

C. The contractor shall be onsite within 24 hours after a call from the owner or designer regarding system or equipment issues.

3.03 VIDEO SECURITY SOFTWARE WARRANTY

A. As part of the project the contractor shall provide a three-year (3) video security recording system and security camera warranty that provides for all software updates during the three years after Substantial Completion.
1. Contractor shall be required to install all software and firmware updates during the three years.

END OF SECTION 28 7800