SECTION 282000 - CLOSED CIRCUIT TELEVISION SYSTEM

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The work shall include furnishing all labor, materials, enclosures, wiring, equipment, and documentation required to provide a completely operational and working Closed Circuit Television System. Any materials or equipment necessary for the proper operation of this system, whether or not specified or described herein, shall be deemed part of this system and shall be provided by the contractor without any additional cost to the client.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

B. General Terms and Conditions of the Contract Documents

1. Division 27– Systems
2. Division 26 – Electrical

C. Network components, wiring, and fiber optic cabling shall conform to all owner requirements, standards, and practices.

D. The Division 26 electrical contractor shall provide conduit infrastructure to support the security system. The CCTV contractor shall coordinate with the electrical contractor to ensure the proper location and placement of this equipment. Conduit shall be provided from the CCTV device, to a location of accessible space. The CCTV contractor shall provide all necessary j-hooks to route their wire and cable from this location to the nearest cable tray or communications room. Where available, the CCTV contractor can utilize cable tray infrastructure provided by other to route their cabling throughout this facility. Within the communication rooms all conduit necessary to route cabling from a rough-in location, to and between equipment racks or panels, shall be provided under this scope of work. All cable tray shown on the drawing to be located in the security command center, or the associated headend equipment room, shall be the responsibility of the CCTV contractor. Cable tray provided for these areas shall conform to division 27 specifications for this hardware.

1.3 CONTRACTOR QUALIFICATIONS

A. The contractor selected for this project must be a direct manufacturer authorized representative of the product they propose to provide. All technicians assigned to install and configure this system shall be factory trained and certified for the proper installation of this equipment. The contractor must have a minimum of 3 qualified

and factory trained technicians to support this system. This company must be of established reputation and experience, regularly engaged in the supply and support of such systems for a period of at least five consecutive years under the current company name. This company shall have a fully staffed office of sales and technical support representatives within a 2-hour travel time to this project.

B. The contractor, as a minimum, must carry a current state issued limited energy license.

C. The installer must be Axis and Genetec certified.

1. Contractor must have references for same size or larger installations.

1.4 SPECIFIED SYSTEM

A. The following CCTV manufacturer has been used as the basis for this design:

1. Genetec

B. The following nationally recognized manufacturers shall be considered as an equal if comparable components are provided:

1. Bosch
2. Panasonic

C. The NVR for this project must be Genetec

D. The use of these systems does not release the contractor from the submittal requirements defined herein. All submittals must conform to the applicable sections of this specification.

1.5 SYSTEM DESCRIPTION:

A. The CCTV System shall be fully integrated with other security components such as access control, alarm monitoring, and intercom communications. All cameras shall be continuously recorded through digital video recorders.

B. The system shall be fully integrated with the access control application to allow events to be directly linked to the surveillance recording:

C. All cameras shall be connected and controlled through a graphical user interface on a pc workstation. This monitoring shall allow viewing individual cameras, camera group, tour sequences, or the playback of previously recorded events. This monitoring shall allow viewing individual cameras, camera group, tour sequences, **Export and Save video clips** and the playback of previously recorder events.

1.6 RESPONSE TO SPECIFICATION

A. The Contractor shall submit a point-by-point statement of compliance with all relevant sections defined herein.

B. The statement of compliance shall consist of a list of all numbered paragraphs within these sections.

Where the proposed system complies fully with the numbered paragraphs as written, such shall be indicated by placing the word "comply" opposite the paragraph number.

Where the proposed system does not comply with the paragraph as written, but the Contractor feels it will accomplish the intent of the paragraph in a manner different from that described, a full description of the intent perceived by the Contractor shall be provided as well as a full description of how the proposal will meet its perceived intent.

Where a full description is not provided, it shall be assumed that the proposed system does not comply with the paragraph in question.

C. Any submission that does not include a point-by-point statement of compliance as described herein, shall be subject to disqualification from consideration as non-compliant.

D. Documentation in support of substitute equipment shall qualify all parameters with tangible values in the response notations or on the manufactures original data sheets and shall not include vague statements such as “limitless” or “virtually limitless”. Submissions documents using this type of statement shall be considered non-compliant.

1.7 SUBSTITUTIONS

A. Substitutions of products proposed to be equal to those specified herein will be considered only when the following requirements have been met:

1. A complete list of such substituted products including drawings and data product sheets.
2. Substitute equipment must be a standard part of that systems current product line and should meet or exceed the capabilities of the equipment specified herein. Beta, Specials, or “One Time” products will not be acceptable. If proposed substitutions do not meet or exceed the performance levels specified herein, the limitations of this equipment must be highlighted and brought to the attention of the consulting engineers. Failure to notify the engineers of these limitations, whether intentionally or by oversight, may result in rejection of those components at any time. Should this occur, the contractor will be required to replace the rejected equipment with re-approved components that meet or exceed the requirements specified. This will be done at no additional cost to the client.

1.8 SUBMITTALS

A. Within 20 business days of receiving contract approval and notice to proceed, the following items shall be submitted to the consulting engineers for review and approval. Submittals shall include, but not be limited to:

1. Product numbers, specifications, and data sheets for all equipment.
2. All wire and cable type and size.
3. Point-to-point wiring diagrams for all devices.
4. Single-line drawings representing the entire system.
5. Termination details.
6. Course outlines for each of the end user training programs. The course outlines shall include the course duration, pre-requisites, and a brief description of the subject matter.
7. Proposed method of wire marking, panel labeling, zone identification, and terminal strip numbering.
8. Project milestone schedule.

1.9 REFERENCES

A. Design and operation of the system shall conform to the following referenced codes, regulations, and standards as applicable:

National Electrical Code (NEC)

Electronic Industry Association ANSI/EIA/TIA

National Electrical Manufacturers Association (NEMA)

Underwriters Laboratories UL 294, UL 639, and UL 1037, UL 1076

National Fire Protection Association (NFPA)

Federal Communications Commission (FCC) 47 CRF Part 15 and 90

Applicable Federal, State, and Local Laws, Regulations, and Codes

PART 2 - PRODUCTS

2.1 ACCESS CONTROL INTEGRATION

A. This client uses a Kantech EntraPass access control system; provide the following components for system integration.

1. Must integrate Kantec with Genetec NVR.

2.2 NETWORK VIDEO RECORDER:

A. The following calculations shall be used for video storage.

1. 30 FPS, 4-CIF, 1080p resolution, 30% motion, 24hrs per day, 45-days video recording, 20% spare camera input capacity overhead.

2.3 STANDARD INTERIOR FIXED MEGAPIXEL MINI-DOME HD IP CAMERA

A. The camera shall include SD/SDHC memory card slot for local storage during los of network communications.

B. The camera should switch from day to night mode automatically

C. The streaming format should be ZIPStream

D. The camera shall have a built in microphone as defined by owner.

E. The camera shall support Power over Ethernet (PoE) IEEE 802.af Class 2. The camera shall have the following connectors: RJ-45 10BASE-T/100BASE-TX PoE; Terminal block for 1 alarm input and 1 output. The camera shall have a built in microphone for two-way audio streaming and shall include external microphones jacks using 3.5mm line level mic input/ output. The camera shall support the following audio formats: AAC LC 8/16 kHz; G.711 PCM 8 kHz; G.726 ADPCM 8 kHz; and configurable bit rates.

F. The camera shall support the following security protocols: Password protection, IP address filtering, digest authentication, user access log, IEEE 802.1X network access control, HTTPS encryption.

G. The camera shall support the following network protocols: IPv4/v6, HTTP, HTTPS, QoS Layer-3 DiffServ, FTP, SMTP, Bonjour, UPnP, SNMPv1/v2c/v3(MIB-II), DNS, DynDNS, NTP, RTSP, RTP, TCP, UDP, IGMP, RTCP, ICMP, DHCP, ARP, SOCKS.

H. The camera shall have a clear polycarbonate transparent dome lens cover with a tamper-resistant plastic casing.

The camera shall support an operating temperature range of 32°F to 122°F (0°C to 50°C) with 20% - 80% relative humidity (non-condensing).

The camera shall include smoked polycarbonate transparent dome cover, mounting bracket, cable shield, weather shield, 16ft (5 m.) length of network cable with pre-mounted gasket.

I. Provide the following optional components when required: Interior Camera: Drop - ceiling mount adapter kit with clear & smoked dome cover.

2.4 INT. / EXT. VANDAL RESISTANT FIXED MEGAPIXEL MINI-DOME HD IP CAMERA

A. The camera shall include SD/SDHC memory card slot for local storage during los of network communications.

B. The camera should switch from day to night mode automatically

C. The streaming format should be ZIPStream

D. The camera shall have a built in microphone as defined by owner.

E. The camera shall support Power over Ethernet (PoE) IEEE 802.af Class 3. The camera shall have the following connectors: RJ-45 10BASE-T/100BASE-TX PoE; Terminal block for 1 alarm input and 1 output. The camera shall have a built in microphone for two-way audio streaming and shall include external microphones jacks using 3.5mm line level mic input/ output. The camera shall support the following audio formats: AAC LC 8/16 kHz; G.711 PCM 8 kHz; G.726 ADPCM 8 kHz; and configurable bit rates.

F. The camera shall support the following security protocols: Password protection, IP address filtering, digest authentication, user access log, IEEE 802.1X* network access control, HTTPS encryption.

G. The camera shall support the following network protocols: IPv4/v6, HTTP, HTTPS, QoS Layer-3 DiffServ, FTP, SMTP, Bonjour, UPnP, SNMPv1/v2c/v3(MIB-II), DNS, DynDNS, NTP, RTSP, RTP, TCP, UDP, IGMP, RTCP, ICMP, DHCP, ARP, SOCKS.

H. The camera shall have a clear polycarbonate transparent dome lens cover with an aluminum inner camera module with encapsulated electronics. The camera shall have a 2200 lb (1000 kg.) vandal-resistant housing that is IP66 and NEMA 4X-rated in an aluminum casing with an integrated dehumidifying membrane.

The camera shall support an operating temperature range of -40°F to 131°F (-40°C to 55°C) with 20% - 80% relative humidity (non-condensing).

The camera shall include smoked polycarbonate transparent dome cover, mounting bracket, cable shield, weather shield, 16ft (5 m.) length of network cable with pre-mounted gasket.

I. Provide the following optional components when required: Interior Camera: Drop-ceiling mount adapter kit with clear & smoked dome cover. Axis T91A wall mounting bracket. Exterior Camera: Axis T91A wall mounting bracket with corner adapter when necessary. Pendant/ Wall mount adapter with sunshield. Ceiling mounted pendant pole with camera adapter kit.

The Interior Vandal Resistant fixed megapixel dome network camera with auto day/ night low-light capabilities and HDTV 720p video format support shall be the Axis Q3505 VMKII, lens determined by view field.

The Exterior Vandal Resistant fixed megapixel dome network camera with auto day/ night low-light capabilities and HDTV 720p video format support shall be the Axis Q3505 VMKII, lens determined by view field in weatherproof enclosure.

2.5 EXTERIOR ADVANCED PTZ DOME NETWORK IP CAMERA

A. The camera shall include SD/SDHC memory card slot for local storage during los of network communications.

B. The camera should switch from day to night mode automatically

C. The streaming format should be ZIPStream

D. The camera shall have a built in microphone as defined by owner.

Include video motion and auto-tracking.

E. The camera shall support High Power over Ethernet (PoE) IEEE 802.at. AXIS T8124 High PoE Midspan 1-port included: 100-240 VAC, max 60W.

F. The camera shall have the following connectors: RJ-45 10BASE-T/100BASE-TX PoE, IP66-rated RJ-45 connector kit included

G. The camera shall support the following security protocols: Password protection, IP address filtering, digest authentication, user access log, IEEE 802.1X network access control, HTTPS encryption.

H. The camera shall support the following network protocols: IPv4/v6, HTTP, HTTPS, QoS Layer-3 DiffServ, FTP, SMTP, Bonjour, UPnP, SNMPv1/v2c/v3(MIB-II), DNS, DynDNS, NTP, RTSP, RTP, TCP, UDP, IGMP, RTCP, ICMP, DHCP, ARP, SOCKS.

I. The camera shall have a IP66-rated, metal casing (aluminum), acrylic (PMMA) clear dome cover pre-mounted to casing, sunshield (polycarbonate). The camera shall have a weight of 7.7lb (3.kg).

The camera shall support an operating temperature range of -40°F to 122°F (-40°C to 50°C) with 20% - 80% relative humidity (non-condensing).

The camera shall include AXIS T8124 High PoE Midspan 1-port, IP66-rated RJ-45 connector kit, clear and smoked dome cover, sunshield.

J. Provide the following optional components: Axis T91A wall mounting bracket with corner adapter when necessary.

The Exterior PTZ dome network camera with auto day/ night low-light capabilities and image stabilization shall be the Axis Q6155-E.

2.6 NETWORK ELECTRONICS

A. All network electronics shall be manufactured by Cisco or an approved equal. Reference the drawings for any additional part numbers and the location for the placement of this equipment. All network electronics shall be provided under this scope of work.

2.7 NETWORK ELECTRONICS

A. All network electronics shall be provided by the Owner. Contractor shall provide all required media converters. Contractor shall coordinate all IP connection requirements with Lee County ITG, to ensure proper support and availability where required.

2.8 CCTV CAMERA POWER SUPPLY

A. Power supplies shall be UL rated, 115 VAC input, 24 VAC output through 8 or 16 fused outputs. Total output current rating shall be equally divided among the fused outputs to support the CCTV system. Power supply shall be housed in NEMA 1 hinged cover enclosures where mounted indoors and in fully weatherproof NEMA 4 enclosures when located outdoors or in an exposed or covered area. All enclosure doors shall be key lockable, keyed alike, and shall include a tamper switch for monitoring by the security system. Each power supply shall include spare fuses, an AC power LED indicator and appropriate mounting hardware. All low voltage power supplies shall be manufactured by Altronix or an approved equal.

2.9 UNINTERRUPTED POWER SUPPLY - UPS

A. All wall mounted low voltage power supplies shall receive a 2-hour battery backup unit with additional battery support space available within the same cabinet. These devices shall be maintained utilizing trickle charge power pack to sustain optimal performance.

B. All headend hardware mounted in equipment racks shall receive UPS power supplies with integrated surge protection. Minimum runtimes in the event of total power loss shall not be less than 10 minutes. The UPS for these systems shall be as indicated on the plans.

C. All computer workstations shall receive UPS power supplies with an integrated surge protector. Minimum runtimes in the event of total power loss shall not be less than 15 minutes. The UPS for these systems shall be APC Smart-UPS 1400 or an approved equal.

2.10 SURGE PROTECTION

A. All CCTV components shall be provided with surge and lightning protection. Provide UL listed multi-stage protection on all low voltage and signal transmission lines. All 120 VAC surge suppression devices shall be APC or an approved equal. For low voltage connections provide surge suppressors manufactured by APC. For coax connections provide line protectors manufactured by APC. For CAT-6 connections provide PNET1BG line protectors manufactured by APC.

2.11 WIRE & CABLE

B. All proposed Cat 6A wire and cable shall be standard length and shall meet or exceed the recommendations established by the equipment manufacturers, and shall comply with all state and local codes.

C. Visually inspect all wire and cable for faulty insulation prior to installation. Protect cable ends at all times with acceptable end caps.

D. Provide grommets and strain relief materials where necessary to avoid abrasion and excess tension on wire and cable.

E. All penetrations through fire rated barriers shall be provided with appropriate fire stopping materials in accordance with NFPA requirements and local fire authority having jurisdiction.

F. coaxial cabling used on this project shall feature a DC resistance rating of less than 15ohm per 1000 feet. All coaxial cable shall have a solid copper center conductor and 95% pure copper braided shield. All video cable connectors and terminations shall be 3-way crimp-on type and shall including connector cables for 24 VAC input and video/data coax output. Twist on style connectors will not be acceptable for any terminations on this project.

G. Installation of Category 6 and Category 6A cable shall be in accordance with EIA/TIA guidelines.

1. The maximum pulling tension shall not exceed 25 pounds to avoid stretching the conductors.
2. The minimum bending radius of the cable shall not be less than 4x the outside diameter of the cable.
3. The cable shall be installed without kinks or twists and the application of cable ties shall not deform the cable bundle.
4. Strip back only as much cable jacket as is required to terminate the cable and the amount of untwisting in a pair as a result of the termination shall not exceed 0.5 in.

H. Cables of similar signal level shall be bundled together and kept physically separate from power cords, plug strips or other circuits with different potential. Reference specification 17100 for additional structured cabling requirements, all cabling for the

CCTV system must fully conform with this section. Exposed wire bundles or individual cables shall be neatly secured with self-clinching nylon "TY-Raps" (Thomas & Betts or equal). Lacing of cables shall not be permitted.

2.12 NETWORK CABLING

A. All network Category 6A shielded cabling required to support the CCTV system between the communication room and camera shall be provided by the Structured Cabling Contractor. The security contractor shall be responsible for providing all certified patch cords between the camera and this jack. Additionally, under this scope of work, within the communication rooms and between hardware in the equipment racks, the contractor shall provide & install this cabling. On exterior pole mounted cameras the contractor shall provide and install all network cabling between the fiber optics modules and the camera when utilized. Low voltage power cabling is the contractors responsibility where required.

2.13 IDENTIFICATION & TAGGING

A. All cables, wires, wiring forms, terminal blocks, and terminals shall be clearly identified by pre-printed labels or tags at both ends. Direct ink markings on the cable shall not be acceptable. The permanent markings shall clearly indicate the function, source, and destination of all cabling, wire, and terminals. Schematic legends shall be placed inside all terminal cabinets to assist with identification.

PART 3 – EXECUTION

3.1 CONTRACTOR RESPONSIBILITIES

A. Upon project commencement, the Contractor shall provide qualified technical personnel on-site. Personnel shall be present on each consecutive working day until the system is fully functional and ready to begin the testing phase of this project.

B. During the installation process the contractor shall maintain an up-to-date set of as-built shop drawings, which shall always be available for review by the client and/or consulting engineers. This set of documents should be clearly annotated with as-built data as the work is performed. These documents will be reviewed as part of the approval process when evaluating payment request applications. At a minimum, the drawings should contain the following information:

1. Quantity and location of all equipment installed.
2. Cable and wire runs along with the designations tags assigned to each.
3. Wiring diagrams that indicate terminal strip layout, identification, and terminations.

C. The contractors Project Manager shall maintain continuous coordination with the consulting engineers. The engineers shall be kept informed of the progress and all conflicts that arise during the course of this project. Prior to the start of construction the contractor shall submit a complete plan and schedule for proposed operations.

This schedule should include information relevant to number of employees assigned to the project, work hours, etc.

3.2 DISTRIBUTION WIRING FOR THE CCTV SYSTEM

A. The provision and installation of all supporting conduit infrastructure and cabling, as required to support the equipment specified herein, shall fully conform to all requirements, standards, and practices identified under associated specification sections 270010, 270528, 271000, 270526.

B. Should a conflict arise between a requirement identified herein, and the above referenced specification sections, the most stringent requirement shall apply. All conflicts encountered during the course of this installation must be brought to the attention of the construction manager, architect, and engineer for resolution prior to proceeding with this work.

C. The CCTV system shall utilize a network of fiber optic and data cabling. Cables and terminations of runs shall be provided as shown on the drawings. Fiber optic cables shall terminate on Fiber Distribution Centers in the vertical rack. All cable shall be terminated in an alphanumeric sequence at all termination locations. All terminations shall comply with, and shall be tested to EIA/TIA standards for Category 6 installations and EIA/TIA standards for fiber optic cable. All coaxial cabling used on this project shall feature a DC resistance rating of less than 15ohm per 1000 feet. Reference specification 271000 for additional structured cabling requirements, all cabling for the CCTV system must fully conform with this section.

D. All communications cabling used throughout this project shall comply with the requirements as outlined in the National Electric Code (NEC) article 760. All cabling shall have CMP and/or appropriate markings for the environment in which they are installed.

E. Sealing of openings between floors, through rated fire and smoke walls, existing or created by this contractor for cable pass through shall be the responsibility of the contractor. Sealing material and application of this material shall be accomplished in such a manner that is acceptable to the local fire and building authorities having jurisdiction over this work. Creation of such openings as are necessary for cable passage between locations as shown on the drawings shall be the responsibility of the contractor’s work. Any openings created by or for this contractor and left unused shall also be sealed as part of this work.

F. The contractor shall be responsible for any damage to any surfaces or work disrupted as a result of his work. Repair of surfaces including painting shall be included as necessary.

G. The wiring in this project will in some places be installed above ceilings, underground, in conduit under raised floors or any combination of the above. All cabling used throughout this project shall comply with the requirements as outlined in National

Electric Code (NEC) article 760. All cabling shall have CMP and/or appropriate markings for the environment in which they are installed.

H. Video Cable:

1. Integrity: A time domain reflectometer (TDR) shall be used to verify the integrity of all installed video cables and connectors. See requirements as listed under contractor testing
2. System Labeling: All system cameras, housing, cables, power supplies, video adapters, and monitors shall be labeled with numbers corresponding to camera numbers shown on the contract drawings.
3. Weatherproofing of Exterior Connections: All video connectors exposed to the exterior atmosphere (exterior outlet boxes, camera housings, etc., shall be filled with an inert silicon 'grease' equal to Dow Corning DC #5 compound before mating with opposite connector half. The connection shall then be completely covered with heat shrink tubing. All connectors, whether located indoors or outdoors, shall be crimp on type.
4. Cleaning and Finishes:

    a. Cleaning: Upon completion all exterior equipment surfaces shall be cleaned of fingerprints, paint splatters, and other foreign substances.
    b. Repair: Any exposed surface that has been scratched or damaged shall be restored to like-new condition.
    c. Debris: All wire trimmings, mortar, and foreign debris shall be removed from equipment areas.

5. Wire Dress and Routing:

    a. All system wiring shall be neatly routed.
    b. Cables of similar signal level shall be bundled together and kept physically separate from power cords, plug strips, audio cabling, or other circuits with different potential. Exposed wire bundles or individual cables shall be neatly secured with velcro. Lacing of cables shall not be permitted.
    c. Tooling used to provide connectors shall be specifically designed for the connector being used.

I. Support of Cables:

1. Video cables used in this system are to be installed within ceiling spaces, underground, under raised flooring or in conduit where indicated. Cables shall be routed through these spaces at right angles to electrical power circuits and supported only from the structure. Cables shall be supported at intervals of not more than 48" on center.
2. Use of ceiling tiles, grid or hanger wires for support of cables shall be prohibited.
3. The system contractor shall install a complete set of supporting category 6 hooks, and fasteners and other supporting hardware for cable run under raised floors for this system as part of the contract. All supporting hardware shall be submitted to the engineer for approval prior to installation.

J. Wall Mountable Interconnect Center (WIC):

1. Provide Wall-Mountable Interconnect Centers (WIC) for storage and protection of fiber optic connections and for termination of spare fiber cables.

K. Grounding & System Conductors

1. A #6 AWG stranded copper wire cable shall be extended between new ground bar located at racks and the UPS ground point. This ground conductor shall be utilized for equipment, termination, equipment rack, and computer equipment grounding.
2. All power circuits, line and low voltage, shall include an equipment conductor or equal to the phase neutral conductors.
3. All grounding shall be in accordance with the Axis grounding specification.

L. Workmanship:

1. Components of the distribution system shall be installed in a neat, workmanlike manner consistent with all best practices.
2. Wiring color codes shall be strictly observed and terminations shall be uniform throughout the building.
3. Identification markings and systems shall be uniform.

3.3 WARRANTEE

A. During the first year of service the contractor shall ensure that manufacturer certified repair and maintenance personnel are available for Emergency Service calls twenty-four (24) hour a day, three hundred sixty five (365) days a year. The maximum on-site response time for emergency services shall not exceed four (4) hours.

B. Emergency Service shall be defined as the loss or failure of any critical component necessary to maintain the overall integrity of building security. Service of this nature shall be provided to the client as indicated under the Guarantee section.

C. Normal Service shall be defined as minor repairs or adjustments to components of the system. Service of this nature shall be provided to the client during normal business hours of operation. Service calls requested by the client shall be addressed by the contractor prior to close of business, on the following business day.

3.4 GUARANTEE

A. All systems, equipment, and materials provided under this scope of work shall be guaranteed by the Contractor for a period of not less than one (1) year. This guarantee shall cover the cost for all warranty service including, labor, materials, programming, and shipping charges. Coverage shall also include telephone support for designated security personnel, and all software updates made available by the system manufacturer. During the first year of service the contractor shall also provide two (2) inspection visits for the purpose of preventive maintenance.

3.5 EXTENDED SERVICE

A. Prior to final acceptance testing, and within thirty 30-days of project completion, the contractor shall submit to the client an option to purchase extended service coverage. This proposal shall provide for the purchase option of 1, 3, or 5, year coverage. Coverage shall include provisions for Labor, Materials, Programming, and General System Maintenance.

3.6 SPARE PARTS

A. Prior to completion of this project the contractor shall submit a list of recommended spare parts for this system. These recommendations shall be based upon the contractors and manufacturers experience with this equipment's performance history and critical impact the device has in overall system operations.

B. All cost estimates submitted for additional equipment shall remain at the same rate provided in the original contract documents.

3.7 CONTRACTOR TESTING

A. Each strand in fiber optic cables shall be tested for correctness of termination and overall transmission loss using an approved fiber optic transmission loss test instrument (OTDR). System loss measurements shall be provided at 850 and 1300 nanometers of the completed installation.

1. A certification report shall be provided listing the OTDR results and both the calculated and measure loss for each fiber optic circuit. The report shall be submitted with the test results as called for above.

B. All testing of CCTV cabling shall be provided in conformance with the requirements established under associated specification 17120.

C. Camera presets and integration with the security system shall be tested and verified. All alarm events shall activate the associated camera(s) and provide the predetermined view of the specified area.

D. The contractor shall develop a report that indicates a complete listing of all equipment and alarm monitoring points in this facility. This list shall be used as a guide during testing to ensure that all components are inspected. The personnel conducting these tests shall indicate the following information on this form:

1. Name of person conducting test
2. Date of test
3. Time of test
4. Results of test

Upon successful completion of tests, the log file(s) generated by this activity shall be printed and submitted along with the testing documents, to the client and consulting engineer for review.

3.8 PREPARATION FOR FINAL ACCEPTANCE TESTING

A. All components shall be inspected to ensure they have been properly installed, securely attached, and remain clean and unmarred. All broken, damaged, or modified items such as walls, doorframes, ceiling tiles, etc., shall be replaced or properly repaired to the satisfaction of the client.

B. All equipment shall be properly adjusted, clearly labeled, and fully operational.

C. All extra or spare materials shall be delivered and stored on the premises as directed.

D. Test report of all system components shall be completed and available for inspection as indicated herein.

E. Provide (4) sets of Individual factory issued Equipment Manuals containing all technical information on each piece of equipment. Advertising brochures or information instructions shall not be used in lieu of technical manuals and information. Documents shall be placed in appropriately sized 3-ring binders, properly labeled for content enclosed.

F. Provide (4) sets of Individual factory issued Operation Manuals containing all technical information on the system. Advertising brochures or information instructions shall not be used in lieu of technical manuals and information. Documents shall be placed in appropriately sized 3-ring binders, properly labeled for content enclosed.

G. Provide Statement of Guarantee including date of termination, and the name/telephone number of person to be called in the event of equipment failure.

3.9 TRAINING AND INSTRUCTION

A. Before the system is turned over to the owner, the manufacturer shall provide 2 days, 16 minimum hours of system operations training on-site using the new equipment.

B. Provide 1 days, 8 minimum hours, of technical training in system setup, maintenance, troubleshooting, and service of this system.

C. Training shall be conducted during normal business hours of the client, at a date and time of mutual convenience to the Client and Contractor.

D. A dedicated representative employed full-time for this purpose by the system manufacturer, shall conduct all training. Representatives of a local dealer operation shall not be considered acceptable

3.10 AS-BUILT DOCUMENTS

A. As-built documents shall be provided as part of this contract. As-built drawings shall be a complete set of AutoCAD Release 2006 floor plans drawings, riser diagrams, and wiring details indicating the layout and interconnection of the system. The original project floor plan disk shall be obtained from the consulting engineer. All cable routings and elevation of each outlet, tie, and riser cable terminations shall be required. All addendum information or project revision resulting in drawing changes that occur during the construction period shall be documented and included in the as-built material. All required as-built documentation is mandatory and shall be required prior to project closeout. A complete set of prints with all changes shall be submitted to the Engineer's for review. Upon completion of the Engineer's review, the Contractor shall provide an updated CD-ROM disk containing the electronic drawing files and four (4) reproducible sets of drawings. This information must include final As-Built conditions and the Engineer's review comments if any.

3.11 FINAL ACCEPTANCE TESTING

A. After testing reports, as-built drawings, and required manuals have been submitted for review, the Contractor shall coordinate a date for Final Acceptance Testing.

B. Testing and acceptance of this system will take place in the presence of the Consulting Engineer and the Clients designated personnel.

C. Acceptance of the system shall require a demonstration of all system components to evaluate their performance and reliability. Prior to this test the system must have been online for a period of sixty (60) days, with an uptime of no less than 99%. Should a major equipment failure occur, the Contractor shall replace the defective component and continue testing period. Any items discovered during final inspection which require the contractors attention, shall be promptly addressed. These items will then be re-inspected by the Consulting Engineer for approval.

D. Upon the completion of acceptable Final Acceptance Testing the Contractor shall submit all finalized project documentation and associated electronic media. Upon approval from the Consulting Engineers and the Client, the Owner will issue a Letter of Completion to the Contractor indicating the date of such completion. This notice will serve as Client acceptance of this system.