SECTION 27 51 21 – VIDEO MONITORING SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Provide all labor, materials, and equipment for the complete installation of Work called for in the Contract Documents.

B. This Section includes the minimum requirements for Video Monitoring System integration for American Airlines.

C. Included in this section are the minimum composition requirements and installation methods for the following:

1. Network Cameras
    a. Installation of owner-furnished cameras and mounts providing coverage of designated areas.
    b. Adjustment of cameras for optimum field of view, based on Owner's direction.
    c. Testing installed cameras and preparation of reports as required by the referenced standards and these documents.
2. American Airlines will provide the video management system, recorders and network electronics.
3. This system is separate from the DFW video surveillance system and is used for American Airlines business operations support purposes.

D. Camera installation requirements:

1. Cameras shall be ceiling or wall-mounted per the manufacturer's recommendations.
2. Mounts shall be ceiling, wall, or parapet-mounted per the manufacturer's recommendations.
3. Adjust the camera for aim, zoom, backlight and focus for optimum field of view.
4. Camera views must be reviewed and approved in writing by the Owner's representative.

1.2 DEFINITIONS AND TERMS

A. Trade association names and communications terminology are frequently abbreviated. The following acronyms or abbreviations may be referenced within this Section:

1.	AA	American Airlines
2.	AHJ	Authority Having Jurisdiction
3.	ANSI	American National Standards Institute
4.	AWG	American Wire Gauge
5.	BICSI	Building Industry Consulting Service International
6.	DFW	Dallas-Fort Worth International Airport
7.	EMI	Electromagnetic Interference
8.	FCC	Federal Communications Commission
9.	IEEE	Institute of Electrical and Electronics Engineers
10.	IPS	Images per Second
11.	ISO	International Standards Organization
12.	LAN	Local Area Network
13.	MER	Main Equipment Room
14.	MP	Megapixel

15.	NEC	National Electric Code
16.	NEMA	National Electric Manufacturers Association
17.	NVR	Network Video Recorder
18.	OAR	Owner's Authorized Representative
19.	PoE	Power over Ethernet
20.	TIA	Telecommunications Industry Association
21.	TR	Telecommunications Room
22.	UL	Underwriters Laboratories
23.	VMS	Video Management System

1.3 QUALITY ASSURANCE

A. All cable and equipment shall be installed in a neat and workmanlike manner. All methods of construction that are not specifically described or indicated in the contract documents shall be subject to the control and approval of the Owner.

B. Equipment and materials shall be of the quality and manufacture indicated. The equipment specified is based upon the acceptable manufacturers listed. Where "approved equal" is stated, or a substitution is requested, equipment shall be equivalent in every way to that of the equipment specified. All substitutions are subject to the control and approval of the Owner.

C. Comply with NEC as applicable to construction and installation of system components and accessories. Strictly adhere to all TIA and BICSI recommended installation practices when installing communications labeling systems.

D. All cable and equipment shall be installed in a neat and workmanlike manner. All methods of construction that are not specifically described or indicated in the contract documents shall be subject to the control and approval of the Owner.

E. Contractor's Qualifications:

1. Firms regularly engaged in the installation of Video Surveillance and Monitoring Systems and that have three (3) years of installation experience with systems similar to that required for this project. The Contractor shall have been actively engaged in installing, maintaining and operating similar systems and services as outlined in this document.
2. Provide references to include client names, phone numbers and a summary of project details. These references will be checked and the clients will be asked questions relative to the performance of your company.
3. Provide verification that installation personnel responsible have been factory trained to install the products described in this Section.
4. Provide full time project manager with a minimum of ten (10) years field experience in installation of communications systems and infrastructures. Project manager shall be assigned for the duration of the project and shall not be replaced without written consent from the Owner.

F. Manufacturer's Qualifications:

1. Firms regularly engaged in manufacture of products of the types, ratings and capacities required for this project; whose products have been in satisfactory use in similar service for not less than five (5) years, with production capabilities per applicable NEMA standards.

G. Material and Work specified herein shall comply with the applicable requirements of:

1. ANSI B20.1 Conveyor Safety
2. ANSI/TIA-568.0-E – Generic Telecommunications Cabling for Customer Premises
3. ANSI/TIA-568.1-D – Commercial Building Telecommunications Infrastructure Standard

4. ANSI/TIA-569-E – Telecommunications Pathways and Spaces
5. ANSI/TIA-606-C – Administration Standard for Telecommunications Infrastructure
6. ANSI/TIA-607-D – Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises
7. BICSI – Telecommunications Distribution Methods Manual, 14th Edition
8. IEEE 802 – Local Area Network Standard
9. NFPA 70 – National Electrical Code (currently adopted edition)
10. UL 13 – Standard for Safety for Power-Limited Circuit Cables
11. UL 444 – Standard for Safety for Communications Cables
12. UL 2044 – Standard for Commercial Closed-Circuit Television Equipment, Third Edition
13. Title 47 CFR Part 15 – Radio Frequency Devices
14. Applicable codes and directives of authorities having jurisdiction

H. Work:

1. The Work shall be performed in compliance with the applicable manufacturer's installation instructions, Standards, and certifications listed herein, the Contract Documents, and governing codes and regulations of the authorities having jurisdiction.
2. The drawing and specification requirements govern where they exceed Code and Regulation requirements.
3. Where requirements between governing Codes and Regulations vary, the more restrictive provision applies.
4. Nothing in the Contract Documents grants authority or permission to disregard or violate any legal requirements.

1.4 CONFLICTS

A. This installation shall be made in strict accordance with the Specifications, Drawings, any applicable codes, referenced publications and standards. In case of conflicts between the aforementioned, notify the Owner in writing prior to commencement of affected work.

1.5 SCHEDULING

A. The Contractor shall comply with all scheduling requests established by Owner, both prior to commencing Work, and during construction. The Contractor shall provide a detailed schedule of work to be performed.

1.6 REQUIREMENTS

A. All references to manufacturers, model numbers and other pertinent information herein are intended to establish standards of performance and quality of construction, except in the case of approved products, in which no substitutions are allowed. The Owner must always approve material submittal and substitutions in writing.

B. Verification that all the components specified and installed meet the criteria specified by the respective component manufacturer, supplier and designer is the responsibility of the Contractor.

C. All installation tools, special equipment and testing apparatus required to accomplish field connections and related work as described herein shall be furnished by the Contractor at no additional cost.

D. The requirements as given in this document are to be adhered to unless revised by the Owner in writing.

E. The Owner reserves the right to waive these requirements at any time.

1.7 SUBMITTALS

A. Comply with provisions of Division 01.

B. Comply with provisions of Section 27 05 00.

C. Provide all submittal requirements under this section as a single package.

D. Provide Shop Drawings showing equipment/locations and arrangements. Provide an assembly drawing of every equipment rack and card cage enclosure with location and dimensions shown. Provide wiring diagrams showing all field connected wiring.

E. Contractor shall not utilize the Consultants' original design drawings in the submittal or shop drawing process. Contractor shall develop their own original shop drawings.

1.8 CONTRACTOR CLOSE OUT SUBMITTALS

A. The intent of this Section is to provide supplemental information to include with the complete documentation of the existing Video Monitoring System, for the purpose of system operation and maintenance during and after the Warranty period. It is intended that the operation and maintenance manuals be exhaustive in the coverage of the system to the extent that they may be used as the sole guide to the troubleshooting, identification, and repair of defective parts.

B. The supplemental information requirement of this Section is in addition to Shop Drawing requirements. Information documentation and Drawing sets shall be compiled after system fabrication and testing and shall incorporate any changes made after Shop Drawing submittal.

1. This information shall include wiring diagrams, schematics, and functional details such that any component, wire, or piece of equipment added to the system may be easily identified by going to the actual equipment and making reference to this information.
2. It is required that all supplemental products be neatly labeled and easily identifiable.
3. Every terminal, wire, component, or piece of equipment, relay, and other such items shall have a number or letter designation.
4. All of these identification characteristics shall be included in the supplemental information documents.

C. Provide manufacturer's standard literature, covering all equipment included in the system installation. The supplemental information shall contain specifications, adjustment procedures, circuit schematics, component location diagrams, and replacement parts identification. All references to equipment not supplied on this Project shall be crossed out.

D. Submit Closeout documentation in accordance with Division 01 of the Project Manual and any applicable supplements. The number of submittal sets required is the greater of either the requirements of Division 01 of the Project Manual, or a minimum of four (4) sets.

1. Segregate documents into separate binders containing data relevant to operational, maintenance, and warranty issues.
2. Provide above closeout documentation as an electronic file in PDF format.

1.9 INTELLECTUAL PROPERTY

A. Should patented articles, methods, materials apparatus, etc., be used in this Work, the Contractor shall acquire the right to use same. The Contractor shall hold the Owner and their agents harmless for any delay, action, suit, or cost growing out of the patent rights for any device on this Project.

B. Should copyrighted software be used in this Work, the Contractor shall acquire the right to use same. The Contractor shall hold the Owner and their agents harmless for any delay, action, suit, or cost growing out of the copyrights for any software on this Project.

C. All software required for the complete operation of the system as specified herein shall be delivered with either full Ownership transferred to the Owner, or a non-time limited license to use on each machine it is installed on, including the right to make backup copies.

1.10 DELIVERY, STORAGE AND HANDLING

A. Deliver materials factory-packaged in containers or reels and handle in accordance with manufacturer’s recommendations. Store in a clean, dry space and protect products from damaging fumes and traffic. Handle materials carefully to avoid damage.

B. Storage space on project site may be limited. Contractor shall coordinate delivery and arrange storage of materials and equipment with the Owner.

C. Components sensitive to damage in a harsh environment shall be stored off-site and delivered as needed.

D. Provide protective covering during construction to prevent damage or entrance of foreign matter.

E. Contractor is responsible for on-site security of tools, test equipment and materials.

F. Replace at no expense to Owner, product damaged during storage, handling or the course of construction.

1.11 PROJECT CONDITIONS

A. Verify conditions on the job site are applicable to this Work. Notify the Designer in writing of discrepancies, conflicts, or omissions promptly upon discovery.

B. The drawings diagrammatically show cabling and arrangements of equipment fitting the space available without interference. If conditions exist which make it impossible to install Work as shown, recommend solutions and/or submit drawings to the Designer for approval, showing how the Work may be installed.

1.12 WARRANTY

A. Warrant labor and product to be free of defects and deficiencies, and to conform to the drawings and specifications as to kind, quality, function, and characteristics, following Contractor Warranty requirements defined in Division 01. Should a failure occur within the Contractor's warranty period, the Contractor shall provide all labor and materials necessary to restore the system to the condition required for the Final Test and Acceptance for this Contract, at no cost to the Owner.

B. All surplus parts and pieces to the installation shall be maintained as a spare parts inventory at the building site. Parts replaced during the warranty period shall have a warranty matching that of the original part from date of replacement.

PART 2 - PRODUCTS

2.1 GENERAL

A. The products specified in this document do not necessarily constitute the exhaustive list of products required to complete the statement of work. Except where described in the SUMMARY subpart of this document, the contractor is responsible for providing any other parts and materials needed to deliver a complete and working system.

2.2 ACCEPTABLE VENDORS

A. The vendors listed are provided to establish a basis-of-design. Alternative vendors may be proposed, for review by the Owner.

1. AXIS Communications

2.3 ACCEPTABLE DISTRIBUTORS

A. Subject to compliance with requirements set forth in in this Specification, the Contractor shall procure all components through manufacturer authorized product distributors.

PART 3 - EXECUTION

3.1 GENERAL

A. Close coordination is required with the American Airlines during execution of the Work. Work to be performed may require off hours scheduling and non-continuous phasing, avoiding disruption to Airport operations.

B. System installation and construction methods shall conform to American Airlines requirements, requirements of the State of Texas and all applicable building codes.

C. All equipment locations shall be coordinated with other trades and existing conditions. Coordinate work with other trades and existing conditions to verify exact routing of all cable tray, conduit, etc. before installation. Coordinate with all the Telecommunications, Mechanical and Electrical Drawings.

D. The Contractor shall use existing conduit and raceway where possible and practicable. All work shall be concealed above ceilings and in walls, below slabs, and elsewhere throughout building. If concealment is impossible or impractical, the Owner shall be notified before starting that part of the work. In areas with no ceilings, install only after the Owner reviews and comments on arrangement and appearance.

E. Where more than one trade is involved in an area, space or chase, all shall cooperate and install their own work to utilize the space equally between them in proportion to their individual requirements. There will be no priority schedule for trades. If, after installation of any equipment, piping, ducts, conduit, and boxes, it is determined that ample maintenance and passage space has not been provided, rearrange work and/or furnish other equipment as required for ample maintenance space. Any changes in the size or location of the material or equipment supplied or proposed that may be necessary in order to meet field conditions or in order to avoid conflicts between trades, shall be brought to the immediate attention of the Owner and approval received before such alterations are made.

F. Where required, the Contractor shall be responsible for cutting, patching, coring and associated work for the system at no additional cost to the Owner. Cut and drill from both sides of walls to eliminate splaying. Patch adjacent existing work disturbed by installation of new work. Cut openings in prefabricated construction units in accordance with manufacturer's instructions.

G. All conduit and sleeve openings used by the Contractor shall be waterproofed or fireproofed in compliance with State and Local Building and Fire Codes. Strict adherence to National, State, and Local Fire Codes, particularly fire stopping will be required.

H. The Contractor shall patch all openings remaining around and inside all conduit, sleeves and cable penetrations devices to maintain the integrity of any fire rated wall, ceiling, floor, etc. The fire stop system shall consist of a dielectric, water resistant, non-hardening, permanently pliable/re-enterable putty along with the appropriate damming materials (where required). The sealant must be capable of being removed and reinstalled and must adhere to all penetrants and common construction materials and shall be capable of allowing normal wire/cable movement without being displaced.

I. All building conduits and sleeves installed and/or used under these Specifications shall be fire stopped, or re-fire stopped, upon cable placement through such passageways.

J. Fire stopping for Openings through Fire and Smoke Rated Wall and Floor Assemblies:

1. Provide materials and products listed. The system shall meet the requirements of "Fire Tests of Through-Penetration Fire Stops" designated ASTM E814. To be used inside all conduits and sleeves. Caulk on exterior of conduit penetration.
2. Provide fire stop system seals at all locations where conduit, fiber, cable trays, cables/wires, and similar utilities pass through or penetrate fire rated wall or floor assembly. Provide fire stop seal between sleeve and wall for drywall construction.
3. The minimum required fire resistance ratings of the wall or floor assembly shall be maintained by the fire stop system. The installation shall provide an air and watertight seal.

3.2 EXAMINATION

A. Inspect the jobsite and survey the conditions to be encountered during performance of the work. Failure of Contractor to become familiar with the site conditions shall not relieve Contractor of responsibility for full completion of the work in accordance with the contract provisions.

B. Verify that all conduit, wires, cables, and equipment are installed and ready for connection and integration with the rest of the system.

C. Examine area to be protected and verify that environmental characteristics will not affect effective communication and interfacing. Report observed problems in writing.

D. Determine that power supplies, conduit, wires, cables, connections, and equipment are ready for installation and interfacing before attempting installation.

E. Check all power and communications cabling for continuity before making connections.

F. Visually inspect each piece of equipment, determine defects, and correct.

G. Inspect locations where installation work will be performed. Verify that conditions found are in accordance with drawings and are acceptable for Contractor's installation work. Report any discrepancies in writing to the Owner stating suggested means of correction.

3.3 INSTALLATION

A. Compliance:

1. Install the equipment in accordance with the contract documents, all applicable codes and standards and the Manufacturer's written instructions. The installed system shall meet all applicable equipment and performance requirements.

B. Standardization:

1. Standardize the installation practices and material to provide uniform materials and procedures to the maximum extent possible.
2. Locations:
    a. Locate pull boxes, wire-ways or other items requiring inspection, removal, or replacement conveniently and accessibly with reference to the finished facilities.
3. Installation Requirements:
    a. Install all system components, including furnished equipment, and appurtenances in accordance with the manufacturer's instructions, and as shown, and shall furnish all necessary interconnections, services, and adjustments required for a complete and operable system as specified and shown. Control signal, communications, and data transmission line grounding shall be installed as necessary to preclude ground loops, noise, and surges from adversely affecting system operation.
    b. Install the equipment in accordance with the standards for safety, NFPA 70, UL 681, UL 1037 and UL 1076, and the appropriate installation manual for each equipment type.
    c. All wiring, including low voltage wiring outside the control console, cabinets, boxes, and similar enclosures, shall be installed in rigid galvanized steel conduit conforming to UL 6 (when outdoors), or electric metallic tubing (EMT) when indoors. Minimum conduit size shall be 1-inch. Grounding shall be installed as necessary to preclude ground loops, noise, and surges from adversely affecting system operation.
    d. Detailed shop drawings shall be provided as part of the submittal process. The shop drawings shall include, but not be limited to exposed conduit and devices, including hangars, brackets, back boxes and related equipment.
    e. All equipment connected to alternating current circuits shall be protected from power line surges. Equipment protection shall meet the requirements of ANSI C62.41. Fuses shall not be used for surge protection.
    f. All inputs shall be protected against surges induced on device wiring. Outputs shall be protected against surges induced on control and device wiring installed outdoors and as shown. All communications equipment shall be protected against surges induced on any communications circuit.
    g. Perform tests as recommended by manufacturer or as required to ensure the VMS equipment is operating properly and meets specified requirements.
    h. Correct all deficiencies detected and retest affected components.
    i. Record test data, tabulate, and write narrative describing tests, results, deficiencies found, corrective measures, and results of retesting. Certify that the equipment has been tested and is ready for performance verification testing.
    j. Service Loops: Service loops shall be provided for all VMS cabling within the Telecommunication Rooms.
    k. The Contractor shall be responsible to verify with American Airlines the exact final location of each camera prior to installation. The Contractor shall be responsible to coordinate with lighting, signage and other subcontractors to avoid conflicts with intended field of view as indicated in the drawings.
        1) If available, arrange for verification of camera mounting arrangement and final locations utilizing 3D modeling of the new condition.
        2) If 3D modeling is not available, Contractor shall arrange for reviewing the proposed camera locations with American Airlines on-site and provide a portable camera (with extension pole) to validate camera views, positions and

mounting locations. This shall be performed when construction has advanced enough to view final major architectural features and potential obstructions.

3) Contractor shall provide Area Tilting and PTZ preset programming for each camera.

3.4 IDENTIFICATION AND LABELING

A. All cables and patch cables shall have a permanent label attached at both ends.

B. All cameras shall be labeled on the outside where the label is readable from 10 feet with the American Airlines assigned VMS camera name.

C. The Contractor shall confirm specific labeling requirements with American Airlines prior to cable installation or termination.

3.5 FIELD QUALITY CONTROL, INSPECTIONS AND TESTING

A. A. General

1. The Contractor shall perform a detailed inspection of the site prior to submitting any technical data for approval.
2. The Contractor shall verify that the proposed equipment and methods of installation are compatible with the existing conditions and prepare a corresponding written report of their findings.
3. The Owner shall be notified in writing if modifications of the existing building are required in order to accommodate the new equipment. These modifications shall be made only upon receiving written approval from the Owner.

B. Test, Commission and Acceptance

1. Conduct an Installation Test and total Acceptance Test upon completion of equipment installation. Testing shall be coordinated as necessary, to demonstrate that all interfaces have been successfully implemented.
2. Installation and Acceptance Test Plan and Reports:

    a. Installation and acceptance tests shall be conducted in the normal operational environment to the maximum extent possible. The tests shall represent operation in the normal mode in which each system will operate. If interfaces are incomplete, provide simulation of those interfaces so that the system may be tested as a complete and stand-alone entity. Perform all equipment repair and/or adjustment that may be required during acceptance testing.

    b. Contractor shall submit a Test Plan for Installation and Acceptance Tests and Commissioning for the review and approval of American Airlines and the Design Engineer. The test plan for each phase shall detail the objectives of all tests. The tests shall clearly demonstrate that the system and its components fully comply with the requirements specified herein. The test plan shall be provided at least forty-five (45) days prior to the scheduled start of each test. Test plans shall contain at a minimum:

        1) Test equipment is to be identified by manufacturer and model.
        2) Interconnection of test equipment and steps of operation shall be defined.
        3) Expected results required to comply with specifications.
        4) Record of test results with witness initials or signature and date performed.
        5) Pass or fail evaluation with comments.

3. Installation and acceptance tests shall be conducted in the normal operational environment to the maximum extent possible. The tests shall represent operation in the normal mode in

which each system will operate. If interfaces are incomplete, provide simulation of those interfaces so that the system may be tested as a complete and standalone entity. Perform all equipment repair and/or adjustment that may be required during acceptance testing.

4. In addition to any acceptance testing requirements specified elsewhere, cameras shall be fully adjusted and tested to provide optimal video pictures and signals. All camera adjustments and settings available shall be utilized and adjusted. All camera adjustments and settings shall be recorded in individual camera test reports for review and acceptance.
5. The Test Plan shall provide conformity to all specification requirements. Satisfactory completion of the test procedure is necessary as a condition of system acceptance.
6. Documentation verification, both interconnects and functionality shall be part of the test. Where documentation is not in accordance with the installed system interconnect and operating procedures, the system shall not be considered accepted until the system and documentation correlate.
7. The Contractor shall cooperate with and provide American Airlines representative(s) the opportunity(s) to participate in any or all of the tests.
8. Test Reports: The Contractor shall submit for each test, a test report document that shall certify successful completion of that test. Submit for review and acceptance within seven (7) days following each test. The test report shall contain, at a minimum:

    a. Commentary on test results.
    b. A listing and discussion of all discrepancies between expected and actual results and of all failures encountered during the test and their resolution.
    c. Complete copy of test procedures and test data sheets with annotations showing dates, times, initials, and any other annotations entered during execution of the test.
    d. Signatures of persons who performed and witnessed the test.

9. Test Resolution: Any discrepancies or problems discovered during these tests shall be corrected by the Contractor at no cost to American Airlines. The problems identified in each phase shall be corrected and the percentage of the entire system re- tested determined by American Airlines, before any subsequent testing phase is performed.
10. Adjustment, Correction, and Completion:

    a. Correct deficiencies and retest affected components.
    b. Make necessary adjustments and modification to system after obtaining approval of American Airlines.
    c. Completion: Performance verification test shall be complete when testing or retesting of each component has produced a positive result and has been approved in writing by American Airlines.

11. Recording:

    a. Describe actual operational tests performed and equipment used and list personnel performing tests.
    b. Record in tabular form all test results, deficiencies, and corrective measures.

12. Termination

    a. Performance verification test shall be terminated by American Airlines when:

        1) Individual components, subsystems, or the integrated system fail to perform as specified.
        2) It is determined that system is missing components or installation is not complete.

    b. Upon termination, corrective work shall be performed and performance verification test rescheduled with American Airlines.
    c. Retesting shall be performed by Contractor at no additional expense.
    d. Contractor shall continue to perform corrective actions and retest until system passes all tests to satisfaction of American Airlines.

13. The Contractor will not be responsible for failures caused by:
    a. Outage of main power in excess of backup power capability provided that automatic initiation of all backup sources was accomplished and automatic shutdowns and restarts of systems performed as specified.
    b. Failure of any American Airlines furnished power, communications, and control circuits provided failure was not due to Contractor furnished equipment, installation, or software.
    c. Failure of existing American Airlines equipment provided failure was not due to Contractor furnished equipment, installation, or software.
14. Obtain specific approval from American Airlines of all lens selection, camera field of view, point of focus, video quality and recording.
15. After all installation and acceptance test requirements specified have been complied with, the equipment shall be commissioned.

C. System Commissioning:

1. Commissioning shall include verification of lens selection, verification of field of view, verification of image quality, verification of focus point and where required final adjustment of position of camera.
2. The Commissioning procedure shall be witnessed by American Airlines. Contractor shall provide a detailed inspection, and physical accounting of each equipment item. An operational demonstration shall then be conducted in which the equipment shall function in the normal operational mode and shall operate completely error-free in terms of hardware and software performance. Occurrence of any equipment failure shall terminate the demonstration. The demonstration shall restart and run for a period of time designated by American Airlines after the failure has been corrected.
3. Prerequisite to Commissioning: Outstanding work items that may exist, such as facility interfaces, project record drawings, and/or in-process change orders, shall be documented and submitted to American Airlines for review prior to start of equipment commissioning. Documentation of outstanding work items shall take the form of punch lists of critical action items lists that describe the work, the expected completion schedule, and the impact upon operation. Depending upon the nature of the outstanding work item, American Airlines may grant a waiver to accomplish partial commissioning of any of the equipment. Completion of waived outstanding work items shall then be assigned to the post-commissioning operations and maintenance.

3.6 SYSTEM STARTUP

A. The Contractor shall not apply power to the system until after:

1. System and components have been installed and inspected in accordance with the manufacturer's installation instructions.
2. A visual inspection of the system components has been conducted to ensure that defective equipment items have not been installed and that there are no loose connections.
3. System wiring has been tested and verified as correctly connected as indicated.
4. All system grounding and transient protection systems have been verified as properly installed and connected, as indicated.
5. Power supplies to be connected to the system and equipment have been verified as the correct voltage, phasing, and frequency as indicated.
6. Satisfaction of the above requirements shall not relieve the Contractor of responsibility for incorrect installations, defective equipment items, or collateral damage as a result of Contractor work/equipment.

3.7 CLEANING

A. Reference Specification Section 27 05 00.

B. Contractor shall ensure that camera lenses are maintained clean through acceptance and are protected from any subsequent construction dust from on-going construction activities near the camera.

C. Any camera lens or dome cleaning required shall be done by manufacturer approved techniques as not to scratch or otherwise damage the lens or dome coating in any way. Damage due to improper cleaning techniques by the Contractor shall require replacement of the damaged components.

3.8 COMPUTERIZED MAINTENANCE MANAGEMENT SYSTEM

A. Asset tags shall be installed and recorded for all cameras installed.

END OF SECTION 27 51 21