

SENSITIVE SECURITY INFORMATION

PROJECT MANUAL



**Louis Armstrong New Orleans
International Airport**

**North Terminal Development Program Phase 1
Issued for Construction
Volume #8 (DIVISION 28)**

NOAB PROJECT # 8910-01233

February 8, 2016

LOUIS ARMSTRONG NEW ORLEANS INTERNATIONAL AIRPORT

KENNER, LOUISIANA

**FOR THE
NEW ORLEANS AVIATION BOARD**

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CITY OF NEW ORLEANS

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SEAL AND SIGNATURE BY DESIGN PROFESSIONAL:

COMMUNICATIONS AND SECURITY (RBA)



Gregory S. Spence 2-8-2016

Engineer of Record: Gregory Scott Spence, PE, Ross & Baruzzini

Applicable Sections:

- 27 01 00 General Requirements for Communications Systems
- 27 05 00 Common Work Results for Communications Systems
- 27 05 26 Grounding and Bonding for Communications Systems
- 27 05 28 Pathways for Communications Systems
- 27 05 36 Cable Trays for Communications Systems
- 27 05 53 Identification for Communications Systems
- 27 07 90 Local Area Network
- 27 11 00 Communications Equipment Room Fittings
- 27 13 00 Communications Backbone Cabling
- 27 15 00 Communications Horizontal Cabling
- 27 42 16 Electronic Visual Information Display System
- 27 51 16 Public Address System
- 27 53 16 Commercial Lane RFID System
- 28 05 00 General Security Systems Requirements
- 28 13 00 Security and Access Control System
- 28 23 00 Video Surveillance Systems

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VOLUME #8 – PORTIONS OF DIVISION 28

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DIVISION 28 ELECTRONICS SAFETY AND SECURITY

28 05 00	General Security Systems Requirements
28 13 00	Security and Access Control System
28 23 00	Video Surveillance System

END OF TABLE OF CONTENTS

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SECTION 28 05 00 – GENERAL SECURITY SYSTEMS REQUIREMENTS**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including NOAB General Provisions and Division 01 Specification Sections, apply to this Section.
- B. Specification 27 01 00 “General Requirements for Communications”.
- C. Specification 27 05 00 “Common Work Results for Communications”.
- D. Specification 27 05 26 “Grounding and Bonding for Communications Systems”.
- E. Specification 27 05 28 “Pathways for Communications Systems”.
- F. Specification 27 05 36 “Cable Trays for Communications Systems”.
- G. Specification 27 05 53 “Identification for Communications Systems”.
- H. Specification 27 07 90 “Local Area Network”.
- I. Specification 27 11 00 “Communications Equipment Room Fittings”.
- J. Specification 27 13 00 “Communications Backbone Cabling”.
- K. Specification 27 15 00 “Communications Horizontal Cabling”.
- L. Specification 28 13 00 “Access Control System”.
- M. Specification 28 23 13 “Video Surveillance System”.
- N. Specification 28 31 11 “Digital Addressable Fire Alarm System”

1.2 SUMMARY

- A. Section includes the general requirements applicable to systems specifications listed in Paragraph 1.1 of this specification. This section shall apply to all referenced documents.

1.3 REFERENCES

- A. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by basic designation only.
- B. Specific reference in Specifications to codes, rules regulations, standards, manufacturer’s instructions or requirements of regulatory agencies shall mean the latest printed edition of each in effect at date of Contract unless the Document is shown dated.
- C. Comply with all local codes and requirements of Authorities Having Jurisdiction (AHJ).
- D. All Local Codes shall prevail. Where local Codes are silent, National Codes and Standards shall be applied. Codes, rules, regulations, and ordinances governing the work, are as fully part of the Specifications as if herein repeated or attached. If the Contractor should note items in the drawings or the specifications, construction of which would be code violations, promptly call them to the attention of the Engineer in writing.
- E. Conflicts: Where the requirements of the specifications conflict with other documents the following shall apply:

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1. Between Plans and Specifications, between different specifications, or between different plans: Comply with the one establishing the more stringent requirement.
2. Between referenced requirements or between industry standards: Comply with the one establishing the more stringent requirements.
3. Between referenced requirements and Contract documents: Comply with the one establishing the more stringent requirements.

F. References:

1. ASTM: American Society for Testing Materials
2. ANSI: American National Standards Institute including:
 - a. ANSI-C2 (2007)
 - b. ANSI/TIA/EIA-526-7 – Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant (Method A)
 - c. ANSI/TIA/EIA-526-14A – Measurement of Optical Power Loss of Installed Multimode Fiber Cable Plant
 - d. ANSI/TIA/EIA-568-B – Commercial Building Telecommunications Cabling Standard
 - e. ANSI/TIA-568-C.0 Generic Telecommunications Cabling for Customer Premises
 - f. ANSI/TIA-568-C. Commercial Building Telecommunications Cabling Standard
 - g. ANSI/TIA-568-C.2 Balanced Twisted-Pair Telecommunication Cabling and Components Standard
 - h. ANSI/TIA-568-C.3 Optical Fiber Cabling Components Standard
 - i. ANSI/TIA/EIA-569-A
 - j. ANSI/TIA/EIA-569-A-1 to A-7
 - k. ANSI/TIA/EIA-569-B Commercial Building Standard for Telecommunications Pathways and Spaces
 - l. ANSI/TIA/EIA-606-A Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
 - m. ANSI/TIA/EIA Joint Standard – 607-A Commercial Building Grounding and Bonding Requirements for Telecommunications
 - n. ANSI/TIA/EIA-758 – Customer-Owned Outside Plant Telecommunications Cabling Standard
 - o. ANSI/TIA/EIA-758-1 – Customer-Owned Outside Plant Telecommunications Cabling Standard
 - p. ANSI/TIA/EIA/IS-811 Telephone Terminal Equipment, Performance and Interoperability for VoIP Feature Telephones
 - q. ANSI/TIA/EIA-854 Full Duplex Ethernet Specification for 1000Mbps Operating Over Category 6 Balanced Twisted Pair Cabling
 - r. ANSI/TIA/EIA-942 Data Center Standards

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3. Institute of Electrical & Electronics Engineers (IEEE)
 - a. 142-1991 Recommended Practice for Grounding of Industrial and Commercial Power Systems
 - b. 1100-1999 Recommended Practice for Powering and Grounding Sensitive Electronic Equipment in Industrial and Commercial Power Systems
 - c. C62.41 Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits
 - d. 802.1 LAN/MAN Bridging and Management
 - e. 802.3 CSMA/CD Access Methods (Ethernet)
 - f. 802.3ae 10 Gigabit Specification
 - g. 802.3z 1000 Base-S specification
 - h. 802.3ab 1000 Base-T specification
 - i. 802.3af/at Power over Ethernet
 - j. 802.3u 100 Base-T specification
 - k. 802.1Q VLAN
 - l. 802.1P Prioritization
 - m. 802.11 a/b/g/n CSMA/CA Access Methods (Wireless LANs)
4. Building Industry Consulting Service International (BICSI)
5. Association of Public Safety Communications Officers (APCO)
6. Federal Communications Commission (FCC) regulations and standards
7. Wireless Communications Principles and Practice second edition, Theodore S. Rappaport
8. Motorola R56, "Standards for Communications Sites"
9. CFR: Code of Federal Regulations; CFR 47 Part 15; Radio Frequency Devices
10. IETF: Internet Engineering Task Force
 - a. NTPv2 (RFC 1119), NTPv3 (RFC 1305)
 - b. SNTP (RFC 1361), Time protocol (RFC 868)
11. ICEA: Insulated Cable Engineers Association S-84-608-1994 Telecommunications Cable, Filled, Polyolefin Insulated Copper Conductor
12. IBC: International Building Code 2006
13. ISO: International Organization for Standardization including:
 - a. International Standards Organization/International Electromechanical Commission (ISO/IEC) DIS11801, January 6, 1994
 - b. ISO 9001; Quality Assurance in Design/Development, Production, Installations and Servicing
 - c. ISO 9003; Quality Assurance in Final Inspection and Test

Construction Documents
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General Security Systems Requirements

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- d. ISO 9004; Quality Management and Quality System Elements Guidelines
 - e. ISO/IEC JTC 1/SC 25/WG 3 N655 (Nov. 2001)
 - f. Class D ISO/IEC 11801, 2nd Ed., Information Technology – Generic Cabling for Customer
 - g. Premises, 2002
 - h. Class E ISO/IEC 11801, 2nd Ed., Information Technology – Generic Cabling for Customer Premises
 - i. Class EA Amendment 1 to ISO/IEC 11801, 2nd Ed., Information Technology – Generic Cabling for Customer Premises, pending publication; Class F ISO/IEC 11801, 2nd Ed., Information Technology – Generic Cabling for Customer Premises, 2002
 - j. Class FA Amendment 1 to ISO/IEC 11801, 2nd Ed.
 - k. ISO 9003 – Model for Quality Assurance in Final Inspection and Test
 - l. ISO 10012-1 – Quality Assurance Requirements for Measuring Equipment
 - m. ISO 18000-6C EPC Gen2 UHF RFID Tags
14. NFPA: National Fire Protection Association:
- a. NFPA-70 (2014)
 - b. NFPA 72 (2012)
 - c. NFPA 101 (2012)
 - d. NFPA 780 (2012)
15. NEMA: National Electrical Manufacturers Association (NEMA)
16. NEC: National Electrical Code – Articles 770 and 800
17. NESC: National Electrical Safety Code
18. UL: Underwriters Laboratories:
- a. UL 83 Thermoplastic Insulated Wire and Cables
 - b. UL 96 Lightning Protection Components
 - c. UL96A Installation Requirements for Lightning Protection Systems
 - d. UL 467 Grounding and Bonding Equipment
 - e. UL 497 Protectors for Paired-Conductor Communication Circuits
19. OSHA: Occupational Safety and Health Agency
20. Local/National Electrical codes
21. Local/National Health & Safety codes
22. Local/National radio frequency regulations
23. Local and national regulations and codes in effect as of date of purchase

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- G. Install material in accordance with the most recent edition of Building Industry Consulting Services International (BICSI®) publications:
1. BICSI – Telecommunications Distribution Methods Manual (TDMM)
 2. BICSI – Information Transport Systems Installation Manual (ITSIMM)
 3. BICSI – System Design Reference Manual
 4. BICSI – Customer-Owned Outside Plant Design Manual
 5. BICSI – Wireless Design Reference Manual
- H. Unless accepted otherwise by the Engineer, use manufacturers and installers that employ a Quality Management System complying with the program described in ISO 9001-2000, or similar system.

1.4 SUBMITTALS

A. Contract Submittals:

1. **Work Plan and Schedule:** The Contractor shall supply a schedule of proposed installation and implementation, including dates and milestones within 30 days of contract award. Updates shall be submitted monthly.
2. **Proposed product data sheets:** The Contractor shall submit catalogue cut-sheets that include manufacturer, trade name, and complete model number for each product specified. Model number shall be handwritten and/or highlighted to indicate exact selection. Identify applicable specification section reference for each product. Product data sheets shall be bound in a three ring binder and shall include a product index listing the model number and description of product.
3. **Samples:** Submit one sample of the product components and if required a complete assembly.
4. **System Block Diagram:** The Contractor shall supply a block diagram that depicts the final system design, including riser diagrams, logical flow, single line diagrams, databases, application servers, communication and distribution methods, and external interfaces.
5. **Configuration:** Submit complete lists of all proposed configuration setups, business rules, process flows, and processes implemented in the system. Lists must be submitted weekly during the project and thirty (30) days prior to any formal testing.
6. **Parts Lists:** The Contractor shall supply complete Systems parts lists and breakdowns that identify each component (to the lowest repairable unit) as well as ordering information for these parts shall be provided. The characteristics of each component shall also be shown, where applicable, to aid in obtaining substitute parts. Schematics and parts layout drawings to the component level are to be provided when available. The Contractor shall supply a complete list and cross-reference of all supplied documents (i.e., name, brief description, and document number).
7. **Test Plans, Test Procedures and Test Reports:** Indicate testing methods, devices, and procedures. Progress payments shall depend on the successful completion of testing and documentation. Provide the test plan at least thirty (30) days prior to the scheduled start of the first test. The test plan shall detail the objectives of all tests and samples of all proposed test forms.

8. Manufacturers' system manuals for each system/component provided under the referenced specification Section, including:
 - a. Design and Installation.
 - b. Operation/System Administration.
 - c. Maintenance and Service.
 - d. End-user.
 9. Training Plan: Indicate proposed training methods as specified in the "Training" section of this specification.
 10. Progress Schedule – Contractor shall submit to Project Engineer estimated construction progress schedules for the Work.
 11. Compliance Matrix: Contractor shall submit a compliance matrix that summarizes compliance or non-compliance with each specification component.
- B. Supply all documents necessary to enable users to operate all systems and to change feature assignments and software parameters without assistance from the Contractor. This includes a complete listing of all software parameters of the system.
- C. Record Drawings: Furnish hardcopy and electronic drawings, in AutoCAD REVIT latest format, of completed work including labeling, where applicable.

1.5 INTELLECTUAL PROPERTY

- A. Software: All furnished software shall be Common-off-the-shelf (COTS) and shall be delivered with standard documentation and shall be registered in the name of the Airport.
1. A backup copy of the configured system software shall be provided on DVD/CD-ROM media. All original distribution software shall be delivered with an installable backup.
 2. All required software licenses shall be identified and supplied by the Contractor.
 3. Commercial software packages shall have all registration and licensing documentation filed indicating the Airport as the Owner of the software.
- B. Patents: 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 Airport harmless for any delay, action, suit, or cost growing out of the patent rights for all devices or software used on this Project.
- C. Copyrights: Should copyrighted software be used in this work, the Contractor shall acquire the right to use same. The Contractor shall hold the Airport harmless for any delay, action, suit, or cost growing out of the copyrights for any software on this Project.

1.6 WARRANTY

- A. General:
1. The Contractor shall warrant complete installation of the equipment, system, and software to be free from defects in materials and workmanship for a period of no less than twelve (12) months, starting with the date of Final System Acceptance.
- B. Hardware Warranty:

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1. The Contractor shall warrant that the proposed hardware equipment will conform to its description and any applicable specifications, and shall be of good quality for the known purpose for which it is intended. This Warranty shall be in addition to any standard Warranty or service guarantee given by the Contractor to the Airport.
 2. The Warranty shall allow for replacement or repair of failed systems, equipment and components.
 3. All hardware installed without an on-site spare shall have a twenty-four (24) hour repair/replacement Warranty from the time the Contractor is notified of the hardware failure.
- C. Software Warranty:
1. The warranty shall allow for replacement or repair of failed components. All software necessary to compile, modify, and maintain software supplied for this specification shall be included in this warranty.
 2. The warranties shall include the price of all software upgrades and computer operating system upgrades during the warranty period. If a new version of the system software becomes available during the warranty period, it shall be upgraded as part of the warranty.

1.7 QUALITY ASSURANCE

- A. General: In addition to the general requirements, the Contractor must have been in the business of selling and installing similar systems for a minimum of five (5) years. The Contractor shall have been actively engaged in installing, maintaining and operating similar systems and services as outlined in the Related Sections portion of this document.
1. Unless accepted otherwise by the Engineer, use manufacturers and installers that employ a Quality Management System complying with the program described in ISO 9001-2000, or similar system.
 2. The Contractor shall upgrade each software package and firmware (where applicable) used in the system to the latest version by the end of the Warranty period.
 3. Installation personnel shall meet manufacturer's training and education requirements for implementation of extended warranty program.
- B. NEC Compliance: Comply with NEC as applicable to construction and installation of all system components and accessories including fire rating to all cables and enclosures as applicable.
- C. UL Compliance and Labeling: Provide system components, which are UL-listed and labeled.
- D. Equipment and materials supplied shall be a standard product of manufacturers regularly engaged in the manufacture and installation of that type of equipment and shall be the manufacturer's latest standard design. Items of the same classification shall be by the same manufacturer and shall be the same series and model. This requirement includes equipment, modules, assemblies, parts, and components. Electrically powered equipment shall be UL approved. Electronic equipment shall meet the requirements of CFR 47 Part 15.
- E. All technicians providing final wire terminations, configurations, and programming on major components shall be manufacturer certified and trained on products being installed under this project.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver system components properly packaged in factory-fabricated type containers.
- B. Handling: Handle equipment and components carefully to avoid breakage, impact, denting and scoring finishes. Do not install damaged equipment. Replace and return damaged units to equipment manufacturer.
- C. Equipment delivered to the job site shall be opened and inspected immediately upon arriving and compared to the approved Shop Drawing submittal and checked for defects. If the equipment is not correct, the equipment shall be returned to the manufacturer immediately and a new order for the approved equipment shall be placed at no cost to the Airport.
- D. Equipment and components shall be protected from the prolonged exposure, weather, humidity, temperature variations, dirt, dust, or other contaminants. Equipment damaged prior to system acceptance shall be replaced at no cost to the Airport.

PART 2 - PRODUCTS**2.1 PRODUCTS**

- A. General: See related section in each Division 27 and 28 Specifications listed under Section 1.1 for product requirements.

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. The Airport assumes no responsibility or liability for transportation from country of origin, storage fees, drayage, import taxes, duty taxes, or other costs associated with the delivery and storage of system components.
- B. Contractor shall be responsible for any and all loss or damage in the shipment and delivery of all material until transfer of title to the Airport.
- C. Contractor shall store products in accordance with manufacturer's instructions, within Contractor's staging area and with seals and labels intact and legible. Store sensitive products in weather-tight enclosures; maintain within temperature and humidity ranges required by manufacturer's instructions.
- D. Contractor shall provide coverings to protect products from damage from traffic and construction operations, remove when no longer needed.
- E. Contractor shall ensure that all work performed under these Specifications is in accordance with the requirements and standards defined and referenced in these Specifications. Any work performed in deviation of these Specifications, any of the referenced material, or any applicable standards or requirements, shall immediately be corrected by the Contractor without additional charges, regardless of the stage of completion. The Contractor shall record all inspection observations. As a minimum, the record shall include the name(s) of personnel conducting the inspection, a brief description of the inspection and the observations. These records shall be available for the Engineer to review at any time. Also, these records shall be delivered to the Engineer before final acceptance.
- F. Installation Inspections: Installation inspections shall be undertaken through the performance of pre-installation, in-progress, and final inspections as follows:

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1. **Pre-Installation Inspection:** The Contractor shall make an inspection of all equipment and material to be used prior to installation. All items shall be verified for compliance with the requirements of these Specifications and all other applicable standards. All equipment, cable, and associated hardware identified for installation shall be inspected for damage and completeness utilizing standard practices to determine integrity and acceptability.
2. **In-Progress Inspection:** At the Engineer's discretion, the Contractor shall perform in-progress inspections that shall include visual inspections of equipment, wiring practices, cabling, placement of equipment, marking of cables and adherence to safety procedures. In addition, the Airport, or his representative, may conduct additional inspections any time.
3. **Final Inspection:** The Contractor shall conduct a final inspection that encompasses all portions of the installation. This inspection shall be performed to ensure that all aspects of the installation have been performed in accordance with these Specifications, standard industry practices and the publications referenced herein. All non-compliance items shall be noted by the Contractor during this inspection. The Engineer shall witness this inspection.
4. **Corrective Action and Verification Inspection:** The Contractor shall perform all corrective actions to ensure that all non-compliance items identified during the final inspection have been corrected.

3.2 INSTALLATION

- A. Comply with Section 27 05 00 Common Work Results for Communications.
- B. **Standards:** All installation activities shall be performed in a neat and professional manner in accordance with all applicable local and national codes. Additionally, the Contractor and all subsequent Sub-Contractors employed to satisfy the requirements of these specifications shall obtain, or satisfy, the following prior to installation:
 1. All licenses and permits.
 2. All insurance and bonding as required.
 3. All other standards or requirements specified in this document.
- C. The contractor shall become familiar with all plans and provide layouts of all equipment in all locations. The contractor shall verify that all equipment is suitable for installation in the locations indicated and assure that proper clearances are maintained as required by code and as indicated on the plans. The contractor shall verify that all large equipment can be placed in the locations indicated and that the route into that space and all doors are large enough to accommodate that equipment. No change orders will be considered for replacing or restocking equipment that does not fit into spaces due to lack of coordination, planning, or field investigation.
- D. Contractor shall install and inspect all hardware required in this specification in accordance with the manufacturer's installation instructions.
- E. Contractor shall adhere to the following during installation of the system:
 1. Underwriter's Laboratories (UL) listing for restricted access installations in business and customer premises applications. This listing is required by the National Electric Code for customer premise installations.
 2. Fire resistance requirements specified by Underwriter's Laboratories in UL 1459, 2nd edition.

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- F. Where undefined by codes and standards, Contractor shall apply a safety factor of at least two (2) times the rated load to all fastenings and supports of system components.
- G. Contractor shall install all system components including furnished equipment, and appurtenances in accordance with the manufacturer's instructions, and shall furnish all cables, connectors, terminators, interconnections, services, and adjustments required for a complete and operable system.
- H. Rack Mounted Equipment:
 - 1. As a general practice, Contractor shall run power cables, control cables, and high level cables on the left side of an equipment rack as viewed from the rear.
 - 2. The Contractor shall run other cables on the right side of an equipment rack, as viewed from the rear.
 - 3. For equipment mounted in drawers or on slides, provide the rack accessories as well as interconnecting cables with a service loop of not less than three feet and ensure that the cable is long enough to allow full extension of drawer or slide.
- I. Contractor shall install all custom and packaged software in the development and production environments'.
- J. Contractor shall provide a migration plan for all new and updated software to be migrated from within the development environment to the production environment.
- K. Final hardware selected and installation of hardware shall be submitted for review by the Engineer. Additionally, the Contractor shall review the cabinets and equipment room to ensure ventilation requirements are met or recommend modifications.
- L. Contractor shall install and configure all software required in this Specification in accordance with the software manufacturer's installation instructions. Apply the latest patches and security updates. Register the application with the manufacturer under the Airport's name.
- M. The contractor shall facilitate, configure, document and test all system connections required by other systems or other facilities not in contract that require access to the system specified herein.
- N. Contractor shall place materials only in those locations that have been previously authorized. Any other locations shall be authorized, in writing, by the Engineer.
- O. Contractor shall provide all tools, applications and test equipment required to install, verify, and test the installation and to determine that it meets the specifications. The Contractor shall furnish all necessary materials required to implement and to achieve the required work performance.

3.3 DOCUMENTATION

- A. This Section requires complete documentation of all systems 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. All documentation, as described here-in shall be submitted to the Engineer for approval thirty (30) days prior to final submission.
- B. Scope: The Contractor shall provide the Airport with Operation and Maintenance Manuals and other documentation on all installed systems. These manuals shall include basic wiring diagrams,

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schematics, and functional details such that any component, wire, or piece of equipment in the system may be easily identified by going to the actual equipment and making reference to this manual. It is required that everything in the system be neatly labeled and easily identifiable. Every terminal, wire, component, or piece of equipment, and other such items shall have a number or letter designation. All of these identification characteristics shall be included in the maintenance and operation manuals.

- C. Refer to Specification Section 27 05 53 Identification for Communication Systems for equipment and cabling identification requirements. In addition to these requirements, each card reader, camera, camera interface box, door interface box, security site enclosure and security cable terminations and ports shall be labeled at the physical location.
- D. The maintenance manual requirement of this Section is in addition to Shop Drawing requirements. Maintenance manuals and Drawing sets shall be compiled after system fabrication and testing, and shall incorporate any changes made after Shop Drawing submittal. The maintenance manuals and drawing books shall be permanently bound in hard plastic covers.
- E. Maintenance Manuals, Manufacturer's Literature: Provide manufacturer's standard literature, covering all equipment included in the system. The maintenance manuals 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.
- F. Drawing Books: All Drawings developed specifically for this Project shall be reduced to 11" X 17", folded and bound with hard plastic covers. The 11" X 17" Drawings provided shall be easily readable after printing, even if this requires breaking large Drawings into several parts. Text shall be no smaller than 2 mm. The drawing book documents shall be produced with current version of AutoCAD REVIT and the electronic files shall be provided to the Airport at the completion of the Project on DVD/CD-ROM. Provide component identification and cross reference on the Drawings to allow the maintenance department to understand the function of each item (the block diagram), find the room where the device is mounted (Contract Document plans), find its location in a rack (Arrangement Drawings), find how it is wired (wiring diagrams), and its detailed Specifications (vendor data sheets), and how to repair it (spare part lists). Include the following drawings as a minimum:
 - 1. System Block Diagram: This drawing shall depict the final system overview, including equipment types, location, IP addresses and any special information.
 - 2. System Riser Diagram(s): These drawings shall show all system components, wire numbers, color codes, pin numbers, component locations and connections, depicting the "as-built", final configuration.
 - 3. Rack Elevation and Wiring Diagram(s): The elevation diagrams shall depict the front views of the equipment racks identifying all equipment installed within. Complete wiring diagrams of the racks shall also be included.
 - 4. Floor plans of the communications rooms showing the location of all equipment effected as a part of this contract within the communications rooms.
 - 5. Elevation drawings of all wall mounted equipment showing the location of each component on the wall. Components on the walls shall be identified as in the functional block diagrams.

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6. Wiring Diagrams: Provide wiring diagrams showing all field installed interconnecting wiring. Wire identification on the diagrams shall agree with the wire markers installed on the equipment.
 7. Documentation: The Contractor shall supply three (3) hardcopies of system documentation and three (3) copies of the documentation in PDF format on CD-ROM that detail the operation of the system. This documentation shall provide complete information on the configuration, business rules, operation, maintenance, and trouble-shooting of the system.
- G. Warranty: The Contractor shall supply all warranties as required in the "Warranty" article of this specification.

3.4 GENERAL TESTING REQUIREMENTS

- A. Phases of Testing:
1. Factory Acceptance Testing.
 2. Integration Testing.
 3. Endurance Testing.
- B. Project Testing: The system installation shall not be considered complete until On-Site Endurance Testing is completed. The purpose is to test the complete system and demonstrate that all specified features and performance criteria are met. All requirements of the specification shall be tested, including:
1. Functionality, including reporting and response.
 2. System capacity.
 3. Hardware and software interaction.
 4. Failure Recovery.
 5. Report generation.
- C. Test Plan/Procedure: Contractor shall provide six (6) copies of the proposed test plan/procedures for each testing phase for the review of the Engineer. The test plan for each phase of testing 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 submission of Test Plans shall adhere to the following:
1. A draft test plan shall be presented to the Engineer at least thirty (30) days prior to the scheduled start of each test.
 2. A workshop for reviewing comments shall be conducted with the Engineer at least fifteen (15) days prior to the scheduled start of each test.
 3. A final test plan shall be submitted to the Engineer at least seven (7) days prior to the scheduled start of each test.
- D. Test plans shall contain at a minimum:
1. Functional procedures including use of any test or sample data.
 2. Test equipment is to be identified by manufacturer and model.
 3. Interconnection of test equipment and steps of operation shall be defined.

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4. Expected results required to comply with specifications.
 5. Traceability matrix referencing Specification requirements with specific test procedures.
 6. Record of test results with witness initials or signature and date performed.
 7. Pass or fail evaluation with comments.
- E. The test procedures shall provide conformity to all Specification requirements. Satisfactory completion of the test procedure is necessary as a condition of system acceptance.
- F. All Test plans must be reviewed by the Engineer. To successfully complete a test, the test document must be signed and dated by both the Contractor and the Engineer.
- G. The Engineer will review, witness and validate the execution of all formal test procedures prepared by the Contractor and deliverable under the contract to assure the tests cover all requirements and that there is a conformity between the conducted test, the test results and Specification requirements.
- H. Documentation verification both interconnects and operationally, 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.
- I. The Contractor shall provide the Airport or Airport representative the opportunity(s) to participate in any or all of tests.
- J. Test Reports: The Contractor shall prepare, for each test, a test report document that shall certify successful completion of that test. Six (6) copies of the test report shall be submitted to the Airport representative for review and acceptance within seven (7) days following each test. The test report shall contain, at a minimum:
1. Commentary on test results.
 2. A listing and discussion of all discrepancies between expected and actual results and of all failures encountered during the test and their resolution.
 3. 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.
 4. Signatures of persons who performed and witnessed the test.
- K. Test Resolution: Any discrepancies or problems discovered during these tests shall be corrected by the Contractor at no cost to Airport. The problems identified in each phase shall be corrected and the percentage of the entire system re-tested determined by the Engineer before any subsequent testing phase is performed.

3.5 FACTORY ACCEPTANCE TESTING

- A. The purpose of this test is to validate that the individual systems components function as standalone equipment and all specified features are met.
- B. The Contractor shall ensure that development of the system is complete, required approvals of submittals have been obtained, and sufficient equipment has been procured to completely demonstrate and test the system.
- C. Factory Acceptance testing shall be completed at an Airport authorized test site.

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- D. Test Setup Equipment: Equipment shall be the actual products or identical models of products to those designated to be delivered and installed at the site. The following equipment shall be setup and used for conducting pre-delivery test:
 - 1. Equipment associated with the system.
 - 2. Devices associated with system.
 - 3. Software associated with system.
 - 4. Administrative tools and equipment.
 - 5. Sufficient data to provide accurate simulation of all potential permutations of operational conditions as required by design.
- E. Acceptance: Acceptance of system to perform sufficiently and provide specified functions shall be determined by the Engineer. Testing may be witnessed by additional Airport authorized personnel.
- F. Acceptance Criteria: Performance of system shall equal or exceed criteria stated in individual Specification sections.
- G. If system does not perform satisfactorily, the Contractor shall make corrections and modifications and schedule new test with the Engineer.
- H. Reporting:
 - 1. Record all test procedures and results.
 - 2. Submit report in accordance with reporting requirements in General Testing Requirements Section.

3.6 INTEGRATION TESTING

- A. The purpose of this test is to validate integration between the system and other interfaced subsystems or systems and to demonstrate that all specified features are met. All requirements of the systems integration shall be tested including connectivity, interaction, interface, format, and data flow.
- B. Integration testing shall be completed at the systems integration laboratory or other authorized location on-site at the Airport. Interfaces may be tested using simulated data to/from other systems.
- C. Test Setup Equipment: Equipment shall be actual products or identical models of products to those designated to be delivered and installed at the site. The following equipment shall be setup and used for conducting the test:
 - 1. Equipment associated with the system.
 - 2. Devices associated with system.
 - 3. Software associated with system.
 - 4. Administrative tools and equipment.
 - 5. Sufficient data to provide accurate simulation of all potential permutations of operational conditions as required by design.

- D. Acceptance: Acceptance of system to perform sufficiently and provide specified functions shall be determined by the Engineer. Testing may be witnessed by additional Airport's personnel.
- E. Acceptance Criteria: Performance of system shall equal or exceed criteria stated in individual Specification sections.
- F. If system does not perform satisfactorily, the Contractor shall make corrections and modifications and schedule new test with the Engineer.
- G. Reporting:
 - 1. Record all test procedures and results.
 - 2. Submit report in accordance with reporting requirements in General Testing Requirements Section.

3.7 ENDURANCE TESTING

- A. The purpose of this test is to validate that the fully integrated system meets the Endurance and High Availability requirements.
- B. Integration testing shall be completed on-site at the Airport. All interfaces shall be tested using actual interfaces to other systems (i.e. no stubs or dummy data.).
- C. Requirements:
 - 1. Provide personnel or equipment to monitor system operations 24 hours per day, including weekends and holidays during Endurance Testing.
 - 2. Start test after:
 - a. Successful completion of Integration Testing.
 - b. Training as specified has been completed.
 - c. Correction of deficiencies has been completed.
 - d. Receipt of written start notification from the Engineer.
 - 3. Monitor all systems during Endurance Testing. Coordinate monitoring with the Engineer.
 - 4. Recording: Record data on forms so as to provide a continuous log of systems performance. Include:
 - a. Date and time for all entries.
 - b. Name of individual making entry.
 - c. Environmental conditions.
 - d. Activities in process.
 - e. Description of all alarms, responses, corrective actions, and causes of alarms. Classify as to type of alarm.
 - f. Description of all equipment failures, including software errors.
 - g. Description of all maintenance and adjustment operations performed on system.
 - h. Daily and weekly tabulations.

- i. Daily entries of performance data shall be reviewed by the Engineer.
5. Airport may terminate testing at any time when the system fails to perform as specified. Upon termination of testing the Contractor shall commence an assessment period as described in Stage II.

3.8 MAINTENANCE AND SUPPORT

A. General:

1. The Contractor shall provide maintenance and support of all components associated with this system at no additional charge during the warranty period. This extends to systems requiring vendor pre-purchased maintenance agreements.
2. The Contractor shall supply a list of special tools, test equipment, and outside inventory required for this Project. The Contractor may recommend specific items to facilitate long-term support of the system as an option.
3. All lead technicians performing installation and maintenance shall have a minimum of two (2) years experience on the proposed system and be manufacturer certified on all hardware/software applications. All maintenance technicians shall be provisioned to attend a one (1) week manufacturer training class each year. Pre-assigned backup technicians shall be available to backfill for onsite technicians who are on vacation, in training or who are out sick.

B. Hardware and Software Support

1. Hardware and Software support shall be supplied by the Contractor directly or by a Sub-Contractor reviewed by the Airport. Support shall cover all equipment and systems referenced in this Specification.
2. The Contractor shall assume full responsibility for the performance of all equipment supplied by the Airport, provided that such equipment meets the specifications set forth by the Contractor.
3. All software shall be delivered with an installable backup.

C. Definitions

1. Preventive and Routine Maintenance: Preventive and routine maintenance services shall be provided in accordance with the provisions of the maintenance manual for each component. Preventative maintenance services shall include inspection, test, necessary adjustment, lubrication, parts cleaning, and upgrades. Routine maintenance services shall include scheduled overhauls as recommended by the equipment manufacturer.
2. Emergency Failure: A system failure is considered an emergency if any of the key components are inoperative to the extent the system cannot function in a normal manner. Emergency services shall include inspections and necessary tests to determine the causes of equipment or software malfunction or failure. The emergency services shall include furnishing and installing components, parts, or software changes required to replace malfunctioning system elements. The Contractor shall provide telephone support twenty-four (24) hours a day, seven (7) days a week. The Contractor shall provide support on-site within two (2) hours of request.

3. Support: Support shall be supplied by the Contractor directly or by a sub-Contractor reviewed by the Airport. Support shall cover all equipment referenced in this specification.

3.9 CLEANING

- A. Upon completion of system installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finish, including chips, scratches, and abrasions.

3.10 TRAINING

- A. The User Training shall include on-the-job-training of at least one (1) week. The training shall be conducted on site at the Airport.
- B. The Contractor shall provide the Airport specified trainees with detailed As-built information by the Contractor Lead Engineer. The training shall provide the Airport personnel with a working knowledge of the system design and layout, and shall provide troubleshooting methods and techniques. In addition, the training shall cover testing, maintenance, and repair procedures for all equipment and applications, which are provided under this Specification.
- C. Course materials shall be delivered to the Airport. Final delivery of the course materials shall include a master hard copy of all materials and an electronic copy in a format reviewed in advance by the Airport. The Contractor shall supply a DVD of each training course.
- D. All training shall be completed a minimum of two weeks prior to the system becoming operational and utilized by the Airport. Training schedule subject to the Airport's review.

3.11 ACCEPTANCE

- 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.
- B. 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.
- C. Acceptance will be withheld until the following have been completed successfully:
 1. Acceptance of all submittals.
 2. Successful testing and delivery of approved test results.
 3. Completed Training as per the specifications as well as successful demonstration of the operation of the entire system.

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4. Final cleanup of the system and work areas.
5. Delivery of all documentation including accepted As-built documentation.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT (APPLICABLE TO WORK SHOWN ON VOLUME 2.1 DRAWINGS ONLY)

- A. No method of measurement will be made for work called out in this section. The performance of this work will not be paid for directly but will be considered as incidental to the work of the Contractor covered under other contract items shown on the Volume 2.1 Drawings.

4.2 PAYMENT (APPLICABLE TO WORK SHOWN ON VOLUME 2.1 DRAWINGS ONLY)

- A. Pricing provided shall fully compensate the Contractor for furnishing all materials and for all preparation, installation, testing, and inspection of these materials; and for all labor, equipment, tools, and incidentals necessary to complete the work.

4.3 PAY ITEMS (APPLICABLE TO WORK SHOWN ON VOLUME 2.1 DRAWINGS ONLY)

- A. Unit Price Pay items are listed in Section 01 22 00, Unit Price Pay Items. For Work not otherwise identified as being paid on Lump Sum basis, where no pay item is listed in Section 01 22 00, such work is considered subsidiary to other work, or incidental and will not be measured separately for payment.

END OF SECTION 28 05 00

SECTION 28 13 00 – SECURITY AND ACCESS CONTROL SYSTEM**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including NOAB General Provisions and Division 01 Specification Sections, apply to this Section.
- B. See Section 28 05 00 “General Security Systems Requirements”, Paragraph 1.1 for related sections.

1.2 SUMMARY

- A. See Section 28 05 00 “General Security Systems Requirements”, Paragraph 1.2.
- B. The Security and Access Control System shall be an extension of the existing Software House CCure 9000 software and associated Istar intelligent field panels from the existing South Airport Terminal. The existing SACS is currently Software House CCure 800 Ver 10.0 but will be upgraded by the Airport Security/IT department to CCure 9000 latest version prior to the 80% substantial completion application for payment invoice during this project. All SACS equipment and software provided for this project shall be compatible with Software House CCure 9000 latest version. This project’s North Terminal, Utility Plant, Parking Garage and associated site shall be partitioned separately from the existing South Terminal in the SACS software.
- C. MSY Airport currently holds a Software House Enterprise CCure 800 site license renewed annually. The existing total SACS capacity is 5000 inputs, 5000 outputs, 1000 readers, and 999 system nodes. The current available system capacity is approximately 3785 inputs, 4490 outputs, 550 readers and 979 input nodes. Where required, contractor shall provide additional software licenses capable of supporting the quantity of readers, workstations, servers, etc. as required to support the actual quantity of portals, card readers, input and output points, servers, workstations, etc. as designed and installed as part of this contract.
- D. The existing SACS monitoring and control of the system shall be maintained in the South Terminal AVCOM control center console SACS workstations. Programming of additional doors, portals, alarms, interfaces, GUI mapping for the North Terminal and associated buildings and site to the existing SACS Software House CCure 9000 software shall be included in this contract.
- E. The existing NICE Situitor Physical Security Information Management (PSIM) monitoring and control of the system shall be maintained in the South Terminal AVCOM control center console PSIM workstations. Programming of additional SACS doors, portals, alarms, interfaces, GUI mapping for the North Terminal and associated buildings and site to the existing PSIM software shall be included in this contract. Contractor shall provide any additional PSIM software licenses, runtime ACS point licenses, and software programming required for the expansion of the Security Access Control System. See Section 2.7 ‘Interface Requirements’ for additional information.
- F. The existing Intellisoft Airport ICE badging system and software shall be maintained in the South Terminal badging office. Any additional programming required for the SACS database interface with this system required as a result of this project shall be included in this contract. Programming of any additional badge holders into the Airport ICE software database shall not

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be included in this contract. Contractor shall provide any additional badging software licenses and software programming required for the expansion of the Security Access Control System.

- G. The existing Airport Crossmatch Live scan Guardian Fingerprint Capture and Identification system and software shall be maintained in the South Terminal badging office. Any additional programming required for the SACS database interface with this system required as a result of this project shall be included in this contract. Programming of any additional badge holders into the Airport ICE software database shall not be included in this contract. Contractor shall provide any additional crossmatch software licenses and software programming required for the expansion of the Security Access Control System.
- H. The Security and Access Control System (SACS) shall control and monitor the new Airport North Terminal, associated site supporting buildings and vehicle gates. The SACS shall provide access control and monitoring functions as well as integrate to the Video Surveillance System (VSS) as well as other systems as specified.
- I. The SACS shall consist of Ethernet based, redundant, primary and redundant hot standby servers, remote workstations, and a hierarchy of Ethernet based intelligent field panels that interface with modules (reader and input/output) that connect specified readers, sensors, devices, and monitor and control devices.
- J. Transportation of digital signals for communications between intelligent field panels and the SACS server shall be via the security Virtual LAN(s) being provided as part of the Airport LAN. Coordinate IP addressing, Ethernet switch port counts and assignments, long-term storage requirements and bandwidth utilization with the low voltage contractor providing and configuring the dedicated Airport LAN. Include cost for this coordination in the cost of this contract.
- K. This contract shall include conduit rough-in for door hardware provided by other trades and contractors and this contractor shall coordinate with all other trades, contractors, general contractors, and projects as needed for a fully functional system.
- L. This contract includes voice intercommunication between vehicle gates intercom equipment and the AVCOM Control Center voice communication system in the South Terminal.
- M. This contract includes voice intercommunication between Parking Garage intercom equipment and the AVCOM Control Center voice communication system in the South Terminal.
- N. The purpose of the SACS is to ensure the following:
 - 1. Access by only authorized individuals to Airport Secure/Secure Identification Display Areas, and any other areas the owner may designate.
 - 2. Prevention of unauthorized access by inadvertent means or unauthorized individuals.
 - 3. Assure that an individual is immediately denied entry to a specified area when that person's access authority for that area is withdrawn.
 - 4. Archiving of all access and alarm events providing audit trails for all these events.
 - 5. Timely notification to Owner authorities of all off-normal events or alarmed events.
 - 6. Integration of SACS with other owner software identified in this specification.

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- O. The project intends to incorporate numerous SACS technologies, including but not limited to, card readers, card readers with Personal Identification and Number (PIN) pads, intrusion detection, and intercom systems. Each individual technology will aid in the verification of the cardholder identity. The system shall be capable of utilizing any combination of these technologies. The system shall be integrated with other systems such as the Video Surveillance System (VSS), Fire Alarm System (FAS), Physical Security Information Management (PSIM), Airport Badging Software and others through industry standard interfaces.

1.3 REFERENCES

- A. See Section 28 05 00 “General Security Systems Requirements”, Paragraph 1.3.
- B. References:
 - 1. Code of Federal Regulations TSA 1542.
 - 2. TSA Field Office Program of Requirements 2013.
 - 3. FAA Recommended Security Guidelines for Airport Planning, Design, and Construction – May, 2011.
 - 4. U.S. Customs and Border Protection Airport Technical Design Standard, June 2012.
 - 5. National Institute of Standards and Technology (NIST) 800 series.
 - 6. NFPA 70 - National Electric Code 2012.

1.4 SUBMITTALS

- A. See Section 28 05 00 “General Security Systems Requirements”, Paragraph 1.4.

1.5 INTELLECTUAL PROPERTY

- A. See Section 28 05 00 “General Security Systems Requirements”, Paragraph 1.5.

1.6 WARRANTY

- A. See Section 28 05 00 “General Security Systems Requirements”, Paragraph 1.6.

1.7 QUALITY ASSURANCE

- A. See Section 28 05 00 “General Security Systems Requirements”, Paragraph 1.7.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. See Section 28 05 00 “General Security Systems Requirements”, Paragraph 1.8.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Power: Any special power treatment required, such as power supplies, filtering or spike elimination that may be required for proper operation and protection of the ACS system, shall be provided with the system. The project site is in an area prone to lightning. Contractor shall provide lightning surge suppressors on all exterior copper circuits to prevent lightning damage to the equipment.
- B. Battery Backup Power: ACS IFP field panels and Intrusion Detection panels shall be supplied from supervised power supplies with battery backup. Power supplies shall be located within communication rooms and shall be tied onto the emergency power circuits. Battery backup

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methods shall provide for a minimum of (4) four hours. Batteries shall be supervised for failures while on primary power. Battery failure outputs and low battery conditions shall be connected to the ACS to notify the system of the failure. Primary power shall be supervised to indicate an "on battery" condition to the system. All power supplies shall be connected to generator power in addition to the battery back-up indicated.

- C. Hardware: Provide a distributed access control system and intrusion detection systems as required for a complete operating system as described herein and shown on the Drawings.

2.2 SYSTEM REQUIREMENTS

- A. General: The access control system shall provide the following card access control system objectives:

1. Access Control.
2. Alarm Monitoring.
3. System Administration.
4. Screen/Forms Creation.
5. Graphical Map Creation.
6. Data Import.
7. Data Export.

- B. Access Control:

1. Controlled entry, via access card readers and associated devices, of only authorized personnel to secured areas based on cardholder information entered and stored in the system database.
2. The access request response time from card presentation, database verification, to electric lock/unlock shall be no more than one (1) second in normal operating mode on a fully loaded system.
3. All access requests, both authorized and denied, shall be sent to the host for storage and annunciation, as required, with the cardholder number, name, and access point/area where access was attempted or gained.
4. The system shall annunciate all alarms at the AVCOM SACS alarm monitoring workstations within one (1) second of the alarm being initiated. The system shall integrate with the Airport PSIM to send alarm information.
5. The system shall provide for automatic lock/unlock of access-controlled doors on a scheduled basis using time zones.
6. The operating mode of access-controlled doors shall be indicated as locked, unlocked, or system controlled. The door position switch or balanced magnetic switch shall be indicated as open or closed.

- C. A cardholder call-up feature shall be included that allows the quick search and display of images in the database.

- D. A System Operator journal shall be available to electronically log important daily events.

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- E. An audit function shall be available for System Operators to locate and track activity on specific cardholders or card readers from the database.
- F. An image comparison feature shall be provided for use in conjunction with a VSS interface. When the image comparison feature is activated for a particular ACS controlled portal, Image comparison shall automatically (upon card read request for access) call-up the photo I.D. of the person requesting access. This shall allow any authorized ACS user to utilize a VSS camera to verify the identity of the person against the I.D. photo before granting access.
- G. The ACS shall provide an individually selectable door shunt time to allow persons with disabilities additional time to access a portal and an extended shunt time to allow additional time to pass through the door before alarm. This shall be selectable by cardholder.
- H. The ACS shall provide an adjustable door shunt time to allow gate agents to dynamically extend door shunt time, permitting aircraft boarding operations without "door held open" alarms. The gate agent via special PIN code entry on the card reader/keypad shall extend the normal portal shunt time. Door shall operate normally when no special PIN code is used.
- I. Graphic Alarm Monitoring Mapping Software: The Map Configuration software must have capabilities to create maps of their facility and to attach icons to those maps. The map import function shall also provide for import of static drawing files from AutoCAD® in either DWG or DXF formats or drawing files from other industry standard CADD and drawing programs such as MicroStation. The system shall provide for nesting of maps with increased resolution with each level of nested map. The system shall also provide dynamic map zoom capability, allowing the operator to use the mouse to window an area of interest for zoom.
- J. Alarms shall be prioritized. The alarm-monitoring screen shall provide information about the time and location of the alarm, along with its priority. The alarm monitoring screen shall be able to sort pending and/or insert new alarms based on any of the following attributes: priority, date/time, IFP, card reader, or card holder. Date/time sorts must be user selectable to be either ascending or descending and must have the option of displaying the seconds of the minute in which the alarm arrived into the system.
- K. The system shall provide for alarm monitoring and/or transaction reporting for specific events, such as, but not limited to the following:
 - 1. Duress condition at a card reader / keypad device (duress PIN).
 - 2. Anti-pass back violation.
 - 3. Rejected access request.
 - 4. Invalid biometric (if biometric in use and activated).
 - 5. Card reader tamper.
 - 6. Card reader off-line.
 - 7. Controller cabinet tampers.
 - 8. SNMP network alarms.
 - 9. Commercial AC power failure.
 - 10. Controller communications failure.

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11. Low battery at UPS power supply.
 12. Monitoring of door devices (door position, magnetic lock bond sensor, tamper switches, etc.).
 13. Monitoring of miscellaneous devices (duress alarm buttons, key switch position, and other contact closure devices, etc.).
 14. TSA Exit Lane Breach Alarm
- L. The system must allow unique emergency instructions to be specified for each type of alarm. If components of the system fail for any reason the system shall be capable of informing the operator of their impact to other down-stream or connected devices, this notification should be done through the Graphical User Interface with a change in the graphics of specifically impacted components. For example, the loss of an Intelligent Field Panel should notify the personnel monitoring the system of what is controlled by that device, be programmed with instructions of what to do for this event, and show the portals or devices affected as off-line on the graphic maps as well as the system device tree.
- M. The system shall allow masking and unmasking (shunt/enable) of alarm points manually by the operator, automatically by time zone, automatically by the activation of another alarm point, or, where required, by a cardholder from a reader keypad. The system shall not allow an alarm point to be masked if the alarm point is in a trouble condition.
- N. All alarm points shall be individually annunciated upon any change of state. Alarm contacts shall not be connected in parallel or series in zones, unless specifically shown on the contract drawings or stated herein. Double doors with alarm contacts on each leaf of the double door unit may be wired in series, for that double door unit.
- O. Access Levels: The access level will determine the doors and times a cardholder is authorized to pass through an ACS controlled portal. Two (2) methods shall be provided: a global specification for general use and a method specific to individual cardholders, intended for customizing access levels where necessary.
- P. Asset Management: The ACS shall provide an asset management database that shall be integral to the ACS system database. The following items shall be included in this tracking of assets.
1. Keys: This function shall document the assignment of keys to personnel as part of the badge/ cardholder enrollment process.
 2. Vehicle Permits: This function shall allow for the vehicle permits to be assigned to the cardholder along with all pertinent information of the vehicle and its association with a company.
- Q. Screens/Forms Creation: Should the system standard fields not be suitable, the system shall provide a form Designing and Editing Module that give System Administrators the ability to modify any standard field to customize the card holder screens as desired. The system shall also allow the System Administrators to add custom fields in addition to any standard fields on a minimum of sixteen pages of information. User defined fields shall not be predefined, meaning only the labels can change while the properties cannot.
- R. Graphical Map Creation: The ACS shall provide Graphical Map creation and Editing Software that must allow the contractor to import customized map backgrounds of the airport facility buildings and floors and to attach custom icons to those maps.

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- S. Data Import: The ACS shall support an import utility that will allow the customer or reseller to import cardholder information into the system database.
- T. System Administration: Access to perform System Administrative tasks such as defining workstation & System Operator permissions set-up, access groups, time zones, reports, maps, etc. is provided from any workstation on the network, with appropriate administrative log-on password. The Contractor shall be responsible for the following programming for all points on the system:
 - 1. All controllers, field panels, card readers, card reader/keypads, biometrics, input and output points.
 - 2. Creation of Owner Facility alarm maps.
 - 3. Alarm messages, defining VSS coverage, what automatic events occurred upon the alarm and providing the operator with “how to respond” instructions for all points.
 - 4. Graphical Map Creation: The ACS provides Graphical Map creation and Editing Software that allows the System Administrators to import customized map backgrounds of their facility including image from a GIS system and to attach custom icons to those maps.
 - 5. Data Import: The ACS supports an import utility that will allow the customer or reseller to import cardholder information into the system database.
 - 6. Access Levels: The Contractor shall program all access levels into the system and the creation of generic users profiles and user groups. The access levels and generic profiles shall be coordinated with all users of the system including but not limited to Airport Employees, Airport Police, Airport Tenants and Customs Border Patrol (where required). As additional portals and points are brought on-line, the Contractor shall be responsible for adding the access points to the profiles and any badge holders if the update is not automatic.
- U. System Reports: System database software shall provide capability for the operator to create custom Crystal Reports formats based on any combination of the database fields from any of the database tables. Appropriate latest version of Crystal Reports shall be provided and follow the same licensing requirements as the rest of the system. The operator shall be able to create queries via point and click mouse selection from a list of the available fields within the database. Operator shall be able to define a range of time for the report. Operator shall have the option of selecting from a list of filters to further refine reporting capabilities. The system shall be configured to provide standard reports, which shall include the following queries as the minimum list of standard reports:
 - 1. Active Badge Report by company.
 - 2. Expired Badge Report.
 - 3. Lost Badge Report.
 - 4. Active Secure Area Badge Report.
 - 5. Inactive Secure Area Badge Report.
 - 6. Notification of Expiration Report (active badges that will expire within a user defined time frame).

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7. Stop List of non-Secure Area Badges.
8. Stop List of Secure Area Badges.
9. Company Report List (list of all companies in the database).
10. Operator Activity Report.
11. Secure Area Access Granted Report (in alpha by name, company name, and/ or badge number order).
12. Non-Secure Area Access Granted Report.
13. Access denied report.
14. Alarm Report.
15. Alarm Acknowledged report.
16. Selected Activity Report.
17. Badge Activity Report (badge trace).
18. Asset Report (A listing of all assets assigned to a company or person).
19. Vehicle Permit report (all or based on expiration date).
20. All reports shall include totals by category and the total number of records for the entire database. System report configuration shall provide the ability to run reports for any company or all companies. Reports shall be configurable based on a beginning and ending dates and by user-defined time frame within a 24-hour period.

2.3 SACS TYPICAL PORTAL FUNCTIONAL OPERATIONS

A. Normal access from card reader side:

1. Scan card.
2. Enter PIN.
3. Open door.
4. Alarm / Door status reports @ AVCOM.
5. Event audit logging on SACS/PSIM console.

B. Variable Hold Open Condition (on select doors, ex. Jet Bridge):

1. Scan card.
2. Enter PIN.
3. Enter desired extended held open time – maximum limit settable.
4. Jetbridge doors to have magnetic hold open device to close door upon expiration of time interval.
5. Open door.
6. Able to hold door open until time entered in step “3” expires, closing door shall automatically reset held open time to default setting.

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7. Held open condition will then alarm visually & audibly both locally and @ AVCOM.
 8. Preset PTZ camera (where present) swings to portal.
 9. Held open condition requires acknowledgement on AVCOM console.
 10. Alarm / Door status reports @ AVCOM.
 11. Event audit logging on SACS/PSIM console.
- C. Duress at Card Reader/Keypad:
1. Scan card.
 2. Enter PIN with incorrect final digit.
 3. Opens door normally / no local annunciation.
 4. Duress condition will then alarm visually & audibly @ AVCOM only.
 5. Preset camera swings to portal.
 6. AVCOM console operator must acknowledge.
 7. Alarm / door status reports @ AVCOM.
 8. Event audit logging on AVCOM SACS/PSIM console.
- D. Door Held Open Condition:
1. Scan card.
 2. Enter PIN.
 3. Open door.
 4. Holding door open past Door Held open time triggers alarms visually & audibly @ AVCOM, and locally. Default should be 25 - 45 seconds for security doors, depending upon application.
 5. Preset PTZ camera(where present) swings to portal.
 6. Console operator must acknowledge.
 7. Alarm / Door status reports @ AVCOM.
 8. Event audit logging on SACS/PSIM console.
- E. Force Open Condition:
1. Door being forcibly opened without proper ID credential card, PIN.
 2. Door begins to open.
 3. Condition will then alarm visually & audibly @ AVCOM and locally.
 4. Preset camera swings to portal.
 5. AVCOM console operator must acknowledge.
 6. Alarm / Door status reports @ AVCOM.
 7. Event audit logging on SACS/PSIM console.

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- F. Invalid PIN:
 - 1. Scan card.
 - 2. Upon entering incorrect PIN, system shall not allow door to open.
 - 3. Alarm / Door status reports @ AVCOM.
 - 4. Continual attempts will sound acknowledgeable visual and audible alarm @ AVCOM and locally.
 - 5. AVCOM console operator must acknowledge.
 - 6. Event audit logging on AVCOM ACS console.
- G. Exit from Crash Bar or REX Push button, (secure and/or non-card reader side of door).
 - 1. Press Exit button or Crash Bar, whichever resides at a given door.
 - 2. You must be able to press button, release it, within 5 seconds, then open door.
 - 3. Pressing of the Crash Bar or button will always allow for fire exit and should sound an alarm if using Crash Bar without first scanning card on any door that also has a card reader present. Exit shall have 15 second delay if door has delayed egress magnetic lock except during fire alarm.
 - 4. Alarm / Door status reports @ AVCOM console workstation.
 - 5. Event audit logging on SACS/PSIM console.

2.4 HARDWARE DEFINITIONS

- A. Host Server: Server capable of supporting 64-bit minimum architecture and providing LAN connectivity for system workstations.
- B. Workstations: A LAN connected personal computer (PC) operating as the User interface to the ACS system.
- C. Intelligent Field Panels (IFP): A distributed intelligence processor that stores the cardholder database to grant or deny access, monitors system activity, and provides data communications interface between Input/Output Panels and the ACS System Host CPUs via Ethernet connection. This device is intended to be located in the Communication Rooms.
- D. Door Interface Box: A passive junction point that connects the portal devices into the ACS System. This device is intended to be located at the Portals on the secure side.
- E. Input / Output Panel or module: A modular card that provides for input and output device connection to the ACS System. This device is intended to be located in the ACS Communications Rooms.
- F. Card Reader: A portal device to read encoded portable cards with some having keypads and/or biometric readers in addition for the purpose of determining access rights.
- G. Keypad: A portal device to send keypad code entered into the system for the purpose of determining access rights.
- H. Magnetic Locks: A device to secure the portal and allow passage through the portal by means of remote control.

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- I. Electric Locks (EL): A device to secure the portal and allow passage through the portal by means of remote control.
- J. Door Position Switch (DPS) / Balanced Magnetic Switch (BMS): A device used to monitor the open/closed status of the portal.
- K. Lock Status Switch: A device used to monitor secured/unsecured status of the portal's electric locking device. For magnetic type locks, this is often referred to as a bond sensor.
- L. Request to Exit Device: A device used to allow egress through a secured portal without creating an alarm condition.
- M. Audible/Visual Alarm: A device used to indicate a breached security condition at the portal. This usually consists of an audible device (horn) and a visual device (strobe).
- N. Door Hold Device: A device used to hold a door open. This may be an electromagnetic device or included as part of the door closer assembly. This device is typically used on a Jet bridge Boarding door or on a dock door.

2.5 SYSTEM ARCHITECTURE

- A. General: The ACS's primary function shall be to regulate access through specific portals at the airport.
- B. Access Control: The system's primary purpose shall be to provide access control.
- C. Alarm Monitoring: The system shall be used for graphical alarm monitoring. Alarms are to be prioritized. The alarm-monitoring screen shall provide information about the time and location of the alarm, along with its priority. The alarm monitoring screen must be able to sort pending and/or insert new alarms based on any of the following attributes: priority, date/time, Intelligent Field Panel, card reader, or card holder. Date/time sorts must be user selectable to be either ascending or descending and must have the option of displaying the seconds of the minute in which the alarm arrived into the system. The Contractor shall coordinate alarm level, text descriptions, etc. with the Owner and enter the information into the system as a part of the system expansion. All maps required for the system shall be entered and populated as required for a fully functional system.
- D. The system must allow unique emergency instructions to be specified for each type of alarm. The Contractor shall coordinate the instructions with the Owner and enter these into the system as a part of the system installation.
- E. Access Levels: The access level will determine the doors and times a cardholder is authorized to pass through an ACS controlled portal. The Contractor shall coordinate the access level layout with the Owner and enter the access levels into the system. Coordinate requirements with the Owner.
- F. Badging Workstations: Badging workstations and ID badge printers are existing in the South Terminal AVCOM offices. The Contractor shall create any additional badge types or formats required as a part of the system expansion. This includes, but is not limited to, the creation of new formats and additional fields including new media as a part of the badge layout. Coordinate exact requirements with the Owner.
- G. SACS/PSIM Graphical Map Creation: The Contractor shall create all maps required by the system expansion. The Contractor shall, at a minimum, import customized map backgrounds of

the new terminal, parking garage, utility plant, site, and associated floors per facility and to attach custom SACS icons to those maps. Coordinate requirements with the Owner.

2.6 SOFTWARE REQUIREMENTS

- A. General: Provide ACS software for the number of LAN connected workstations indicated on the Drawings. The ACS workstation operating system shall be Software House CCurre 800, latest version available. Provide licenses for the server to allow the workstations to each have a dedicated license so that all workstations can be on the system simultaneously.
- B. The system shall support the location of map icons on the User-generated graphics. Map icons stand for system card readers, alarm inputs, etc., and change their display color depending on the real-time status of the system.
- C. The system shall be full multi-user, capable of communicating with multiple workstations. Each workstation shall be capable of executing the full range of system commands concurrent with other Users and system processes.
- D. The system shall be implemented with an inactivity logoff feature that shall saves work in progress before logging out. If any connected operator has been determined to have no activity on their workstation for an administrator-defined period of time; that User shall be automatically logged out of the system. The administrator shall be able to disable this feature for selected workstations or Users.
- E. Date/Time/Calendar/Schedule Control:
 - 1. The Access Control System shall have an extensive date/time/calendar/schedule control subsystem. The Contractor shall be responsible for programming the time/calendar/schedule controls.
 - 2. Holiday: The system shall provide the ability to define a minimum of twenty (20) User defined holidays. The Contractor shall program all holidays into the system.

2.7 INTERFACE REQUIREMENTS

- A. General: Contractor shall provide all cost associated with the interfaces to other system as specified. All programming, customs configuration, development, implementation, and testing shall be provided. Final Acceptance will not be given until all interfaces have been demonstrated to be fully functional and meeting all requirements stated.
- B. Video Surveillance System (VSS): The ACS shall interface with the VSS so that upon alarm, the system shall automatically call up the closest VSS camera(s) live view on a selected monitor(s) and activate PTZ preset (for PTZ type cameras) so that camera is pointed in the direction of where the alarm occurred. The intent is to provide automatic call-up of the closest camera when an alarm is triggered by the ACS so that responding operators can view and track associated live video activity related to the cause of the alarm. In addition, ACS events shall be associated with related digital video recordings of the alarm area. The intent is to provide tagging of associated recorded video and allow for playback of this video from within the ACS alarm monitoring and reporting software applications. The ACS shall also be capable of causing changes to VSS digital recording parameters such as frames per second and resolution based on alarm events. Include necessary VSS/digital video management software module/option and all costs associated with this work. From any ACS workstation both live and playback views from the VSS shall be supported as well as PTZ camera control. This interface

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shall be accomplished via software programmable data type communications so that software changes within the ACS to change or add linked video via new cameras can be accomplished without requiring any re-wiring of the system. The Access Control head end shall be capable of interfacing with the VSS system head end using either database events and triggers or XML interface. Integration utilizing relays or hardwired input/output based method shall not be allowed. IP direct interface via dedicated security system LAN shall occur in the ST NOC.

- C. Fire Alarm System: The ACS shall interface with the Fire Alarm System (FAS) so that relay output contacts from the fire alarm system will unlock the means of egress secured portals during emergency fire/ life safety potential situations. For standard magnetic locks which are required to release during the a fire alarm, fire alarm contacts from addressable control modules (relays) and/or fire alarm panel controlled relays shall be connected to the magnetic lock positive power leg directly feeding magnetic locks such that failure of other ACS components or ACS communications shall not defeat fire alarm release of the ACS controlled doors. For delayed egress magnetic locks, the fire alarm relay shall be tied into the fire alarm release. If no fire alarm relay is provided, the contractor shall provide wiring from the communication room to provide this release or shall provide a fire alarm relay at that location to meet the release requirements. The card reader/keypad control of elevators on the SACS shall be automatically bypassed upon a fire alarm condition. FA contractor shall provide a normally closed dry output contact from the fire alarm system whereupon a fire alarm the contact shall open and the SACS shall bypass the card reader control of elevators.
- D. Interfaces with other systems (automatic doors, vehicle gates, jet bridge control systems): This ACS shall provide monitoring and control functions of various automatic doors, vehicle gates, jet bridge control operations. This contract shall include all costs associated with investigation of systems interface, connection, and testing so that all document function and control is operational.
- E. SACS integration with NICE Situator PSIM shall comply with the following:
 - 1. The PSIM shall maintain existing Software House gateway and ACS management license module.
 - 2. The PSIM shall provide required ACS point runtime licenses plus 10% spare for NT ACS points subtracting any South Terminal demolition ACS points.
 - 3. The PSIM shall include an Access Control Systems (ACS) events view and management for unifying and controlling all connected ACS systems regardless of external vendor type or brand.
 - 4. The PSIM discovery feature shall facilitate the querying and importing of all ACS readers and contacts.
 - 5. The PSIM shall have a discovery feature, similar to the one used for importing sensors, to query external ACS systems for badge holders and import them into the system. If available and supported by the interface, badge holders pictures shall also be imported. This import will not be mandatory for displaying external ACS badge holders' details (including their pictures, if supported by the external system interface) as part of reported ACS events.
 - 6. The badge holders' discovery features shall support filtering options to easily find the relevant badge holders and add them to the system.

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7. The PSIM shall support various queries directly from the ACS events list. Queries shall be based on specific sensors (door readers), badge holders, ACS event results, time and date.
8. The PSIM ACS view shall enable users to pause/continue the real time scrolling of ACS events.
9. The PSIM ACS functionality shall support the filtering/querying of historical events of individual ACS sensors (readers) or badge holders. It shall be possible to display the history or generate a report.
10. The PSIM shall support an automatic association between ACS events and badge holders who triggered them.
11. The PSIM shall support quick and single-click easy access from ACS event/sensor to its GIS map location. When the link is clicked, the GIS map view will change to display the appropriate view with a highlighted relevant sensor.
12. The PSIM shall provide easy, one click links directly from the events list to video cameras related to the ACS event or sensor.
13. The PSIM shall have an easy, one click link directly from the events list to the related pre-event video playback.
14. The PSIM shall allow administrators to disable 'Access Granted' events logging in the PSIM database during busy hours, in order to prevent a massive duplicate logging of ACS events (both in the external ACS system and in the PSIM system). ACS exceptions should still be logged and trigger actions during these hours.
15. The PSIM shall support the ability to generate customizable access control reports, on demand, directly from the ACS screen.
16. The PSIM shall support the ability to generate customizable access control reports, on demand, directly from the ACS screen.

2.8 FUNCTIONAL REQUIREMENTS

- A. Workstations and Servers: The Contractor shall provide multiple servers, workstations, and software. The equipment provided shall meet the following requirements:
 1. Server Configuration: The server configuration shall consist of dual, redundant servers with one existing server in the South Terminal AVCOM NOC and one new server in the North Terminal MCR. The servers shall be mounted in physically diverse locations with all communications between the servers being provided over LAN connection(s). The intent is to prevent a single system point of failure. The servers shall be identical, with one NOC server acting as the primary and the second server in the NT MCR acting as a hot stand-by computer with automatic fail over capabilities. The two servers shall maintain synchronized databases automatically with the use of Marathon Ever Run software. Upon loss of communication of the system with the primary host, the secondary server shall automatically assume the control of the system and become the primary server. Upon the re-establishment of communication with the server, the two servers shall automatically re-synchronize without requiring re-booting of the servers.
 2. Alarm Monitoring Workstation: The Contractor shall provide the alarm monitoring workstations as described in the specifications and on the drawings.

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3. System Software: The Contractor shall provide all software, licenses, etc. as required for a fully operational system as described in the specifications and on the drawings.
- B. Operator Interface: The system shall have the ability to categorize system operator access, based upon certain privileges and restrictions. The system should integrate either Active Directory or other windows based policy manager for managing user access and authentication (user login and user permissions within the ACS system). Each system operator shall have characteristics defined by the system administrator as follows:
1. A user name that is used for display and historical purposes.
 2. A password unique to that User name.
 3. A privilege level that defines the commands and functions that the User may access.
 - a. Privilege Levels: The system shall support the creation of privilege levels that define the commands that a system operator may access, and the nature of that access. For ease of privilege assignment, base definition of operator privileges for an operator shall be defined by the selection of an operator profile from a list of user defined profiles. For each group of privileges defined by an operator profile, the system shall allow modification of this profile for an individual operator by the inclusion or exclusion of any command. For each command included in the definition of a privilege level, the system shall permit the activation of that command for view-only or for full capability. Using this method of definition, it shall be possible to create a separate user profile for each system user log-on password.
 - b. Pre-configuration of Operator Profiles: The system shall be pre-configured with commonly used operator profiles. The system administrator shall be able to add or modify operator profiles, in accordance with the specific needs of the Owner.
 - c. Restrictions: In addition to restriction by command as described above, the system shall permit further restrictions on each system operator by specifying the following:
 - 1) The doors that the operator can lock and unlock.
 - 2) The control point outputs that the operator may activate and deactivate.
 - 3) The monitor points that the operator may arm and disarm.
 - 4) The readers for which the operator may view access/alarm activity when monitoring the system.
 - 5) The monitor points that the operator may view activity of when monitoring the system.
- C. Portal Operation: The ACS workstations shall be able to electronically lock or un-lock both ingress and egress all man doors, rollup doors, and vehicle gates from the workstation position.

2.9 APPLICATION DESIGN

- A. Application Partitioning: The ACS shall employ an application partitioning design so that applications are broken into separate distinct programs capable of running independent of other ACS applications. Applications shall include, but not be limited to, alarm monitoring, system administration and configuration, access panel drivers, import modules, and cardholder forms designing modules. Each client workstation shall have the ability to be installed with any combination of the above listed modular applications. A system written as a single monolithic code base shall not be acceptable.

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- B. Graphical User Interface: The ACS shall support a user friendly, Microsoft Windows® graphical user interface that shall be intuitive. The intent is that the GUI shall have the following features: All messages and interface text shall be in English prose. All functions shall be either keyboard or mouse driven to allow the System Operators to choose the method of navigating through the screens. In the alarm-monitoring module of the ACS software, all major functions (opening a door, acknowledging alarms, etc.) shall be accomplished via mouse clicks. Operator actions that could affect system integrity, or the security of portals and/ or monitored alarm points shall require multiple mouse clicks and/ or acknowledgement of confirmation windows to protect against inadvertent activation of these functions.
- C. Distributed Local Decision Making: The ACS shall employ a distributed architecture so that all access decisions are made locally at the IFP. All decisions to grant access shall be made by the local IFP. In the event that the IFP cannot process the request, the IFP shall transfer the request to the head-end. The system shall monitor all request transfers and notify the system operators if a large percentage (user defined) of requests are being processed by the head-end, either from a specific location or overall.
- D. Global Input/Output Functionality: The ACS shall be capable of having distributed Input/Output capability such that inputs on a module or panel on one IFP can activate outputs on output modules on a separate IFP. The intent is that the card reader need not be attached to the same IFP as the outputs. For example, the card reader for an outbound baggage belt can actuate contacts that interact with the baggage system controllers located remotely without having to run dedicated wiring from point to point. All communications shall be via the SECURITY VLAN.
- E. Bi-directional Data Interface to External Databases: The ACS shall support a real time, bi-directional data interface to external databases such as Human Resources or Time and Attendance. The interface capabilities shall allow data to be imported into or exported out of the ACS in real time or in a batch mode basis. Data used for import shall be retrieved directly from an external database or through an import file. Data provided for export shall be applied directly to an external database or through an export file. Any data shall be imported or exported including image data. The file used for import or created by export shall have the ability to be structured in a wide variety of ways. Import of data shall be performed utilizing data integrity checks to verify accuracy and completeness of the import data during the import process. For example, the ACS shall be able to receive data from the fingerprinting application and populate fields in the ACS with the appropriate information to prevent double entry of data. This shall only occur once fingerprints and background checks have been received and approved.
- F. The ACS shall also support the capability a one step download and distribution process of cardholder and security information from an external Human Resource type database to the ACS database, all the way down to the IFP database. This shall be a guaranteed process, even if the communication path between the ACS application server and the IFP is broken. If the communication path is broken, the data shall be stored in a temporary queue and shall be automatically downloaded once the communication path is restored.
- G. Application Installation: The ACS shall support a simplified installation procedure that guides System Administrators through the installation of the application server and any client workstations. The ACS shall automatically detect previous versions installed on the workstations for fast and efficient upgrade installations.

- H. **Multimedia Integration:** The ACS shall extensively integrate and utilize multimedia throughout the ACS software. Real-time, dynamic graphical maps will mean that the map screen will not have to re-paint or refresh each time a new alarm or event condition occurs. The ACS shall support a customizable alarm annunciation and a flashing colored system icon for each alarm in the ACS. The ACS shall also support customizable instructions so that each alarm or event in the ACS can have both a text set of instructions and audio instructions. Real-time live user video verification integrated into alarm monitoring shall also be available to view cardholder activity in high priority areas.
- I. **Network Architecture:** The ACS shall be designed to support an advanced, distributed network architecture, whereas IFPs do not need to be home-run wired back to the ACS host. IFP's shall be connected to a Local Area Network/Wide Area Network via industry standard TCP/IP communication protocol. The system shall be native TCP/IP, not converted serial or other legacy protocol over TCP/IP.
- J. **Object Oriented Programming:** The ACS shall be designed using the latest programming techniques and advanced 64-bit programming tools to optimize ACS performance. Thus, the ACS shall be designed utilizing object oriented programming. Object Oriented Programming shall allow for ease of ACS maintenance and will allow the ACS to be easily expanded and upgraded as the Customer's needs grow.

2.10 OPERATING SYSTEM

- A. **General:** The ACS shall support the 64-bit Microsoft Windows 7 Professional multi-tasking, multi-threading operating system as well as Microsoft Server 2012 for ACS servers. The ACS must meet the requirements listed below for a Windows based system:
 - 1. **Interface:** Object Oriented Programming shall allow for ease of ACS maintenance and will allow the ACS to be easily expanded and upgraded as the Customer needs grow.
 - 2. **Networking:** The operating system shall support TCP/IP networking protocols.
 - 3. **Remote Access Services (RAS):** The operating system shall support full remote diagnostics abilities through network VPN. Coordinate with owner whether remote access is allowed as well as coordination of any outside connections.
 - 4. **Security:** The operating system shall support Active Directory and certificate server for managing user policy and authentication.
- B. Local desktop security shall be available through Active Directory policy.

2.11 CLIENT/SERVER RELATIONAL DATABASE MANAGEMENT SYSTEM (RDBMS)

- A. The ACS shall support Microsoft SQL Server. Provide SQL licenses required to suit project.
- B. These databases, through ODBC, shall be true client/server, high performance, and ANSI standard capable of handling high transaction rates and multiple users concurrently accessing and modifying the database.
- C. **Preservation of Data Integrity:** The ACS's RDBMS shall preserve data integrity in the following ways:
 - 1. **Transaction Processing:** Transaction processing guarantees the consistency and recoverability of the RDBMS. Transaction processing shall assure that all transactions are

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performed as a single unit of work, even in the presence of a hardware or general ACS failure.

2. **Enforced Data Integrity:** The ACS's RDBMS shall enforce data integrity within the database itself, guaranteeing that complex business policies will be followed. The ACS's RDBMS shall use advanced data integrity features such as data types, defaults, and rules to enforce data integrity. Stored procedures and triggers shall also be used to insure the integrity and security of data.
3. **User-Defined Data Types:** The ACS's RDBMS shall utilize data types, which provide the simplest form of data integrity by restricting what kinds of information (for example: characters, numbers, or dates) may be stored in the columns of the database tables.
4. **Defaults:** The ACS's RDBMS shall also utilize Defaults, which allow the ACS to specify a value that the RDBMS inserts if no explicit field value is entered.
5. **Rules:** The ACS's RDBMS shall enforce rules, which are integrity constraints that go beyond those implied by a field's data type. Whenever a user enters a value, the RDBMS shall check the value against any rule that has been created for the specified field.

2.12 CLIENT/SERVER ARCHITECTURE

- A. The ACS shall support a two-tier mature client/server architecture in which the central application server performs all of the data processing. The application server shall hold the database. The clients can be one of many types of workstations including administrative, alarm monitoring, access control, or enrollment and badging workstations. The client shall send all requests to the application server, which does all of the processing. The application server then sends only the results of the request back to the client. This minimizes network traffic and ensures data integrity as a central database is performing all processing.

2.13 MIGRATIONS AND UPGRADES

- A. Activating features, increasing card reader capacity, and enabling additional functionality shall all be able to be accomplished over VPN without the vendor having to go to the Customer site. Coordinate if VPN access to the security LAN will be allowed with the Owner. If allowed, the VPN head-end and user licenses shall be provided as part of this contract. Provide not less than ten (10) user licenses.
- B. All systems shall be one hundred percent (100%) upward compatible. Access control field hardware shall be compatible with all systems. Access control field hardware (IFPs, Card Readers, etc.) shall not have to be replaced or upgraded as the Customer migrates from one ACS level to the next. Design intent is to ensure that a platform is selected so that it is not orphaned with further software upgrades.
- C. Client Workstations, cameras, printers, and data shall also be compatible from one (1) ACS level to the next. These devices shall not require replacement, as the ACS grows from small to large.

2.14 INTERNAL SYSTEM SECURITY PROVISIONS

- A. **Supervised Wiring:** Selected field wiring shall be supervised. Cutting, shorting or altering connections of any wire listed as supervised below shall be detected, and activate an alarm condition at system workstations. Provide wiring supervision for the following functions:

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1. Tamper Switches.
 2. Panic alarms.
 3. Door Position Switches/ Balanced magnetic switches.
- B. Equipment Tamper Switches: Provide tamper switches for all field equipment enclosures arranged to detect physical access to any active component of the system. Lock control and power units shall have tamper switches connected to the ACS system for supervision.
- C. Provide signs for all tamper monitored enclosures warning that an alarm will sound if access is attempted, and giving the telephone number of the security workstation operator.
- D. Request for access processing shall consider three (3) modes of operation:
1. Request for access shall normally be processed by the IFP. The IFP panels shall contain all cardholder and configuration data to grant or deny access to the associated portal.
 2. In the event that the IFP cannot process the access request, the access request shall be deferred to the Host. The Host shall contain all cardholder and configuration data to grant or deny access to the associated portal.
 3. In the event that the IFP cannot process the request for access and cannot communicate with the Host, access granted conditions shall be based solely on a valid code unique to owner.
- E. Multiple Contractor User privilege levels will likely be established during the installation and testing periods of this Project. As a condition of system final acceptance, all Contractor User privileges shall be removed from the system, unless otherwise authorized in writing, by the Owner.

2.15 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
- B. Airport Access Control System (ACS software, controllers, panels and modules):
1. Tyco / Software House C-Cure 9000 and Istar Pro to match latest installed version in the South Terminal.
- C. Smart Card Readers with Keypad:
1. HID Multi Class SE
 2. Approved Equivalent
- D. Smart Card Readers:
1. HID Multi Class SE
 2. Approved Equivalent
- E. Smart Cards:
1. HID Iclass Smart/Prox Cards (provided by Airport)
- F. Servers and Computer Workstations
1. Dell

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2. HP
3. Approved Equivalent
- G. Electromagnetic and Electric Locks (Provided by Division 8 – Section 08 71 00 “Door Hardware”).
- H. Door Position Switches / Balanced Magnetic Switches
 1. Interlogix / Sentrol
 2. Approved Equivalent
- I. Surface and special application security balanced magnetic switches for overhead doors, baggage doors, fences, and gates:
 1. Interlogix / Sentrol
 2. Approved Equivalent
- J. Visual and/or Audible Devices:
 1. Bosch
 2. Wheelock
 3. Approved Equivalent
- K. PIR Sensor:
 1. Bosch
 2. Interlogix
 3. Securitron
 4. Approved Equivalent
- L. Request to Exit Push Buttons (Provided by Division 08 – Section 08 71 00 “Door Hardware”).
- M. Key Switches (Provided by Division 8 – Section 08 71 00 “Door Hardware”).
- N. Magnetic Hold Open Devices (Provided by Division 08 – Section 08 71 00 “Door Hardware”).
- O. Duress Alarm Push Button:
 1. Dynalock
 2. Locknetics
 3. Securitron
 4. Approved Equivalent
- P. Card Reader Pedestals:
 1. EMX Industries
 2. Safety Technologies
 3. Approved Equivalent
- Q. IP Intercom Call Station:

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1. Talkaphone
 2. Pre-Approved equal
- R. Wall Mount Emergency Phone Station:
1. Talkaphone
 2. Pre-Approved equal
- S. Power Supplies (controller, module, and door hardware):
1. Alarm Safe
 2. Altronix
 3. Security Door Controls
 4. Locknetics
 5. Software House
 6. Approved Equivalent
- T. Federal Inspection Service (FIS) Intrusion Detection System:
1. Bosch
 2. Honeywell
 3. Approved Equivalent

2.16 ACCESS CONTROL SYSTEM DEVICES

- A. Magnetic Locks and Delayed Egress Magnetic Locks:
1. See Specification Section 08 71 00 "Door Hardware" for magnetic lock requirements.
 2. Device installation, conduit, wiring, and terminations by this contractor.
 3. Coordinate installation with Door Hardware installer.
 4. Magnetic locks installed on egress doors shall be immediately automatically unlocked upon fire alarm.
 5. Delayed Egress magnetic locks shall be unlocked after 15 seconds delay upon panic bar activation without a valid card read and pin input or immediately upon fire alarm.
 6. Magnetic locks shall be capable of unlocking from remote SACS workstation software.
 7. See SACS door details on drawings for functional description and wiring information.
- B. Exit Door Panic Hardware: The panic hardware provided shall have the following characteristics:
1. See Specification Section 08 71 00 "Door Hardware" for panic hardware requirements.
 2. Device installation, conduit, wiring, and terminations by this contractor.
 3. Coordinate installation with Door Hardware installer.

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4. Where indicated on drawings, units shall have two separate switches with minimum 3.0 amp rating at 24 V DC (DPDT). One switch shall immediate release magnetic lock and the other switch shall be connected to an ACS input.
- C. Door Position Switch (Security doors): Provide high security balanced magnetic switches at door locations as indicated on the drawings. Switches shall have the following features and characteristics:
1. Construction: Rugged construction designed for flush mounting for new doors or surface mounting for existing doors into steel doorframes and doors.
 2. High security: Balanced, triple-biased type switch.
 3. Contacts: Independent form-C contacts wired in a SPDT configuration. Provide DPDT where indicated for Intrusion Detection System signaling.
 4. Life expectancy: 10,000,000 cycles.
 5. Gap distance: 1/2", maximum.
 6. Classification: UL listed 634 for use with security systems.
 7. Tamper proof: Integral magnetic and pry tamper contacts.
- D. Door Position Switch (Overhead Doors and Baggage Doors): Provide high security balanced magnetic switches as indicated on the drawings. Switches shall have the following features and characteristics:
1. Construction: Rugged construction designed for surface mounting to door and to the floor.
 2. High security: Balanced, triple-biased type switch.
 3. Contacts: Independent form-C contacts wired in a SPDT configuration.
 4. Life expectancy: 10,000,000 cycles.
 5. Gap distance: 1", minimum; 2", maximum.
 6. Classification: UL listed 634 for use with security systems.
 7. Rating: Indoor and Outdoor use, encapsulated.
- E. Door Position Switch (Vehicle and Pedestrian Gate): Provide industrial rated balanced magnetic switches at rolling gate locations as indicated on the drawings. Switches shall have the following features and characteristics:
1. Construction: Rugged construction designed for surface mounting.
 2. High security: Balanced magnetic reed type switch.
 3. Contacts: Independent form-C contacts wired in a SPDT configuration.
 4. Life expectancy: 10,000,000 cycles.
 5. Gap distance: 3" minimum; 5" maximum.
 6. Classification: UL listed 634 for use with security systems.
 7. Rating: Indoor and Outdoor use, encapsulated.

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- F. Special Application Switches (Equipment tamper status): Provide magnetic switches within equipment compartments as indicated on the drawings but at a minimum shall be installed in door and camera interface boxes, intelligent field panels, and power supply cabinets. All special application general/door position switches, unless otherwise noted in the drawings shall be provided by this contract: Switches shall have the following features and characteristics:
1. Construction: Rugged construction designed for surface mounting within enclosures for detection of opening or tampering.
 2. Type: Single reed type switch.
 3. Contacts: Normally open coordinated with ACS equipment for monitoring of wiring integrity.
 4. Life expectancy: 10,000,000 cycles.
 5. Gap distance: 1/2", maximum.
- G. Key Switch: The key switches and cores provided shall have the following characteristics:
1. See Specification Section 08 71 00 "Door Hardware" for key switch requirements.
 2. Device installation, conduit, wiring, and terminations by this contractor.
 3. Coordinate installation with Door Hardware installer.
 4. Key Switch – Duress alarm button disable and reset.
 5. The key switch shall include cylinder that will accept the removable core.
 6. The key switch shall be DPDT, two switches that can each be monitored separately. One set shall cut power directly to the magnetic lock for emergency entry and the other set shall be monitored by the ACS system as an alarm condition.
 7. The key shall be capable of being removed in either the on or off position.
 8. Switch shall have minimum rating of 2 amps at 28VDC.
 9. Key switch shall be mounted on a single gang faceplate.
- H. Smart Card Readers and Smart Card Readers with Keypad: Provide contactless devices with the following characteristics:
1. Basis of Design Manufacturer: HID IClass SE: RP40 or RPK40(with keypad).
 2. Supports FIPS-201 Credentials including PIV, PIV-I,CIV,CAC, TWIC,FRAC; contactless interface.
 3. Supports standard 13.56Mhz iclass and 125kHz proximity. Supports Iclass SE Secure Identity Object (SIO).
 4. Supports Mifare, MIFARE, and MIFARE DESFire EV1.
 5. Encryption: Multi layer security.
 6. Read Range: Minimum 3-inch.
 7. ISO card compatibility: HID and ISO 14443A and B units that also read additional ISO card compatibilities are acceptable (multi-read units as long as they capable of reading the

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secure sectors of the selected card technology. Reader selection shall be coordinated and compatible with the smart card technology selected.

8. Power: 85 milliamps @ 5 - 16 VDC.
 9. Visual/Audible indicators: Tri color LED and tone signal for verification (card accept and card reject) and prompt for pin input as well as verification of command functions initiated at the reader.
 10. Output Format: OSDP with SCP over RS485 or standard Wiegand (with reader mounting tamper switch).
 11. Construction: Housing suitable for indoor mounting on flat surfaces or recessed using appropriate back boxes. For exterior applications the unit must be outdoor rated or manufacturer approved outdoor enclosure used.
 12. Keypad: Internal 12 button numerical.
- I. Audible/Visual Alarm Units: Provide alarm indicator units at the door locations indicated in the drawings with the following characteristics:
1. Wall mounted, white in color with no labeling so that it will not be confused with fire alarm units.
 2. Audible: Selectable tones and dB levels with a minimum of eight (8) field selectable tones and two (2) volume levels. Tone selection shall be coordinated with fire alarm provider and Owner so that the ACS audible is different from the fire alarm.
 3. Visual: Selectable high/low setting with blue colored lens available in other colors such as amber, blue, or green (confirm lens color selection with Owner prior to ordering).
 4. Initially, both audible and visual inputs shall be wired together so that both are controlled from a single switched power output from the access control equipment. Provide capability to only activate either strobe or tone or have both features independently controlled.
 5. Voltage: 24 VDC.
- J. Request to Exit Push Buttons: Install request to exit push buttons at door locations as indicated on the drawings. Devices shall have the following features and characteristics:
1. See Specification 08 71 00 "Door Hardware" for request to exit push buttons for requirements.
 2. Coordinate installation with Door Hardware installer.
 3. Device installation, conduit, wiring, and terminations by this contractor.
 4. See SACS door details on drawings for functional description and wiring information.
- K. Magnetic Hold Open Devices: Install magnetic hold opens at door locations as indicated on the drawings. Devices shall have the following features and characteristics:
1. See Specification 08 71 00 "Door Hardware" for magnetic hold opens for requirements.
 2. Coordinate installation with Door Hardware installer.
 3. Device installation, conduit, wiring, and terminations by this contractor.
 4. See SACS door details on drawings for functional description and wiring information.

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- L. Duress Alarm Push Buttons shall be provided with the following characteristics:
1. Wall mounted, heavy duty, vandal resistant 1" diameter stainless steel push button on single gang brushed stainless steel faceplate.
 2. Momentary action contacts rated 1 amp @30VDC with 7" color coded #18 AWG wire lead terminations.
- M. Card Reader Pedestals shall be provided with the following characteristics:
1. Motorized sliding gate Vehicle Gates: Provide dual height pedestal with one card reader at 42" AFG and one card reader at 84" AFG. Pedestal shall be 2" x 2" steel, (2) 12" sweeps with black powder paint and weather proof hood capable of mounting card reader and intercom station.
 2. Arm type vehicle gates and pedestrian swing gates: Provide pedestal with one card reader at 42" AFG. Pedestal shall be 2" x 2" steel with 12" sweep, with black powder paint and weather proof hood.
- N. IP Intercom Call Station (Vehicle Gates):
1. IP66 vandal resistant marine grade stainless steel faceplate. Flush Mount in Gate Weatherproof enclosure with card reader).
 2. Highly reflective "CALL" lettering on front
 3. Power over Ethernet (PoE, 802.3af).
 4. Full duplex hands free communication.
 5. Built in auto dialer for six phone numbers.
 6. Supports standard Session Initiation Protocol (SIP).
 7. Network: 10/100 Base TX Ethernet.
 8. Operating Temperature: -40 Deg F – 131 Deg F.
 9. Basis of Design: Talkphone VOIP-600C
- O. Wall Mount IP Emergency Call Station (Parking Garage):
1. IP66 vandal resistant marine grade stainless steel faceplate. Recess mount in IP66 enclosure.
 2. Highly reflective "EMERGENCY" lettering on front.
 3. Power over Ethernet (PoE, 802.3af).
 4. Full duplex hands free communication.
 5. Built in auto dialer for six phone numbers.
 6. Supports standard Session Initiation Protocol (SIP).
 7. Network:10/100 Base TX Ethernet.
 8. Operating Temperature: -40 Deg F – 131 Deg F.
 9. Basis of Design: Talkphone VOIP-600E

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- P. Access Control Power Supplies: Power supplies (for active components and field devices): Power supplies shall be located as required in Communication Rooms with the following characteristics:
1. Wall mounted, rugged housing with lockable door.
 2. Input Voltage: 120 VAC, 60Hz, filtered 12 VDC (Controller and IFP panels) outputs rated at 2 amps minimum. Provide AC failure supervision.
 3. Separate fused output per powered device.
 4. 4 hour battery backup in dual battery configuration to be provided within housing. Provide low battery warning and built in charger.
 5. Cabinet shall use same key as IFP panel.
 6. Units shall be UL approved for security access system applications.
- Q. Lock Control Power Supplies: Power supplies (for magnetic and electric locks): Power supplies shall be located as required in Communication Rooms with the following characteristics:
1. Wall mounted, rugged housing with lockable door.
 2. Input Voltage: 120 VAC, 60Hz, filtered 12 VDC and 24VDC outputs rated at 3.5 amps minimum. Provide AC failure supervision.
 3. (16) Class 2 rated fused outputs.
 4. 4 hour battery backup to be provided within housing. Provide low battery warning and built in charger.
 5. Cabinet shall use same key as IFP panel.
 6. Units shall be UL approved for access system lock applications.

2.17 INTELLIGENT FIELD PANELS

- A. The Intelligent Field Panel (IFP) shall be a distributed intelligence processor and may include single or multi-door portal interface functionality. The intelligent field panel database shall be downloadable from the host CPU. Processing tasks shall consist of access decisions; sensor shunting, input/output relationships and audit trail reporting. The intelligent field panel shall monitor and control input/output panels. The intelligent field panel will communicate with the host CPU and input/output panels using the Owner network via encrypted means. The intelligent field panel shall respond to communications polling from the host CPU and in turn shall poll downstream panels. If any panels fail the poll/response cycle, alarm data shall immediately be transmitted to the host CPU. Upon re-establishment of the link, event history files from the intelligent field panel shall be uploaded to the host CPU. The intelligent field panel shall store all system events in a history file, which shall be transmitted to the host CPU either on demand or automatically when event memory reaches approximately 85% capacity. Critical alarms shall be immediately processed at the intelligent field panel and transmitted along with the current history file, to the host CPU. A secondary communication means shall be provided. For example, a dial-up would be an appropriate back-up in case the network communication was lost. The IFP shall be provided with sufficient memory such that it is capable of storing not less than 10,000 cardholders (and associated access levels and schedules), 40,000 transactions, and all associated schedules, dates, etc., but not less than 64

MB of SDRAM memory shall be provided. IFP Panels shall be provided with 24 hour battery back up using re-chargeable NiMH batteries. The IFP shall provide sufficient processing speed to consistently initiate Request to Exit (REX) processes prior to Balanced Magnetic Switch change of state or, shall provide the ability to delay the Balanced Magnetic Switch change of state until the REX can be sensed and processed.

- B. IFP Portal/Card Reader Modules: Modules shall be provided for the electrical interface for card readers, door monitor points, door devices and related signaling and control devices as indicated on the drawings plus 25% spare.
- C. IFP Input/Output Modules: The input panel shall provide system input point connection, monitoring, and reporting functions. The input points shall be configurable for series circuits and "four-state" or "Class B" supervision, which shall be compatible with all dry contact type sensors and switches. Input point change of state signals shall be routed to the intelligent field panel or directly to the network, which shall process all, input signals and initiate the appropriate response action. Responses shall be User programmable at the host CPU. The input panel shall respond to communications polling from the intelligent field panel to verify valid communications link between the panels. The output panel shall provide system output device functions. The output points shall be programmable Form-C relays and/or open collector outputs. Relay status or dynamic relay state change commands shall be processed at the intelligent field panel and routed to the output panel. Commands may also be initiated from a system User via the operating software. The output panel shall respond to communications polling from the intelligent field panel to verify valid communications link between the panels.

2.18 SACS SERVER REQUIREMENTS

1. 19" Rackmount – 1RU Server chassis. Maximum 28" Depth.
2. Processor: Intel E5- 1.8 GHz or better.
3. Memory: 8GB RAM.
4. Internal Storage: 400 Gb hard drive.
5. OS/Application Drive/RAID Level: (2) 450 GB – RAID 1.
6. Standard SVGA video card.
7. Operating System: Windows Server 64 bit latest edition.
8. Minimum 4 USB ports.
9. (2) 1 GBe Ethernet ports.
10. (2) 8Gbs fiber channel ports.
11. Fully Redundant hot plug fans.
12. Dual 120 VAC, 60Hz power supplies.

2.19 SACS WORKSTATION EQUIPMENT REQUIREMENTS

- A. Computer Workstation:
 1. Processor: Intel Core i7 2600 @3.4GHz.
 2. Memory: 8GB of RAM DDR.

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3. Internal Storage: 500 GB.
 4. Optical Disk: 16x DVD+/- RW.
 5. Minimum 4 USB ports.
 6. Windows 7 Professional OS.
 7. Software: Microsoft Office, McAfee Security 3 year service, SACS client software as indicated on drawings.
 8. 100/1000 Ethernet NIC.
 9. Ergonomic 103 keys multi-media keyboard and optical mouse.
 10. Include USB fingerprint sensor for security access.
 11. 240 Watt, 100-240 VAC, 50/60Hz Power Supply.
- B. Video Card (s):
1. 2 monitor support.
 2. PCI Express x16 compatible.
 3. Minimum 784MB DDR3 graphics memory.
 4. Low profile half length card.
 5. DVI connectors supporting 1600 x 1200 resolution per display.
 6. RoHs and WEE compliant, support 4:3 and 16:9 aspect ratio.
 7. Supports configuration of two displays arranged horizontally.
 8. Vertically or combination of both orientations.
- C. Display Screen:
1. LCD TFT active matrix.
 2. 22-inch viewable size.
 3. 178-degree viewing angle.
 4. 16:9 aspect ratio.
 5. Black colored enclosure.
 6. Minimum of two USB 2.0 Ports.
 7. 1600 x 1200 DVI Native resolution.
 8. 32-bit color support.
 9. Minimum 160 MHz video bandwidth.
 10. DVI connector.
 11. 800:1 minimum contrast ratio.
 12. 120-240 VAC, 50/60Hz power supply.
- D. Secure Keyboard/Mouse Switcher:

1. 2-channel supporting USB and PS/2 keyboard and mouse.
2. Minimum 10 foot cables.
3. Audio and Video ports are not required.
4. Advanced H/W and S/W security.
5. NIAP Common Criteria validated to EAL 4+.

2.20 SECURITY SITE ENCLOSURES

- A. Enclosure: 29”H x 24”W x 12” Deep, Type 3R with integral fan and filter, adjustable thermostat, white powder coat paint for exterior applications.
- B. Solar shield top and intake cover, external mounting brackets.
- C. Hinged gasketed door.
- D. Hasp and staple for pad locking.
- E. Grounding lug, bonding provision on door.
- F. Data pocket on door.
- G. Terminal block kit.
- H. Minimum 24” AFG to bottom of enclosure. Enclosure shall be mounted to stainless steel unistrut assembly. Unistrut assembly shall be mounted to (2) concrete foundations or pad as specified in Civil FAA concrete specifications.

2.21 INDUSTRIAL RATED NETWORK SWITCHES

- A. These devices shall be used at exterior non-conditioned cabinets.
- B. Basis of Design: Cisco IE3000 8-port switch, or equal.
- C. All network devices shall be of the most current deployment. No end-of-life products shall be permitted.
- D. Provide (8) 10/100 Base T full duplex switched ports for connectivity to non-PoE field equipment.
- E. Provide 1-Gig SFP uplink ports and power supply.

2.22 DOOR INTERFACE BOXES

- A. Enclosure: 12”H x 12”W x 6” Deep, NEMA 1 for indoor use.
- B. Removable door with continuous hinge.
- C. Hasp and staple for pad locking.
- D. Data pocket on door.
- E. Terminal block kit.

2.23 CABLING

- A. See Cable Schedule on the drawings. Contractor shall verify the manufacturer’s recommended cables for provided system. See Section 3.2.

2.24 INTRUSION DETECTION SYSTEM (IDS)

- A. The Intrusion Detection System (IDS) shall provide for alarm monitoring of intrusion device alarms, and shall consist of alarm panels to monitor/control intrusion detection devices, digital keypad and display modules to arm/disarm the IDS, and intrusion detection field devices.
- B. The system shall be interfaced with the ACS for remote monitoring and control functions of the systems from FIS ACS workstations. Verify ACS/IDS interface configurations with FIS.
- C. The IDS shall be capable of grouping intrusion device inputs according to area and shall allow for scheduled or manual control of those groups as defined by the user.
- D. The IDS shall provide for local control and monitoring of the intrusion devices through control panels and digital keypad and display modules. Additionally, the IDS shall be monitored and controlled remotely by the ACS. Provide all software, hardware and equipment necessary to interface the IDS with the ACS for remote monitoring and control functions.
- E. The IDS shall be capable of being monitored by an FIS off-site central station monitoring facility.
- F. Digital Keypad and Display Module:
 1. The digital keypad shall provide alpha numeric LED display of IDS status, entry/exit delays and intrusion alarm situations.
 2. The digital keypad shall include an audible speaker for annunciation of system status, delays and alarm situations.
 3. System shall provide for user defined security codes for control and command function entries.
- G. Intrusion Detection Motion Sensor – Standard:
 1. Provide dual-technology intrusion detection motion sensors for detecting the presence of a person within certain areas, as indicated on the Drawings.
 2. The dual-technology motion sensor shall utilize a combination of passive infrared (PIR) and microwave detection technologies for intrusion detection.
 3. The intrusion detection motion sensor shall be wired as an alarm input to the IDS, and shall be compatible with the IDS system.
 4. Detection pattern: up to 50' x 50'.
 5. Output contact: Alarm: Normally closed form c contact is opened when detection zone is entered.
 6. Tamper: Normally closed form c contact is opened if an attempt is made to remove top cover of unit.
 7. Power requirements: 9 – 15V.
 8. Mounting: Surface or Wall mounted.

2.25 SPARE PARTS

- A. The Contractor shall furnish spare parts for the ACS and IDS system. The intent of the spare parts inventory is to allow the immediate replacement of failed or faulty components to the

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lowest level of field repair to maintain system-operating integrity. Any spare parts used throughout the duration of this Project shall be replaced prior to final acceptance. Furnish spare parts as follows:

1. Processing Devices – Communications Control Panels, furnish one (1) spare.
 2. Processing Devices – Intelligent Field Panels, furnish five-percent (5%) spare of each type but no less than one (1) of each type used in the Project.
 3. Processing Devices –Card reader modules, furnish five-percent (5%) spare of each type but no less than four (4) of each type used in the Project.
 4. Processing Devices – Input/Output Panels, furnish five-percent (5%) spare of each type but no less than four (4) of each type used in the Project.
 5. Power supplies - furnish five percent (5%) spare of each type but no less than one (1) of each type used in the Project.
 6. Surge Suppressors – Furnish five of each type.
- B. Devices - furnish five percent (5%) spare of each type but no less than two (2) of each type used in the Project.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. See Section 28 05 00 “General Security Systems Requirements”, Paragraph 3.1.

3.2 WIRING

- A. Comply with requirements in Section 27 05 28 "Pathways for Communication Systems".
- B. Wiring Method: Install cables in raceways.
- C. Except raceways are not required where cable trays or J hooks are used for cabling in accessible indoor ceiling spaces from the Door Interface Box to the Communication Room IFP panel. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.
- D. Splices, Taps, and Terminations: For power and control wiring, use numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- E. For LAN connection and fiber-optic and copper communication wiring, comply with Section 27 13 00 "Communications Backbone Cabling" and Section 27 15 00 "Communications Horizontal Cabling".
- F. Refer to ACS Cable Schedule on drawings.

3.3 INSTALLATION

- A. See Section 28 05 00 “General Security Systems Requirements”, Paragraph 3.2.

3.4 GROUNDING

- A. Cable Shields: All pair shields shall be grounded at one (1) point only. Cables that originate from processing equipment and serve field devices shall be grounded to the signal ground terminal in the processing equipment.
- B. Comply with Section 27 05 26 "Grounding and Bonding for Communication Systems".
- C. Comply with NFPA 70, National Electrical Code and BICSI TDMM.
- D. Grounding: Provide independent-signal circuit grounding recommended in writing by manufacturer.

3.5 DOCUMENTATION

- A. See Section 28 05 00 "General Security Systems Requirements", Paragraph 3.3.

3.6 GENERAL TESTING REQUIREMENTS

- A. See Section 28 05 00 "General Security Systems Requirements", Paragraph 3.4.
- B. The following minimum tests shall be performed on each portal, witnessed by the construction manager/engineer and verified at the AVCOM ACS and PSIM consoles:

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ACCESS CONTROL SYSTEM - DOOR TESTING FORM

BUILDING		DATE:	
COMM RM		TIME:	
ASP DOOR #			
DOOR #		R&B:	
DESCRIPTION			
DOOR TYPE		CONTR.	
REF DWG.			

LINE #	TESTS	PASS	FAIL	RE-TEST	REMARKS
1	VALID BADGE READ				
2	INVALID BADGE READ				
3	LOST BADGE READ				
4	DOOR HELD TIME				
5	DOOR HELD ALARM				
6	EXTENDED SHUNT TIME				
7	DOOR FORCED A/V				
8	DOOR FORCED ALARM				
9	CAMERA CALL UP				
10	DOOR HOLDER				
11	REX OPERATION				
12	PIR OPERATION				
13	TAMPER OPERATION CR				
14	TAMPER OPERATION A/V				
15	TAMPER OPERATION JB				
16	DURESS ALARM				
17	ALARM SIGNAL				
18	DOOR INVENTORY				

WARNING: This record contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this record may be disclosed to persons without a "need to know", as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator or the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For U.S. government agencies, public disclosure is governed by 5 U.S.C. 552 and 49 CFR parts 15 and 1520.

3.7 FACTORY ACCEPTANCE TESTING

A. See Section 28 05 00 "General Security Systems Requirements", Paragraph 3.5.

3.8 INTEGRATION TESTING

A. See Section 28 05 00 "General Security Systems Requirements", Paragraph 3.6.

3.9 ENDURANCE TESTING

A. See Section 28 05 00 "General Security Systems Requirements", Paragraph 3.7.

3.10 MAINTENANCE AND SUPPORT

A. See Section 28 05 00 "General Security Systems Requirements", Paragraph 3.8.

3.11 CLEANING

A. See Section 28 05 00 "General Security Systems Requirements", Paragraph 3.9.

3.12 TRAINING

A. See Section 28 05 00 "General Security Systems Requirements", Paragraph 3.10.

3.13 ACCEPTANCE

A. See Section 28 05 00 "General Security Systems Requirements", Paragraph 3.11.

PART 4 - MEASUREMENT AND PAYMENT**4.1 MEASUREMENT (APPLICABLE TO WORK SHOWN ON VOLUME 2.1 DRAWINGS ONLY)**

- A. Cabling shall be measured by type, size, and quantity of linear feet in place, completed, and approved.
- B. SACS equipment shall be measured by type and quantity in place, completed, and approved.
- C. Other SACS accessories shall not be measured for payment but shall be included in SACS Equipment costs noted above.

4.2 PAYMENT (APPLICABLE TO WORK SHOWN ON VOLUME 2.1 DRAWINGS ONLY)

- A. Pricing provided shall fully compensate the Contractor for furnishing all materials and for all preparation, installation, testing, and inspection of these materials; and for all labor, equipment, tools, and incidentals necessary to complete the work.

4.3 PAY ITEMS (APPLICABLE TO WORK SHOWN ON VOLUME 2.1 DRAWINGS ONLY)

- A. Unit Price Pay items are listed in Section 01 22 00, Unit Price Pay Items. For Work not otherwise identified as being paid on Lump Sum basis, where no pay item is listed in Section 01 22 00, such work is considered subsidiary to other work, or incidental and will not be measured separately for payment.

END OF SECTION 28 13 00

SECTION 28 23 00 – VIDEO SURVEILLANCE SYSTEM**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including NOAB General Provisions and Division 01 Specification Sections, apply to this Section.
- B. Specification Section MSY 28 05 00 “General Security Systems Requirements”.

1.2 SUMMARY

- A. See Specification Section 28 05 00 “General Security Systems Requirements”, Paragraph 1.2.
- B. The Video Surveillance System (VSS) shall be an extension of the Verint Video Management System and shall provide digital video capture, transportation, management, recording, live viewing, playback, and storage for the North Terminal and associated buildings and site. The VSS shall be based on capturing and processing Ethernet transmission of video signals from cameras. The entire VSS system shall be capable of being partitioned and allow sharing of selected video signals between Airport Buildings over the Security VLAN. VSS Camera monitoring and control capability shall be provided at multiple airport buildings.
- C. This section includes all labor and materials including, but not limited to: Video Servers, management and database servers, storage area network, video management software, camera monitoring, control, archiving, software and camera licenses, Power over Ethernet (POE) IP fixed cameras and IP cameras with pan, tilt zoom (PTZ) features, camera housings and mounting hardware, and power supplies required to form a fully functional and operational network based video surveillance system. Provide all software licenses required for the specified monitoring and control.
- D. Network switches with POE capability shall be provided as specified in Section MSY 27 07 90 “Local Area Network.”
- E. VSS cabling shall be provided as specified in Section MSY 27 15 00 “Communications Horizontal Cabling”.
- F. The programming, testing, owner training and documentation of the installed VSS as shown on the Drawings and specified herein are part of this contract. All costs associated with programming, testing, training and documentation of the system shall be included in the contract.
- G. The contractor shall provide required cables, conduit, conduit supports, lightning and surge protection, mounting bracket fabrication, and connection to 120 VAC power.
- H. The system shall provide live and recorded video monitoring of cameras at the MSY South Terminal AVCOM control center and at client workstations in the North Terminal. Video monitoring in the AVCOM shall utilize the existing console monitors and the existing large format LCD monitors. Programming of new cameras into the existing Verint Nextiva 6.3 video management software shall be included in the contract.
- I. The Storage Area Network (SAN) shall provide digital video storage for the cameras and shall be compatible with the existing video storage SAN build out in the South Terminal Network Operations Center. The SAN shall be comprised of storage arrays as well as providing fiber switches required to provide a dedicated transport for this system to assure consistent video

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storage. The SAN shall be a traditional SAN comprised of fiber switches, controllers, and disk arrays. The SAN capacity shall be sized based upon the camera storage requirements. The SAN utilization shall not exceed 70% of the total capacity of the full SAN build-out. Expansion of the SAN shall be by the addition of additional disk arrays, but shall not require the addition of fiber switches, network connections, or controllers. The spare capacity shall provide the capability to add future additional storage capacities to accommodate additional cameras. Refer to Part 2.16 Video Storage in this section.

- J. The existing Verint VSS system in the South Terminal is integrated to the Software House SACS and the NICE PSIM in the South Terminal AVCOM/NOC. Additional North Terminal, Site, Parking Garage, UP building cameras shall be integrated to the Software House SACS and the NICS PSIM as part of this project. Refer to Part 2.22 Integration Requirements.

1.3 REFERENCES

- A. See Specification 28 05 00 "General Security Systems Requirements", Paragraph 1.3.

1.4 SUBMITTALS

- A. See Specification 28 05 00 "General Security Systems Requirements", Paragraph 1.4.

1.5 INTELLECTUAL PROPERTY

- A. See Specification 28 05 00 "General Security Systems Requirements", Paragraph 1.5.

1.6 WARRANTY

- A. See Specification 28 05 00 "General Security Systems Requirements", Paragraph 1.6.

1.7 QUALITY ASSURANCE

- A. See Specification 28 05 00 "General Security Systems Requirements", Paragraph 1.7.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. See Specification 28 05 00 "General Security Systems Requirements", Paragraph 1.8.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Provide at the time of installation the latest version of all equipment and software. Discontinued equipment or equipment which has been officially noted as end-of-production or end-of-life shall not be acceptable.
- B. Subject to the requirements of the quality assurance specifications, provide all equipment of like kind by a single manufacturer. Manufacturers listed are not pre-approved with regard to specific equipment requirements and must meet all of the specification requirements for each equipment category and device type for approval.
 - 1. IP Fixed Style and Pan/Tilt/Zoom Style Cameras: The following camera manufacturers shall be considered equals to the Axis cameras basis of design as specified herein:
 - a. Arecont
 - b. Avigilon
 - c. Axis

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- d. DVTEL
- e. Pelco
- f. Samsung
- g. Sony
- 2. Lenses:
 - a. Approved Equivalent (by camera manufacturer)
- 3. Camera Power Supplies:
 - a. Altronix
 - b. Axis
 - c. DVTEL
 - d. Pelco
 - e. Sony
 - f. Approved Equivalent
- 4. Camera Interface Boxes:
 - a. Hoffmann
 - b. Approved Equivalent
- 5. Video Management System:
 - a. Verint (to match existing)
- 6. Video, Database and Management Servers, Computer Workstations, Printers
 - a. Dell
 - b. HP
 - c. Approved Equivalent
- 7. Storage Area Network:
 - a. Dell
 - b. HP
 - c. Promise Technologies
 - d. EMC
 - e. Approved Equivalent
- 8. Fiber Channel Stackable Switch:
 - a. Dell
 - b. HP
 - c. QLOGIC

- d. EMC
- e. Approved Equivalent
- 9. Camera Poles
 - a. Valmont
 - b. Approved Equivalent
- 10. Audio Microphone
 - a. Shure
 - b. Approved Equivalent

2.2 TYPE A1,A2,A3,A8,A9 INTERIOR IP FIXED CAMERA DOME

A. General:

1. The camera shall:
 - a. Be designed to provide at least two video streams in HDTV 1080p (1920 x 1080) at up to 30 frames per second (60Hz mode) or 25 frames per second (50Hz mode) using H.264 or Motion JPEG.
 - b. Be equipped with Day/Night functionality and remote zoom and focus capabilities.
 - c. Operate on an open source; Linux-based platform, and including a built-in web server.
 - d. Be equipped with a slot for SD/SDHC memory card expansion.
 - e. Be manufactured with a tamper resistant body.
2. Hardware:
 - a. Use a high quality IR-sensitive progressive scan sensor.
 - b. Be equipped with a removable IR-cut filter, providing so-called day/night functionality.
 - c. Be equipped with a high-quality varifocal lens, provide automated iris functionality with P-Iris control, and provide remote zoom and focus functionality.
 - d. Provide pictures down to 0.15 lux while in day mode (with IR-filter in use) and down to 0.03 lux while in night mode (with IR-filter removed).
 - e. Support memory expansion by providing an available SD/SDHC card slot.
3. Video Resolution
 - a. The camera shall be able to deliver at least two individually configurable full resolution full frame rate video streams over IP networks.
 - b. Supported video resolutions shall include:
 - 1) 1920 x 1080.
 - 2) 1280 x 960.
 - c. The camera shall be able to provide both landscape format (4:3 and 16:9 aspect ratio) as well as corridor format (3:4 and 9:16 aspect ratio).
4. Encoding

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- a. The camera shall:
 - 1) Support Motion JPEG encoding in a selectable range up to 30 frames per second in all resolutions.
 - 2) Support Baseline Profile H.264 encoding with motion estimation in up to 30 frames per second in all resolutions.
 - 3) Support Main Profile H.264 encoding with motion estimation and context-adaptive binary arithmetic coding (CABAC) in up to 30 frames per second in all resolutions.
 - 4) Be able to provide independently configured simultaneous H.264 and Motion JPEG streams.
 - 5) Support both Constant Bit Rate (CBR) and Variable Bit Rate (VBR) in H.264.
 - 6) Provide configurable compression levels.
 5. Transmission:
 - a. The camera shall allow for video to be transported over:
 - 1) HTTP (Unicast).
 - 2) HTTPS (Unicast).
 - 3) RTP (Unicast & Multicast).
 - 4) RTP over RTSP (Unicast).
 - 5) RTP over RTSP over HTTP (Unicast).
 - b. The camera shall support Quality of Service (QoS) to be able to prioritize traffic.
 6. Image control:
 - a. Support a configurable maximum shutter in the range from 2 to 1/29.500 second in 60Hz mode and the range from 2 to 1/24.500 seconds in 50 Hz mode.
 - 1) Incorporate Automatic and Manual White Balance.
 - 2) Be equipped with an electronic shutter and support automatic and manually defined exposure zones.
 - 3) Be equipped with Wide Dynamic Range functionality.
 - 4) Provide Back Light Compensation.
 - 5) Allow for rotation of the image in steps of 90°.
- B. Functionality:
1. Web server:
 - a. The camera shall contain a built-in web server making video and configuration available to multiple clients in a standard operating system and browser environment using HTTP, without the need for additional software.
 - b. Optional components downloaded from the camera for specific tasks, e.g. Active X, shall be signed by an organization providing digital trust services, such as Verisign, Inc.
 2. IP addresses:
 - a. The camera shall support both fixed IP addresses and dynamically assigned IP addresses provided by a Dynamic Host Control Protocol (DHCP) server.
 - b. The camera shall allow for automatic detection of the Camera based on UPnP and Bonjour when using a PC with an operating system supporting this feature.

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- c. The camera shall provide support for both IPv4 and IPv6.
3. Event functionality:
 - a. The camera shall be equipped with an integrated event functionality, which can be triggered by:
 - 1) Video Motion Detection.
 - 2) Schedule.
 - 3) Camera tampering.
 - 4) Embedded third party applications.
 - 5) Edge storage disruption detection
 - b. Response to triggers shall include:
 - 1) Notification, using TCP, SMTP or HTTP.
 - 2) Image upload, using FTP, SMTP or HTTP.
 - c. The camera shall provide memory for pre & post alarm recordings.
 - d. Event functions shall be configurable via the web interface.
4. Edge storage:
 - a. The camera shall support continuous and event controlled recording to:
 - 1) Local memory added to the cameras SD-card slot.
 - 2) Network attached storage, located on the local network.
5. Protocol support:
 - a. The camera shall incorporate support for at least IP, HTTP, HTTPS, SSL/TLS, TCP, ICMP, SNMPv1/v2c/v3 (MIB-II), RTSP, RTP, UDP, IGMP, RTCP, SMTP, FTP, DHCP, UPnP, ARP, DNS, DynDNS, SOCKS, NTP and Bonjour.
 - b. The SMTP implementation shall include support for SMTP authentication.
6. Text overlay:
 - a. The Camera shall:
 - 1) Provide embedded on-screen text with support for date and time, and a customer-specific text, camera name, of at least 45 ASCII characters.
 - 2) To ensure accuracy, the camera shall accept external time synchronization from an NTP (Network Time Protocol) server.
 - 3) Provide the ability to apply a privacy mask to the image.
 - 4) Allow for the overlay of a graphical image, such as a logotype, into the image.
7. Security:
 - a. The camera shall:
 - 1) Support the use of HTTPS and SSL/TLS, providing the ability to upload signed certificates to encrypt and secure authentication and communication of both administration data and video streams.
 - 2) Support IEEE 802.1X authentication.
 - 3) Provide support for restricting access to pre-defined IP addresses only, so-called IP address filtering.

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- 4) Restrict access to the built-in web server by usernames and passwords at three different levels.
8. API support:
 - a. The camera shall be fully supported by an open and published API (Application Programmers Interface), which shall provide necessary information for integration of functionality into third party applications.
 - b. The camera shall conform to ONVIF Profile S or ONVIF Version 1.01 or higher as defined by the ONVIF organization, and shall be upgradable at any time.
 9. Embedded applications:
 - a. The camera shall provide a platform allowing the upload of third party applications into the camera.
 - b. The camera vendor shall provide a compatibility tool for the application vendor to verify the stability and performance impact of their uploaded application.
 10. Installation and Maintenance:
 - a. The camera shall:
 - 1) Be supplied with Windows-based management software which allows the assignment of IP addresses, upgrade of firmware and backup of the Cameras' configuration.
 - 2) Support the use of SNMP-based management tools according to SNMP v1, 2c & 3 / MIB-II.
 - 3) Allow updates of the software (firmware) over the network, using FTP or HTTP.
 - 4) Provide the ability to apply a rectangle of customer-defined number of pixels to the image, which can be used as a pixel counter identifying the size of objects in number of pixels.
 - b. All customer-specific settings shall be stored in a non-volatile memory and shall not be lost during power cuts or soft reset.
 11. User logs:
 - a. The camera shall:
 - 1) Provide a log file, containing information about the 250 latest connections and access attempts since the unit's latest restart. The file shall include information about the connecting IP addresses and the time of connecting.
 - 2) Provide a connection list of all currently connected viewers. The file shall include information about connecting IP address, time of connecting and the type of stream accessed.
- C. Camera diagnostics:
1. The camera shall:
 - a. Be equipped with LEDs, capable of providing visible status information. LEDs shall indicate the camera's operational status and provide information about power, communication with receiver, the network status and the camera status.

- b. Be monitored by a Watchdog functionality, which shall automatically re-initiate processes or restart the unit if a malfunction is detected.

D. Interfaces:

1. Network interface:

- a. The camera shall be equipped with one 100BASE-TX Fast Ethernet-port, using a standard RJ-45 socket and shall support auto negotiation of network speed (100 MBit/s and 10 MBit/s) and transfer mode (full and half duplex).

E. Enclosure:

1. The camera enclosure shall include the following:

- a. Manufactured with a tamper resistant body providing encapsulated electronics.
- b. Clear and smoked transparent cover.
- c. The camera enclosure shall provide the ability to adjust the camera modules angle with at least $\pm 180^\circ$ horizontal, $\pm 85^\circ$ vertical and $\pm 170^\circ$ rotation while maintaining an image that is not interfered with by the camera housing.

F. Power requirements:

1. Power over Ethernet according to IEEE 802.3af - Class 2.

G. Environmental:

1. The camera shall:

- a. Operate in a temperature range of 0°C to $+50^\circ\text{C}$ (32°F to $+122^\circ\text{F}$).
- b. Operate in a humidity range of 10–85% RH (non-condensing).

2.3 TYPE C1,C2,C3,C6,C7 EXTERIOR IP FIXED CAMERA DOME

A. General:

1. The camera shall:

- a. Be designed to provide at least two video streams in HDTV 1080p (1920x1080) at up to 30 frames per second (60Hz mode) or 25 frames per second (50Hz mode) using H.264 or Motion JPEG.
- b. Be equipped with Day/Night functionality and remote zoom and focus capabilities.
- c. Be equipped with integral infrared illumination.
- d. Operate on an open source; Linux-based platform, and including a built-in web server.
- e. Be equipped with a slot for SD/SDHC memory card expansion.
- f. Be manufactured with an all-metal body, support operation between -40 to $+131^\circ\text{F}$ and be both IP66 and NEMA 4X-rated.

B. Hardware:

1. The camera shall:

- a. Use a high quality IR-sensitive progressive scan sensor.

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- b. Be equipped with a removable IR-cut filter, providing so-called day/night functionality.
 - c. Be equipped with a high-quality varifocal lens, provide automated iris functionality with P-Iris control, and provide remote zoom and focus functionality.
 - d. Minimum illumination of 0.09 lux at 1/30 shutter, no sens up allowed. 0 lux with IR illumination.
 - e. Support memory expansion by providing an available SD/SDHC card slot.
- C. Video:
- 1. Resolution:
 - a. The camera shall be able to deliver at least two individually configurable full resolution full frame rate video streams over IP networks.
 - b. Supported video resolutions shall include:
 - 1) 1920 x1080.
 - 2) 1280x960.
 - c. The camera shall be able to provide both landscape format (4:3 and 16:9 aspect ratio) as well as corridor format (3:4 and 9:16 aspect ratio).
 - 2. Encoding:
 - a. The camera shall:
 - 1) Support Motion JPEG encoding in a selectable range up to 30 frames per second in all resolutions.
 - 2) Support Baseline Profile H.264 encoding with motion estimation in up to 30 frames per second in all resolutions.
 - 3) Support Main Profile H.264 encoding with motion estimation and context-adaptive binary arithmetic coding (CABAC) in up to 30 frames per second in all resolutions.
 - 4) Be able to provide independently configured simultaneous H.264 and Motion JPEG streams.
 - 5) Support both Constant Bit Rate (CBR) and Variable Bit Rate (VBR) in H.264.
 - 6) Provide configurable compression levels.
 - 3. Transmission:
 - a. The camera shall allow for video to be transported over:
 - 1) HTTP (Unicast).
 - 2) HTTPS (Unicast).
 - 3) RTP (Unicast & Multicast).
 - 4) RTP over RTSP (Unicast).
 - 5) RTP over RTSP over HTTP (Unicast).
 - b. The camera shall support Quality of Service (QoS) to be able to prioritize traffic.
 - 4. Image control:
 - a. Support a configurable maximum shutter in the range from 2 to 1/29.500 second in 60Hz mode and the range from 2 to 1/24.500 seconds in 50 Hz mode.
 - 1) Incorporate Automatic and Manual White Balance.

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- 2) Be equipped with an electronic shutter and support automatic and manually defined exposure zones.
- 3) Be equipped with Wide Dynamic Range functionality.
- 4) Support a configurable maximum shutter in the range from 2 to 1/29.500 second in 60Hz mode and the range from 2 to 1/24.500 seconds in 50 Hz mode.
- 5) Provide Back Light Compensation.
- 6) Allow for rotation of the image in steps of 90°.

D. Audio:

1. The camera shall support two-way full duplex audio:
 - a. Input sources:
 - 1) External microphone.
 - 2) External line device.
 - b. Output sources:
 - 1) External line device.
2. Encoding:
 - a. The camera shall support:
 - 1) AAC LC at 8/16 kHz.
 - 2) G.711 PCM at 8 kHz.
 - 3) G.726 ADPCM at 8 kHz.

E. Functionality:

1. Web server:
 - a. The camera shall contain a built-in web server making video and configuration available to multiple clients in a standard operating system and browser environment using HTTP, without the need for additional software.
 - b. Optional components downloaded from the camera for specific tasks, e.g. Active X, shall be signed by an organization providing digital trust services, such as Verisign, Inc.
2. IP addresses:
 - a. The camera shall support both fixed IP addresses and dynamically assigned IP addresses provided by a Dynamic Host Control Protocol (DHCP) server.
 - b. The camera shall allow for automatic detection of the Camera based on UPnP and Bonjour when using a PC with an operating system supporting this feature.
 - c. The camera shall provide support for both IPv4 and IPv6.
3. Event functionality:
 - a. The camera shall be equipped with an integrated event functionality, which can be triggered by:
 - 1) Video Motion Detection.
 - 2) Schedule.
 - 3) Camera tampering.

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- 4) Embedded third party applications.
- 5) External input.
- 6) Audio Detection.
- 7) Edge storage disruption detection.
- b. Response to triggers shall include:
 - 1) Notification, using TCP, SMTP or HTTP.
 - 2) Image upload, using FTP, SMTP or HTTP.
 - 3) Activating external output.
- c. The camera shall provide memory for pre & post alarm recordings.
- d. Event functions shall be configurable via the web interface.
4. Edge storage:
 - a. The camera shall support continuous and event controlled recording to:
 - 1) Local memory added to the cameras SD-card slot.
 - 2) Network attached storage, located on the local network.
 - b. The camera shall be able to detect and notify Edge storage disruptions.
5. Protocol support:
 - a. The camera shall incorporate support for at least IP, HTTP, HTTPS, SSL/TLS, TCP, ICMP, SNMPv1/v2c/v3 (MIB-II), RTSP, RTP, UDP, IGMP, RTCP, SMTP, FTP, DHCP, UPnP, ARP, DNS, DynDNS, SOCKS, NTP and Bonjour.
 - b. The SMTP implementation shall include support for SMTP authentication.
6. Text overlay:
 - a. The Camera shall:
 - 1) Provide embedded on-screen text with support for date and time, and a customer-specific text, camera name, of at least 45 ASCII characters.
 - 2) To ensure accuracy, the camera shall accept external time synchronization from an NTP (Network Time Protocol) server.
 - 3) Provide the ability to apply a privacy mask to the image.
 - 4) Allow for the overlay of a graphical image, such as a logotype, into the image.
7. Security:
 - a. The camera shall:
 - 1) Support the use of HTTPS and SSL/TLS, providing the ability to upload signed certificates to encrypt and secure authentication and communication of both administration data and video streams.
 - 2) Support IEEE 802.1X authentication.
 - 3) Provide support for restricting access to pre-defined IP addresses only, so-called IP address filtering.
 - 4) Restrict access to the built-in web server by usernames and passwords at three different levels.
8. API support:

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- a. The camera shall be fully supported by an open and published API (Application Programmers Interface), which shall provide necessary information for integration of functionality into third party applications.
 - b. The camera shall conform to ONVIF Profile S or ONVIF Version 1.01 or higher as defined by the ONVIF organization, and shall be upgradable at any time.
9. Embedded applications:
- a. The camera shall provide a platform allowing the upload of third party applications into the camera.
 - b. The camera vendor shall provide a compatibility tool for the application vendor to verify the stability and performance impact of their uploaded application.
10. Installation and Maintenance:
- a. The camera shall:
 - 1) Be supplied with Windows-based management software which allows the assignment of IP addresses, upgrade of firmware and backup of the Cameras' configuration.
 - 2) Support the use of SNMP-based management tools according to SNMP v1, 2c & 3 / MIB-II.
 - 3) Allow updates of the software (firmware) over the network, using FTP or HTTP.
 - 4) Provide the ability to apply a rectangle of customer-defined number of pixels to the image, which can be used as a pixel counter identifying the size of objects in number of pixels.
 - b. All customer-specific settings shall be stored in a non-volatile memory and shall not be lost during power cuts or soft reset.
11. User logs:
- a. The camera shall:
 - 1) Provide a log file, containing information about the 250 latest connections and access attempts since the unit's latest restart. The file shall include information about the connecting IP addresses and the time of connecting.
 - 2) Provide a connection list of all currently connected viewers. The file shall include information about connecting IP address, time of connecting and the type of stream accessed.

F. Camera diagnostics:

1. The camera shall:
 - a. Be equipped with LEDs, capable of providing visible status information. LEDs shall indicate the camera's operational status and provide information about power, communication with receiver, the network status and the camera status.
 - b. Be monitored by a Watchdog functionality, which shall automatically re-initiate processes or restart the unit if a malfunction is detected.

G. Interfaces:

1. Network interface:
 - a. The camera shall be equipped with one 100BASE-TX Fast Ethernet-port, using a standard RJ-45 socket and shall support auto negotiation of network speed (100 MBit/s and 10 MBit/s) and transfer mode (full and half duplex).
 - b. Audio: The camera shall be equipped with one 3.5 mm jack for line/mic input and one 3.5 mm jack for line output.
2. Inputs/Outputs:
 - a. The camera shall be equipped with one digital (alarm) input and one digital output, accessible via a removable terminal block. This input shall be configurable to respond to normally open (NO) or normally closed (NC) dry contacts.

H. Enclosure:

1. The camera enclosure shall include the following:
 - a. Manufactured with an all-metal vandal resistant body providing encapsulated electronics.
 - b. Clear and smoked transparent cover.
 - c. IP66-rating.
 - d. NEMA 4X-rating.
 - e. Impact resistance according to IK10.
 - f. Thermostat, heater and fan inside the enclosure.
 - g. Fitted with a dehumidifying membrane.
 - h. Removable weather shield.
2. The camera enclosure shall provide the ability to adjust the camera modules angle with at least $\pm 180^\circ$ horizontal, $\pm 85^\circ$ vertical and $\pm 170^\circ$ rotation while maintaining an image that is not interfered with by the camera housing.

I. Power requirements:

1. Power over Ethernet according to IEEE 802.3af - Class 2.

J. Environmental:

1. The camera shall:
 - a. Operate in a temperature range of -40°F to $+131^\circ\text{F}$.
 - b. Operate in a humidity range of 10–100% RH (condensing).

2.4 TYPE G1,G2,G3 INTERIOR FIXED MEGAPIXEL DOME CAMERA

A. General:

1. Be designed to provide a 4K ultra HD resolution using H.264 or Motion JPEG.
2. Provide non mechanical (moving) pan and tilt with a digital zoom.
3. Be manufactured with a tamper resistant body.

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4. Be equipped with integral infrared illumination.
- B. Hardware:
1. Use a high quality progressive scan sensor.
 2. Be fitted with a quality lens with fixed iris.
 3. Provide pictures down to 0.3 lux color, .04 black and white.) Lux with IR illuminator on.
 4. Support local memory by providing a microSD/microSDHC card slot.
 5. Video Resolution: The camera shall be able to deliver at least two individually configured full resolution video streams over IP networks.
 6. The camera shall provide support for the following resolutions:
 7. Resolution shall be scalable from CIF to Ultra HD 4K (3840 x 2160)
 8. Bandwidth configurable
- C. Encoding:
1. Support both Constant Bit Rate (CBR) and Variable Bit Rate (VBR) in H.264 and MPEG-4.
 2. Provide configurable compression levels.
 3. Support motion estimation in H.264/MPEG-4 Part 10/AVC.
- D. Transmission:
1. The camera shall allow for video to be transported over:
 - a. HTTP (Unicast).
 - b. HTTPS (Unicast).
 - c. RTP (Unicast & Multicast).
 - d. RTP over RTSP (Unicast).
 - e. RTP over RTSP over HTTP (Unicast).
 2. The camera shall support Quality of Service (QoS) to be able to prioritize traffic.
- E. Image control:
1. The camera shall incorporate an electronic shutter operating in the range 1 and 1/10000 second. Predefined modes for Prio low noise, Prio motion and Standard mode.
 2. The camera shall incorporate Automatic and Manual White Balance.
 3. The camera shall support automatic and manually defined exposure zones.
 4. The camera shall incorporate Wide Dynamic Range functionality - Dynamic Contrast.
 5. The camera shall provide backlight compensation.
 6. The camera shall support manually defined values for:
 - a. Color level.
 - b. Brightness.

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- c. Sharpness.
- d. Contrast.
- 7. The camera shall incorporate a function for optimization of low light behavior.
- F. Web server:
 - 1. The camera shall contain a built-in web server making video and configuration available to multiple clients in a standard operating system and browser environment using HTTP, without the need for additional software.
 - 2. Optional components downloaded from the camera for specific tasks, e.g. Active X, shall be signed by an organization providing digital trust services, such as Verisign, Inc.
- G. IP addresses:
 - 1. The camera shall support both fixed IP addresses and dynamically assigned IP addresses provided by a Dynamic Host Control Protocol (DHCP) server.
 - 2. The camera shall allow for automatic detection of the Camera based on UPnP and Bonjour when using a PC with an operating system supporting this feature.
 - 3. The camera shall provide support for both IPv4 and IPv6.
- H. PTZ functionality:
 - 1. The camera shall provide non mechanical PTZ functionality (no moving parts).
 - 2. The camera shall provide 180° rotation.
 - 3. The camera shall incorporate digital zoom.
 - 4. The camera shall reach selected position within 0.1 second.
 - 5. The camera shall provide at least 100 preset positions.
 - 6. The camera shall provide a guard tour functionality which allow the camera to automatically move between selected presets using an individual speed and viewing time for each preset.
- I. Event functionality:
 - 1. The camera shall be equipped with an integrated event functionality, which can be triggered by:
 - a. Video Motion Detection.
 - b. Schedule.
 - c. Camera tampering.
 - d. Embedded third party applications.
 - e. Edge storage disruption detection.
 - f. PTZ functionality.
 - 2. Response to triggers shall include:
 - a. Notification, using TCP, SMTP or HTTP.
 - b. Image upload, using FTP, SMTP or HTTP.

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- c. Recording to local storage or network shared storage.
 - d. Go to Preset positions.
 3. The camera shall provide memory for pre & post alarm recordings.
 4. Event functions shall be configurable via the web interface.
- J. Edge storage:
1. The camera shall support continuous and event controlled recording to:
 - a. Local memory added to the cameras SD-card slot.
 - b. Network attached storage, located on the local network.
 2. The camera shall be able to detect and notify Edge storage disruptions.
 3. Protocol support.
 4. The camera shall incorporate support for at least IP, HTTP, HTTPS, SSL/TLS, TCP, ICMP, SNMPv1/v2c/v3 (MIB-II), RTSP, RTP, UDP, IGMP, RTCP, SMTP, FTP, DHCP, UPnP, ARP, DNS, DynDNS, SOCKS, NTP, CIFS/SMB and Bonjour.
 5. The SMTP implementation shall include support for SMTP authentication.
- K. Text overlay:
1. Provide embedded on-screen text with support for date and time, and a customer-specific text, camera name, of at least 45 ASCII characters.
 2. To ensure accuracy, the camera shall accept external time synchronization from an NTP (Network Time Protocol) server.
 3. Provide the ability to apply a privacy mask to the image.
 4. Allow for the overlay of a graphical image, such as a logotype, into the image.
- L. Security:
1. Support the use of HTTPS and SSL/TLS, providing the ability to upload signed certificates to encrypt and secure authentication and communication of both administration data and video streams.
 2. Support IEEE 802.1X authentication.
 3. Provide support for restricting access to pre-defined IP addresses only, so-called IP address filtering.
 4. Restrict access to the built-in web server by usernames and passwords at three different levels.
- M. API support:
1. The camera shall be fully supported by an open and published API (Application Programmers Interface), which shall provide necessary information for integration of functionality into third party applications.
 2. The camera shall conform to ONVIF Profile S or ONVIF Version 1.01 or higher as defined by the ONVIF organization, and shall be upgradable at any time.

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N. Embedded applications:

1. The camera shall provide a platform allowing the upload of third party applications into the camera.
2. The camera vendor shall provide a compatibility tool for the application vendor to verify the stability and performance impact of their uploaded application.

O. Installation and Maintenance:

1. Be supplied with Windows-based management software which allows the assignment of IP addresses, upgrade of firmware and backup of the Cameras' configuration.
2. Support the use of SNMP-based management tools according to SNMP v1, 2c & 3 / MIB-II.
3. Allow updates of the software (firmware) over the network, using FTP or HTTP.
4. Provide the ability to apply a rectangle of customer-defined number of pixels to the image, which can be used as a pixel counter identifying the size of objects in number of pixels.
5. All customer-specific settings shall be stored in a non-volatile memory and shall not be lost during power cuts or soft reset.

P. Access logs:

1. Provide a log file, containing information about the 250 latest connections and access attempts since the unit's latest restart. The file shall include information about the connecting IP addresses and the time of connecting.
2. Provide a connection list of all currently connected viewers. The file shall include information about connecting IP address, time of connecting and the type of stream accessed.

Q. Camera diagnostics:

1. Be equipped with LEDs, capable of providing visible status information. LEDs shall indicate the camera's operational status and provide information about power, communication with receiver, the network status and the camera status.
2. Be monitored by a Watchdog functionality, which shall automatically re-initiate processes or restart the unit if a malfunction is detected.

R. Network interface:

1. The camera shall be equipped with one 100BASE-TX Fast Ethernet-port, using a standard male RJ-45 connector and shall support auto negotiation of network speed (100 MBit/s and 10 MBit/s) and transfer mode (full and half duplex).

S. Enclosure:

1. The camera enclosure shall include the following:
 - a. Manufactured with a tamper resistant body.
 - b. Power requirements.
 - c. Power over Ethernet according to IEEE 802.3af - Class2.

T. Environmental:

1. Operate in a temperature range of 32 °F to +113 °F).

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WARNING: This record contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this record may be disclosed to persons without a "need to know", as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator or the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For U.S. government agencies, public disclosure is governed by 5 U.S.C. 552 and 49 CFR parts 15 and 1520.

2. Operate in a humidity range of 15–85% RH (non-condensing).

2.5 TYPE B1,B2,B3 INTERIOR IP PTZ DOME CAMERA

A. General:

1. Be designed to provide individually configured video streams in HDTV 1080p (1920x1080) resolution at 30/25 frames per second using H.264.
2. Be equipped with Day/Night functionality, provide high speed pan and tilt functions and be equipped with 20x optical and 12x digital zoom.
3. Operate on an open source; Linux-based platform, and including a built-in web server.
4. Be equipped with a slot for SD/SDHC memory card expansion.
5. Be manufactured IK10 rated.
6. Utilize Power over Ethernet.
7. Utilize a separate power injector allowing the camera and heater/fan functions to be powered over the network cable.

B. Hardware:

1. Use a high quality IR-sensitive progressive scan sensor.
2. Be equipped with an automatically and manually removable IR-cut filter, providing so-called day/night functionality.
3. Be equipped with a high quality F1.6 – F3.5 DC-iris lens with motorized 20x optical zoom.
4. Provide pictures down to 0.8 lux at F1.6 while in day mode (with IR-filter in use) and down to 0.04 lux at F1.6 while in night mode (with IR-filter removed).
5. Be equipped with accurate high-speed pan-tilt functionality with 360° endless pan range and a 220° tilt range.
6. Provide pan and tilt speed between 0.05° - 450°/sec.
7. Support memory expansion by providing an available SD/SDHC card slot.
8. Resolution: The camera shall be able to deliver at least two individually configurable full resolution full frame rate video streams over IP networks.
9. Supported resolutions shall include:
 - a. HDTV 1080p (1920x1080).
 - b. HDTV 720p (1280x720).

C. Encoding:

1. Support Motion JPEG encoding in a selectable range from 1 up to 30/25 frames per second in all resolutions.
2. Support H.264 encoding in a selectable range from 1 up to 30/25 frames per second in all resolutions.
3. Be able to provide independently configured simultaneous H.264 and Motion JPEG streams.

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4. Support both Constant Bit Rate (CBR) and Variable Bit Rate (VBR) in H.264.
 5. Provide configurable compression levels.
 6. Support motion estimation in H.264.
- D. Transmission:
1. The camera shall allow for video to be transported over:
 - a. HTTP (Unicast).
 - b. HTTPS (Unicast).
 - c. RTP (Unicast & Multicast).
 - d. RTP over RTSP (Unicast).
 - e. RTP over RTSP over HTTP (Unicast).
 2. The camera shall support Quality of Service (QoS) to be able to prioritize traffic.
- E. Image control:
1. Incorporate Automatic and Manual White Balance.
 2. Be equipped with an electronic shutter and support automatic and manually defined exposure zones operating in the range 1/4 and 1/30.000 second.
 3. Be equipped with Wide Dynamic Range functionality.
 4. Provide Back Light Compensation.
 5. Allow for rotation of the image.
- F. Web server:
1. The camera shall contain a built-in web server making video and configuration available to multiple clients in a standard operating system and browser environment using HTTP, without the need for additional software.
 2. Optional components downloaded from the camera for specific tasks, e.g. Active X, shall be signed by an organization providing digital trust services, such as Verisign, Inc.
- G. IP addresses:
1. The camera shall support both fixed IP addresses and dynamically assigned IP addresses provided by a Dynamic Host Control Protocol (DHCP) server.
 2. The camera shall allow for automatic detection of the Camera based on UPnP and Bonjour when using a PC with an operating system supporting this feature.
 3. The camera shall provide support for both IPv4 and IPv6.
- H. PTZ functionality:
1. Provide at least 100 preset positions.
 2. Provide e-flip functionality, which will automatically rotate the image 180° electronically when following a moving object passing under the camera.

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3. Provide a guard tour functionality which allows the dome to automatically move between selected presets using an individual speed and viewing time for each preset.
 4. Be able to record a custom PTZ tour, operated using an input device such as a joystick, mouse or keyboard, and then use and recall this as a guard tour.
 5. Be able to detect and automatically follow moving objects in the cameras field of view.
- I. Event functionality:
1. The camera shall be equipped with an integrated event functionality, which can be triggered by:
 - a. Video Motion Detection.
 - b. Fan malfunction.
 - c. Camera temperature outside operative range.
 - d. PTZ position.
 - e. Schedule.
 - f. Local storage full.
 2. Response to triggers shall include:
 - a. Notification, using TCP, SMTP or HTTP.
 - b. Image upload, using FTP, SMTP or HTTP.
 - c. Preset call up.
 - d. Guard Tour activation.
 - e. Recording to local storage.
 3. The camera shall provide memory for pre & post alarm recordings.
 4. Event functions shall be configurable via the web interface.
 5. The camera shall hold a so called 'Gatekeeper' functionality, whereby the camera will pan, tilt and zoom into a predefined position and then automatically return to its previous position when motion is detected in the scene.
- J. Protocol support:
1. The camera shall incorporate support for at least IP, HTTP, HTTPS, SSL/TLS, TCP, ICMP, SNMPv1/v2c/v3 (MIB-II), RTSP, RTP, UDP, IGMP, RTCP, SMTP, FTP, DHCP, UPnP, ARP, DNS, DynDNS, SOCKS, NTP and Bonjour.
 2. The SMTP implementation shall include support for SMTP authentication.
- K. Text overlay:
1. Provide embedded on-screen text with support for date & time, and a customer-specific text, camera name, of at least 45 ASCII characters.
 2. To ensure accuracy, the camera shall accept external time synchronization from an NTP (Network Time Protocol) server.

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3. Provide 8 individually configurable privacy masks to conceal defined areas in the image as non-viewable. These masks shall be dynamically adjusted based on current zoom-factor, and not be able to bypass.
4. Allow for the overlay of a graphical image, such as a logotype, into the image.

L. Security:

1. Support the use of HTTPS and SSL/TLS, providing the ability to upload signed certificates to encrypt and secure authentication and communication of both administration data and video streams.
2. Support IEEE 802.1X authentication.
3. Provide support for restricting access to pre-defined IP addresses only, so-called IP address filtering.
4. Restrict access to the built-in web server by usernames and passwords at three different levels.

M. API support:

1. The camera shall be fully supported by an open and published API (Application Programmers Interface), which shall provide necessary information for integration of functionality into third party applications.
2. The camera shall conform to the network video standard as defined by the ONVIF organization.

N. Installation and Maintenance:

1. Be supplied with Windows-based management software, which allows the assignment of IP addresses, upgrade of firmware and backup of the Cameras' configuration.
2. Support the use of SNMP-based management tools according to SNMP v1, 2c & 3 / MIB-II.
3. Allow updates of the software (firmware) over the network, using FTP or HTTP.
4. All customer-specific settings shall be stored in a non-volatile memory and shall not be lost during power cuts or soft reset.

O. User logs:

1. Provide a log file, containing information about the 250 latest connections and access attempts since the unit's latest restart. The file shall include information about the connecting IP addresses and the time of connecting.
2. Provide a connection list of all currently connected viewers. The file shall include information about connecting IP address, time of connecting and the type of stream accessed.

P. Camera diagnostics:

1. Be equipped with an LED, indicating the camera's functional status.
2. Be monitored by a Watchdog functionality, which shall automatically re-initiate processes or restart the unit if a malfunction is detected.

Q. Interfaces:

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1. The camera shall be equipped with one 100BASE-TX Fast Ethernet-port, using a standard RJ-45 socket and shall support auto negotiation of network speed (100 MBit/s and 10 MBit/s) and transfer mode (full and half duplex).
- R. Enclosure:
 1. Clear and smoked transparent cover.
 2. IK-10 rated.
- S. Power requirements:
 1. PoE IEE 802.3af.
- T. Environmental:
 1. Operate in a temperature range of 32°F to +122°F.
 2. Operate in a humidity range of 20–80% RH (non-condensing).

2.6 TYPE D3,D5,D6,D7 EXTERIOR IP PTZ DOME CAMERA

- A. General:
 1. Be designed to provide individually configured video streams in HDTV 1080p (1920x1080) resolution at 30/25 frames per second using H.264.
 2. Be equipped with integrated infrared illumination.
 3. Be equipped with Day/Night functionality, provide high speed pan and tilt functions and be equipped with 20x optical and 12x digital zoom.
 4. Operate on an open source; Linux-based platform, and including a built-in web server.
 5. Be equipped with a slot for SD/SDHC memory card expansion.
 6. Be manufactured with an all-metal body, support operation down to -40°F and be both IP66 and NEMA 4X-rated.
 7. Utilize Power over Ethernet.
 8. Utilize a separate power injector allowing the camera and heater/fan functions to be powered over the network cable.
- B. Hardware:
 1. Use a high quality IR-sensitive progressive scan sensor.
 2. Be equipped with an automatically and manually removable IR-cut filter, providing so-called day/night functionality.
 3. Be equipped with a high quality F1.6 – F3.5 DC-iris lens with motorized 20x optical zoom.
 4. Minimum illumination of 0.09 lux at 1/30 shutter, no sens up allowed. 0 lux with IR illumination.
 5. Be equipped with accurate high-speed pan-tilt functionality with 360° endless pan range and a 220° tilt range.
 6. Provide pan and tilt speed between 0.05° - 450°/sec.

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7. Support memory expansion by providing an available SD/SDHC card slot.
 8. Resolution: The camera shall be able to deliver at least two individually configurable full resolution full frame rate video streams over IP networks.
 9. Supported resolutions shall include:
 - a. HDTV 1080p (1920x1080).
 - b. HDTV 720p (1280x720).
- C. Encoding:
1. Support Motion JPEG encoding in a selectable range from 1 up to 30/25 frames per second in all resolutions.
 2. Support H.264 encoding in a selectable range from 1 up to 30/25 frames per second in all resolutions.
 3. Be able to provide independently configured simultaneous H.264 and Motion JPEG streams.
 4. Support both Constant Bit Rate (CBR) and Variable Bit Rate (VBR) in H.264.
 5. Provide configurable compression levels.
 6. Support motion estimation in H.264.
- D. Transmission:
1. The camera shall allow for video to be transported over:
 - a. HTTP (Unicast).
 - b. HTTPS (Unicast).
 - c. RTP (Unicast & Multicast).
 - d. RTP over RTSP (Unicast).
 - e. RTP over RTSP over HTTP (Unicast).
 2. The camera shall support Quality of Service (QoS) to be able to prioritize traffic.
- E. Image control:
1. Incorporate Automatic and Manual White Balance.
 2. Be equipped with an electronic shutter and support automatic and manually defined exposure zones operating in the range 1/4 and 1/30.000 second.
 3. Be equipped with Wide Dynamic Range functionality.
 4. Provide Back Light Compensation.
 5. Allow for rotation of the image.
- F. Web server:
1. The camera shall contain a built-in web server making video and configuration available to multiple clients in a standard operating system and browser environment using HTTP, without the need for additional software.

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2. Optional components downloaded from the camera for specific tasks, e.g. Active X, shall be signed by an organization providing digital trust services, such as Verisign, Inc.

G. IP addresses:

1. The camera shall support both fixed IP addresses and dynamically assigned IP addresses provided by a Dynamic Host Control Protocol (DHCP) server.
2. The camera shall allow for automatic detection of the Camera based on UPnP and Bonjour when using a PC with an operating system supporting this feature.
3. The camera shall provide support for both IPv4 and IPv6.

H. PTZ functionality:

1. Provide at least 100 preset positions.
2. Provide e-flip functionality, which will automatically rotate the image 180° electronically when following a moving object passing under the camera.
3. Provide a guard tour functionality which allows the dome to automatically move between selected presets using an individual speed and viewing time for each preset.
4. Be able to record a custom PTZ tour, operated using an input device such as a joystick, mouse or keyboard, and then use and recall this as a guard tour.
5. Be able to detect and automatically follow moving objects in the cameras field of view.

I. Event functionality:

1. The camera shall be equipped with an integrated event functionality, which can be triggered by:
 - a. Video Motion Detection.
 - b. Fan malfunction.
 - c. Camera temperature outside operative range.
 - d. PTZ position.
 - e. Schedule.
 - f. Local storage full.
2. Response to triggers shall include:
 - a. Notification, using TCP, SMTP or HTTP.
 - b. Image upload, using FTP, SMTP or HTTP.
 - c. Preset call up.
 - d. Guard Tour activation.
 - e. Recording to local storage.
3. The camera shall provide memory for pre & post alarm recordings.
4. Event functions shall be configurable via the web interface.

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5. The camera shall hold a so called 'Gatekeeper' functionality, whereby the camera will pan, tilt and zoom into a predefined position and then automatically return to its previous position when motion is detected in the scene.
- J. Protocol support:
1. The camera shall incorporate support for at least IP, HTTP, HTTPS, SSL/TLS, TCP, ICMP, SNMPv1/v2c/v3 (MIB-II), RTSP, RTP, UDP, IGMP, RTCP, SMTP, FTP, DHCP, UPnP, ARP, DNS, DynDNS, SOCKS, NTP and Bonjour.
 2. The SMTP implementation shall include support for SMTP authentication.
- K. Text overlay:
1. Provide embedded on-screen text with support for date & time, and a customer-specific text, camera name, of at least 45 ASCII characters.
 2. To ensure accuracy, the camera shall accept external time synchronization from an NTP (Network Time Protocol) server.
 3. Provide 8 individually configurable privacy masks to conceal defined areas in the image as non-viewable. These masks shall be dynamically adjusted based on current zoom-factor, and not be able to bypass.
 4. Allow for the overlay of a graphical image, such as a logotype, into the image.
- L. Security:
1. Support the use of HTTPS and SSL/TLS, providing the ability to upload signed certificates to encrypt and secure authentication and communication of both administration data and video streams.
 2. Support IEEE 802.1X authentication.
 3. Provide support for restricting access to pre-defined IP addresses only, so-called IP address filtering.
 4. Restrict access to the built-in web server by usernames and passwords at three different levels.
- M. API support:
1. The camera shall be fully supported by an open and published API (Application Programmers Interface), which shall provide necessary information for integration of functionality into third party applications.
 2. The camera shall conform to the network video standard as defined by the ONVIF organization.
- N. Installation and Maintenance:
1. Be supplied with Windows-based management software, which allows the assignment of IP addresses, upgrade of firmware and backup of the Cameras' configuration.
 2. Support the use of SNMP-based management tools according to SNMP v1, 2c & 3 / MIB-II.
 3. Allow updates of the software (firmware) over the network, using FTP or HTTP.

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4. All customer-specific settings shall be stored in a non-volatile memory and shall not be lost during power cuts or soft reset.
- O. User logs:
 1. Provide a log file, containing information about the 250 latest connections and access attempts since the unit's latest restart. The file shall include information about the connecting IP addresses and the time of connecting.
 2. Provide a connection list of all currently connected viewers. The file shall include information about connecting IP address, time of connecting and the type of stream accessed.
- P. Camera diagnostics:
 1. Be equipped with an LED, indicating the camera's functional status.
 2. Be monitored by a Watchdog functionality, which shall automatically re-initiate processes or restart the unit if a malfunction is detected.
- Q. Interfaces:
 1. The camera shall be equipped with one 100BASE-TX Fast Ethernet-port, using a standard RJ-45 socket and shall support auto negotiation of network speed (100 MBit/s and 10 MBit/s) and transfer mode (full and half duplex).
- R. Enclosure:
 1. Manufactured with an all-metal body.
 2. Clear and smoked transparent cover.
 3. IP66-rating.
 4. NEMA 4X-rating.
 5. Temperature and humidity sensors, heater and fans inside the enclosure.
 6. Removable sunshield.
- S. Power requirements:
 1. 74W High PoE+ from a separate power injector. 100-240 VAC/50-60 Hz supplied to high PoE power injector.
- T. Environmental:
 1. Operate in a temperature range of -40°F to +122°F.
 2. Operate in a humidity range of 20–80% RH (non-condensing).
 3. Be equipped with Arctic Temperature Control, allowing camera start-up at temperatures down to -40°F.

2.7 POWER OVER ETHERNET MIDSPANS

- A. 1 port High PoE Midspan for data and power over Cat 6 cable.
- B. Data Rate/ 10/100/1000 Mbps.
- C. Connector: Shielded RJ-45, EID 568A and B.

- D. Wattage 30 watt or 60 watt as required for exterior fixed or PTZ IP cameras.
- E. Compliance: RoHS, WEEE, CE, IEEE 802.3af, IEEE802.3at.
- F. Plug and play installation, auto detect poe and high poe devices.
- G. 120VAC, 60Hz power supply.
- H. Provide surge suppression module, integral or separate unit.
- I. Manufacturers: Axis T8123/8124 or approved equivalent..

2.8 CAMERA POWER SUPPLY

- A. Although IP cameras with POE capability are preferred for interior cameras, if necessary for interior cameras and as required for all exterior cameras, 24/28 VAC output individually fused camera power supplies shall be provided for Network IP cameras with PTZ capabilities. Camera power supplies shall be UL listed 24/28-volt units.
- B. Low voltage outputs shall have automatically resetting over current protection devices. Each output shall be electrically isolated from other outputs on the supply.
- C. Each camera power supply shall be connected to a 120 VAC, 60Hz circuit.
- D. Provide 4, 8 and 16 output power supplies as required for each location. Individual, plug-in type power supplies shall not be acceptable.
- E. The power supplies shall also contain Transient Voltage Surge Suppression with a response time of less than 1 nanosecond, peak pulse current 60A, and the failure of surge suppression capabilities will result in open circuit to indicate module needs replacing.

2.9 CAMERA INTERFACE BOXES

- A. Enclosure: 16”H x 12”W x 6” Deep, Type 4X, IP66, 14 gauge Stainless steel.
- B. Removable door with continuous hinge, gasketing.
- C. Hasp and staple for pad locking.
- D. Stainless steel door clamp assemblies.
- E. Grounding lug, bonding provision on door.
- F. Data pocket on door.
- G. Terminal block kit.

2.10 USB JOYSTICK CONTROLLER

- A. The USB Joystick device shall allow the workstation operator to control Fixed and PTZ cameras using non-proprietary USB joystick control.
- B. Shall be desktop model with full joystick control of PTZ functions.
- C. The USB Joystick device shall meet the following minimum specifications:
 - 1. Keyboard interface – USB 2.0.
 - 2. Cable – USB, captive, 16 ft (minimum).
 - 3. Keyboard – 12 key keypad, camera, monitor and multiple view keys minimum.

4. Joystick – Fully proportional pan/tilt, variable speed joystick with keys for lens iris and focus control. The barrel-type joystick shall provide precise pan and tilt control of fixed speed and variable speed positioning systems and twisting the joystick shall zoom the lens in and out.
 5. Jog/Shuttle – Proportional, fast forward, reverse, and video transport.
- D. Provide power supply, as required.

2.11 FIBER OPTIC TO COPPER ETHERNET MEDIA CONVERTERS

- A. 1 duplex channel two way data transmission over one or two fibers.
- B. 100Base –TX (RJ-45) to 100 Base-FX 850nm or 1310nm multi-mode.
- C. Link budget 13 dB up to 11 miles.
- D. IEEE Standard 802.3.
- E. Switch selectable crossover, automatic polarity correction, Auto negotiation, autocross, link pass through, automatic link restoration, field upgradable firmware
- F. Provide power supply except where installed in a rack mounted chassis where power supply is integral to the chassis.
- G. Ethernet media converters shall be either chassis mount or rack mounted in Telecommunication Rooms and wall/surface mount where installed in Camera Interface Boxes.
- H. Provided chassis based where multiple units are provided.
- I. Manufacturer: IFS or approved equivalent.

2.12 VIDEO DIGITAL DISPLAY CONTROLLER (DDC)

- A. The DDC shall support any digital video stream on the network and allow for the decoding of up to 32 simultaneous streams from any video encoder or recorder. It shall also allow for simultaneous and independent viewing of both live and recorded video.
- B. The DDC shall decode MPEG-4 and H.264 baseline, main, and high profile encoded video streams.
- C. The DDC shall decode up to twelve H.264 baseline, 1920 x 1080 resolution, 30 ips video streams simultaneously.
- D. The DDC shall drive two high-resolution monitors through DVI or HDMI connections for displaying the video footage.
- E. Diagnostics shall be systemized with other system components. Any faults shall be reported to users that have subscribed to diagnostic alarms regardless of where the user is located. In addition, the DDC shall also support SNMP messages and traps and be compatible with SNMP versions 1 and 2.
- F. Video System Specifications:
 1. Maximum Resolution: 2560 x 1600 resolution; 60 Hz (NTSC).
 2. Video Coding: MPEG-4 and H.264 baseline, main, and high profiles.
 3. Decoding Performance: 12X real-time H.264 baseline streams at 1920 x 1080 (NTSC/PAL).

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4. Video Outputs/Connector Types: 2 DVI or HDMI outputs with required cables and connectors to monitor.
5. Screen Configurations: 1 image (1 x 1), 4 images (2 x 2), 9 images (3 x 3), 16 images (4 x 4), 6 images (1 large + 5 small), 10 images (2 large + 8 small), 13 images (1 large + 8 small); Each high definition monitor (16:9 aspect ratio) can also display 6 images (3 x 2) and 12 images (4 x 3).
6. Network Specifications Interface: 1, Ethernet RJ-45 port (10/100Base-T).
7. Power: 120VAC with power cord.

2.13 VSS MONITORING LCD/LED DISPLAYS:

- A. Display Diagonal Sizes: 46"; refer to drawings for sizes and locations.
- B. Aspect Ratio: 16:9.
- C. LED or LED/LCD Technology.
- D. Colors --- 16.7 million.
- E. 1920 x 1080p @ 60Hz (Analog / Digital) Minimum native resolution.
- F. Minimum 8 ms Display Response Time.
- G. Designed for 24/7 operational use.
- H. Closed Caption Decoder.
- I. Minimum Viewing Angle: Horizontal: 178°, Vertical: 178° Minimum Viewing Angle.
- J. Anti-Glare, Anti-Reflective screen treatment.
- K. Operating Temperature --- 0° to 35°C (32° to 95°F).
- L. Operating Humidity --- 20% to 90%, non condensing.
- M. Power Save mode.
- N. Power Timer.
- O. Internal Power Supply.
- P. 120V, 60Hz Power Requirements.
- Q. System management and control via RS-232 or Ethernet LAN.
- R. Formats Supported: HDTV Formats 1920 x 1080, 1080p Minimum, NTSC, ATSC, VESA type graphics, up to 1920x1200 (WUXGA) minimum.
- S. Analog Video inputs: RGBHV on 75-Ohm BNC (and/or) PC Video Input Analog HD15, Component Video (Y/Pb/Pr) Input, Composite Video Input.
- T. Digital Video inputs: (2)HDMI HDCP Compliant, (v) 1.3b compliant or later, (1) DVI.
- U. Control inputs: Ethernet/TCP-IP (RJ-45), RS232, Infrared.
- V. Accessories: User's Manual, power cord, wireless remote control and remote mouse receiver with batteries.

- W. Provide VESA wall mounted bracket unless otherwise noted with tilt adjustment: +5 ° -15 °. Weight Capacity shall be rated twice complete display (including speakers) weight. When ceiling pipe mounted, provide 25 ° tilt adjustment.

2.14 VSS PRINTERS

- A. Color Laser Printer:
1. Resolution: 1200 x 600 dpi.
 2. Speed: Up to 30 ppm (Color and B&W).
 3. Monthly duty cycle: Up to 75,000 pages.
 4. Paper trays: 3.
 5. 1024MB Memory.
 6. Capacity: Minimum 500 sheets.
 7. Network Ready: 100/1000 Base-TX Ethernet embedded print server.
 8. Additional Hi-Speed USB 2.0 port.

2.15 DATA GRADE SURGE ARRESTOR

- A. DIN Rail mountable.
- B. RJ45 socket input/output.
- C. Earthing by DIN rail.
- D. Protection on all pins.
- E. Minimum rated continuous current: 0.5A.
- F. DC Breakdown Voltage: <60 VDC.
- G. Minimum Response Time: 1ns.
- H. Maximum Surge Current Capacity: 10kA 8/20 micro second wire-wire.
- I. Allow for passage of power over Ethernet 802.3af.
- J. Rated for transmission of Cat 6 1000BASE-T data.

2.16 VSS VIDEO MANAGEMENT SOFTWARE(VMS)

- A. Provide additional Verint Nextiva V6.3 server VMS software for video, database and management servers in the North Terminal where required. Provide latest version software compatible with existing South Terminal Airport installed Verint Nextiva VMS software. Provide Verint Nextiva V6.3 client VMS software for VSS computer workstations in the North Terminal where required.
- B. Provide camera programming for the additional cameras as part of this project for the Verint VMS and NICE PSIM. Provide all software licenses required for the additional cameras. Configuration of the NT and site cameras shall be configured into a separate device tree in the VMS software from the existing South Terminal cameras.

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- C. Provide camera programming for the decommissioning of any removed cameras from the South Terminal for the Verint VMS as part of this project. Coordinate all work with the Airport maintenance provider and Airport IT/Security department.
- D. The system shall be based on open architecture software and shall allow the use of any industry standard computer hardware, LAN hardware, and data storage equipment (non-proprietary hardware). Systems requiring the use of proprietary hardware shall not be acceptable.
- E. The system shall be an entirely plug-and-play IP/Ethernet based system which shall allow the display of live video streams, the recording and playback of digital video streams from multiple video surveillance IP cameras simultaneously on the System's operator console and/or on clients. Clients may include selected workstations, laptops, or other devices on the Airport network.
- F. The system shall provide the capability to integrate IP fixed and PTZ cameras, video encoders, and management and storage servers on a standard IP/Ethernet network.
- G. The system shall operate Commercial Off-The-Shelf (COTS) hardware and on industry standard server operating system with all the controls done via keyboard and mouse
- H. The software installed in both servers and workstations shall be similar in Graphical User Interface, therefore, an operator shall need to learn only one interface for both control and programming of the system and functions, offering the ability to remotely configure most system components from any recorder or workstation.
- I. The recorder shall also offer a full multi-user authorization logon application. This application shall offer levels of authorization based on defined sites and functions. In addition, a full setup utility shall be available for the Administrator to configure authorizations. The login window shall consist of a User Name and Password field. The software shall offer a full multi-user authorization process as follows:
 - 1. User groups shall be created once globally and shall appear in all recorders and workstations connected to the network.
 - 2. Users shall be created once globally and shall be given rights to particular groups.
 - 3. Groups shall be authorized and given specific access to each unit, permitting "function-specific" profiles.
 - 4. Users created and authorized for each machine shall be able to login to any recorder and workstation and automatically have their group rights for that machine follow them.
 - 5. There shall be no virtual limit on the amount of Groups and Users that can be authorized in the software.
 - 6. The recorder shall allow for each group to be authorized or denied access, per component, to: Login, Logout, Setup: Network & Site Name, User and Group Management, Site Authorization, Auto Login, Macro Create-Edit, Alarm Setup, Authentication Settings, Device Setup, Pre & Post Alarm Times, Storage Database Utilities, Auto Record, Exit to OS, RS-232 Setup, Priority Setup, Registration Setup, Manual Record Setup, Scheduler for Macros(multiple actions), Reports, Scheduler/Macro, Shutdown/Close, Record, Stop, Change Quality, Picture Export and Print, Control PTZ, Live View, Playback Recorded Images, Edit Camera titles, Define Alarm conditions, System reports, Relay Operation, and Alarms Functions.

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J. Workstation Graphical User Interface Software:

1. The Graphical User Interface (GUI) shall provide a multi-channel display area containing access to a listing of all connected cameras, Site and terminal maps and device tree, a navigator window, a control dialog display area, a toolbar, a display mode control area, a function control area, a video display controls area and other image controls area. Each area shall contain the necessary controls to operate and setup the system.

a. The Main Window shall provide the following:

- 1) Site and Device Tree depicting each recorder with all connected cameras, visually differentiating between PTZ and fixed cameras by either icons or camera tags.
- 2) A multi-screen display area that allows for screen displays of a Single camera, Quad, 3x3, 4x4, and Full screen of any of the above selected multi-screen displays. The main window shall be capable of spanning multiple monitors through the use of multiple display cards per workstation.

K. Shall have the ability to view, record, playback and archive video from cameras located at remote locations over the IP network. (Multi-location recordings).

L. Shall provide the capability to record audio with the associated camera, when audio recording is necessary and the camera has audio feature supported by the software.

M. Shall allow time synchronized multiple cameras view/playback.

N. Shall provide a tamper-proof log file on user's activity in the system using encryption and integrity check.

O. Shall be scalable to support an unlimited number of cameras with multiple servers.

P. Shall provide 24 hours scheduler to activate and deactivate the following features on a per camera basis:

1. Bring cameras on/off line.
2. Sound audible alarm on motion detection in camera's field of view.
3. Send e-mail/text, pager notification on motion detection events with/without video image attachment.
4. Start/stop and change patrolling sequence for PTZ cameras.

Q. Software shall have an advanced motion detection capabilities with the functions as described below. The administrator shall have the ability to use one, several or any non-conflicting combinations of the following functions, on a per camera basis:

1. Pre-recording images up to 999 seconds (User defined) before a motion is detected in the cameras field of view and continue recording for up to 999 seconds (user defined) after the motion stopped in the cameras field of view.
2. Adjustments of motion level sensitivity from 0 –10,000 units in 1 unit increments.
3. Up to 1024 inclusion / exclusion motion detection zones per camera.
4. Change recorded frame rate when motion is detected.
5. Annunciate motion as an event or alarm on the operator's workstation on a time schedule basis.

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- R. The system shall monitor camera video and provide alerts for the following malicious acts:
 - 1. Camera masking – attempts to ‘cover up’ the camera view either by painting the lens or covering the camera fixture with a bag or blanket.
 - 2. Blinding – use of a bright light source or laser aimed directly into the camera lens.
 - 3. Signal cut – interruption of the camera signal cable.
 - 4. Power cut – interruption of AC or DC power to the camera.
- S. Shall simultaneously record, playback and display live video (Triplex), and shall provide the capability to include audio.
- T. Shall have the ability to record and store images at rates between 1 frame per hour to 30 frames per second on a per camera basis, dynamically configurable based upon user parameters.
- U. Shall have the ability to store the recorded images on Storage Area Network (SAN) and shall not be limited by partition or drive size.
- V. Shall be able to perform multiple archiving per day.
- W. Shall have the option to start recording on an event setup by the operator/administrator.
- X. Shall have the option to increase the recording FPS on motion detection, on event detection or operator command.
- Y. Shall have the ability to adjust image resolution up to 2,048 x 1,536 on a per camera basis. The frame rate and recording duration shall be individually adjustable for each camera.
- Z. Shall have the ability to adjust the compression level of the video image data size, to save on storage size, when needed.
- AA. Shall allow operator to select the controlled display monitor by mouse click or touch screen.
- BB. Shall allow the operator to switch a camera between live view and playback in less than 1/2 of a second.
- CC. Shall allow operator to pause live video.
- DD. Shall allow operator to rewind or forward video on a frame-by-frame basis.
- EE. Shall allow operator to play video back and forth by using a slider button for ease of video investigation.
- FF. Shall allow operator to continuously play forward and backward a recorded video and increase or decrease the playback speed.
- GG. Shall allow the operator to select time and date for playback and be able to retrieve this video within less than 5 seconds.
- HH. Shall allow operator to digitally zoom in and out of pre-recorded video in paused, playback or live video mode and adjust the zoomed area up, down, left or right.
- II. Shall allow operator to control PTZ cameras using non-proprietary USB joystick control.
- JJ. Shall allow Administrator/operator to write (copy) archived video to CD/DVD, as email attachment, external hard drive (thumb drive), etc. if allowed by user rights.

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KK. Shall be an IP Network based Virtual Video Matrix. Capable of display of live, recorded and playback of digital video images from any camera or the SAN on any IP based monitor or workstation on the network.

LL. Shall have multiple modes for pushing live video to the operator workstations:

1. Manual – Operator initiated calling of live video.
2. Automatic – Triggered by internal motion detection from the specific camera or another associated camera.
3. 3rd Party – Triggered by a URL command from another system or serial data exchange via TCP/IP socket or RS232.

MM. Shall enable system to issue disconnect of video stream to operator workstations.

NN. Shall be able to communicate and receive image streams from unlimited number of local and remote Video Servers.

OO. Shall support cameras using H.264 compression.

2.17 VSS MASTER SERVERS

A. Provide a Verint Nextiva Master Server (Secondary physically diverse location set up as a hot standby server) in the North Terminal MCR. Remove the existing secondary Nextiva master server that is located in the existing NOC in the South Terminal. Maintain the existing primary master server in the ST NOC. Re-configure and upgrade the existing Stratus Everun software to latest version for primary/secondary hot standby master server in the ST AVCOM and NT MC.

B. Master Server Configuration: The servers shall consist of dual, redundant servers. The servers shall be mounted in physically diverse locations with all communications between the servers being provided over LAN connection(s). The intent is to prevent a single system point of failure. The servers shall be identical, with one server acting as the primary and the second server acting as a hot stand-by computer with automatic fail over capabilities. The two servers shall maintain synchronized databases automatically. Upon loss of communication of the system with the primary host, the secondary server shall automatically assume the control of the system and become the primary server. Upon the re-establishment of communication with the server, the two servers shall automatically re-synchronize without requiring re-booting of the servers.

C. Master Server Equipment requirements:

1. 19” Rackmount – 1RU Server chassis. Maximum 28” Depth.
2. Processor: Intel E5- 1.8 GHz or better.
3. Memory: 8GB RAM.
4. Internal Storage: 400 Gb hard drive.
5. OS/Application Drive/RAID Level: (2) 450 GB – RAID 1.
6. Standard SVGA video card.
7. Operating System: Windows Server 64 bit latest edition.
8. Minimum 4 USB ports.
9. (2) 1 GBe Ethernet ports.

10. Fully Redundant hot plug fans.
11. Dual 120 VAC, 60Hz power supplies.

2.18 VSS VIDEO SERVERS

- A. Provide Verint Nextiva Video processing/recording servers as required for the number of cameras installed for the North Terminal project and rack mount in the North Terminal MCR. Provide dual fiber channel 8Gbps connections to the SAN fiber channel switches for connection to the SAN video storage per each video server.
- B. The processing/recording server receives camera IP streams from cameras or CODECS, converts the video stream into a compressed video format, and then writes the video stream to the long term storage device, in this case the SAN. The processing server shall be capable of receiving video from a minimum of thirty two (32) cameras simultaneously. The processing server shall be able to provide compression of all cameras received by the server at thirty (30) frames per second at a minimum resolution of 1080P for each camera. The processing server shall be able to interface with large (>200TB) network storage arrays or drives. The use of a system that is limited to less than the noted size shall not be allowed. Each server shall be able to log multiple drives or partitions, but the intent is that each server will log only a single partition for storage of all camera video for cameras assigned to that server. The intent is that the storage size and cameras per partition not be limited by the system software. Each server shall have the capability of logging multiple partitions or drives.
- C. All System configurations, changes, setups and operation shall be password protected and always available to the System administrator for access and use.
- D. The system shall support an API, and provide a Software Development Kit (SDK), for integration with 3rd party software systems.
- E. Shall support DNS entries for camera naming of IP addresses from network DHCP server.
- F. Video processing/recording server equipment requirements:
 1. 19" Rackmount – 1RU Server chassis. Maximum 28" Depth.
 2. Processor: Intel E5- 1.8 GHz or better.
 3. Memory: 8GB RAM.
 4. Internal Storage: 400 Gb hard drive.
 5. OS/Application Drive/RAID Level: (2) 450 GB – RAID 1.
 6. Standard SVGA video card.
 7. Operating System: Windows Server 64 bit latest edition.
 8. Minimum 4 USB ports.
 9. (2) 1 GBe Ethernet ports.
 10. (2) 8Gbps fiber channel ports.
 11. Fully Redundant hot plug fans.
 12. Dual 120 VAC, 60Hz power supplies.

2.19 VIDEO STORAGE

- A. Storage area network video total terabyte storage shall be minimum 250TB utilizing minimum 15 images per second per camera in the north terminal MCR. Contractor shall submit with shop drawing submittal a SAN video storage calculation based upon actual cameras submitted and factory tested. Provide a separate storage calculation utilizing the existing 200TB SAN storage in the South Terminal NOC in combination with the North Terminal MCR 250TB storage.
- B. The Storage Area Network (SAN) shall include processors, disk arrays, dual power supplies and fiber channel interfaces with scalability for future.
- C. The SAN shall be configured for the minimum usable storage capacity using modular disk array enclosures.
- D. Each SAN Disk Array enclosure shall be equipped with two x 8Gbs front-end optical ports.
- E. Each SAN Disk Array enclosure shall be equipped with 16 drives (3.5”), SAS/SATA.
- F. The SAN shall support RAID 0, 1, 1E, 3, 5, 6, 10(0+1), 30, 50, 60 levels and Windows Server 2012 /2012R2 O/S. The SAN shall be configured for RAID 6.
- G. The SAN shall include management software that shall support copying, mirroring, and swapping of storage volumes; zoning of servers; logical unit number (LUN) mapping; Disk masking; and support for server clustering.
- H. Read and Write caching shall be enabled for the entire SAN.
- I. The SAN shall include data protection features.
- J. Power: 100 – 240VAC, 50 – 60 Hz with intelligent power management for energy conservation.

2.20 FIS/CBP VIDEO STORAGE

- A. The FIS/CBP Network video recorder with integral storage shall be minimum 24TB video storage with the storage calculation based upon generic cameras with the following minimum parameters per camera: RAID 5 or 6, minimum 1920 x 1080 pixel resolution based upon camera type, 30 images per second, high quality video with H.264 compression, 50% motion for video storage up to 30 days. Contractor shall submit with shop drawing submittal with video storage calculation based upon actual cameras submitted and factory tested.
- B. Network Video Recorder equipment requirements:
 - 1. 19” Rackmount – 1RU Server chassis. Maximum 28” Depth.
 - 2. Processor: Intel E5- 1.8 GHz or better.
 - 3. Memory: 8GB RAM.
 - 4. Internal Storage: 400 Gb hard drive.
 - 5. OS/Application Drive/RAID Level: (2) 450 GB – RAID 1.
 - 6. Standard SVGA video card.
 - 7. Operating System: Windows Server 64 bit latest edition and VMS Verint client software.
 - 8. Minimum 4 USB ports.
 - 9. (2) 1 GBe Ethernet ports.

10. Fully Redundant hot plug fans.
11. Dual 120 VAC, 60Hz power supplies.
12. Integral video storage as indicated above.

2.21 FIBRE CHANNEL STACKABLE SWITCH

- A. (16) port 8 Gbps, hot pluggable industry standard 3.3V SFP+ transceivers.
- B. (4) 10/20 Gbps XPAK MSA-compliant hot pluggable industry standard optics (10 Gbps standard).
- C. All topologies including stack, cascade, cascaded loop, and mesh.
- D. All ports are universal, auto-discovering, self configuring.
- E. Fabric point to point bandwidth: 1.700 Mbps full duplex on 8 Gbps ports, 5,100 Bps full duplex on 20 Gbps ports.
- F. Aggregate Bandwidth: 544 Gbps per chassis non-blocking architecture.
- G. Modes of Operation: Fabric, public loop, broadcast.
- H. Fibre Channel Classes of Service: Class 2, 3 and F.
- I. Cable Types 50 Micron MMFO and 9 micron SMFO.
- J. Interopable with leading SAN management applications.
- K. Fabric Management capabilities.
- L. Voltage 100 – 240VAC, 50 – 60 Hz.
- M. Dimensions: 1.7” x 1.7” x 20” Deep.
- N. UL listed: 60950-1.
- O. Dual hot swap power supplies and fans.
- P. Basis of Design: QLOGIC 5802V series.

2.22 VSS WORKSTATION EQUIPMENT REQUIREMENTS

- A. Computer Workstation:
 1. Processor: Intel Core i7 2600 @3.4GHz.
 2. Memory: 8GB of RAM DDR.
 3. Internal Storage: 500 GB.
 4. Optical Disk: 16x DVD+/- RW.
 5. Minimum 4 USB ports.
 6. Windows 7 Professional OS.
 7. Software: Microsoft Office, McAfee Security 3 year service, SACS and VSS client software as indicated on drawings.
 8. 100/1000 Ethernet NIC.

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9. Ergonomic 103 keys multi-media keyboard and optical mouse.
 10. Include USB fingerprint sensor for security access.
 11. 240 Watt, 100-240 VAC, 50/60Hz Power Supply.
- B. Video Card (s):
1. 4 monitor support.
 2. PCI Express x16 compatible.
 3. Minimum 784MB DDR3 graphics memory.
 4. Low profile half length card.
 5. DVI connectors supporting 1600 x 1200 resolution per display.
 6. RoHs and WEE compliant, support 4:3 and 16:9 aspect ratio.
 7. Supports configuration of two displays arranged horizontally.
 8. Vertically or combination of both orientations.
- C. Display Screen:
1. LCD TFT active matrix.
 2. 22-inch viewable size.
 3. 178-degree viewing angle.
 4. 16:9 aspect ratio.
 5. Black colored enclosure.
 6. Minimum of two USB 2.0 Ports.
 7. 1600 x 1200 DVI Native resolution.
 8. 32-bit color support.
 9. Minimum 160 MHz video bandwidth.
 10. DVI connector.
 11. 800:1 minimum contrast ratio.
 12. 120-240 VAC, 50/60Hz power supply.
- D. Secure Keyboard/Mouse Switcher:
1. 2-channel supporting USB and PS/2 keyboard and mouse.
 2. Minimum 10 foot cables.
 3. Audio and Video ports are not required.
 4. Advanced H/W and S/W security.
 5. NIAP Common Criteria validated to EAL 4+.

2.23 INTEGRATION REQUIREMENTS

- A. SACS Integration: The VSS system shall integrate with the Software House Access Control System such that the VSS system shall respond to alarm events associated with this system by calling designated camera views near the site of the alarm to designated alarm monitors at operator's AVCOM workstation when the alarm is acknowledged by the operator.
- B. NICE Physical Security Information Management (PSIM) Integration: The VSS System shall integrate with the NICE PSIM (Physical Security Information Management). Additional cameras added as part of this project shall be integrated with the NICE PSIM software installed in the South Terminal AVCOM /NOC. The NICE PSIM integration shall match the functionality currently being provided for the South Terminal existing VSS system and shall include but not limited to the following:
1. The PSIM shall maintain the existing Verint Video Management gateway and license module.
 2. The PSIM shall provide additional VSS camera runtime licenses for the NT buildings plus 10% spare subtracting any South Terminal demolition camera runtime licenses. Existing block of ST camera licenses total is 381.
 3. The PSIM shall have a built-in virtual video matrix for the display and management of live and recorded video from multiple external video systems of different makes and models.
 4. The PSIM shall have proven integration and deployments with at least but not limited to the following video vendors: AgentVI, American Dynamics, Axis, Barco, Bosch, Cisco, Controp, D-Link, DVTel, Escbaz, Exacq, Genetec, GE, Honeywell, Houston, IBM, ioimage, InfoDraw, JCI, JVC, Jupiter, Lenel, Lumenera, Magal, Mango DSP, Mate, Mavix, Milestone Video System, NICE, Object Video, Panasonic, Pelco, Phoenix, RSI Video Technologies, Salient, Samsung, Sight Logix, StarDot, Verint, Vicon, VideoIQ, Vigilant, Vivotek, Win4Net, Xtralis.
 5. In addition to the primary video matrix, the PSIM shall support the definition of multiple secondary video matrix displays. It shall be possible to undock any or all of these screens from the main application panel and display them on separate monitors.
 6. The PSIM video display shall automatically display a camera tree with all defined cameras and their respective site locations in the organization structure. The tree shall be searchable to enable users to quickly and easily locate any camera connected to the system.
 7. The PSIM shall support the following on demand requests to open up cameras: drag-and-drop from the camera tree to a matrix viewer, double-click the camera from the camera tree, right-click on a camera tree, click on related camera from an incident, click on camera from a map view.
 8. Camera type and status shall be clearly and visually reflected on the camera tree icon. Applicable types are PTZ and fixed cameras. Statuses shall be – Alarm, Failure, and Disconnected.
 9. The PSIM shall have a configurable option to automatically popup individual cameras and predefined camera groups upon detection of an event (or a combination of events as defined in the rules). Automatically opened cameras shall occupy the next available viewer slot on the primary matrix.

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10. The PSIM shall support a flexible adjustment of video matrix layouts to 1x1, 2x2, 3x3 and 4x4 cameras per screen.
11. The PSIM shall support the display of full screen video cameras with no camera trees or any other cluttering menus. Upon double-clicking any matrix camera viewer, the camera displayed in that viewer shall be enlarged to occupy the full screen. Double-clicking the screen again, will return the matrix to its original display.
12. The PSIM shall support PTZ control of supported cameras. PTZ functionality shall be made available by moving the mouse inside the relevant video viewer, using an external joystick or using a built-in special control made especially for this purpose.
13. The PSIM shall enable users with appropriate permission levels to setup camera preset positions. It shall be possible for these presets to be activated on demand directly from the camera tree or activated automatically upon triggered events. It should be possible to synchronize camera presets with external video system settings.
14. The PSIM shall enable users with appropriate permission levels to setup and save video layouts consisting of matrix viewer configuration and displayed cameras. These saved layouts shall be available for on demand display or for activation via various automatic actions.
15. The PSIM shall support the configuration of virtual tours consisting of cameras coupled with preset positions. The tour shall be displayed as a predefined sequence of segments. Each segment shall be configurable with its displaying duration.
16. A virtual tour shall have a manual over ride control to go back forward or pause the camera.
17. Virtual tours shall be available for popup to any slot of the video matrixes on demand or by automatic action triggered by rule/workflow.
18. The PSIM shall support the automatic popup of individual cameras, camera playbacks, video tours and multiple cameras according to predefined trigger/actions or rules.
19. Cameras popped up as a result of an alarm shall be opened on the primary video matrix and clearly and visually indicated as such.
20. The PSIM shall support the on demand locking of individual video slots and/or the overall matrix display to prevent newly opened streams from replacing previously opened streams.
21. The PSIM shall support context sensitive dropdown menus that provide only applicable functionality according to camera subsystems feature set. Context menus will vary according to the view from which the camera is selected (i.e., camera selected on the tree, sensors pane or GIS map). Among others, the menus shall support live video, playback (with additional filter definition menu), presets, start/stop recording, and more.
22. The PSIM shall support video playback actions such as Fast Forward, Rewind, Frame By Frame, Forward Slow Motion, Forward Fast Motion.
23. The PSIM shall support defining a retention policy of video recordings, thus enabling to mark specific recording timeframes for retention even when the external video system recycles the allocated video storage space.
24. The PSIM shall support digital zooming of displayed video.

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25. The PSIM shall support the ability to capture, save and export video clips of live and prerecorded video for post event distribution and analysis. When supported by the external video system, a variety of encoding codecs shall be provided to reduce the file size.
26. The PSIM shall support the capability of authorized users to place cameras on their accurate GIS X:Y:Z locations. It shall be possible to position the cameras by point and click and/or by entering the accurate coordinates.
27. Camera icons on the GIS map shall reflect their status. It shall be possible to perform applicable camera operations directly from the map. Double-clicking a camera shall open up live video either in a floating window in the map context or in the video matrix.
28. When opening up a camera in a floating window, it shall be possible to transfer it to the video matrix with a single mouse click.
29. The PSIM shall allow administrators to associate individual cameras or groups of cameras, predefined in layouts, with GIS map zones. It shall be possible to request the displaying of zone cameras directly from the GIS map.
30. The PSIM shall allow administrators to configure camera orientation and Field of View (FOV). It shall be possible to turn FOV transparent overlay on/off for presentation on top of the GIS map.
31. The PSIM shall support the displaying of all relevant cameras by clicking any arbitrary GIS map point location.
32. The PSIM shall support the capability to easily slave supported cameras to targets, such as those detected by radars, thus giving users the ability to visually track continuously moving targets.
33. The PSIM shall provide video pursuit capability - enables users to easily track suspicious moving objects or people in real-time by opening the selected adjacent camera as the object or person moves out of a camera's view.
34. The PSIM shall enable the displaying a "panoramic" view of an environment by opening all surrounding cameras adjacent to a particular camera with a single-click.
35. The PSIM shall facilitate the presentation of video on external video walls and/or video monitors. It shall be possible to click-and-drag individual cameras into pre-configured external monitors' layout. It should also be possible to recall and activate external video wall presentation salvos/presets.
36. The PSIM shall support the ability to prohibit access to live video and PTZ control to cameras according to users' predefined roles. The blocking capability shall be activated according to predefined users' hierarchy (i.e. users with higher hierarchical levels will be able to block access for users' of lower levels).
37. The PSIM shall support audio channels association with video channels. It shall be possible to listen to audio sound of an opened camera. It shall also be possible to broadcast PA announcements to individual channels or to groups of channels.
38. The PSIM shall support the capability to easily calibrate video cameras' orientation.
39. The PSIM shall support receiving, distinguishing and triggering pre-configured actions on any video analytics event received from external systems.

40. The PSIM shall support dual video channels for external video system redundancy. With such a configuration, the same cameras shall be accessible for viewing and playback from a primary or secondary NVRs by on demand switching from the PSIM client application.
41. Upon application restart, the PSIM shall have a configurable option to recall and restore video layouts and displayed cameras from just prior to application shutdown.

2.24 INTERIOR/EXTERIORCAMERA POLES

- A. 4” round, non-tapered, 10 feet in height.
- B. 4” round, non-tapered, 12 feet in height (Eight (8) locations in the SSCP south of TSA ETD stations)
- C. Pole shaft extruded from seamless alloy aluminum, natural color
- D. Covered hand hole
- E. Anchor base cast from 356 alloy aluminum and supplied with 2 piece base cover. Anchor bolts conform to ASTM F1554 Grade 55, nuts, washers. Bolts have an L bend on one end and are galvanized a minimum of 12” on the threaded end.
- F. Refer to civil site drawing details for foundation details for exterior applications. Installation shall conform to Louisiana wind and hurricane standards.
- G. Finish selected by architect for interior poles.

2.25 AUDIO MICROPHONES

- A. Cardioid pattern with wide dynamic range and 50 – 17,000 Hz frequency response, 180 ohms impedance for ceiling hanging applications
- B. White mini condenser cardioid mic, w/cable, in line pre-amp and stand adaptor.
- C. Connectors to associated video camera audio inputs.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. See Section 28 05 00 “General Security Systems Requirements”, Paragraph 3.1.
- B. Site Verification of Conditions:
 1. Continuously verify that the site conditions are in agreement with the specifications and the design drawings. Specific mounting locations, exact wire and cable runs, and conduit routing have not been specified or delineated on the Drawings. Coordinate all aspects of the Work with other trades and construction manager.
 2. Examine pathway elements intended for cables. Check raceways and other elements for compliance with space allocations, installation tolerance, hazards to camera installation, and other conditions affecting installation.
 3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 WIRING

- A. Comply with requirements in Section 27 05 28 "Pathways for Communication Systems".
- B. Wiring Method: Install cables in raceways unless otherwise indicated:
 - 1. Except raceways are not required in cable trays or in J hooks in accessible indoor ceiling spaces and attics.
- C. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.
- D. Splices, Taps, and Terminations: For power and control wiring, use numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- E. For LAN connection and fiber-optic and copper communication wiring, comply with Section 27 13 00 "Communications Backbone Cabling" and Section 27 15 00 "Communications Horizontal Cabling".
- F. Grounding: Provide independent-signal circuit grounding recommended in writing by manufacturer. Comply with NEC and BICSI TDMM.

3.3 INSTALLATION

- A. See Section 28 05 00, Paragraph 3.2.
- B. Identify system components, wiring, cabling, and terminals according to Section 27 05 53 "Identification for Communication Systems."
- C. Field Of View Adjustment: Aim each fixed VSS camera for the optimum view of the area that it is intended to cover, using a monitor to view the camera output. Final aiming and field of view shall be approved and accepted by the Engineer and Owner prior to project close out. PTZ camera preset positions shall be approved and accepted by the Users (Police, Operations, etc.) and Owner prior to project close out. The lens shall be selected based upon the desired field of view. If the final field of view is not acceptable due to lens limitations, the contractor shall provide the appropriate lens at no additional cost to the Owner. Coordination of the field of view and the appropriate lens is the responsibility of the contractor.

3.4 DOCUMENTATION

- A. See Section 28 05 00 "General Security Systems Requirements", Paragraph 3.3.

3.5 GENERAL TESTING REQUIREMENTS

- A. See Section 28 05 00 "General Security Systems Requirements", Paragraph 3.5.
- B. Phased VSS System Testing: A phased testing approach shall be implemented to insure that the system is capable of operating as designed. The tests shall be structured to prove that higher-level components are functional prior to connection to lower level components. Successful completion of each testing phase is required before proceeding to the next level of testing. Any problems

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discovered during these tests will be documented and brought to the attention of the Engineer and corrected at Contractor's expense. The Contractor shall promptly correct all problems encountered, providing field service personnel appropriately trained for the types of problems encountered.

- C. Final test and Acceptance: Upon completion of Phased System Testing, the system will be operating at normal traffic capacity with the cameras transmitting video to the video servers and from the video servers to the SAN for this test. This test shall prove "under load" communications, video integrity, I/O functionality and system logic. All VSS functions shall be demonstrated to ensure the entire system is operational as required by these specifications and drawings. The Contractor shall provide a test schedule including the time and dates at least 10 days prior to the proposed test date. The Owner's representative will observe the testing. This test shall be conducted by the final test and acceptance plan as outlined below.
- D. Test VSS software and recording including all described subsystems and for proper configuration and operation of:
 - 1. Real-time recording, image rate recording, and back-up archive recording.
 - 2. Retrieval of video, both short term and archive video. Test for retrieval of video based on time and date retrieval.
 - 3. Scheduled recording.
 - 4. Status displays.
 - 5. System alerts.
 - 6. Alarm review software.
 - 7. Video authentication software.
 - 8. System security by User login ID.
 - 9. Video query.
 - 10. Video loss detection.
 - 11. Alarm recording.
 - 12. On-demand recording.
 - 13. Continuous recording.
 - 14. Integrity of video storage.
 - 15. Logging functions.
 - 16. Video-export functions.
 - 17. View live video features.
 - 18. Alarm review software operation.
 - 19. Alarm history integrity.
- E. Camera Tests and Inspections:

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1. Inspection: Verify that units and controls are properly installed, connected, and labeled, and that interconnecting wires and terminals are identified.
 2. Pretesting: Align and adjust system and pretest components, wiring, and functions to verify that they comply with specified requirements. Conduct tests at varying lighting levels, including day and night scenes as applicable. Prepare video-surveillance equipment for acceptance and operational testing as follows:
 - a. Prepare equipment list.
 - b. Verify operation of auto-iris lenses.
 - c. Set back-focus of fixed focal length lenses. At focus set to infinity, simulate nighttime lighting conditions by using a dark glass filter of a density that produces a clear image. Adjust until image is in focus with and without the filter.
 - d. Set back-focus of zoom lenses. At focus set to infinity, simulate nighttime lighting conditions by using a dark glass filter of a density that produces a clear image. Additionally, set zoom to full wide angle and aim camera at an object 50 to 75 feet away. Adjust until image is in focus from full wide angle to full telephoto, with the filter in place.
 - e. Set and name all preset positions; consult Owner's personnel.
 - f. Set sensitivity of motion detection.
 - g. Connect and verify responses to alarms.
 - h. Verify operation of control-station equipment.
 3. Test Schedule: Schedule tests after pretesting has been successfully completed and system has been in normal functional operation for at least 14 days. Provide a minimum of 10 days' notice of test schedule.
 4. Operational Tests: Perform operational system tests to verify that system complies with Specifications. Include all modes of system operation. Test equipment for proper operation in all functional modes.
- F. Video surveillance system will be considered defective if it does not pass tests and inspections.
- G. Prepare test and inspection reports.
- H. The following minimum tests shall be performed on each camera, witnessed by construction manager/engineer, verified at the AVCOM VSS and PSIM consoles:

SENSITIVE SECURITY INFORMATION

NOAB Project # 8910-01233

Louis Armstrong New Orleans International Airport
North Terminal Development Program Phase 1

VIDEO SURVEILLANCE SYSTEM - CAMERA TESTING FORM

CAMPUS / BUILDING		DATE:	
ASSOCIATED COMM RM		TIME:	
MONITORING LOCATION		WEATHER:	
CAMERA LOCATION		WITNESS	
NEAREST DOOR #		R&B:	
CAMERA DESCRIPTION			
CAMERA TYPE & MANUF / MODEL#		CONTR.	
CAMERA IP ADDRESS / SERIAL#			
REF DWG.			

LINE #	TESTS	DATA	PASS	FAIL	RE-TEST	ADDITIONAL COMMENTS
1	FIELD OF VIEW					
2	PIXELS PER FOOT - DENSITY REQUIREMENT					
3	HORIZONTAL FIELD OF VIEW (FT)					
4	VERTICAL FIELD OF VIEW (FT)					
5	IMAGE QUALITY ON A SCALE OF 1 TO 20					
6	LENS FOCAL LENGTH SET (MM)					
7	CAMERA RESOLUTION AND ASPECT RATIO					
8	IMAGES PER SECOND (IPS)					
9	# OF DAYS RECORDED TO DIGITAL STORAGE					
10	VIDEO STORAGE REQUIRED IN GB					
11	# OF HOURS IN OPERATION PER DAY					
12	AMOUNT OF MOTION IN SCENE (LOW, MED, HIGH)					
13	AVE. BANDWIDTH (KBPS)					
14	EXISTING LIGHTING MEASUREMENT					
15	BACKLIGHT COMPENSATION %					
16	NOISE AND VIBRATION (L,M,H)					
17	MOTION DETECTION ALARM					
18	ALARM SIGNAL TO ACS OR IDS					
19	WINDOW MASKING OR PRIVACY ZONES					
20	ENVIRONMENTAL RATING & HEATER/BLOWER					
21	PAN / TILT / ZOOM					
22	CAMERA INVENTORY LIST (INCLUDE ACCESSORIES, MIDSPANS, CONVERTERS, CABLE, MOUNTING, ETC)					

3.6 FACTORY ACCEPTANCE TESTING

A. See Section 28 05 00 "General Security Systems Requirements", Paragraph 3.6.

3.7 INTEGRATION TESTING

A. See Section 28 05 00 "General Security Systems Requirements", Paragraph 3.7.

3.8 ENDURANCE TESTING

A. See Section 28 05 00 "General Security Systems Requirements", Paragraph 3.8.

3.9 MAINTENANCE AND SUPPORT

A. See Section 28 05 00 "General Security Systems Requirements", Paragraph 3.9.

3.10 CLEANING

A. See Section 28 05 00 "General Security Systems Requirements", Paragraph 3.10.

3.11 TRAINING

A. See Section 28 05 00 "General Security Systems Requirements", Paragraph 3.11.

3.12 ACCEPTANCE

A. See Section 28 05 00 "General Security Systems Requirements", Paragraph 3.12.

PART 4 - MEASUREMENT AND PAYMENT**4.1 MEASUREMENT (APPLICABLE TO WORK SHOWN ON VOLUME 2.1 DRAWINGS ONLY)**

- A. Cabling shall be measured by type, size, and quantity of linear feet in place, completed, and approved.
- B. VSS cameras shall be measured by type and quantity in place, completed, and approved.
- C. Other VSS accessories shall not be measured for payment but shall be included in VSS Equipment costs noted above.

4.2 PAYMENT (APPLICABLE TO WORK SHOWN ON VOLUME 2.1 DRAWINGS ONLY)

- A. Pricing provided shall fully compensate the Contractor for furnishing all materials and for all preparation, installation, testing, and inspection of these materials; and for all labor, equipment, tools, and incidentals necessary to complete the work.

4.3 PAY ITEMS (APPLICABLE TO WORK SHOWN ON VOLUME 2.1 DRAWINGS ONLY)

- A. Unit Price Pay items are listed in Section 01 22 00, Unit Price Pay Items. For Work not otherwise identified as being paid on Lump Sum basis, where no pay item is listed in Section 01 22 00, such work is considered subsidiary to other work, or incidental and will not be measured separately for payment.

END OF SECTION 28 23 00

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