

Drawing Sheet	Description	Remarks
ARCHITECTURE		
G000.00	Bulletin's cover sheet	
G000.01	Index of drawings incorporates revision clouds for revised sheets.	
AN501.01	Revised a number of door types in coordination with electrical drawings.	
ELECTRICAL		
E201.00	Ramp Level overall floor plan with MSR (Security) Rooms clouded.	
E201.07	1/8" Enlarged MSR Security Room clouded.	
E201.14	1/8" Enlarged MSR Security Room clouded	
E202.00	Second Level overall floor plan with designated rooms clouded.	
E202.10	1/8" Enlarged Rooms clouded	
E203.00	Second Level overall with designated rooms clouded.	
E203.09	1/8" Enlarged Rooms clouded.	
E203.10	1/8" Enlarged Rooms clouded.	
E420	1/4" Enlarged rooms clouded showing changes & added Lockable cabinets.	
E520	Complete revised security / Intercom Riser Diagram, additional new multiple (SM) Fiber to be installed from MSR Rooms to new Designated Rooms.	
E620	Revised Camera / Intercom Schedule & panelboard schedule.	
E630	New panelboard schedules.	
E720	Revised Door Details.	
E722	Typical Detail sheet (Not Used).	
PROJECT MANUAL		
Section 28 23 00	Replaces previous Specification section with new IP driven section for security Cameras and Intercom.	

MIAMI DADE AVIATION DEPARTMENT (MDAD)

MDAD Project No. AA005A

1 – ‘CC E & Satellite E’ & ‘D to E Connector’ - Stucco and Painting.

2 – Cameras, Door Frames Hardware and Access Control at ‘Satellite E’ and ‘Lower E’.

3 – ‘Satellite E’ A-VDGS.

4 – New Lightning Protection System at ‘Satellite E’ & ‘Lower E’.

Phase 3C 100% Complete Contract Documents for Permit

October 15, 2020

Miami International Airport – Miami, Florida

- ✓ Asbestos Report (Enclosed separately)
- ✓ Structural Calculations (Enclosed separately – Signed and Sealed)
- ✓ Project Specifications Signature sheets (Enclosed separately – Signed and Sealed)

DIVISION 0 - BIDDING REQUIREMENTS, CONTRACT FORMS, AND CONDITIONS OF THE CONTRACT

Not part of this submittal

DIVISION 1 – GENERAL REQUIREMENTS

Section 01 02 70	Applications for Payment
01 03 00	Alternates
01 04 00	Coordination
01 04 50	Cutting and Patching
01 05 00	Surveying and Field Engineering
01 06 10	Posting of Notices
01 09 00	Reference Standards
01 10 00	Existing Utilities
01 12 00	Hot Work Operations
01 12 00-01	Hot Work Permit Form
01 20 00	Project Meetings
01 30 00	Submittals
01 31 00	Construction Schedules
01 31 10	Construction Schedules (CPM Format) Lump Sum Contract
01 31 10-01	Time Impact Analysis Summary sheet (TIA)
01 31 40	Construction Scheduling Management System
01 34 00	Shop Drawings
01 37 00	Schedule of Values
01 40 50	Contract Quality Control
01 41 00	Project Testing Lab Services
01 44 00	Contractor Quality Control Program
01 50 50	Mobilization
01 50 60	Contractor Overhead
01 51 10	Temporary Electricity
01 51 20	Temporary Lighting

01 51 40	Temporary Telephone
01 51 50	Temporary Water
01 51 60	Temporary Sanitary Facilities
01 53 00	Barriers and Enclosures
01 53 50	Protection of Work and Property
01 55 00	Contractor's Access and Employee's Parking
01 56 30	Handling of Incidental Fuel Spillage during Construction
01 56 90	Construction Cleaning
01 57 00	Airfield Operational Safety During Construction
01 57 10	Maintenance of Airport Landside Traffic
01 59 00	Field Representative's Office & Testing Lab.
01 60 00	Material and Equipment
01 70 10	Contract Closeout procedures
01 71 00	Final Cleaning
01 72 00	Project Record Documents
01 74 00	Warranties and Guarantees
01 75 00	Measurement of Quantities

DIVISION 2 – EXISTING CONDITIONS

Section 02 11 17	Selective Demolition
------------------	----------------------

DIVISION 5 – METALS

Section 05 12 00	Structural Steel Framing
05 50 00	Metal Fabrications
05 52 13	Railings and Handrails

DIVISION 6 – CARPENTRY

Section 06 10 00	Rough Carpentry
06 16 00	Sheathing

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

Section 07 42 13.6	Modular Metal Wall Panels
07 62 00	Sheet Metal Flashing and Trim
07 81 23	Intumescent Fireproofing
07 84 00	Through-Penetration Firestop Systems
07 90 00	Joint Sealers
07 95 00	Expansion Control

DIVISION 8 – DOORS AND WINDOWS

Section 08 11 00	Steel Doors and Frames
08 30 50	Access Doors
08 46 20	Automatic Swinging Doors
08 71 00	Door Hardware
08 80 00	Glazing

DIVISION 9 – FINISHES

Section	09 22 00	Portland Cement Plaster (Stucco)
	09 22 16	Non-Structural Metal Framing
	09 25 00	Gypsum Wallboard Systems
	09 65 13	Resilient Base and Accessories
	09 90 00	Painting

DIVISION 10 – FINISHES

Section	10 52 00	Fire Extinguishers, Cabinets and Accessories
---------	----------	--

DIVISION 26 – ELECTRICAL

Section	26 00 00	Basic Electrical Requirements
	26 05 00	Basic Electrical Materials and Methods
	26 05 19	Wires and Cables
	26 05 26	Grounding
	26 05 29	Supporting Devices
	26 05 33.13	Raceways
	26 05 33.16	Electrical Boxes and Fittings
	26 05 53	Electrical Identification
	26 05 83	Electrical Connections for Equipment
	26 08 00	Electrical Systems Commissioning
	26 08 02	Electrical Systems Functional Testing Requirements
	26 24 16	Panelboards
	26 27 26	Wiring Devices
	26 28 00	Circuit & Motor Disconnects
	26 28 13	Fuses
	26 29 13	Motor Starters/Controllers
	26 41 00	Lightning Protection System
	26 43 00	Surge Suppression System

DIVISION 27 – COMMUNICATIONS

Section	27 01 00	General Requirements for Communication Systems
	27 05 26	Grounding & Bonding for Communications Systems
	27 05 28	Pathways for Communications Systems
	27 05 44	Sleeve & Sleeve Seals for Communications Pathways & Cabling
	27 05 53	Identification for Communication Systems
	27 11 00	Communications Equipment Room Fittings
	27 13 00	Communications Backbone Cabling
	27 15 00	Communications Horizontal Cabling
	27 15 13	Communications Copper Horizontal Cabling
	27 15 43	Communications Faceplates and Connectors
	27 16 19	Communications Patch Cords, Station Cords, and Cross Connect Wire

DIVISION 28 -- ELECTRONIC SAFETY AND SECURITY

Section	28 00 00	General Requirements for Communication Systems
	28 08 00	Commissioning of Access Control Doors
	28 23 00	CCTV Camera Installation and Programming Integration Services Bulletin 002 (09.09.2022)
	28 23 01	Advanced Visual Docking Guidance System (A-VDGS)
	28 31 00	Fire Alarm Detection and Annunciation Systems

END OF DOCUMENT

SECTION 282300

TECHNICAL SPECIFICATION
CCTV CAMERA INSTALLATION AND
PROGRAMMING INTEGRATION SERVICES

PART 1 GENERAL

1.1 SUMMARY

- A. Miami-Dade Aviation Department - MDAD (the "Owner") as part of Miami International Airport (MIA) requires Installation and Programming Integration Services ("Work") of Audio Interface Units ("Intercoms") and Closed-Circuit Television cameras ("CCTV") for Miami International Airport's ("Project"). The Project Manual, associated Drawings including General Notes and Sequence of Operation, further specifies CCTV and Intercom installation and programming integration requirements.

MDAD IS/T will review, manage, and approve all actions performed by Trade Contractors, associated contractors or vendors.

- B. CCTV Installation Services: Trade Contractor and/or Vendor shall install, terminate, adjust Field of View (FOV), test and commission all CCTV cameras and associated hardware within all areas in Miami International Airport, Municipal Airports and associated MDAD property.

Trade Contractor shall provide, install, integrate and commission rooftop fixed and PTZ cameras, lenses & housings in locations directed by Owner's Drawings. Trade Contractor shall provide all required cameras, lenses, including any special housings, brackets and pedestals, all associated network hardware and software support.

- C. Intercom Installation Services: Trade Contractor shall provide, install terminate, test and commission all required Intercom components and cabling, including Intercom Stations (w/speaker and call button).

- D. Additional Head-End Equipment: IF additional Head-End Equipment is required, Trade Contractor shall be requested to provide, terminate, program, test, and commission Head-End Devices. Trade Contractor shall provide all cost associated with providing, programming, documentation, testing and commissioning such devices.

IF Trade Contractor be requested to provide additional head-end equipment, then Trade Contractor shall also produce shop drawings for layout and configuration of head-end security equipment existing and required to be added and installed. Shop Drawings shall provide full detail for Trade Contractor to perform installation and interconnection of head-end equipment. Shop drawings shall be to scale for affected MSR(s) showing equipment layout for floor plan, rack, and wall elevations. Shop drawings shall include schedules of all necessary products (assemblies, equipment, and systems, including racks, cabinets, UPS and head-end security equipment to be

installed. Shop Drawings shall depict both, existing and installed equipment.

- E. Programming Integration Services: Trade Contractor shall integrate and test all newly installed Intercoms and CCTV Cameras with existing Access Control System (ACS), Owner's Security System and the Security Operation Workstation (SOW). Programming Integration Services include configuration and interfaces to Gateway, Digital Video Recording System (DVRs), Access Control System and video equipment, and Juniper MPLS Network.
- F. Ensure Device Compatibility: Trade Contractor shall warrant all CCTV and Intercom devices, associated terminations; software, interfaces and integration are 100% compatible with existing MDAD Systems.
- G. Implementation: Trade Contractor shall install and program Intercoms and CCTV cameras to meet program system implementation.

1.2 RELATED DOCUMENTS ...

Project Manual including Drawings, Division 0, Division 1, Division 27 and Division 26 Sections shall form an integral part of the Project requirements.

1.3 DEFINITIONS, ABBREVIATIONS, ACRONYMS

Reference standards, abbreviations, and definitions contained in this Section are not necessarily a complete list but are general to the extent they may not be defined explicitly elsewhere.

A. DEFINITIONS:

Managing General Contractor (MGC) – Contractor selected through bid and award process overseen and managed by MDAD IS/T

Trade Contractor – CCTV/Intercom Installation and Program Integration provider whose Individual, firm, partnership, joint venture or corporation enters into a Contract with the Managing General Contractor, including all subcontractors, vendors and suppliers at all tiers.

MGC Project Manager / MGC Project Superintendent – Authorized representative charged with the professional administration of this construction Contract.

MGC Safety Manager – Authorized and qualified MGC representative charged with the professional administration of the Safety Requirements of the Project.

Owner's Representative – An authorized representative of the Owner who is an employee of the County.

Design Professional (DP) – Engineer of Record

B. ABBREVIATIONS – ACRONYMS

ACS Access Control System

AOC Airport Operations Center

A/E	Architectural/Engineering Firm
AHJ	Authority Having Jurisdiction
AOA	Aircraft Operation Area
API	Application Program Interface
ASN	Airport Security Network
CAD	Computer-Aided Design
CCTV	Closed Circuit Television
CMS	Cable Management System
DGM	Design Guideline Manual
DP	Design Professional
DRS	Digital Recording System
DVADTSD	Digital Video, Audio and Data Transport System Network
DVRS	Digital Video Recording System
DVTS	Digital Video Transport System
FAA	Federal Aviation Agency
FOV	Field of View
LAN	Local Area Network
MDAD	Miami-Dade Aviation Department
IS/T	Information Systems/ Telecommunications
MSR	MDAD Security Room
MTR	MDAD Telephone Room
NTP	Notice to Proceed
PTCS	Preliminary Trade Contractor Schedule (of Work)
SIA-TVAC	Security Institute Association CCTV to Access Control
SIDA	Security Identification Designated Area
SOW	Security Operation Workstation
TCS	Trade Contractor Schedule (of Work)
TCSSSP	Trade Contractor Site Specific Safety Plan
UPS	Uninterruptible Power Supply

1.4 REFERENCED REQUIREMENTS

The publications listed below shall form an integral part of this specification. Specific reference to codes, rules, regulations, standards, requirements of regulatory agencies, MDAD Life Safety Master Plan shall meet the latest printed edition of each in effect at date of Project Manual unless document referenced herein is specifically dated.

Trade Contractor performance shall comply with all Owner and manufacturer's requirements, Closed Circuit Television Manufacturers Association (CCTMA) guidelines and requirements of Authorities Having Jurisdiction (AHJ).

All Work shall be performed in accordance with following standards:

- A. All applicable Federal, State, and local codes, rules, regulations, and ordinances governing the Work, are as fully part of Specification and Project Manual as if hereto

attached. If Trade Contractor should note items in the drawings or specifications, construction of which would be code violations, Trade Contractor shall promptly call them to attention of Managing General Contractor and Design Professional in writing. Where requirements of other sections of the specifications are more stringent than applicable codes, rules, regulations, and ordinances, the specifications shall apply.

- B. SIA TVAC - 01: CCTV to Access Control – Message Set for System Integration document
- C. SFBC: South Florida Building Code, including adopted standards
- D. MDAD Design Guideline Manual, Section 13710, titled Card Reader / Security Doors Sequence of Operation.
- E. MDAD Design Guideline Manual, Section 13613, titled Cabling Standard.
- F. MDAD Design Guideline Manual, Section 13700 MIA Terminal Security 12/06
- G. MDAD Design Guideline Manual, Section 13705 Card Reader / Security Doors and Related Alarm Systems
- H. MDAD Terminal Life Safety Master Plan – Mandatory Requirements
- I. NEC Standards
- J. NEMA: National Electrical Manufacturers’ Association
- K. NFPA 15, 70, 72, 90A and 101
- L. ANSI/TIA/EIA Standards (refer to drawings)
- M. UL Underwriters Laboratory including but not limited to, UL 1863
- N. FCC Part 68-76 inclusive
- O. Building Industry Consulting Services International (BICSI®) publications:
 - 1. BICSI – Telecommunications Distribution Methods Manual
 - 2. BICSI – Telecommunications Cabling Installation Manual
- P. General Requirements – Division 1, Division 28 and Division 28 of the Project Manual are applicable in the execution of this Work. Applicable Sections including, but not limited to:
 - Section 01010: Summary of Work
 - Section : Allowances
 - Section : Application for Payment
 - Section : Alternatives
 - Section : Coordination
 - Section : Regulatory Requirements
 - Section : Existing Utilities
 - Section : South Florida Compliance
 - Section : Project Meetings
 - Section : Progress Schedule
 - Section : Shop Drawings, Product Data & Samples
 - Section : Schedule of Values
 - Section : Construction Photograph
 - Section : Trade Contractor’s Quality Control

- Section : Materials and Equipment
- Section : Storage and Protection
- Section : Substitutions and Product Options
- Section : Project Closeout
- Section : Final Cleaning
- Section : Project Records Documents
- Section : Operating and Maintenance Data
- Section : Spare Parts and Maintenance Material
- Section : Warranties and Bonds
- Section : Basic Electrical Requirements
- Section : Basic Electrical Material
- Section : Raceway, Box, and Cabinets
- Section : Circuit & Wire Identification
- Section : Prefunctional Test Checklist – CCTV and Intercom Systems
- Section : Phased Functional Testing and Commissioning Requirements for CCTV and Intercom System

- Q. In event of conflicts, ambiguities, or discrepancies, precedence in resolving such conflict, ambiguities, or discrepancies shall be in accordance with General Conditions Provisions and the following under MDAD guidance:
 - a. Large-scale details shall govern over small-scale details

- R. In case of discrepancies between plans and specifications not determined by above, the Design Professional shall be sole determiner of the intent. Such interpretations by Design Professional shall be in writing, and shall be consistent with, and reasonably inferable from intent of the Project requirements.

1.5 CCTV, INTERCOM AND SECURITY SYSTEM DESCRIPTION

A. General Description

IP CCTV cameras and IP Intercoms shall connect to an existing special security network consisting of digital network transmission equipment and digital video recording system. Video, voice, and data connections are through communications rooms to demarcation panels located in MDAD Security Rooms (MSR) OR MDAD Telephone Rooms (MTR) equipped with ASN equipment. The MSR's and MTR's contain Security System infrastructure to support installation the installation of CCTV and Intercom devices.

IP CCTV Cameras shall connect to the Security network (ASN). All connectivity requirements, to extend existing network, to new MTR's will be included and provided in this project.

Owner's Security System consist of access control, live video/audio surveillance, audio/video recording and overall transport of audio, video and data, including high-

speed data network and video/audio transmission and video/audio storage components.

The CCTV and Intercom Systems shall be electrically served from the Emergency Power Systems (Emergency Generator sets) or as directed by MDAD.

Trade Contractor shall ensure Intercom and CCTV installation along with program integration are completed in accordance with Schedules as defined in Division 1.

B. CCTV System Description

Functionally, Security Operation Workstation (SOW) notifies a Airport Operations Center (AOC) Security Operator monitoring the Airport at his console position when a security event occurs such as a security door violation.

C. Audio – Intercom System Description

Functionally the Audio Interface Unit provides two-way audio communications between (AOC) Security Operation Workstation and Intercom Stations located throughout the Airport.

The Intercom Station is a surface-mounted, hands free, full duplex intercom. Its internal amplifiers and speaker operate from standard Ethernet connection from intercom back to the ASN location with two LED indicators to advise user of call placed and received status.

Two-way audio shall be connected between a security operator and intercom station when one of two scenarios occur and are acted upon by the security operator.

Scenario One – When the AOC security operator initially acquires alarm from ACS queue, he/she has the option of establishing audio connection based upon how that alarm has been configured in ACS.

Scenario Two – When call button is pushed, it presents an active call in the “conference “ queue of all SOW’s in the group. The first operator to answer connects to the call.

1.6 SCOPE OF WORK – DESCRIPTION

A. Scope of Work – General

Trade Contractor shall provide MDAD IS/T all equipment, materials, labor, and services required, not specifically mentioned, or shown, which may be necessary to complete or perfect all Work and to ensure Work complies with requirements stated or as reasonably inferred by Project documents. In addition, Trade Contractor shall:

1. Employ job superintendent or project manager during the course of the installation to provide coordination of Work described in this specification and with other trades. Trade Contractor shall provide technical information when requested by other trades and attend project coordination / status meetings. This person shall be responsible for quality control during installation, equipment set-up, and testing in accordance with provisions stated in the Project Manual.

2. Ensure programming integration service is performed by personnel who are MDAD Security Systems approved/certified for type of Integration Services required ensuring continuity of Owner's original equipment manufacturer's warranty and services for Head-End Systems. Trade Contractor shall use the existing Security Systems Integrator Service provider for this scope of work.
3. Provide all required documentation to MDAD IS/T.
4. Provide accurate set of redline and shop and as-built drawings. Trade Contractor shall keep redlined drawings up to date on a daily basis. This set will be used to submit periodic updated and final As-Built Drawings per schedule shown below.
 - ❖ Pay applications
 - ❖ Project Close-Out (Final)
7. Trade Contractor installation responsibilities shall include end-to-end coordination of general troubleshooting, camera adjustment, field of view, placement, and camera / intercom software interfaces.
8. Trade Contractor shall provide wire management including cable dressing and machine printed labels for identification of Intercom and camera cabling, surge suppression and power as required by Project Manual. Cable identification shall be in accordance with format nomenclature referenced in MDAD structured cable specifications.
9. Trade Contractor shall submit updated Inventory Log on first day of each month for all installed Intercoms and installed or modified cameras.

Trade Contractor shall coordinate with Managing General Contractor, Owner and other subcontractors for implementation of Work in accordance with Project Manual requirements.

- Location of CCTV Camera
- Port number
- Security room #
- Drawing/ Specifications
- Physical Topology

B. Scope of Work - New CCTV and Intercom Installations

Trade Contractor shall provide all equipment, materials, labor, and services required to install, program, integrate and test CCTV and Intercom Systems including but not limited to the following:

1. Camera Installation: Trade Contractor shall:
 - (a) Provide and Install cameras, housing, lenses, and other associated equipment
 - (b) Trade Contractor shall provide, all cabling, patch cords, terminations to Owner's Head-End equipment, mounting brackets, mounting kits, surge protection, power supplies and components locations to MDAD Telecom for

future project planning.

- (c) Ensure all camera installations are in accordance with equipment manufacturer's written instructions, in compliance with National Electrical Code, and with recognized industry practices, to ensure CCTV system complies with requirements and serves intended purposes.
- (d) Be responsible for complete installation and testing of all CCTV cameras and camera settings.
- (e) Install flexible conduit, fittings from existing junction box to cameras, provide indoor ceiling mounting kits, 2-foot patch cables (for elevator cab only), mounting brackets/kits, and surge suppression for outdoor camera (PTZ or fixed).

Camera power is provided from ASN communications rooms to the camera via POE. POE loads per switch shall be calculated and approved by EOR prior to installation.

Field of View Adjustment: Trade Contractor shall adjust Field of View (FOV) and focus for each newly installed camera in accordance with design requirements.

Trade Contractor shall aim each fixed CCTV camera for optimum view of the area that it is intended to cover, using a WEB browser and IP connectivity to view camera output.

Trade Contractor shall set, and name all preset positions per Owner's direction. Owner shall approve final aiming and PTZ camera preset prior to Final Acceptance. All required presets are to be shown on drawing updates.

- 3. Surge Suppression: All exterior cameras shall include fast acting transient voltage surge suppression on all copper conductors. Signal paths for all exterior mounted cameras shall be fully protected against transient voltages with fast acting surge suppressors at every termination point. The suppression equipment shall protect each conductor utilizing both common mode and differential mode devices. Trade Contractor shall be responsible to provide, install and test suppressors for exterior cameras in accordance with requirements stated in Project Manual and manufacturer's instructions.

The suppressor shall be installed in-line with copper circuits at the point where they enter building and via rack mountable surge suppressors at active equipment (inside MSR or MTR).

Trade Contractor shall submit in their closeout documents a letter from the surge protection manufacturer stating that the manufacturer or the manufacturers' representative has inspected the installation. The certification letter must state that the installation has been done in accordance with the manufactures' requirements and the warranty is in effect.

- 4. Video, Control, Power and Audio Cabling – MSR / MTR Room Set-up: Except as specified in drawings and specifications, Trade contractor will provide low voltage

cabling and base building contractor will provide 110V power wiring.

5. Camera Troubleshooting and Adjustment of Focus and Field of View: For new cameras installed and commissioned under this Project, Trade Contractor shall provide camera troubleshooting and adjustment on “as requested basis” throughout the duration of this Contract.
6. Mounting Brackets: Trade Contractor shall:
 - ❖ Provide all CCTV mounting kits, indoor and outdoor rated as required. Roof top kits will include a lightning protection device and attachment to the building grounding / bonding system, rated for lightning dissipation.
 - ❖ Submit a detailed shop drawing indicating all mounting components proposed for each camera location.
 - ❖ Ensure all exterior camera mounts are installed rigidly to eliminate camera movement in winds up to 185 mph.
7. Dipswitch: Not required on IP cameras.
8. Elevator Patch Cable: Trade Contractor shall provide mini two (2) foot patch cable as required.
9. Elevator Cameras: Trade Contractor shall provide (unless otherwise directed by MDAD) and test elevator cameras and mounting enclosure. All cables, cross connects will be provided by Trade Contractor. Trade Contractor must coordinate with Elevator Installer prior to performing any Work.
10. Flex Conduit: Trade Contractor shall provide flexible conduit from junction box serving the camera-to-camera housing.
11. Intercom installation: Trade Contractor shall provide, and test all required door and elevator Intercom Systems in strict accordance with intent of the plans, drawings and specifications subject to terms and conditions of Contract Documents.

Signals from Intercom shall be received on standard Ethernet CAT6 cable and terminated to RJ45 patch panel mounted in the MSR or MTR.

Trade Contractor shall interface Intercom Systems with existing Headset Preamps located at Security Operation Workstation(s). The Preamps enable low power audio headsets to interface with line level audio in/out devices. The headset’s microphone output is amplified to line levels while incoming line level audio is adjusted to earpiece levels. In addition, the Preamp provides adjustable level, monitor tone to the audio out path. Upon connection, this tone provides a record warning tone to the Intercom Station.

Trade Contractor Intercom Installation responsibilities include:

- a. Termination of all connections, and provide all fastenings and support, sleeves, inserts, grommets, rings, frames, and field adjustments.
- b. Integration of Intercom System with Owner’s Security System.

- c. Ensure all equipment exposed to elements is weather protected.

C. Scope of Work - CCTV and Intercom Programming Integration Services

To keep continuity under responsible party needed to maintain equipment until successful commissioning and start of warranty, Trade Contractor shall use only technicians certified by Juniper Networks, Qognify, and CNET. Trade Contractor will submit the following minimum certifications of individuals performing the work to ensure compliance with this requirement.

- a. Digital Video, Audio and Data Transport System (DVADTS)
- b. Digital Video Recording System (DVRS)
- c. Digital Video Transport System (DVTS)

Certified Technician shall integrate all Security Control Cameras, Camera pan-tilt-zoom (PTZ) control, and Emcom Intercoms, MDAD Security System, and Qognify DVRS. In addition, Trade Contractor shall ensure interfaces support Security Operations' ability to use all current video display applications that allow selection and viewing of selected cameras and two-way communication of Intercom System. A certified Contractor will be required to integrate the ACS with the CCTV System. The Trade Contractor shall use the existing Security Systems Integrator Service provider for this scope of work.

- a. Security System Interface includes (but is not limited to):
 - ❖ Digital Video, Audio and Data Transport System (DVADTS) – Network. (ASN) This existing system is a high-speed 20GbE MPLS Ethernet data network that spans the Airport. DVADTS's sole purpose is to provide high-speed inter-connectivity and integration of all security system components, equipment, computers, and any other security devices needing this type of connectivity.
 - ❖ Digital Video/Audio Recording System (DVRS) This existing system records video from the operational or security CCTV cameras and audio from Intercoms and makes this information available to Security Operation Workstation. Recording is also automatically initiated by any alarm monitored by Access Control System or continuously recorded 24 x 7 x 365.
 - ❖ Digital Video Transmission System (DVTS) This existing system is a real time video and audio Ethernet based switching network system that provides video and audio selected by operator of the Security Operation Workstation or automatically initiated by any alarm monitored by Access Control System.
- b. Trade Contractor Programming Integration Services shall include:
 - (1) Interface and Integration Implementation shall be performed for:
 - ❖ All fixed and PTZ Camera video and Intercoms
 - ❖ PTZ camera Control, Intercom Audio and Control signals

- ❖ DVRS and DVTS Video, audio and control signals
 - ❖ All new DVRS and DVTS equipment with existing and new DVADTS
 - ❖ New DVADTS equipment with existing Security System equipment
 - ❖ All hardware and software configuration, logical and physical settings, operating systems and application code required to integrate all new equipment to existing Security System
 - ❖ All network configuration including but not limited to IP addresses, VLAN configuration, firewall configurations, etc.
 - ❖ All physical connections, including demarcations, jumper cables and cable management required to connect new devices
 - ❖ Configuration of Equipment to allow users to access, control and view live, recorded video and listen to live and recorded audio synchronized camera and intercom from respective security door.
 - ❖ Create and implement graphics and user interface controls in audio and video systems
 - ❖ Configure Equipment to allow users to access, control and view live and recorded video from each respective camera
 - ❖ Integrate the controls for all PTZ cameras
 - ❖ Provide interfaces that support Digital Video Transmission System control of cameras installed as part of this Project
 - ❖ Provide interfaces between Intercom System and Digital Video Transmission System
 - ❖ Integrate functions of the Intercom within Digital Recording System
 - ❖ Verify through testing all cameras and Intercom installed under this Project meet required sequence of operations
 - ❖ Interface and integration to ACS alarm processing software, the digital video, audio display, voice, and video from the camera and intercom areas. (2) Integrate System door alarm with respective door camera to automate the coordinated access control, camera and intercom response for each respective door, (3) Configure camera workstation viewing application to access all new operational cameras and intercoms.
- (2) Inter-rack cabling: A service loop will be found on top of the DVRS Rack. Trade Contractor shall run and connect cabling from video and audio input over to DVTS rack and connect to CNET This shall include dressing the cable, applying connections and terminations.
- (3) Each camera and intercom must be individually configured to transmit a video /audio signal. Trade Contractor shall associate camera and Intercom with a port on the chassis and configure that port in current database. In addition, each camera and intercom shall be placed in a map with its corresponding address and configuration assigned in Manager Database.

- (4) Trade Contractor shall test and verify Manager Database to chassis signaling.
- (5) Trade Contractor shall provide Gateway Video and Audio configuration. All new camera inputs shall be configured and tested from the sub-systems to accept API calls. Trade Contractor shall provide gateway information to ACS Vendor for ACS interface.
- (6) Trade Contractor shall provide Vision Channel configuration. Each camera and Intercom shall be individually assigned to a DVRS channel and configured for that channel.
- (7) Trade Contractor shall ensure all Systems and workstations are time sequenced. Configuration includes, but is not limited to:
 - ❖ Record Mode settings
 - ❖ Recording Parameters
 - ❖ Video and Audio Channel Settings
 - ❖ Manual Start/Stop Recording
 - ❖ Each camera and Intercom shall be placed into its proper grouping.
- (8) Trade Contractor shall test end-to-end solution. This shall involve video stream testing, local camera, and Intercom configuration verification, DVADTS, DVTS and DVRS testing. Note: testing requires Trade Contractor to physically test at end station location.
- (9) Trade Contractor shall provide Inter-Rack, ENET cabling, PTZ wiring and configuration.
- (10) Trade Contractor shall update data tables with:
 - ❖ Alarm ID number
 - ❖ Camera ID number
 - ❖ Camera location description
 - ❖ Camera Shortcut number
 - ❖ Intercom ID Number
 - ❖ Intercom location description
 - ❖ PTZ Presets and camera "Home Position"

D. Testing and Commissioning

Testing and Commissioning of CCTV Camera and Intercom Systems shall be a process of quality assurance and testing to ensure CCTV and Intercom Installation and Integration Services meet performance, functionality and quality requirements approved by MDAD. Trade Contractor shall perform System Testing and Commissioning for all new camera and Intercom installations and integration end-to-end in accordance with requirements stated in Project Manual.

Trade Contractor shall be required to perform Out-of Phase Testing and Commissioning for CCTV and Intercom installations that are deemed substantially complete and are available for Beneficial Occupancy. This shall hereafter be known as

“Phased Testing and Commissioning”. In such event, Trade Contractor shall perform all testing and documentation requirements, satisfy all punch list items, and accompany Managing General Contractor and Owner’s Representative or their designee on all Phased Testing and Commissioning which will be reviewed and approved by MDAD IS/T and/or assigned MDAD official.

————Shutdown Requirements: Trade Contractor shall follow Owner’s Shutdown requirements prior to performing work on operational (live) CCTV Cameras.

1.7 SUBCONTRACTOR’S QUALIFICATIONS

- A. Trade Contractor Qualification Requirements: Trade Contractors must have at least five (5) years of successful installation experience with projects of similar size and environments utilizing brand of CCTV equipment proposed for this project. Installation experience must be for Work completed within last five (5) years and must include at least one (1) airport installation of similar size, complexity, and brand of CCTV and Head-End equipment.
- B. Trade Contractor shall include with Bid a list of references with specific information regarding type of project, size of project, involvement in providing of equipment and systems, name of CCTV, Intercoms and head-end equipment manufacturers. List shall include contact names and contact phone numbers.

1.8 TRADE CONTRACTOR DUTIES (include, but not limited to)

- A. Trade Contractor shall provide Installation and Programming services for CCTV Cameras and Intercoms in a neat, safe and professional manner according to standards.
- B. Trade Contractor shall provide material and equipment that is new, and conforms to grade, quality, and standards as specified. Equipment and materials of the same type shall be a product of the same manufacturer throughout duration of Contract. If supply, availability or construction environment requires substituting any product for a product specified herein or previously Approved, Trade Contractor shall notify Managing General Contractor as described in Division 1 of Project Manual.
- C. Trade Contractor shall be responsible for providing a safe work environment for its own employees as well the general public, Owner’s employees and contractors, airline employees and contractors, and vendors or other airport customers and service personnel.
- D. Trade Contractor shall take all necessary precautions and preventative steps in assuring its employees, subcontractors and others are completely protected from any harm because of construction activities.
- E. Trade Contractor shall comply with MDAD Site Safety, Health & Environmental Program. Trade Contractor is held accountable for implementing all OSHA, Federal, State, and local codes, standards or regulations that are applicable to Work being performed under this Contract.

1.9 PERMITS, FEES, AND CERTIFICATES OF APPROVAL

- A. As applicable, Trade Contractor shall make application and coordinate obtaining permits for all construction and installation that are part of this Project. All cost associated with such Permits and Fees shall be deemed included in Contract Pricing.
- B. As prerequisite to final acceptance, Trade Contractor shall satisfactorily complete commissioning and all punch list items.
- C. Current Calibration Certifications must be submitted for all test equipment.

1.10 SUBMITTALS

- A. General: Trade Contractor submittals shall comply with all requirements stated in Project Manual including, but not limited to:
 - Division 0, Section Trade Contractor Safety Requirements
 - Division 0, Section Trade Contractor Hurricane Preparedness Plan
 - Division 1, Section Progress Schedule
 - Division 1, Section Shop Drawings, Product Data & Samples
 - Division 1, Section Schedule of Values
 - Division 1, Section Construction Photographs
 - Division 1, Section Substitutions and Product Options
 - Division 1, Section Systems Demonstrations
 - Division 1, Section Project Close-out
 - Division 1, Section Project Records Documents
 - Division 1, Section Operating and Maintenance Data
 - Division 1, Section Spare Parts and Maintenance Material
 - Division 1, Section Warranties and Bonds

Process for documentation submittals and approval are further described in Division 1.

- B. Submittal Log: Within ten (10) days after Notice to Proceed (NTP), from MDAD IS/T and MDAD PM, Trade Contractor shall provide a Submittal Log matrix listing all required submittals and scheduled date for each submittal. This Log shall be updated monthly with the date documents were submitted and status of each submittal.
- C. Installation and Programming Plan: Within fifteen (15) days after NTP, Trade Contractor shall submit to MDAD IS/T and MDAD PM for approval, an Installation Plan and Schedule for entire project indicating when (and number of days required) for procurement, installation, programming, testing, and commissioning. The Plan shall detail how Work will be accomplished, highlighting minimal interruption to ongoing Airport operations and/or construction activities. Plan shall provide daily Work Schedule for employees and subcontractors, protection of existing equipment, daily cleanup and other activity that assures continuing operation with minimal impact on other construction activities.

Plan shall meet requirements of the Project Schedule and reflect phasing requirements for all trades. Approved Installation Plan and Schedule shall be maintained and updated in accordance with Division 1. At a minimum, Plan and

Schedule shall clearly show:

1. Specific location / identification of each Work activity per phasing drawings
 2. Sequence and interdependency of all activities required for complete performance
 3. Delivery activities for all equipment including dates for ordering long lead items
 4. Detailed schedule for all pretesting and phased commissioning / testing activities
- D. Three-Week Rolling Schedule: Trade Contractor shall submit to MDAD IS/T and MDAD PM a Three-Week Rolling Schedule each week to be used at weekly progress and coordination meetings. The Rolling Schedule shall reflect previous week's activity progress along with a projection of activities expected during following two-week period.
- E. Project Management Plan: Trade Contractor shall provide to MDAD IS/T and MDAD PM at Pre-Construction Meeting a Project Management Plan describing basic goals, budget, strategic, logistic, physical and technical objectives for project and quality control standards. Plan shall also include the following:
- (1). Workflow Chart describing each stage of the project
 - (2). Organization Chart showing Trade Contractor and their subcontractors and interrelationships with Managing General Contractor and Owner along with their lines of authority
 - (3). Description of Trade Contractor project personnel and daily duties
 - (4). Total dollar value of Project with estimated dollar value of each Phase Description
 - (5). Method to be used to ensure cost containment
 - (6). Value Engineering Recommendation
- F. Safety and Security Plan: At the Pre-Construction Meeting, successful Contractor shall submit for approval a Site-Specific Safety Plan in accordance with Project Manual - Division 0. Safety Plan includes, but not limited to:
- ❖ Hurricane Preparedness Plan
 - ❖ Emergency Response Plan
 - ❖ Emergency Action Plan
 - ❖ Security Plan
 - ❖ Incident Reporting Plan
- G. Schedule of Value: Within seven (7) days after execution of Contract Division 1, Trade Contractor shall submit to MDAD IS/T and MDAD PM for review and approval, a Schedule of Value in compliance with requirements of Division 1, Section 01370 including, but not limited to, submittal of a preliminary Schedule of Values allocated to various portions of Work.

- H. Functional Testing and Commissioning Plan: Trade Contractor shall submit to MDAD IS/T and MDAD PM for review and approval, a Functional Testing and Commissioning Plan six (6) weeks after NTP. Plan shall detail the objectives of all tests, test methods, test procedures, test scripts, witness sign-off and test report format.

Functional Testing and Commissioning Plan shall clearly demonstrate CCTV and Intercom Systems and their components fully comply with the requirements specified herein (Refer to Division 16).

- I. Manufacturer's Instructions: Four weeks prior to start of first camera / intercom installation, for all Trade Contractor provided equipment, Trade Contractor shall submit six copies of the manufacturer's current printed instructions, for storage, assembly, installation, startup, adjusting and testing. These documents shall become an integral part of Testing and Commissioning process and final Close-Out Documentation.

- J. Shop Drawings & Product Data - General: In accordance with Division 1 Requirements, Trade Contractor shall submit to Managing General Contractor shop drawings, product data (including cut sheets and catalog information), and samples. Trade Contractor shall submit shop drawings, product data, and samples as a complete set for initial submission and for resubmission required for approval, as described in Division 1.

Trade Contractor shall submit shop drawings, product data, and samples with such promptness and in such sequence as to cause no delay in the Work or in activities of separate contractors. Trade Contractor, showing date and Trade Contractor's legitimate firm name, shall sign all drawings and documentation submittals.

1. By submitting shop drawings, product data, and samples, Trade Contractor represents it has carefully reviewed and verified materials, quantities, field measurements, and field construction criteria related thereto. Trade Contractor also represents it has checked, coordinated, and verified information contained within shop drawings, product data, and samples conform to requirements of Work.
2. The approval of shop drawings, product data and samples submitted by Trade Contractor shall not relieve Trade Contractor of responsibility for deviations from Project requirements, unless Trade Contractor has specifically informed Managing General Contractor in writing of such deviation at time of submittal and Trade Contractor received written approval of each specific deviation.
3. Managing General Contractor/Owner/Design Professional will not check illegible submittals.
4. If substitution of any product is required, Trade Contractor shall submit shop drawings, product data and samples in accordance with Division 1 Section 01630 for approval. Trade Contractor shall test requested substitutions in Owner's test lab to ensure it meets specification and compatibility

requirements.

5. The review and approval, or other appropriate action upon shop drawings, product data and samples, is for limited purpose of checking for conformance with information given and design concept expressed. Owner/MGC, DP review of such submittals is not conducted for determining accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Trade Contractor. The review shall not constitute approval of safety precautions or of construction means, methods, techniques, sequences, or procedures. The approval of a specific item shall not indicate approval of an assembly of which item is a component.
 6. Trade Contractor shall perform no portion of Work requiring submittal and review of shop drawings, product data, or samples until the respective submittal is approved.
- K. Shop drawings – Specific Requirements: Trade Contractor shall comply with Division 1 requirements pertaining to Shop drawings and provide information to MDAD IS/T. Shop drawing must provide detail indicating all mounting components proposed for each camera / intercom location. Submittal requirements include but are not limited to the following:
1. Show Equipment Quantities, locations, types and arrangements
 2. Rough-in diagrams
 3. Design calculations and methods
 4. System block diagram, indicating interconnection between system components and subsystems
 5. Wiring diagrams showing field installed wiring
 6. Schedule and Tables
 7. Flow Diagram showing normal flow of data throughout the Intercom and CCTV Systems and other systems they interface with
 8. Interface requirements, including connector types to external systems and systems or components not supplied by Trade Contractor
 9. Programming settings and presets
 10. For Rack mounted equipment, provide assembly drawing of every equipment rack with locations, quantities, model numbers of individual components contained in the rack. MSR Cabinet Layout shall document Rack/Cabinet Number, depict location of each head-end system, serial number and asset number of each device associated with Intercoms and CCTV Cameras, and related UPS and Network devices. This is regardless if Head-end System was existing or new (installed under this contract). Trade Contractor shall provide such drawings for all MTR and MSR Rooms to MDAD IS/T.

- L. Parts List – Specific Requirements: Within thirty (30) days after NTP, Trade Contractor shall submit a complete list of major products included in this installation. List shall incorporate all products provided by Trade Contractor, including spare parts. Parts List shall include every component used by Trade Contractor in the Installation of Cameras and Intercoms. Parts Lists shall include part numbers, model numbers, and supplier’s address and contact information. Owner requires parts lists to identify each component (to lowest repairable unit) along with ordering information.
- M. Product Data – Specific Requirements: Product Data shall include the manufacturer name, model number and related Specification paragraph numbers for each product provided by Trade Contractor. Product data shall show products’ mechanical and electrical specifications, as applicable. Trade Contractor shall provide catalog cut sheets and information for the following:
1. All metallic and nonmetallic conduits, including surface raceways, outlet boxes, and fittings and flex conduit used at camera and Intercom mounting location
 2. Terminal blocks and patch panels
 3. Equipment housings
 4. Camera ceiling and roof-top mounting kits
 5. Camera mounting brackets
 6. Surge protection devices and enclosures
 7. Elevator Cameras, housing, kits and brackets
 8. Intercom devices
 9. Video Extenders
 10. Head-End Equipment (if applicable)
- N. Samples: Trade Contractor shall comply with requirements of Division 1 as it pertains to samples. At a minimum, sample submittals include the following:
1. Connectors
 2. Flex conduit used at camera mounting
 3. Surge Protection and Enclosure
 4. Power Supply and Enclosure
- O. Operation, Maintenance and Programming Data (O&M): Trade Contractor shall provide Operation and Maintenance Manuals for all Trade Contractor provided devices, such as but not limited to Cameras (provided by Trade Contractor), Intercoms, Surge Protection, and Power Supplies. Manuals shall include installation, operation, and maintenance, including preventative maintenance instructions from the manufacturer. O&M Manuals shall meet or exceed the requirements of Division 1, O&M Manuals shall:
1. Serve as training and reference manual for all aspects of day-to-day-maintenance and major system repairs.
 2. Include complete set of as built installation drawings for each system

3. Include photographs and drawings showing installation details and locations of equipment Routine preventive maintenance procedures, corrective diagnostic troubleshooting procedures
 4. Programming Manual shall detail any software packages supplied with the systems and independent programming of system, point schedule, and software trouble shooting procedure
- P. Project Close-Out Documentation: Trade Contractor shall comply with all Project Closeout requirements shown in Division 1. Trade Contractor shall submit as-built project records, including but not limited to the following:
1. Approved shop drawings
 2. Plan drawings indicating locations and identification of Intercoms, CCTV cameras, field of view, telecommunications and MSR rooms
 3. Labeling and administration documentation
 4. Software Licenses in the name of the Owner (if applicable)
 5. Combined Warranty Statement from the Trade Contractor
 6. Warranty documents from 3rd party vendors for equipment and materials
 7. All approved Test Reports
 8. Final Inventory Logs
 9. Product List and Product Data Sheets
 10. Manufacturer's Instructions
 11. Operation & Maintenance Manuals
 12. Recommended Spare Parts List
 13. Data Table Print Out
 14. Photographs
 15. Approved (fully signed) check list Pre-functional Check completed for each Phased Installation
 16. Approved (fully signed) 16998 Functional Testing and Commissioning for each Phased Installation
- Q. Test Report: Trade Contractor shall submit test results to Managing General Contractor as required.
- R. Progress Report: Trade Contractor shall provide a Progress Report weekly to Managing General Contractor. Such report shall detail Work completed and any issues that may impede installation schedule.
- S. Camera As-Built Inventory Log: Throughout the term of this Contract, Trade Contractor shall record and maintain Camera Inventory Log on an Excel spreadsheet. Inventory records shall include, but is not limited to, the following information:
1. Installed Camera Number
 2. Installed Camera Model Number
 3. Installed Camera Serial Number
 4. Installed Camera Asset Number

5. Installed Camera IP address
6. Floor Location
7. Drawing Sheet Number
8. Camera Type (Fixed / PTZ)
9. Camera Specification Description (CM-1, CM-2, etc)
10. Installed Lens
11. Surge Suppressor ID
12. Dip Switch Setting (Address)
13. Location Coordinates (column lines)
14. Cable termination location in MSR or MTR. (Row#, Rack #, PP # Port #)
15. ASN Switch Port Number
16. Elevator ID, if applicable
17. Related Door ID, if Applicable
18. Date of Installation
19. Date of Commissioning
20. Equipment Provided by Owner or Trade Contractor
21. Starting Date and Ending Date of 36-month Warranty (applicable to devices provided by Trade Contractor)

1. Intercom As-Built Inventory Log: Throughout the term of this Contract, Trade Contractor shall record and maintain Intercom Inventory Log on an Excel spreadsheet. Inventory records shall include, but is not limited to, the following information:

1. Installed Intercom ID
2. Installed Intercom Model Number
3. Intercom Serial Number
4. Intercom Asset Tag Number
5. IP Address
6. Floor Location
7. Location Coordinates (column lines)
8. Cable termination location in MSR or MTR. (Row#, Rack #, PP # Port #)
9. ASN Switch Port Number
10. Related Door ID, if Applicable
11. Date of Installation
12. Date of Commissioning
13. Starting Date and Ending Date of 36-month Warranty

U. Training Documentation: Trade Contractor shall submit all training documentations as required by Division 1, Section 01670, Systems Demonstrations.

1.11 QUALITY ASSURANCE

- A. Trade Contractor shall ensure provided productions and installation and programming services meet all requirements including but not limited to:
- ❖ Division 1 – Trade Contractor’s Quality Control
 - ❖ NECA 1
 - ❖ NFPA 70
 - ❖ UL Approval

1.12 WARRANTY

- A. Trade Contractor shall provide a joint written warranty of the manufacturer(s) (of devices provided by Trade Contractor) and installation and programming integration services on a single document.
- B. Trade Contractor shall warrant parts supplied by Trade Contractor, complete installation, and programming of the equipment to be free from defects in materials and workmanship for a period of no less than thirty-six (36) Months. The starting point for the warranty shall be from date of Beneficial Occupancy as determined by successful completion of Testing and Commissioning.

Trade Contractor shall submit a written warranty signed by Trade Contractor, installer and program integrator for cameras and intercoms agreeing to correct system deficiencies and replace components that fail in materials or workmanship with specified warranty period when installed and used according to manufacturer’s written instructions. This warranty (parts and labor) shall be in addition to, and shall not limit, other rights Managing General Contractor and Owner may have under other provisions of the Contract.

- C. In addition to Warranties required, Trade Contractor shall ensure all manufacturers’ warranties are transferred to Owner. Trade Contractor shall submit these warranties on each item provided by Trade Contractor. Warranty shall detail specific equipment or subparts that are subject to separate conditional warranty. Final payment shall not relieve Trade Contractor of these obligations.
- D. During the warranty period, Trade Contractor shall begin rework or replacement of equipment within 2 hours of first notification and must be completed within 24 hours. Repair must be raised to the highest priority until work is completed. If repairs cannot be completed during this period, or if ordering of parts is required, Trade Contractor shall provide Managing General Contractor and Owner written update, every 24 hours, on the progress of repairs.
- E. Upon receipt of notice from Managing General Contractor/Owner of the failure of any part during the Warranty period, Trade Contractor shall replace affected parts or parts with new parts and software corrected promptly at no cost to Owner for labor or parts.

1.13 COMMISSIONING AND ACCEPTANCE

Commissioning is a systematic process to ensure all CCTV and Intercom equipment and

MDAD Project No. AA005A Section 28 23 00
PHASE 3C 100% Complete Contract Documents for Permit – September 9, 2022 Technical Specification
CCTV Camera
Installation & Programming Integration Services
Page 21 of 40

systems performs interactively according to design intent and Owner's operational needs.

- A. Final Acceptance of each phase of installation shall be withheld until the following have been completed successfully:
 - 1. Acceptance of all submittals and required documentation
 - 2. Successful Testing & Commissioning
 - 3. Completion of Punch List
- B. All cost associated with Testing and Commissioning shall be deemed included in Contract total.

1.14 INVOICING

Prices in Schedule of Values shall be referenced when invoicing for parts, installation and documentation that have received Owner's Acceptance.

1.15 SEQUENCING AND SCHEDULING

- A. Trade Contractor shall complete Work according to Sequence of Work described below.
 - 1. CAMERAS
 - a. Contractor shall pull wiring through conduit to junction boxes provided by the Electrical contractor. CCTV Trade Contractor must coordinate with contractor for camera mounting location and distribution needs to ensure connection paths. Contractor is responsible to install Owner Approved RJ45 connector on CCTV CAT6 and test all cables before connection to camera and intercoms
 - b. Trade Contractor shall then cross connect to Camera and begin sequence of settings, adjustments, focusing and pre-testing.
 - c. Trade Contractor shall coordinate with Owner and Managing General Contractor to ensure installation and programming of new CCTV cameras shall not disrupt existing equipment and/or Airport and Construction operations.
 - d. When modifying existing installation, Contractor shall coordinate Work to be done so not to disrupt Airport and Construction Operations.
 - e. When adding, deleting, or working on live CCTV Systems, Trade Contractor shall follow Shutdown Procedures shown in Project Manual. (Note: MDAD Shutdown request is required when adding or deleting any device or component to an active System.)
 - f. Trade Contractor shall be responsible for testing and commissioning of CCTV Systems and interfaces with the Security System back to the Security Operation Workstation.

2. INTERCOMS

- a. Contractor shall pull wiring through conduit to junction boxes provided by the Electrical subcontractor.
 - b. Contractor shall provide terminated wire and cable. The CAT6 cables shall be tested, and test results submitted to MGC prior to intercom installation.
 - c. Trade Contractor shall provide Push-to-Call full duplex Intercom and associated terminations. Conduit, and junction boxes will be provided by Electrical contractors. Contractor will provide termination at existing termination block.
 - d. Trade Contractor shall cross connect Intercom connection at Intercom install location and at MSR / MTR as required.
 - e. Trade Contractor shall coordinate with Owner and Managing General Contractor to ensure installation and programming of new intercoms shall not disrupt existing equipment and/or Airport and Construction operations.
 - f. When modifying existing installation, Trade Contractor shall coordinate Work to be done so not to disrupt Airport and Construction Operations. (Note: Shutdown request is required when adding or deleting any device to an active System.)
 - g. Trade Contractor shall be responsible for testing and commissioning of the Intercom Systems and interfaces with the Security System back to the Security Operation Workstation.
- B. Trade Contractor shall perform all Work in accordance with current Construction Schedule as defined in Division 1.

PART 2 PRODUCT

2.1 GENERAL

The approved equipment manufacturers are listed below. Functional equivalents shall be considered so long as hardware/software meets or exceeds this Specification and is 100% compatible with existing system(s). Compatibility shall be proven in Owner's Test Lab.

A.

CAMERAS –Axis and approved alternates.

- a. Axis P91 Corner camera and T8640 kit if required.
- b. AXIS P3364 –V or Owner approved equal.

If Trade Contractor wants to seek Owner's approval for "Equal", Trade Contractor shall test recommended substitution in Owner's Test Lab and show recommended substitution meet Specification and System compatibility requirements.

Trade Contractor shall designate and coordinate delivery dates for each product in Trade Contractor's Schedule of Work with Project PM to request required equipment from Owner's Inventory.

Trade Contractor shall assemble, install, connect adjust and finish products in accordance with manufacturer's recommendations.

B TRADE CONTRACTOR PROVIDED EQUIPMENT: Trade Contractor shall provide, test and commission all other equipment as needed to complete Work indicated by this specification and supporting drawings, including but not limited to:

1. Transient and Surge Suppression Equipment:

- a. Ditek
- b. Polyphaser

Surge Protection Devices shall also provide noise filtering for electromagnetic and radio frequency interferences (EMI/RFI), as recommended by equipment manufacturer. Frequency range for (EMI/RFI) noise filtering suppression shall be 10KHz to 100MHz at 40 db.

2. Mounting Accessories

- a. Camera mounting bracket and accessories shall be provided by Trade Contractor as required for each camera position and as shown in Project Drawings.
- b. The product for all exterior camera mounts shall be installed rigidly to eliminate camera movement in winds up to 185 mph. See Project Drawings for rooftop mounting configuration and mounting systems.
- c. Roof-top mounting accessories shall include waterproof electrical box with surge protector inside.
- d. Certain interior mounting brackets shall be custom designed to Owner's specification. Trade Contractor shall coordinate with Managing General Contractor/Owner for specific mounting bracket product to be used.

3. Intercom

- a. The Intercom Station shall be Emcom Systems Model IP860.

Intercom shall be surface-mounted, hands-free, full-duplex ¾" metal button, submersible speaker. Its internal amplifier and speaker shall operate from line level audio in and its microphone and preamp shall provide line level audio to remote systems. The unit shall provide contact signaling information to alert of activation and shall have two indicators to advise of a call placed or received. It shall include following additional features:

Dimensions: 5.00"H x 5.00" W x 1.8"D.

Panel: Stainless Steel

Weight: 3 lbs

Connectors: RJ45

- b. Authorized Supplier Information:

Certified Network Professionals, Inc.

Contact: Orlando Suero

Phone: (954) 610-0443

4. Testing Equipment
Trade Contractor shall use a Laptop with CCTV camera vendor software and POE injector to test IP CCTV cameras.
5. Surge Suppression Equipment
Trade Contractor shall provide Surge Suppression devices for all outdoor cameras. Surge suppression devices shall protect all cables that serve outdoor cameras..
6. UPS
If requested by Owner, Trade Contractor shall provide Minuteman Model E 2300 UPS for use in the MSR's and MTR's UPSs are to be installed in cabinets or 19" racks as directed by Owner. Contractor shall energize and test the UPSs. UPS requirements are as follows:
UPC: 784755150738
Warranty: Include 3 years – Parts and labor including batteries
2300VA/1380W 120 VAC true sinewave,
SNMP Card Required: YES
Back-up time – full load: 9.6 minutes
Back-up time – half load: 23.5 minutes
7. Connectors
RJ45 connectors and associated CAT6 cabling, shall be tested end to end with certified calibrated equipment. All test results will be part of project closeout documents.
8. Conduit, Cable Trays, J-Boxes, Hoffman Type Boxes, CAT6, UL Racks and Cabinets (Items listed in Attachment A, Section B2)
If requested by Owner, Trade Contractor shall provide any necessary Conduit, Cable Trays, CAT6, 19 Inch Racks and/or Cabinets needed to complete the work. All such items shall be provided, installed, and tested in accordance with the Contract requirements, including but not limited to Specification Sections: Division 26 and 27.

C. CAMERA QUANTITY AND MOUNTING TYPE

Estimated quantity and mounting type is shown below:

Approximate Camera Quantities (Refer to drawings for actual count)		
CM1	FIXED	TBD
	PTZ	TBD
CM2	FIXED	TBD
	PTZ	TBD

CM3	FIXED	TBD
CM4	FIXED	TBD
	PTZ	TBD
CM5	FIXED	TBD
	PTZ	TBD
CM6	FIXED	TBD
TOTAL		TBD

Refer to Project Drawings for exact detail on quantity and Mounting Type.

D. INTERCOM QUANTITY AND MOUNTING TYPE

Estimated Quantity of Intercoms and Audio Interface Mixer Units is shown below:

Emcom IP860 Intercoms: TBD

2.2 SYSTEM REQUIREMENTS

A. Cameras shall have:

1. High resolution color
2. High dynamic range for eliminating or significantly reducing adverse background lighting conditions
3. Function in very low light and nighttime lighting conditions

2.3 CAMERA ENVIRONMENTAL SPECIFICATIONS

- A. Humidity: 0% to 90% relative, non-condensing
- B. Operating temperature: 14 F to +122 F (-10 C to +50 C)
- C. Storage Temperature: 14 F to +140 F (-10 C to +60 C)
- D. Enclosure rating:
 - 9350 Series: NEMA 4 (IP65)
 - 9349 Series: Plenum rated

2.4 INTERCOM ENVIRONMENTAL SPECIFICATIONS

- A. Operating Temperature: -20C to +50C

2.5 AGENCY APPROVALS

- A. Safety: CE, UL

PART 3 EXECUTION

3.1 GENERAL

- A. Trade Contractor shall ensure all Work performed shall be in accordance with requirements described in the Project Manual. Trade Contractor shall immediately correct Work performed in deviation of the requirements without additional charges, regardless of the stage of completion.

- B. Owner assumes no responsibility or liability for storage fees, freight, taxes, or other costs associated with delivery and storage of system components. Trade Contractor shall be responsible for loss or damage of all material until transfer of title to Owner.
- C. Before attempting installation, Trade Contractor shall verify all cables, connections and support equipment are ready for installation and integration with the rest of the system verify with responsible MDAD technical shop.

3.2 COORDINATION REQUIREMENTS

- A. Trade Contractor shall comply with Managing General Contractor/Owner requirements to coordinate work of various trades having independent responsibilities for installing, connecting to and placing in service associated equipment and products.
- B. Trade Contractor shall coordinate with other trades towards the general purpose of having installation/construction progress as rapidly and as smoothly as possible with minimum interference between trades.
- C. Trade Contractor shall make provisions to coordinate with Managing General Contractor to minimize disruption of the construction operation. This may require part of installation Work performed in off-peak hours-
- D. Whenever Work (or portion thereof) is dependent upon the work of other subcontractors or if Work will affect another subcontractor, or if Work may potentially be impacted by another subcontractor, then CCTV / Intercom Trade Contractor is required to, at a minimum:
 - ❖ Notify Managing General Contractor
 - ❖ Coordinate its Work with dependent work of other subcontractors as required by the Contract
 - ❖ Provide necessary dependent data and requirements to Managing General Contractor and appropriate subcontractor(s)
 - ❖ Examine dependent drawings, specifications and submittals
 - ❖ Examine previously placed dependent work
 - ❖ Check and verify dependent dimensions of previously placed work. Notify Managing General Contractor if dependent dimensions which are unsatisfactory or will prevent a satisfactory installation of its Work
 - ❖ Attend and participate in coordination meetings with other subcontractors
- E. Integration Programming Coordination: In addition to the above, the following Owner Organizations are involved in Programming Coordination of CCTV Cameras and Intercoms:
 1. MDAD Information Systems and Telecommunications Division: This Division will be responsible for operation and maintenance of the data network (ASN) and Network Management components of the Security System.
 2. MDAD Facilities Maintenance: This organization will be responsible for

maintenance of video and audio recording and switching component of Security System. Once each Phase is tested and commissioned, this organization will be responsible for the entire System, including Cameras and Intercoms, and video / audio to the transmission, recording and monitoring equipment.

- F. This Contract requires close coordination with Matrix Systems representative, the vendor for Access Control System and Certified Network Professionals, Inc. , the vendor for the Security Systems and Network.
- G. If Managing General Contractor/Owner or their authorized representatives determine Trade Contractor is failing to coordinate Work with the work of other contractors as required by this Contract, Managing General Contractor/Owner or its authorized representatives may upon 72 hours written notice:
 - 1. Withhold any payment otherwise owed hereunder until Trade Contractor complies with MGC/Owner's directions
 - 2. Direct others to perform portions of Contract and charge cost of Work against Trade Contractor's Contract amount
 - 3. Terminate any and all portions of this Contract for Trade Contractor's failure to perform in accordance with Contract requirements

3.3 GENERAL MEETING REQUIREMENTS

- A. Project Pre-Construction Meeting: After Award of Order, Managing General Contractor will call for and administer a Pre-Construction Meeting in accordance with Division 1. Managing General Contractor and Owner's Authorized Representatives, Trade Contractor and all their sub-contractors shall attend Pre-Construction Meeting. Project Pre-Construction Meeting Agenda shall include the following:
 - ❖ Introduction of Trade Contractor's authorized representative who shall be responsible for working and coordinating with Managing General Contractor's representative(s) relative to overall project
 - ❖ Bill of materials, noting long lead-time items
 - ❖ Preliminary draft of Bill of Materials, noting long lead-time items
 - ❖ Preliminary Trade Contractor Schedule shall be based on Pre-Bid Schedule. Trade Contractor Schedule shall including all major Work components that materially affect any other Work on the project. Refer to Division 1, for more detail
 - ❖ Personnel and vehicle permit procedures
 - ❖ Use of premises
 - ❖ Location of Trade Contractor's on-site offices
 - ❖ AOA access
 - ❖ Employee parking
 - ❖ Security
 - ❖ Housekeeping
 - ❖ Safety Program

- ❖ Review of Preliminary Trade Contractor Schedule
- ❖ Clarifications of Project requirements

Contractor shall distribute copies of minutes to attendees. Attendees shall have 5 working days to submit comments or additions to the minutes.

- B. Progress / Coordination Meetings: Managing General Contractor will schedule and administer weekly on-site Progress Meetings throughout duration of the Work as defined in Division 1 of the Project Manual. Trade Contractor’s Project representative and sub-contractors, Owner / Owner Authorized Representative, Design Professional and Managing General Contractor shall attend all Progress Meetings. Progress Meeting Agenda shall include, but not be limited to, following items as appropriate:
- ❖ Review of Work progress
 - ❖ Status of related Construction Work Schedules and dependencies
 - ❖ Submittals
 - ❖ Delivery schedules
 - ❖ Quality Control
 - ❖ Pending changes and/or substitutions
 - ❖ Review of Trade Contractor’s safety program activities and results, including report on all serious injury and/or damage accidents
 - ❖ Other items affecting progress of Work

Trade Contractor shall distribute copies of minutes to attendees. Attendees shall have five (5) working days to submit comments or additions to meeting minutes.

C. Ad-hoc Meetings

Trade Contractor shall be required to attend meetings as may be called by any party by notifying all desired participants two (2) working days in advance, giving reason for meeting. In the event of emergency, Ad-hoc meetings may be held without advance notice.

Trade Contractor shall schedule and conduct meetings as necessary to coordinate responsibilities as described in the Project Manual. Trade Contractor shall maintain minutes of coordination meetings and ensure all attendees and interested parties receive a copy of the minutes resulting from coordination meetings with-in three (3) days from meeting date.

3.4 PRE-INSTALLATION SITE SURVEY

- A. Trade Contractor shall survey site to determine system-interfacing requirements. During walk through, Trade Contractor shall inspect site and survey the conditions to be encountered during the performance of the Work prior to starting Work. Failure of Trade Contractor to become familiar with site conditions shall not relieve Trade Contractor of responsibility for full completion of the Work in timeframe required.
- B. Trade Contractor shall review areas of potential interference and resolve conflicts before proceeding with Work.

- C. Trade Contractor shall examine areas and conditions under which Systems are to be installed and shall not proceed with Work until satisfactory conditions have been achieved.

3.5 INSTALLATION

- A. All installation activities shall be performed in a neat and professional manner in accordance with all applicable local and national codes. Additionally, Trade Contractor and their subcontractors shall obtain, or satisfy, (if applicable) the following prior to installation:
 - 1. All licenses and permits
 - 2. Employee and sub-contractors Access Badges
 - 3. All insurance and bonding as required
 - 4. All other standards or requirements specified in this document
- B. Trade Contractor shall install, inspect and test all hardware required in this specification in accordance with manufacturers' instructions, the requirements stated herein including but not limited to Section 1.6 (Scope of Work) above.
- C. System installation and construction methods shall conform to requirements of Federal Communications Commission and Federal and State, County, and city ordinances. Where undefined by codes and standards, Trade Contractor shall apply a safety factor of at least two (2) times the rated load to all fastenings and supports of system components.
- D. Trade Contractor shall install all system components including Owner furnished equipment, and appurtenances in accordance with manufacturer's instructions, NFPA 70, and ANSI-C2. Trade Contractor shall furnish all cables, connectors, terminators, interconnections, services, and adjustments required for a complete and operable system.
- E. All media shall be listed for application, marked and protected as per the NEC standards.
- F. Install all media in approved flexible conduits/or penetration according to design criteria and manufacturer's written instructions. Trade Contractor shall:
 - 1. Install transmission media without damaging conductors, shield, or jacket.
 - 2. Not bend cable, in handling or installation, to smaller radii than the minimum specified or recommended by cable manufacturer.
- G. Trade Contractor shall provide telecommunication bonding and grounding for CCTV and Intercom Systems as required to preclude ground loops, noise, and surges from adversely affecting system operation. Ground loops shall be avoided by making ground connections at only the control station.
- H. All device mounting shall be of a secure permanent nature. Double-sided foam tape shall not be used to secure any devices or components.

- I. Trade Contractor shall use tap connectors that are compatible with cable material. No splices are permitted unless specifically approved in writing by Owner.
- J. Trade Contractor shall bond shields and drain conductors to ground at only one point in each circuit.
- K. Trade Contractor shall connect components to wiring system and ground as indicated and instructed by manufacturer and according to ANSI/TIA/EIA-607.
- L. Trade Contractor shall tighten connectors and terminals, including screws and bolts, according to equipment manufacturer published torque-tightening values. Where manufacturer's torque requirements are not indicated, tighten connectors and terminals according to tightening torque specified in UL Standard 486A.
- M. Trade Contractor shall provide all cross-connect and jumper cables and all other connectors, cables, panels, equipment, etc., required to connect cameras and Intercoms to Owner furnished equipment for end to end Systems integration.
- N. Camera Installation:
Trade Contractor shall follow manufacturers' installation requirements in addition to the following requirements:
 - 1. Place and mount cameras as detailed by camera location drawings.
 - 2. Aim and focus cameras to provide Field of View indicated on the drawings. Coordinate final camera aiming with Owner and Managing General Contractor being present.
 - 3. Pendant Mounting: Secure the wall or corner plate to wall using four (4) fasteners that can each withstand 120 kg (265 lb) pullout force.
 - a. A minimum 0.64 cm (1/4 -inch) stud (maximum of 10 mm [3/8-inch] stud) or equivalent is required.
 - b. If using Corner or Mast plate, secure wall plate to this plate using four (4) 3/8" x 1" bolts.
 - 4. Ceiling mounted cameras: Install 3/4" flexible conduit from the end of rigid conduit / J-box termination point to camera back box to provide for future camera repositioning. Flexible conduit shall not exceed 10 ft. in length.
 - 5. Surge Protection: Provide line surge protection and patch cable from surge protector to exterior camera location. Surge Protection shall protect components from voltage surges originating external to equipment housing and entering through power, communication, signal, control, or sensing leads. Include surge protection for external wiring of each conductor entry connection to components.
 - 6. Outdoor Mounting: Use only liquid-tight fittings or liquid-tight conduit fittings in the two (2) holes in the back of back/wall mounting plate, or bottom of the pendant arm. When using liquid tight fittings, it is important to use appropriate cable width for a snug fit.

7. Cameras mounted on building roof shall not penetrate roof or rooftop membrane unless absolutely necessary. If rooftop penetration is necessary, Trade Contractor shall coordinate and receive Owner's written approval for design and construction change prior to any roof penetration.
8. All video connectors exposed to the weather at camera locations shall be filled with inert silicon "grease" equal to Dow Corning C #5 compound before mating with opposite connector half. The connection shall then be completely covered with heat shrink tubing.
9. Trade Contractor shall closely coordinate installation with cable contractor. The following is example of Responsibilities required by each Trade.
 - a. Trade Contractor shall provide mounting bracket/kits needed for camera installation.
 - b. Trade Contractor shall provide flexible conduit between junction box and camera mount.
 - c. Trade contractor will provide power, signal and control wiring and install RJ45 terminations needed for the camera connection.
 - d. Trade contractor will terminate Signal and Control wiring at termination block in the Telecom Rooms.
 - e. Trade Contractor shall provide 24V Surge protectors at the Camera and 19" Rack Mount 16 position (RJ45) Surge Protectors in the MSR / MTR.
 - f. Unless otherwise noted, Head End Equipment currently exists and/or will be provided by Owner.

M. Intercom Installation:

As shown on the Typical Security Room Wiring Requirements Drawing for the Intercom, Trade Contractor shall:

- a. Provide Push-to-Call full duplex intercom and associated terminations. Conduit, wiring (ENET CAT6) or approved cable and junction boxes will be provided by others. cable contractor will provide termination at existing rated patch panel . All equipment shall be set level, properly aligned and bolted together where in sections. Secure all material and equipment firmly in place.
 - b. Circuit identification nameplates are required for each Intercom Circuit.
- O. Materials damaged during installation shall be repaired to a new condition or shall be replaced. Equipment finishes that have been scratched or marred shall be touched up to match the original finish or shall be completely refinished. Matching shall be determined by inspecting Managing General Contractor.
- P. Trade Contractor shall remove all installation debris from worksite immediately to minimize potential for Foreign Objects of Destruction (FOD) being introduced into Aircraft Operations Area (AOA). Trade Contractor shall exercise care to protect occupants and facility from any damage at all times.

3.6 PROGRAMMING INTEGRATION SERVICES

- A. Trade Contractor shall provide Programming Integration and System test all interfaces in accordance with manufacturers' instructions and requirements stated herein including but not limited to Section 1.6 (Scope of Work).
- B. Trade Contractor shall configure and program all PTZ cameras to the following minimum parameters:
- C. Trade Contractor shall work with Matrix and CNP staff to ensure that real time and recorded history viewing of camera video and intercom audio is available via application software operating or accessible from access control workstations. In addition, Trade Contractor shall ensure Matrix Frontier Software interface and can perform proper sequence of operations and that Frontier originated alarm messages are automatically presented with both video and audio from a camera and intercom from alarm area and can be processed from the Security Operation Workstation.

3.7 PRETESTING

- A. Trade Contractor shall provide testing, mounting and connection adjustments in coordination with Managing General Contractor/Owner to ensure a fully functional CCTV System.
- B. Trade Contractor shall prepare equipment for Phased Testing and Commissioning as follows:
 - 1. Align, adjust system and pretest components, wiring and functions to verify they comply with specified requirements.
 - 2. Conduct CCTV tests at varying lighting levels, including day and night scenes as applicable.
 - 3. Verify operation of auto-iris lenses.
 - 4. Set back-focus of fixed focal length lenses via vendor software. 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.
 - 5. 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.
 - 6. Pretest the essential features of Intercom System.
 - 7. Perform Pre-Functional Testing in accordance with Division 28.

3.8 DOCUMENTATION. ALL DOCUMENTATION FOR SECURITY and CCTV SYSTEMS SHALL BE CONSIDERED AS SSI MATERIALS, and that is controlled under 49CFR parts 15 and 1520

- A. General Documentation required Phase Acceptance and Final Close-out:
 - 1. As-Built Drawings: Trade Contractor shall supply drawings that accurately depict all installed equipment and materials. Trade Contractor shall develop all shop

drawings and all “as-built” drawings using AutoCAD format as further defined in Division 1.

Trade Contractor shall update Shop drawings / As-Built Drawing seven (7) times during the term of the Contract. Updated Drawings shall document all installed Intercoms and CCTV Camera locations along with each MSR Cabinet Layout.

MSR Cabinet Layout shall document Rack/Cabinet Number, depict location of each head-end device, along with serial number and asset number of each device associated with Intercoms, CCTV Cameras, and related UPS and Network devices. This is regardless if Head-end device were existing or new (installed under this contract). Trade Contractor shall provide such drawings for MSR Room.

2. System Wiring Diagrams: Trade Contractor shall provide System Wiring Diagrams that show all power, signal and control wiring, all System components, wire numbers, color codes, pin numbers, component locations, grounding, and connections, depicting the “as-built”, final configuration.

Wiring diagram shall also show Surge Protection Device wiring, bonding, and grounding connections.

3. Functional Block Diagram: Trade Contractor shall provide functional block diagrams that show single-line interconnections between components for signal transmission and control.
4. System Block Diagram: Trade Contractors shall provide a System Block Diagram that show interconnection between System components and subsystems.
5. Program Settings: Trade Contractor shall document all program settings and pre-sets.
6. Updated Inventory Log – submitted monthly.
7. Warranty Documentation per Specification.

B. Project Record Documents:

1. For duration of Project, Trade Contractor shall maintain Project Records in accordance with the Section of the Project Manual.
2. Trade Contractor shall provide all documentation as described in this Specification and Project Manual Division 1 Sections titled:
 - ❖ Shop Drawings, Product Data and Samples
 - ❖ Operating and Maintenance Data
 - ❖ Spare Parts and Maintenance Materials
 - ❖ Warranties and Bonds

3.9 FIELD QUALITY CONTROL

- A. Trade Contractor’s responsibility for Quality Control shall include, but is not limited to, inspections, tests, reports and record keeping.
- B. Trade Contractor’s Quality Control shall ensure conformance to applicable

specifications and drawings with respect to workmanship, materials, installation, identification, testing requirements and ensuring compliance with technical performance and functional requirements.

- C. Trade Contractor shall not apply power to the Systems until after:
 - 1. Systems and components have been installed and inspected in accordance with manufacturer's installation instructions.
 - 2. A visual inspection of system components has been conducted to ensure defective equipment items have not been installed and there are no loose connections, are set level and properly aligned.
 - 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; and
 - 5. Power supplies connected to the system and equipment have been verified as the correct voltage, phasing, and frequency as indicated.
- D. Satisfaction of the above requirements shall not relieve Trade Contractor of responsibility for incorrect installations, defective equipment items, or collateral damage due to Trade Contractor work/equipment.
- E. Set and test sensitivity of motion detection.
- F. Connect and verify responses to alarms.
- G. Verify operation of control-station equipment.
- H. All cabling identification is verified and complete.

3.10 LOSS – DAMAGE

Trade Contractor shall be responsible for any lost or damaged Cameras and Intercoms or other associated hardware/materials provided to Trade Contractor by Owner, or Trade Contractor provided material until time of Final Acceptance. This includes damage at time of installation. Trade Contractor shall be responsible to replace immediately all such loss or damaged to all Cameras or Intercoms and materials at Trade Contractor's expense, including cost of labor.

3.11 TESTING AND COMMISSIONING

- A. General Testing Requirement
 - 1. Trade Contractor shall perform Pre-Functional Testing in full accordance with Division 28. Trade Contractor shall ensure all pre-functional checkouts are executed and documented. Owner, Managing General Contractor and/or Design Professional shall document pre-functional checkouts were completed according to approved plans. This may include Owner, Managing General Contractor and/or DP witnessing pre-functional checkout.
 - 2. Individual Systems / Components that form an integral part of other systems shall require multiple testing to show that not only do they work on their own, but perform properly when integrated with other systems.
 - 3. Trade Contractor shall develop a Functional Testing and Commissioning Plan in

accordance with requirements stated in Division 28. The Test Plan including Procedure and Scripts shall:

- ❖ Follow accepted industry testing practices and have a method of independent verification described.
 - ❖ Delineate responsibility of each trade affected and appropriate section of the Specification.
 - ❖ Define requirements for documentation.
 - ❖ All test plans, procedures and scripts shall contain at a minimum the following elements:
 - a. Statements of purpose identifying the goals of the test
 - b. The methods used for testing
 - c. Test Procedure steps, expected results
 - d. Duration and schedule of tests
 - e. Procedure for documentation and recording test results
 - f. Procedure for handling test anomalies and failures
 - g. Calibration certificate of test equipment
3. Calibration: Test Equipment, used by Trade Contractor, shall be currently certified and calibrated by an independent test and calibration firm, to the manufacturer's specifications.
 4. MGC/Owner's approval of the Test plan, procedure, and scripts shall be required prior to execution of each Phased Test.
 5. Trade Contractor shall be present for all inspection, testing and commissioning and will be required to have applicable subcontractors present for inspections and commissioning related to their work.
 6. Each test result shall be fully documented by Trade Contractor and approved by Managing General Contractor/Owner.
 7. Trade Contractor shall submit detailed Testing Records complete with witness and approval signatures.
 8. MGC shall witness all testing.
 9. Owner or the Owner's agent shall witness all testing.
 10. Any specified item that does not satisfy the requirements of this specification shall be reinstalled, replaced, adjusted, or added by Trade Contractor as necessary to correct noted deficiencies at no additional cost.
 11. After correction of a noted deficiency, re-testing shall be performed to verify effectiveness of the corrective action.
 12. The acceptance of any material, workmanship or equipment by Managing General Contractor/Owner shall not preclude subsequent rejection of such items, should those items be later found defective.

13. MGC/Owner reserves the right to have Trade Contractor repair or replace any defective items or damage incurred to existing facility, concrete, etc., at Trade Contractor's expense, if damage occurs due to actions directly attributed to Trade Contractor.
 14. In the event of any component of the System failing to meet part of its acceptance test, an observation shall be reported in writing detailing test failure problems.
 15. All acceptance test results, observations, calibration certificates and Certificates of Compliance for all system elements shall be compiled into a Testing and Commissioning Report and supplied to Managing General Contractor/Owner for approval, no later than five (5) days after completion of subject test.
 17. The completed Pre-functional Checklist shall form an integral part of Phased Testing and Commissioning Report and Project Close-Out.
 18. It shall be Trade Contractor's responsibility to facilitate the coordination of testing and commissioning activities in order to meet Work Schedule as defined in Division 1.
 19. All cost for testing and commissioning shall be included in total contract price.
 20. Trade Contractor shall ensure all subcontractors and vendors execute their testing and commissioning responsibilities.
 21. Trade Contractor shall be responsible for all cost associated with retesting.
 22. If any checklist item or test cannot be completed due to the project completion level, required occupancy condition or other deficiency, execution of such checklists items or testing may be delayed upon written approval of MGC. Such test shall be conducted prior to Final System Acceptance and Project Closeout.
- B. Camera and Intercom Testing: During the course of performing Phased Testing and Commissioning, Trade Contractor shall be responsible to demonstrate CCTV and Intercom Systems complies with all requirements. These requirements include but are not limited to the following requirements:
1. Trade Contractor shall perform functional testing of Intercom System and camera video and control operation from the field locations back to the SOW.
 2. IP Camera must provide all functionality, as indicated on manufactures data sheet. Camera will be installed with current version of firmware installed and firmware version documented on the data sheet and inventory log.
 3. Cameras Fixed Position: Test for proper back-focus, confirm proper field of view adjustments.
 4. Pan/Tilt/Zoom Cameras: Test for proper pan/tilt/zoom operation, proper auto-homing feature functionality, and proper back-focus.
 5. Link: Test total camera connection link for proper operation. Test for excessive cable and termination losses. Test from end camera device to demarcation point and connection to the System head-end equipment locations at MIA Security Rooms.

6. Ensure tests are conducted such that daytime and nighttime conditions can be evaluated as applicable.
 7. Documentation must be provided listing camera ID, Cable ID, Surge Suppressor ID, Camera Type (Fixed/PTZ), Serial Number, and Picture Quality – both daytime and nighttime.
 8. Conduct end-to-end testing for each CCTV Intercom cable pair/conductor for continuity, ground fault, proper termination, shorts and crossed pairs.
 9. Test Intercoms to ensure intercoms are free of audible hum, electronic noise, poor speech reproduction, and audio feedback.
- C. Solution Testing: Trade Contractor shall test end-to-end solution. Solution testing must be coordinated with ACS subcontractor. This involves video stream testing, local camera configuration verification, DVADTS, DVTS, and DVRS new camera integration testing. Fixed and PTZ Door Cameras test shall include test showing when ACS Alarm is generated, the video from appropriate camera is shown on the SOW and SOW is also capable of retrieve playback from storage for all newly installed cameras. When ACS Alarm is generated, the PTZ camera moves to show door. Solution Testing must test all alarms and presets.
- D. Functional Testing: Test Plan shall include performance testing of the dynamic functions and operations of CCTV and Intercom Systems using direct observation or monitoring methods. Functional testing is the dynamic testing of the Systems (rather than just components) under full operation. Functional Testing shall demonstrate CCTV and Intercom System programming are operating according to documented design intent and Project Manual.
- E. Problem Correction: Any problems encountered including damage to Airport owned equipment during this test shall be documented and brought to the attention of Owner/MGC and corrected at Trade Contractor's expense. Trade Contractor shall promptly correct all problems encountered in the installation or function of a component, piece of equipment, or system that is not in compliance with Contract Documents.
- F. Test Documentation: Trade Contractor shall supply forms to be used during these tests for authorization and initialing by Managing General Contractor/Owner and Trade Contractor. The forms shall clearly define items tested, leaving room for the date, CCTV /Intercom element designation, and initials. All CCTV and Intercom functions shall be demonstrated to ensure operation as required by specification and drawings.
- G. Phased Commissioning: Commissioning process shall ensure all cameras, Intercoms and integrated programming performs according to Project requirements. Commissioning shall verify:
1. Equipment meets Project Manual requirements
 2. Installation meets Project Manual requirements
 3. Integration Programming meets Project Manual requirements

4. System Performance meets Project Manual requirements
5. Documentation meets Project Manual requirements
6. Training meets Project Manual requirements

At a minimum, documentation shall include the following verifications:

- ✓ Installation of CCTV and Intercom Systems are installed according to manufacturer's recommendations and successfully passed all pre-functional checklist and testing.
 - ✓ Proper performance of equipment and associated programming interfaces.
 - ✓ All required documentation is complete and approved.
 - ✓ All equipment and systems are properly installed, connected, and labeled according to manufacturer's recommendations and industry accepted minimum standards.
 - ✓ Interconnecting wires and terminals are identified.
 - ✓ All equipment and systems receive adequate operational checkout by installing contractors.
 - ✓ Operation and Maintenance documentation provided is complete.
 - ✓ If applicable, verification all project closeout documentation is complete and approved.
 - ✓ Field of View - photograph of each camera shall be stored on CD and made part of each Phased Commissioning Documentation.
 - ✓ Trade Contractor shall complete" – Data Sheets as part of each Prefunctional Test.
- H. Trade Contractor shall be responsible to coordinate Testing and Commissioning with Owner, Managing General Contractor and other subcontractors.
- I. The Testing and Commissioning process does not take away from or reduce the responsibility of Trade Contractor to provide a finished and fully functioning System.

3.12 MAINTENANCE AND SUPPORT

A. Occupancy Adjustments and Emergency Repair:

Anytime after successful commissioning and acceptance of cameras and before Final Project Close-Out, Trade Contractor agrees:

1. To provide on-site assistance to troubleshoot, check cable connections, check proper operation of cameras and lenses.
2. Verify operation of auto-iris lenses and adjust back-focus as needed.
3. Adjust preset positions as requested by Managing General Contractor/Owner.
4. Provide written report of adjustments and recommendations, replacing cameras / devices and adjusting FOV / focus to suit actual occupied conditions and to optimize performance. The on-site assistance described in this provision is in addition to the Warranty requirements of the Contract.

5. In the event of camera or Intercom failure, Trade Contractor shall provide on-site support within two (2) hours of request.

3.13 TRAINING

- A. Training shall be provided in accordance with the requirements in Project Manual Division 1 – Systems Demonstrations.

3.14 CLEANING

- A. Trade Contractor shall comply with all requirements stated in Project Manual Division 1, Section 01710 – Final Cleaning and the following:
 1. Clean installed items using methods and materials recommended in writing by manufacturer.
 2. Clean intercom and video surveillance system components, including camera-housing windows, lenses, monitor screens and intercom faceplates.
 3. Remove burrs, dirt, and construction debris and repair damaged finish, including chips, scratches, and abrasions.
 4. Touch-up paint as needed.
 5. General cleaning and maintenance of the premises
 6. Coordination and direction of the cleanup work of its employees

3.15 SPARE PARTS

- A. Spare parts shall be a minimum 10%, Trade Contractor shall comply with requirements shown in Division 1, Section 01732. Trade Contractor shall be required to provide (on-site) the following spare parts 180 days prior to final close out of the project (or sooner as may be requested by Owner).

3.16 PROJECT CLOSEOUT

Trade Contractor shall comply with the requirements stated in the Contract Documents and Specifications, including but not limited to Project Manual Division 1 – Project Closeout and Section 01720 Project Record Documents.

END OF SECTION