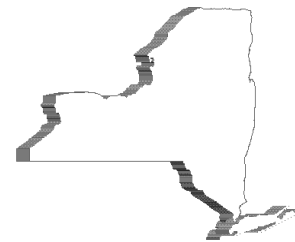




STATE OF NEW YORK
OFFICE OF GENERAL SERVICES
DESIGN AND CONSTRUCTION GROUP
THE GOVERNOR NELSON A. ROCKEFELLER
EMPIRE STATE PLAZA
ALBANY, NY 12242



ADDENDUM NO. 5 TO PROJECT NO. 44220-C

**Construction Work
Provide Conversion of 4th Floor to Wet Lab, Building No. 4
New York Psychiatric Institute
1051 Riverside Drive
New York, NY 10032**

February 5, 2014

NOTE: This Addendum forms a part of the Contract Documents. Insert it in the Project Manual. Acknowledge receipt of this Addendum in the space provided on the Bid Form.

SPECIFICATION GROUP

1. Page 011000 – 2, Add to Paragraph 1.08.A:
“The building is a fully occupied research facility, and facility work hours are 7:30 a.m. to 6:00 p.m. Off-hours are defined as 6:00 p.m. to 7:30 a.m. Monday through Thursday, and from Friday 6:00 p.m. to Monday at 7:30 a.m.”
2. Page 011000 – 4, Add to Paragraph 1.09.B:
“Refer to Drawing G-200 for additional information. Deliveries and use of facility loading dock must be coordinated in advance with Director’s Representative and the Facility. Early morning deliveries before 7:30 a.m., or weekend deliveries, are best.
3. Page 011000 – 4, Change Paragraph 1.09.C to read:
“The contractor shall perform the following work off-hours: demolition, removals including abatement, any rigging, any work on 3rd and fifth floors, core-drilling and concrete chopping, and any utility shutdowns.”
4. Page 011000 – 4, Change Paragraph 1.09.E to read:
“Utilities shut downs to be carefully coordinated with Director’s Representative and Facility, and must be done off-hours.”
5. Page 011000 – 4, Delete sub-paragraph 1.09.F.1 which begins with “OGS to provide...”
6. Page 011000 – 4, Delete Paragraph 1.09 H in its entirety.
7. Page 230000 – 10, Change Paragraph 1.28.A to Read:
“A. This contract shall provide a full year service and warranty of all mechanical components and systems.”

8. SECTION 280500 COMMON WORK RESULTS FOR ELECTRONIC SAFETY AND SECURITY: Add the accompanying section (pages 280500 – 1 through 280500 – 33) to the Project Manual.
9. SECTION 281300 ELECTRONIC ACCESS CONTROL AND FACILITY MONITORING: Add the accompanying section (pages 281300 – 1 through 281300 – 31) to the Project Manual.
10. SECTION 282000 ELECTRONIC SURVEILLANCE: Add the accompanying section (pages 282000 – 1 through 282000 – 16) to the Project Manual.

DRAWINGS

11. Drawing No. FA-101
 - a. FIRE ALARM GENERAL NOTE, Change Note 24. To Read:

“24. The Contractor shall provide all labor, material, equipment and coordination for all fire alarm modification work required by the Contract Documents, to provide a complete, operation and code compliant fire alarm system, not clearly and specifically listed to be furnished, installed and/or provided by the Owner’s Fire Alarm Vendor (SimplexGrinnell) as detailed in FIRE ALARM GENERAL NOTE 27. Contact Yevgeny Kopylov of the Owner’s Fire Alarm Vendor (SimplexGrinnell) at (917) 510-6324.”
 - b. FIRE ALARM GENERAL NOTE, Change Note 26. To Read:

“26. A general outline of the Contractor’s responsibility, which does not superseded the requirement detailed in FIRE ALARM GENERAL NOTE 24, includes but is not limited to the following:

 - a. The complete raceway system, with pull strings, supports, back boxes, grounding, etc... for all fire alarm equipment and peripherals.
 - b. Furnish and installing waterflows and tamper switches including the raceway system. Wiring shall be provided by the Owner’s Fire Alarm Vendor (SimplexGrinnell).
 - c. Coordination.
 - d. Testing of equipment provided by the Contractor.
 - e. Provide all 120 volt power circuits in accordance with NFPA 72 and the NEC. This includes but is not limited to each Fire Alarm Control and Notification Alarm Circuit (NAC) Panels. Coordinate with Owner’s Fire Alarm Vendor (SimplexGrinnell) for quantity and locations.
 - f. Submittals and shop drawings as required by the Specifications for equipment and material provided by the Contractor.”
 - c. FIRE ALARM GENERAL NOTE, Add Note 27. To Read:

“27. The Owner’s Fire Alarm Vendor’s (SimplexGrinnell) scope of work shall include the following:

 - a. Provide all specialty fire alarm (Simplex) equipment and peripherals including low voltage and data wiring, with the exception of waterflow devices and tamper switches (provided by the contractor), on the raceway system provided by the Contractor’s.
 - b. Wiring for waterflow devices and tamper switches.
 - c. Programming.

- d. Testing.
- e. Submittals and shop drawings as required by the Specifications for equipment and material provided by the Owner's Fire Alarm Vendor (SimplexGrinnell).
- f. The Owner's Fire Alarm Vendor (SimplexGrinnell) will provide a Simplex 4004R Preaction Releasing Panel and specialty devices and appliances for the Reliable DDX preaction system as detailed in drawing SP-601 and as modified by this addendum."

11. Drawing No. SP-601

a. PREACTION SPRINKLER SYSTEM, In C. Change Note 1. To Read:

- "1. Reliable (Model DDX 2" Prepak with releasing panel delete option) integrated fire protection single interlocked preaction system with 2" Reliable Model D deluge valve, and all necessary components, with the exception of the Simplex 4004R Preaction Releasing Panel and specialty devices and appliances, to provide a complete, operation and code compliant preaction system."

b. PREACTION SPRINKLER SYSTEM GENERAL NOTE, Add Note 2. To Read:

- "2. The Contractor shall provide all labor, material, equipment and coordination for all required by the Contract Documents, to provide a complete, operation and code compliant preaction system, not clearly and specifically listed to be furnished, installed and/or provided by the Owner's Fire Alarm Vendor (SimplexGrinnell) as detailed in PREACTION SPRINKLER SYSTEM GENERAL NOTE 4. Contact Yevgeny Kopylov of the Owner's Fire Alarm Vendor (SimplexGrinnell) at (917) 510-6324."

c. PREACTION SPRINKLER SYSTEM GENERAL NOTE, Add Note 3. To Read:

- "3. A general outline of the Contractor's responsibility, which does not superseded the requirement detailed in PREACTION SPRINKLER SYSTEM GENERAL NOTE 4, includes but is not limited to the following:
 - a. Provide a complete raceway system, with pull strings, supports, back boxes, grounding, etc... for all releasing panel and notification equipment and peripherals.
 - b. Coordination.
 - c. Testing of equipment provided by the Contractor.
 - d. Provide all 120 volt power circuits in accordance with NFPA 72 and the NEC. Coordinate with Owner's Fire Alarm Vendor (SimplexGrinnell) for exact location.
 - e. Submittals and shop drawings as required by the Specifications for equipment and material provided by the Contractor."
 - f. All sprinkler work including piping, fittings, supports, etc..."

d. PREACTION SPRINKLER SYSTEM GENERAL NOTE, Add Note 4. To Read:

- "4. The Owner's Fire Alarm Vendor's (SimplexGrinnell) scope of work shall include the following:
 - a. The Owner's Fire Alarm Vendor's (SimplexGrinnell) work will be limited to electronic equipment connected to the Simplex 4004R

Preaction Releasing Panel. All other work, including sprinkler work shall remain the responsibility of the Contractor.

- b. Provide a Simplex 4004R Preaction Releasing Panel networked to the Facility's existing Simplex 4100ES control panel.
- c. Provide all non factory low voltage and data wiring to Simplex devices and appliances.
- d. All releasing panel devices and notification appliances including Simplex smoke detectors, pull stations, audio/visual appliances, etc..."

12. Drawing No. SE-100

- a. SECURITY GENERAL NOTE, Change Note 1. To Read:

"1. The Contractor shall provide all labor, material, equipment and coordination for all electronic safety and security work required by the Contract Documents, to provide complete, operation and code compliant electronic safety and security systems, not clearly and specifically listed to be furnished, installed and/or provided by the Owner's Security Vendor (Tyco Integrated Security) as detailed in attached Owner's Security Vendor's (Tyco Integrated Security) PROPOSAL. Contact Robert McClean of the Owner's Security Vendor (Tyco Integrated Security) at (585) 321-3118.

- b. SECURITY GENERAL NOTE, Add Note 7. To Read:

"7. A general outline of the Contractor's responsibility, that does not superseded the requirement to provide all work in the Contract Documents not clearly and specifically listed to be furnished, installed and/or provided by the Owner's Security Vendor (Tyco Integrated Security) as detailed in attached Owner's Security Vendor's (Tyco Integrated Security) PROPOSAL, includes but is not limited to the following::

- a. The complete raceway system, with pull strings, supports, back boxes, etc... for all electronic safety and security equipment and peripherals.
- b. Furnish and installing electric transfer hinges and electric locksets, provided as part of door hardware, including the raceway system. Wiring shall be provided by the Owner's Security Vendor (Tyco Integrated Security).
- c. Coordination.
- d. Testing of equipment provided by the Contractor.
- e. Provide all 120 volt power circuits in accordance with the NEC. All power wiring must be connected to emergency power. This includes but is not limited to the power supplies for the new controller and separate power for the locksets, and a power outlet for the DVR. Coordinate with Owner's Security Vendor (Tyco Integrated Security) for exact location.
- f. Submittals and shop drawings as required by the Specifications for equipment and material provided by the Contractor."

13. Drawing No. SE-100

- a. BLOCK DIAGRAM, FIRST FLOOR, CONTROL PANEL FOR DOOR D167. Change The Note At The Control Panel To Read:
 - 1) "Existing Control Panel on the Second Floor."

14. Drawing No. SE-100

- a. SECURITY SYSTEM KEYED NOTE. Add Keyed Note 1. To Read:

- “1. Door D167, located on the first floor, shall be wired from the junction box, shown on the drawing, to the existing controller on the second floor. Coordinate location with Owner’s Security Vendor (Tyco Integrated Security).”

- 15. Drawing No. SE-100
 - a. BLOCK DIAGRAM, EIGHTH FLOOR, CONTROL PANEL FOR DOOR D873.
Change The Note At The Control Panel To Read:
 - 1) “New Control Panel on the Fourth Floor.”

- 16. Drawing No. SE-100
 - a. SECURITY SYSTEM KEYED NOTE. Add Keyed Note 2. To Read:
 - “2. Door D873, located on the eighth floor, shall be wired from the junction box to the new controller on the fourth floor in the IT Closet 402.”

- 17. Drawing No. E-104:
 - a. POWER KEY NOTES: Add note 8:
 - “8. Panel LP-LV-1 located on floor, allow for 100 linear feet.”

- 18. Drawing No. E-104:
 - a. L1 LEVEL PART PLAN: Add POWER KEY NOTE 8 to column lines 2 between B and C.

- 19. Drawing No. E-104:
 - a. POWER KEY NOTES: Add note 9:
 - “9. Location of EDB-LV-IT”

- 20. Drawing No. E-104:
 - a. L1 LEVEL PART PLAN: Add POWER KEY NOTE 9 to column lines 1 between B and C.

END OF ADDENDUM

James Dirolf, P.E.
Director of Design

Tyco IS National Account Program / NEW YORK STATE CONTRACT

Date:		Month	Day	Year	NYS OMH TIMR CONTRACT NO: C008241	
					CONTRACT PERIOD: JULY 01, 2005 TO AUGUST 31, 2015	
					Tyco Integrated Security is licensed by N.Y.S. Dept of State # 12000025576	
Prepared For:	Tremark			Proposal Description	Proposal ID	
Facility Name:	NYPI					
RFP Number:	0003			OGS Project 44220 Building 4 Wet Lab.		

1. Scope of Work

- a. Location of building
- b. Location of floors
- c. TYCO IS WORK SCOPE
- d. Electrical contractor compliance with
- e. outline of any reusable equipment or wiring
- f. Special Terms and Conditions

City	State	ZIP
New York	NY	10032
Building #4 floors 1, 4, 8		
<i>Provide ACFS and CCTV equipment, cable and installation as per bid documents and drawings dated 11/6/13. Door D167 to be connected to existing controller on floor 2. East and West stairway doors to be monitored for exit only. Doors D402, D412B, D416, D423 and DD409 to be connected to new controller in Telcom Room 402. Eighth floor door D873 to be wired to new controller on floor 4. Provide new CCTV recorder for 10 new cameras to be installed on 4th floor. Both controller and CCTV recorder to be connected to OMH network. Network drops to be provided by OMH CITER. All electrified locking hardware to be by others.</i>		

2. Assignment of responsibility

- a. Tyco IS local sales contact, telephone, pager email, and fax numbers
- b. Tyco IS Engineering contact, telephone, pager email, and fax numbers
- c. Tyco IS Technician contact, telephone, pager email and fax numbers
- d. State Agency contact (at site being surveyed, IF APPLICABLE)
- e. Construction services Supervisor (NYS OGS OR OTHER IF APPLICABLE)
- f. Tyco IS Subcontractors (Elect, Door & Hardware, Networking,) Tyco central server & computer support.
- g. STATE CONTRACT (Contact)
Tyco NATIONAL ACCOUNT MANAGER

John Bohdan 973-826-6149 jbohdan@tyco.com

3. Tyco IS Project Management Plan

- a. Project Manager's telephone, pager, email, and fax number
- b. Equipment ordering, estimate date of delivery after PO is received
- c. Bench system testing all equipment is functional prior to installation
- d. Drawings are completed (WHEN)
- e. Installation plan is in place with specific responsibilities & schedule (WHEN)

f. Documentation, As-built & System/Operator manual to user (WHEN)

4. Service Commitment

a. Warranty period one year parts and labor

b. Call back response time and telephone number for problems

c. Service contract, system operator manual to user

5. Cost Estimate Breakdown

a. Tyco IS parts, electronic (use state purchasing contract pricing)

b. Electrical, if Tyco IS's prime, or other Subcontractors

c. Wiring both electrical and fiber including termination cost; Misc. items

d. Software if required with cost of upgrade program if applicable

e. Labor, broken down by installation for (skilled labor P Rate)

f. This estimate should include detailed breakdown on engineering submittals, project management, drawings, installation, training

MATERIAL COSTS (state contract) \$18,943.95	INSTALL. CABLE \$14,687.00	MATERIAL COSTS (NON state contract)
SUB CONTRACTOR	ENG. OTHER \$525.00	CENTRAL STATION SVC'S
WIRE & CABLE \$5,651.95	TRAINING \$587.48	MISC. ITEMS \$1,125.00
MAINT OPTION	TECH SUPER	SOFTWARE UPGRADE PROGRAMMING LABOR
PM SERVICES	PROGRAMMING \$1,174.96	TESTING \$1,174.96
INSTALLATION DEVICES \$5,874.80	SUBMITTALS	DRAWINGS

Total Job Cost	\$49,745.10	Total →	\$49,745.10
Central Station Services			

6. Master Schedule of installation and Service Delivery

Y-N	Category	Installation Item	DETAIL
N	Access Control Service	Door Hardware	
		Location of Access	
		Location of Access	
Y	CCTV Service	Field Equipment	
		Location of Control	
N	Fire Alarm Services	Field Device Schedule	
		Location of Main	
N	Network Services /	Location of Telecom hood	
		Location of Network Jack	
N	Intrusion Alarm Service	Field Device Schedule	
		Location of Main Panel(s) & Keypad(s)	
Y	Fence Security	Field Device Schedule	
		Location of Main	
N	Integration	Delineation of system special considerations	

Y-N	Service	Service Type	Comment
Y	Professional Services	SYSTEM	
N		SUBMITTALS	
N		DRAWINGS	
Y		PROJECT	
Y		AS BUILT DRAWINGS	
Y	Field Technical	CABLING	
Y		CONDUIT	
Y		FIELD DEVICE	
Y		HEAD END INSTALLATI	
N		ELECTRONIC	
Y		110 V OUTLETS	
N		NETWORK JACKS	
Y		PROGRAMMING	
Y		FINAL TEST	
Y		CUSTOMER TRAINING	

[Back](#)



Rider For Additional Service

RFP Number: 0003

THIS RIDER made this _____ day of _____ is part

of and is to be attached to Agreement made the 1st day of July 2005 (C008241) by and between Tyco Integrated Security One Winners Circle Albany, NY

hereinafter called "Tyco IS", and Office of Mental Health, State of NY

hereinafter called the "Customer", for RIDER FOR ADDITIONAL SERVICES UNDER THE TIMR CONTRACT

service in the premises of the Customer at NYPI

in the City of New York State of NY Zip 10032

Description of Work:

Provide ACFMS and CCTV equipment, cable and installation as per bid documents and drawings dated 11/6/13. Door D167 to be connected to existing controller on floor 2. East and West stairway doors to be monitored for exit only. Doors D402, D412B, D416, D423 and DD409 to be connected to new controller in Telcom Room 402. Eighth floor door D873 to be wired to new controller on floor 4. Provide new CCTV recorder for 10 new cameras to be installed on 4th floor. Both controller and CCTV recorder to be connected to OMH network. Network drops to be provided by OMH CITER. All electrified locking hardware to be by others.

OMH NOTICE TO PROCEED

Tyco has been notified by OMH to proceed on the following project: (A PO # will not be required to bill)

OMH DECLARATION:

The Office of Mental Health agrees that Tyco accepts this notice to proceed with the understanding that Tyco recognizes this document as the customer's purchase order to order promise to pay. All work to be performed shall be done under the provisions of our NYS contract.

OMH recognizes that if for any reason the emergency work is cancelled, OMH will reimburse Tyco, Inc. for all costs associated to the project at the contract agreed units up until the notice of cancellation is received by Tyco IS.

The Customer hereby agrees to pay Tyco, its Agents or Assigns, the sum of \$49,745.09

Time and Material Forty Nine Thousand Seven Hundred Forty Five Dollars and Nine Cents

payable upon signing of this Agreement and the balance payable upon completion of the installation, and to pay in addition the sum No Dollars and No Cents

per annum payable in advance.

The parties hereto mutually agree that the aforesaid Agreement, of which this Rider is made a part, is and shall be and remain in full force and effect in accordance with all of the terms and conditions thereof, modified only as in this Rider specifically provided. It is further agreed to that the original expiration date of the referenced Agreement shall be extended for a period of years.

This Rider is not binding unless approved in writing by an authorized representative of the Company described as Tyco.

Tyco Integrated Security
Tyco IS

New York State Office of Mental Health
Customer

William Bivona Jr.

X

By _____

By _____

William Bivona Jr.
Authorized Representative of Tyco IS

Authorized Representative of NYS OMH

8. Materials and Services Schedule

Rev F1 09-23-2013

RFP Number: 0003

MFG	ITEM NO	QTY	MODEL	DESCRIPTION	COST	TOTAL	YOU MUST SELECT Y/N Maintenance Y/N	Maintenance Cost	Initials	Received Date
Comment		1	ACFMS	Access Control and Facility Monitoring System						
UTC GE Access - fka GE Security	26,885	1	M5PRMPP	M5 PXNplus, Picture Perfect - Serial Ethernet, 10 100Mb	\$2,571.39	\$2,571.39				
Access - fka	26,769	1	110100501	M/5	\$1,406.24	\$1,406.24				
HID	9,686	7	5365E1P00	MP DESIGNER BLACK CABLE LEAD	\$133.70	\$935.93				
Access - fka	26,766	1	110071001	rated for .04A @ 24VDC	\$530.35	\$530.35				
Access - fka	26,767	1	110072003	Includes 20 EOL supervision resistors	\$530.35	\$530.35				
Access - fka	26,852	7	521252001	box which has keylock and t	\$200.90	\$1,406.29				
Altronix	1,228	1	AL600ULX	UL/CUL Listed. Fire (UL 1481) Access Control (UL 294)	\$316.05	\$316.05				
Altronix	1,232	2	AL600ULACMJ	with ACM8 Power Controller Fire/Access interface	\$407.18	\$814.36				
Tyco IS	25,815	6	477967	Battery 12V 7AH	\$15.92	\$95.54				
Sentrol	23,141	12	1078C-G	Diameter, Closed Loop, Grey, 3/8" Gap Size	\$5.47	\$65.69				
Comment		1	CCTV	Closed Circuit TV Surveillance System						
Pelco	20,624	10	FD5-DV10-6	Lens	\$296.57	\$2,965.72				
Pelco	21,965	1	MCS16-10	Listed, 120/240 VAC input, 24/28 VAC output.	\$189.81	\$189.81				
Pelco	20,149	1	DX4816HD-2000	16-CH, 8IP, H.264 HVR, 480 IPS @ 4CIF, DVDRW	\$6,245.80	\$6,245.80				
Pelco	22,048	1	PMCL419HB	resolution with input interfaces of 2BNC looping 1 DVI 1	\$870.45	\$870.45				
				Sub Total:		\$18,943.95				
MFG	ITEM NO	QTY	MODEL	Additional Items not on State Contract	COST	TOTAL	Y/N	Cost	Initials	Received Date
MFG	ITEM NO	QTY	MODEL	WIRE AND CABLE	COST	TOTAL	Y/N	Cost	Initials	Received Date
PAIGE ELECT.	18,365	2500	808050	RG59/U + 18/2c Siamese, STR, Shielded, CMP, Plenum, White, 500' Reel	\$0.57	\$1,428.69				
PAIGE ELECT.	18,455	2500	454932APR	Composite Access 18/6c + 18/4c + 22/4c + 16/2c, STR, Shielded, CMP, Plenum, Purple, 500' Reel	\$1.56	\$3,896.25				
PAIGE ELECT.	18,502	1000	740049A	18/4c, STR, Shielded, CMP, Plenum, Gray, 1000' Reel	\$0.33	\$327.01				
				Sub Total:		\$5,651.95				
	See Bottom of Custom-Misc Costs Tab	1		Misc Material necessary for Job Completion		\$1,125.00				
MFG	ITEM NO	QTY	MODEL	Sub Contractors	COST	TOTAL				
				Sub Total:						

Labor Services and Sin 246-50

Total Hours	Work Classification	City	Notes	Prevailing Wage	Unit Cost	Total
	PM SERVICES	Tyco SS&E	System Sales and Engineering	NO	\$87.50	
8.00	PROGRAMMING	New York	KIRBY FORENSIC / MANHATTAN / NYPI	YES	\$146.87	\$1,174.96
8.00	TESTING	New York	KIRBY FORENSIC / MANHATTAN / NYPI	YES	\$146.87	\$1,174.96
4.00	TRAINING	New York	KIRBY FORENSIC / MANHATTAN / NYPI	YES	\$146.87	\$587.48
100.00	INSTALL. CABLE	New York	KIRBY FORENSIC / MANHATTAN / NYPI	YES	\$146.87	\$14,687.00
40.00	INSTALLATION DEVICES	New York	KIRBY FORENSIC / MANHATTAN / NYPI	YES	\$146.87	\$5,874.80
	SUBMITTALS	Tyco SS&E	System Sales and Engineering	NO	\$87.50	
	DRAWINGS	Tyco SS&E	System Sales and Engineering	NO	\$87.50	
	TECH SUPER	New York	KIRBY FORENSIC / MANHATTAN / NYPI	YES	\$146.87	
6.00	ENG. OTHER	Tyco SS&E	System Sales and Engineering	NO	\$87.50	\$525.00
166.00	Total Hours				Total Labor:	\$24,024.20

	Amount	Hours
State Contract Equipment Totals:	\$18,943.95	
Cable Totals:	\$5,651.95	
Sub Contractor Totals:		
Software Upgrade LABOR:		
LABOR Services:	\$24,024.20	
TOTALS:	\$49,745.10	166.00

Investment Summary

Total Project Cost:	\$25,720.89
Labor:	\$24,024.20
Sub Total Job:	\$49,745.09
Total Job Cost	\$49,745.09

Notes: _____

SECTION 280500

COMMON WORK RESULTS FOR ELECTRONIC SAFETY AND SECURITY

PART 1 - GENERAL

1.1 SUMMARY

A. Work Included:

1. Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - a. Grounding and bonding for Electronic Safety and Security (ESS).
 - b. Pathways for ESS.
 - c. Lightning and Surge Protection for ESS.
 - d. Vibration and Seismic Controls for ESS.
 - e. Equipment Enclosures for ESS.
 - f. Electronic Components for ESS.
 - g. Exposed Components.
 - h. Cables for ESS.
 - i. Identification for ESS.
 - j. Electronic Safety and Security (ESS) equipment coordination and installation.
2. Provide labor, materials and equipment necessary to complete the work of the Electronic Safety and Security (ESS) Systems, including but not limited to the following:
 - a. Access Control and Facility Monitoring System (ACFMS)
 - b. Video Surveillance (CCTV) System (VSS)
 - c. Associated cabling, enclosures and uninterruptible power supplies.

1.2 RELATED DOCUMENTS

- A. Division 00 "Procurement & Contracting Requirements Group"
- B. Division 01 "General Requirements"
- C. Division 07 Section "Fire and Smoke Protection"
- D. Division 26 Section "Cable Trays for Electrical Systems"
- E. Division 26 Section "Identification for Electrical Systems"
- F. Division 26 Section "Grounding and Bonding for Electrical Systems"
- G. Division 26 Section "Hangers and Supports for Electrical Systems"
- H. Division 26 Section "Vibration and Seismic Controls for Electrical Systems"
- I. Division 26 Section "Overcurrent Protective Device Coordination Study"
- J. Division 26 Section "Raceway and Boxes for Electrical Systems"
- K. Division 27 Section "Communication Rooms Fittings"
- L. Division 27 Section "Communications Backbone Cabling"
- M. Division 27 Section "Communications Equipment Room Fittings"
- N. Division 28 Section "Access Control/Facility Monitoring System"
- O. Division 28 Section "Video Surveillance System"

1.3 ABBREVIATIONS AND DEFINITIONS

A. Abbreviations

ACFMS	Access Control and Facility Monitoring System
ACP	Access Control Panel
AFF	Above Finished Floor
ANSI	American National Standards Institute
AWG	American Wire Gauge
CPU	Central Processing Unit
CR	Card Reader
CRT	Computer Terminal with Keyboard
CCTV	Close Circuit Television
EIA	Electronic Industries Alliance
ESS	Electronic Safety and Security
FCC	Federal Communications Commission
Fps	frames per second
GUI	Graphical User Interface
ISC	Intelligent System Controller
iSCSI	Internet Small Computer Systems Interface
IP	Internet Protocol
LAN	Local Area Network
LPS	Lock Power Supply
Mbps	Megabits per second
MC	Magnetic Contact
MHz	Megahertz
NIC	Network Interface Card
NVR	Network Video Recorder
RMS	Rack Mount Space (1.75")
RU	Rack Unit (1.75")
RAID	Redundant Array of Independent Disks
RAID0	Block Level Striping without Parity or Mirroring
RAID5	Block Level Striping with Distributed Parity
SCP	Security Control Panel
SCS	Structured Cabling System
SDK	Software Development Kit
SSA	Software Support Agreement
SMS	Security Management System
TB	Terra Bytes
TCP/IP	Transmission Control Protocol / Internet Protocol
UL	Underwriters Laboratories
UPS	Uninterrupted Power Supply

UTP	Unshielded Twisted Pair
VSS	Video Surveillance System
WAN	Wide Area Network

B. Definitions

1. "Provide" shall mean furnish and install.
2. "Work" shall mean all labor, materials, equipment, apparatus, controls, accessories, and all other items required for a proper and complete installation.
3. "Concealed" shall mean hidden from sight in chases, furred spaces, shafts, embedded in construction or in crawl space.
4. "Exposed" shall mean not installed underground or concealed as defined above.
5. "Furnished by others" shall mean materials or equipment purchased and set in place under other sections of the general contract and connected to the systems covered by this section of the specifications by this trade contractor.
6. "Coordinate" shall mean all work provided under this section of the specification shall be in compliance with work of other trades.
7. "Demonstration" shall mean the verification by operation, movement or adjustment of an item or system and the comparison of the item or system performance against a qualitative standard or standards as set forth in the specific requirements of the cited paragraph.
8. "Test" implies the systematic exercising of an item or system under all specified conditions with quantitative measurement of specified parameters and comparison of performance against the quantitative standards set forth. The Security Contractor shall pre-test/pre-commission the installed system before the Owner's Representatives shall test the system. Provide sign-off sheets to the Owner's Representatives certifying that the system is ready for testing and commissioning.
9. Base Design/System: The intent of this phrase(s) is to describe the security systems specified herein, without regard or reference to the alternates appended to this document. The base design and base system present minimum acceptable performance levels and the Owner's desire to provide priority consideration to the most economic security system that meets these performance levels.
10. Contractor: This term designates the company which conducts the Work and is responsible to ensure that others provide specified Work as described in the Specifications for security systems. This term specifically refers to a company that is qualified to perform the Work specified herein related to the integration of all electronic security access control systems and components and the fabrication and installation of all security equipment.
11. Electrical work: shall include furnishing and installing all security system interconnecting conduits, junction boxes, outlet boxes, electrical troughs, cable ladders, plywood backboard and other associates mounting hardware. Interconnecting security conduits shall be installed with a nylon pull string inside the conduits for installation of interconnecting conductors. In addition, the It shall include installation of the electrical power for the security system. Refer to the electrical drawings and electrical specifications for installation requirements.
12. Door Hardware Supplier: The Company engaged to provide materials and services for all door hardware, door frames, and mechanical locking hardware.
13. Door/Frame Security Hardware Package: This term signifies the security hardware package associated with a security access controlled and/or alarm monitored door. Security door hardware includes an electrified lock, electric

strike, electrified panic hardware, electric power transfers or electrified hinges, magnetic door contacts, lock power supplies, termination cabinets, and final connection of wiring to door security devices and to the appropriate screw terminals on the screw-type termination strips located in the termination box.

1.4 STANDARDS AND CODES

- A. Ensure that the design and fabrication of the equipment is in accordance with applicable engineering codes and standards. When specific requirements are stated in this Section that exceed and/or overlap those requirements of the codes and standards referenced here, this Section shall govern.
- B. Ensure compliance with all applicable prevailing codes and laws within the jurisdiction of the site as applicable to the extent of this section.
- C. Provide a complete fully operational turnkey security system as specified within these documents.
- D. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only. The most current version of the following standards shall be referenced.
 - 1. American National Standards Institute (ANSI) Publications:
 - a. National Electrical Safety Code
 - 2. American Society for Testing and Materials (ASTM) Publications:
 - a. Standard Practice for Security Engineering Symbols
 - 3. National Fire Protection Association (NFPA) Publications:
 - a. National Electrical Code
 - 4. National Electrical Manufacturers Association (NEMA) Publications:
 - a. Industrial Control Devices and Assemblies.
 - b. Enclosures for Industrial Controls and Systems
 - c. Enclosures for Industrial Controls and Systems
 - d. Enclosures for Electrical Equipment
 - 5. Underwriters Laboratories, Inc., Standard for Safety:
 - a. UL 5 Surface Metal Raceways and Fittings
 - b. UL 6 Rigid Metal Conduit
 - c. UL 50 Cabinets and Boxes
 - d. UL 65 Electric Wired Cabinets
 - e. UL 83 Thermoplastic-Insulated Wires
 - f. UL 96 Lightning Protection Components
 - g. UL 193 Fuses
 - h. UL 294 Access Control System Units
 - i. UL 437 Key Locks
 - j. UL 444 Communication Cables
 - k. UL 486A/B Wire Connectors and Soldering Lugs
 - l. UL 493 Thermoplastic-Insulated Underground Feeder and Branch Circuit Cables
 - m. UL 497B - Protectors for Data Communication and Fire Alarm Circuits
 - n. UL 512 Fuse Holders

- o. UL 514B Boxes, Fittings for Conduit and Outlets
 - p. UL 603 Power Supplies For Use With Burglar-Alarm Systems
 - q. UL 609 Local Burglar Alarm Units and Systems
 - r. UL 611 Central-Station Burglar-Alarm Systems
 - s. UL 632 Electrically Actuated Transmitters
 - t. UL 634 Connectors and Switches For Use With Burglar Alarms Systems
 - u. UL 639 Intrusion Detection Units
 - v. UL 651 Conduit, Schedule 40' and 80' Rigid PVC
 - w. UL 796 Electrical Printed Wiring Boards
 - x. UL 797 Electrical Metallic Tubing
 - y. UL 827 Central Stations For Watchman, Fire-Alarm, and Supervisory Services
 - z. UL 1037 Anti-theft Alarms and Devices
 - aa. UL 1076 Proprietary Burglar Alarm Units and Systems
 - bb. UL 1773 Boxes, Termination
6. Applicable Federal, state and local laws, regulations, ordinances and codes.
 7. Nothing in this Section, including revocation of certain specific codes, standards or specifications, shall relieve the Security Contractor of the responsibility for compliance with the codes, standards or specifications which are generally recognized to be applicable to the Work specified herein.

1.5 SUBMITTALS

A. General Procedures

1. All submittals shall comply with the requirements of Division 01.
2. Do not commence work that requires review of any submittals until receipt of returned submittals with appropriate final action.
3. Submittals that deviate from the procedures outlined herein will be rejected. No allowance or extension of project time will be considered due to lost time associated with procedural deviation.
4. Do not submit substitute items that have not been approved.
5. Preparation and Transmittal of Submittals:
6. Transmit each submittal with a transmittal form. Submittals received without a transmittal form may be returned without action. The transmittal form shall include: project name and address, number and date of submittal, name and address of the issuing entity.
 - a. Sign or initial each copy of each submittal to certify compliance with requirements of the Contract Documents.
 - b. Submittals shall include a Table of Contents listing all items included and relevant references to contract documents. For product data sheets the table of contents shall include: product name and manufacturer, page number of the corresponding specification section.
 - c. Product data sheets shall be grouped according to the specifications sections. Submittals shall include relevant information only. Product being submitted shall be clearly identified.
7. Timing of Submittals
 - a. Prepare and transmit each submittal requiring approval sufficiently in advance of scheduled performance of the related work to allow for

adequate review and processing time, including time for re-submittal if necessary.

- b. If processing time for a particular submittal will be critical to progress of the work, advise and notify the Owner or its representatives accordingly.

B. List of Submittals:

1. Pre-Construction Submittals:

- a. Quality Assurance (QA) Plan
- b. Qualifications and Certificates
- c. Materials and Equipment List
- d. Product Data for every product installed
- e. Manufacturer Quality Assurance Tests and Source Quality Control Reports
- f. Shop drawings
- g. Samples

2. During Construction:

- a. Coordination Drawings
- b. System Labeling

3. Post Construction:

- a. Test Plan and Procedures
- b. Field Quality Control Reports/Test Results
- c. Record (as-built) Drawings
- d. Spare Parts List
- e. Manuals
- f. Maintenance Support
- g. Warranties

C. Quality Assurance Plan: submit a QA plan and reporting program containing a project schedule with anticipated milestone dates for all project related tasks (i.e. shop drawing submittal, various construction milestones, testing, acceptance, etc.).

D. Qualifications and Certificates

1. Installer Qualifications:

- a. Qualification Data: The work specified herein shall be performed by a qualified installer, as defined and described herein.
- b. Installer shall be certified installer for the specific manufacturers and systems provided.

2. Seismic Qualification Certificates: For equipment frames from manufacturer.

- a. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
- b. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions. Base certification on the maximum number of components capable of being mounted in each rack type. Identify components on which certification is based.
- c. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

- E. Materials and Equipment List:
1. Complete list of all materials, equipment and accessories proposed for his Work. This list shall include manufacturers, complete catalog identification numbers and model or system designator, quantities, options, product data as described below, basic system architectural block diagrams, and CPU software operating features.
 2. The submittal shall be in sufficient detail so that the equipment and materials proposed can be readily identified.
 3. Submittal of partial lists is not acceptable.
- F. Product Data:
1. For each type of product indicated.
 2. Shall be ordered by specifications section. Each product data shall reference the appropriate section and subsection.
 3. Collect Product Data into a single submittal for each element of construction or system.
 4. Include construction details, material descriptions, dimensions of individual components and profiles, and standard colors and finishes. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories. It shall also include roughing-in diagrams and templates, standard wiring diagrams, controls and performance curves. Where Product Data must be specially prepared or modified because standard printed data is not suitable for use, submit as "Shop Drawings".
 5. Clearly mark each copy to identify pertinent products, models, and accessories. Show performance characteristics and capacities. Show dimensions and clearances required. Include the following information:
 - a. Reference to appropriate specification section and subsection.
 - b. Compliance with recognized trade association standards.
 - c. Compliance with recognized testing agency standards.
 - d. Application of testing agency labels and seals.
 - e. Notation of dimensions verified by field measurement.
 - f. Notation of coordination requirements.
 - g. Manufacturer's printed recommendations.
- G. Samples: Along with project data and shop drawings, submit one (1) sample for each exposed security devices and security devices with color and finish options, for review by the Architect. The Owner's Representatives/Architect shall retain these devices as record of the approved equipment for the length of the project.
- H. Shop Drawings:
1. The shop drawing submittals shall include highly detailed, to-scale, drawings describing the products (systems, equipment, devices and materials) and services as to precise locations, mounting and installation methods, details and dimensions, schedules, conduit sizing, conduit routing, riser diagrams, point-to-point interconnect diagrams, equipment schedules, zoning schedule, door schedules, VSS camera schedules, system interface schedules or diagrams, power requirement schedules, stand-by/emergency power schedule, cost reports, and such other diagrammatic or written descriptions which shall allow a thorough and accurate understanding of the security systems and equipment that are being

- furnished, how they are intended to function, how they will be installed, and all other necessary information of similar intent.
2. No work shall commence nor shall any equipment be ordered until the submittals have been approved in writing. All work shall be in accordance with approved submittals. A detailed completion schedule shall be submitted with all submittals.
 3. Indicate, among other requirements noted herein, the accurate locations of all conduit, raceway, junction and utility boxes, termination panels, transformers (if any), power supplies, panels, and all other equipment noted.
 4. Clearly illustrate all mounting locations and methods, with particular detail for the installation of intrusion sensors, locking hardware, and request-to-exit devices at doors, sensors located at windows and the mounting of interior and exterior VSS cameras. While some drawing details may be “typical,” the shop drawings shall illustrate the installation detail of each unique application.
 5. Include plans, elevations, sections, details, and attachments to other work.
 6. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 7. Equipment schedules and details shall provide the following information, as appropriate in each case: door number; door type; door position switch; request-to-exit type; request-to-exit location; auxiliary request-to-exit device, if any; lock type; power requirements; emergency power; access control type; special installation requirements; timed-shunt times; shunt type; precise, to-scale mounting location; zone or point designation; remote control of lock by specific and designated control console; VSS camera number activated by sensor or switch closure; input/output programming schedules; CPU output reports structure.
 8. Camera schedules and details shall provide the following information: camera number; camera type; monitor number for each camera (if any); sequencing [if any]; camera model number; camera features, such as auto-iris; lens specification; power requirements; type of power input; cable type; length of cable run; camera mounts; camera housing; camera housing features, such as heater, etc.; camera drives; switcher position; switcher type; monitor type; cameras displayed on each monitor, especially linked displays; DVR positions; alarm queuing; special installation or carpentry requirements; camera and/or lens controls; alarm homing; termination method; lightning, ground loop, etc. protection.
 9. Clearly illustrate the fields of view of each camera, as well as “park” positions for panning and zooming cameras (if any). If the camera is capable of wide-angle and telephoto viewing, both fields of view shall be indicated. The installer's “aiming point” shall be indicated. The submittal shall clearly identify outdoor cameras mounting details and maintenance access concepts and design.
 10. System interface schedules or diagrams shall clearly identify: sensors and switches which queue cameras, as well as the number of camera activated; DVR activation logic; VSS monitor switching logic; interfaces, if any, between the access control system; distributed processing capabilities and functions; sensors and switches exclusively used as request-to-exit devices.
 11. Equipment Racks and Cabinets: Include workspace requirements and access for cable connections.
 12. Exposed equipment: Submit one (1) sample for each exposed security devices and security devices with color and finish options, for review by the Engineer

and Architect. The Engineer/Architect shall retain these devices as record of the approved equipment for the length of the project.

13. Grounding: Indicate location of grounding bus bar and its mounting detail showing standoff insulators and wall mounting brackets.
 - I. System labeling: submit labeling scheme and samples.
 - J. All post construction submittals must be presented and approved prior to final acceptance.
 - K. Formal Test Plan and Procedures: 30 days prior to acceptance testing and final inspection, submit a formal test plan and test procedures.
 - L. Spare Parts and Components List: At the conclusion of the work, submit a complete list of manufacturers' recommended spare parts and components required in order to satisfactorily maintain and service the systems for a minimum of two years.
 - M. Manuals:
 1. Prior to final acceptance, complete sets of Operation, Maintenance and Service Manuals shall be submitted for systems and equipment provided under this contract.
 2. The manuals shall be compiled, assembled and indexed, in an easily identifiable hard cover form. Three (3) sets of the manuals shall be submitted prior to final acceptance testing.
 3. The manuals shall include the following:
 - a. Complete operating instructions.
 - b. Complete maintenance instructions, wiring diagrams, troubleshooting instructions.
 - c. System service instructions for work which manufacturers recommend user service.
 - d. Complete parts lists for each major item of equipment and/or for each system.
 - e. Complete collection of manufacturers' product and catalog literature for equipment and systems installed under this contract.
 - f. Manufacturers' warranties.
 - g. Operating characteristics, performance data, ratings, and manufacturers' specifications for each item of equipment or system.
 - h. Where practical, internal wiring diagrams and schematics.
 - i. Name, address, and telephone number for service for each item of equipment or system.
 - j. Software User Documentation: Manual shall include operating instructions, programming instructions, technical documentation and maintenance procedures to permit making changes to system configuration.
 - N. Record Drawings
 1. Produce and keep up-to-date, a complete record as-built set of prints (black-line bonds) which shall be corrected, and marked-up to show every change from the original Specifications and Contract Drawings through final acceptance. This set of drawings shall be protected against soiling, tears, and similar damage and defacement. This set shall be kept on the job site and shall be used only as a record set. (This shall not be construed as authorization to make changes in the Work without proper approvals.)

2. The as-built drawings will be kept up-to-date and will be checked monthly as a requirement for approval of monthly progress payments.
3. Upon completion of the work and before final payment, produce and submit a final set of record drawings by updating the AutoCAD files of the construction set of drawings (to be provided by the Owner) with the information from the as-built set. The submittal shall include the original record set of black-bonds and the electronic files of the as-built drawings in both AutoCAD format and PDF format.
4. At the conclusion of this project, two sets of black-line bond and two copies of the drawing files on Windows based media, formatted for use by AutoCad 2009 (or later version), of all the security drawings specifically prepared for this Contract, shall be provided. The drawings shall be instrument drawn and shall contain all changes shown in the record set. Sepia line drawings on paper are not acceptable.

O. Maintenance Support

1. Provide all on-going repairs, scheduled maintenance, and warranty repair and maintenance support to the Owner for the installed systems on a year-round basis. [Note: This is in addition to the mandatory one-year warranty and repair service required in the bid by the Specification.] Repair or maintenance services shall be available within four hours upon a call by the Owner. Submit a cost proposal for a one year maintenance and service agreement, with options for three (3) and five (5) years, for all equipment furnished under this scope.
2. Routine preventive maintenance:
 - a. Site visits for inspection and adjustment at least once every calendar month for the year after final acceptance of the installation.
 - b. A factory field service force shall be capable of performing all needed inspections, training personnel to service equipment and have the ability to provide other services as might arise in relation to equipment servicing.
3. Free software upgrades during the warranty period.

P. Warranties

1. As a condition precedent to the final payment, execute a written guarantee (warranty) to the Owner certifying that all the contract requirements have been completed in accordance to the final Specifications and Contract Drawings and warranting all materials and equipment furnished by him under this contract to remain in satisfactory operating condition (ordinary wear and tear, abuse and causes beyond his control for this Work excepted) for a period of one (1) year from the date of final acceptance or beneficial use, whichever is later.
2. All defects or damages due to faulty materials or workmanship shall be repaired or replaced without delay to the Owner's satisfaction at no cost to the Owner.
3. Provide four (4) periodic inspections at no cost to the Owner during the warranty period.
4. When equipment and labor covered by the installer's warranty or by a manufacturer's warranty have been replaced or restored because of his failure during the period of that warranty, the warranty period for the replaced or repaired equipment or restored work shall be reinstated for a period of time equal to the original warranty period, and commencing with the date of completion of the replacement or restoration work. In the event that any manufacturer

customarily provides a warranty period greater than one (1) year, the Security Contractor's warranty shall be for the greater period of time.

5. In no case shall the integrated system/security equipment warranties be voided where user-programmable programming changes are performed by the trained Owner's appointed system programming representative, to include redefining system input/output points, operation characteristics, time delays, and report formats to the Owner's site-particular requirements.

Q. Definition of Acceptance

1. The acceptance of the installation will be based upon satisfactory performance during a thirty (30) day period of beneficial use beginning after all of the other acceptance requirements listed below have been satisfied in full by the Owner.
2. Acceptance of the installation will be reasonably and good faith determined by the Owner or its agents. Partial use of the installation prior to completion will not be considered as contributing in part or in whole to the thirty day period. Problems discovered during the thirty (30) day period covered under the responsibilities of the Vendor must be fixed at no cost to the Owner.
3. Acceptance will not be given, and no final payments will be made, until all problems have been fixed to the Owners' full satisfaction. Acceptance does not absolve the installer from any of its obligations under warranties and guarantees. The other acceptance criteria are the following:
 - a. All tests have been passed and all required test results have been submitted in appropriate format and have been accepted without dispute by the Owner.
 - b. All required documentation has been submitted.
 - c. All required labeling has been completed.
 - d. All work has been completed as required by the specifications, including all cable runs and pathways in their permanent places, and all cabinets, racks and cable pathways (i.e. ladder, tray, etc.) secured.
 - e. All Punch List items have been completed.
 - f. All warranties for the installation have been obtained by installer.
 - g. Written notification has been submitted that the installation is completed and that all specification requirements have been met.
4. Upon satisfactory completion of acceptance requirements and after satisfactory performance during the thirty (30) day period, and correction of any defects found, the Owner will notify the contractor in writing of its acceptance of the installation.

1.6 SUBSTITUTIONS, DEVIATIONS AND CHANGES

A. Substitutions

1. Requests for substitution are permitted for materials specified with an "or approved equivalent" clause or other language of same effect in the Contract Documents. No request for substitution will be entertained if this clause has not been specified.
2. All requests for substitution shall be accompanied by a product data sheet submittal as outlined in paragraph 1.5 above.
3. Substitutions may be permitted if the requirements of the proposed substitution comply with the general requirements and product specifications of the Contract Documents.

- B. Deviations
 - 1. Any deviations or changes involving extra work are not permissible without prior review and written approval by the Owner or its duly authorized representative.
- C. Changes
 - 1. All work described in these documents shall follow the methods, requirements and general arrangement of this Specification unless otherwise noted.
 - 2. All pricing and proposals for changes shall be submitted detailing all items and related costs in accordance with the provisions of the contract for changed work.

1.7 TRAINING (Not Used)

1.8 QUALITY ASSURANCE

- A. Unless otherwise specifically noted, all equipment, material and articles to be installed shall be new, best of their respective kinds, free from defects, listed by Underwriter's Laboratories for the intended use, bearing their label and of the most suitable grade for the purpose intended.
- B. Non-compliant products installed as a part of this scope shall be removed and replaced at no additional cost to the Owner.
- C. Unless otherwise specifically noted, reference to any equipment, material, article or patented process, by trade name, make or catalog number shall be regarded as establishing a standard of performance and quality. Provide the name of the manufacturer, the model number and other identifying data and information respecting the performance, capacity, nature and rating of the electrical, mechanical and other equipment to be incorporated in the work.
- D. When so directed, samples shall be submitted for approval at no cost to the Owner. Equipment, material and articles procured, installed, or used without required approval shall be at the risk of subsequent rejection. Warranties for all installed products shall be in accordance with the Contract General Provisions and as cited herein.
- E. The services of a qualified manufacturer's technical representative, thoroughly experienced in the installation and operation of the type of system being provided shall be obtained at no cost to the Owner, to consult on equipment selection, installation, and testing of the specified systems if and as requested by the Owner or its authorized representatives.
- F. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- G. Grounding: Comply with ANSI-J-STD-607-A.
- H. Modularity: Provide components designed for modular increase or decrease of system capability by installation or removal of plug-in modules. System components shall be designed to facilitate modular subassembly and part replacement.
- I. Reliability: Provide only new, unused components free from flaws or imperfections, which are in current manufacturing production. Components shall be manufactured to meet all the requirements specified herein and shall be free from characteristics or defects which affect the appearance or which might affect the serviceability or render the equipment unsuitable for the intended purpose. The workmanship shall be of

superior quality. The MTBF for any sensor component shall not be less than five-thousand (5000) hours. Provide components designed for continuous operation. Electronic components of the system shall be of the solid-state type, mounted on printed circuit boards conforming to UL seven-hundred-ninety-six (UL-796). Boards shall be plug-in, quick-disconnect type. Circuitry shall not be so densely placed as to impede maintenance. Power-dissipating components shall incorporate safety margins of not less than twenty-five (25) percent with respect to dissipation ratings, maximum voltages, and current-carrying capacity. Light duty relays and similar switching devices shall be solid-state type or hermetically sealed electro-mechanical type.

- J. Maintainability: The components shall be capable of being maintained using commercially available standard tools and equipment. Components shall be so arranged and assembled that they are readily accessible to maintenance personnel without compromising the defeat resistance of the various ESS subsystems.
- K. Availability: Provide products and services available within the project schedule established for this scope of work.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Comply with the requirements of the Construction Indoor Air Quality Management Plan and the Construction Waste Management Plan.
- B. Deliver materials in original packaging, bearing brand name and identification of manufacturer or supplier.
- C. Store materials to keep them dry and protected from soiling, dirt or damage. Neatly stack gypsum boards flat to prevent sagging.
- D. Handle gypsum boards to prevent damage to edges, ends or surfaces. Protect trim accessories from being bent or damaged.

1.10 COORDINATION

- A. Coordinate layout and installation of security equipment in the telecommunications rooms, copper and/or fiber backbone and LAN requirements with the Owner and the Structured Cabling System (SCS) installer.
- B. Meet jointly with Owner to exchange information and agree on details of equipment arrangements and installation interfaces.
- C. Record agreements reached in meetings and distribute them to other participants.
- D. Coordinate location of power raceways and receptacles with locations of security equipment requiring electrical power to operate.
- E. Coordinate arrangement, mounting, and support of electronic safety and security equipment:
 - 1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
 - 2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
 - 3. To allow right of way for piping and conduit installed at required slope.
 - 4. So connecting raceways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.

- F. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.
- G. Coordinate location of access panels and doors for electronic safety and security items that are behind finished surfaces or otherwise concealed.
- H. Coordinate sleeve selection and application with selection and application of firestopping specified in the Electrical Section.
- I. Coordinate routing of the security cables.
- J. Coordinate the installation of the door/frame security package with the door hardware supplier. Security door hardware includes an electrified lock, electric strike, electrified panic hardware, electric power transfers or electrified hinges, magnetic door contacts, lock power supplies, termination cabinets, and final connection of wiring to door security devices and to the appropriate screw terminals on the screw-type termination strips located in the termination box. Responsibility for furnishing and installing a typical Door/Frame Security Package is divided as follows:
 - 1. Door Hardware supplier responsibilities:
 - a. Shall furnish and install factory-prepared door frame fitted with factory prepared cut-outs and appropriate pre-welded outlet boxes to accept the door security devices.
 - b. Shall furnish and install all non-security mechanical hardware. This shall include but not limited to mechanical hardware, hinges, door closers, door stops, etc.
 - c. Shall furnish all electronic locksets, power transfer hinges, door monitoring contacts, request-to-exit devices for the new doors.
 - 2. Security supplier responsibilities:
 - a. Shall install all door monitoring contacts, electromagnetic locks, shear locks, and request to exit devices for the existing doors. Devices shall be retrofitted to the existing doors, as specified on the drawings.
 - b. Shall install all magnetic contacts and electronic locksets and power transfer hinges, provided by the door hardware supplier, as specified on the drawings.
 - c. Shall furnish and install termination cabinet furnished with screw-type termination block(s). The termination block(s) shall include additional screw terminals to accept the wiring interconnect inputs from the card reader(s), request-to-exit passive infrared detectors and/or the request-to-exit push button switch, and shunt switch, as required, which are not part of the door/frame security hardware package.
 - d. Shall coordinate with the electrical work all hi-voltage power to security equipment a required, including but not limited to, the types and sizes of interconnecting wiring, outlet box sizes, electrical contacts needed and screw terminal sizes.
 - e. Shall coordinate with the SCS installer who will be providing data connections for the cameras, control panels, servers, workstations and any other security equipment that requires data or telephone connectivity.
 - 3. Electrical supplier responsibilities:
 - a. Shall furnish, install and final connect all security door conduits and interconnect wires from door power supply and termination cabinet and/or

- junction box to all security devices associated with a door/frame security door location.
- b. Shall furnish and install all other security system interconnecting conduits, junction boxes, outlet boxes, electrical troughs, and other associated mounting hardware. Interconnecting security conduits shall be installed with a nylon pull string inside the conduits for installation of interconnecting conductors.

PART 2 - PRODUCTS

2.1 GROUNDING AND BONDING FOR SECURITY SYSTEMS

- A. Comply with requirements in Division 26 Section "Grounding and Bonding for Electrical Systems" for grounding conductors and connectors.
- B. Comply with ANSI-J-STD-607-A.

2.2 PATHWAYS FOR ELECTRONIC SAFETY AND SECURITY

- A. Hangers and Supports
 1. Cable Support: NRTL labeled.
 2. Comply with NFPA 70 and UL 2043 for fire-resistant and low-smoke-producing characteristics.
 3. Cable hangers and non-continuous supports shall be designed to prevent degradation of cable performance and pinch points that could damage cable. Cable tie slots fasten cable ties to brackets.
 4. Shall have various attachment options for: wall, ceiling, joist, beam, flange, raised floor pedestal and others type of mounting.
 5. Support brackets with cable tie slots for fastening cable ties to brackets.
 6. Lacing bars, spools, J-hooks, and D-rings, straps and other devices.
 7. Cable straps (ties) shall be reusable Velcro-style with hook and loop or d-ring, available in various colors and sizes. Plenum rated straps shall be used in plenum spaces.
- B. Conduits and Back Boxes:
 1. Provide where indicated on drawings or as required.
 2. Conduit and boxes sizes as shown on the communications drawings.
 3. Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems."
 4. Flexible metal conduit shall not be used unless specifically noted.
- C. Sleeves
 1. Refer to Division 26 "Electrical".
- D. Sleeve Seals and Firestopping
 1. Install to seal exterior wall penetrations.
 2. Use type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal

3. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and pathway or cable.
- E. Grout
1. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, non-staining, mixed with water to consistency suitable for application and a 30-minute working time.

2.3 LIGHTING AND SURGE PROTECTION

- A. Intrusion detection, access monitoring and control, video circuitry, and communication circuits that connect to outdoor mounted equipment shall be protected at both ends against excessive voltages.
- B. This requirement shall apply for circuits that are routed both in underground conduits and overhead runs. As a minimum, both primary detection devices, such as three (3) electrode gas-type surge arrestor, and secondary protectors shall be installed to reduce dangerous voltages to levels that will cause no damage. Fuses shall not be permitted as lightning and power surge protection devices.
- C. Provide fail-safe gas tube type surge arrestors on all exposed security data circuits. Breakdown voltage for the unit shall be three-hundred to five-hundred (300-500) VDC. The unit shall have equal performance for bi-polar operation with an automatic reset feature, and a minimum life of one thousand (1000) surges with ten (10) times one-thousand (1000) microsecond wave-form at one-thousand (1000) amperes.

2.4 VIBRATION AND SEISMIC CONTROLS FOR ESS

- A. Security systems components shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
- B. The term “withstand” means “the unit will remain in place without separation from any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event”.
- C. Equipment shall be seismically rated and braced according to IBC 1621.

2.5 IDENTIFICATION FOR SECURITY ESS

- A. Comply with requirements of Division 26 Section "Identification for Electrical Systems".
- B. The identification for the communications systems shall meet all the requirements of a Class 3 facility as defined by ANSI/TIA/EIA 606-A, Administration Standard for the Telecommunications Infrastructure of Commercial Buildings.
- C. Comply with TIA/EIA-606-A and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.
- D. Identify all the components of the security systems.
- E. For fire-resistant plywood, do not paint over manufacturer's label.
- F. All labels shall be preprinted or computer-printed type.
- G. Type, format, wording, printing, and placement of labels shall be coordinated with Owner's existing administration plan

H. Labeling System

1. PC-based software, WINDOWS compatible, capable of supporting alpha numeric characters and Windows True Type Fonts.
2. Compatible with laser printers.
3. Label sizes supported:
4. Minimum: 0.8" W x 0.2" H.
5. Maximum: 3.0" W x 12.0" H.

2.6 EQUIPMENT ENCLOSURES FOR ESS

- A. Cabinets or housings, power supply enclosures, terminal cabinets, multiplexer, data gathering panels, wiring gutters, and other component housings, collectively referred to as enclosures, shall be so formed and assembled as to be sturdy and rigid.
- B. Thickness of metal in cast and sheet metal enclosures of all types shall not be less than those in Tables I and II, UL six-hundred-eleven (UL-611). Sheet steel used in fabrication of enclosures shall be not less than fourteen (14) gauge. Doors and covers shall be flanged. Where doors are mounted on hinges with exposed pins, the hinges shall be of the tight pin type or the ends of hinge pins shall be tack welded to prevent ready removal. Doors having a latch edge length of less than twenty-four (24) inches shall be provided with a single lock. Where the latch edge of a hinged door is twenty-four (24) inches or more in length, the door shall be provided with a three (3)-point latching device with lock; or alternatively with two (2) locks, one (1) located near each end.
- C. Any ventilator openings in enclosures and cabinets shall conform to the requirements of UL six-hundred-eleven (UL-611).
- D. Unless otherwise indicated, sheet metal enclosures, excluding control console enclosures, shall be designed for wall mounting with top holes slotted. Mounting holes shall be in positions which remain accessible when all major operating components are in place and the door is open, but shall be inaccessible when the door is closed. Covers of pull and junction boxes provided to facilitate initial installation of the system shall be held in place by tack welding, brazing, or one-way screws. Zinc labels shall be affixed to such boxes indicating they contain no connections. These labels shall not indicate that the box is part of the security system.
- E. Excluding the cabinets and other enclosures located in Security or Telecommunications Rooms, all enclosures, cabinets, housings, boxes, raceways, and fittings of every description having hinged doors or removable cover plates which contain circuits of the security system and its power supplies, shall be provided with cover-operated corrosion-resistant tamper switches, arranged to initiate an alarm signal when the door is moved as little as one quarter (1/4) inch from its normally closed position.

2.7 EXPOSED COMPONENTS

- A. Components exposed and accessible to the public shall be of a design and construction typical and suitable for such use. All device fasteners shall be an approved security type. All components and materials shall be resistant to vandalism and waterproof.

2.8 ELECTRONIC COMPONENTS FOR ESS

- A. All electronic components of the system shall be of the solid-state type, mounted on printed circuit boards conforming to UL seven-hundred-ninety-six (UL 796). Boards

shall be plug-in, quick-disconnect type. Circuitry shall not be so densely placed as to impede maintenance. All power dissipating components shall incorporate safety margins of not less than twenty-five (25) percent with respect to dissipation ratings, maximum voltages, and current-carrying capacity. All electronic printed circuit boards furnished and installed shall be provided with a mildew/fungus-resistant and moisture inhibiting coating.

2.9 CABLES FOR ESS

- A. PVC-Jacketed, RS-232 Cable: Paired, 2 pairs, No. 22 AWG, stranded (7x30) tinned copper conductors, polypropylene insulation, and individual aluminum foil-polyester tape shielded pairs with 100 percent shield coverage; PVC jacket. Pairs are cabled on common axis with No. 24 AWG, stranded (7x32) tinned copper drain wire.
 - 1. NFPA 70, Type CM.
 - 2. Flame Resistance: UL 1581 Vertical Tray.
 - 3. Plenum-Type, RS-232 Cable: Paired, 2 pairs, No. 22 AWG, stranded (7x30) tinned copper conductors, plastic insulation, and individual aluminum foil-polyester tape shielded pairs with 100 percent shield coverage; plastic jacket. Pairs are cabled on common axis with No. 24 AWG, stranded (7x32) tinned copper drain wire.
 - 4. NFPA 70, Type CMP.
 - 5. Flame Resistance: NFPA 262 Flame Test.
- B. PVC-Jacketed, RS-485 Cable: Paired, 2 pairs, twisted, No. 22 AWG, stranded (7x30) tinned copper conductors, PVC insulation, unshielded, PVC jacket, and NFPA 70, Type CMG. RS-485 communications require 2 twisted pairs, with a distance limitation of 4000 feet.
 - 1. Plenum-Type, RS-485 Cable: Paired, 2 pairs, No. 22 AWG, stranded (7x30) tinned copper conductors, fluorinated-ethylene-propylene insulation, unshielded, and fluorinated-ethylene-propylene jacket.
 - 2. NFPA 70, Type CMP.
 - 3. Flame Resistance: NFPA 262 Flame Test.
- C. Multiconductor, PVC Readers and Wiegand Keypads Cables: No. 22 AWG, paired and twisted multiple conductors, stranded (7x30) tinned copper conductors, semirigid PVC insulation, overall aluminum foil-polyester tape shield with 100 percent shield coverage, plus tinned copper braid shield with 65 percent shield coverage, and PVC jacket.
 - 1. NFPA 70, Type CMG.
 - 2. Flame Resistance: UL 1581 Vertical Tray.
 - 3. For TIA/EIA-RS-232 applications.
- D. Paired PVC Readers and Wiegand Keypads Cables: Paired, 3 pairs, twisted, No. 22 AWG, stranded (7x30) tinned copper conductors, polypropylene insulation, individual aluminum foil-polyester tape shielded pairs each with No. 22 AWG, stranded tinned copper drain wire, 100 percent shield coverage, and PVC jacket.
 - 1. NFPA 70, Type CM.
 - 2. Flame Resistance: UL 1581 Vertical Tray.
- E. Paired PVC Readers and Wiegand Keypads Cable: Paired, 3 pairs, twisted, No. 20 AWG, stranded (7x28) tinned copper conductors, polyethylene (polyolefin) insulation,

individual aluminum foil-polyester tape shielded pairs each with No. 22 AWG, stranded (19x34) tinned copper drain wire, 100 percent shield coverage, and PVC jacket.

1. NFPA 70, Type CM.
 2. Flame Resistance: UL 1581 Vertical Tray.
- F. Plenum-Type, Paired, Readers and Wiegand Keypads Cable: Paired, 3 pairs, No. 22 AWG, stranded (7x30) tinned copper conductors, plastic insulation, individual aluminum foil-polypropylene tape shielded pairs each with No. 22 AWG, stranded tinned copper drain wire, 100 percent shield coverage, and fluorinated-ethylene-propylene jacket.
1. NFPA 70, Type CMP.
 2. Flame Resistance: NFPA 262 Flame Test.
- G. Plenum-Type, Multiconductor, Readers and Wiegand Keypads Cable: 6 conductors, No. 20 AWG, stranded (7x28) tinned copper conductors, fluorinated-ethylene-propylene insulation, overall aluminum foil-polyester tape shield with 100 percent shield coverage plus tinned copper braid shield with 85 percent shield coverage, and fluorinated-ethylene-propylene jacket.
1. NFPA 70, Type CMP.
 2. Flame Resistance: NFPA 262 Flame Test.
- H. Paired Lock Cable: 1 pair, twisted, No. 16 AWG, stranded (19x29) tinned copper conductors, PVC insulation, unshielded, and PVC jacket.
1. NFPA 70, Type CMG.
 2. Flame Resistance: UL 1581 Vertical Tray.
- I. Plenum-Type, Paired Lock Cable: 1 pair, twisted, No. 16 AWG, stranded (19x29) tinned copper conductors, PVC insulation, unshielded, and PVC jacket.
1. NFPA 70, Type CMP.
 2. Flame Resistance: NFPA 262 Flame Test.
- J. Paired Lock Cable: 1 pair, twisted, No. 18 AWG, stranded (19x30) tinned copper conductors, PVC insulation, unshielded, and PVC jacket.
1. NFPA 70, Type CMG.
 2. Flame Resistance: UL 1581 Vertical Tray.
- K. Plenum-Type, Paired Lock Cable: 1 pair, twisted, No. 18 AWG, stranded (19x30) tinned copper conductors, fluorinated-ethylene-propylene insulation, unshielded, and plastic jacket.
1. NFPA 70, Type CMP.
 2. Flame Resistance: NFPA 262 Flame Test.
- L. Paired Input Cable: 1 pair, twisted, No. 22 AWG, stranded (7x30) tinned copper conductors, polypropylene insulation, overall aluminum foil-polyester tape shield with No. 22 AWG, stranded (7x30) tinned copper drain wire, 100 percent shield coverage, and PVC jacket.
1. NFPA 70, Type CMR.
 2. Flame Resistance: UL 1666 Riser Flame Test.

- M. Plenum-Type, Paired Input Cable: 1 pair, twisted, No. 22 AWG, stranded (7x30) tinned copper conductors, fluorinated-ethylene-propylene insulation, aluminum foil-polyester tape shield (foil side out), with No. 22 AWG drain wire, 100 percent shield coverage, and plastic jacket.
 - 1. NFPA 70, Type CMP.
 - 2. Flame Resistance: NFPA 262 Flame Test.
- N. Paired AC Transformer Cable: 1 pair, twisted, No. 18 AWG, stranded (7x26) tinned copper conductors, PVC insulation, unshielded, and PVC jacket.
 - 1. NFPA 70, Type CMG.
- O. Plenum-Type, Paired AC Transformer Cable: 1 pair, twisted, No. 18 AWG, stranded (19x30) tinned copper conductors, fluorinated-ethylene-propylene insulation, unshielded, and plastic jacket.
 - 1. NFPA 70, Type CMP.
 - 2. Flame Resistance: NFPA 262 Flame Test.
- P. LAN Cabling: Comply with Division 28 Section "Conductors and Cables for Electronic Safety and Security."
 - 1. NFPA 262.
- Q. Composite Cable:
 - 1. Element 1 (Lock Power): 18 AWG, 4 Conductor Non-Shielded Plenum
 - 2. Element 2 (Card Reader): 22 AWG, 3 Pair Overall Shielded Plenum
 - 3. Element 3 (Door Position Switch): 22 AWG, 2 Conductor Non-Shielded Plenum
 - 4. Element 4 (Request to Exit Device): 22 AWG, 4 Conductor Non-Shielded Plenum

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR SECURITY SYSTEMS INSTALLATION

- A. All materials shall be installed as per the manufacturers' instructions, unless noted otherwise.
- B. Comply with NECA 1.
- C. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.
- D. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.
- E. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both communications equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
- F. Right of Way: Give to piping systems installed at a required slope.
- G. Bundle, lace, and train conductors and cables to terminal points without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.

- H. Coordinate location of power raceways and receptacles with locations of communications equipment requiring electrical power to operate.
- I. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- J. Thoroughly clean areas and spaces where work is performed or used as access to work. Remove completely, paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore all surfaces to their original condition.
- K. All wall-mounted equipment shall be mounted square and plumb.
- L. Complete work according to the agreed upon schedule. Cooperate in coordinating your activities with other planned and ongoing work at the site in a manner that facilitates meeting the schedule. This includes coordination with the various trades in determining work schedules and in resolving physical installation issues.
- M. All materials, cables, components, and all aspects of the installation must meet all local, state, and federal laws, as well as applicable code and regulatory requirements. They must also meet the requirements of any other entity legally empowered to set standards or codes governing composition and use in this installation, as well as any rules specific to the site. Code and regulatory requirements must prevail if there are any conflicts with requirements stated or implied in this specification and its companion documents. Where there is uncertainty in determining precedence, or what specific code or regulatory requirements apply, an Authority Having Jurisdiction (AHJ) over the issue in question will decide.
- N. The Owner reserves the right to require the removal from the project of any staff that it deems careless, problematic, or is identified by competent authority as not conforming to required safety codes, regulations, or standards, or is cited for performing or acting in an objectionable manner, thus affecting the safety or productivity of others.
- O. Take all necessary safety and health precautions and warnings required by codes and regulations to protect the project, its workers, the public, and the property of others. Applicable OSHA regulations or AHJ directives must be followed.
- P. Accept responsibility for all damages to persons or property that occurs as a result of its fault or negligence.
- Q. Designate a Project Manager to act as the technical and managerial interface with the Client and or its representatives.
- R. Participate in meetings covering technical, installation, and coordination and management issues.
- S. Perform all work required under this specification in a skillful and professional manner in accordance with standards and practices documented and/or accepted by industry, such as the ANSI/TIA/EIA, NECA standards and codes. Technicians must be familiar with the proper assembly and installation of all components they are working with, and must follow manufacturer's specific installation requirements.
- T. Maintain its installation and storage areas free from an accumulation of waste material and rubbish, and dispose of them in a manner acceptable to the Owner.
- U. Provide all tools needed to perform its required work. Upon completion of the project, all tools, equipment, and materials not designated as belonging to the Client must be

removed. After completion, the work areas must be left in a clean and unobstructed condition.

- V. Contractor must be responsible for the security of all its installation materials, whether purchased by, or supplied to the Security Contractor, as well as tools and ancillary components and documents.
- W. Order all components in a timely manner so that installation dates are not compromised. Materials must either be on hand, or available on short notice, so that the installation may be expedited if required, or if the opportunity to do so presents itself.
- X. Obtain all necessary permits.
- Y. Ensure that any excess materials are ordered for the project they are kept in their original condition and packaging for restocking.
- Z. Where required by local code, trade harmony shall be observed by using only approved union based installation workforce.

3.2 ENCLOSURES FOR ESS

- A. All enclosures that are not installed in a secured space, such as Security Room/Closet or IT/Telecommunications Rooms, shall have tamper provisions:
- B. Tamper switches shall be mechanically mounted to maximize the defeat time when enclosure covers are opened and removed. The minimum amount of time required to depress or defeat the tamper switch after opening or removing the cover shall be greater than one (1) second.
- C. Enclosure and tamper switch shall function in such a manner as to not allow direct line of sight to any internal components or the tampering of the switch or circuit wiring. Tamper switches shall be inaccessible until the switch is activated; have mounting hardware concealed so that location of the switch cannot be observed from the exterior of the enclosure; be under electrical supervision at all times, irrespective of the protection mode in which the circuit is operating; shall be spring-loaded and held in the closed position by the door protected; and shall be wired so that they break the circuit when the door is disturbed.
- D. Tamper switches on doors which must be opened to make normal maintenance adjustments to the system and to service the power supplies shall be of the push/pull set, automatic-reset type. Covers of pull and junction boxes provided to facilitate initial installation of the system need not be provided with tamper switches.

3.3 ALARM ANNUNCIATION

- A. Alarm annunciation shall include intrusion detection, tamper, fail safe, line fault, and power loss.
- B. Intrusion Detection: Intrusion detection alarms shall include the full range of interior point protection sensors, volumetric space, access control protection sensors, and duress alarms. Duress alarms shall be annunciated to clearly distinguish them from other intrusion detection alarms.
- C. Tamper: Enclosures, cabinets, housings, boxes, raceways, and fittings having hinged doors or removable covers and which contain circuits for the security system and its power supplies, shall be provided with cover operated, corrosion-resistant tamper switches, arranged to initiate an alarm signal when the door or cover is moved as little

as one quarter (1/4) inch from the normally closed position. Tamper switches shall be mechanically mounted to maximize the defeat time when enclosure covers are opened or removed. The minimum amount of time required to depress or defeat the tamper switch after opening or removing the cover shall be one (1) second. Enclosure and tamper switch shall prevent direct line of sight to any internal components and prevent switch or circuit tampering. Tamper switches shall be inaccessible until the switch is activated; conceal mounting hardware so that location of the switch cannot be observed from the exterior of the enclosure; be under electrical supervision at all times, irrespective of the protection mode in which the circuit is operating; shall be spring-loaded and held in the closed position by the door or cover protected; and shall be wired to break the circuit when the door or cover is disturbed. Tamper switches on doors which must be opened to make normal maintenance adjustments to the system and to service the power supplies shall be of the push/pull set, automatic reset type. Tamper alarms shall be annunciated to be clearly distinguishable from intrusion detection alarms.

- D. **Fail-Safe Alarms:** Provide a fail-safe capability in all critical elements of the system. Fail-safe is defined as the capability to monitor for proper system functions and to report an alarm when a failure is detected in any critical system function. This shall include, but not be limited to, the capability to monitor communication link integrity and to provide self-test. When diminished functional capabilities are detected, the system shall provide annunciation of the fault. Fail-safe alarms shall be annunciated to clearly distinguish them from other types of alarms.
- E. **Fail-Safe Locking:** All locking shall be fail-safe to the extent that such locking is permitted by appropriate and pertinent life-safety and building codes. Fail-safe locking shall be understood to mean that upon failure, locks shall fail in the “unlocked” and “unsecured” position. All locking shall be interconnected into the building's fire alarm system and, upon activation of the fire alarm system, shall immediately “unlock” to permit emergency egress from the building. The Security Contractor shall coordinate all interface requirements with the fire alarm system installer. The Security Contractor shall furnish and install the necessary interface relays and interconnecting wiring, conduits, and mounting hardware, etc. to effect this operation.
- F. **Line Fault:** As a minimum, fault isolation at the systems level shall have the same geographic resolution as provided for intrusion detection. The communication links of the security system shall have an active mode for line fault detection. Active mode is defined as that in which some type of signal is continuously sent across the link, resulting in simple link breaks being readily detected. The system shall be either a static system or a dynamic system. In a static system, the “no-alarm” condition shall always be represented by the same signal, which shall be different than the signal originally transmitted. The dynamic system shall represent “no-alarm” with a signal which continually changes with time.
- G. **Power Loss:** Provide the capability to detect when any critical component of the system experiences loss of primary power and/or is switched over to either emergency power or uninterruptible power and to declare an alarm. The alarm shall clearly annunciate the identity of the component experiencing the power loss.

3.4 GROUNDING AND BONDING

- A. Comply with requirements in Division 26 Section "Grounding and Bonding for Electrical Systems" for grounding conductors and connectors.

- B. Comply with ANSI-J-STD-607-A.
- C. All cabling used to bond grounds are to be tagged with labels with the point of origin i.e. going to/coming from, with printed labels.

3.5 PATHWAYS INSTALLATION FOR SECURITY SYSTEMS

- A. Comply with NECA 1.
- B. Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems" for installation of conduits and wireways.
- C. All conduits shall be electrical metallic tubing (EMT), except where otherwise noted. Exceptions shall be requested in writing as appropriate, such as for different conduit types for various classes of construction, such as for cast-in-place concrete, and placement in cable ducts. Minimum size of conduit shall be three quarter (3/4) inch. Connections shall be threadless type fittings or couplings. Fastenings and supports for conduit shall be in accordance with the national and local codes.
- D. Security Contractor shall submit conduit and wire layout drawings showing circuit numbers, wiring and conduit routings for approval by the Engineer prior to the initiation of Work. Shop drawings of the security systems conduit routing shall be coordinated by Security Contractor with fire wall construction, mechanical duct work, structural components, fire protection, and plumbing.
- E. Install manufactured conduit sweeps and long-radius elbows whenever possible.
- F. Care shall be taken to ensure that access to other building components (e.g., air conditioning ducts) is not restricted by cable pathways.
- G. Cable management and support hardware must be UL listed for use in the environments in which they will be employed.
- H. Position conduit ends adjacent to a corner on backboard where a single piece of plywood is installed, or in the corner of room where multiple sheets of plywood are installed around perimeter walls of room.
- I. Secure conduits to backboard when entering room from overhead.
- J. Extend conduits 3 inches above finished floor.
- K. Provide metal conduits with grounding bushings and connect with grounding conductor to grounding system.
- L. Bundle, lace, and train conductors and cables to terminal points without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.
- M. Pathways shall be installed parallel or perpendicular to walls, structural members, or intersections of vertical planes and ceilings. Changes in direction of runs shall be made with symmetrical bends or cast metal fittings.
- N. All conduits shall be affixed or supported at intervals and using prescribed methods and devices in accordance with governing codes. No run of conduit between outlets or fittings shall contain more than four quarter bends (360 degrees). Bends shall be made such that the conduit will not be injured and that the interval diameter will be effectively reduced.

- O. All conduit connections shall be tight so as not to create intermittent loss of ground protection. All cut ends entering into fittings shall be reamed smooth or have a bushing inserted to prevent damage to wire insulation.
- P. Conduit, raceways and other pathways shall be kept at least six inches from uninsulated flues, steam pipes or any pipe containing a hot gas or liquid. So far as practical, avoid traps and dips in conduit runs, which might collect moisture.
- Q. Strict attention shall be given to all conduits containing fiber optic cabling to ensure that manufacturer's recommended conduit bend radii limitations/restrictions are followed.
- R. Where conduits connect to sheet steel enclosures, they shall be fastened with two (2) locknuts where insulating bushings are used. Bushings shall be installed on ends of all conduits where they terminate in pull boxes, outlet boxes, cabinets, etc. and shall be of the insulating type and shall be securely fastened with locknuts on each side. Crushed or deformed conduits shall not be installed. Bushings shall not be used as locknuts. Open ends shall be sealed around security conductors to be liquid tight using an approved air-drying sealer after capping ends with insulated bushings.
- S. Conduits crossing expansion joints in concrete slabs shall be provided with suitable expansion fittings, or other suitable means, to compensate for building expansion and contraction. Conduits traversing hazardous areas shall use the penetrations and fittings shown on the drawings and provided under other sections of the contract. Seal the fittings subsequent to verifying the integrity of the contained conductors.
- T. Pathways shall not block ceiling or equipment access doors. Where conduit or raceway is passed through walls, floors, ceilings or roofs, annular space shall be sealed or patched. Openings in firewalls and all corridor walls shall be sealed with mineral wool or an approved silicone sealant.
- U. No pathways shall be fastened to other pipe or conduit or installed so as to prevent the ready removal of other pipe or conduit for repairs.
- V. Conduit, panels, devices and boxes shall be secured by means of shields in concrete, machine screws on metal surfaces and wood screws on wood construction material. Threaded studs driven in my power charge and provided with either lock-washers and nuts or nail type nylon anchors are not acceptable in lieu of machine screws. Wood plugs shall not be used as expansion shields. Unless conditions or Drawings dictate otherwise, panels shall be located between 3'-6" and 6'-0" above floor level.

3.6 SLEEVES INSTALLATION FOR SECURITY SYSTEMS

- A. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.
- B. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
- C. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.
- D. Cut sleeves to length for mounting flush with both surfaces of walls.
- E. Extend sleeves installed in floors 50 mm above finished floor level.

- F. Size pipe sleeves to provide 6.4-mm annular clear space between sleeve and pathway or cable, unless indicated otherwise.
- G. Seal space outside of sleeves with grout for penetrations of concrete and masonry
 - 1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.
- H. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and pathway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 7 Section "Joint Sealants."
- I. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pathway and cable penetrations. Install sleeves and seal pathway and cable penetration sleeves with firestop materials. Comply with requirements in Division 7 Section "Through-Penetration Firestop Systems."
- J. Roof-Penetration Sleeves: Seal penetration of individual pathways and cables with flexible boot-type flashing units applied in coordination with roofing work.
- K. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel or cast-iron pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 25-mm annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- L. Underground, Exterior-Wall Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 25-mm annular clear space between pathway or cable and sleeve for installing mechanical sleeve seals.

3.7 FIRESTOPPING

- A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for electronic safety and security installations to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Specification Section "Penetration Firestopping".
- B. Cable/wire runs and conduit shall be installed in accordance with applicable electrical Work standards, national and local codes as well as manufacturers' specifications of installed equipment.
- C. Where required by local code, trade harmony shall be observed by using only approved union based installation workforce.

3.8 CABLE/WIRES INSTALLATION

- A. Cable/wire runs and conduit shall be installed in accordance with applicable electrical Work standards, national and local codes as well as manufacturers' specifications of installed equipment.
- B. All ESS conductors shall be separated from 240V primary power lines. ESS conductors shall not share any conduit in which primary power conductors are run. Junction and receptacle boxes carrying 240V, or higher voltage, shall not in any way be attached to or carry security systems conductors.
- C. Conductors shall be copper, and shall not have a diameter less than eighteen (18) AWG unless otherwise indicated. Exceptions will be made for vendor-provided leads and internal equipment wiring. If required, modify equipment wiring fittings which will not accept eighteen (18) AWG minimum conductors. Conductors for intercom systems and for multiplexer data communications shall be a minimum of twenty-two (22)

AWG. Other exceptions may be granted for use of smaller gauge conductors upon approval by the Owner's representatives.

- D. Conductors interconnected to equipment subject to movement shall be stranded or shall be of a type manufactured specifically for such interconnections.
- E. Wire fill, conductors, and conduit shall be sized in compliance with the National Electrical Code. The number of conductors required may vary on the basis of the manufacturers of the selected equipment. In no event, shall conduit fill exceed 40%.
- F. In the event that ESS conductors must share conduit with other low voltage conductors, prior approval is required. All system conductors shall be run concealed wherever practical, and shall be placed in conduit.
- G. All conductors shall be run continuously between sensors, processors, junction boxes, terminal strips or panels, and other approved devices. Splices between such locations are not to be permitted. Necessary junctions shall be made using screw-type terminal blocks, or in accordance with manufacturer's requirements for equipment connections.
- H. Line supervision requirements shall be observed
- I. All conductors shall be color coded and tagged consistently. Coordination with the Owner's representatives regarding the exact wire coding and tagging is mandatory. Transposing or changing color coding of conductors shall not be permitted. Conductor identification shall be provided within each enclosure where a tap, splice or termination is made, and at the equipment terminal of each conductor. Terminal and conductor identification shall match that shown on approved shop drawings. Hand lettering or marking will not be accepted. Marking shall be an approved permanent type utilizing an approved method. Tagging devices shall be approved and shall be permanent, not subject to inadvertent separation. All conductors at control consoles shall be bundled, neatly fanned out, and tagged. Cables and wires shall be tagged to clearly indicate their electrical characteristics, circuit number and panel designation. Tagging shall be such that several conductors may be disconnected and reconnected without the use of drawings.
- J. If required by manufacturers' specifications, shielding requirements shall be observed.
- K. Only approved pulling compounds shall be used. Pull strengths shall not exceed standards established by the National Electrical Code.
- L. Submit conduit and wire layout drawings showing circuit numbers, wiring and conduit routings for approval by the Engineer prior to the initiation of Work. Shop drawings of the security systems conduit routing shall be coordinated by Security Contractor with fire wall construction, mechanical duct work, structural components, fire protection, and plumbing.

3.9 SLEEVE-SEAL INSTALLATION

- A. Install to seal exterior wall penetrations.
- B. Use type and number of sealing elements recommended by manufacturer for pathway or cable material and size. Position pathway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pathway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.10 IDENTIFICATION FOR SECURITY SYSTEMS

- A. Identify ALL system components, wiring, and cabling complying with TIA/EIA-606-A. Comply with requirements in Division 26 Section "Identification for Electrical Systems." Comply with requirements in Division 09 Section "Interior Painting" for painting backboards. For fire-resistant plywood, do not paint over manufacturer's label.
- B. See evaluations for discussion of TIA/EIA standard as it applies to this Section. Paint and label colors for equipment identification shall comply with TIA/EIA-606-A for Class 3 level of administration including optional identification requirements of this standard.
- C. All permanent labels must be durable and legible and suited for long term use in the environments in which they will be located. Labels shall be preprinted or computer-printed type. Handwritten labels are unacceptable unless approved by the Owner.
- D. Label all equipment, enclosures, cables, terminations and any other components using unique identifiers.
- E. Labeling scheme for all communications systems is subject to prior approval by the Owner.
- F. All cables shall be color coded and tagged consistently. Transposing or changing color coding of conductors shall not be permitted. Conductor identification shall be provided within each enclosure where a tap, splice or termination is made, and at the equipment terminal of each conductor. Terminal and conductor identification shall match that shown on approved shop drawings. Hand lettering or marking will not be accepted. Marking shall be an approved permanent type utilizing an approved method. Tagging devices shall be approved and shall be permanent, not subject to inadvertent separation. All conductors at control consoles shall be bundled, neatly fanned out, and tagged. Cables and wires shall be tagged to clearly indicate their electrical characteristics, circuit number and panel designation. Tagging shall be such that several conductors may be disconnected and reconnected without the use of drawings.

3.11 CLEAN, SQUARE INSTALLATION

- A. All equipment shall be clean and free of paint and other defacing materials. All installations shall be square and plumb. Take care that other trades do not deface equipment and do not move equipment out of square and plumb.

3.12 ELECTRICAL POWER

- A. High Voltage Power:
 - 1. Furnish and install wiring, conductors, conduit, and termination for the supply of power to security system components as part of the electrical work. Except for the interconnection into the door hardware furnished devices, it shall be the responsibility of the security supplier to furnish and install all low-voltage conductors and to make all final connections of same. complete information regarding high voltage power requirements for the security equipment.
- B. Low Voltage Power:
 - 1. Low voltage power shall be provided through the use of two-winding isolation-type transformers and rectifier circuits and shall supply DC voltages, where and

as required. Voltage levels shall be as rated for the various systems' operational requirements. All low voltage power supplies shall be fully regulated, float type, with battery back-up, capable of supporting the operation of all equipment for a minimum of four hours. Low voltage power supplies shall be required to provide central lock power, camera power, advanced processor controller power and sensor devices power.

C. Batteries:

1. Provide backup power by dedicated batteries in remotely located system elements such as remote access control panel units. Batteries shall be sized to provide continuous stand-by operation for a minimum of four (4) hours without recharge or replacement.

3.13 TESTING

- A. General: Verify that all requirements of this specification are met. Verification shall be through a combination of analyses, inspections, demonstrations and tests, as described below.
- B. Verification by Inspection: Verification by inspection includes examination of an item and the comparison of pertinent characteristics against the qualitative or quantitative standard set forth in the cited paragraph. Inspection may require moving or partially disassembling the item to accomplish the verification. Inspection shall be made of all equipment installations, proper functioning of all locking hardware and lock controls, mounting and wiring of electrical and signal distribution cabinets and components, and mounting and placement of sensors, VSS cameras, etc. to ensure compliance to the specifications and that the overall installation is accomplished in a professional and workmanlike manner. The Owner's quality control representative(s) shall have full opportunity to witness the required Security Contractor inspections or to conduct his own inspections of the installation.
- C. Verification by Test and Demonstration: Verify by formal demonstrations or tests that the requirements of this Specification have been met.
- D. Test Verification Requirements: Paragraphs 1-3 below list specific requirements which shall be verified by formal demonstration/test. The Owner, or its authorized representatives, shall be afforded a fourteen (14) day advance notice of all subsystem demonstrations/tests. The Owner's Representative reserve the right to witness any and/or all of the tests described below.
 1. Preliminary Tests: Following installation, individually test each sensor and other components and verify the proper functioning of each component within a particular subsystem. Each subsystem shall be similarly tested until all detection zones, alarm assessment components, alarm reporting and display and access control functions have been verified. Any deficiency pertaining to these requirements shall be corrected prior to final functional and operational tests of the system. When subsystem verification is complete, the entire system shall be tested to assure that all elements are compatible and function properly as a complete system.
 2. System Operation Test: Following completion of the preliminary tests and the security system and component formal demonstrations conduct a formal test, to be known as the "System Operation Test", in which all components and subsystems of the security system are demonstrated to operate together as an

integrated system. This test shall be performed over a continuous seventy-two (72) hour period. A testing plan and test procedures for each portion of the test shall be prepared and submitted 45 days prior to the start of any testing for approval in accordance with this Specification. Approval of the test procedures must be obtained prior to notification of testing to Owner or its representative. Demonstrate that the security system components and subsystems meet specification requirements in the "as-installed" operating environment during the "System Operation Test". While no formal environmental testing is required, measure and record temperature, humidity, and other environmental parameters, and shall include this data in the test report to document the environmental parameters and the environment conditions which were encountered during the "System Operation Test".

3. Tests Upon Completion of Work: Upon completion of the Work, the system shall be subjected to complete functional and operational tests. When all required corrections have been accomplished, the system shall be re tested. The Owner or Owner's Representatives shall be notified in writing fourteen days in advance of the proposed final acceptance testing and inspection date. The advance notice shall include certification that the installation is complete and operable and has satisfactorily performed the final tests specified herein. The acceptance testing and final inspection will be accomplished in the company of the Owner's representatives. Prior to the test date, prepare and submit for approval a complete and detailed final acceptance test check off list ("punch list"). The list shall be a complete representation of all specified functions and conditions, including contingency, priority, and abnormal modes of operation. The arrangement of the list shall be such as to provide an orderly method of tabulating checks of system features, response and operation. The tests shall be structured so that all sensors and controls are stimulated directly in their installed and finally adjusted positions and all audible and visual displays, signals, alarms and other responses are observed and printed. At the time of final acceptance testing all required tests shall be repeated and all defects will be corrected until the system is found to be acceptable to the Owner's Representative. A log of all test activities and results shall be maintained by the Security Contractor. Typed copies of this log shall be submitted within seven days of the testing. Final tests shall include, but not limited to the following:
 - a. Test of all central CPU's, peripherals, and all panel control functions.
 - b. Test all graphic control and annunciation panel functions and displays.
 - c. Test electrical supervision of all input/output sensor and data communication bus circuits.
 - d. Test of all alarm initiating devices.
 - e. Test of remote battery and battery chargers.
 - f. Test of the UPS system including a battery discharge test
 - g. Test of access control system to include tie-in to fire alarm system.
 - h. Complete operation tests under emergency power.
 - i. Test of fiber optics signal transmission system.
 - j. Visual inspection of all wiring;
 - k. Verification that all required submittals have been provided and have been accepted;
 - l. Demonstrate software and programming/reprogramming functions of all micro-processor systems.
 - m. Verification of systems response time.

- n. Carefully plan and coordinate the final acceptance tests so that all tests can be satisfactorily completed during one continuous testing period. Provide all necessary instruments, labor and materials required for tests, the equipment manufacturer's technical representative, and qualified technicians in sufficient numbers to perform the tests within the time limits imposed by this Specification.
 - o. In the event that the Owner, or authorized representative(s) are required to witness a re-test at a later date because the contractor is either not adequately prepared to conduct the acceptance tests or because the systems being tested are failing such tests, which shall be solely determined by the Owner's representatives witnessing the tests, the costs of witnessing additional tests (based on time and materials at the established rates of the Owner's representatives) shall be borne exclusively by the contractor. In such an event, directly compensate the Owner's representatives witnessing the tests; compensation shall be provided within thirty calendar days of such, and all, additional tests.
 - p. Although successful completion of the final acceptance test has been completed, the security system shall not be considered accepted until it is determined that the complete security system is continuously trouble-free and operational, in a manner satisfactory to the Owner, for at least a seven-day period following final acceptance testing. A print-out of the system's activity log will be accepted as proof of compliance with this requirement. In the event that the system fails this operational test, make the necessary adjustments and the seven-day period will restart from the beginning. If the system fails to complete this operational test for four (4) consecutive seven-day restarted test periods, the system shall be considered inoperable and unacceptable. Make all necessary repairs, adjustments, and/or replacements, at his cost. When all adjustments have been completed and after proper notice has been given, the complete acceptance test will be re-performed and witnessed from the beginning. Contractor shall be liable for all expenses for witnessing the retest as specified above. Repeated unsatisfactory operation and chronic system failures shall be considered cause for the complete system removal and replacement by the Owner. In this event, the Security Contractor shall be liable for all expenses and damages incurred, including legal fees and court costs.
4. Reliability/Maintainability Data: Record hours of component, subsystem and system operation, together with failure and repair data. This information shall be incorporated into the System Test Report to be submitted.

3.14 MAINTENANCE AND OPERATING INSTRUCTIONS

- A. Prior to completion of the work, provide field operating instructions with respect to operation functions and maintenance procedures for the equipment and systems installed. Prepare six (6) copies of maintenance and operating instruction manuals prior to application for final payment. Organize operating and maintenance data into suitable sets of manageable size.
- B. All equipment provided under this Section of the Specifications shall be placed in operation and shall function continuously in an operation test for a period of one week, without shut down due to mechanical failure.

- C. Prior to scheduling the project final inspection and after completion of the entire installation period, provide all work required to adjust all controls, and all maintenance to place the systems in operation to meet the requirements of this Section of the Specifications and Contract Documents.
- D. Provide operating, service, maintenance instruction manuals containing replacement data for the equipment which will require operating, maintenance or replacement and one copy of this literature shall be available during the instruction of the operating personnel while the others are checked for completeness.
- E. Sufficient advance notice shall be given to Owner's designated operating personnel for the specific instruction period. Upon completion of instruction, obtain from the representative(s) written verification that the above mentioned instruction has been performed. Such verification shall be forwarded to the Owner.
- F. Each copy of the approved operating and maintenance manual shall contain copies of approved shop drawings, equipment literature, cuts, bulletins performance charts, pump curves, details, equipment and engineering data sheets and typewritten instructions relative to the care and maintenance for the operation of the equipment, all properly indexed and bound in a hard back three ring binder. Fly sheets shall be placed before instructions covering each section. The instruction sheets shall be in 8 1/2 inches by 11 inches with large sheets of drawings folded in neatly. Each manual shall have the following minimum contents:
 - 1. Table of Contents
 - 2. Maintenance
 - a. Maintenance and Lubricating Instructions
 - b. Replacement Charts
 - c. Preventive Maintenance Recommendations
 - d. Trouble-shooting Charts for Equipment Components
 - e. Testing Instructions for each Typical Component
 - f. System Draining and Filling Instructions
 - g. Two typed sets of charts indicating equipment tag number, location of equipment, specific equipment service, greasing and lubricating requirements as recommended, lubricant type and intervals of lubrication.
 - h. Two types sets of instructions for ordering spare parts. Each set shall include name, telephone number and address of where they may be obtained.
 - 3. Manufacturer's Literature
 - a. The equipment for which shop drawings have been submitted and approved.
 - b. Wiring Diagrams
 - c. Installation Drawings
 - d. Manufacturer's Representative and Contract Information
 - e. Guarantees

3.15 CLEANING AND ADJUSTING

- A. Subsequent to installation, clean each system component of dust, dirt, grease or oil incurred or accrued from other project activities, and prepare for system activation by manufacturer's recommended procedures for adjustment, alignment or synchronization.

- B. Each component shall be prepared in accordance with the appropriate provisions of the component's installation, operations and maintenance manuals.
- C. Any damage caused to parts of the building, its finish, or furnishings, shall be repaired at no cost to the Owner.
- D. All items of equipment shall be thoroughly inspected and any items dented, scratched or otherwise damaged, in any manner, shall be replaced or repaired and painted to match the original finish. All items so repaired and refinished shall be brought to the attention of the Owner's Representative for inspection and approval.

3.16 SPECIAL TOOLS

- A. Provide any and all special tools, recommended by the manufacturer of items furnished, noted as not being commonly available.

3.17 CERTIFICATES OF APPROVAL

- A. Upon completion of the work, furnish to Owner's Representative in duplicate, certificates of inspection and/or approval from state and local inspection authorities having jurisdiction indicating the installed systems compliance to their requirements.

END OF SECTION 280500

SECTION 281300

ACCESS CONTROL AND FACILITY MONITORING SYSTEM (ACFMS)

PART 1 - GENERAL

1.1 SUMMARY

- A. This section describes the components that shall comprise the Access Control and Facility Monitoring System (ACFMS) and the practices to be used when installing them. All information herein is intended to present minimum standards of performance, quality and construction.
- B. The system shall include all computer hardware and software, communications devices, access control panels, reader electronics circuit boards, I/O boards, card readers, request-to-exit devices, intrusion detection sensors, duress switches, power supplies, and any conduit, wiring, conductors, raceways, termination cabinet enclosures, mounting hardware, and all other devices as indicated on the Contract Drawings.
- C. Connect the equipment provided under this scope to the existing Access Control System server. This equipment shall integrate seamlessly into the existing system. Provide any required configuration and programming required.
- D. Work Included:
 - 1. ACFMS Workstation
 - 2. ACFMS Controllers
 - 3. Card Readers
 - 4. Door Hardware
 - 5. Enclosures, Cabling and Power Supplies
 - 6. Connection to the existing building and campus security system

1.2 ALLOWANCES

- A. An allowance for the following portions of the Work of this Section is included in Section 01210:
 - 1. Services of the Company Field Advisor as described in QUALITY ASSURANCE.
 - 2. All items listed in SUBMITTALS.
 - 3. Engineering and reprogramming associated with the installation of the new equipment and updating existing information.
 - 4. All products listed in PART 2 of this Section except:
 - a. Protective devices (surge suppressors).
 - b. Interconnection cabinets and terminal strip cabinets.
 - c. Conductors and cable.
 - d. Signs, labels, markers, and nameplates.
 - e. Labor for installation of the products is not included in the allowance and shall be included in the contract sum.
 - 5. Spare parts listed in Part 1 of this Section.

1.3 STANDARDS AND CODES

- A. Refer to Division 28 Section “Common Work Results for Electronic Safety and Security”.

1.4 DEFINITIONS

- A. Access Cycle: A grouping of 7 day types, one for each day of the week, that defines when an event will occur or when access will be granted during a repetitive weekly time frame.
- B. Access Level: A group of doors, up to 512, to which one of the system access cycles has been assigned to each door. This determines when an individual or group of personnel will be allowed access through any of the doors assigned to the access level.
- C. Access Period: An increment of time defined by a beginning time and ending time that is used to designate when an event will occur or when access will be granted.
- D. ACFMS: Access Control and Facility Monitoring System.
- E. ACFMS Server: A set of IBM RISC 6000 computers arranged in a redundant configuration with UPS backup, located at OMH CITER Headquarters @44 Holland, Albany NY.
- F. Alarm: Any of the possible normal system transactions or conditions produced by the system controllers that are designated by the operator as alarm conditions. Designation of the alarms is made using the alarm assignment function.
- G. Anti-Passback: An individual is allowed access at the entry reader of a controlled point but is denied further use of the key/card for additional entry at the controlled point until the key/card has been used in the exit reader associated with the same controlled point.
- H. Auto-Unlock: The free access period given to a particular door, output, or floor when an unlock cycle time period is assigned to it. This function overrides normal key access operation and places the door, output, or floor in an unlocked or activated state for the duration of the assigned period.
- I. CD/SD: Cardholder database/screen designer.
- J. CITER: Computer Information Technology & Educational Resources department. Main offices are at 44 Holland Avenue, Albany.
- K. Company Field Advisor: An employee of the Company which lists and markets the primary components of the system under their name who is certified in writing by the Company to be technically qualified in design, installation, and servicing of the required products or an employee of an organization certified by the foregoing Company to be technically qualified in design, installation and servicing of the required products. Personnel involved solely in sales do not qualify.
- L. Database: Values, times, schedules, employee data, etc. that are maintained by the server, controller and/or workstation.
- M. Daytype: A group of up to 4 access periods within a 24-hour period, that does not overlap, that will define when an event will occur or access will be granted during the 24-hour time frame.
- N. Ethernet: OMH data network structure required for communication between equipment control units. Ethernet equipment and structure is required for established GE/Casi Picture Perfect System.

- O. Event: A normal system transaction or condition that occurs within the system.
- P. FICC: Facility Information Center Coordinator. Network support technician at each facility.
- Q. IW: Imaging workstation. Badging for access control cards are produced at this workstation.
- R. Key Switch Bypass: A remote keyed switch wired directly to magnetic lock at door location used by emergency personnel to disable door lock for emergency access through door. Entry with key switch bypass alarms the AC/FMS.
- S. Wide Area Network (WAN): The communication network utilized between the AC/FMS server, workstations and microcontrollers in a multiple workstation system.
- T. Local Area Network (LAN): The Facility Ethernet network where all controller interfaces are implemented on a system that employs multiple operators or multiple workstations to perform simultaneous operations.
- U. Micro-Controller: A controller that resides on any of the networks associated with the AC/FMS server and workstations. Micro-controllers may also be considered those controllers that are located at the same physical site or remote to the AC/FMS server or workstations and does not utilize a modem or dial telephone network for the communication. Micro-controllers control readers, door release, and door processing events and retain the system memory for its related components. Some micro-controllers are hardwired to other up-stream controllers where required due to lack of data outlets or IP address limitations.
- V. Operator: An authorized person that is designated as having the capability of programming, operating, or monitoring the activities of the AC/FMS.
- W. Reader: Access Control programmed card reader for controlled access into designated spaces. Proximity, RF and/or Smart Card fingerprint type.
- X. Request to exit: A remote key switch, button, passive infrared detector, or integral contact to door hardware, when activated, requests release of door magnetic lock through the micro controller. Valid requests to exit bypass door contact for non-alarm entry or exit through door.
- Y. SQL: Structured query language; refers to statements that specify a function. SQL reports may be established to provide standards OMH Safety Office reports of system operation.
- Z. TCP/IP: Transmission control protocol/internet protocol; designation for communications standard that allows inter-operability between new technologies and existing platforms.
- AA. User Assignment: Assignment to the user's key or card number to an access level. This determines when a particular user will be granted access to which doors.
- BB. VIS: Video Imaging System. ACFMS System component for ID badge production.
- CC. Workstation: A computer, monitor, keyboard, mouse, UPS and printer(s) that allow the operator to interface with the ACFMS, when a multi-user, multi-workstation system is required. A workstation is directly connected to the LAN network and communicates with the ACFMS server over the WAN.
- DD. Alarm Monitoring Workstation: Workstation located in main Safety Offices.

- EE. ID Badging Workstations: Workstation located in Safety Offices or adjacent to the office (as directed).
- FF. Refer to Division 28 Section "Common Work Results for Electronic Safety and Security" for additional definitions.

1.5 SUBMITTALS

- A. Waiver of Submittals: The "Waiver of Certain Submittal Requirements" in Section 01330 does not apply to this Section.
- B. Submittals Package: Submit the shop drawings, product data, and quality control submittals specified below at the same time as a package.
 - 1. Company Field Advisor Letter: With the submittals package include a letter from the Company Field Advisor stating that he/she has reviewed the Submittals Package for accuracy and completeness, and approves all materials and installation methods included in the Submittals Package.
- C. Shop Drawings:
 - 1. Composite wiring and/or schematic diagrams of the complete system as proposed to be installed (standard diagrams will not be acceptable).
 - a. Include transient surge and lightning protection grounding details for video signal circuits, control circuits, audio circuits, and ac power conductors.
 - 2. Scale elevation drawings showing mounting of components.
 - 3. Scale drawings of central monitoring console layout based on the supplied console drawings showing location and mounting of AC/FMS components.
 - 4. Scale drawings of CMSC showing location and mounting of components.
 - 5. Rack mount enclosure layout for remotely located control equipment.
 - 6. Scaled floor plans and elevation drawings showing location of all major components associated with the system.
 - a. Demonstrate that the allotted space is sufficient for the installation of major components.
- D. Product Data:
 - 1. Catalog sheets, specifications and installation instructions.
 - 2. Bill of materials.
 - 3. Detailed description of system operation (format similar to SYSTEM DESCRIPTION).
 - 4. State number of inputs and outputs used specifically for this project and number of video inputs and outputs available for future use if system is expanded to maximum capacity.
 - 5. Total electrical load of the complete system.
 - a. Include for each system component that utilizes batteries the battery ampere-hour capacity recommended for each component by the Company producing the system, for the specified duration.
 - 6. Statement from the Company producing the system, for each size and type of single conductor and multiconductor cable proposed for use, indicating that the electrical characteristics meet the requirements of the Company.

7. Name, address and telephone number of nearest fully equipped service organization.

E. Quality Control Submittals:

1. Copy of license required by New York State General Business Law Article 6-D for installing Security Systems.
 - a. Also include copy of identification card issued by the Licensee for each person who will be performing the work.
2. Installer's Qualifications Data: Include the following for each person who will be performing the Work:
 - a. Name.
 - b. Employers name, business address and telephone number.
 - c. Name and addresses of the required number of similar projects worked on which meet the experience criteria.
 - d. Current copy of manufacturer's equipment certification for products supplied in this project.
3. Company Field Advisor Data: Include:
 - a. Name, business address and telephone number of Company Field Advisor secured for the required services.
 - b. Certified statement from the Company listing the qualifications of the Company Field Advisor.
 - c. Services for each product for which authorization is given by the Company, listed specifically for this project.
 - d. Certified letter from the Company stating their acknowledgement and schedule for requirements of Company Field Advisor site supervision and overall project review for compliance to the Company's installation standards.
4. List of Completed Installations:
 - a. For products from a Company which are specified by catalog number or description and are not viable or available at the time of the submittal process due to obsolesces or supersession, furnish the name, address and telephone number of at least 3 comparable installations which can prove the proposed products from the specified Company are the Company's recommended replacements and have operated satisfactorily for one year.
5. Outline of Onsite Training Programs Required of Company Field Advisor:
 - a. Provide a separate outline of the training programs to be used to train the maintenance and security personnel, including:
 - 1) System overview.
 - 2) System programming.
 - 3) Operation of system equipment.
 - 4) System maintenance.
 - 5) Estimated length (time) of each segment.
6. Miscellaneous Documentation:
 - a. Equipment factory certification document confirming the valid, in-effect manufacturers agreement indicating that the security contractor is an existing authorized and trained equipment installer for all the proposed equipment.

- b. Letter of agreement from the AC/FMS equipment manufacturer stating their on-site technical involvement for system setup, programming and operator training.
 - 7. Detailed project "Work Plan" compiled for the specific project to include:
 - a. On site work guide lines with specific NYS Office of Mental Health site requirements.
 - b. Directions for proper storage of all equipment.
 - c. Training schedule and personnel contacts for this specific project.
 - d. Problem resolution matrix with all field contacts and project managers.
 - e. Completion/Acceptance form with strategic installation milestones and sign- off requirements.
 - f. Project scheduling plan.
 - g. Detailed project installation drawings compiled for this project.
- F. Contract Closeout Submittals:
 - 1. System acceptance test report.
 - 2. Certificate: Affidavit, signed by the Company Field Advisor and notarized, certifying that the system meets the contract requirements and is operating properly.
 - 3. Equipment settings chart for control equipment indicating micro-controller module dip-switch settings, control equipment programming charts for each programmable component of the system.
 - 4. Operation and Maintenance Data:
 - a. Deliver 2 hard copies, covering the installed products, to the Facility Representative. Provide 4 CD Electronic files for the entire O&M manuals to Include:
 - 1) Operation and maintenance data for each product.
 - 2) Equipment data sheets as submitted with any corrections on actual installed product.
 - 3) Complete point-to-point wiring diagrams of entire system as installed. Identify all conductors and show all terminations and splices. (Identification shall correspond to markers installed on each conductor.)
 - 4) Name, address, and telephone number of nearest fully equipped service organization.
- G. Refer to Division 28 Section "Common Work Results for Electronic Safety and Security".

1.6 QUALITY ASSURANCE

- A. UL Listing: The system shall be listed in the UL Security Equipment Product Directory under product category "ALVY-Access Control System Units Section BP5721".
- B. Test Facility: The Company producing the system shall have test facilities available, which can demonstrate that the proposed system meets contract requirements.
- C. Qualifications: The person(s) installing the Work of this Section and their supervisor shall be personally experienced and certified by the equipment manufacturer in access

control/facility monitoring systems and shall have been engaged in the installation of access control/facility monitoring systems for a minimum of 3 years.

1. Furnish the names and addresses of 5 similar projects which the foregoing people have worked on during the past 3 years.
- D. The Company producing the system shall have a comprehensive distance-learning program based on CD technology and/or Internet Web technology. Users shall be able to log onto the manufacturers web page and complete all technical training programs on-line at the student's convenience. Students shall be able to obtain technical certification through a series of Web-based tests. Training courses that must be available are:
1. Field control panel and reader installation.
 2. System administrator training.
 3. System operator training.
 4. Software installation training.
 5. Access vision video imaging & badge production training.
- E. Company Field Advisor: Secure the services of a Company Field Advisor to:
- F. Assist in the preparation of the submittal package.
1. Review the submittals package for accuracy and completeness.
 2. Prepare outline of training programs to be used to train facility personnel.
 3. Review video-training programs for accuracy and completeness.
 4. Spend a minimum of 80 working hours at the contract site:
 - a. Rendering advice regarding installation and final adjustment of the system.
 - b. Assisting in initial programming of the system.
 - c. Rendering advice on the suitability of each system component and each dipswitch setting for its particular application.
 - d. Witnessing final system test and then certify with an affidavit that the system is installed in accordance with the contract documents and is operating properly.
 - e. Training facility maintenance personnel in operation, programming and routine maintenance of the system (minimum of two 8-hour sessions).
- G. Refer to Division 28 Section "Common Work Results for Electronic Safety and Security"

1.7 WARRANTIES

- A. Special Warranty: The one year period required by paragraph 9.8 of the General Conditions is extended to (2) years for the Work of this Section when approved. Refer to Supplementary Conditions.
- B. Manufacturer's Warranty: Product and component specific manufacturer's standard warranty where greater than the 2 years required by the special warranty.
- C. Equipment integrator and contractor shall respond to warranty service requests within 4 hours of initiation of call to the facility location.

1.8 MAINTENANCE

- A. Service Availability: A fully equipped service organization capable of guaranteeing response time within 8 hours to service calls shall be available 24 hours a day, 7 days a week to service the on-going installation and the completed system.
- B. Spare Parts:
 - 1. 3 of each size fuse for power supplies.
 - 2. 1 micro-controller power supply.

1.9 COORDINATION

- A. Refer to Division 28 Section “Common Work Results for Electronic Safety and Security”.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. This specification outlines the requirements for an Access Control and Facility Monitoring System (ACFMS), including uninterruptible power system. All information herein is intended to present minimum standards of performance, quality and construction.
- B. Provide and install all hardware and software, annunciation monitors, signage, communications devices, access control panels, reader electronics circuit boards, I/O boards, card readers, request-to-exit devices, intrusion detection sensors, power supplies, and any conduit, wiring, conductors, raceways, termination cabinet enclosures, mounting hardware, and all other devices as required for a complete and fully functional system, whether specified herein or not.
- C. The system will be installed on some of the floors of an existing building and shall match and be fully integrated into the existing system installed on the other floors of the building. Equipment and devices shall be the same as the ones existing on the other floors of the building. The system shall also tie into the existing campus system head-end.
- D. New controllers to be provided on 4th floor to connect readers and access control devices on that floor and the card reader and associated devices for door D873 on the 8th floor. Card reader for door D167 to be connected to the existing controller located on 2nd floor.
- E. The existing ACFMS server (head-end) is located in different building. Coordination with the owner is required for accessing the server. Local Area Network (Ethernet) connectivity will be provided for communication between the existing server and the Control Panels.
- F. Coordinate the installation of the door/frame security package with the Door Hardware Section of project specifications. Contractor shall generate a spreadsheet identifying all the doors to receive electronic security devices and validate that the door hardware submittal and doors submittal shall support the required security functions. Should a conflict in function be identified, the security contractor shall alert the Architect. The contractor shall be responsible to ensure that the door and door hardware supplier is aware of the required security functions.

- G. Electronic locking devices and request-to-exit devices will be provided under the Door Hardware Section.
- H. Coordinate the installation with all other trades and provide final termination of all conductors, except as provided by the Electrical Contractor.
- I. Coordinate with the Telecommunications Contractor to provide a data outlet adjacent to the ACPs. The Ethernet connectivity will be provided by the Owner. Provide and install the patch cords.
- J. Provide any required configuration and programming required for integrating the equipment provided under this scope into the existing system. Coordination with the Owner is required. Coordinate the security requirements of this Section with all other trades.

2.2 SYSTEM FUNCTIONALITY

- A. The access control/facility monitoring system (ACFMS) controls and monitor doors and remote security systems located throughout the facility.
 - 1. When a card is read by a reader it is processed by a micro-controller to determine if it is a valid card and if the card has rights to open the associated door.
 - 2. Each transaction is printed and displayed on activity monitors.
 - 3. Status of doors that are controlled by readers and doors that are monitored via a door position switch are continually monitored.
 - 4. An alarm is generated if one of the monitored doors is opened without a valid reader request or exit request.
- B. The ACFMS shall be fully integrated, combining access control, alarm reporting and acknowledgement, alarm graphics (where established), standard reports, video badge imaging, [and CCTV (as required in limited instances)] systems into a distributed control and management system.
 - 1. ACFMS shall be a distributed system of fully intelligent, stand-alone micro-controllers, operating in a multi-tasking, multi-user environment supporting an Ethernet LAN.
 - a. Access control decisions, (permit or deny entry) are made by each micro-controller, utilizing its database. The Micro-Controller reports all field events to the AC/FMS server over LAN/WAN connections for display, response and records retention purposes.
 - 2. The workstations shall be connected through LAN/WAN connections to the AC/FMS Server.
- C. The ACFMS shall provide management and control of individual personnel access to selected areas, the monitoring of facility alarm devices, and the regulation of entry/exit control devices while simultaneously maintaining archival data to generate printed reports relating to all controlled activities.
- D. The ACFMS shall integrate a number of functions with overall administration performed by the ACFMS Server. The following sub-systems are features of the ACFMS architecture:
 - 1. Access control.
 - 2. Security alarm door monitoring.

3. Personnel database management - remotely controlled at AC/FMS server location.
 4. Historical reporting.
 5. Audit trail.
 6. Personnel locator.
 7. Dynamic color graphics - showing all floor plans and device locations. Not presently in use
 8. Guard tour capability. Not presently in use.
 9. Video ID badging and card printing.
- E. An alarm monitoring workstations and ID Badging Workstation are existing and located remotely.
1. The AC/FMS Server that communicates with the facility AC/FMS is located at OMH Capital Offices CITER Computer Center.
 2. Workstations provided by OMH will be network capable for connection to the ACFMS Server via LAN/WAN network. Network repeaters will be used where required for proper network communications.
 3. Database population for OMH database personnel shall be accomplished by the contractor for the system from existing files. Contractor shall provide the necessary labor for employee and contractor database inputs. Contractor shall be OMH-CITER pre-authorized and have signed all OMH non-disclosure forms prior to accessing the database.
 4. The personnel database in the ACFMS server will have information about badge holders, such as name, address, department, access rights and personnel type.
- F. System Alarm and Monitoring Functions:
1. Priority Levels: Up to eight priority levels may be user programmed (the 3 level priority system below is a minimum).
 - a. Priority Level 1: Life safety/exterior breach attempt (duress, fire alarm, camera motion detector).
 - b. Priority Level 2: Interior breach - non-controlled doors.
 - c. Priority Level 3: Normal function door denials.
 2. Request to Enter from Reader: System grants or denies request.
 - a. Grants Request: Door will open and transaction is recorded.
 - b. Denied Request: Door remains closed, transaction is recorded. User may program denied request as an alarm condition if desired (Priority Level 3).
 3. Door Forced Open (Monitored doors and reader equipped doors): An alarm is recorded, priority level 2, however, user may change priority level at any time.
 4. Anti-Pass Back (All doors may be considered as anti-passback): Prevents a card from being passed back to be used again on entry. Doors configured for anti-pass back are controlled such that a request for entry must be followed by a request for exit until the request for entry is accepted again. The duration between requests is unlimited.
 5. Request for Entry/Exit Approved: Records a transaction.
 6. Request for Entry/Exit Denied: Records a transaction, issues a priority level 2 alarm.
 7. Fire Alarm Activation: System is programmed for "fail-secure" mode in the event of fire alarm activation.

- a. Upon signal from the fire alarm system that an event has occurred, a priority level one alarm is issued to workstation(s).
 - b. The exit doors in the building in which the alarm has occurred DO NOT automatically unlock for free escape to the exits. (Or as directed by the facility Director and Chief Safety Officer).
- 8. Upon loss of building power, all held doors remain secure. System is programmed for "fail-secure" mode in the event of power loss.
- 9. CCTV System Interface:
- G. Alarm monitoring workstations can be partitioned to completely control what workstation can access information and/or change information. All passcodes are provided by the Chief Safety Officer.
- H. All transactions are annunciated, displayed, and recorded. The AC/FMS server relays alarm information to workstations as the user directs.
- I. Supervision of initiating device circuits (wiring to readers, alarm monitor and alarm detectors) indicates alarm conditions at the micro-controller(s) when attempts are made to compromise the system by bridging or wiring over alarm detectors or cutting initiating device circuit wiring.
 - 1. A communication failure indication (print-out, display and alarm) occurs at the micro-controller(s) when a reader or alarm monitor does not respond with a message each time it is polled by its micro-controller.
 - 2. A disabled reader or alarm monitor connection causes a printout showing the time, address and message indicating that device is disabled. A report is also made when the device is restored to normal.
- J. Printers: existing.
- K. System administration shall occur through a graphical user interface. The software is user-oriented, with on-line help, instructional prompts and text descriptions.
- L. The system shall support up to 32 micro-controllers that control up to 256 readers and monitors up to 1,536 alarm points.
- M. Micro-controller supports a maximum of 8 or 16 readers and/or keypads, depending upon model.
- N. Micro-controller operates in either local or remote configurations. A micro-controller in a remote configuration has the ability to receive calls from the AC/FMS Server, or call the AC/FMS Server in the event of an alarm condition, via TCP/IP communication.
- O. An internal clock allows for time scheduling.
- P. The ACFMS processes data from doors and maintains an active key base file of up to 24,000 individual keys/cards to four issue levels.
 - 1. Automatically invalidates previous issue whenever a higher-level issue key is used in the system.

- Q. Each door has independent monitors or controls for alarm bypass, door status input, lock release input, and programmable door-open-too-long time. All monitor inputs are supervised.
- R. The AC/FMS makes all decisions regarding access granted or denied. All pertinent data required to execute such decisions resides at the micro-controller(s). Active key file, daytypes, access cycles, etc., are maintained at the AC/FMS Server and micro-controllers.
 - 1. A message buffer of at least 5000 events automatically stores messages in the event communications are lost with the AC/FMS Server.
 - 2. Micro-controllers are reprogrammed from the AC/FMS server automatically in the event of power loss, telemetry interrupt or detection of program corruption during a routine central progress supervision cycle.
- S. The Micro-controller(s) are capable of controlling door unlock automatically by time schedule. The AC/FMS is programmable to allow implementation of the auto unlock condition immediately or only after the first valid card is presented at the door.
- T. Anti-passback is available in all units.
 - 1. Implementation is by program selection available to the user.
 - 2. The user selects whether the anti-passback status 3 is implemented upon a valid read or if it is implemented only after the AC/FMS recognizes that the door entry has been opened after the valid read.
 - 3. Anti-passback status automatically resets at midnight daily and/or if an emergency unlock of all doors is implemented from a workstation

2.3 EXISTING ACFMS

- A. The ACFMS system at the facility is an integrated portion of the Casi-Rusco Unix based "Picture Perfect" system located at OMH Capital Offices CITER Computer Center @44 Holland Avenue, Albany NY.
 - 1. AC/FMS facility alarm monitoring workstations utilize Casi-Rusco Access Vision Windows based software to integrate with, and manage, the Picture Perfect System.
 - 2. AC/FMS facility badging workstations utilize Casi-Rusco Access Vision and Access Vision Imaging Windows based software to integrate with, and manage, the Picture Perfect System.
- B. Micro-controllers make all necessary decisions and transfer the transaction record to the AC/FMS server.
 - 1. Micro-controller communication consists of any combination of direct connect, IP address and dial-up communication where required.
- C. System is expandable to allow unlimited field panels, unlimited readers and unlimited alarm points. (Limitations are only based on AC/FMS server capacity and number of micro-controllers on the system.)
 - 1. The system is capable of supporting a remote building through the use of IP addresses LAN or dialup modems.

- D. In the multi-station version of the system, the AC/FMS server located at CITER supports unlimited remote LAN connected facility workstations.
1. LAN communications protocol is Microsoft NetBEUI or TCP/IP, operating over an Ethernet topology.
 2. All field panels are connected to the AC/FMS server through the OMH LAN/WAN.

2.4 COMPUTER HARDWARE

A. Client Workstation Minimum requirements

1)	Processor:	PIII or Better
2)	Operating ISMS:	Windows NT or 2000 XP in 2005
3)	Software:	Netscape Navigator version 4.08 or later, Internet Explorer version 4.01 SP2.5 or later, or client software
4)	Hard Drive:	9.1 GB SCSI
5)	RAM:	128MB SDRAM
6)	3.5" Floppy Drive:	Required
7)	Sound Card:	Required for sound operations.
8)	CD ROM:	32 X
9)	Modem:	Optional
11)	Monitor:	Minimum 1024 x 768 Resolution
12)	RS232 Serial Ports:	2 Minimum
13)	Network Card:	10/100Mb Ethernet Card or 16MB Token Ring
14)	Printer:	Required to Generate Reports
15)	Speakers:	Required for sound operations

B. Client Workstation Utilizing Photo Imaging Option

1)	Video Capture Card-3D:	Required for each computer for badge production
2)	RS232 Serial Ports:	1 Available
3)	Signature Pad:	Optional
4)	Wedge-enrollment Reader:	RF Ideas

C. Workstation Parameters (Dell Computers as furnished by OMH/CITER):

1. Processor: PIII or Better.
2. Operating ISMS: Windows 2000. XP in 2005
3. Software: Netscape Navigator version 4.08 or later, Internet Explorer version 4.01 SP2.5 or later, or client software.
4. Hard Drive: 9.1 GB SCSI.
5. RAM: 128 MB SDRAM.
6. 3.5" floppy drive.
7. CD ROM: 32 X.
8. Modem (optional).
9. Monitor: Minimum 17", 1024 x 768 Resolution, or flat screen LED.

10. RS232 Serial Ports: 2 Minimum.
11. Sound card and speakers for sound operations.
12. Additional features for workstations utilizing Video Imaging System:
 - a. Video capture card: Integral Technologies Flashpoint 3D-Plus.
 - b. RS232 serial port.
 - c. Signature pad. (Provided by equipment supplier)
 - d. Wedge reader/enrollment reader for card testing process. (Provided by equipment supplier)
13. UPS 2200 Watt. Provided by CITER with computer equipment.
14. Keyboard.
15. Mouse.
16. Hard disk capacity to store 500,000 event transactions and magnetic tape for archival storage of the system data.
17. Capacities:
 - a. Doors/Readers: Unlimited
 - b. Access Periods: 4 per day
 - c. Daytypes: 16
 - d. Access Cycles: 16 with 7 daytypes per cycle
 - e. Access Levels: 128
 - f. Issue Levels: 4
 - g. Users: 20,000
 - h. Terminal/Workstations: Unlimited
 - i. Printer Per Station: 2
 - j. Holiday Periods: 32
 - k. Holiday Daytypes: 16
 - l. Holiday Access Cycles: 16 with 7 daytypes per cycle
 - m. Event Controls: Unlimited inputs/unlimited outputs
 - n. Authorization Levels: 9
 - o. Anti-Passback Types: 2
 - p. Alarm or Alarm Types: 256
 - q. Alarm Instructions: 256 text, unlimited in graphics
 - r. Alarm Response Messages: Unlimited
 - s. History Transactions: 500,000
 - t. Door Descriptors: 32 characters per door
 - u. Input Descriptors: 32 characters per input
 - v. Output Descriptors: 32 characters per output
 - w. Alarm Response Messages: 4 lines/64 characters per line for graphics. 2 Lines/90 characters per line text
 - x. Alarm Instructions: 2 lines/32 characters per line
18. Networking Capabilities:
 - a. Network Card: 10/100Mb Ethernet Card or 16MB Token Ring
 - b. Capable of operation as a node on a LAN/WAN network.
 - c. Operate on the LAN/WAN and be connected to the AC/DMS server.
 - d. Each workstation on the LAN is capable of executing the full range of system commands concurrently with other system users.
 - e. LAN capable of supporting data speed of not less than 10 MBT and a transaction rate of at least 300 per second.

- D. Printer Parameters (Hewlett Packard, Lexmark, or Epson printers as furnished by OMH/CITER):
 - 1. Laser jet printers.

2.5 WORKSTATION SOFTWARE

- A. GE-Security/Casi Access Vision software, and:
 - 1. Install Access Vision software in workstations furnished by OMH/CITER. These workstations are designated as alarm monitoring workstations.
 - 2. Program workstations to enable system to perform functions specified under SYSTEM DESCRIPTION and facility requirements.
- B. Access Vision Software Features – General:
 - 1. Alarm Monitoring Workstations display in real-time, alarms and alarm resets along with valid and invalid entry activity.
 - a. A manual mode allows operator to respond to alarm or trouble conditions.
 - 2. The operator is able to generate the complete set of standard reports.
 - 3. (At least) two real time monitoring windows display badge activity, and alarm activity.
 - a. Monitoring windows may be activated individually or concurrently.
 - b. An audible tone sounds upon alarm conditions.
 - c. Alarm acknowledgement is accomplished by selecting from a drop-down list of previously entered alarm instructions or from text entry.
 - d. Color icons within each of the monitoring windows depict between different transaction types or alarm priorities and processing states.
 - 4. Independent database tables may be created for selected groups of information (people, badges, time schedules, etc.).
 - a. Data from the database is retrieved through input of a small amount of information into standard data input forms, and then selecting the search option.
 - b. The results of the search are displayed in a list form, and allow the operator to select the record to work on.
 - c. When a record is selected, it is displayed within the data entry form already on the monitor.
 - d. Operator may edit, add, delete, find and print options for records in selected databases.
 - 5. Upon an alarm event, user-created graphics are recalled.
 - a. The graphics are generated from standard drawing packages in AutoCAD format.
 - b. The graphics files follow an AutoCAD format.
 - c. The alarm graphics system can display multiple triggered points on the same map.
 - d. Icons are used to represent alarm points and readers.
 - 6. User may control elevators from within the access control software.
 - a. There are three methods of control, no floor tracking, floor tracking and floor tracking using keypad.
 - b. Allows control up to 16 elevator cabs from a single micro-controller.

- c. The elevator reader is connected to the same micro-controller as the digital inputs and digital outputs used to control the elevator cab.
- 7. User may configure an interface to CCTV control units.
 - a. The interface provides a means to relate access control system alarm events to predefined CCTV camera actions.
- 8. A report generation system allows the operator to select personnel, historical, or configuration reports.
 - a. The report generator allows grouping and sorting of data by any field in the table.
 - b. The operator does not have to use SQL command language to generate standard reports.
 - c. The report generator software supports the storage of report templates and for recall of a previously defined report.
 - d. The report generator produces a report that displays by badge holder, who can gain access through a particular door and at what times the badge holder can gain that access.
 - e. Reports are viewable on screen, printed to local printers, or exported to a variety of Windows applications, such as Excel, Word, and Access, as well as email programs.
- 9. A diagnostic mode of operation tracks communication from the database to the field panels.
 - a. The diagnostic information is written to log files such that the information can be retrieved later.
 - b. The system supports remote diagnostics, where authorized support personnel can remotely dial into the system computer to monitor and retrieve troubleshooting information.
- 10. 10. Supports badge number lengths between 4 and 12 digits.
 - a. Entire badge number is stored in controller.
 - b. Unique badge ID formats, (such as those commonly found with Wiegand technology) are supported.
- 11. Supports global anti-passback for all field panels that are online.
 - a. When a badge enters an anti-passback "IN" reader, the anti-passback portion of the badge record in all the field panels which are online is updated to the "IN" condition.
 - b. Similarly, when a badge exits a facility through an anti-passback "OUT" reader, the anti-passback portion of the badge record in all the field panels which are online is updated to the "OUT" condition.
 - c. When a field panel is off-line from the host, such as one at a dialup site, the anti-passback function will reside within the field panel and the eight readers it controls. Anti-passback becomes a local function at dialup controller sites.
- 12. Allows the operator to assign up to a four-digit number for the badge holder's Personnel Identification Number (PIN).
 - a. PIN number is used in conjunction with a normal badge transaction on a reader setup for badge and PIN transactions.
- 13. Each field panel is capable of up to 1024 time schedules.

- a. The system is able to generate a report on the number of time schedules being utilized by a controller.
14. Input Point Shunt Time:
 - a. Input points associated with readers allow a maximum shunt time of 255 seconds.
 - b. Input points not associated with readers allow a maximum shunt time of 64 seconds. When the input is triggered, it allows up to two outputs to be triggered.
 - c. One of the outputs can be made to trigger for a specific duration of up to 64 seconds or be able to be configured to follow the input. The output will be triggered so as long as the input is in an alarm state.
 - d. The second output will trigger for a specific duration of up to 64 seconds and be allowed to be on a different controller from the input.
 15. Output Point Energize Time:
 - a. Output points associated with readers have a maximum energize time of 255 seconds.
 - b. Output points not associated with readers have a maximum energize time of 64 seconds.
 16. System supports at least four operation modes, a "Normal Mode" and three alternate operation modes.
 - a. The alternate operation modes direct system operation during holidays and other special time periods. The system permits the alternate operating modes to be scheduled up to a year in advance.
 - b. "Modes" are definable down to the field panel level.
 17. Multi-tasking, multi-user password restriction allows individual operator access (up to 65 different passwords).
 - a. Workstations can restrict access to the viewing and/or editing functions as defined by the user.
 - b. All activity occurring in the system is reported on a LCD/CRT and a printer while simultaneously storing the transaction on the hard drive.
 - c. Each workstation LCD/CRT displays normal activity and alarm conditions in a split screen configuration.
 18. Alarm conditions may be displayed in either text or graphically.
 - a. Graphic production is accomplished by utilizing an integral color graphics software package.
 19. Upon an alarm event, the software provides recall of user-created graphics.
 - a. The graphics are generated from AutoCAD files.
 - b. The alarm graphics system is to be able to display multiple triggered points on the same map.
 - c. Icons represent alarm points and readers.
 20. If communication is lost between the micro-controller(s) and the AC/FMS server, the micro-controllers begin to store occurring activity until the AC/FMS server is back on line at which point all past activity is reported and stored on the hard drive.
 - a. The AC/FMS server retains the master program for each micro-controller in the system and periodically polls each micro-controller and reviews its program.

- 1) If there is a discrepancy in the review, the AC/FMS server reprograms the micro-controller automatically without operator intervention.
- 2) It reviews the micro-controller at a rate of at least one micro controller per second on each RS422 channel.

21. Workstations support a mouse for graphic design, controls and operations.

C. Cursor Control and Editing Functions:

1. User may enter, edit and verify data entered into the system using the keyboard and LCD/CRT display.
 - a. Basic operation is centered around positioning the cursor at the desired location for selecting a function or entering or editing a particular data field with a given system-programming screen.
 - b. Cursor command keys and screen editing controllers simplify the task of moving between screens and manipulating the data entries throughout the AC/FMS operation.
2. The various screens that comprise the AC/FMS operator interface are similar in concept and layout, and in general all follow the same convention for creating, adding or deleting the information that customizes the system for each users specific needs.
 - a. Except the Sign on Screen, all screens have a status at the top that displays the user-defined name of the system, the operators' name, alarm status and the current time and date.
 - b. A menu bar is utilized to indicate the operator's options.
 - c. The left and right arrows move the cursor on the bar back and forth. The operator will see that current selection highlighted and by pressing the "Enter" key will cause the system to execute that selection.
 - d. The next lines form the area the operator uses to create, add or delete data.
 - e. The menu bar contains command options for each screen that allows the operator to edit, change the current data in existing fields, or save the currently displayed data.
3. Variables that the user may change:
 - a. Access Cycles: A collection of 7 daytypes that define a repetitive weekly cycle of access or timed event control.
 - 1) Also displays or prints current access cycles.
 - b. Access Levels: Assigns access cycle to individual doors to allow for the formation of up to 128 different combinations of doors and access cycle combinations. Each access level determines when an individual or group of users will be allowed access through a specific group of system doors.
 - c. Access Period/Daytypes: Establishes the period during which person (or persons) will be given access during a 24-hour period or which a controlled event will occur. Up to four periods may be assigned to a 24-hour daytype.
 - d. Alarm Assignments: Allows operator to designate the alarms within the system. Alarms may be individual doors, I/O points or groups of similar alarms. Each alarm may have an alarm response message assigned that is displayed when the alarm is generated.
 - 1) Also displays or prints current alarm assignment data.

- e. Assign Controllers: Allows the type of controllers to be specified for the system and allows editing of specific information relating to each controller.
- f. Card Assignments: Allows the assignment of individual or card groups to an access level (time/door combinations).
- g. Controller Assignments: Displays or prints current controller assignments.
- h. Daylight Savings Time: Assigns when daylight savings time will be started and cancelled.
- i. Daytypes: Displays or prints current daytypes.
- j. Door Alarm Bell: Toggles the alarm on or off that is activated when a door alarm condition is generated.
- k. Door Message: Allows the operator to suppress printing and display of normal user transaction messages from individual doors. Defaults to no suppression.
- l. Doors:
 - 1) Doors maybe assigned to the cards in a group fashion. Each door can be assigned to any card.
 - 2) Doors can also be assigned to a group and the door can be added to each card along with any combination of individual doors and/or groups.
- m. History Recall: Displays or prints a report based on user-selected criteria controlling the search or selection of the historical database.
- n. Holidays: Set up to 32 holiday periods. Holiday convert the operation of the system from times controlled by standard daytypes, access cycles, and access levels to times controlled by holiday daytypes, holiday access cycles, and holiday access levels.
- o. Input/Output Assignments: Displays or prints current input and output programming data.
- p. I/O Message: Allows operator to suppress the display and printing for individual inputs or outputs within the system defaults to no suppression. Information is recorded to the hard disk even if it is suppressed at the printer or monitor.
- q. Message Suppression: Displays or prints current message suppression status.
- r. Modify Logo: Allows user to customize the logo appearing on the screen.
- s. Override Doors: Allows the operator to immediately have control of a door or of all doors within the system.
- t. Override Outputs: Allows operator to immediately have manual control of an output or of all outputs within the system.
- u. Password Assignment: Allows the assignment of system master password, system facility code, and up to 8 user passwords of each of the 8 different levels. Verification and warning screen appears to indicate that you are writing over existing data.
- v. Personnel Data: Allows the operator to designate 30 different data fields. Data specific to each user may then be entered into each of the data fields. The operator is able to do a data filed search of any or all the fields as needed.
 - 1) Display or print reports based on operator selected search criteria of personnel database (structure determined by OMH-CITER personnel).

- w. Personnel Locator: Displays or prints last door transaction or anti-passback level of a selected key or card number.
- x. Printer/Monitor: Allows routing of various output data to the system output devices.
- y. Program a Remote: Allows operator to immediately download the latest database of program information to a specific controller or to all controllers within the system (this function is controlled by OMH-CISM management).
- z. Reports:
 - 1) Select Graphics System: Selects whether the integrated graphics system or text mode will be utilized to display and monitor active alarm conditions.
 - 2) Set Authorization: Allows user to pre-select which function of the system may be utilized at each password level.
- aa. Setup: Selection of this option allows the operator to customize various operational aspects of the system.
- bb. System Setup: Displays or prints current system setup data.
- cc. System Time Out: Sets the amount of time between keystrokes that will be allowed before the system automatically reverts to a secured mode. Also assigns the sign on screen or the activity screen as the default screen to which the system will revert in the secured mode.
- dd. Terminal Alarm Bell: Toggles the alarm bell on or off that is activated when an active alarm condition is present at the display terminal.
- ee. Time and Data: Set system time and date.
- ff. Visitor Assignments: Displays or prints current visitor card assignment data.

D. General Screen Controls and Commands:

- 1. Selection of this option places the system in the editing mode for the currently displayed screen or function. The field of data on the screen that can be edited will be highlighted. The user can add, delete, or modify existing data fields with the cursor's editing, escape, mode, and navigation key as previously described.
 - a. Delete: Allows the operator to delete an entire unit or data group from the database that has been previously assigned. Primary use of this function is to remove a controller assignment, user assignment, and personnel data record or alarm assignment from the database.
 - b. Save: Allows the operator to save the data or record currently displayed. When data is added, modified or deleted from a screen, the operator must always use the save function to record changes.
 - c. Add: Specifically used in the alarm assignments screen editor to select the next available unused alarm from the database.
 - d. Display: The display function is selectable from the report editing screens and allows the operator to display the selected report on the operator LCD/CRT.
 - e. Print: Selectable command from the reports editing screens, allows the operator to print the selected report on all report-designated printers.
 - f. Acknowledge: Selectable from the alarm display window, allows the operator to acknowledge the currently displayed alarm.
 - g. Reset: Selectable from the alarm display window, allows the operator to reset all acknowledged alarms. Alarms that have not been acknowledged cannot be reset.

- h. Comment: The comment function is available from the alarm display window and allows the operator to insert specified actions taken in response to a displayed alarm. This comment is recorded in the database and is retrievable from the reports file.
- E. Dynamic Color Graphics Display Package:
1. Permits the automatic display of user generated (digitized video and/or line drawing), pixel mapped 3-D graphics in response to alarm detection.
 - a. The use of ASCII mapped graphics is not acceptable.
 - b. The user can customize screen displays and direct the system to present a user-defined image on the screen when a specific (user selected) alarm condition is detected.
 2. The graphic representation and the visual location of an alarm are provided along with specific instructions to aid in expediting it's appropriate handling.
 - a. The display can also be customized by the user to provide the annunciation of multiple alarms nominal of 32 on a single page to provide a simple means of visually summarizing which alarms are currently recorded in the system and whether they have been acknowledged and reset.
 3. In the event of multiple alarms, the operator has the ability to request to see the next alarm on highest priority basis.
 - a. The user assigns a priority designation to each alarm definition.
 - b. When requesting the display of alarms on a priority basis, the system displays the highest priority alarm first. This will be the highest priority alarm currently recorded in the system that has not yet been presented to the user.
 4. User may zoom (move) from one page to another (via selection of Zoom Icon) with the mouse pointer on the graphic alarm display screen. Up to 32 Zoom Icon's are allowed on a single screen.
 - a. This feature permits the user to design an extensive multi-layered graphic system where an alarm causes the presentation of a high level image.
 - b. Upon the display of the high level image, the user zooms deeper into the facility providing greater definition of the geographic location of the alarm.
 - c. There is no limit to the depth of the zoom chain.
 - d. Full screen of text instructions can be linked to an alarm condition.
 5. Graphics are an integral part of the standard software package, allowing each workstation to operate in the text edit and graphics mode of operation.

2.6 ACFMS CONTROLLERS

- A. Micro-Controllers: GE-Security/Casi Micro 5-PXN Plus:
1. Features:
 - a. Microprocessor-based, digital technology.
 - b. Distributed intelligence architecture, with micro-controllers operating independently of one another.
 - c. All database information stored at the micro-controller level.
 - d. All decision-making performed at the micro-controller, eliminating degraded mode operation.

- e. Proprietary software programs and control logic information coordinate and drive the system hardware stored in Flash Read Only Memory (ROM).
 - f. ROM (field) that can be upgraded from AC/FMS server.
 - g. Capable of receiving program instructions from the AC/FMS server, maintaining its program and executing decisions at the local door level.
2. Capacity:
 - a. Micro/5-PXN supports two 8 reader boards, four 2 reader boards, four 20 digital input boards, and four 16-digit output boards (This configuration supports the maximum configuration of 16 readers with or without keypad, 80 additional supervised digital inputs, and 64 additional digital outputs.).
 - b. Each Micro supports 7 boards including the CPU and Power/Com boards.
 3. Digital Output Boards (Use to control various system functions):
 - a. Provides digital outputs rated at .04 amps at 40V dc per output.
 - 1) LED for each output point.
 - 2) Each output addressed individually.
 4. Digital Output Relay Boards (Use to control various system functions):
 - a. Provides relay outputs rated at 2 amps at 40V dc or 30V ac per output point.
 5. Digital Input Boards (Use to monitor various building functions):
 - a. Provides for four-state supervised inputs using standard 1k-ohm resistors.
 - 1) Closed contact - Normal.
 - 2) Open contact - Alarm.
 - 3) Low line impedance or short circuit.
 - 4) High line impedance or open circuit
 6. Power Supply and Battery Backup: GE Security Casi-6 amp (minimum) power supply with integral charger adequate to support each micro-controller.
 - a. Low battery and no battery supervision (form "C" contacts) connected to input of micro-controller for reporting to AC/FMS server.
 - b. Include fire alarm interface input trigger for connection from Fire Alarm panel.
 - c. Lockable cabinet.
 - d. Capable of 24-hour backup.
 - e. 12VDC batteries

2.7 CREDENTIAL READERS

- A. Install new HID PROX readers or BioMetric readers as needed for new locations.
- B. General: Existing card readers shall be reused all locations. New readers shall be provided at all new locations. Where required provide HID 5365 Mini-Prox readers.
 1. 5-16 vdc Operation
 2. Operating temperature -22o -150o F
 3. 6.0" x 1.7" x 1.0"
 4. Maximum read range up to 5.5"
 5. Weigand output
 6. Polycarbonate UL 94
- C. Biometric Smart iClass Card Readers:

1. Provide BioScript IClass Fingerprint/Smart Card Model- VSmart readers for Sensitive areas as indicated on the drawings, OR
 2. Provide Labcal SAC IClass Fingerprint/Smart Card Model-Sentry readers for Sensitive areas as indicated on the drawings.
- D. Provide all enrollment software and enrollment station with technical support for enrolling initial number of Employees into the system and onto the cards.
- E. The iCLASS reader shall incorporate the Authentec, Inc. sensor model AF-S2. The AF-S2 sensor shall be manufactured of silicon and shall be capacitive-based. The sensor surface area shall measure 24 x 24 x 3.5 mm. The sensor shall additionally incorporate Authentec's TruePrint technology, which utilizes a patented radio frequency (RF) imaging technique that allows the sensor to generate an image of the shape of the live layer of skin that is buried beneath the surface of the finger. For more information on this imaging technology
- F. The iCLASS reader shall be mounted on the wall or structure to be in compliance with all American Disabilities Act (ADA), local and federal laws as they apply to the installation. The reader should also be mounted at a height that is comfortable to use. In general, the reader is mounted such that the height of the sensor (top of the device) is between 48 and 54 inches from the ground. Should the reader be installed below this mounting height (i.e., on a turnstile), installation of a wedge piece shall be required between the mounting surface and the iCLASS wall mounting plate. The reader shall require free space above the reader such that the user has room to place their finger on the sensor. Roughly, 2-3 inches (or more) of free space is recommended depending on if there is any obstruction interfering with the view of the reader. The reader should also be provided with free space (roughly 3-4 inches recommended) below the device for convenient access to the bottom RJ11 RS-232 port.
- G. Power Requirements:
1. The iCLASS reader shall operate on DC power between 12 and 24 volts, however, operation at 12 VDC is recommended. The iCLASS shall consume approximately a maximum of 12 watts of power:
 - a. At 12 VDC the device shall require up to 1.5 A during operation. The iCLASS reader shall require an isolated power supply (not provided with reader). This power supply may be optionally purchased from the manufacturer.
 - b. The power supply should be:
 - 1) Isolated from other equipment including card reader power, lock power, door controller power and other interference-causing or non-manufacturers electro-mechanical devices (i.e., power supply should be dedicated to the iCLASS reader(s)). Regulated and filtered. Protected by means of an uninterruptible power supply (UPS) or Battery backup.
 - 2) UL-Listed Class II power supply at 12 VDC, 1.5 A.
 - 3) Properly ground the readers per the manufactures recommendations.
- H. Operation:
1. The iCLASS reader shall be designed to integrate easily into most access control systems. To function, a fingerprint must be enrolled and stored on an iCLASS

contactless smart card or directly on the reader and this can be done through the Admin software included with the reader or through an Administrator Mode accessible through the keypad and display. Once a fingerprint is enrolled, authentication may be performed any number of times. Authentication may be initiated either through the keypad by presenting a smart card to the reader. After authentication, the iCLASS shall send a Wiegand string to the door controller equipment for appropriate action.

I. Enrollment:

1. Provide training and enrollment software to the facility for enrollment of employees. Provide initial enrollment of 25 employees in the base contract.

2.8 ACCESS CARDS

A. The AC/FMS utilizes card products designed specifically for security applications.

1. Custom card finishes available on all cards for direct dye sublimation printing and preprinting of custom artwork.
2. Manufactured HID Proximity Cards:
3. Laminated PVC slightly thicker than a standard credit card.
4. Utilizes read-only proximity technology.
5. Utilizes read/write IClass technology chips
6. Each card contains an antenna that powers the chip from energy absorbed by the proximity card as it enters the RF field generated by the card reader.
7. Available in several finishes.
8. Allows photo images to be printed directly onto the card.
9. Full color customer offset printing on one or both sides.
10. Hot stamp external ID number.
11. Self-sealing photo flap.
12. OMH embedded logo and New York State seal pre-embedded into plastic stock
13. Provide HID IClass model 2022BCGMNN-A1193/FORMAT H50567
14. NO Slot punch.

B. Provide ____ active cards and ____ non-active cards for temporary badge production.

C. Provide ____ OMH SB-34H silk-screened lanyards.

D. Provide ____ 508-ZSJ with anti-print transfer material vertical card pouches

E. and ____ 508-ZHOSJ horizontal card pouches as manufactured by JAM Plastics.

2.9 POWER SUPPLIES AND BATTERY BACKUP

A. For Door Locking Equipment: Altronix's AL600ULM 6 amp 12/24 VDC power supplies, batteries and battery chargers:

B. Interconnect fire alarm input to power supply for emergency operations.

2.10 DOOR HARDWARE

- A. Door Status Switches: Sentrol Model 1078 recessed door contacts and/or model 2076 Stainless steel surface contacts.
- B. Door Strikes: Von Duprin 6000 Series
- C. Magnetic Locks: Securitron M62 Series, 1600 lb. minimum holding force, no exception.

2.11 AC/FMS INTERCONNECTION CABINETS

- A. Lockable, vandal resistant, surface mounted cabinets constructed of 14-gage steel, size as recommended by the Company producing the system. Paint cabinets green and stencil "AC/FMS".

2.12 TERMINAL STRIP CABINETS – CLASS 1, 2 AND 3 WIRING

- A. Lockable, vandal resistant, surface mounted cabinets constructed of 14-gage steel, size as recommended by the Company producing the system. Equip cabinets with barrier type double screw terminals rated 300 V minimum, meeting UL 94 requirements for materials classed 94 V-0. Use identification strips, tags or labels to identify each conductor. Paint cabinets green and stencil on cover purpose of cabinet.

2.13 CABLES

- A. All electrical characteristics shall meet the requirements of the Company producing the system (attenuation, conductor to conductor capacitance, cross-talk, dc resistance, velocity of propagation, etc.). All cables within the buildings shall be plenum rated cable unless otherwise specified and approved.
- B. Outdoor Cables:
 - 1. Provide cable as recommended by access control/facility monitoring system manufacturer or company filed advisor. Cable shall be flooded type with a high-density polyethylene jacket suitable for exterior use.
- C. Indoor Cables:
 - 1. Signal Line Circuits (Wiring from Central Controller to Card Reader Terminals and Alarm Monitor Terminals): Jacketed, 22 gage insulated copper, individually twisted shielded pairs; Belden Corp.'s 8723-7 pair cable.
 - 2. Initiating Device Circuits (Wiring from Card Reader Terminals and Alarm Monitor Terminals to Alarm Detectors): Jacketed, 22 gage insulated copper twisted shielded pairs; Belden Corp.'s 8451.
 - 3. Wiring from Card Reader Terminals to Release Devices: Jacketed, 18 gage insulated copper twisted pair; Belden Corp.'s 8461.
 - 4. Terminal, Faceplate and Release Device Grounding: 16 gage insulated copper conductor; Belden Corp.'s 9980.
 - 5. Wiring shall be shielded or unshielded as recommended by the Company producing the system.

D. Communication Cables:

1. Multiconductor Cables: NFPA 70 types CMP, CMR, CMG:
 - a. Insulated conductors (other than in a coaxial cable), copper.
2. Conductors twisted, shielded and jacketed as recommended by the Company producing the system.
3. Other types of cables may be used in accordance with NFPA 70 Table 800.53 "Cable Uses and Permitted Substitutions", as approved, if listed as being suitable for the purpose.
4. Cabling from Host to Micro controller: Dedicated Belden 8723 22-AWG, 2-pair twisted shielded wire is recommended; however, 2-pair twisted shielded wire within the 18-to 22-AWG range is acceptable. Grounding of the shield at the Micro/5 controller grounding studs is required.
5. Cabling to Readers: For 12V readers using cable distances greater than 500 feet and/or a current per reader greater than 150 mA, use Belden 8725 (or equivalent) 20-AWG, 4-pair twisted shielded wire. For 12V readers using cable distances less than 500, use wire within 18- to 22-AWG range. Recommended maximum distance is 1,000 feet but is reader dependent. For 5V readers, maximum cable distance is 300 feet with pull-up resistors.

E. Interconnecting cables, for door sense switches, readers.

1. Tinned copper conductors, polypropylene insulated.
2. Four groups of two conductors with 22 AWG stranded tinned copper drain wire.
3. Each group individually Beldfoil shielded with polyester tape wrap, chrome PVC jacket.
4. Cabled around a common axis.
5. Suggested working voltage: 400 V.
6. Color-coding: Red, Black, Green, White, White/Red, White/Black, White/Green, White/Yellow.

2.14 CONNECTORS

- A. Connectors for Cables: As produced by Amphenol Corp. (Weatherproof type where installed in exterior locations.)

2.15 GROUNDING

- A. Comply with requirements in Division 26 Section "Grounding and Bonding for Electrical Systems" for grounding conductors and connectors.
- B. Insulators shall electrically isolate bus bars from the wall, or other mounting surfaces, thereby controlling the current path.
- C. Provide required stainless steel hardware to fasten the two-hole ground lugs to the bus bar.

2.16 LABELING

- A. Station Locator: Flip type bound file, indexed with tabs and equipped with 8-1/2 x 11 inch (minimum) plans showing location of each card reader and location of all major equipment associated with the system. Enclose each plan in clear plastic envelope so that plans can be removed and updated.

- B. Wiring Diagram: Provide One line diagram showing interconnection of all major components associated with the system within the Operation and Maintenance Manuals and As-Built wiring diagrams.
- C. Provide Nameplates: Precision engrave letters and numbers with uniform margins, character size minimum 3/16 inch high.
 - 1. Phenolic: Two color laminated engraver's stock, 1/16 inch minimum thickness, machine engraved to expose inner core color (white).
 - 2. Aluminum: Standard aluminum alloy plate stock, minimum .032 inches thick, engraved areas enamel filled or background enameled with natural aluminum engraved characters.
 - 3. Provide engraved nameplates for all equipment except card readers and door contacts.
- D. Markers:
 - 1. Premarked self-adhesive; W.H. Brady Co.'s B292, B708, Ideal Industries' Mylar/Cloth wire markers, or Markwick Corp.'s permanent wire markers, Plastic Extruded Parts Inc.'s Flexible Sleeve or ID Band Markers, or Thomas and Betts Co.'s E-Z Code WSL self-laminating.
 - 2. Other Styles: To suit application by W.H. Brady Co., Ideal Industries, Marwick Corp., Plastic Extruded Parts, Inc., or Thomas and Betts Co.

2.17 WIRE MANAGEMENT PRODUCTS

- A. Cable Clamps and Clips, Cable Ties, Spiral Wraps, etc: as manufactured by Catamount/T&B Corp., or Ideal Industries Inc.
- B. While in use covers for IP data outlets. Provide Thomas/Betts or equal clear covered "while in use" box covers with integral lock to secure the IP address outlets located in accessible locations.

2.18 ACCESSORIES

- A. Include accessories required to perform the functions summarized in SYSTEM DESCRIPTION and indicated on the drawings.

2.19 DOOR ALARMS

- A. Provide DSI 4200 K3 or K2 self contained door alarms with reset only switch with removable core for local alarm indication of exit doors scheduled for "emergency only" use.
- B. Integrate output of door alarm station to micro-controller for alarm reporting to Alarm workstation.
- C. Connect local door contact to input of door alarm unit.
- D. Provide 12VDC power supply for door alarms. Provide minimum of 3 amp. Supply to support multiple door alarm locations.

2.20 REQUEST-TO-EXIT

- A. Provide GE/Sentrol Rex detector PIR where required for automatic bypass of exit alarm for automatic exiting from a secure location.

PART 3 - EXECUTION

3.1 INTERRUPTIONS TO EXISTING SYSTEMS

- A. Maintain the existing system in its present condition to the extent possible while installing new Work. Existing system at no time shall be rendered inoperable without the expressed written consent of the facility Chief Safety Officer and the EIC. Only existing systems that are malfunctioning and causing delays in the installation of the new system will be considered for disconnection prior to the new system acceptance testing.
- B. When changes or removals are required to the existing AC/FMS system such that its ability to act as an AC/FMS system is impaired, provide a temporary wireless AC/FMS system so that each area is covered at all times by a functioning system. Notify Building Supervisor (thru Director's Representative) of proposed temporary measures and scheduling. Both the proposed temporary measures and the scheduling must be approved by the Director's Representative.

3.2 INSTALLATION PRACTICES

- A. Install system in accordance with the Company's printed instructions unless otherwise indicated.
- B. Coordinate with the Facility Representative for placement of the controllers in secured locations as shown on the drawings. Detail and configure the system to specific site conditions with the Facilities help and approval.
- C. Contact the FICC and coordinate all equipment IP addresses and equipment location for any components located in or connected to the facility data network and data rooms. All materials shall be installed as per the manufacturers' instructions, unless noted otherwise.
- D. Comply with NECA 1.
- E. Bundle, lace, and train conductors and cables to terminal points without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.
- F. Comply with NECA 1, "Good Workmanship in Electrical Contracting."
- G. Refer to Division 28 Section "Common Work Results for Electronic Safety and Security".
- H. All equipment shall be installed according to manufacturers' instructions.

3.3 GENERAL

- A. Examine pathway elements intended for cables. Check raceways, cable trays, and other elements for compliance with space allocations, installation tolerances, hazards to cable installation, and other conditions affecting installation.
- B. Examine roughing-in for LAN and control cable conduit systems to PCs, Controllers, card readers, and other cable-connected devices to verify actual locations of conduit and back boxes before device installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Comply with EIA/TIA-606, "Administration Standard for the Telecommunications Infrastructure of Commercial Buildings."
- E. Obtain detailed Project planning forms from manufacturer of access-control system; develop custom forms to suit Project. Fill in all data available from Project plans and specifications and publish as Project planning documents for review and approval.
- F. Record setup data for control station and workstations.
- G. For each Location, record setup of Controller features and access requirements.
- H. Propose start and stop times for time zones and holidays, and match up access levels for doors.
- I. Set up groups, facility codes, linking, and list inputs and outputs for each Controller.
- J. Assign action message names and compose messages.
- K. Set up alarms. Establish interlocks between alarms, intruder detection, and video surveillance features.
- L. Prepare and install alarm graphic maps.
- M. Develop user-defined fields.
- N. Develop screen layout formats.
- O. Propose setups for guard tours and key control.
- P. Discuss badge layout options; design badges.
- Q. Complete system diagnostics and operation verification.
- R. Prepare a specific plan for system testing, startup, and demonstration.
- S. Develop acceptance test concept and, on approval, develop specifics of the test.
- T. Develop cable and asset management system details; input data from construction documents. Include system schematics and Visio Technical Drawings.
- U. In meetings with Architect and Owner, present Project planning documents and review, adjust, and prepare final setup documents. Use final documents to set up system software.

3.4 CABLING

- A. Wiring Method: Install wiring in raceway and cable tray except within consoles, cabinets, desks, and counters and except in accessible ceiling spaces and in gypsum board partitions where unenclosed wiring method may be used. Use NRTL-listed

plenum cable in environmental air spaces, including plenum ceilings. Conceal raceway and cables except in unfinished spaces.

- B. Install LAN cables using techniques, practices, and methods that are consistent with Category 6 rating of components and that ensure Category 6 performance of completed and linked signal paths, end to end.
- C. Install cables without damaging conductors, shield, or jacket.
- D. Boxes and enclosures containing security system components or cabling, and which are easily accessible to employees or to the public, shall be provided with a lock. Boxes above ceiling level in occupied areas of the building shall not be considered to be accessible. Junction boxes and small device enclosures below ceiling level and easily accessible to employees or the public shall be covered with a suitable cover plate and secured with tamperproof screws.
- E. Install end-of-line resistors at the field device location and not at the Controller or panel location. All wiring where exposed shall be installed in conduit, minimum 3/4" or larger, in accordance with NFPA 70 and local codes.
- F. All cables shall be terminated and connected onto termination strips. Conductors at all junction points or termination shall be tagged with conductor identification.
- G. Comply with EIA/TIA-569, "Commercial Building Standard for Telecommunications Pathways and Spaces."
- H. Cable application requirements are minimum requirements and shall be exceeded if recommended or required by manufacturer of system hardware.
- I. RS-232 Cabling: Install at a maximum distance of 50 feet.
- J. RS-485 Cabling: Install at a maximum distance of 4000 feet.
- K. Card Readers and Keypads:
 - 1. Install number of conductor pairs recommended by manufacturer for the functions specified.
 - 2. Unless manufacturer recommends larger conductors, install No. 22 AWG wire if maximum distance from Controller to the reader is 250 feet, and install No. 20 AWG wire if maximum distance is 500 feet.
 - 3. For greater distances, install "extender" or "repeater" modules recommended by manufacturer of the Controller.
 - 4. Install minimum No. 18 AWG shielded cable to readers and keypads that draw 50 mA or more.

3.5 ELECTRICAL POWER

- A. All AC power feeds to the system shall be installed in conduit separate from the data bus communication and low voltage control cables. The 240 VAC input power shall be furnished and installed by the Electrical Contractor. The Security Contractor shall be responsible for coordinating his requirements with the Electrical Contractor.
- B. The Security Contractor shall furnish and install, in accordance with the manufacturer's instructions, all interconnect wiring, and equipment necessary for the erection of a complete system as described herein and shown on the drawings. All wiring termination, except 240 VAC power inputs and above door finish hardware device inputs, shall be the responsibility of the Security Contractor.

3.6 TESTING AND SYSTEM ACCEPTANCE

- A. Refer to Division 28 Section “Common Work Results for Electronic Safety and Security”.

3.7 DEMONSTRATION

- A. Refer to Division 28 Section “Common Work Results for Electronic Safety and Security”.

END OF SECTION 281300

SECTION 282300

VIDEO SURVEILLANCE

PART 1 - GENERAL

1.1 SUMMARY

- A. This section describes the components that shall comprise the Video Surveillance System (VSS) and practices to be used when installing them. All information herein is intended to present minimum standards of performance, quality and construction.
- B. The system shall include all hardware and software, closed-circuit cameras, lenses, auto-iris, controls, power supplies, mounts, housings and any conduit, wiring, conductors, raceways, termination cabinet enclosures, mounting hardware, and all other devices required for a complete and fully functional system, whether specified herein or not.
- C. Section Includes:
 - 1. Video Recorders
 - 2. Video Storage
 - 3. CCTV Cameras
 - 4. CCTV Cabling and Power Supplies
 - 5. Integration to existing Video Surveillance System

1.2 ALLOWANCES

- A. An allowance for the following portions of the Work of this Section is included in Section 01210:
 - 1. Services of the Company Field Advisor as described in QUALITY ASSURANCE.
 - 2. All items listed in SUBMITTALS.
 - 3. Engineering and reprogramming associated with the installation of the new equipment and updating existing information.
 - 4. All products listed in PART 2 of this Section except:
 - a. Protective devices (surge suppressors).
 - b. Interconnection cabinets and terminal strip cabinets.
 - c. Conductors and cable.
 - d. Signs, labels, markers, and nameplates.
 - e. Labor for installation of the products is not included in the allowance and shall be included in the contract sum.
 - 5. Spare parts listed in Part 1 of this Section.

1.3 STANDARDS AND CODES

- A. Refer to Division 28 Section "Common Work Results for Electronic Safety and Security".

1.4 SUBMITTALS

- A. Waiver of Submittals: The "Waiver of Certain Submittal Requirements" in Section 01330 does not apply to this Section.
- B. Submittals Package: Submit the shop drawings, product data, and quality control submittals specified below at the same time as a package.
 - 1. Company Field Advisor Letter: With the submittals package include a letter from the Company Field Advisor stating that he/she has reviewed the Submittals Package for accuracy and completeness, and approves all materials and installation methods included in the Submittals Package.
- C. Shop Drawings:
 - 1. Composite wiring and/or schematic diagrams of the complete system as proposed to be installed (standard diagrams will not be acceptable).
 - a. Include transient surge and lightning protection grounding details for video signal circuits, control circuits, audio circuits, and ac power conductors.
 - 2. Scale elevation drawings showing mounting of components.
 - 3. Scale drawings showing location and mounting of components.
 - 4. Rack mount enclosure layout for remotely located control equipment.
 - 5. Scaled floor plans and elevation drawings showing location of all major components associated with the system.
 - a. Demonstrate that the allotted space is sufficient for the installation of major components.
- D. Product Data:
 - 1. Catalog sheets, specifications and installation instructions.
 - 2. Bill of materials.
 - 3. Detailed description of system operation (format similar to SYSTEM DESCRIPTION).
 - 4. State number of inputs and outputs used specifically for this project and number of video inputs and outputs available for future use if system is expanded to maximum capacity.
 - 5. Total electrical load of the complete system.
 - a. Include for each system component that utilizes batteries the battery ampere-hour capacity recommended for each component by the Company producing the system, for the specified duration.
 - 6. Statement from the Company producing the system, for each size and type of single conductor and multiconductor cable proposed for use, indicating that the electrical characteristics meet the requirements of the Company.
 - 7. Include a letter of agreement from the CCTV/ Digital Video Recorder manufacturer stating their on-site technical involvement for system setup, programming, testing and training.
 - 8. Name, address and telephone number of nearest fully equipped service organization.
- E. Quality Control Submittals:

1. Copy of license required by New York State General Business Law Article 6-D for installing Security Systems.
 - a. Also include copy of identification card issued by the Licensee for each person who will be performing the work.
2. Installer's Qualifications Data: Include the following for each person who will be performing the Work:
 - a. Name.
 - b. Employers name, business address and telephone number.
 - c. Name and addresses of the required number of similar projects worked on which meet the experience criteria.
 - d. Current copy of manufacturer's equipment certification for products supplied in this project.
3. Company Field Advisor Data: Include:
 - a. Name, business address and telephone number of Company Field Advisor secured for the required services.
 - b. Certified statement from the Company listing the qualifications of the Company Field Advisor.
 - c. Services for each product for which authorization is given by the Company, listed specifically for this project.
 - d. Certified letter from the Company stating their acknowledgement and schedule for requirements of Company Field Advisor site supervision and overall project review for compliance to the Company's installation standards.
4. List of Completed Installations:
 - a. For products from a Company which are specified by catalog number or description and are not viable or available at the time of the submittal process due to obsolesces or supersession, furnish the name, address and telephone number of at least 3 comparable installations which can prove the proposed products from the specified Company are the Company's recommended replacements and have operated satisfactorily for one year.
5. Outline of Onsite Training Programs Required of Company Field Advisor:
 - a. Provide a separate outline of the training programs to be used to train the maintenance and security personnel, including:
 - 1) System overview.
 - 2) System programming.
 - 3) Operation of system equipment.
 - 4) System maintenance.
 - 5) Estimated length (time) of each segment.
6. Miscellaneous Documentation:
 - a. Equipment factory certification document confirming the valid, in-effect manufacturers agreement indicating that the security contractor is an existing authorized and trained equipment installer for all the proposed equipment.
 - b. Letter of agreement from the cctv equipment manufacturer stating their on-site technical involvement for system setup, programming and operator training.
7. Detailed project "Work Plan" compiled for the specific project to include:

- a. On site work guide lines with specific NYS Office of Mental Health site requirements.
- b. Directions for proper storage of all equipment.
- c. Training schedule and personnel contacts for this specific project.
- d. Problem resolution matrix with all field contacts and project managers.
- e. Completion/Acceptance form with strategic installation milestones and sign-off requirements.
- f. Project scheduling plan.
- g. Detailed project installation drawings compiled for this project.

F. Contract Closeout Submittals:

- 1. Include a System acceptance test report signed by both the Company Field Advisor and the Owner's Representative certifying that the CCTV System fulfills the contract requirements, the manufacturers recommendations and is operating to the requirements of the Owners Representative.
- 2. Include on a computer disk a Digital Video Recorder test recording of 2 minute (active scenes) from each camera location, showing both day and night scenes.
- 3. Include on a computer disc of all PTZ cameras showing complete range of control. Pan left, pan right, tilt up, tilt down, zoom in and zoom out for both day and night scenes.
- 4. System acceptance test report.
- 5. Certificate: Affidavit, signed by the Company Field Advisor and notarized, certifying that the system meets the contract requirements and is operating properly.
- 6. Equipment settings chart for control equipment indicating micro-controller module dip-switch settings, control equipment programming charts for each programmable component of the system.
- 7. Operation and Maintenance Data:
 - a. Deliver 2 hard copies, covering the installed products, to the Facility Representative. Provide 4 CD Electronic files for the entire O&M manuals to Include:
 - 1) Operation and maintenance data for each product.
 - 2) Equipment data sheets as submitted with any corrections on actual installed product.
 - 3) Complete point-to-point wiring diagrams of entire system as installed. Identify all conductors and show all terminations and splices. (Identification shall correspond to markers installed on each conductor.)
 - 4) Name, address, and telephone number of nearest fully equipped service organization.

G. Refer to Division 28 Section "Common Work Results for Electronic Safety and Security".

H. Refer to Division 28 Section "Common Work Results for Electronic Safety and Security".

1.5 QUALITY ASSURANCE

A. UL Listing: The system shall be listed in the UL Security Equipment Product Directory

- B. Test Facility: The Company producing the system shall have test facilities available, which can demonstrate that the proposed system meets contract requirements.
- C. Qualifications: The person(s) installing the Work of this Section and their supervisor shall be personally experienced and certified by the equipment manufacturer in access control/facility monitoring systems and shall have been engaged in the installation of access control/facility monitoring systems for a minimum of 3 years.
 - 1. Furnish the names and addresses of 5 similar projects which the foregoing people have worked on during the past 3 years.
- D. The Company producing the system shall have a comprehensive distance-learning program based on CD technology and/or Internet Web technology. Users shall be able to log onto the manufacturers web page and complete all technical training programs on-line at the student's convenience. Students shall be able to obtain technical certification through a series of Web-based tests.
- E. Company Field Advisor: Secure the services of a Company Field Advisor to:
- F. Assist in the preparation of the submittal package.
 - 1. Review the submittals package for accuracy and completeness.
 - 2. Prepare outline of training programs to be used to train facility personnel.
 - 3. Review video-training programs for accuracy and completeness.
 - 4. Spend a minimum of 80 working hours at the contract site:
 - a. Rendering advice regarding installation and final adjustment of the system.
 - b. Assisting in initial programming of the system.
 - c. Rendering advice on the suitability of each system component and each dipswitch setting for its particular application.
 - d. Witnessing final system test and then certify with an affidavit that the system is installed in accordance with the contract documents and is operating properly.
 - e. Training facility maintenance personnel in operation, programming and routine maintenance of the system (minimum of two 8-hour sessions).
- G. Refer to Division 28 Section "Common Work Results for Electronic Safety and Security".

1.6 WARRANTIES

- A. Special Warranty: The one year period required by paragraph 9.8 of the General Conditions is extended to (2) years for the Work of this Section when approved. Refer to Supplementary Conditions.
- B. Manufacturer's Warranty: Product and component specific manufacturer's standard warranty where greater than the 2 years required by the special warranty.
- C. Equipment integrator and contractor shall respond to warranty service requests within 4 hours of initiation of call to the facility location.

1.7 MAINTENANCE

- A. Service Availability: A fully equipped service organization capable of guaranteeing response time within 8 hours to service calls shall be available 24 hours a day, 7 days a week to service the on-going installation and the completed system.

- B. Furnish the following spare parts:
 - 1. 3 of each size fuse for all electronic equipment.
 - 2. 2- Pelco ICS111-CDV39A fixed color camera.
 - 3. 1-Spectra IV SE.

1.8 COORDINATION

- A. Refer to Division 28 Section "Common Work Results for Electronic Safety and Security".

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. This specification outlines the requirements for an Video Surveillance (CCTV) System (VSS), including uninterruptible power system. All information herein is intended to present minimum standards of performance, quality and construction.
- B. Provide and install an intelligent CCTV System which shall include all hardware and software, Video Recorders, storage, cameras, power supplies, and any conduit, wiring, conductors, raceways, termination cabinet enclosures, mounting hardware, and all other devices as required for a complete and fully functional system, whether specified herein or not. All information herein is intended to present minimum standards of performance, quality and construction.
- C. The system will be installed on the 4th floor of an existing building and shall tie into and be fully integrated into the existing system installed on the other floors of the building. Equipment and devices shall be the same as the ones existing on the other floors of the building. The video recorder shall be installed in the IT Room on that floor and be connected via Local Area Network to the system server.
- D. The existing CCTV server is located in different building. Coordination with the owner is required for accessing the server. Local Area Network (Ethernet) connectivity will be provided for communication between the existing server and the Video Recorder.
- E. The closed circuit television (CCTV) surveillance system consists of:
 - 1. Hi-resolution color camera stations and intercom stations located throughout the facility.
 - 2. CCTV monitors, digital video recorders (DVR), keyboards, pan-tilt-zoom controllers, DVR CRT monitor, independent intercom station equipment, and a multiplexed-microprocessor based camera monitoring and control system (CM & CS).
 - a. Monitors, keyboards, intercom master, etc.) are located within the control monitoring security console (CMSC) located in the Safety Office of Building _____. CMSC is existing.
- F. An attendant at the CMSC operates the CM & CS and observes the monitors to survey and evaluate the status of personnel in the areas within viewing range of the camera stations.
 - 1. Personnel at remote camera system viewing workstations (RCSVW) may also operate the system in future locations (_____) through Internet or Local Area

- Network connection and observe monitors within the limits established and programmed into the system for each workstation.
2. Software for remote monitoring and control is included under this contract.
- G. The attendant may converse with a person standing in proximity to camera stations that are equipped with intercom units.
1. The person presses a wall mounted intercom talk button, then delivers desired message.
 - a. Pressing the camera number ID button on the controller allows the attendant to view the person, then acknowledge call through the intercom master station by pressing the "talk button".
 - b. Access to the door is controlled by the attendant by pressing a push button or key controlled switch located on the intercom master station that activates the remote door strike at the selected door.
- H. Scenes are viewed by camera stations:
1. Pan-Tilt-Zoom Camera Stations: Complete adjustable viewing of scenes, controlled by attendant from CM&CS keyboard/joystick control unit and in the future, remotely through the RCSVW's.
 2. Fixed Camera Stations: Vari-focal, auto-iris lens equipped cameras view a fixed scene (not remotely adjustable).
- I. Video signals from selected camera stations are transmitted to dedicated monitors through multiplexer units.
1. Each monitor continuously displays the scene viewed by the camera stations to which it is dedicated through the multiplexer.
 2. a. Other monitors display multiple camera scenes.
 3. Monitors in the Safety Office are controlled by the CM&CS.
 4. The scenes displayed by dedicated monitors in the Safety Office are also displayed on selected alarm monitors that are connected to the output of the CM&CS.
 5. Examples of Scenes Being Displayed in Different Formats:
 - a. Individual camera at ward entrance on the second floor transmit video signal to single dedicated monitors in each Nurse's Station.
 - b. Cameras in Building ___ transmit their signals to the Quad Video Processor and 14" monitor at the Reception desk and loops through to the 4th floor Nurses Station quad Processor and 14" monitor for remote viewing.
 - c. The individual video outputs from the 4th floor monitor are sent to the Safety office in Building __ for recording.
- J. Keyboard/joystick control units, connected to the CM&CS allow the attendant(s) to control the following within the limits established and programmed by pass code level into the system for each keyboard control unit.
1. Camera station functions including addressing, pan and tilt (joystick control) zoom, and focus. (Iris is automatically controlled, but can be overridden from the main joystick controller and be manually controlled through CM&CS).
 2. Camera station automatic sequencing run and hold.
 3. The programmed sequence may either be continuously repeated until the hold button is depressed or the sequence may be programmed to stop on a selected camera station until the run button is pushed.

4. Single "quick look" sequence.
 5. Call up of prepositioned scenes.
 6. up of any camera station to any monitor connected to the output of the CM&CS.
 7. Scheduled or programmed patterns for P-T-Z cameras.
 8. Establish "zone blanking" for areas requiring privacy.
- K. The CM&CS automatically controls and limits the function of each camera station, monitor, and keyboard control unit in the system. (The DVR's are controlled by the common computer PC keyboard connected to the DVR's). The functions are not alterable through normal operation of the CM&CS by the attendant (an access level modification is required to change parameters). The following may be programmed by the system manager via the transmitter/controller programming keyboard and supplemental programming unit:
1. Automatic roll-free sequencing of camera stations powered by the CCTV central power supply; in any order on monitors connected to the output of the CM&CS.
 2. Dwell time (2 to 60 seconds) that each camera station scene is displayed in sequence on the monitor.
 3. Time and date.
 4. On screen camera station identification (2 or 3 digit numeric plus up to 20-alphanumeric for each individual camera). The positioning and brightness is independently adjustable for each monitor.
 5. Thirty-two propositioned scenes (32 automatic) for each zoom-pan/tilt camera station.
 6. Privacy zones for non-viewable scenes.
 7. P-T-Z scanning patterns for each camera to view the surrounding areas.
 8. Alarm call up function for yard cameras with man gate contacts.
 9. Associated user operation programming.
 10. Preference Tabling: Video output is restricted to designated camera stations. It restricts specific monitors that are connected to the output of the CM&CS from system wide access of camera stations. Monitor will only receive video signal from predetermined camera stations.
 11. Prioritizing: Permits assignment of priority operation of the keyboard control units. The keyboard with the higher priority may take control of monitors that are connected to the output of the CM&CS or operations of a remote control function associated with a lower priority keyboard control unit.
 12. Specific partitioning, preference tabling, prioritizing, and lockout functions:
- L. Access to the system functions is controlled through at least 2 levels of access security to prevent program modifications or use by unauthorized personnel.
1. At the lowest level of access, the keyboard programming functions are disabled. The attendant has minimum access to the system functions (camera switching and remote control).
 2. At the highest level of access, the system manager may modify programs.
- M. An external alarm from an infra-red motion detector or door alarm connected to a multiplexer causes the camera station in alarm to take priority over sequencing cameras and hold on one or more predetermined CM&CS video outputs (monitors and DVR's).
1. The video from the camera station in alarm is automatically called up and displayed on a specific monitor connected to the output of the CM&CS.

- a. Alarm overrides camera sequence on the alarm (armed) monitor.
 - b. Multiple alarms cause sequencing at the rate of 2 seconds among alarmed camera stations.
 - c. Attendant may enable or disable alarm call up to alarm monitors, and may arm or disarm individual camera stations for alarm call up.
 - d. Alarm status (arm/off) of each camera and monitor is displayed on the monitors.
- 2. The video signal from the camera station in alarm from a remote alarm device or when the DVR detects motion automatically activates the DVR:
 - a. If DVR is "stopped" it will automatically "start" and record video in "real-time" mode.
 - b. If DVR is currently operating in the "time-lapse" mode, it will automatically switch to the "real-time" mode.
 - 3. Time, date, and camera station identification is recorded on the DVR's hard drive in conjunction with the video from the camera station in alarm.
- N. The DVR's can also be manually controlled using a common keyboard operation.
- O. When camera station signals are displayed on monitors connected to the output of the CM&CS, camera station identification, date, and time are also displayed.
- P. Failure of the 120V ac primary (main) power supply:
 - 1. Causes the uninterruptible power supply (UPS) back up units to supply power for the CM & CS to be functional for 2 hours.
 - a. Remote cameras connected to single camera power supplies do not operate until facility generator provides power.
 - b. The facility generator will provide 120 VAC power after switchover.
 - 2. Automatically transfers the CM&CS to its secondary (standby) power supply to maintain:
 - a. Time/date generator for a minimum of 2 hours.
 - b. Preposition scene-programming stored in the keyboard control unit memory for minimum of 8 hours.
- Q. Coordinate the installation with all other trades and provide final termination of all conductors.
- R. Provide any required configuration and programming required for integrating the equipment provided under this scope into the existing system. Coordination with the Owner is required. Coordinate the security requirements of this Section with all other trades.

2.2 VIDEO RECORDER SYSTEM

- A. The video recording system shall be Hybrid Video Recorder (HVR) equipped with a 2000GB of storage and is capable of recording analog and IP cameras.
- B. The ability to support eight Pelco megapixel IP cameras, or Axis cameras, gives customers new power and flexibility in their IP migration path.

- C. Capable of storing and playing back digitized images from 1 to 16 analog and 8 IP camera inputs at .5 or 15 images per second (NTSC) per camera refreshing simultaneous recording rate to an Internal Hard Disk Drive. Encryption of each image shall be provided to prevent and/or detect manipulation of recorded images using separate authentication software. The unit shall include internal video motion detection with multiple sensitivity settings to allow fast visual verification of motion related events during playback of the recorded images.
- D. The system shall allow operators to view any camera recorded through the use of an external View Station PC. The maximum allowable time for displaying a recorded video stream from any recorded camera shall not exceed 1 second from the time an operator initiates the desired function. The system shall provide a complete Audit Trail Database, with Six Month History, tracking who did what, where, and when in the recorder system.
- E. Recording Modes: continuous recording, motion detection, scheduled recording modes, and alarm activation or event-based recording.
- F. Event Marking motion detection, scheduled recording modes, user events, alarm inputs.
- G. Viewing: live and instantaneous playback viewing at any viewing station connected to the network without stopping the recording process of any video input.
- H. Multiple Tasks: The system shall also allow for scheduled recordings and event recordings to be combined in normal operation.
- I. Video formats: inputs can be from fixed color cameras, B&W cameras, PTZ cameras, infrared cameras, X-Ray cameras, low light cameras, or any other camera that provides a composite NTSC/PAL 1v p-p video signal.
- J. Recorded Video Quality: at least 40dB PSNR quality compared to the original video and support either NTSC or PAL formatted video.
- K. Integration: Communicates Alarm and Relays with Pelco's CM6800E Matrix Switcher.
- L. DVR Management: Provides automatic video routing to a Back-Up Spare Recorder via the Matrix Switch.
- M. Mechanical:
 - 1. Rack mountable
 - 2. Operating temperature: 41°F to 85°F (5° to 29°C).
 - 3. Relative humidity: maximum 80% non-condensing.
 - 4. Construction: industrialized casing and mount in a standard EIA Rack.
- N. Provide a hybrid video recorder with the following capacity and parameters:
 - 1. 16 looping analog cameras and up to 8 IP megapixel cameras.
 - 2. Video compression (IP camera) H.264, MPEG-4, JPEG
 - 3. Storage capacity storage shall support recording all video at no less than 15 frames per second, 24 hours/7days a week at a minimum resolution of 4CIF. Provide minimum 30 days of storage, but no less than 2TB.

- O. Live video shall be displayed at 30 fps at minimum 4CIF on the requested monitor. Reduction in quality or frame rate shall not be acceptable for live video display.
- P. The system shall have a minimum video resolution of 4CIF.
- Q. Provide 19" LCD with looping BNC and DVI inputs and to support the HVR.
- R. Provide Pelco DX4816HD-2000 HDR and Pelco PMCL419HB monitor.

2.3 CCTV CAMERAS

- A. Shall be analog fixed dome high resolution color cameras.
- B. The dome camera system shall integrate a camera and lens package into a enclosure that can be mounted directly to, or recessed into, a ceiling or wall.
- C. The indoor mini dome camera system shall be a true day/night option, with 1/3" CCD high resolution (540 TVL) color camera with auto iris and varifocal lens.
- D. The camera shall have 24 VAC or 12 VDC operation (autosensing).
- E. The camera shall have manual 3-axis (pan/tilt/rotation) positioning to allow adjustment for optimum camera rotation and placement.
- F. The indoor mini dome camera system shall meet or exceed the following design and performance specifications:
- G. The camera is FCC Part 15, Class A and CE compliant.
- H. The recessed indoor camera models are UL rated as suitable for use in environmental air handling spaces, other than inside air ducts or furnace plenums, and so stated in the installation manual.
- I. A jumper shall be provided on the power supply board for configuring to 24 VAC power.
- J. All cameras shall be protected from incorrect placement of the 12 VDC/24 VAC jumpers.
- K. Provide Pelco FD5-DV10-6.

2.4 CAMERA POWER SUPPLY

- A. Indoor multiple camera power supply, 120/230 VAC input. Sixteen fused 24/28 VAC Outputs, total current capacity of 20A (480 vA)).
- B. Electrical Specifications:
 1. Input Voltage 120 50/60 Hz
 2. Output Voltage 24/28 VAC
 3. Output Fuse: Fuse to match load.
 4. Input Connectors Wire nut
 5. Output Connectors Screw-type barrier strips
 6. Input Wire Size 12-16 gauge solid wire
 7. Output Wire Size 12-22 gauge solid or stranded wire
- C. Pelco MCS16-10.

2.5 CCTV INTERCONNECTION CABINETS

- A. Lockable, vandal resistant, surface mounted cabinets constructed of 14 gage steel, size as recommended by the Company producing the system. Paint cabinets green and stencil cover "CCTV".

2.6 TERMINAL STRIP CABINETS – CLASS 1, 2 AND 3 WIRING

- A. Lockable, vandal resistant, surface mounted cabinets constructed of 14 gage steel, size as recommended by the Company producing the system. Equip cabinets with barrier type double screw terminals rated 300 V minimum, meeting UL 94 requirements for materials classed 94 V-0. Use identification strips, tags or labels to identify each conductor. Paint cabinets green and stencil on cover purpose of cabinet.

2.7 CCTV CABLES

- A. All electrical characteristics shall meet the requirements of the Company producing the system (attenuation, conductor to conductor capacitance, cross-talk, dc resistance, velocity of propagation, etc.).
- B. Indoor Cables-Plenum Rated:
 - 1. Video Signal Cable: Coaxial type, 75 ohm, 95 percent copper braid shield, solid copper center conductor, 100 percent sweep tested from 5 - 300Mhz.
 - a. West Penn 25815 RG59/U.
 - b. RG-59/U for distances of less than 750 feet.
 - c. Used as interconnect cables between the Nitek equipment and the multiplexers.
 - d. Used as interconnect cables between the Video Matrix Controller and LCD monitors.
 - 2. Power Cables:
 - a. Size for power loss of 10% or less as measured at the remote device location.
 - 3. Communications Cable-Plenum Rated:
 - a. West Penn 254245 Cat-5E cable.

2.8 CONNECTORS

- A. BNC Connectors-Video signal Cable: 2-piece crimp on connector as produced by Amphenol Corp. Twist on BNC connectors will not be approved.
- B. BNC connectors-Video Patch Cables: West Penn CN-BM53-18 or approved equal. Twist on BNC connectors will not be approved.

2.9 GROUNDING

- A. Comply with requirements in Division 26 Section "Grounding and Bonding for Electrical Systems" for grounding conductors and connectors.
- B. Insulators shall electrically isolate bus bars from the wall, or other mounting surfaces, thereby controlling the current path.
- C. Provide required stainless steel hardware to fasten the two-hole ground lugs to the bus bar.

2.10 LABELING

- A. Station Locator: Flip type bound file, indexed with tabs and equipped with 8-1/2 x 11 inch (minimum) plans showing location of each card reader and location of all major equipment associated with the system. Enclose each plan in clear plastic envelope so that plans can be removed and updated.
- B. Wiring Diagram: Provide One line diagram showing interconnection of all major components associated with the system within the Operation and Maintenance Manuals and As-Built wiring diagrams.
- C. Provide Nameplates: Precision engrave letters and numbers with uniform margins, character size minimum 3/16 inch high.
 - 1. Phenolic: Two color laminated engraver's stock, 1/16 inch minimum thickness, machine engraved to expose inner core color (white).
 - 2. Aluminum: Standard aluminum alloy plate stock, minimum .032 inches thick, engraved areas enamel filled or background enameled with natural aluminum engraved characters.
 - 3. Provide engraved nameplates for all equipment except card readers and door contacts.
- D. Markers:
 - 1. Premarked self-adhesive; W.H. Brady Co.'s B292, B708, Ideal Industries' Mylar/Cloth wire markers, or Markwick Corp.'s permanent wire markers, Plastic Extruded Parts Inc.'s Flexible Sleeve or ID Band Markers, or Thomas and Betts Co.'s E-Z Code WSL self-laminating.
 - 2. Other Styles: To suit application by W.H. Brady Co., Ideal Industries, Marwick Corp., Plastic Extruded Parts, Inc., or Thomas and Betts Co.

2.11 WIRE MANAGEMENT PRODUCTS

- A. Cable Clamps and Clips, Cable Ties, Spiral Wraps, etc: as manufactured by Catamount/T&B Corp., or Ideal Industries Inc.
- B. While in use covers for IP data outlets. Provide Thomas/Betts or equal clear covered "while in use" box covers with integral lock to secure the IP address outlets located in accessible locations.

2.12 ACCESSORIES

- A. Include accessories required to perform the functions summarized in SYSTEM DESCRIPTION and indicated on the drawings.

PART 3 - EXECUTION

3.1 INTERRUPTIONS TO EXISTING SYSTEMS

- A. Maintain the existing system in its present condition to the extent possible while installing new Work. Existing system at no time shall be rendered inoperable without

the expressed written consent of the facility Chief Safety Officer and the EIC. Only existing systems that are malfunctioning and causing delays in the installation of the new system will be considered for disconnection prior to the new system acceptance testing.

- B. When changes or removals are required to the existing CCTV system such that its ability to act as a CCTV system is impaired, provide a temporary wireless system so that each area is covered at all times by a functioning system. Notify Building Supervisor (thru Director's Representative) of proposed temporary measures and scheduling. Both the proposed temporary measures and the scheduling must be approved by the Director's Representative.

3.2 INSTALLATION PRACTICES

- A. Install system in accordance with the Company's printed instructions unless otherwise indicated.
- B. Coordinate with the Facility Representative for placement of the controllers in secured locations as shown on the drawings. Detail and configure the system to specific site conditions with the Facilities help and approval.
- C. Contact the FICC and coordinate all equipment IP addresses and equipment location for any components located in or connected to the facility data network and data rooms. All materials shall be installed as per the manufacturers' instructions, unless noted otherwise.
- D. All materials shall be installed as per the manufacturers' instructions, unless noted otherwise.
- E. Comply with NECA 1.
- F. Bundle, lace, and train conductors and cables to terminal points without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.
- G. Comply with NECA 1, "Good Workmanship in Electrical Contracting."
- H. All equipment shall be installed according to manufactures' instructions.
- I. Refer to Division 28 Section "Common Work Results for Electronic Safety and Security".

3.3 GENERAL

- A. Examine pathway elements intended for cables. Check raceways, cable trays, and other elements for compliance with space allocations, installation tolerances, hazards to cable installation, and other conditions affecting installation.
- B. Examine roughing-in for LAN and control cable conduit systems to PCs, Controllers, card readers, and other cable-connected devices to verify actual locations of conduit and back boxes before device installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Comply with EIA/TIA-606, "Administration Standard for the Telecommunications Infrastructure of Commercial Buildings."

- E. Obtain detailed Project planning forms from manufacturer of access-control system; develop custom forms to suit Project. Fill in all data available from Project plans and specifications and publish as Project planning documents for review and approval.
- F. Prepare a specific plan for system testing, startup, and demonstration.
- G. Develop acceptance test concept and, on approval, develop specifics of the test.
- H. Develop cable and asset management system details; input data from construction documents. Include system schematics and Visio Technical Drawings.
- I. In meetings with Architect and Owner, present Project planning documents and review, adjust, and prepare final setup documents. Use final documents to set up system software.

3.4 CABLING

- A. Wiring Method: Install wiring in raceway and cable tray except within consoles, cabinets, desks, and counters and except in accessible ceiling spaces and in gypsum board partitions where unenclosed wiring method may be used. Use NRTL-listed plenum cable in environmental air spaces, including plenum ceilings. Conceal raceway and cables except in unfinished spaces.
- B. Install LAN cables using techniques, practices, and methods that are consistent with Category 6 rating of components and that ensure Category 6 performance of completed and linked signal paths, end to end.
- C. Install cables without damaging conductors, shield, or jacket.
- D. Boxes and enclosures containing security system components or cabling, and which are easily accessible to employees or to the public, shall be provided with a lock. Boxes above ceiling level in occupied areas of the building shall not be considered to be accessible. Junction boxes and small device enclosures below ceiling level and easily accessible to employees or the public shall be covered with a suitable cover plate and secured with tamperproof screws.
- E. Install end-of-line resistors at the field device location and not at the Controller or panel location. All wiring where exposed shall be installed in conduit, minimum 3/4" or larger, in accordance with NFPA 70 and local codes.
- F. All cables shall be terminated and connected onto termination strips. Conductors at all junction points or termination shall be tagged with conductor identification.
- G. Comply with EIA/TIA-569, "Commercial Building Standard for Telecommunications Pathways and Spaces."
- H. Cable application requirements are minimum requirements and shall be exceeded if recommended or required by manufacturer of system hardware.
- I. RS-232 Cabling: Install at a maximum distance of 50 feet.
- J. RS-485 Cabling: Install at a maximum distance of 4000 feet.
- K. Card Readers and Keypads:
 - 1. Install number of conductor pairs recommended by manufacturer for the functions specified.

2. Unless manufacturer recommends larger conductors, install No. 22 AWG wire if maximum distance from Controller to the reader is 250 feet, and install No. 20 AWG wire if maximum distance is 500 feet.
3. For greater distances, install "extender" or "repeater" modules recommended by manufacturer of the Controller.
4. Install minimum No. 18 AWG shielded cable to readers and keypads that draw 50 mA or more.

3.5 ELECTRICAL POWER

- A. All AC power feeds to the system shall be installed in conduit separate from the data bus communication and low voltage control cables. The 240 VAC input power shall be furnished and installed as part of electrical work. The Security Contractor shall be responsible for coordinating his requirements with the Electrical Contractor.
- B. The Security Contractor shall furnish and install, in accordance with the manufacturer's instructions, all interconnect wiring, and equipment necessary for the erection of a complete system as described herein and shown on the drawings. All wiring termination, except 240 VAC power inputs and above door finish hardware device inputs, shall be the responsibility of the Security Contractor.

3.6 TESTING AND SYSTEM ACCEPTANCE

- A. Refer to Division 28 Section "Common Work Results for Electronic Safety and Security".

3.7 DEMONSTRATION

- A. Refer to Division 28 Section "Common Work Results for Electronic Safety and Security".

END OF SECTION 282300