(NOTE TO DESIGNER: These Specifications are basic minimum criteria to be met in preparing the final specifications for this section, which is the responsibility of the Designer.)

SECTION 28 05 00
COMMON WORK RESULTS FOR ELECTRONIC SAFETY AND SECURITY

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Summary
B. Related Documents
C. Reference Standards And Codes
D. Administrative Requirements
E. Work Results - Description Of Project
F. Commissioning Administration
G. Proposal Submittals
H. Submittals For Project Record
I. Equipment Relocation And System Startup
J. Sequencing And Scheduling
K. Quality Assurance - Contractor Qualifications
L. Product Schedule
M. Warranty
N. Manufactured products
O. Equipment Requirements
P. Labeling
Q. Equipment Protection
R. Site Conditions
S. Examination
T. Preparation
U. Product Quality Assurance
V. Demolition / Removal
W. Firestopping
X. Construction Waste Management
Y. Closeout Activities
Z. Singular Number
AA. Training

1.2 SUMMARY

A. This document identifies the design and specification requirements for a complete and functional Electronic Safety and Security system to be performed for the University of Houston [Project Name]. [Insert Project description.]. The Electronic Safety and Security as specified herein will support the access control, intrusion, video surveillance, electronic personal protection systems connectivity, and various other low voltage devices.

B. This Section, Requirements for Electronic Safety and Security Installations, applies to all sections of Division 28.

C. The Architectural Plans and Specifications, General Conditions, Supplementary General Conditions and other requirements of Division 1, the Mechanical Plans and Specifications, the Electrical Plans and Specifications, and the Security Plans may apply to the work specified in the Division 28 Sections, and shall be complied with in every respect. The Contractor shall examine all of these documents, which make up the Contract Documents, and shall coordinate them with all security work on the Security plans and in the Division 28 specifications.

D. Contract Documents: Drawings and specifications are to be used in conjunction with one another and to supplement one another. In general the specifications determine the nature and quality of the materials, and the drawings establish the quantities, details, and give characteristics of performance that should be adhered to in the installation of the security system components. If there is an apparent conflict between the drawings and specifications, the items with the greater quantity or quality shall be estimated upon and installed. Clarification with the Owner or their designated representative about these items shall be made prior to bid response.

E. The Architect may at any time, by written order, make changes within the general scope of any contract resulting from this proposal document. If such changes expand, reduce, change or modify the scope of work, the price for the change shall be increased or decreased at the unit prices set forth in the Unit Pricing Section, and the amount shall be deducted from, or added to, the sale price of the system to the Owner. No costs will be added to the project without prior written approval from the Architect.

1.3 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Related Division 28 Sections include:
1. 28 05 00 Common Work Results for Electronic Safety and Security
2. 28 05 26 Grounding and Bonding for Electronic Safety and Security
3. 28 05 28 Pathways for Electronic Safety and Security
4. 28 05 53 Identification for Electronic Safety and Security
5. 28 06 00 Testing for Electronic Safety and Security
6. 28 13 00 Access Control
7. 28 16 00 Intrusion Detection
8. 28 23 00 Video Surveillance
9. 28 26 00 Electronic Personal Protection System

C. Adherence to, and compliance with, the codes and standards referenced, and the University of Houston Campus Design Guidelines is mandatory. Requests to deviate from the University standards and design solutions prescribed in these guidelines may be submitted, on a case-by-case basis, in accordance with the instructions in the Policy and Procedures section of these guidelines. No deviation from the requirements of the National Electrical Code (NEC) will be allowed.

1.4 REFERENCES

A. Related Division 28 Sections include: (*Latest issue and addenda)
1. National Electric Code (NEC), Latest Issue

2. ADA Standards for Accessible Design 28 CFR Part 36
2. U.S. Department of Labor Occupational Safety & Health Administration (OSHA)
3. UH Information Technology Telecommunications Infrastructure Standards
4. BICSI Electronic Safety & Security Design Reference Manual
5. ANSI/TIA/EIA568-B.1 - Commercial Building Telecommunications Cabling Standard*
6. ANSI/TIA/EIA568-B.2 - Commercial Building Telecommunications Cabling Standard*
7. ANSI/TIA/EIA568-B.3 - Optical Fiber Cabling Components Standard*
8. ANSI/TIA/EIA569 - Commercial Building Standard for Telecommunications Pathways and Spaces*
9. ANSI/TIA/EIA606-A - Administration Standard for Commercial Telecommunications Infrastructures, June 21, 2002*
10. ANSI J-STD-607-A, Commercial Building. Grounding/Bounding Requirements- Joint Standard for Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications, 2002*
11. ANSI/TIA/EIA758-A - Customer-owned Outside Plant Telecommunications Infrastructure Standard, May 2005*
12. International Standards Organization/International Electro technical Commission (ISO/IEC) IS 11801, 2000*
13. Underwriters Laboratories (UL) Cable Certification and Follow up Program*
14. National Electrical Manufacturers Association (NEMA)*
15. American Society for Testing Materials (ASTM)*
16. Chapter 208- State of Texas Communications Wiring Standard
17. UH MAPP - UH Manual of Administrative Policies and Procedures
18. BICSI Electronic Safety & Security Design Reference Manual

B. Acronyms and Abbreviations

1. ADA Americans with Disabilities Act
2. AKA Also known as
3. AMS Access management systems
4. ANSI American National Standards Institute
5. AP Access provider
6. ASTM American Society for Testing and Materials
7. AWG American Wire Gauge
8. BICSI Building Industry Consulting Services International
9. CATV Community antenna television
10. CCTV Closed circuit television
11. CO-OSP Customer owned outside plant
12. DVR Digital video recorder
13. EF Entrance facility
14. EIA Electronic Industries Alliance
15. EMI Electromagnetic interference
16. FCC Federal Communications Commission
17. FPS Frames per second
18. HVAC heating, ventilation, and air conditioning
19. IEEE The Institute of Electrical and Electronics Engineers
20. ITNO Information Technology Network Operations
21. ISO International Organization for Standardization
22. LAN Local area network
23. Mb/s Megabits per second
24. MC Main cross-connect AKA Main Distribution Frame (MDF)
25. MDF Main distribution frame AKA main cross-connect (MC)
26. NEMA National Electrical Manufacturers Association
27. NESCÒ National Electrical Safety Code
28. NFPA National Fire Protection Association

29. NVR Network video recorder
30. OFOI Owner Furnished Owner Installed
31. RCDD Registered Communications Distribution Designer
32. SCS Structured Cabling System
33. SMS Security management systems
34. TBB Telecommunications bonding backbone
35. TR Telecommunications room AKA Intermediate Distribution Frame (IDF)
36. TGB Telecommunications grounding busbar
37. TMGB Telecommunications main grounding busbar
38. TIA Telecommunications Industry Association
39. UHPS University of Houston Public Safety Department
40. UL Underwriters Laboratories
41. UPS Uninterruptable power supply
42. UTP Unshielded twisted-pair
43. WA Work area
44. WAP Wireless access points
45. X cross-connect

1.5 ADMINISTRATIVE REQUIREMENTS

A. Coordination
   1. The Security Contractor, here after referred to as “Contractor”, shall provide all materials, components, tools and labor necessary for the complete installation of all Electronic Safety and Security work required in the contract documents and specified herein.
   2. The Communications Cabling Contractor, here after referred to as “Communications Contractor”, shall provide all materials, components, tools and labor necessary for the complete installation of all communications work required in the contract documents and specified herein.
   3. The Electrical Contractor, here after referred to as “Electrical Contractor”, shall provide materials, components, tools and labor to complete the electrical power distribution.
   4. Work furnished and installed by the Contractor as specified in Division 28 and as shown in SC and T drawings includes:
      a. Identification for Electronic Safety and Security Systems;
      b. Electronic Safety and Security Systems Cabling;
      c. Patch Cords, Station Cords, and Cross-Connect Wire;
      d. Coordination with Communications Contractor;
      e. Coordination with OFOI Communications Services;
      f. Coordination with Wayfinding Guidelines.
   5. Work under this Division not in contract (NIC) that will be Owner Furnished/Owner Installed (OFOI) includes:
      a. [include OFOI items]
   6. Work furnished and installed by the Electrical Contractor as specified in Division 28 and as shown in E and SC drawings includes:
      a. The conduits and back boxes for the Electronic Safety and Security device outlets.
      b. Electrical circuits for the Security rooms.
   6. Work furnished and installed by others.
      a. The new ER walls shall be covered with rigidly fixed ¾” marine plywood, void free, 8 ft high, and capable of supporting attached equipment and hardware. Plywood should be covered with two coats of fire retardant paint.

1.6 WORK RESULTS - DESCRIPTION OF PROJECT

A. Administrative Services
   1. Contractor is required to provide test results and as-built documentation/record drawings prior to job acceptance. Refer to Section 28 06 00.

B. Grounding and Bonding for Electronic Safety and Security
   1. Bonding conductors from the TMGB or TGB will be installed to all security equipment cabinets, equipment racks, raceway, cable ladder rack, cable tray, sleeves and conduits. Bond all TGBs to the TMGB per Section 280526.
   2. Bond TMGB to building ground per Section 280526.
   3. Final design and specifications for the Grounding and Bonding system shall be coordinated with the Electrical Engineer of Record.

C. Pathways for Electronic Safety and Security
   1. VoIP Powered Devices
      a. The primary horizontal cable support system shall be conduit to cable tray and or J hooks, installed parallel to column lines. Wall penetrations shall transition to properly firestopped sleeves, then back to cable tray and or J hooks.
      b. Outlets having one single cable require a single gang box that routes to the cable tray via min.1" conduit with pull string. Unless noted otherwise on drawings.
      c. Conduit runs may not be longer than 100ft or contain more than two 90 degree bends between pulling points, pull boxes or reverse bends without the use of a properly sized junction box. Insulated throat compression fittings must be used for security conduit runs, with termination points having plastic or grounding bushings installed.
      d. Riser sleeves in ER/TR must be properly installed with bushings and firestop. Provide Shop Drawings of all core drilling locations for coordination with Architect and Owner prior to drilling.
      e. All security conduits shall be provided with a measured pull tape.
   2. Access Control Devices
      a. The primary horizontal cable support system for Access Control devices shall be conduit or dedicated cable tray or J hook pathway. Wall penetrations shall transition to properly firestopped sleeves, then back to cable tray and, or, J hooks.

D. Identification for Electronic Safety and Security
   1. All cable labeling will be compliant with TIA/EIA606-A - Administration Standard for Commercial Telecommunications Infrastructures as described in Section 28 05 53.
   2. All labeling will comply with Owner administrative labeling scheme of cabling and its numerical positions on the termination hardware. Ensure compliance with Owner's preferred administrative labeling standards.

E. Electronic Safety and Security Equipment Room Fittings
   1. Contractor shall provide each ER/TR with proper equipment installed per Division 28 specifications and drawings.

G. Electronic Safety and Security Horizontal Cabling
   1. Installed by Communications Contractor:
      a. Security camera cables will consist of plenum rated, Category 6, 4 pair UTP copper cables terminated on 48 port, RJ45, Category 6, 568B patch panels in the ER/TRs. The maximum horizontal distance shall be 295 feet.
      b. Access control cables will consist of plenum rated, 4C 22AWG 2pr. (Installed by Communications contractor, unless noted on drawings)
      c. Unless noted, provide proper plenum rated cabling for all Electronic Safety and Security equipment and devices- locations as detailed on the Security drawings.
   2. Installed by Electrical Contractor:
      a. Security camera power cables will consist of plenum rated, 18AWG-2C, Low voltage cabling installed by Contractor). Unless noted on drawings, 16AWG-2C. High voltage cabling installed by Electrical Contractor.

H. Termination Hardware
   1. All Electronic Safety and Security cabling shall terminate in proper enclosures, back boxes,

electronic devices per drawing, specifications, and manufacturer standards.

I. Patch Cords, Station Cords, and X-Connect Wire
   1. Contractor shall provide two (2) Category 6 patch cords per Security camera cable installed: 50% 5' length, 50% 3' length. (Provided by communications contractor)

J. Data Communications Equipment
   1. Data communications equipment will be OFOI.

K. Network Connectivity for Other Trades: Communications Contractor will provide the following only for Division 28, unless noted on drawings.
   1. Electronic Safety and Security –Copper and fiber cabling and termination hardware as required facilitating voice and data network connectivity for IP cameras, Emergency Call Towers, Access Control Panels. Refer to Security drawings and specifications for details.
   2. Fire Alarm –Copper or fiber connectivity as required for Fire Alarm Panels.
   3. Elevator Equipment Room – Copper connectivity to elevator equipment room(s). Coordinate with elevator equipment provider.

L. Commissioning Administration
   1. Contractor shall comply with General Commissioning Requirements of the Security infrastructure system.

M. Project Meetings
   1. Contractor shall attend preconstruction meetings with Project Team.
   2. Contractor shall provide representation on Project Team Meeting as specified in Division 1 and by the General Contractor as required.
   3. Contractor will provide representation on the Commissioning Team as required for implementation of the Commissioning Plan.

O. Preconstruction Evaluation
   1. Examination of buildings and site shall be the responsibility of the Contractor. Examine conditions for compliance with Electronic Safety and Security design specifications. Validate Security section is in accordance with related Contract Documents and the specified Owner's operational needs.

P. Construction Documentation
   1. Contractor shall coordinate requirements with General Provisions specified in Division 1 - Construction Progress Documentation.
   2. Contractor shall provide weekly progress report including synopsis of previous week's completed tasks, list of ongoing work, and updated schedule addressing milestones. Also include items for Owner coordination.
   3. Contractor shall provide weekly report of inspection by project manufacturer certified installation firm to confirm Contractor's work is compliant with industry and manufacturer standards.

1.7 PROPOSAL SUBMITTALS

A. Follow Division 1 and this section.

B. A list of technical product education (training) completed by the Contractor's project personnel.
   1. 100 percent of the on-site installation team members shall possess certification by Pelco Manufacturer as having completed the necessary training for installation, programming, and troubleshooting.
   2. At a minimum, one (1) on-site personnel shall have appropriate Strand Video System training for installation, programming, and troubleshooting.
   3. 100 percent of on-site installation personnel shall have BISCI certification in effect through the bidding process, installation, testing, documentation and acceptance. Documentation of all on-site personnel shall be provided post recommendation of selected contractor before final ITNO approval will be given.

4. Certificates shall be included in all responses to RFP/RFO documents.
5. Documentation of all on-site personnel shall be provided post recommendation before final ITNO approval will be given.

C. Price Quotation Information -
1. Submit Itemized Unit Pricing for Labor and Material.

D. The Contractor shall review this Section; Codes and Standards - Latest issue and addendums and state understanding and compliance or exception.

E. Project schedule including all work components.

F. Product Data: For each type of product indicated below. Product data to include, but not limited to materials, finishes, approvals, load ratings, and dimensional information.
1. Submittals shall include the manufacturers cut sheets for the following:
a. Equipment enclosures and/or racks;
b. Electronic equipment/Devices;
c. Cables;
d. Connectors and termination hardware;
e. Protection hardware;
f. Fire stopping materials;
g. Test equipment to be used;
h. Cable support hardware.

G. Product Data Manufacturer’s literature sheets for all materials and equipment, including a copy of the proposed warranty, recommended preventative maintenance and spare part inventory recommendations. Literature containing more than one device shall be clearly marked to delineate item(s) included in the work. Clearly indicate color or special finishes.

H. Manufacturer and Contractor statement of RoHS: Restriction of Certain Hazardous Substances Compliance.

I. Design and Installation Certificates: Signed by local cable manufacturer's representative certifying that design is acceptable with cable manufacturer's Design Engineer(s) and Contractor is authorized by manufacturer to install registered (warranty) cabling system.

J. A minimum of five (5) representative educational facilities security projects must be submitted as references to include the school's name, location, Architect or Engineer, cost of the security project and the contact person at the school district to include phone number.

K. Submit written proof that the contractor is certified by the manufacturer of the products and adheres to the engineering, installation and testing procedures and utilizes the authorized manufacturer components and distribution channels in provisioning this Project.

1.8 SUBMITTALS

A. Submit in accordance with Section xx xx xx, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. The Owner's approval shall be obtained for all equipment and material before delivery to the job site. Delivery, storage or installation of equipment or material which has not had prior approval will not be permitted at the job site.

C. All submittals shall include adequate descriptive literature, catalog cuts, shop drawings and other data necessary for the Owner to ascertain that the proposed equipment and materials comply with specification requirements. Catalog cuts submitted for approval shall be legible and clearly identify equipment being submitted.

D. Submittals for individual systems and equipment assemblies which consist of more than one item or component shall be made for the system or assembly as a whole. Partial submittals will not be

considered for approval.

1. Mark the submittals, "SUBMITTED UNDER SECTION_____".
2. Submittals shall be marked to show specification reference including the section and paragraph numbers.
3. Submit each section separately.

E. The submittals shall include the following:
   1. Information that confirms compliance with contract requirements. Include the manufacturer's name, model or catalog numbers, catalog information, technical data sheets, shop drawings, pictures, nameplate data and test reports as required.
   2. Elementary and interconnection wiring diagrams for communication and signal systems, control system and equipment assemblies. All terminal points and wiring shall be identified on wiring diagrams.
   3. Parts list which shall include those replacement parts recommended by the equipment manufacturer, quantity of parts, current price and availability of each part.

F. Manuals: Submit in accordance with Section 01 00 00, GENERAL REQUIREMENTS.
   1. Maintenance and Operation Manuals: Submit as required for systems and equipment specified in the technical sections. Furnish four copies, bound in hardback binders, (manufacturer's standard binders) or an approved equivalent. Furnish one complete manual as specified in the technical section but in no case later than prior to performance of systems or equipment test, and furnish the remaining manuals prior to contract completion.
   2. Inscribe the following identification on the cover: the words "MAINTENANCE AND OPERATION MANUAL," the name and location of the system, equipment, building, name of Contractor, and contract number. Include in the manual the names, addresses, and telephone numbers of each subcontractor installing the system or equipment and the local representatives for the system or equipment.
   3. Provide a "Table of Contents" and assemble the manual to conform to the table of contents, with tab sheets placed before instructions covering the subject. The instructions shall be legible and easily read, with large sheets of drawings folded in.
   4. The manuals shall include:
      a. Internal and interconnecting wiring and control diagrams with data to explain detailed operation and control of the equipment.
      b. A control sequence describing start-up, operation, and shutdown.
      c. Description of the function of each principal item of equipment.
      d. Installation and maintenance instructions.
      e. Safety precautions.
      f. Diagrams and illustrations.
      g. Testing methods.
      h. Performance data.
      i. Pictorial "exploded" parts list with part numbers. Emphasis shall be placed on the use of special tools and instruments. The list shall indicate sources of supply, recommended spare parts, and name of servicing organization.
      j. Appendix; list qualified permanent servicing organizations for support of the equipment, including addresses and certified qualifications.

G. Approvals will be based on complete submission of manuals together with shop drawings.

H. After approval and prior to installation, furnish the Resident Engineer with one sample of each of the following:
   1. A 12 inch length of each type and size of wire and cable along with the tag from the coils of reels from which the samples were taken.
   2. Each type of conduit and pathway coupling, bushing and termination fitting.
   3. Conduit hangers, clamps and supports.

4. Duct sealing compound.

1.9 SUBMITTALS FOR PROJECT RECORD

A. Follow Division 1 and this Section.
1. Drawings: As-built documentation must be submitted five (5) business days prior to obtaining approval for cutover to any portion of the security system. Furnish for review and comments, 4 complete sets of E size (30 by 42) and 4 complete sets of C size as-built drawings along with 4 CDs containing all electronic AutoCAD 2000 or newer (DWG) files.
2. Final approved Shop Drawings: Include plan and elevation of TRs, cable pathway details Backbone and horizontal, and cable locations and cable ID#, block diagrams, Interface requirements including connector types and pin-outs for all security equipment, Fabrication drawings for custom built equipment.
3. Final approved Shop Drawings: One set shall be laminated and placed in appropriate ER/TR/ER.
4. 4 sets of equipment /device inventory data must be submitted for all cable, termination hardware Submit data in binders and electronically on CDs in "Microsoft Excel" format, listing products furnished, including:
   a. Manufacturer's name and part numbers.
   b. Cable numbers utilizing the Owner's cable numbering standard.
   c. Location and UH label / tagging assignments.
5. Manufacturer Certificates: Within 10 days of completion of the project, Contractor shall deliver letter signed by local Structured Cabling Components representatives and Contractor's RCDD stating that installed cabling system complies with all requirements specified in manufacturer's installation guidelines and that there were no accidents, improper installation, mishandling, misuse, damage while in transit, unauthorized alteration, unauthorized repair, failure to follow instructions, or misuse with the structured cabling system that could adversely impact warranty.
6. Test Reports: 4 sets of hard copies with 4 copies on CD in compliance with related Test Result Documentation.
7. Submitted test results and other submittals that are non-compliant will be reviewed and returned to the Contractor with comments.
8. Re-submitted test results and other submittals that are non-compliant will be reviewed and returned to the Contractor with comments.
9. Subsequent reviews of test results and other submittals will be performed jointly by the Contractor and the Communications Consultant and Contractor will pay Communications Consultant's published hourly rate during third review and thereafter.
10. Manufacturer's warranty to the Owner. This shall include, but is not limited to: Owner's name and project name and address. (Within three weeks of substantial completion).
11. Within 10 days of completion of the project, Contractor shall deliver letter signed by local SCS Manufacturers representative and Contractor's RCDD stating that installed cabling system complies with all requirements specified in installation guidelines and that there were no accidents, improper installation, mishandling, misuse, damage while in transit, unauthorized alteration, unauthorized repair, failure to follow instructions, or misuse with the structured cabling system that could adversely impact warranty.
12. Within 21 days of completion of the project, the communications contractor and/or the manufacturer's local representative will provide Owner the Performance Warranty signed by the manufacturer. The warranty shall list the owner and name of the facility, including location, as the holder of the warranty.

1.9 EQUIPMENT RELOCATION AND SYSTEM STARTUP

A. Upon notice of construction completion, the selected Contractor will be responsible for system startup services for the new telecommunication room. The Contractor shall be responsible for ensuring the new equipment rooms, cabinets, floors and walls are clean and ready for equipment installation. On behalf of the Owner, the Contractor shall be responsible for coordinating with the GC and other trades to keep

the ER and TRs clean and dust free at all times.

B. It shall be the responsibility of the Contractor to develop and implement a full migration project schedule detailing the responsibilities of assigned personnel, along with contingency plans, and submit it to the Owner, or their designated representative, for approval.

C. During the transition period, Contractor shall have the necessary supervisory, technical, and other personnel available throughout relocations and cutover of the Electronic Safety and Security systems. This is to ensure that technicians are on site to observe the operation and maintenance of the equipment, and to resolve any related issues during system start-up.

D. Contractor shall ensure all amenities are present prior to equipment relocation. Contractor shall immediately contact the Owner, or their designated representative, if a required service such as HVAC, electrical, UPS, etc., are not present.

E. Contractor shall accomplish a smooth and successful transition of operations and services to the new telecommunication room. The transition includes the coordination, migration, testing, and problem resolution with the system vendors.

1.10 SEQUENCING AND SCHEDULING

A. An initial planning meeting will be held with the successful bidder to clarify all requirements (systems, services, distribution methods, etc.), identify responsibilities, and schedule the events that will transpire during the implementation of the project. Within two (2) weeks of the initial meeting, the Contractor shall provide a written report and project schedule to clearly document the events and responsibilities associated with the project.

B. Contractor shall be responsible for the development and implementation of a complete project schedule detailing the responsibilities of assigned personnel and submit it to the GC and Owner for approval.

1.11 QUALITY ASSURANCE - CONTRACTOR QUALIFICATIONS

A. Follow Division 1 and this Section.

B. Video Surveillance
1. The contractor must be a member of Building Industry Consulting Service International (BICSI).
2. The Contractor shall have a minimum of one (1) full time employee on staff that is a BICSI Registered Communications Distribution Design (RCDD) with Pelco certification on staff. The RCDD shall review and approve the design and construction plans and inspect work and report status on a weekly basis of Electronic Safety and Security system.
3. Supervisor or Lead Technician shall possess BICSI certificates of completion for training course TE300.
4. Installation Technicians should possess BICSI certificates of completion for the training course IN100 for ITS Installer Level 1 and preferably IN200 for ITS Installer Level 2.
5. 100 percent of the on-site installation personal must be Pelco trained and Certified.
6. A copy of the Pelco certificates or verification by Pelco records must accompany contractor bid, no expired certificates and certificates issued under Pelco past certification programs will be accepted.
7. Testing Technicians should possess manufacturer's certificates of completion for the test equipment used on the project.
8. The contractor shall not subcontract installation of Electronic Safety and Security system cabling, termination or testing without the written consent of University of Houston review, and confirmation to University of Houston of proposed subcontractor’s current and valid certified status.
9. The contractor shall have worked satisfactorily for a minimum of five (5) years on systems of this type and size.

10. Upon request by UH, furnish a list of references with specific information regarding type of project and involvement in providing of equipment and systems.
11. Material shall be new, and conform to grade, quality, and standards specified. Materials of the same type shall be a product of the same manufacturer throughout.
12. Subcontractors shall assume all rights and obligations toward the contractor that the contractor assumes toward the University of Houston.
13. Quality Assurance inspections will be coordinated with ITCS, UHPS Project Managers.
14. The Contractor shall possess the most recent version of the TIA/EIA 568 B Series Telecommunications Building Wiring Standards available from Global Engineering Documents.
15. The Contractor shall possess at least one copy of BICSI Telecommunications Distribution Methods Manual, Eleventh Edition, or newer.
16. Testing Technicians should possess manufacturer's certificates of completion for the test equipment used on the project.
17. Untrained, undocumented, or otherwise unqualified personnel are not allowed to perform any portion of the Electronic Safety and Security installation.
18. All personnel must be permanent employees of the contractor, or approved sub-contractors.

PART 2 - PRODUCTS

2.1 PRODUCT SCHEDULE

A. Refer to Division 28 sections for approved product and schedules.
1. 28 05 00 Common Work Results for Electronic Safety and Security
2. 28 05 26 Grounding and Bonding for Electronic Safety and Security
3. 28 05 28 Pathways for Electronic Safety and Security
4. 28 05 53 Identification for Electronic Safety and Security
5. 28 06 00 Testing for Electronic Safety and Security
6. 28 13 00 Access Control
7. 28 16 00 Intrusion Detection
8. 28 23 00 Video Surveillance
9. 28 26 00 Electronic Personal Protection System

2.2 WARRANTY

A. Network cabling warranty will be provided per Division 27.

B. Provide a minimum (1) year warranty on all parts and labor.

C. Provide an extended service agreement (3) year, with (5) year option, for parts and labor warranty at time of proposal.

D. The Labor, Material and Performance Warranty shall cover the testing and replacement of all security equipment and cabling components. The structured cabling system shall be a complete certified system. The system and all components shall be performance matched and guaranteed by the manufacturer.

E. Person / Entity Covered
1. This warranty is for the sole benefit of Owner and any successor in interest to the site in which such Registered SCS was originally installed.
2. All communications work and materials not included in the SCS components shall be warranted by the contractor that performed the work for a minimum of three years from the date of substantial completion.

2.3 MANUFACTURED PRODUCTS

A. Materials and equipment furnished shall be of current production by manufacturers regularly engaged in the manufacture of such items, for which replacement parts shall be available.

B. When more than one unit of the same class of equipment is required, such units shall be the product of a single manufacturer.

D. Manufacturers Qualifications: The manufacturer shall regularly and presently produce, as one of the manufacturer's principal products, the equipment and material specified for this project, and shall have manufactured the item for at least three years.

E. Product Qualification:
1. Manufacturer's product shall have been in satisfactory operation, on three installations of similar size and type as this project, for approximately three years.
2. The University reserves the right to require the Contractor to submit a list of installations where the products have been in operation before approval.

F. Service Qualifications: There shall be a permanent service organization maintained or trained by the manufacturer which will render satisfactory service to this installation within four hours of receipt of notification that service is needed. Submit name and address of service organizations.

G. Equipment Assemblies and Components:
1. Components of an assembled unit need not be products of the same manufacturer.
2. Manufacturer of equipment assemblies, which include components made by others, shall assume complete responsibility for the final assembled unit.
3. Components shall be compatible with each other and with the total assembly for the intended service.
4. Constituent parts which are similar shall be the product of a single manufacturer.

H. Factory wiring shall be identified on the equipment being furnished and on all wiring diagrams.

I. When Factory Testing Is Specified:
1. The Owner shall have the option of witnessing factory tests. The contractor shall notify UH through the Construction Manager a minimum of 15 working days prior to the manufacturers making the factory tests.
2. Four copies of certified test reports containing all test data shall be furnished to UH Public Safety (UHPS), facilities planning and Construction Department (FP&C), Information Technology Communications Services (ITCS), Information Technology Availability Center (ITAC) prior to final inspection and not more than 90 days after completion of the tests.
3. When equipment fails to meet factory test and re-inspection is required, the contractor shall be liable for all additional expenses, including expenses of the Owner.

2.4 EQUIPMENT REQUIREMENTS

A. Where variations from the contract requirements are requested in accordance with Section 00 72 00, GENERAL CONDITIONS and Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, the connecting work and related components shall include, but not be limited to additions or changes to branch circuits, circuit protective devices, conduits, wire, feeders, controls, panels and installation methods.

2.5 LABELING

A. Install a UH identification tag which clearly indicates information required for use and maintenance of active equipment and spare equipment, coordination for tagging through UHPS and ITCS.

B. Nameplates shall be laminated black phenol resin with a white core with engraved lettering, a minimum of 6 mm (1/4 inch) high. Secure nameplates with screws. Nameplates that are furnished by manufacturer as a standard catalog item, or where other method of identification is herein specified, are exceptions

C. Confirm administrative labeling scheme of cabling and its numerical positions on the termination hardware. Ensure compliance with Owner's preferred administrative labeling standards.

2.6 EQUIPMENT PROTECTION

A. Equipment and materials shall be protected during shipment and storage against physical damage, dirt, moisture, cold and rain:
   1. During installation, enclosures, equipment, controls, controllers, circuit protective devices, and other like items, shall be protected against entry of foreign matter; and be vacuum cleaned both inside and outside before testing and operating and repainting if required.
   2. Damaged equipment shall be, as determined by the ITSC, ITAC, UHPS, FP&C placed in first class operating condition or is returned to the source of supply for repair or replacement.
   3. Painted surfaces shall be protected with factory installed removable heavy Kraft paper, sheet vinyl or equal.
   4. Damaged paint on equipment and materials shall be refinished with the same quality of paint and workmanship as used by the manufacturer so repaired areas is not obvious.

2.7 SPARE PARTS

A. Provide one spare camera for each type of camera utilized on the project.

PART 3 - EXECUTION

3.1 SITE CONDITIONS

A. Existing Site Conditions
   1. Cable pathways and runs to individual outlets are not shown in their entirety but shall be provided as if shown in their entirety. The Contractor shall coordinate with other trades to determine exact routing.

B. Environmental Limitations
   1. Due to the critical nature of the environment, the Contractor shall use extra effort to provide a clean work environment, free from trash/rubbish accumulated during and after cabling installation. Contractor shall remove all rubbish from job site daily at his or her own expense.

3.2 EXAMINATION

A. Examination of buildings and site shall be the responsibility of the Contractor. Examine conditions for compliance with requirements of other sections in which related work is specified and determine if conditions affecting performance of the work of this Section are satisfactory. Do not proceed with work of this Section until unsatisfactory conditions have been corrected in an acceptable manner.

B. Verify liquid-carrying pipes are not installed in or above Electronic Safety and Security equipment rooms.

C. Verify fire-rated backboards are properly installed and painted following Section 06105. Notify the Project Manager immediately and prior to installation in the event that the backboards are not installed or painted properly.

D. Verify conduit, raceways, and boxes are properly installed.

E. Prior to starting the installation, the assigned installation supervisor shall participate in a walk-through of the project site with the Project Manager to review the installation documentation, verify that all construction necessary for the installation has been completed, and verify all installation methods and cable routes.

F. The Contractor shall provide a complete installation according to the written specifications and drawings. If the scope of work to be performed by the Contractor changes, it shall be in writing. Contractor shall respond to these changes with a complete material list, including pricing, labor, and taxes in writing per Division 1 requirements. Contractor shall not proceed with additional scope of work without signed approval by the General Contractor.

3.3 PREPARATION

A. Protection of Surroundings
1. Repair: Patching and repair of facilities, finishes, and equipment. Any damage to building or site caused by Contractor, including grass, paving, curbs etc., shall be restored at Contractor's expense to match condition prior to damage. If necessary and requested by the General Contractor, Contractor shall provide professional services to clean or repair scratched/soiled finishes at their own expense.
2. Contractor shall keep all foods and liquids (water, drinks, etc.) in designated break areas.
3. The Contractor shall obtain the Architect's and Engineer's written permission via the General Contractor before proceeding with any work necessitating cutting into or through any part of building structures such as girders, beams, concrete or tile floors, partition and/or ceilings.
4. If it becomes necessary to cut through any wall, floor, or ceiling to install any work under this Section of the Contract or to repair any defects that may appear up to the expiration of the guarantee period, such cutting shall be done by the Contractor under the supervision of the General Contractor.
5. Patching of all openings cut by the Contractor, or repairing of any damage to the work of other trades caused by cutting or by the failure of any part of the work installed under this Contract, shall be performed by the appropriate trade but shall be paid for by the Contractor.
6. Openings cut through concrete and masonry shall be made with masonry saws and/or core drills and at such locations acceptable to the Architect/Engineer. Impact-type equipment shall not be used except where specifically approved by the Architect/Engineer.
7. All openings shall be restored to “as-new” condition under the appropriate Specification Section for the materials involved, and shall match remaining surrounding materials and/or finishes.
8. Refer to Division 1 for additional information.

3.4 PRODUCT QUALITY ASSURANCE

A. All materials and equipment provided shall be the standard Commercial-Off-The-Shelf (COTS) products of a manufacturer engaged in the manufactures of such products. All materials shall be typical commercial designs that comply with the requirements specified. All materials and equipment shall be readily available through manufacturers and/or distributors. All equipment shall be supplied complete with any optional items required for proper installation.

B. In the event of a breach of the representations and warranties contained herein, the Contractor, at their own expense, shall take all measures necessary to correct and make the Electronic Safety and Security work in compliance with the applicable manufacturer written technical recommendations and standards.

3.5 DEMOLITION / REMOVAL

A. Unless indicated otherwise, all items that must be removed due to interference with work of this contract remain the property of the Owner, and are to be salvaged at the Owner's discretion. Any material to be salvaged, other than Contractor's waste material, must be approved in writing by the General Contractor.

3.6 FIRESTOPPING.

A. The Contractor is required to properly fire-stop any penetrations through fire barriers utilized for the placement of security cabling. Provide fire resistant intumescent materials to restore fire ratings to wall, floor, or ceiling penetrations according to local and national codes.

B. Verify the hourly rating of the barrier.

C. Select the UL Listing to match or exceed the barrier.

D. Adhere to cable loads and fill procedure in the Listing.

E. Seek pre-approval from the Authority Having Jurisdiction (Inspector).

F. When installing the System, be sure not to exceed the listing limitations.

G. After installation, place information labels and take digital photographs of both sides of each firestopped penetration in the System for future reference.

H. All openings shall be restored to “as-new” condition under the appropriate Specification Section for the materials involved, and shall match remaining surrounding materials and/or finishes.

I. Provide fire resistant materials to restore fire ratings to all wall, floor, or ceiling penetrations used in the distribution and installation for security cabling system. Coordinate fire stopping procedures and materials with General Contractor and Div.7.

J. Solutions and shop drawings/submittals for fire stop materials and systems shall be presented to the General Contractor for written approval of materials prior to purchase and installation.

K. Materials shall be installed per manufacturer instructions, be UL listed for intended use, and meet NEC codes for fire stopping measures.

L. The material chosen shall be distinctively colored to be clearly distinguishable from other materials, adhere to itself, and remain resilient and pliable to allow for the removal and/or addition of communication cables without the necessity of drilling holes in the material.

M. The fire stopping material shall maintain/establish the fire rated integrity of the wall/barrier that has been penetrated.

N. Contractor shall coordinate with electrical contractor and ensure Security Pathway firestopping is properly identified and labeled. Contractor shall laminate and permanently affix to each side of a fire wall/floor penetration, the following information:
   1. Installing Contractor's name, address and phone number.
   2. Alpha-numeric unique identifier (floor/penetration - A1)
   3. Name of manufacturer of fire stop system.
   4. Part & model numbers of system and all components.
   5. Phone numbers of manufacturer's corporate headquarters in U.S. and local distributor's name and phone number.

3.7 CONSTRUCTION WASTE MANAGEMENT

A. Contractor shall remove all excess material and debris from the site upon completion of work each day and in a manner approved by the General Contractor's Project Manager. See Division 1.

3.8 CLOSEOUT ACTIVITIES

A. Acceptance shall be subject to substantial completion of all work, successful post-installation testing which yields 100% PASS rating, and receipt of full documentation as described herein.
   1. All Proposal Submittals and Project Record Submittals.
   2. Training to Owner's representative on methods to add and remove fire stop barriers, add and remove isolation conduit seals and add and remove IP 67 rated outlets.
   3. Maintenance manuals specified in Div. 1 to GC and Owner regarding structured cabling system, firestopping and conduit sealing methods and manufacturer's recommended maintenance instructions.
   4. Contractor shall complete all punch list items within five (5) days of notification by GC.

3.9 Contractor shall wipe down all equipment, racks, cabinets, and sweep and mop ER/TR floors prior to Substantial Completion..

3.10 Contractor shall complete Closeout Checklist listing status of all submittals, maintenance manuals, Owner training, and punch list items and deliver per Division 1.

3.11 SINGULAR NUMBER

A. Where any device or part of equipment is referred to in these specifications in the singular number (e.g., "the switch"), this reference shall be deemed to apply to as many such devices as are required to complete the installation as shown on the drawings.

3.12 TRAINING

A. Training shall be provided in accordance with Article, INSTRUCTIONS, of Section 01 00 00, GENERAL REQUIREMENTS.

B. Training shall be provided for the particular equipment or system as required in each associated specification.

C. A training schedule shall be developed and submitted by the contractor and approved by ITCS, ITAC, UH Public Safety Department at least 30 days prior to the planned training.

END OF SECTION