

University of Houston Master Specification

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SECTION 28 0500 - COMMON WORK RESULTS FOR ELECTRONIC SAFETY AND SECURITY

These specifications provide basic minimum criteria to be met in preparing the final specifications for this Section, which is the responsibility of the Designer. Revise this Section by deleting and inserting text to meet Project-specific requirements.

Maintain Section format, including the UH Master Spec designation and version date in bold in the center columns in the header and footer. Complete the header and footer with Project information.

Designer is required to adhere to the University's "Electronic Access Control Design Guide" and "Network Infrastructure Design Standards" available in Owner's Design Guidelines on the Facilities Planning and Construction web site.

This Section uses the term "Architect" or "Engineer." Change this term to match that used to identify the design professional as defined in the General and Supplementary Conditions.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

Delete hidden text after this Section has been edited for the Project.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to work of this Section.
- B. The Contractor's attention is specifically directed, but not limited, to the following documents for additional requirements:
 - 1. The current version of the Uniform General Conditions for Construction Contracts, State of Texas, available on the web site of the Texas Facilities Commission.
 - 2. The University of Houston's Supplemental General Conditions and Special Conditions for Construction.

1.2 SECTION INCLUDES

- A. Administrative and coordination requirements for Electronic Safety and Security scope of work.

1.3 REFERENCES

- A. Related Division 28 Sections and the latest revisions and pertinent addenda of the following:
 - 1. National Electric Code (NEC).
 - 2. ADA Standards for Accessible Design 28 CFR Part 36.
 - 3. U.S. Department of Labor Occupational Safety & Health Administration (OSHA).

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4. BICSI Electronic Safety & Security Design Reference Manual.
5. ANSI/TIA568.1-E - Commercial Building Telecommunications Cabling Standard.
6. ANSI/TIA568.3-D - Optical Fiber Cabling Components Standard.
7. ANSI/TIA569-D - Commercial Building Standard for Telecommunications Pathways and Spaces.
8. ANSI/TIA606-C - Administration Standard for Commercial Telecommunications Infrastructures.
9. ANSI J-STD-607-C, Commercial Building. Grounding/Bonding Requirements- Joint Standard for Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications.
10. ANSI/TIA758-A - Customer-owned Outside Plant Telecommunications Infrastructure Standard.
11. International Standards Organization/International Electro technical Commission (ISO/IEC) 11801-6.
12. Underwriters Laboratories (UL) Cable Certification and Follow up Program
13. National Electrical Manufacturers Association (NEMA)
14. American Society for Testing Materials (ASTM)

B. Acronyms and Abbreviations

1. ACS Access Control System
2. ADA Americans with Disabilities Act
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. BDF Building Distribution Frame (Main Communications Room)
9. BICSI Building Industry Consulting Services International
10. CATV Community antenna television
11. CC Cross Connect
12. CCTV Closed circuit television
13. CO-OSP Customer Owned Outside Plant
14. DVR Digital Video Recorder
15. EAC Electronic Access Control
16. EF Entrance Facility
17. EIA Electronic Industries Alliance
18. EMI Electromagnetic Interference
19. FCC Federal Communications Commission
20. FPS Frames per second
21. HVAC Heating, Ventilation and Air Conditioning
22. IEEE The Institute of Electrical and Electronics Engineers
23. IDS Intrusion Detection System
24. ITNO Information Technology Network Operations
25. ISO International Organization for Standardization
26. LAN Local Area Network

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- 27. Mb/s Megabits Per Second
- 28. MC Main Cross-Connect or Main Distribution Frame (MDF)
- 29. MDF Main Distribution Frame or main cross-connect (MC)
- 30. NEMA National Electrical Manufacturers Association
- 31. NESCÒ National Electrical Safety Code
- 32. NIC Not in Contract
- 33. NFPA National Fire Protection Association
- 34. NVR Network Video Recorder
- 35. OFOI Owner Furnished Owner Installed
- 36. RCDD Registered Communications Distribution Designer
- 37. SCS Structured Cabling System
- 38. SMS Security Management Systems
- 39. TBB Telecommunications Bonding Backbone
- 40. TR Telecommunications room or Intermediate Distribution Frame (IDF)
- 41. TGB Telecommunications Grounding Busbar
- 42. TMGB Telecommunications Main Grounding Busbar
- 43. TIA Telecommunications Industry Association
- 44. UHPS University of Houston Public Safety Department
- 45. UL Underwriters Laboratories
- 46. UPS Uninterruptable Power Supply
- 47. UTP Unshielded Twisted-Pair
- 48. VMS Video Management System
- 49. WA Work Area
- 50. WAP Wireless Access Point

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination

1. Work furnished and installed by the Contractor as specified in Division 28 Sections and as shown in Electrical, Security, and Technology Drawings includes:
 - a. Electronic Access Control Systems
 - b. Video Surveillance Systems
 - c. Intrusion Detection Systems
 - d. Personal Protection Systems (Call Boxes and Call Towers)
 - e. Grounding and Bonding for Electronic Safety and Security Systems
 - f. Identification for Electronic Safety and Security Systems
 - g. Testing for all Electronic Safety and Security Systems
 - h. Coordination with Communications, Electrical, Elevator and Door Hardware Contractors
 - i. Coordination with Owner's EAC and Campus Safety Representatives
2. Work under this Division that is not in the Contract and will be Owner Furnished Owner Installed includes:

INCLUDE LIST OF OWNER FURNISHED, OWNER INSTALLED ITEMS FOR THIS PROJECT IN SUBPARAGRAPH BELOW.

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- a. <include list of OFOI items>.
- b. Network Equipment
3. Work provided by the Electrical Contractor as specified in Division 28 and as shown in Electrical, Technology, and Security Drawings includes:
 - a. Conduits and back boxes for Electronic Safety and Security device outlets
 - b. Horizontal and vertical gutter boxes for cable management in Security Rooms
 - c. Electrical circuits for Security Rooms, Doors with Operators, Emergency Call Boxes and Call Towers.
 - d. Bonding backbone and associated buss bars
4. Work provided by the Communications Contractor as specified in Division 28 and as shown in Technology and Security Drawings includes:
 - a. IP-based security cabling
5. Work furnished and installed by others:
 - a. Security Room walls covered with 8-foot tall, AXC 3/4 inch fire-rated plywood finished with two coats of fire retardant white paint, leaving stamps exposed.

1.5 WORK RESULTS - DESCRIPTION OF PROJECT

A. Administrative Services

1. Attend vendor and product submittal coordination meetings per each Division 28 section.
2. Provide shop drawings per each Division 28 section.
3. Provide as-built drawings and test results prior to Project acceptance. Refer to Section 28 0600 "Testing for Electronic Safety and Security."

B. Grounding and Bonding for Electronic Safety and Security

1. Coordinate final layout and installation of the grounding and bonding system with the Electrical Engineer of Record.
2. Install bonding conductors from the TMGB or TGB to all security equipment cabinets, equipment racks, raceway, cable ladder rack, cable tray, sleeves and conduits. Bond all TGBs to the TMGB in compliance with Section 28 0526 "Grounding and Bonding for Electronic Safety and Security."
3. Bond TMGB to building ground in compliance with Section 28 0526 "Grounding and Bonding for Electronic Safety and Security."

C. Pathways for Electronic Safety and Security

1. Provide conduit and other pathways in accordance with Section 28 0528 "Pathways for Electronic Safety and Security."

D. Identification for Electronic Safety and Security

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1. Provide cable labeling in compliance with ANSI/TIA606-C - Administration Standard for Commercial Telecommunications Infrastructures and as described in Section 28 0553 "Identification for Electronic Safety and Security."
 2. Comply with Owner's preferred administrative labeling standards for cabling and its numerical positions on the termination hardware.
- E. Electronic Safety and Security Equipment Room Fittings
1. Provide each BDF/IDF and Security Room with proper equipment per Division 28 Specifications and Drawings.
- F. Electronic Safety and Security Horizontal Cabling
1. Provide cabling per Sections 28 1300 "Access Control," 28 1600 "Intrusion Detection" and 28 2300 "Video Surveillance."
- G. Termination Hardware:
1. Terminate all electronic safety and security cabling in proper enclosures, back boxes and electronic devices per Drawings and manufacturer standards.
- H. Data Communications Equipment
1. Data communications equipment will be OFOI.
- I. Inter-connectivity with Other Trades:
1. Network Interface – Coordinate interconnection of copper cabling provided by Communications Contractor with IP cameras, Emergency Call Boxes and Call Towers, Access Control Panels, etc. Refer to Security and Technology Drawings and Division 27 specifications for details.
 2. Fire Alarm – Provide Copper or fiber connectivity as required for fire alarm panels. Coordinate with Section 28 3100 "Addressable Fire Alarm System."
- [SELECT ONE OR BOTH OPTIONS IN SUBPARAGRAPH BELOW TO SUIT PROJECT.](#)
3. Elevator Equipment Room – Provide Copper connectivity to elevator equipment room(s). Coordinate with [Section 14 2100 "Electric Traction Elevators] [and] [Section 14 2400 "Hydraulic Elevators].
- J. Commissioning Administration:
1. Comply with Section 01 9113 "General Commissioning Requirements" for commissioning of the Electronic Safety and Security systems.
- K. Project Meetings
1. Comply with requirements of Section 01 3100 "Project Management and Coordination" and individual Division 28 Sections.

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2. Schedule an initial planning and coordination meeting to clarify Project requirements (systems, services, distribution methods, etc.), identify responsibilities, and establish key milestones for the Project.
3. Within two weeks of the initial meeting, provide a written report and project schedule to document the Electronic Safety and Security events and responsibilities associated with the Project.
4. Provide representation on the commissioning team as required for implementation of the Commissioning Plan. Refer to Section 01 9113 "General Commissioning Requirements."

1.6 ACTION SUBMITTALS

- A. Comply with requirements of Section 01 3300 "Submittal Procedures."
- B. Include the following:
 1. Product Information: Include the manufacturer's name, model or catalog numbers, catalog information, technical data sheets, pictures, nameplate data, and test reports as required.
 2. Shop Drawings and Wiring Diagrams: Provide elementary and interconnection wiring diagrams for communication and signal systems, control systems and equipment assemblies. Identify all terminal points and wiring.
- C. Parts List:
 1. Identify replacement parts recommended by the equipment manufacturer, quantity of parts, unit prices and lead time for each part.

1.7 SUBSTITUTION REQUESTS

- A. Comply with requirements of Section 01 2500 "Substitution Procedures."
- B. Submit product samples for substituted or end of life replacement products.

1.8 QUALITY ASSURANCE

- A. Follow Section 01 4000 "Quality Requirements" and this Section.
 1. All on-site installation technicians shall be manufacturer trained and certified.
 2. All installation technicians shall possess manufacturer's certificates for systems used on the project.
 3. Testing technicians shall possess manufacturer's certificates of completion for the test equipment used on the Project.
 4. Contractor shall not subcontract installation of Electronic Safety and Security system cabling, termination or testing without written approval of the Owner's Project Manager and EAC and Campus Safety Representatives.

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5. Contractor shall have worked satisfactorily for a minimum of five years on systems of the specified type and size.
6. Contractor shall furnish a list of references with specific information describing type of project, involvement in providing equipment and systems, and names and contact information.
7. Contractor shall coordinate quality assurance site observations and testing with the Owner's EAC and Campus Safety Representatives..

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Protect equipment and materials shipment and storage against physical damage, dirt, moisture, temperature extremes, and precipitation.

1.10 SPARE PARTS

- A. Provide one spare camera model for each type installed per Section 28 2300 "Video Surveillance."
- B. Provide spare access control parts per Section 28 1300 "Access Control."
- C. Provide one spare panic button for every 20 installed per Section 28 1600 "Intrusion Detection."
- D. Provide one spare IP communications plate for every three installed per Section 28 2600 "Electronic Personal Protection Systems."

1.11 WARRANTY

- A. Manufacturer's standard form in which manufacturer agrees to repair or replace all security equipment and cabling components that fail in materials or workmanship within specified warranty period.
 1. Provide parts registration, including date and serial numbers, for all components.
 2. Provide components that are performance matched and warranted by the manufacturer.
 3. Warranty Period: Two years from date of Substantial Completion including parts, labor and testing after replacement.

PART 2 - PRODUCTS

2.1 PRODUCTS

- A. Refer to individual Division 28 sections for approved products and schedules.

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- B. Provide materials, equipment and accessories that are standard Commercial-Off-The-Shelf (COTS) products of a manufacturer engaged in the manufacture of such products. All products shall be typical commercial designs that comply with the requirements specified and are readily available through manufacturers and authorized distributors.

2.2 EQUIPMENT REQUIREMENTS

- A. Where variations from the Contract Documents are requested in accordance with the "Uniform General Conditions," Section 01 6000 "Product Requirements," and Section 01 2500 "Substitution Procedures," 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.

2.3 LABELING

- A. Refer to Section 28 0453 "Identification for Electronic Safety and Security."

PART 3 - EXECUTION

3.1 SITE CONDITIONS

- A. Prior to starting the installation, schedule a walk-through of the Project site with the Owner's Project Manager and EAC and Campus Safety Representatives to review the installation documentation and verify that construction necessary for the installation has been completed and complies with Division 28 requirements.
- B. Verify liquid-carrying pipes are not installed in or above Security Rooms.
- C. Verify fire-rated plywood backboards are properly installed and painted in accordance with Section 09 9123 "Interior Painting."
- D. Verify conduit, raceways, and boxes are properly installed.
- E. Verify that Security Rooms are clean and dust free.
- F. Notify the Owner's Project Manager and EAC and Campus Safety Representatives immediately, and prior to installation, in the event that field conditions do not comply with Division 28 requirements.
 - 1. Proceed with installation only after non-compliant conditions have been corrected.

3.2 PREPARATION

- A. Protection of Surroundings:

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1. Protect surrounding construction in compliance with the requirements of Section 01 5000 "Temporary Facilities & Controls."
2. Patch and repair facilities, finishes, and equipment in compliance with Section 01 7300 "Execution."

3.3 PRODUCT QUALITY ASSURANCE

- A. Verify that all materials, accessories and equipment match the approved submittals.

3.4 FIRESTOPPING

- A. Properly fire-stop penetrations through fire barriers used for the placement of security cabling. Refer to Section 07 8413 "Penetration Firestopping."
- B. Coordinate with Electrical Contractor and ensure security pathway fire-stopping is properly identified and labeled. Laminate and permanently affix to each side of fire or smoke-rated partitions or floor ceiling assemblies, 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 stopping system
 4. Part and 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.

3.5 CONSTRUCTION WASTE MANAGEMENT

- A. Refer to Section 01 74 19 "Construction Waste Management and Disposal" for requirements.

3.6 SYSTEM TESTING AND STARTUP

- A. Refer to Section 28 0600 "Testing for Electronic Safety and Security."

3.7 CLOSEOUT ACTIVITIES

- A. Follow Section 01 7700 "Closeout Procedures" and this Section.
- B. Acceptance shall be subject to Substantial Completion of all work, successful post-installation testing and completion of the tasks listed below:
 1. Approval of Submittals for Project Record Documents.
 2. Completion of punch list items.
 3. Cleaning of installed work in compliance with Section 01 7700 "Closeout Procedures."
 4. Completion of Closeout Checklist in compliance with Section 01 7700 "Closeout Procedures."

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C. Submittals for Project Record

1. As-Built Drawings: As-built documentation shall be submitted five business days prior to obtaining approval for cutover to any portion of the security system. Furnish, for review and comments, four complete sets of E size (30 by 42) drawings along with electronic copies in .dwg and .pdf formats.
2. Final Approved Shop Drawings: Include the following:
 - a. Plan and elevations of Security Rooms.
 - b. Cable pathway details.
 - c. Backbone and horizontal cable locations and cable ID#.
 - d. Equipment.
 - e. Mac address and assigned IP address.
 - f. Block diagrams.
 - g. Interface requirements including connector types and pin-outs for all security equipment.
 - h. Fabrication drawings for custom built equipment.
3. Laminated As-Builts: One set of full size final as-built drawings. Place copies in the appropriate Security Room.
4. Equipment Inventory: Four sets of hard copies and one electronic copy of equipment /device inventory data for all cable, terminations and hardware in .xlsx format, listing products furnished, including:
 - a. Manufacturer's name and part numbers.
 - b. Cable numbers using the Owner's cable numbering standard.
 - c. Location and Owner's label / tagging assignments.
 - d. Mac address, cable ID, and IP address of all network devices.
5. Test Reports: Digital copies in PDF and native format with related Test Result Documentation.
6. Operation and Maintenance Manuals: Four hard copies and one electronic copy in PDF format.

D. Warranty

1. Within 21 days of Substantial Completion of the Project, provide Owner with the Warranty signed by the manufacturer. The warranty shall list the Owner and name of the facility, including location, as holder of the warranty.

E. Operation and Maintenance (O&M) Manuals:

1. Provide the following identification on the cover: "OPERATION AND MAINTENANCE MANUAL," the name and location of the system, equipment, building, name of Contractor, and contract number.
2. 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.

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3. Provide a "Table of Contents" and assemble the manual to conform to the table of contents, with tab sheets placed before instructions covering each subject. The instructions shall be legible and easily read, with large sheets of drawings folded in.
4. Include the following:
 - a. Internal and interconnecting wiring and control diagrams with data to explain detailed operation and control of the equipment
 - b. 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 with list of qualified permanent servicing organizations for support of the equipment, including addresses and certified qualifications

3.8 TRAINING

- A. Provide training in accordance with Section 01 7900 "Demonstration and Training" and Division 28 Sections.
- B. Develop and submit a training schedule approved by Owner's Project Manager and EAC and Campus Safety Representatives at least 30 days prior to each planned training session required in each Division 28 Section.
- C. Provide training for the particular equipment or system as required in each associated Division 28 specification.

END OF SECTION 28 0500

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