

## **ELECTRONIC SAFETY AND SECURITY DESIGN GUIDE SURVEILLANCE AND CALL STATIONS**

### **BACKGROUND AND PURPOSE**

The University of Houston Electronic Safety and Security Systems consists of Electronic Access Control (EAC), Video Surveillance, Intrusion Detection and Emergency Call Stations. This guideline will provide a basis of design for Surveillance and Call Stations with a list of minimum requirements for each design deliverable.

The Security Design professional is expected to apply these guidelines together with the University of Houston Master Specifications as appropriate for each Project. <https://uh.edu/facilities-planning-construction/vendor-resources/owners-design-criteria/master-specs/>

### **BASIS OF DESIGN**

#### **PATHWAY REQUIREMENTS**

Pathway for PoE or other network enabled devices fall under Division 27 requirements. Reference UH Network Infrastructure Design Standards  
<https://www.uh.edu/infotech/services/computing/networks/network-infra-standards/>

#### **VIDEO SURVEILLANCE**

Provides centralized management of Security Cameras including access to live and recorded video camera footage via existing Video Management System (VMS). New Camera installations are required to integrate with this system.

VMS Procurement and Installation responsibilities are as follows:

- VMS Workstations: OFOI (Project Funded)
- VMS Software Licenses: CFOI
- Expansion of Centralized Video Storage Servers: OFOI (Project Funded)
- Cameras, Mounts and accessories: CFCI
- VMS Pathway and Wiring: CFCI
- Exterior Component Grounding and Bonding: CFCI
- POE Switches supporting VMS Components: OFCI (Project Funded)
- POE injectors and Powered fiber-optic systems for remote components: CFCI
- Dedicated Camera Poles: CFCI

#### **Video Storage:**

Video Storage is Owner furnished Owner Installed (OFOI), but Project Funded.

To assist the Owner in determining storage requirements, Designer to provide a list of Camera types and Counts by Floor Distributor as part of each deliverable starting with Design Development.

#### **Camera Model Selection**

Reference the approved Camera Models in Master Specification Section 28 2300, Video Surveillance.

Review the approved models list at project kick-off and prior to Issue for Construction.

Immediately contact the Project Manager and CSS if alternative camera models are required or if approved camera models are discontinued, and obtain approval for model change recommendations.

Place cameras as needed to achieve views and resolutions in the areas listed in the Video Surveillance View and Resolution Guideline schedule below.

Clearly identify camera type, location, height, and mount type in the design documents. Refer to Video Camera Schedules in the Documentation Requirements Section.

**Camera Placement - Interior**

For interior cameras, generally mount them on the ceiling or recess ceiling. If ceilings are higher than 14ft or the functional application requires a lower installation (facial recognition areas), mount the camera on the wall or pendant.

Properly locate camera devices and coordinate camera placement with other ceiling and wall elements. Coordinate with the Architect to confirm mount, accessory, and camera housing colors, and verify color and/or painting options with manufacturers.

INTERIOR VIDEO SURVEILLANCE VIEW AND RESOLUTION GUIDELINES		
COMMON VIEW AREAS	REQUIRED VIEW	REQUIRED RESOLUTION
BUILDING ENTRIES / EXITS INTERIOR	FACIAL IDENTIFICATION	100 PPF
RECEPTION, CASHIER, AND TELLER STATIONS	IDENTIFICATION	80 PPF
STAIRWELLS AND LANDINGS	RECOGNITION	40 PPF
BACK OF HOUSE EXTERIOR DOORS	RECOGNITION	40 PPF
IT, SECURITY, MECHANICAL, ELECTRICAL FACILITIES ENTRY	RECOGNITION	40 PPF
HIGH VALUE STORAGE INTERIOR	RECOGNITION	40 PPF
DEPARTMENTAL SPACES REQUIRING AUDIT	RECOGNITION	40 PPF
CORRIDORS, OPEN SPACES AND WAITING AREAS	OBSERVATION	10 PPF

**Camera Placement - Exterior**

Mount Exterior Cameras on either soffits, parapets, walls, call towers, or poles.

Design the placement and mount detailing to meet viewing requirements, ensure easy serviceability, withstand Houston weather conditions, prevent water ingress into the mounting structure, and allow for manufacturer-required camera bonding and grounding.

Coordinate building-mounted camera rough-in details with the Architect to confirm proper waterproofing.

Ensure lighting pole-mounted camera details meet wind loading and cable pathway requirements.

If building or lighting poles cannot achieve the required camera views, place a dedicated camera pole. Refer to Section 28 2300, Video Surveillance for more information.

SITE AND EXTERIOR VIDEO SURVEILLANCE VIEW AND RESOLUTION GUIDELINES		
COMMON VIEW AREAS	REQUIRED VIEW	REQUIRED RESOLUTION
BUILDING APPROACH	GENERAL OBSERVATION	20 PPF
LOADING DOCK	RECOGNITION	40 PPF
PASSENGER DROP OFF	RECOGNITION	40 PPF
PARKING AREA ENTRY/EXIT LANES	LICENSE PLATE CAPTURE	120 PPF
PARKING AREAS	GENERAL OBSERVATION	20 PPF
WALKING PATHWAYS	GENERAL OBSERVATION	20 PPF
CALL STATION AREAS	IDENTIFICATION	80 PPF
EMERGENCY EXITS FROM EXTERIOR	GENERAL OBSERVATION	20 PPF
BIKE RACKS	RECOGNITION	40 PPF
EXTERIOR GATES, STORAGE PARCEL STORAGE LOCKERS	RECOGNITION	40 PPF
EXTERIOR GATERING SPACE	OBSERVATION	10 PPF
DEPARTMENTAL SPACES AS APPROVED	AS NEEDED	AS NEEDED

Coordinate data cabling requirements with the Technology Systems Consultant for exterior cameras.

### EMERGENCY CALL STATIONS

Provide either wall-mounted or free-standing IP Emergency Call Stations along with associated area video surveillance in parking areas, pedestrian walkways, multi-story building elevator lobbies and other locations determined by UH Security. General Location Requirements:

**Surface Parking Areas:** Two Call Towers visible from any point of parking area. 200ft – 250ft separation

**Parking Garages:** Wall-mounted units adjacent to Elevator Lobbies and Stairwell Entrances

**Pedestrian Walkways:** Two Call Towers visible from any point of walkway. 250ft – 500ft separation

**Multi-story Buildings:** Flush Call Station in Elevator Lobbies.

Coordinate data cabling requirements with the Technology Technology Systems Consultant.

Reference Master Specification Section 28 2600 Emergency Call Boxes for information.

**DOCUMENTATION REQUIREMENTS**

**RESPONSIBILITY MATRIX**

Include a Responsibility Matrix in all design documents to clearly outline the Project Scope. Example below:

SECURITY RESPONSIBILITY MATRIX				
SCOPE OF WORK	GENERAL CONTRACTOR	SECURITY CONTRACTOR	DOOR HARDWARE	OWNER
CONDUIT	X			
JUNCTION BOXES	X			
120V POWER	X			
ACCESS PANELS	X			
CABLE HOOKS / SECURITY ROOM RACEWAY		X		
SECURITY ROOM PLYWOOD	X			
SECURITY ROOM BUSSBAR AND TBB	X			
FIRE ALARM CONNECTIONS / RELAYS	X			
PANEL AND DEVICE BONDING		X		
SECURITY PANELS AND ACCESSORIES		X		
SECURITY POWER SUPPLIES AND BATTERIES		X		
SECURITY CABLING (NON IP)		X		
ELECTRIFIED DOOR HARNESSSES, HINGES AND LOCKSETS			X	
DOOR CONTACTS		X		
REQUEST TO EXIT (PIR)		X		
REQUEST TO EXIT (INTEGRATED)			X	
LOCAL AUDIBLE DOOR ALARMS		X		
POE DOOR HARNESSSES, HINGES AND LOCKSETS		X		
WIRELESS LOCKSETS		X		
ACCESS CONTROL SYSTEM LICENSES		X		
INTRUSION SYSTEM / DURESS BUTTONS		X		
NETWORK VIDEO RECORDERS				X
CAMERAS		INSTALL		FURNISH
CAMERA MOUNTS AND ACCESSORIES		INSTALL		FURNISH
VIDEO MANAGEMENT SYSTEM LICENSES		X		
NETWORK CABLING TO SECURITY ROOM	X			
NETWORK CABLING TO CAMERAS	X			
NETWORK CABLING TO POE LOCKS	X			
NETWORK CABLING TO CALL STANCHIONS	X			
CALL STANCHIONS AND BOXES		X		
POE INTERCOMS AND ACCESSORIES		X		
NETWORK SWITCHES				X
WORKSTATION COMPUTERS				X

**DEVICE MODELING**

Model each device using BIM software to Level of Development (LOD) 300 to simplify the review, coordination, and schedule development process. Avoid using annotative symbols not tied to a modeled family.

Model device families to scale, ensuring they are hosted to the appropriate surface, at the correct location and height.

Include mounting accessories, if applicable, in the modeled device families.

Customize the modeled device families to include parameters associated with information required in the appropriate Schedules Section.

Tie the modeled device families to annotative symbols similar to those shown below:

### DEVICE NUMBERING

Ensure all symbols include a unique and intuitive identifier to streamline review and coordination. Use a minimum text height of 3/32" when including text.

Identifiers vary from project to project, but usually follow a DT-LA## pattern:

Device Type (DT) – Level (L), Area (A), Device Number (XX).

Examples:

CR-1B001: Is a Card Reader Door on Level 1 Area B of the Drawings set,

C-501: Is Camera on Level 5 of small building with no Area Plan,

C-S025: Is a Camera on the Site Plan,

DB-3C002: Duress Button on Level 3 Area C,

DP-RA002: Door Position on the Roof Area A,

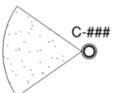
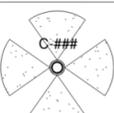
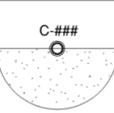
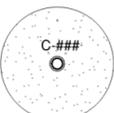
CT-001: Is a Call Tower (As they are only found outdoors, there is no need for an "S").

Note: Design numbering will be replaced by the Owner Label per Section 28 XXXX during construction.

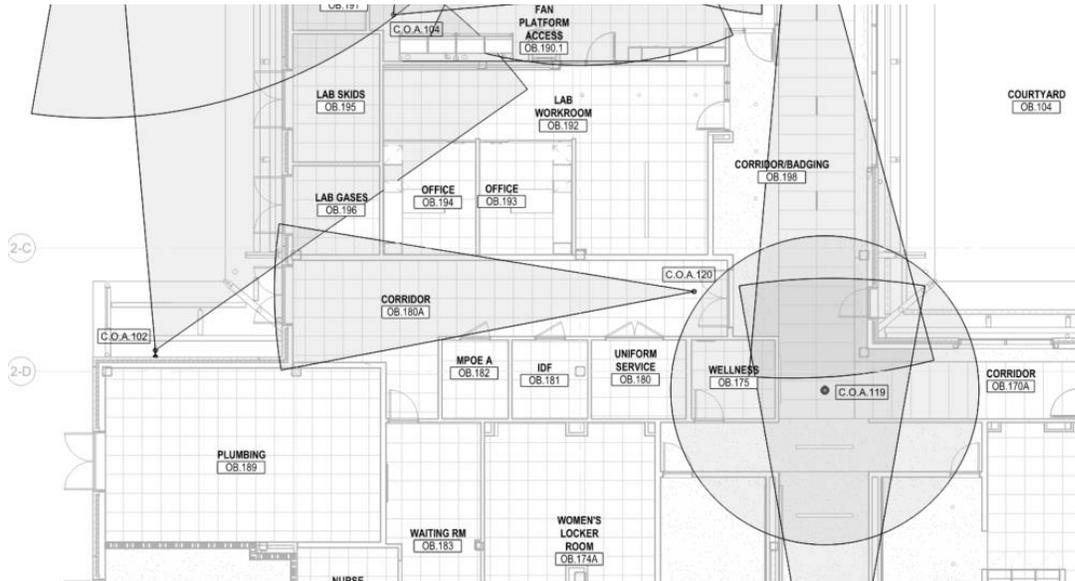
### DEVICE SYMBOLOGY

Device symbology is permitted to vary from designer to designer but should be clear enough to capture scope without flipping to between sheets (other than the index sheet).

#### Video Surveillance:

	FIXED IP CAMERA (VIDEO SURVEILLANCE)
	ADJUSTABLE MULTI SENSOR IP CAMERA (VIDEO SURVEILLANCE)
	MULTI SENSOR 180 DEGREE IP CAMERA (VIDEO SURVEILLANCE)
	FISHEYE 360 IP CAMERA (VIDEO SURVEILLANCE)

Note: Show cameras devices to scale with viewing cones adjusted such that desired viewing area is clear. Reference snip below:



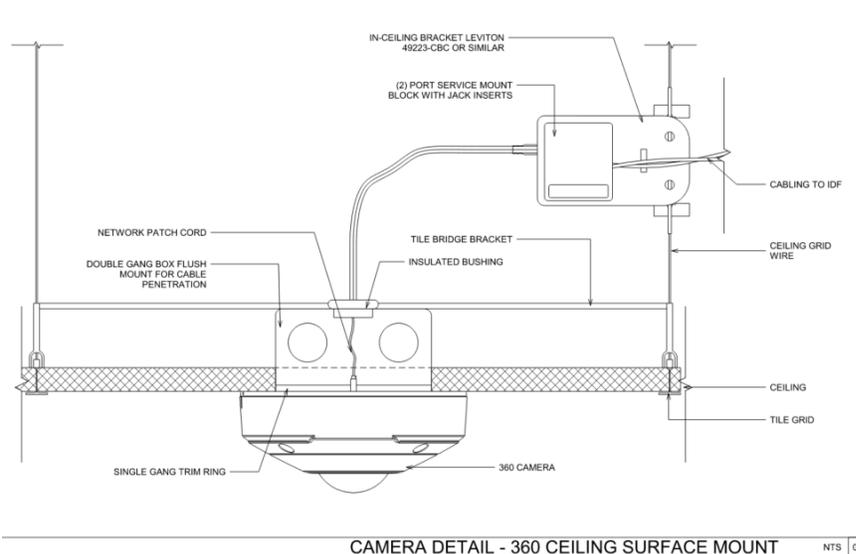
**DETAILS**

Include details for each unique installation type on the project in the final Construction Document review deliverable.

**Example**

Ceiling-mounted Cameras in drop ceilings and hard ceilings have different rough-in requirements so two details are required.

**Camera Rough-in Example:**



CAMERA DETAIL - 360 CEILING SURFACE MOUNT NTS | 02



**SCHEDULES**

Provide preliminary schedules at Design Development and completed schedules in Construction Document final review.

Include Schedules on associated site, floor or reflected ceiling plain sheets. Examples completed schedules is below:

**Video Surveillance:**

SITE CAMERA SCHEDULE									
CAMERA ID	LOCATION	PURPOSE	CAMERA TYPE	MOUNT TYPE	MOUNTING HEIGHT	RESOLUTION AT TARGET	ROUGH-IN DETAIL	CAMERA VIEW	TERMINATION LOCATION
C-S01	PARKING ENTRY	LPR	EXT LPR	CAMERA POLE	9' 0"	100 PPF	TY602/1	TY901/1	PARKING ENCLOSURE
C-S02	CALL TOWER 01	OBSERVATION	EXT MULTI 1	CALL TOWER PENDANT	12' 0"	40 PPF	TY601/4	TY901/2	CALL TOWER 01
C-S03	PARAPET	OBSERVATION	EXT MULTI 2 / PTZ	PARAPET	N/A	VARIES	TY601/5	TY901/3	FD 702
C-S04	SOUTHEAST FAÇADE	BIKE AREA RECOGNITION	EXT DOME 1	WALL ARM	12' 0"	40 PPF	TY601/1	TY901/4	FD 102
C-S05	ENTRY SOFFIT	ENTRY APPROACH RECOGNITION	EXT DOME 2	EXTERIOR RECESSED	14' 0"	40 PPF	TY601/2	TY901/5	FD 102
C-S06	LOADING DOCK	RECOGNITION	EXT DOME 1	WALL ARM	14' 0"	40 PPF	TY601/1	TY901/6	FD 154
C-S07	SOUTHWEST CORNER	EXTERIOR OBSERVATION	EXT MULTI 1	CORNER	14' 0"	20 PPF	TY601/3	TY901/7	FD 154
C-S08	CULLEN SITE ENTRY	OBSERVATION	EXT MULTI 1	LIGHT POLE	14' 0"	20 PPF	TY602/2	TY901/8	POWERED FIBER

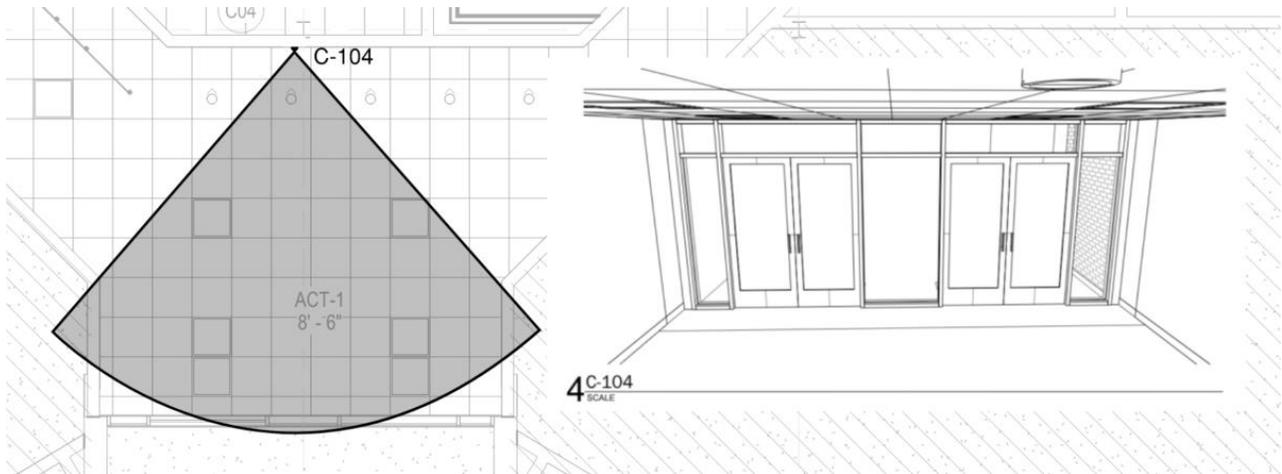
LEVEL 1 CAMERA SCHEDULE									
CAMERA ID	LOCATION	PURPOSE	CAMERA TYPE	MOUNT TYPE	MOUNTING HEIGHT	RESOLUTION AT TARGET	ROUGH-IN DETAIL	CAMERA VIEW	TERMINATION LOCATION
C-101	ENTRY LOBBY 102	OBSERVATION	INT DOME 1	RECESSED CEILING	12' 0"	20 PPF	TY603/1	TY902/1	REFERENCE TELECOM
C-102	VESTIBULE 100	FACIAL RECOGNITION	INT DOME 2	SURFACE WALL	9' 0"	100 PPF	TY603/2	TY902/2	REFERENCE TELECOM
C-103	RECEPTION 105	RECOGNITION	INT DOME 2	RECESSED CEILING	10' 0"	40 PPF	TY603/1	TY902/3	REFERENCE TELECOM
C-104	CORRIDOR 110	CORRIDOR OBSERVATION	INT DOME 1	RECESSED CEILING	10' 0"	20 PPF	TY603/1	TY902/4	REFERENCE TELECOM

**Site Devices:**

SITE DEVICE SCHEDULE						
SITE DEVICE	LOCATION	DEVICE 01	DEVICE 02	DEVICE 03	DETAIL	TERMINATION
CALL TOWER 01	NORTH PEDESTRIAN WALKWAY	IP CALL STATION 01	CAMERA C-S10		TY607/1	DB 194 (COPPER)
CALL TOWER 02	NORTH PEDESTRIAN WALKWAY	IP CALL STATION 02	CAMERA C-S11		TY607/1	POWERED FIBER
CALL TOWER 03	NORTH PEDESTRIAN WALKWAY	IP CALL STATION 03	CAMERA C-S12		TY607/1	POWERED FIBER
LIGHT POLE 01	PARKING AREA - NORTH	CAMERA C-S21	CAMERA C-S22		TY607/3	FD 101 (COPPER)
LIGHT POLE 02	PARKING AREA - CENTRAL	CAMERA C-S23			TY607/2	POWERED FIBER
LIGHT POLE 03	PARKING AREA - SOUTH	CAMERA C-S24			TY607/2	POWERED FIBER
CAMERA POLE 01	PARKING AREA ENTRY / EXIT	CAMERA C-S31	CAMERA C-S32	CAMERA C-S33	TY608/3	PARKING ENCLOSURE 01
CAMERA POLE 02	CULLEN DRIVE ENTRY	CAMERA C-S34	CAMERA C-S35		TY608/2	POWERED FIBER
CAMERA POLE 02	CULLEN DRIVE EXIT	CAMERA C-S36			TY608/1	POWERED FIBER

**CAMERA VIEWS**

Provide a simulated view for each camera. Use Video Surveillance Schedules to provide sheet reference.



## **CONSTRUCTION ADMINISTRATION**

Provide periodic overviews of the project, including a review of the construction advancements and observations that the contractors are working within set guidelines and conforming to technical specifications. The sequence and milestones of the observations should be coordinated and aligned with the General Contractors milestones and construction schedules. At a minimum these observations should be performed before any phase of construction is completed, i.e. underground conduit pathways before cover, underground conduit pathways before structural completion, in-wall rough in before closure, above-ceiling rough in before closure, device installation, equipment room turn overs, pre-punch, punch and punch list validation. Additionally review submittals containing technical information regarding material and equipment supplied by the contractor. Ensure compliance of product data and shop drawings conform to overall project specific design and UH design and master specifications. Review, approve and recommend any changes to the project specifications. Attend and contribute to OAC meetings, sub-contractor kick-off calls, first of its kind installation and QAQC meetings.

### **Activities:**

- Participate in project meetings as required to properly implement the work.
- Provide coordination with the Architect, Owner, Engineers, and other consultants.
- Respond to Requests for Information (RFI).
- Conduct site visits to observe the installation and quality of work and prepare Field Observation Reports. Field Observation reports include detailed information of deficiencies, exact location as referred to by drawing or specification. A photo or illustration of deficiencies and remediation needed to comply with the construction documents or owner standards. Any significant deficiencies that would affect overall project completion should be brought to the immediate attention of the general contractor, UH FPC Project Manager and UH EAC Project Manager.
- Review completed and returned Field Observation Reports to ensure remediation complies with Construction Documents and Owner Standards.
- Submit construction progress reports that address existing or potential problems. Coordinate with General Contractor for any unforeseen condition during design that needs to be addressed in construction administration phase to ensure conformance with UH Design standards and Master Specifications.
- Coordination with Architect, Owner, Engineers, and other consultants to issue ASI's, PRs, or updated construction documents as required.

### **Deliverables**

- Consultant approved product data submittals.
- Consultant approved shop drawing submittals.
- Field Observation Reports.
- Final Punch list Observation Reports.
- Consultant approved close-out documents.
- Record Drawings based on Contractor provided as-builts.