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# DIVISION 27 COMMUNICATIONS

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## Part 1 - General

### 1.1 Purpose

These guidelines identify and define Sam Houston State University requirements and policies for designing and installing telecommunications infrastructure and substructure at all Sam Houston State University facilities. Use of, and compliance with these guidelines is mandatory for Sam Houston State University personnel, and for architects, engineers, and installation contractors working on Sam Houston State University projects.

This General Information outlines the major codes, standards, and guidelines to be followed when planning ~~for~~. 8.6(g).9(c).7(d Td (f)Tj ,Tw 1.6(u3e)iv)9(e)3.9f98 2e

## 1.4 Scope and Deliverables

- A. The Division of Information Technology Services (IT@Sam) utilizes applicable codes, standards, and industry guidelines for the planning and design of telecommunications infrastructure. In the initial design phase of a building as well as with renovations or redesign, consideration shall be made to provide the space requirements for present telecommunications design needs and more importantly for maximum growth. Some of the guidelines herein may exceed industry standards and take precedence over those standards.
- B. IT@Sam requires that a complete set of blueprints and specification manuals be submitted for IT@Sam review. Once the blueprints are finalized, a complete set of 15x22 size blueprints is required, plus the architectural sheets and e-sheets in electronic format (PDF and DWG).

## 1.5 Regulatory Requirements, Codes and Standards

- A. All designs shall be in compliance with the following codes, industry standards, and practices, as well as, IT@Sam specific requirements described in this document. It is the responsibility of the designer to know and comply with the most current version of each document, or its most recent successor document, referenced below:
  - ANSI/EIA/TIA-568-B, Commercial Building Telecommunications Cabling Standard or its most recent successor document
  - ANSI/EIA/TIA-570, Residential and Light Commercial Building Telecommunications Wiring Standard or its most recent successor document
  - ANSI/EIA/TIA-569, Commercial Building Telecommunications Pathways and Spaces or its most recent successor document
  - ANSI/EIA/TIA-606, Administration Standard for the Telecommunications Infrastructure of Commercial Buildings or its most recent successor document
  - ANSI/TIA/EIA-607, Commercial Building Grounding and Bonding Requirements for Telecommunications or its most recent successor document
  - ANSI/NFPA-70,

- Corning EWP

## 1.5 Specific Equipment

In



- Pedestal: ETP-WM

Description: Wall-mount emergency/information station provides an integrated security solution.

- This link, [http://www.talkaphone.com/category.cfm?sct=1&sbs=2, co.9\(w\)13.5\(g\)06ehgs.8\(=\)0.T/MCI](http://www.talkaphone.com/category.cfm?sct=1&sbs=2,co.9(w)13.5(g)06ehgs.8(=)0.T/MCI)



- A. The Contractor, by submitting their RCDD number, certifies that he has a Registered Communications Distribution Designer on staff who will design the layout for this project, and that his cabling staff has the technical training and ability to install the cabling in a professional manner consistent with the best standards of the trade within BICSI guidelines. He further certifies that each cable system shall be tested fully to verify compliance with Category 6 standards and will be labeled consistently end to end meeting specifications given by IT@Sam. IT@Sam shall be notified prior to testing, and shall have the option to have a representative present during any or all testing. The Contractor shall complete the job within the expectations of Sam Houston State University's defined timeframe.
- B. The Contractor shall provide all the labor and scheduling coordination, as well as all materials and equipment, per IT@Sam specification as stated herein, which are required to render a BICSI Standard Category 6 compliant cabling system from each telecommunications port designated

- A. The Contractor shall place identical labels at the telecommunications faceplate and the patch panel in numerical order, as well as on each end of every cable for each Category 6 cable system. The labeling scheme shall be consistent with: the room number where it originates, a period, a letter indicating which faceplate within the room, and a number indicating the port within that faceplate, i.e., “203.a2”, or “110.b1”. If there are multiple faceplates within the room, the alphabetical sequence shall begin at the door and will increment sequentially in a clockwise direction around the room.
- Special circumstance connections, such as for wireless, camera, courtesy phone, or door access connections, should be placed together in a common area on the patch panel. These should be labeled with WAP-closet-







- E. Where telecommunications cables cannot be concealed within the walls at a telecommunications port location, surface mounted wire mold shall be installed. The wire mold shall extend into and above the ceiling a minimum of 2", and continue down to a surface mounted box. The surface mounted full-sized, single gang box will house the faceplate and modular jacks as well as provide mechanical protection for the terminals. The wire mold and surface mounted box colors shall match, and shall complement the existing wall color. Wire mold may be of either metal or plastic which shall be mechanically affixed to the surface. Mounting brackets will be concealed or pre-approved by IT@Sam.

### 3.3 Inside Plant Wireless

- A. Wireless access point locations shall be located above ceiling when practical and shall consist of 2 (Two) data lines terminated into a small surface mount box at the end of a 15' service loop. The loop shall be suspended above the ceiling and labeled for easy identification as well as being labeled on face plate and cable.
- B. A building shall have at least 2 wireless access point lines for every 1800 sf of floor space with staggered locations so that they don't overlap on the adjacent floor.
- C. Wireless access point line locations above the ceiling shall be marked with a removable sticker that is visible from the floor.

### 3.4 Inside Plant Telephone

- A. All telephone station lines shall be data station lines and shall follow the appropriate standards.
- B. There shall be at least one courtesy phone location per floor in a structure.
- C. The location shall be 40" AFF and be terminated with a wall phone keystone jack to a single gang telephone face plate, as specified.
- D. The location should be generally in the area of the elevator but final placement shall be decided after consulting with SHSU.

### 3.5 Inside Plant Public Safety and Cellular Communications

#### 3.5.1 Bidirectional Amplification for Public Safety Two-Way Radio and Cellular/Smart Phone

- A.

public safety

D.



### 4.3 Splicing

- A. All splices of copper cable up to 300 pair shall be set up as a butt splice and housed in an appropriately-sized stainless case. All stainless cases shall be pressure encapsulated. The splice itself shall be made utilizing a fold back technique. Splices up to 300 pair shall be made using 3m UY-2 filled connectors.
- B.



## 6.2 Certification Requirements ament tion

- F. Projection screens for ceilings higher than 10', shall be ceiling recessed electric and have a low voltage interface for contact closure control using Crestron control systems. The screen shall be HD, with a 16:9 aspect ratio. The cable used to connect the low voltage controller to the low voltage switch located in the ceiling shall conform to manufacturer's published guidelines.  
Wall-

into adjacent rooms. Walls or sound attenuation barriers must be used to insure each classroom's audio environment is isolated from each other.

### **6.7 Multimedia and Video, Basic Technology Enhanced Classroom**

- A. The teaching position is defined by the positioning of the floor box, the screen(s) and the projector(s). Coordination with MEP and others will be necessary to ensure that the teaching podium can be placed over the floor box without creating obstructions to the projected image.
- B. Projector used in SHSU classrooms shall have an RJ-45 Ethernet capability with a web interface



### 6.10 Lighting, Conduit and Networking, Basic Technology Enhanced Classroom

- A. Do not place any ceiling light fixtures within 7' of any projection screens, unless reflectors restrict lights directly downward to not spill or reflect onto screens. The front panel of lights reflecting onto the screen will be independently controlled.
- B. Plan for the instructor to adjust all the lighting levels for his needs from near the teaching position. All lights will be controlled from a minimum of two points; near entry/exit to room, and near location of instructor/media cabinet. Besides being able to completely shut off the front panel of lights near the projection screen, the other lights in the room should be able to be dimmed by switching off either half the bulbs in each fixture, or either one or two bulbs in each fixture.
- C. AV consultant and MEP shall coordinate to ensure that the location of pendant lighting shall not obstruct the throw of the projector image.

### 6.11 Storage and IDF, Conduit and Networking, Basic Technology Enhanced Classroom

- A. Provide at least one lockable closet per building, minimum 25 sf (5' W x 5' D x 10' H). Support and storage closets will be accessible from hallways and will NOT be inside the classrooms, with a 36" wide entrance, electrical power and lighting for IT@Sam storage of emergency support ladder and replacement equipment to prevent loss of class time.
- B. When an AV IDF is specified for a project, the IDF shall have two 4" EMT conduits running between the AV IDF and a telecommunications closet. In addition, one 4" EMT conduit shall provide a pathway between the AV IDF and the hallway cable tray. The IDF shall have at least one free standing rack. The IDF shall have data, electrical power, and lighting installed. Consult owner for final design details.

### 6.12 Specific AV Equipment

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- C. Ceiling height must be no less than 10', and no greater than 11' for acoustical and video requirements.
- D. Array microphones will be used to capture both the instructor and the student audio interaction.
- E. Video Conferencing System shall be capable of sending and receiving shared content.
- F. Shall be capable of hosting multi-point calls using the software option.
- G. Shall be capable of 1080p camera and video + content resolution. If required, the appropriate software key shall be installed.

### 7.1 Projection Screens, ITV Technology Enhanced Classroom, ITV additions

- A. Contractor will specify screen size and will install ceiling recessed screens.
- B. Optimal distance between the first row of seating and the projector screen is 1.5 x the width of the specified screen. Optimal distance to farthest is 4x screen height.
- C. Provide space for whiteboard on side(s) of screen.
- D. The bottom of the screen should be a minimum of 4' above the audience floor, allowing those seated toward the rear of the audience to see the screen.
- E. Projection screens for ceilings 10' or lower, shall be a Dalite model, ceiling recessed manual. The screen shall be a HD, with a 16:9 aspect ratio.
- F. Projection screens for ceilings higher than 10', shall be ceiling recessed electric and have a low voltage interface for contact closure control using Crestron control systems. The screen shall be HD, with a 16:9 aspect ratio. The cable used to connect the low voltage controller to the low voltage switch located in the ceiling shall conform to manufacturer's published guidelines. A ceiling mounted switch to cut power to the screen in the event the device needs to be serviced. Wall-mounted raise/lower switches would be required adjacent to the lighting controls, centralized at a location near the instructor's station. These switches would need to be clearly marked with text "Screen Control", "Raise", and "Lower" Coordinate with the MEP and IT@Sam early in the project to avoid possible problems with teaching position placement.
- G. For ITV simulation: all student seats to be within 70-degree side-side cone established from center of screen. No greater than 30-degree vertical angle defined from the eyes of the closest student viewer to the top of any screen; horizontal line parallel to the floor that extending through the eyes.

### 7.2 Data Projector Mounting, ITV Additions

- A. In general, the projector is ceiling mounted approximately 12' – 16' from screen in front of projector lens in a room with standard height ceiling. Distance from screen to front of projector lens varies with size of screen, which is determined by height of ceiling and depth of room, and projector model/type. IT@Sam and distance calculators should be consulted to determine the correct projector make and model.
- B. The projector ceiling mounting kit is aligned to be centered on the projector screen – center row of ceiling grid should be clear between 0' – 20' (from projection screen) of all A/C vents, smoke detectors, lighting, etc. to allow for future repositioning of projector infrastructure.

- C. Mounting hardware for non-suspended ceiling mount projector locations shall be recommended by AV consultant and approved by contractor. IT@Sam and distance calculators should be consulted to determine the correct projector make and model.
- D. Projector power shall have a duplex 120-volt power outlet and two data outlets with a 15' tail to allow for repositioning of projector if needed. The projector should be mounted in a plenum enclosure or be flush mounted in the tile with the projector's support column. See specific equipment for ceiling Projection Mounting System required by IT@Sam.
- E. HVAC intake/exhaust ducts should not be located any closer than 6' to the projector location; this will eliminate circulation competition with the projector's own fan and cooling unit.

### 7.3 Audio, ITV Additions

- A. Sound system in the classroom shall be a 70-volt distributed system with speakers placement determined based on an analysis of the height of the ceiling, the dispersion of the speakers crossing at 50" above the floor and a constant sound footprint over the seating area of the room with a sound pressure level of 50-60 dB above background noise level that shall be attainable at 50% of total system gain. Speaker count and placement should be approved by IT@Sam.
- B. Amplifiers shall be sized for the number of channels of sound reinforcement required for the application or if sound zones are required.
- C. Noise level is to be no higher than NC = 30 in general and NC = 20 at grills or registers. ANSI/ASA S12.60-2002 sets 35 decibels for maximum background noise for unoccupied school classrooms. Separate classrooms should not share same plenum area, as sound will carry over into adjacent rooms. Walls or sound attenuation barriers must be used to insure each classroom's audio environment is isolated from each other.
- D. Ceiling pendant mounted microphone system. Voice tracking camera positioning may be required. In room systems with two or more cameras the camera position presets available shall be greater than ten with the final number available coordinated with IT@Sam.
- E. All microphones shall be connected to a DSP sound mixer and be programmed to minimize feedback and provide the sound reinforcement of the student speaking while turning off the closest overhead speaker. Mix minus unit shall be configured with expansion cards as needed and have at least two spare inputs and outputs.

### 7.4 Multimedia and Video, ITV Additions

- A. The teaching position is defined by the positioning of the floor box, the screen(s) and the projector(s). Coordination with MEP and others will be necessary to ensure that the teaching podium can be placed over the floor box without creating obstructions to the projected image.
- B. Projector used in SHSU classrooms shall have an RJ-45 Ethernet capability with a web interface for setting the projector configuration remotely. The projector shall also be Crestron RoomView compatible.
- C. Projectors used in SHSU classrooms shall have at least 2 HDMI inputs.
- D. Projectors used in SHSU classrooms shall be capable of fitting the Chief RPMAU mount and the mount will have a locking mechanism listed under specific equipment.
- E. All projector locations shall have two data lines located above ceiling in close proximity to the projector when practical and shall consist of a data line terminated into a small surface mount

box at the end of a 15' service loop. The loop shall be suspended above the ceiling and labeled

- D. Contractor shall be responsible for networking all projector and control system devices in consultation with SHSU to integrate all Crestron network devices into the SHSU local area network and program existing Crestron Fusion RoomView server including XPaneloonis0(e)9.5(o)3.4(o)1autry

## 8.1 Projection Screens, Auditorium or Large Lecture Halls Addition

- A. There may be a requirement for two projection screens or a larger single screen in large classrooms. Contractor will determine and coordinate such needs with IT@Sam staff.
- B.



- Typical Labeling







