DESIGN STANDARD FOR AUDIOVISUAL SYSTEMS

General:

Solano Community College (SCC) is intent on moving to 21st century unified communications and data systems, consistent with industry standards and best practices as they evolve. To that end all SCC Audio/Visual (AV) will be digital (unless laws or codes specify otherwise) and/or will be digitally controlled through an enterprise management system, and be tightly integrated into the data components of the SCC Technology plan.

Purpose:

The purpose of this document is to standardize the basic elements of the audiovisual systems design process, and to guide AV to the integrated solutions envisioned above. This Design Standard has the purpose of creating a consistent application of AV systems design throughout the Solano Community College District, therefore achieving a standard of quality for maintenance and reliability throughout all renovation and new building projects. This standard serves as a supporting document to the Solano Community College Technology Plan. Any deviations from this standard _**must**_ be approved by SCC Information Technology (IT) Management.

Background of Audiovisual Systems within the District:

Audiovisual Systems cover both instructional and informational AV technology. Instructional AV technology covers systems that support teaching, learning, and research. Students and staff members use this technology in pursuit of the College's educational goals. Informational AV technology covers the digital signage systems deployed around the College. Students and staff members use this technology to share content with the different audiences that may occupy the spaces within the College.

For the purposes of this document the instructional AV technology will be referred to as AUDIOVISUAL SYSTEMS. Informational AV technology will be referred to as DIGITAL SIGNAGE SYSTEMS.

Audiovisual Systems-Related Support Staff and Committees:

Chief Technology Officer
Director, Technology Services & Support
Desktop Services
Network Services
Strategic Technology Advisory Committee (STAC)

Design Standard:

Smart Classroom General Descriptions

Audio/Video (A/V) Cabinet:
- ➢ Located next to wall adjacent to teaching wall 5' from teaching wall corner.
- ➢ 2" Conduit from ceiling to a recessed A/V wall plate behind A/V cabinet location.
- ➢ Refer to Page 4 of this document for conceptual drawing
- ➢ In certain situations, the room configuration may dictate the elimination or repositioning of the A/V Cabinet. Elimination/Repositioning of cabinet **must** be coordinated with SCC IT Management.
- ➢ Equipment purchase, cabinet construction and installation to be accomplished by SCC IT.

Lighting:
- ➢ Shall be coordinated for appropriate levels related to room functions.
- ➢ Lighting controls, if control system is installed, can be controlled via the District's A/V control system.
- ➢ Lighting controls **must** be configured so that lights ***directly over the teaching wall*** can be dimmed or turned off independently of the other lights in the room for maximum viewing capability.
- ➢ Industry standards and guidelines shall be followed.
- ➢ Refer to Codes & Standards section of this document for a list of related standards.

Power requirements:
- ➢ (1) Single gang dual power outlet ***above the ceiling*** at the projector location or ***behind*** TV in a recessed box.
- ➢ (2) Single gang dual power outlets at the A/V cabinet. (1) to be at the table top height of Cabinet and (1) below/behind cabinet, within a ***recessed box***.
- ➢ Refer to Page 4 of this document for conceptual drawing

Data requirements:
- ➢ (1) 4-port wall jack, in a recessed box, below/behind cabinet next the single gang power outlet noted above.
  - • Data cables to be run to IDF/MDF within the building
  - • Data ports should be labeled as per the District labeling standard detailed in the SCC Telecom Standards Guideline.
- ➢ (2) Cat 6 (shielded) to be run and terminated from a wall jack, within a recessed box, located next to the 4-port data plate at the smart cabinet location to the Projector/TV location.
- ➢ Refer to Page 4 of this document for conceptual drawing.

Audio requirements:
- ➢ (2) Audio wires (proper gauge for installed speakers) to be run from AV wall plate, within a recessed box, at the smart cabinet location to the speaker locations within the room. Consult with district IT for location of speakers.
  Note: Audio terminations at wall plate to be coordinated with District IT.
- ➢ Refer to Page 4 of this document for conceptual drawing

Projection screens:
- ➢ May be motorized or manual roll up and shall be sized appropriately for the room size and desired coverage areas.
- ➢ Motorized screens shall be used in areas in which the screen sizes are larger than 12 ft., typically Large Lecture, Multipurpose rooms and Cafeterias.
- ➢ Motorized screens to be programmed and controlled via the A/V control console if possible.
- ➢ Smaller screens shall be manual roll up.
- ➢ Screens are to be centered on teaching wall mounted no more than 6" below the ceiling (in rooms with normal ceiling heights).
- ➢ Screens to be purchased by District IT and installed by A/V contractors.

Screen mounts:
- ➢ Must have backing of sufficient size to support size of screen.
- ➢ Mounts to be purchased by District IT and installed by A/V contractors.

Projectors:
- ➢ Shall be industry standard High Definition, with HDMI and Internet Protocol (IP) input, native 16:9 format.
- ➢ Mounted at an appropriate distance from screen so as to take up as much screen space as possible. Coordinate with District IT prior to mounting.
- ➢ Projector mount may have to be offset 3.5" right of screen as viewed from the screen location to accommodate for the offset of the projector lens (If Lens is not center of projector). Coordinate with District IT prior to installation.
- ➢ Care should be taken to **NOT** place anything in the projection path (i.e. lights, art work hangers etc.)
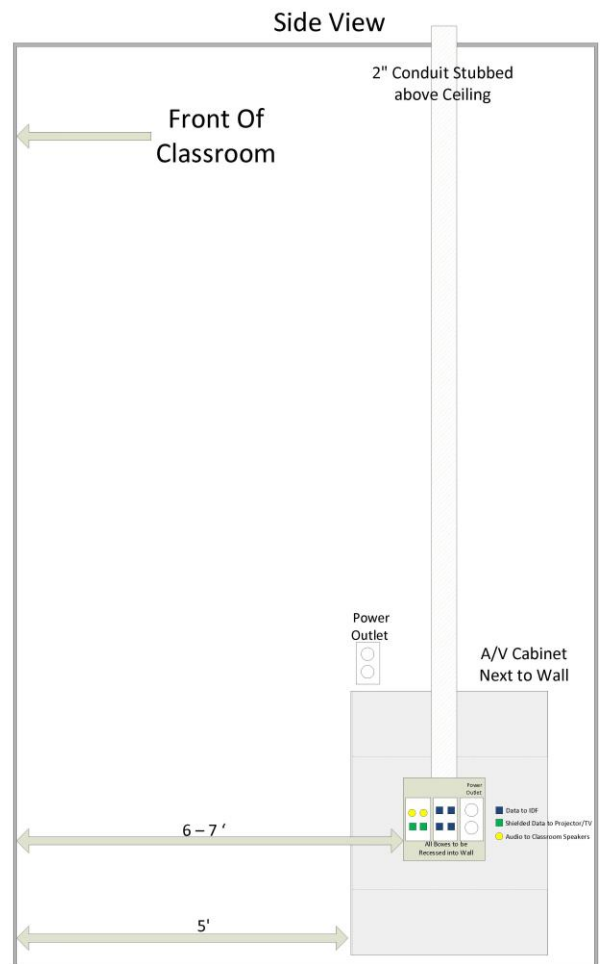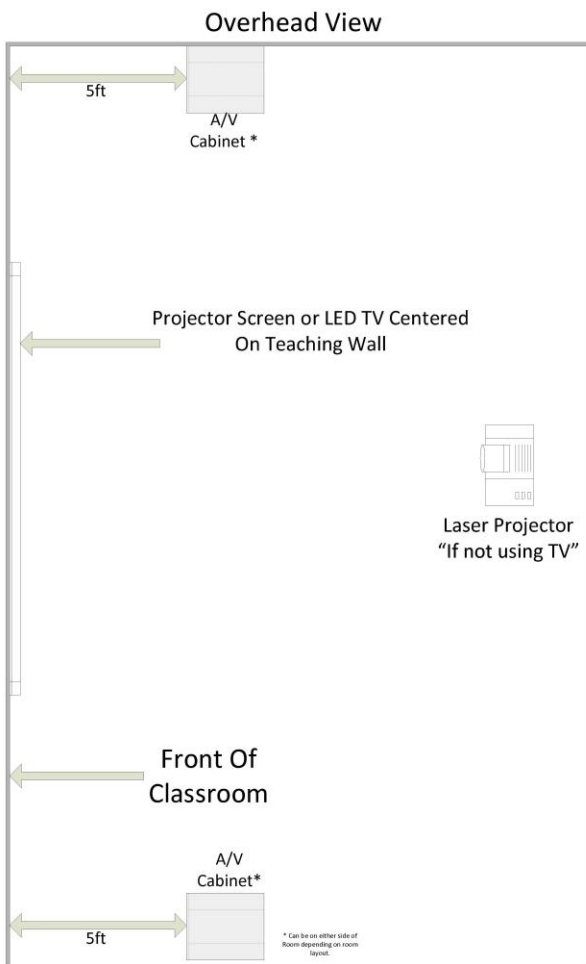- ➢ Projectors to be purchased by District IT and installed by A/V contractors.

Television:
- ➢ Industry standards should be followed when determining the correct size of the room. The chart below can assist with determining screen size. A/V Consultant in conjunction with District IT will determine appropriate size for room.

Optimal viewing distance by the size of the television and the resolution
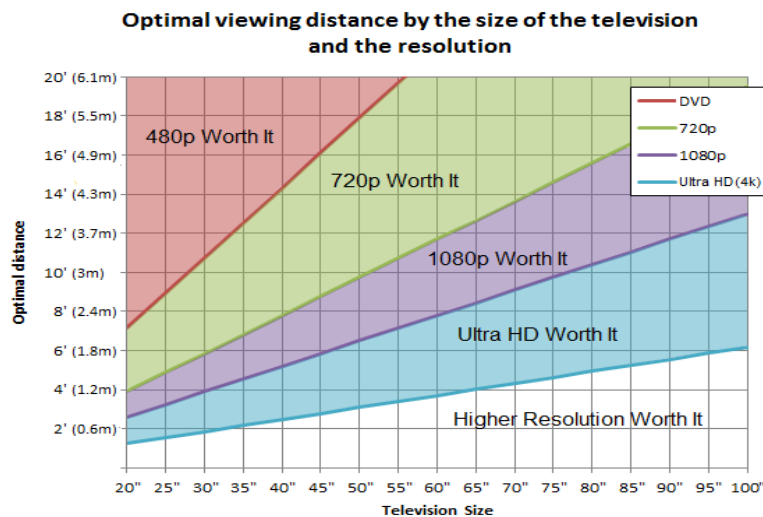
Television: (cont)

- ➢ Proper backing for the TV must be installed for TV locations.
- ➢ TV's should at a minimum have (3) HDMI and (1) RS-232 connections.
- ➢ Power and Data locations to be within a recessed box and above TV Mount and behind TV. Consult with District IT on location.
- ➢ Tilted Mounts shall be installed as to allow easy access to TV Inputs and Controls.
- ➢ TV's and Mounts to be purchased by District IT and installed by A/V contractors.

Visual Layout of Smart Classroom

Overhead View

5ft

A/V Cabinet *

Projector Screen or LED TV Centered On Teaching Wall

Laser Projector "If not using TV"

Front Of Classroom

A/V Cabinet*

5ft

* Can be on either side of Room depending on room layout.

Side View

2" Conduit Stubbed above Ceiling

Front Of Classroom

Power Outlet

A/V Cabinet Next to Wall

Power Outlet

■ Data to IDF
■ Shielded Data to Projector/TV
● Audio to Classroom Speakers

All Boxes to be Recessed into Wall

6 – 7 '

5'

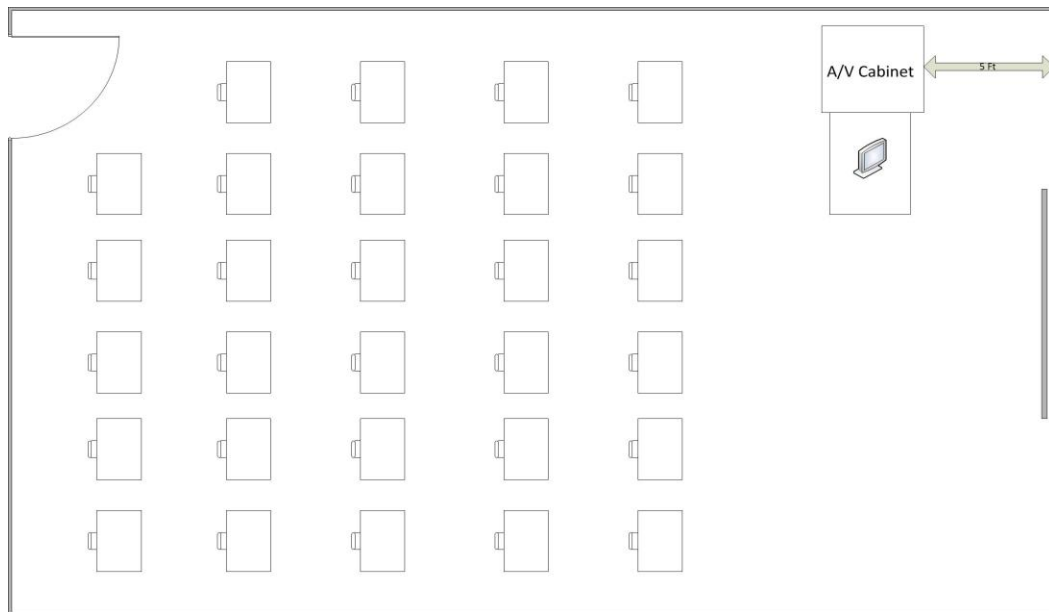**Audiovisual Systems – Smart Classroom**

Smart Classrooms shall utilize a ceiling mounted projector and projection screen or LED TV, A/V Cabinet and ceiling mounted speakers.

An ADA compliant teaching table shall be located next to the A/V cabinet. Monitor and document camera shall be installed on the table.

System inputs shall be via input panel in the A/V Cabinet that will include HDMI, Audio and data ports.

Classroom content will be managed and controlled via the Districts A/V control system. Displays, Inputs and speakers shall integrate with A/V control system to support automatic switching of inputs and control of audio volume.

Typical Smart Classroom Layout

Audiovisual Systems – Computer Labs

Computer Labs shall utilize a ceiling mounted projector and projection screen or LED TV, A/V Cabinet and wall/ceiling mounted speakers.

An ADA compliant teaching table shall be located next to the A/V cabinet. Monitor and document camera shall be installed on the table.

A/V cabinet to be configured with (2) teacher station monitors.

System inputs shall be via input panel in the A/V Cabinet that will include HDMI, Audio and data ports.

Classroom content will be managed and controlled via the Districts A/V control system. Displays, Inputs and speakers shall integrate with A/V control system to support automatic switching of inputs and control of audio volume.

Typical Computer Lab Layout

A/V Cabinet   5 Ft
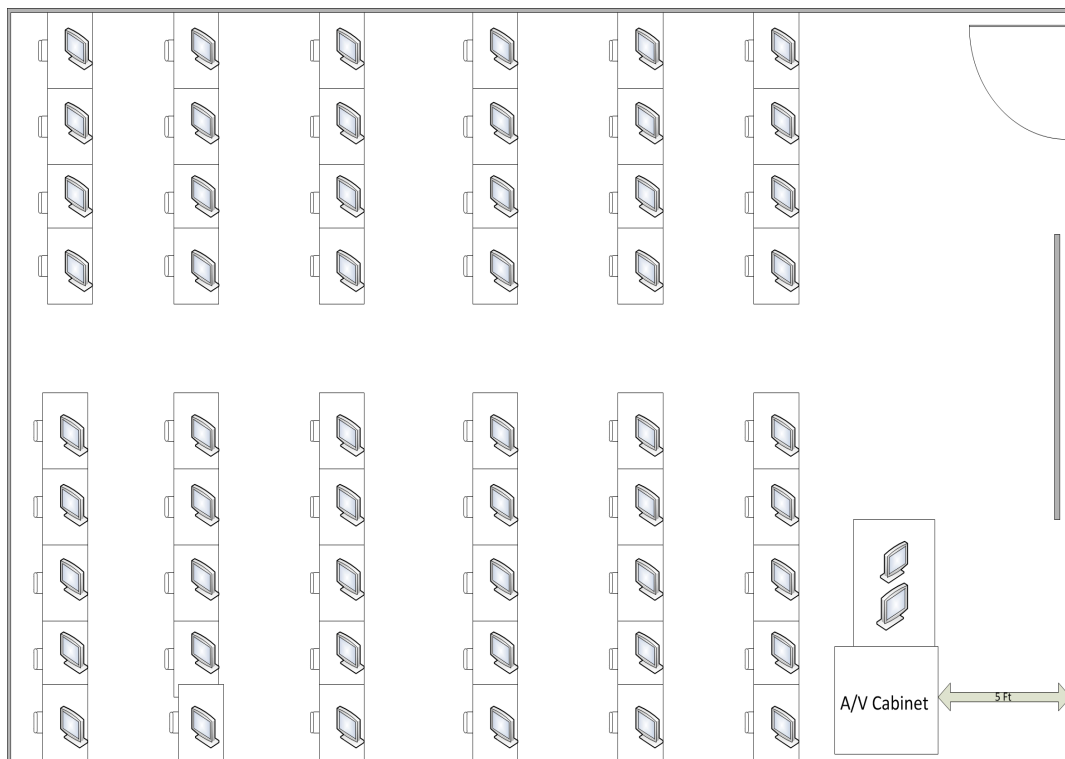
Audiovisual Systems – Conference Rooms

Conference Rooms shall utilize single wall mounted LED flat panel display sized accordingly for video content presentation. Size of flat panel display shall be determined by using the minimum display dimension formulas illustrated in Figure 1.
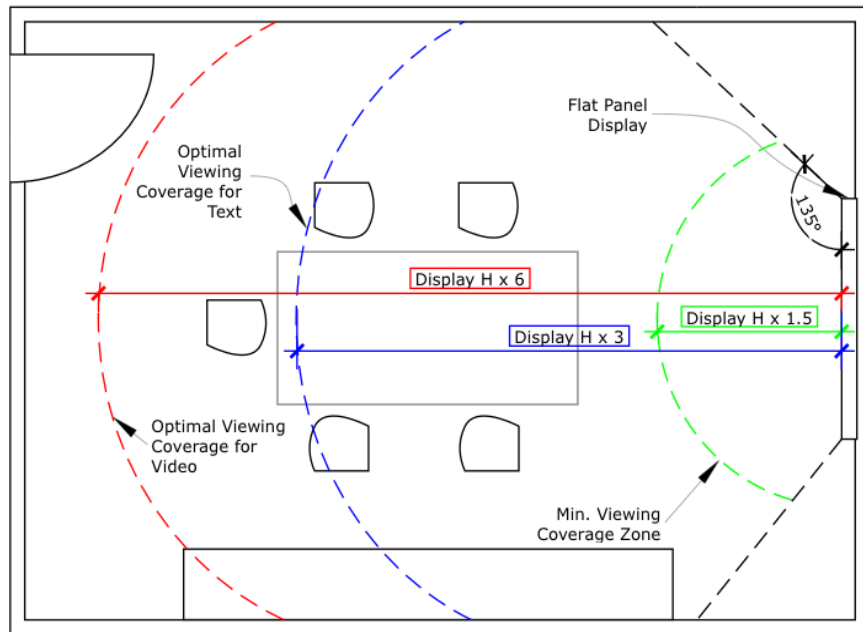

Figure 1: *Minimum display dimensions shall be calculated using the coverage area formulas represented above. Acceptable coverage area begins at the green dashed circle, which is calculated by obtaining the height of the display and multiplying it by 1.5. Alternatively, one could obtain the desired minimum coverage area and divide this by 1.5. Similarly, the blue and red dashed circles represent the optimal coverage areas for text and video images, respectively.*

Power requirements:
  ➢ (1) Single gang dual power outlet, within recessed box, to be installed above TV mount/behind the LED display.

Data requirements:
  ➢ (1) 2-port wall jack, within recessed box, behind LED display.
  ➢ (1) 2-Port data jack to be installed within the cable cubby or input panel on display wall.
    • Data cables to be run to IDF/MDF within the building
    • Data ports should be labeled as per the District labeling standard detailed in the SCC Telecom Standards Guideline.

Audio/Video requirements:

- ➢ (2) HDMI Cables run from Input Panels (either Cable cubby or Display Wall) to TV-HDMI inputs.
- ➢ Ceiling mounted speakers may be installed to provide the best sound throughout the conference room.
  - Coordinate with District IT to determine if speakers are needed.
- ➢ Tilted Mount shall be installed to provide easy access to display inputs and controls wherever possible

Lighting shall be coordinated for appropriate levels related to room functions.

Industry standards and guidelines shall be followed.

Refer to Codes & Standards section of this document for a list of related standards.

Typical Conference Room Layout
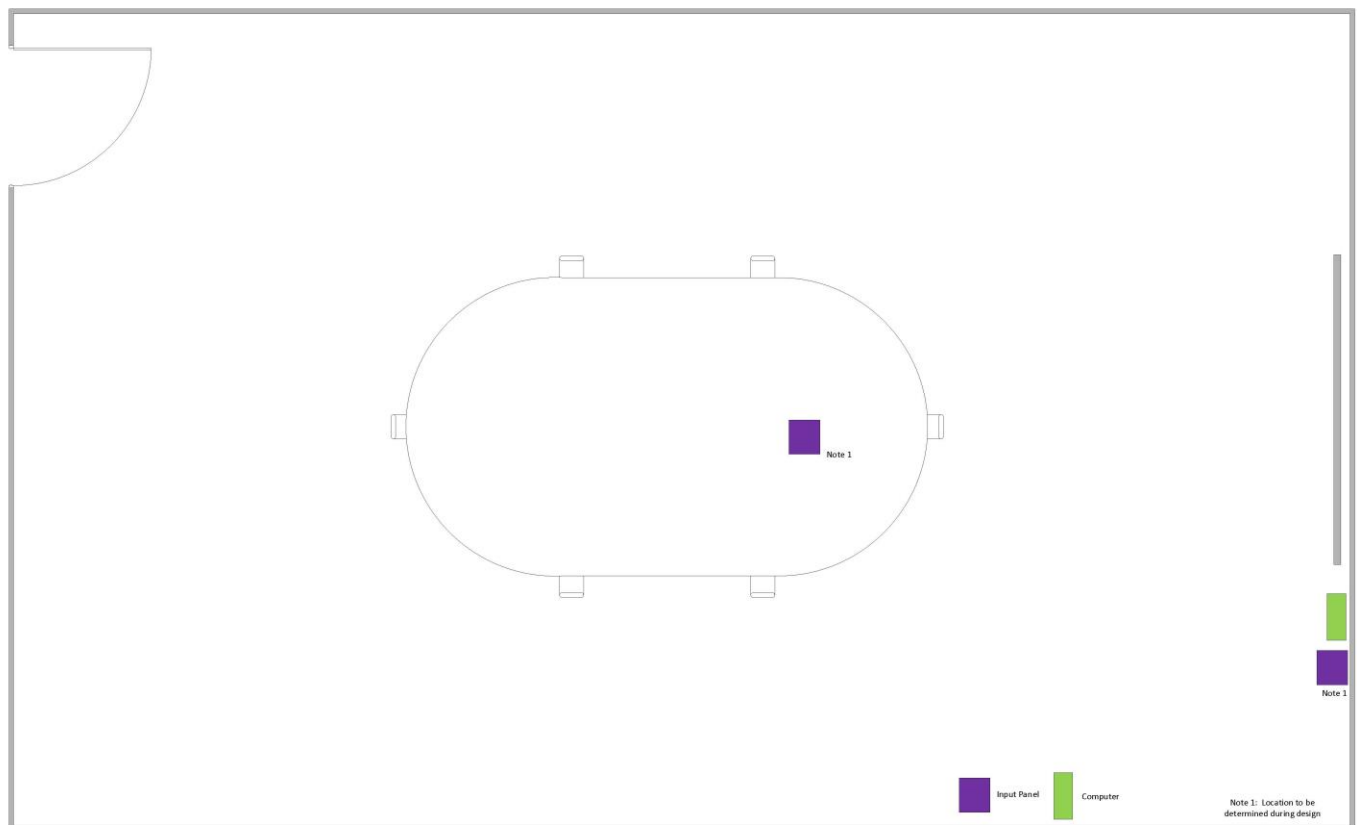
Note: *Larger conference rooms may require the addition of multiple cable cubbies to provide Data and Power outlets only. Coordinate number and location of additional cubbies with SCC IT.*

Digital Signage Systems

Digital signage content shall be displayed via LED flat panel displays sized accordingly for this application. Size of flat panel display shall be determined by using the minimum display dimension formulas illustrated in Figure 1. Digital signage is found typically in Lounges and public spaces, but may be required in specialty areas as well.

Power requirements:
  ➢ (1) Single gang dual power outlet, within recessed box, installed above TV mount/behind the LED display.

Data requirements:
  ➢ (1) 2-port wall jack, within recessed box, installed above TV mount/behind LED display.
    • Data cables to be run to IDF/MDF within the building
    • Data ports should be labeled as per the District labeling standard detailed in the SCC Telecom Standards Guideline.

Audio/Video requirements:
  ➢ Tilted Mount shall be installed to provide easy access to display inputs and controls wherever possible
  ➢ TV should be mounted on wall so as to permit optimal viewing and is to be secured to the mount to prevent easy theft.
  ➢ If deployed in outdoor or unmonitored public areas consideration should be given to anti-vandalism measures including cabinets with toughened Macaralon type screen protection.
  ➢ Content will be managed and controlled by the districts content management system

Coordinate all power/data and installation requirements with SCC IT prior to installing.

Refer to Codes & Standards section of this document for a list of related standards.

Preferred Manufacturers:

LED Flat Panel Displays:
1. Samsung
2. Sharp
3. NEC
4. Other as approved by IT

Video Projectors:
1. Panasonic
2. Hitachi
3. Epson
4. Other as approved by IT

Equipment purchases will be by District IT department.   Certain circumstances may dictate vendor purchase (specialty/Nonstandard classroom equipment)

If contractor purchased, a complete Equipment lists/Bill of Materials **_must_** be approved by SCC Technology Services Management prior to purchase.

Purchases must follow the Technology Purchases policy of Solano Community College.

Substitutes Allowed:

All substitutions must be approved by SCC IT Management. Requests for substitutions must be submitted in writing prior to design, purchase, and installation.

Associated Design Standards and Construction Specifications

Codes and Standards:
ANSI/INFOCOMM 1M-2009 Audio Coverage Uniformity in Enclosed Listener Areas
ANSI/INFOCOMM 2M-2010 Standard Guide for Audiovisual Systems Design and Coordination Processes
ANSI/INFOCOMM 3M-2011 Projected Image System Contrast Ratio

Construction Specifications:
274100 Audiovisual Systems
274200 Digital Signage Systems