SECTION 27 40 00 -- CLASSROOM AUDIO/VISUAL GUIDELINES

PART 1 GENERAL

1.1   SUMMARY

A.   Guidelines: Installed classroom AV design is inherently tied to the specific space in question. Factors such as ambient light control, sound reflectivity, size and shape all play a role in determining appropriate display tools.

   1.   Designs should reflect the industry standard DM (digital media) signal transmission..
   2.   Designs should recognize the need to refresh AV equipment and cabling on average every five years.
   3.   Projects that result in spaces that will be scheduled by the Registrar are required to add Crestron DM room control system with LCD touch panel interface as well as programming to add spaces(s) to the CIS RoomView server.

1.2   SUBMITTALS

A.   Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

B.   Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.

C.   Warranty: Submit manufacturer's standard warranty. We require 2 years parts & labor extended warranty on all installations. Include labor and materials to repair or replace defective materials. Warrantees must be submitted as a project deliverable.

D.   Maintenance Data: Submit manufacturer's maintenance data, including maintenance schedule.

E.   Extra Stock: Submit extra stock equal to 2 percent of total used.

1.3   QUALITY ASSURANCE

A.   Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

B.   Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 780, "Definitions" Article.

PART 2 PRODUCTS

2.1   ROOM SPECIFICATIONS

A.   Smaller spaces (<12 seats) are typically outfitted with:

   1.   Large format digital flat panel display (Samsung LCD/LED commercial/professional models. ME55/ME65 or equivalent).
   2.   Direct input HDMI and VGA/w audio-follow.
   3.   Flat panel displays have built-in speakers for audio playback.
   4.   Hard room network taps specified for patron access to the web-based video.

5.   Ethernet connection is also needed for the RoomView Express room-control/monitor software.
6.   Crestron digital room controller DM-RMC-100
7.   Crestron wall plate digital media transmitter DM-TX-200
8.   Crestron Digital presentation system DMPS-300-C
9.   Crestron LCD touch panel TPS-6
10. Install requires minimum 6 data taps dedicated to room control/operation.

B.   Medium spaces (15-25) vary greatly in approach. Typically a projector/screen combination is specified, but depending on pedagogy:

1.   Dual flat panels (Samsung LCD/LED commercial/professional models. ME55/ME65 or equivalent).
2.   Projector should be 16:9 aspect ratio with a minimum resolution of 1920 x 1200. (Eiki LC-WB200/LC-WUL100L or current Eiki equivalent + appropriate lensing. HD wide screen.)
3.   Installed projection screen, recessed/powered/tensioned where appropriate (DaLite).
4.   Depending on room size, installed room speakers may be required for audio playback. (JBL Control series; sized/quantity to space; ceiling-voice; wall-program)
5.   Equipment rack can either be free standing or contained within room podium.
6.   Digital room system (Crestron DMPS-100/200/250/300)
7.   Digital room controller (Crestron DM-RMC-100)
8.   Digital wall plate transmitter (Crestron DM-TX-200)
9.   LCD touch panel (Crestron TPS-6).
10. Region-free BluRay DVD (commercial/professional models. Sony BDPS480 or equivalent)
11. Auxiliary video/audio inputs to include: composite video; component YPbPr video; HDMI; VGA; 3.5mm audio; RCA audio. The Crestron room control system in the rack requires network connectivity for remote access/polling.
12. Install requires minimum 8 data taps dedicated to room control/operation.

C.   Large spaces (+50) dependent on room configuration and materials to be displayed:

1.   Multiple projectors are positioned so as to enable projection and simultaneous use of whiteboards. This requires projectors capable of creating viewable images in rooms lit for note-taking. (Eiki LC-WUL100L or better or current Eiki equivalent. HD widescreen.)
2.   Installed motorized projection screen for rooms with projection. (DaLite)
3.   Audio reinforcement is required in larger spaces, especially spaces that are dual-purposed for classroom and event activities.   (JBL speakers, Audio-Technica wireless mics/receivers/antennas, Shure mixers, Mackie/Prosonus sound boards, BSS digital audio processors, Crown amplifiers)
4.   Teaching podium (Spectrum) outfitted with a condenser gooseneck microphone (Audio-Technica). Consider installed computer with dedicated monitor (Dell small form tower + monitor on articulating arm). Smart Sympodium annotation tablet can be configured to double as monitor for installed computer. Aux video/audio inputs; laptop connections (HDMI + VGA), power, ethernet
5.   Minimum (2) channels of wireless audio – (4) is optimal; up to (6) hard-wired audio mic inputs for panel discussions. Loudspeaker size, location and quantity are space-specific. (Audio-Technica wireless receivers, wireless handhelds & lavalieres, antenna system. ListenTech assistive listening transmitters/receivers per ADA requirements for room size) (ListenTech LS-02-072)
6.   Digital soundboard is required to manage these audio signals. (Presonus) Crestron programming to accommodate need for 'live' mode (mic mixing) and 'auto' mode basic presentations with podium mic.

7. Require region-free BluRay DVD so visiting faculty/speakers from international locations can be accommodated (Sony BDPS480 or equivalent).

8. Spaces of this size may be considered for lecture capture installation. This requires an Echo360 HD (current campus standard) appliance, network connectivity and input feeds from teaching podium VGA, audio and as an option, installed room camera(s). Required brand: Echo 360 HD capture system; Crestron camera-control joystick, Vaddio USB HD cameras. Network connectivity to rack-mounted capture device and wall-mounted cameras needed for this service. Annual licensing not included in these specs, but is required. Coordinate through Catherine Zabriskie, Director, Academic Technology Services.

9. Equipment racks (Middle Atlantic) are to be kept to a minimum size to accommodate required equipment. Depending on room size/complexity, a media booth may be required.

10. Crestron room processor (DMPS-100/200/250/300)

11. Crestron digital room controller (DM-RMC-200)

12. LCD touch panel (Crestron TPS-6). More complex spaces may require larger touch panels (Crestron TPS-12) or additional wall control panels if podium is removable.

13. Require region-free BluRay DVD playback. (Sony BDPS480 or equivalent).

14. Aux video/audio inputs required: composite video; component YPbPr video; HDMI; VGA; 3.5mm audio; RCA audio. The Crestron room control system in the rack requires network connectivity for remote access/polling.

15. Audio processing gear (BSS LondonBlu digital sound processors, Crown amplifiers, Furman power supplies)

16. Audio-Technica 4000 series wireless mic systems (ATW4313) + body pack lavaliere mic AT989 + handheld mic AEWT3300)

17. Proper rack mounted cooling (multiple fans) may be required to avoid overheating from concentration of rack equipment processing gear.

18. Consider addition of video teleconferencing codec (Tandberg)

19. Install requires minimum 10 data taps dedicated to room control/operation.

D. Ambient light control and adjustment is critical to managing the quality of the projected/displayed image in a given space. Where exterior windows are present it is recommended that both light-filtering and room-darkening shades be installed. Room lighting should be banked such that the fixtures closest to the screen/display can be turned off/dimmed, leaving some light banks available for task lighting/note taking. In a large space with many/large windows, tying the control of these shades/screens/lights to the room touch panel is required.

E. Network connectivity should include room wireless access. In spaces outfitted with room control touch panels, adequate rack space is required to house standard playback media (BluRay DVD) as well as room controller, audio amps and auxiliary inputs. Equipment rack location will require at minimum (3) data ports – laptop user, Crestron, installed computer).

F. Proper power to support all equipment, rack equipment and motorized screen. Low voltage power control for lighting, shades. Recommend installation of an uninterruptible power supply (APC UPS SC1000/1500) at equipment rack.

G. Media Technology Service (AV): Specification of current equipment models must be MTS approved equal or equivalent.

1. Projector Models Specified on Recent Projects:
   a. Eiki LC-XL200 (XGA – 1024 x 768, 6000 ANSI lumens, 1000:1 contrast ratio)
   b. Eiki LC-WXL200 (WXGA – 1280 x 800, 5500 ANSI lumens, 800:1 contrast ratio)
   c. Eiki LC-WB200 (WUXGA – 1920 x 1200, 5000 ANSI lumens, 2000:1 contrast ratio)

    d.   Eiki LC-WUL100 (WUXGA – 1920 x 1200, 5000 ANSI lumens, 2000:1 contrast ratio)

    e.   Eiki LC-WSP3000 (WUXGA – 1920 x 1200, 5000 ANSI lumens, 2000:1 contrast ratio)

2.   Required Crestron components to support RoomView remote access in a digital space:

    a.   Crestron digital presentation system DMPS-100/200/250/300

    b.   Crestron digital media switcher (DM-MD8x8)

    c.   Crestron DM input cards (DMC-HD/CAT)

    d.   Crestron Room Controller + DM CAT receiver (DM-RMC-100/200/300)

    e.   Crestron Ethernet card (C2ENET-2)

    f.   Crestron Digital media CAT transmitter wallplate (DM-TX400-3G) A/V Preferred Vendors:

Shanix Technologies
40 Worthington Road
Cranston, RI 02920
(401) 941-4222
www.shanix.com.

Ambient
75 New England Way
Warwick, RI 02886
(401) 941-8500
www.ambientsound.com

3.   Shanix & Ambient have developed and implemented the standard Crestron interface used on campus. They are required to be involved with any new rooms which include the installation of a Crestron control system in order to ensure it is programmed properly with the Brown standard GUI and that the system in integrated into our existing RoomView control server.

H.   Video Conferencing:

1.   Brown currently maintains a Tandberg VCS-TMS infrastructure system for video conferencing.   Currently we are specifying Tandberg endpoints.   The information contained in this section is inclusive of the video conferencing portion and does not include the displays needed to see (Projection system). Those systems should follow the definition on the previous pages of this document.

2.   Items outside the video conferencing equipment which are required include:

    a.   Flat panel or projector/screen

    b.   Audio system

    c.   Crestron control system

    d.   Polycom conference phone

    e.   Telephone line

    f.   Network connection setup on the Brown/VOIP network

    g.   Power outlets to support equipment

3.   Other factors can greatly affect a video conference and need to be considered:

    a.   Room Brightness – are shades needed? dimmable lighting?

    b.   Room set-up in a manner such that all seats are viewable via the camera.

    c.   Sound issues – is the room fairly sound proof – minimized sound in and out of the

           room

    d.   Number/location of cameras needed

    e.   Number/location of microphones needed

4.   Tandberg Standard Equipment Specifications:

    a.   C20:

        1).   1 - CTS-QSC20-K9, QuickSet C20 - Incl NPP, PreHD1080pCam, Mic, Rmt, Cbls

        2).   1 - CTS-PHD-1080P12X, 12 X Zoom Percision HD Camera

        3).   1 - CTS-PHD-1080P4XSI, 4 X zoom Percision HD Camera

        4).   1 - LIC-QSC20-DD, QuickSet C20 - Dual Display Option (requires LIC-QSC20-HD)

        5).   1 - LIC-QSC20-HD, QuickSet C20 - HD (720p) option

        6).   1 - LIC-QSC20-PR, QuickSet C20 - Premium Resolution Option (requires LIC-QSC20-HD)

        7).   Support 1-3yr

        8).   CTS-CTRL-DVC8 TelePresence Touch 8"

    b.   C40:

        1).   1 - CTS-INTP-C40-K9, IntPkg C40 - NPP, PHD 1080p Cam, Rmt Cntrl, Mic, Cbls ++

        2).   1 - LIC-INTP-C40-DD, Codec C40 Integrator Package Dual Display (DD) Option

        3).   1 - LIC-INTP-C40-MS, IntPkg C40, 4Way Individual Transcoding Multisite Option

        4).   1 - LIC-INTP-C40-PR, IntPkg C40 Premium Resolution (1080p/720p60) Option

        5).   Support 1-3yr

        6).   CTS-CTRL-DVC8 TelePresence Touch 8"

    c.   C60:

        1).   1 - CTS-INTP-C60-K9, IntPkg C60 - NPP, PHD 1080p Cam, Rmt Cntrl, Mic, Cbls ++

        2).   1 - LIC-INTP-C60-MS, IntPkg C60, 4 Way HD Multisite (HD-MS)

        3).   1 - LIC-INTP-C60-PR, IntPkg C60 Premium Resolution (1080p/UXGA) Option

        4).   Support 1-3yr

        5).   CTS-CTRL-DVC8 TelePresence Touch 8"

5.   Any installation of Video Conferencing equipment must be coordinated with CIS Media Technology Services. This coordination will ensure that proper equipment is selected and that the units can communicate with the CIS Central Video Conferencing Infrastructure.

PART 3 EXECUTION

3.1   INSTALLATION

A.   Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.

B.   Restore or replace damaged components and finishes. Test for proper operation. Clean and protect work from damage.

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