CNMCC Westside Campus WSI Building – Classroom Scope of Work Outline

The following information specifies audiovisual needs for each classroom at the CNMCC Westside Campus WSI Building (Construction PHASE III).

The total numbers of classrooms for Westside I (WSI) is thirteen (13) with a total of two (2) conference rooms and are indicated as follows:

- WSI Classrooms will include rooms 102, 103, 104, 106, 201, 301, 302, 303, 307, 310, 312 and 313
- Room WSI-304 is a Lecture Hall with expanded audiovisual requirements
- Conference Rooms will include WSI-309 and WSI-314A
- CNM will provide thirteen (13) motorized front projection screens, twelve (12) ceiling projector mounting plates and one (1) motorized projector lift. All projection screens shall be controlled from the control system via low voltage contact closure.
- Overviews of the functionality per room type are below.

A. The following is intended to further describe the Work and clarify design intent and is not an exhaustive description of the systems.

B. WSI Classrooms 201, 301, 302, 303, 307, 310, 312 and 313:

1. A ceiling mounted motorized front projection screen shall be available for display of a single ceiling mounted video projector.

2. Input sources shall be the following:
   a. Computer with audio located in the lectern. Computer to be provided by CNM.
   b. Inputs for portable devices located in the Flip-top control panel: VGA with 3.5mm audio, HDMI and composite video with stereo audio.
   c. Document Camera: VGA cable shall be located at the lectern side grommet to allow connection of a portable document camera.
   d. Blu-Ray player (via HDMI). Player to be mounted in the lectern equipment rack.

3. Program audio volume control/equalization/amplification shall be provided. Loudspeakers shall be ceiling mounted.
4. In WSI rooms 307, 310, 312 and 313 (only) a microphone input (FXLR) shall be located at the side grommet for connection of a portable wireless microphone. Volume control to be via portable microphone receiver (only).

5. A lectern will be located at the front of the room and the audio visual equipment shall be rack mounted in the lectern equipment rack. A 20’ “whip” shall be provided to connect the lectern to wall plate.

6. System control shall be via a flip-top control button-type control panel mounted in the lectern top surface. Button text and locations to be confirmed with CNM before ordering.

7. The flip-top control panel is the user interface to the system and shall include the following controls:
   a. Source Selection: “PC”, “DVD”, “Laptop”, “HDMI”, and “DOC”. (Composite video input to be selected from the front panel of the switcher (only).)
   b. Program Volume control: “VOL +” and “VOL -” with bar graph
   d. Video and Audio Mute: “A MUTE” and “V MUTE”
   e. System power – on/off macro. (“PWR”) Power macro will include: projector on/off with warm up/cool down lockout and projection screen up/down.

C. Classroom WSI-102 (Piano Classroom):

1. A ceiling mounted motorized front projection screen shall be available for display of a single ceiling mounted video projector.

2. Input sources shall be the following:
   a. Computer with audio located in the lectern. Computer to be provided by CNM.
   b. Inputs for portable devices located in the Flip-top control panel: VGA with 3.5mm audio, HDMI and composite video with stereo audio.
   c. Blu-Ray player (via HDMI). Player to be mounted in the lectern equipment rack.
   d. A stereo audio input from the Yamaha keyboard system “hub”. Provide audio cable from Hub Monitor Output to Crestron Switcher. Source labeled as “PIANO” on the control panel. This will allow audio from a piano to be played back through the wall mounted program speakers.

3. Program audio volume control/equalization/amplification shall be provided. The system shall be configured in stereo audio mode. Two loudspeakers shall be wall mounted.

4. An auxiliary audio input rack panel shall be provided and connected to the CNM provided Yamaha keyboard control system.
5. The analog audio from the Blu-Ray player shall be connected to an audio DA and routed to the associated input of the DigitalMedia switcher as well as the CD input of the CNM provided Yamaha system. This will allow use of the Blu-Ray player as a CD player for the keyboard system.

6. An equipment rack will be located at the front of the room and the audio visual equipment shall be rack mounted within the equipment rack. A 5’ “whip” shall be provided to connect the equipment rack to wall plate. A rack mount keyboard tray shall be provided.

7. System control shall be via a flip-top control button-type control panel mounted in the equipment rack top surface. Button text and locations to be confirmed with CNM before ordering.

8. The flip-top control panel is the user interface to the system and shall include the following controls:
   a. Source Selection: “PC”, “DVD”, “Laptop”, “HDMI”, and “PIANO”. (Composite video input to be selected from the front panel of the switcher (only).)
   b. Program Volume Control: “VOL +” and “VOL -” with bar graph
   d. Video and Audio Mute: “A MUTE” and “V MUTE”
   e. System Power – on/off macro. (“PWR”) Power macro will include: projector on/off with warm up/cool down lockout and projection screen up/down

D. Classrooms WSI-103 (Art Studio) and WSI-104 (Ceramics Studio)

1. A ceiling mounted motorized front projection screen shall be available for display of a single ceiling mounted video projector.

2. Input sources shall be the following:
   a. Computer with audio located in the lectern. Computer to be provided by CNM. The CNM furnished computer monitor will be mounted by the Vendor to an adjustable arm mounted to the top of the portable equipment rack.
   b. Inputs for portable devices located in the Flip-top control panel: VGA with 3.5mm audio, HDMI and composite video with stereo audio.
   c. Blu-Ray player (via HDMI). Player to be mounted in the lectern equipment rack.
   d. Document Camera: VGA cable shall be located at the lectern side grommet to allow connection of a portable document camera.

3. Program audio volume control/equalization/amplification shall be provided. Loudspeakers shall be ceiling mounted.

4. A portable equipment rack will be provided with built-in keyboard tray and side flip-up shelf.

5. This will allow use of the Blu-Ray player as a CD player for the keyboard system.
6. The equipment rack will be located at the front of the room and the audio visual equipment shall be rack mounted within the equipment rack. A 15’ “whip” shall be provided to connect the equipment rack to wall plate.

7. System control shall be via a flip-top control button control panel mounted in the equipment rack top surface. Button text and locations to be confirmed with CNM before ordering.

8. The flip-top control panel is the user interface to the system and shall include the following controls:
   b. Program Volume Control: “VOL +” and “VOL -” with bar graph
   d. Video and Audio Mute: “A MUTE” and “V MUTE”
   e. System Power – on/off macro. (“PWR”) Power macro will include: projector on/off with warm up/cool down lockout and projection screen up/down

E. Classroom WSI-106 (Earth and Planetary Science Lab):
   1. A ceiling mounted motorized front projection screen shall be available for display of a single ceiling mounted video projector.
   2. Input sources shall be the following:
      a. Computer with audio located in the equipment rack. Computer to be provided by CNM.
      b. Inputs for portable devices located in the Flip-top control panel: VGA with 3.5mm audio HDMI and composite video with stereo audio.
      c. Blu-Ray player (via HDMI). Player to be mounted in the lectern equipment rack.
      d. A Document Camera input (VGA w/ 3.5mm audio) (or second laptop input) will be mounted on a single gang j-box provided on the instructor’s lab bench.
   3. Program audio volume control/equalization/amplification shall be provided. Five (5) loudspeakers shall be ceiling mounted.
   4. An equipment rack will be provided with a rack mountable keyboard tray.
   5. The equipment rack will be located at the front of the room and the audio visual equipment shall be rack mounted within the equipment rack. A 15’ “whip” shall be provided to connect the equipment rack to the wall plate.
   6. System control shall be via a flip-top control button control panel mounted in the equipment rack top surface. Button text and locations to be confirmed with CNM before ordering.
   7. The flip-top control panel is the user interface to the system and shall include the following controls:
b. Program Volume Control: “VOL +” and “VOL -” with bar graph
d. Video and Audio Mute: “A MUTE” and “V MUTE”
e. System Power – on/off macro. (“PWR”) Power macro will include: projector on/off with warm up/cool down lockout and projection screen up/down

F. Lecture Hall WSI-304:

1. A ceiling mounted motorized front projection screen shall be available for display of a single video projector located on a ceiling mounted motorized lift. The lift is provided under separate contract. The Vendor is responsible for all required hardware and mounts to mount the video projector in an inverted position within the lift.

2. The following sources can be displayed:
   a. Computer with audio located in the lectern. Computer to be provided by CNM.
   b. Inputs for lectern portable devices located in the Flip-top control panel: VGA with 3.5mm audio, HDMI and composite video with stereo audio.
   c. Document Camera: VGA cable shall be located at the lectern side grommet to allow connection of a portable document camera.
   d. Blu-Ray player (via HDMI). Player to be mounted in the lectern equipment rack.
   e. Two HDMI inputs on wall plates at the front of the room.
   f. An HDMI input located in the control booth
   g. An analog computer input: VGA w/ 3.5mm stereo audio located in the control booth

3. Speech and program audio volume control/equalization/amplification shall be provided. This room is equipped with ceiling loudspeakers for “lecture hall” mode and wall mounted loudspeakers for use as program audio reinforcement during “performance” mode.

4. A gooseneck microphone will be mounted on the lectern and connected directly to the floor box plate.

5. A lectern will be located at the front of the room and audio visual equipment shall be rack mounted in the lectern equipment rack. A 3’ “whip” shall be provided to connect the lectern to the floor box plate.

6. Microphone inputs are provided in the three floor boxes and the two front wall plates. Record outputs are provided in the two wall plates.

7. A mixing console is provided for live audio mixing during “performance” mode and will be located in the control booth. With the exception of the two lectern microphone inputs and the two wireless microphones, all microphone inputs will be routed directly to the mixing console.
The outputs of the mixing console (Stereo Left/Right Program Audio and a Mono Speech) will be routed to the Digital Signal Processor (DSP).

8. One HDMI output will be located in each of two of the floor boxes. This output will follow the projected image.

9. System control shall be via a flip-top control touch screen control panel mounted in the lectern top surface and a table-top touch screen located in the control room. The system shall have the ability to control the lectern sources from either touch screen. The system shall function with or without the lectern operational in case it is removed from the room.

10. The flip-top touch screen is the user interface to the system and shall include the following controls:
   a. Source Selection: “PC”, “DVD”, “LAPTOP”, “HDMI”, “DOC” and “AUX”.
   b. Program Volume Control: “VOL UP” and “VOL DOWN” with bar graph
   c. Microphone Volume Controls: volume up and volume down with bar graphs for the lectern microphone and the one wireless microphone. Both of these volume controls are via the system DSP.
   d. Blu-Ray Transport Control: All standard controls with arrow buttons as a pop-up control when “DVD” is selected as a source.
   e. Video and Audio Mute: “AUDIO MUTE” and “VIDEO MUTE”
   f. System Power – on/off macro. (“PWR”) Power macro will include: Lift up/down with projector cool down delay, projector on/off with warm up/cool down lockout and projection screen up/down.

11. The control booth touch screen shall include all controls from the lectern touch screen and include the following additional controls:
   a. Source Selection: “HDMI 1”; “HDMI 2”; “BOOTH HDMI”; “BOOTH VIDEO” and “BOOTH LAPTOP”
   b. Microphone Volume Control: volume up and volume down for second wireless microphone.
   c. Utility page with: Lift up/down; Screen up/down and Video Projector on/off.

12. Equipment rack for switchers, audio amplifiers and signal processing equipment shall be located in the control booth. Sufficient cable length shall be provided to allow the rack to be pulled out for service and maintenance.

G. Study Room WSI-309 and Conference Room WSI-314A:

The two Conference Rooms will utilize a single 70” wall mounted flat panel monitor. Input connections will be provided in the table. Connections to include HDMI and analog computer video/audio (HD15 video with 3.5mm audio) on a single gang plate. Twisted pair transmitters to be mounted within the table leg(s). Disconnects (RJ-45) for table inputs shall be provided in the floor cores (Wiremold poke thru).
System control to be provided by a wall mounted single-gang button controller. Controls to include (with icon-type graphics):
Power ON, Power Off, Laptop, HDMI, Volume Up, Volume Down and Audio Mute. Control Panel shall include timed power off function to turn off the display after a predetermined time in which the control panel in not used.

The following items will need to be provided and will be the components used for the classroom installations. Specifications listed below are a minimum level of performance. Equipment substitutions shall be clearly noted as part of the bid response and are subject to review and approval by CNM. The equipment shall meet the following functional requirements:

Video Projectors:

For WSI Classrooms 106, 201, 301, 302, 303, 304, 307, 310, 312 and 313:

Panasonic PT-EW630U Data Projector (ceiling mounted)

- 5,500 ANSI Lumen 16:10 WXGA LCD
- Contrast 5,000:1
- HDMI input with HDCP
- RS-232C Control
- Powered zoom lens: 1.7 – 2.8:1. Image shall fill the projection screen width from location of ceiling mount plate as installed by General Contractor. In WSI Rooms 106, 201, 307, 310, 312 and 313 throw distance shall be 20’. In WSI Rooms 301, 302 and 303 the throw distance shall be 16’. In Room 304 the throw distance shall be 26’ and the video projector provided shall fit within the lift supplied.
- Closed Captioning Decoder built in
- Crestron RoomView enabled
- Vertical and horizontal lens shift
- 3,000 hour lamp replacement cycle
- Provide spare lamp for each projector
- Mounting pipe length to be determined per room in field

For WSI Classrooms 102, 103 and 104:

Panasonic PT-VW430U Data Projector (ceiling mounted)

- 4,300 ANSI Lumen 16:10, WXGA LCD
- Contrast: 3500:1
- HDMI input with HDCP
- RS-232C Control
• Manual zoom lens: 1.18 – 1.90:1 Image shall fill the projection screen width from location of ceiling mount plate as installed by General Contractor. In WSI Rooms 102, 103 and 104 the throw distance shall be 14’.
• Closed Captioning Decoder built in
• Crestron RoomView enabled
• 4,000 Hour lamp and filter replacement cycle
• Vertical lens shift
• Provide spare lamp for each projector
• Mounting pipe length to be determined per room in field

BMS LCD LOC-IV –W (White) One (1) Data Projector Ceiling Mount Per Room

• Weight capacity – 150 lbs. (UL rated)
• Mount is to adjust, without tools, 15° +/- Tilt, Pitch, Roll, and swivel 360°
• Provide 1.5” pipe (white) to secure mount to ceiling plate. Length of mounting pipe to be determined based on field conditions. Video projector shall be mounted with the video projector lens even with the top of the projected image. A keystoned image and/or the use of the video projector’s keystone correction shall not be accepted.
• Size : 14.4” x 12.2” x 18.1” (W x D x H)

BITS LCG3 Smart Power Strip (or equivalent) Energy Saving Power Strips with the following features:

• One master outlet controlling selected other outlets (PC)
• Three switchable outlets controlled by master outlet
• Two unswitched outlets that remain “Hot” at all times (Control System)
• Mount in equipment rack or lectern of all systems

VFI PD3009G Modern Podium to include:

• Side flip-up shelf and two space painted steel utility shelf
• Built-in 14RU equipment rack
• Rear access to rack equipment
• Gray laminate
• Classrooms 201, 301, 302, 303, 304, 307, 310, 312 and 313 (only)
• Vendor to provide VGA cable for connection to document camera through a grommet located above the podium side flip up shelf
• USB Hub mounted in 3” grommet hole

Classroom Speaker System to include:

• Atlas GD87W Ceiling Speakers (4, 5 or 6 per room based on seating capacity)
• Atlas 818R T Bar Bridge for mounting speakers
• Atlas L9587 Speaker Enclosures
• Plenum Speaker Wire (18/2)
Lecture WSI-304 Hall Speaker Systems:

A. Program Loudspeakers – JBL Control 30
   - Coverage: 120 x 110 degrees
   - Frequency Response: 40 Hz – 16 KHz (+/- 3 dB)
   - 150W 70 V transformer and 8 Ohm thru
   - Includes wall mounting bracket

B. Ceiling Loudspeakers – Atlas FAP62T
   - Coverage: 110 degrees
   - Frequency Response: 63 Hz – 20 kHz (+/-7dB)
   - 70V Taps: 2, 4, 8, 16 & 32W
   - Coaxial 6” with ported enclosure

Panasonic DMP-BD77 Smart Network Blu-Ray Disc Player or equivalent.
   - Mount on rack shelf in lectern or equipment rack
   - Shall have Blu-Ray, DVD and CD playback capability

Equipment for Conference Room WSI-314A and Study Room WSI-309:

Sharp PN-E702 LED Monitor:
   - 70” Diagonal LCD
   - Professional 24/7 operation design
   - Built-in Speakers
   - Resolution: 1920 x 1080
   - Provide wall mount bracket Chief LTMU

Crestron BPC8W Wall Mounted Control Panel with all required control/switching programming:
   - Eight Programmable Buttons
   - One RS-232 Port (Monitor Control)
   - Single Gang format
   - Auto Shut Down (Timed – 2 hours)
   - Controls shall include (with feedback from monitor): Power On; Power Off, Audio Mute, Volume Up, Volume Down, HDMI input selection and VGA input selection.

Table Input Plate and UTP Transmission:
   - Single Gang Plate (for table box) with HDMI, HD15 and Stereo Mini audiovisual connectors
   - Provide UTP transmitter/receiver set for VGA and computer audio and mount under table
   - Provide UTP transmitter/receiver set for HDMI with HDCP and mount under table
• Provide RJ-45 modules in floor core as required for above cabling. Wiremold/Mid Atlantic AV9015BK modules.

Crestron Digital Media Signal Routing and Control System:

The principle system control and audio visual switching unit (Crestron DMPS-100-C) will be rack mounted in the available podium or equipment rack. The audio will follow the selected source through the system to the ceiling mounted speakers. This system includes all the following listed components to achieve full functionality desired in the classroom control and routing system.

Components per room include:

Crestron DMPS-100-C Multimedia Presentation System:

The Multimedia Presentation System provides and integrates the following principal systems:

• Audio/Video switching, including, but not limited to HDMI with HDCP
• Audio/Video reinforcement and distribution
• Video interface equipment
• Audio interface equipment
• Ethernet and e-control support
• RoomView and SNMP support
• Room automation control processor
• DigitalMedia transport via a single CAT5e cable

Crestron DM-RMC-Scaler-C DigitalMedia Receiver:

• Receive all video and control signals over a single CAT5e type cable
• Scale all video to the native resolution of the video projector and output HDMI digital video signal.
• Shall include one bidirectional RS-232 port for control of the video projector
• Compact design allowing mounting at video projector

Crestron C2N-FTB –D-B Flip Top Media Center with Cable Storage Compartment:

• Dimensions: 5.39 in (13.69 cm) – with lid closed x 6.75 in (17.14 cm) x 5.71 in (14.50 cm)
• To be mounted in podium or equipment rack with cut-out provided by vendor/installer
• Programmable buttons with LED feedback – Button Quantity: 20
• Provide engraved Button Caps (Text and button locations to be coordinated with CNM)
• Volume control and LED bar graph with feedback
• Built-in IR receiver and light sensor
• VGA w/audio cable provided in cable storage compartment for connection of portable laptop
• HDMI cable provided in cable storage compartment for connection of portable device
• Composite video with stereo audio cable provided in cable storage compartment for connection of portable device.

Crestron C2N-FT-TPS4-D-B Flip Top Touchscreen Media Center with Cable Storage Compartment (Room 304):
  • Dimensions: 5.39 in (13.69 cm) – with lid closed x 6.75 in (17.14 cm) x 5.71 in (14.50 cm)
  • To be mounted in podium or equipment rack with cut-out provided by vendor/installer
  • 3.6” Touchscreen with fixed side buttons
  • Volume control and LED bar graph
  • Built-in IR receiver and light sensor
  • VGA w/audio cable provided in cable storage compartment for connection of portable laptop
  • HDMI cable provided in cable storage compartment for connection of portable device
  • Composite video with stereo audio cable provided in cable storage compartment for connection of portable device

Crestron TPS-6-B-T Touch Screen (Room 304):
  • 5.7” Diagonal
  • 640 x 480
  • Cresnet and Ethernet communication
  • Provide TPS-6X-FPB-T-Engraved

Crestron CP2E Control System Processor (Room 304):
  • Two RS-232 Ports
  • Two IR Ports
  • Four Relay Ports
  • Cresnet Control port
  • Ethernet Port

Control System programming:
Provide fully-functional control systems with all required control system programming including, but not limited to Crestron RoomView. RoomView programming shall include remote control for Crestron control unit and video projector remote management and monitoring functions.
Vendor shall have a control system programmer assigned to this project who is certified by the control system manufacturer. A certified independent programmer is acceptable. Vendor shall provide the name, Certification level and Certification Number as part of the bid response.
The vendor will be responsible for the fully operational installation and Crestron component programming of the listed systems and components using all necessary and construction rated cables. Crestron approved cable shall be provided for all Digital Media components.
Control programming code shall be the property of CNM. At the conclusion of the project, the Vendor shall provide CNM a hard disk with all current programming files including source codes. Vendor shall provide the final control system program to CNM in compiled and editable formats. If any changes are made to control system programming during subsequent service calls, the revised code shall be provided to CNM.

RoomView programming shall include the following minimum monitoring/control functionality: Room Name, Online, Log, System Power, Display Power, Display Usage, Schedule, Filter Usage and Shutdown Time. Exact layout and configuration shall be coordinated with CNM. Vendor shall coordinate with CNM ITS to provide and program control system IP addresses. E-mail notifications shall be programmed for air filter and lamp notifications from RoomView.

Plates and Panels:

Drawings for the below rack panels and plates are provided as part of the bid documents. Confirm plate layout, connectors and text with CNM before ordering. Floor Plans and other Special Systems drawings are also provided as part of the bid documents. These additional drawings are provided as reference only.

Custom 3-Gang input wall panels located by power and data at identified teaching wall for each classroom. Backbox provided by General Contractor. Plate includes the following jacks:
- One Crestron DM jack (RJ-45)
- One Screen control jack (4-pin FXLR)
- Speaker (70V) (1/4” Phone type locking)

Custom 3-Gang input wall panels located by power and data at identified teaching wall in room WSI-304. Backbox provided by General Contractor. Plate includes the following jacks on the Stage Left and Stage Right locations (Qty 2):
- Female XLR (2)
- MXLR (1)
- Decora Style Opening (1) (For HDMI DM Transmitter)

Custom 6-Gang input plate located in the Wiremold RFB-11 floor box in room WSI-304. Floor box provided by General Contractor. Plate includes the following jacks at the center location (Qty 1)
- Female XLR (4)

Custom 6-Gang input plate located in the Wiremold RFB-11 floor box in room WSI-304. Floor box provided by General Contractor. Plate includes the following jacks at the Stage Left location (Qty 1):
- Female XLR (4)
- Decora Style Opening (1) (For HDMI Receiver)
Custom 6-Gang input plate located in the Wiremold RFB-11 floor box in room WS1-304. Floor box provided by General Contractor. Plate includes the following jacks at the Stage Right location (Qty 1 (lectern Location)):

- Female XLR (4)
- Female 4-pin XLR (1)
- RJ-45 (DM Input)
- Decora Opening (1) (For HDMI Receiver)

Custom single RU rack panel in Room WSI-102 with engraved text. Input text to read “Left” and “Right”. Above both inputs, text to read “Aux In”. (Qty 1):

- Female RCA Feed-thru (2)

The Vendor will provide all equipment and cabling required to enable these systems. Meeting all applicable Codes is the sole responsibility of the Vendor. The data network and electrical 120V outlets will be provided by CNM. Vendor to extend 120V power from the wall outlet to the lectern and also provide an Ethernet cable from the teaching wall data outlet to the lectern control system. All cables to/from the lectern shall be neatly bundled and the Vendor shall provide a cable cover from the wall to the lectern in each classroom. The cable cover make/model shall be submitted for approval by CNM before ordering. Computer(s) will be provided by CNM.

Vendors shall supply a list of all sub-contractors who will be working on this project as part of the bid response.

“All work performed shall be completed by a State licensed/bonded contractor possessing either an EE98 or ES-3/ES3J low voltage license.”

“All work performed shall also be permitted through the Construction Industries Division “CID” and all inspection approvals be submitted to CNM as verification of work performed and state code compliance requirements.”

The Vendor will be responsible for providing a final system design that meets CNM specifications, meets all applicable code requirements and achieves the desired functionality. The selected Vendor will be responsible for a complete and fully functional installation. The Vendor will test systems and demonstrate to CNM staff (Audiovisual Services) system functionality. CNM reserves the right to accept or deny the installed systems based on demonstrated functionality.
At the conclusion of the project, the Vendor shall provide CNM with a binder (or binders as required) containing Owner’s Manuals for system components. The Vendor shall include in the binder and a list of Serial Numbers of all system components and include the room location of each component.

Systems shall be warrantied for one year from the date of sign-off by CNM. The vendor’s response to system faults, individual component failure and/or control system programming issues within the warrantee period shall be the next business day after notification by CNM of any technical issue. On site response, component replacement or repair is required by end of business the next day.