1.0 GENERAL

1.1 Related UBC Guidelines

.1 UBC Learning Space Design Guidelines

1.2 Description

.1 Audio-video infrastructure requirements for Sections 27 41 16 to 27 41 52.

2.0 DESIGN REQUIREMENTS

2.1 Basic Requirements

.1 Provide electrical power of the voltage, current and phase(s) required, from the main sources of supply to each audio-visual equipment load requiring supply of power. Typically a 120 VAC, 15A, single phase connection is required unless specified otherwise by UBC IT Audio Visual through design consultation.

.2 Provide an audio-visual raceway system consisting of outlet boxes, conduits, cable trays, pull boxes, sleeves and caps, and pull strings.

.3 Provide plywood backing behind finished wall surface for audio-visual equipment such as flat panel displays, projection screens and equipment racks.

2.2 Performance Criteria

.1 Basket tray shall be sized for communications and audio-visual cable density plus 25% future expansion capacity:

.1 Continuous, rigid, welded steel wire mesh spaced 50mm x 100mm;
.2 Continuous T-weld on top rail of tray;
.3 And Finish: electroplated zinc coating.

.2 A zone conduit system shall be used in areas where basket tray is not feasible. Zone pull boxes c/w access hatches shall be spaced maximum 9 meters apart. All outlet box conduits shall homerun to the nearest zone pull box.

.3 Power connection shall be adjacent to audio-visual outlet box.

.4 Pathways shall avoid potential sources of electromagnetic interference by maintaining clearances of at least:

.1 305mm from fluorescent ballasts;
.2 305mm from electrical distribution conduit and cable less than 1kV;
.3 1000mm from electrical distribution conduit and cable more than 1kV;
.4 1220mm from motors and transformers;
.5 And 305mm from HVAC equipment, ducts and pipes.

.5 Audio-visual outlet boxes shall be masonry back box with minimum depth of 90mm. Outlet box shall be recessed if wall mounted below finished ceiling. All outlet boxes shall have cover plates installed and colour coordinated with other outlets and services.
.6 Floor boxes with audio-visual requirements shall be able to accept Extron AAP or MAAP plates. Floor box lid shall allow cable egress while in the closed position. Floor box shall be intended for AV cabling and termination use, and allow sufficient room for all required cabling without cable strain at the connectors.

.7 The bend radius shall be at least six (6) times the internal diameter for conduit that has an internal diameter of 50mm or less. The bend radius shall be at least ten (10) times the internal diameter for conduit that has an internal diameter more than 50mm.

.8 The maximum number of bends between cable pull boxes in a conduit run shall be two (2) 90 degree bends.

.9 Conduit runs shall have no continuous sections longer than 30m between pull boxes.

.10 If a conduit run requires a reverse bend between 100 degree and 180 degree then a pull box shall be inserted into the bend but shall not be used as the bend.

.11 Pull boxes shall be installed in fully accessible spaces.

.12 Support and secure all boxes independent of the conduit connected thereto.

.13 All conduit ends shall be protected by insulating bushings.

.14 Conduit stub and insulating bushing shall be as short as possible inside the outlet box to ensure that it does not obstruct installation of the audio-visual device. Refer to AVSK-03 for AV outlet box detail.

.15 All conduits shall be left with a nylon pull string installed.

.16 Plywood backing shall be a minimum of 20mm thick and spanned between a minimum of three (3) studs. The dimensions of the backing shall be sized appropriately for the equipment being installed.

.17 Each outlet box shall be clearly marked in back of box with an ‘AV#’ that corresponds to the riser diagram and floor plan.

.18 Audio-visual conduits and outlet boxes shall be colour coded with paint or similar. The colour shall be different from other systems including communications pathway.

2.3 General Device Requirements

.1 This section will aid Consultants and Contractors with general infrastructure requirements for each type of audio-visual device. Final infrastructure requirements shall be verified by UBC IT Audio Visual prior to finishing design or pricing scope of work.

.2 Ceiling Mount Projector

.1 Provide ceiling mount double duplex receptacle, shared with respective electric screen 15A circuit.
.2 Provide ceiling mount 2-gang projector outlet box.
.3 Provide 41mm conduit from projector outlet box to audio-visual rack back box.
.4 If the room does not have a rack, then conduit shall run to audio-visual input plate outlet box and provide ceiling mount data outlet box adjacent to projector outlet box.
.3 Wall Mount Flat Panel Display
   .1 Provide wall mount double duplex receptacle on dedicated 15A circuit.
   .2 Provide wall mount 2-gang display outlet box.
   .3 Provide 41mm conduit from display outlet box to audio-visual rack back box.
   .4 If the room does not have a rack, then conduit shall run to audio-visual input plate outlet box and provide wall mount data outlet box adjacent to display outlet box.
   .5 Provide plywood backing behind display.

.4 Wall Mount Digital Signage Flat Panel Display
   .1 Provide wall mount duplex receptacle.
   .2 Provide wall mount data outlet box adjacent to duplex receptacle.
   .3 Provide plywood backing behind display. Refer to AVSK-01 for typical flat panel display mounting detail.

.5 Recessed Electric Screen
   .1 Provide ceiling mount power connection c/w local disconnect switch on left-hand side of screen, shared with respective projector 15A circuit.
   .2 Provide ceiling mount single-gang electric screen outlet box mounted on left-hand side of electric screen.
   .3 Provide wall mount single-gang manual screen control outlet box mounted adjacent to local light switch.
   .4 Provide 21mm conduit from each outlet box to audio-visual rack back box.
   .5 If the room does not have a rack, then conduit shall run to the audio-visual control panel outlet box.

.6 Wall Mount Electric Screen
   .1 Provide ceiling mount duplex receptacle on left-hand side of screen, shared with respective projector 15A circuit.
   .2 Provide ceiling mount single-gang electric screen outlet box mounted on left-hand side of electric screen.
   .3 Provide wall mount single-gang manual screen control outlet box mounted adjacent to local light switch.
   .4 Provide 21mm conduit from each outlet box to audio-visual rack back box.
   .5 If the room does not have a rack, then conduit shall run to the audio-visual control panel outlet box.
   .6 Provide plywood backing at screen anchor points.

.7 Ceiling Mount HD Camera
   .1 Provide ceiling mount duplex receptacle.
   .2 Provide ceiling mount single-gang camera outlet box adjacent to power receptacle.
   .3 Provide 35mm conduit from camera outlet box to audio-visual rack back box.

.8 Wall Mount HD Camera
   .1 Provide wall mount duplex receptacle.
   .2 Provide wall mount single-gang camera outlet box adjacent to power receptacle.
   .3 Provide 35mm conduit from camera outlet box to audio-visual rack back box.
.9 Ceiling Mount Microphone

.1 Provide ceiling mount single-gang microphone outlet box above finished ceiling.
.2 Provide 27mm conduit from microphone outlet box to audio-visual rack back box.
.3 Multiple microphone outlet boxes can be daisy chained but conduit size may need to be increased to accommodate the additional cabling.

.10 Wall/Ceiling Mount Antenna

.1 Provide ceiling or wall mount single-gang antenna outlet box.
.2 Provide 27mm conduit from antenna outlet box to audio-visual rack back box.

.11 Wall/Ceiling Mount Room Support IP Camera

.1 Provide one (1) wall or ceiling mount duplex receptacle.
.2 Provide one (1) wall or ceiling mount data outlet box adjacent to power receptacle.

.12 Ceiling Mount Speaker

.1 Provide ceiling mount single-gang outlet box above finished ceiling.
.2 Provide 27mm conduit from speaker outlet box to audio-visual rack back box.
.3 If the room does not have a rack, then conduit shall run to an additional wall or ceiling mount 2-gang outlet box mounted adjacent to the local display device.
.4 Multiple speaker outlet boxes can be daisy chained but conduit size may need to be increased to accommodate the additional cabling.

.13 Wall Mount Speaker

.1 Provide wall mount single-gang speaker outlet box.
.2 Provide 21mm conduit from speaker outlet box to audio-visual rack back box.
.3 If the room does not have a rack, then conduit shall run to an additional wall or ceiling mount 2-gang outlet box mounted adjacent to the local display device.
.4 If required by system design, provide duplex receptacle adjacent to speaker outlet box (to support the use of active speakers).

.14 Wall Mount Control Panel

.1 Provide wall mount 3-gang outlet box.
.2 Provide 27mm conduit from control panel outlet box to audio-visual rack back box.
.3 If the room does not have a rack, then conduit shall run to local display device outlet box.

.15 Wall Mount Audio-Visual Input Plate

.1 Provide wall mount 3-gang outlet box.
.2 Provide 41mm conduit from input plate outlet box to audio-visual rack back box.
.3 If the room does not have a rack, then conduit shall run to local display device outlet box.
.4 Refer to AVSK-02 for AV input plate J-hook installation detail.

.16 Table Mount Audio-Visual Devices

.1 Provide floor box c/w with double duplex receptacle and 41mm conduit from floor box to audio-visual rack back box.
.2 If the room does not have a rack, then conduit shall run to local display device outlet box.

.17 Audio-Visual Equipment Rack (each)

.1 Provide wall mount double duplex receptacle on dedicated 15A circuit.
.2 Provide wall mount data outlet box adjacent to power receptacle.
.3 Provide wall mount 300mm x 300mm rack back box.
.4 If the rack is wall mounted, provide plywood backing.

.18 Fixed Instructor Lectern

.1 Provide four (4) double duplex receptacles on single 15A circuit.
.2 Provide data outlet box adjacent to each rack power receptacle.
.3 Provide data outlet box adjacent to power receptacle in trough.
.4 All conduits for power, communications and audio-visual shall stub up below lectern trough. Stubs shall never be installed underneath lectern rack bay locations.

.19 Mobile Instructor Lectern

.1 Provide wall mount duplex receptacle on dedicated 15A circuit.
.2 Provide wall mount data outlet box adjacent to duplex receptacle.
.3 Provide wall mount 3-gang furniture whip outlet box mounted adjacent to duplex receptacle.
.4 Provide 41mm conduit from outlet box to audio-visual rack back box

.20 Lighting Integration

.1 Provide 2-gang outlet box adjacent to the local low-voltage lighting controller.
.2 Provide 27mm conduit from lighting integration point outlet box to audio-visual rack back box.

.21 Window Blind Integration

.1 Provide 2-gang outlet box adjacent to the blind controller.
.2 Provide 27mm conduit from blind integration point outlet box to audio-visual rack back box.

***END OF SECTION***