1.0 GENERAL

1.1 Related Technical Requirements

.1 Division 27 Communications

1.2 Description

.1 Audio-video infrastructure requirements for Division 27A Audiovisual

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, 20A, single phase connection is required unless specified otherwise by SFU Audiovisual 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.

.4 All A/V equipment infrastructure shall be seismically restrained according to BCBC or local building codes, whichever is more stringent.

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 provided in separate conduits from A/V, however terminations may occur in common outlet box as permissible by code.

.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 metal 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 ‘Decora’ style 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 pullbox 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 SFU-AV ‘Outlet box’ Standard Detail drawing (based on AVIXA Standard - inquire with SFU for availability).

.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 Refer to Audiovisual Identification Standard (Section 27A 08 00) for conduit labelling etc.

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 SFU Audiovisual 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 3-gang (includes AV and network) receptacle on dedicated 15A circuit.
   .2 Provide wall mount 3-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 place outlet box and provide wall mount data outlet box adjacent to display outlet box.
   .5 Provide plywood backing behind display, minimum 20mm thickness.

.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 Motorized 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 Motorized 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 Anchor point backing shall be sufficient thickness to clear any/all writing board lights or ledges by minimum 10mm.

.7 Ceiling Mount HD Camera
   .1 Provide ceiling mount duplex receptacle.
   .2 Provide ceiling mount camera outlet box adjacent to power receptacle. Box shall be two-gang outlet box where power required, single where POE is specified. Consult with SFU AV.
   .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 camera outlet box adjacent to power receptacle. Box shall be two-gang outlet box where power required, single where POE is specified. Consult with SFU AV.
   .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 where required – consult with SFU AV.
   .2 Plenum junction boxes shall be installed as per manufacturers specifications.
   .3 Provide 27mm conduit from microphone outlet box to audio-visual rack back box.
   .4 Multiple microphone outlet boxes can be daisy chained but conduit size may need to be increased to accommodate the additional cabling.
   .5 Wireless audio devices are not permitted.

.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 Coordinate speaker rough-in frames with general contractor and AV consultant.
   .2 Speakers must be installed minimum 150mm from HVAC equipment.
   .3 All 70 volt speaker installations to be parallel circuits. Low impedance installations can be series or combination series/parallel wiring.
   .4 Provide 27mm conduit from speaker outlet box to audio-visual rack back box.
   .5 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.
   .6 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 outlet box that is sized and compatible with the indicator control or button panel.
   .2 Wall Mount Control Panel to be secured appropriately and approved by SFU AV.
   .3 Provide 27mm conduit from control panel outlet box to audio-visual rack back box.
   .4 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 All cabling not installed in conduit to be run in cable trays.
.16 Table Mount Audio-Visual Devices
   .1 Provide floor box with 2-gang outlet box for AV. Consult with SFU AV for power outlets required.
   .2 If the room does not have a rack, then conduit shall run to local display device outlet box.
   .3 Consult with SFU-AV regarding model, size, and positioning of table mounted cable-cubbies or connector boxes.

.17 Audio-Visual Equipment Rack (each)
   .1 Provide wall mount double duplex receptacle on dedicated 15A circuit.
   .2 Consult with SFU for size of data outlet back boxes.
   .3 300 x 300mm wall box applies to installations where in-wall cable conduits dictate this size of opening and provide space for cable service loops. Consult with SFU AV.
   .4 If the rack is wall mounted, provide plywood backing.

.18 Fixed Instructor Lectern
   .1 Provide minimum of one quad power outlet box per rack location within the lectern. Maximum of one dedicated 15A circuit per quad box.
   .2 Provide data outlet box adjacent to each rack power receptacle.
   .3 Provide data outlet box adjacent to power receptacle in lecturn millwork.
   .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. Confirm exact location with SFU ITS AV. All conduit racks to be cut flush with floor.

.19 Mobile Instructor Lectern
   .1 Provide wall mount or floor mount quad receptacle as required on dedicated 15A circuit.
   .2 Provide wall mount data outlet box adjacent to quad receptacle.
   .3 Provide floor or wall box to accommodate cable snake coiling. Consult with SFU regarding size.
   .4 Provide 41mm conduit from outlet box to audio-visual rack back box

.20 Lighting Integration
   .1 Consult with SFU Facilities Services for all requirements.
   .2 Lighting zoning and dimming requirements for classrooms to be determined via consultation with SFU AV and Facilities. Coordination to be completed upon receipt of reflected ceiling plans.
   .3 Provide 2-gang outlet box adjacent to the local low-voltage lighting controller.
   .4 Provide 27mm conduit from lighting integration point outlet box to audio-visual rack back box.

.21 Window Blind Integration
   .1 Consult with SFU Facilities Services for all requirements.
   .2 In spaces with motorized window coverings, the control shall be through a low voltage wall control, as well as through RS232, network, or contact closures via Crestron Control Systems.
   .3 Provide 2-gang outlet box adjacent to the blind controller.
   .4 Provide 27mm conduit from blind integration point outlet box to audio-visual rack back box.

***END OF SECTION***