
VANGUARDIA

A BURO HAPPOLD COMPANY

Co-op Live - Canalside

Scope of Works

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22/05/2025

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Introduction

This document provides an outline audio specification for the Co-op Live Canalside development. The Canalside area will be used for events such as live music, DJ and sometimes live bands, MCFC screenings, Fan zones, and other big sporting events, as well as private functions where there will be music/speeches. The design specification describes the components and systems that make up the proposed audio system within the project, in order to provide suitable sound reinforcement. Drawings and general provisions of contract including general and special conditions and general requirements, apply to work outlined in this document.

The AV integrator shall be responsible for the supply, on-site coordination, integration, programming, testing, setup and commissioning of all items of software and hardware listed within this document, inclusive of all associated as-built drawings.

Although the system is not designed as a life-safety system a level of resilience has been provided in the design to enable the functionality of the system to be used for safety announcements from the Co-op Arena.

Design Criteria

Performance criteria

The sound system shall be suitable for reinforcement of ancillary / background live music, performances, speech presentation and audio playback from videos and media players. It is proposed high quality point sources are used with subwoofers for low frequency enhancement.

For the avoidance of doubt, the earmarked performance space is an ancillary use only to the main purpose of the Canalside development. Live music will be used in the space in the same way background music would be, with no publicly available tickets for live music events in the space.

The design of the system will be split into two areas (the performance and background area), to create different listening experiences.

The system shall allow zoning of each of the areas for maximum control. Zoning shall be provided for the following;

- Internal space 1
- Internal Space 2
- Performance space
- Undercroft
- External Bar
- External Terrace

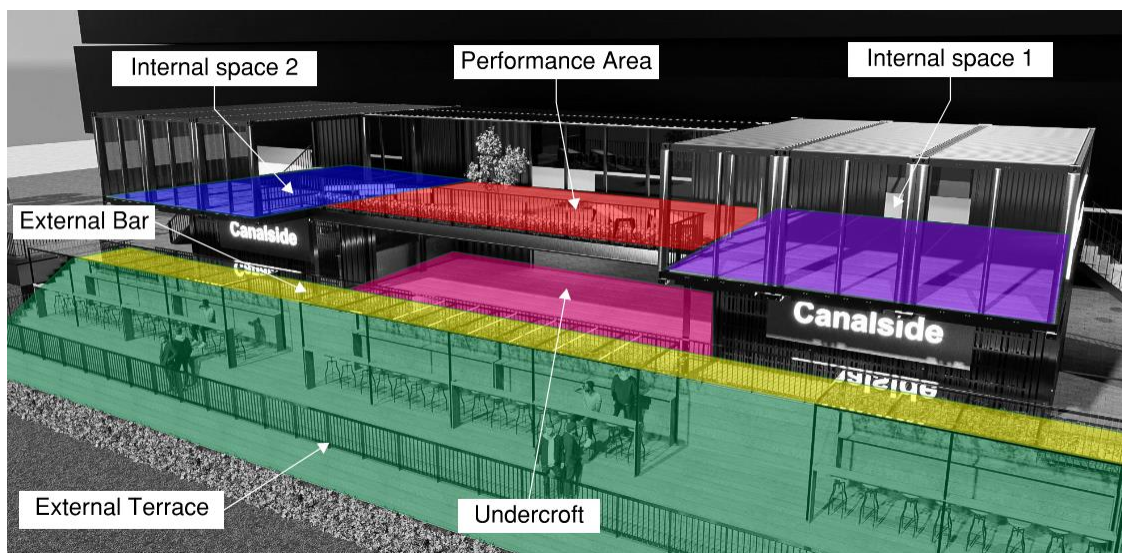


Figure 1 – Loudspeaker zoning sketch

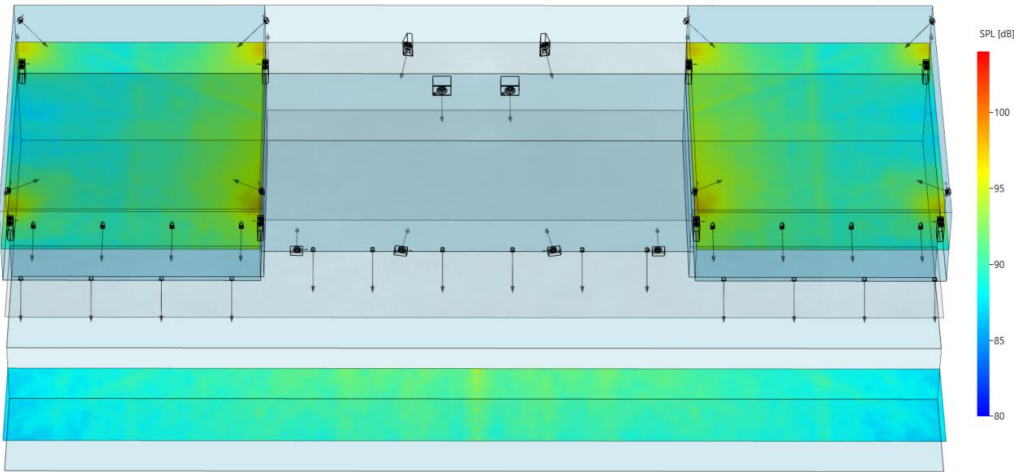


Figure 2– SPL dBA profile for the performance area.

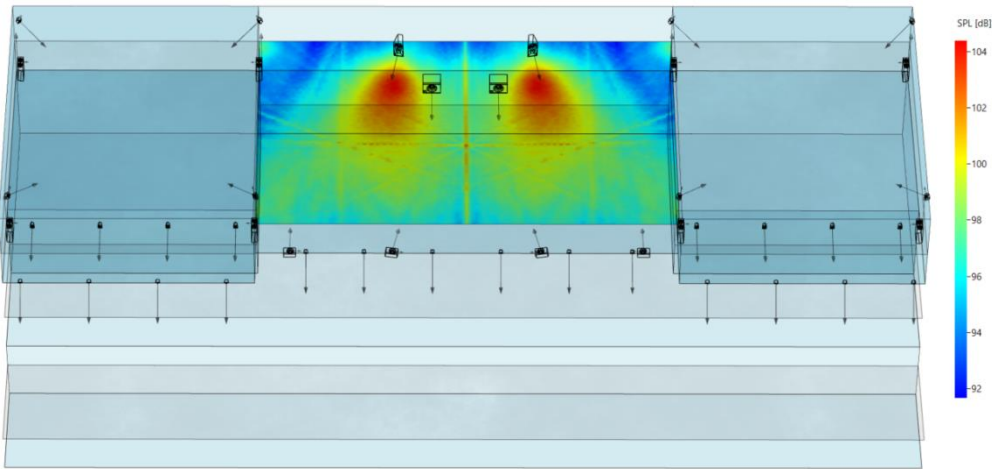


Figure 3 – SPL dBA profile for the background area.

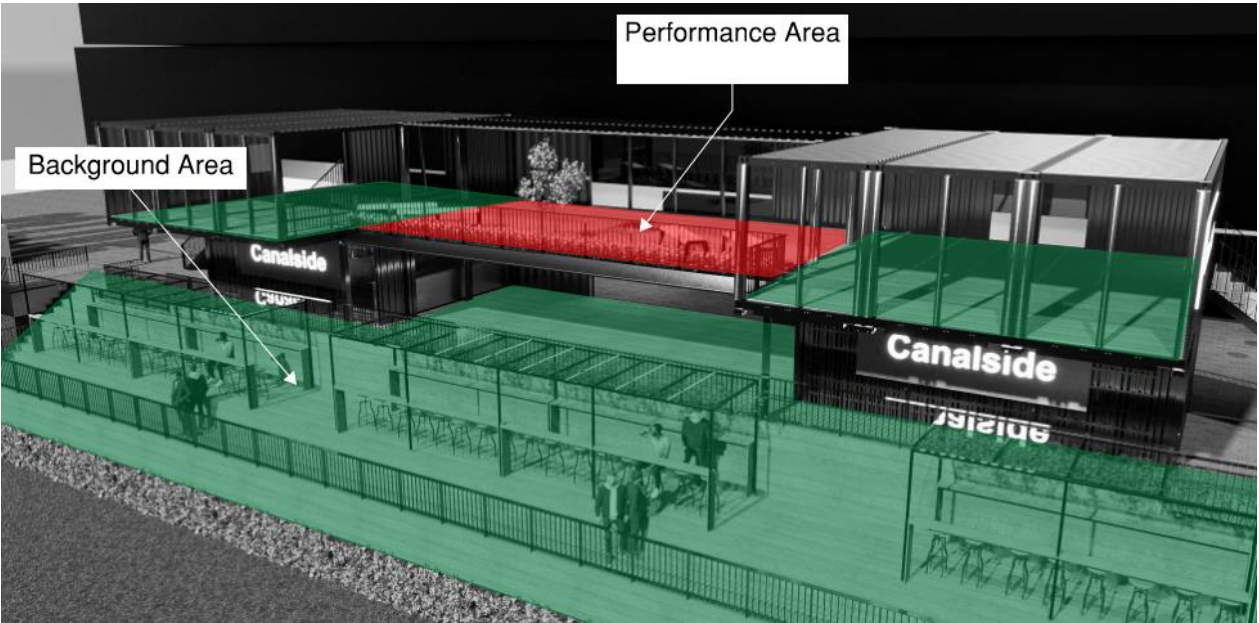


Figure 4 – Indicative Background and Performance areas.

	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	dBA
Performance space	96	91	91	88	88	85	85	90
Background music	84	83	83	83	83	75	73	86

The

overall design levels shall have the capability to achieve the following minimum performance levels indicated in Table 1 when measured with Pink Noise input (Crest factor 12dB).

Table 1 – Outline performance characteristics for each area

The final operating SPL levels shall be finalised during the commissioning process to ensure the noise guidance is satisfied.

Products

Loudspeakers

Higher output loudspeakers with extended sub-bass shall be used for the performance area. These shall consist of d&b audio 10s loudspeakers (or equivalent) to provide a left right stage image. Additional 12s subwoofers shall be provided to enhance the lower frequencies.

For the distributed background music, a combination of 8s and 5s point source loudspeakers shall be used.

Total quantities of loudspeakers are provided below;

Product	Use	Quantity
d&b audio 10S loudspeaker	Stage loudspeakers	2
d&b audio 12s Subwoofer	Stage subwoofers	2
d&b audio 8S loudspeaker	Undercroft loudspeakers	4
d&b audio 5s loudspeaker	Distributed loudspeakers	30
d&b audio Bi8 subwoofer	Distributed subwoofer	8

2D Loudspeaker Layouts

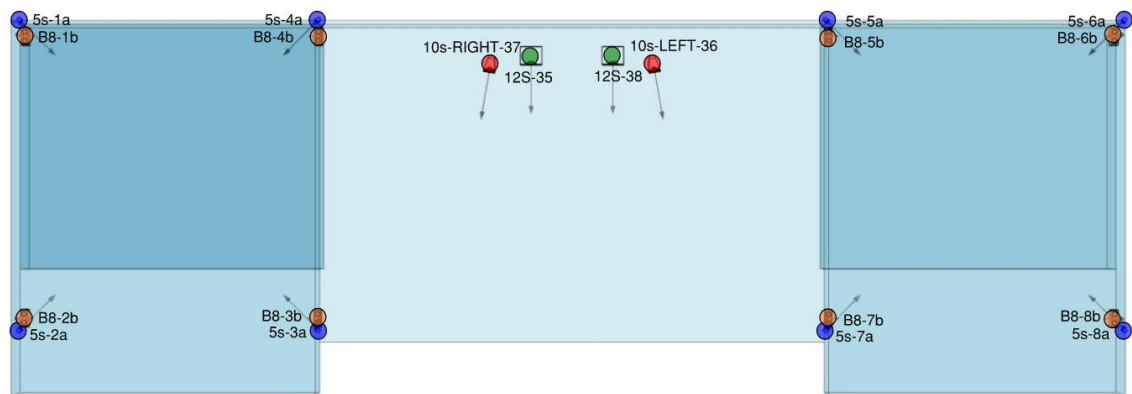


Figure 5 – First floor loudspeaker layout

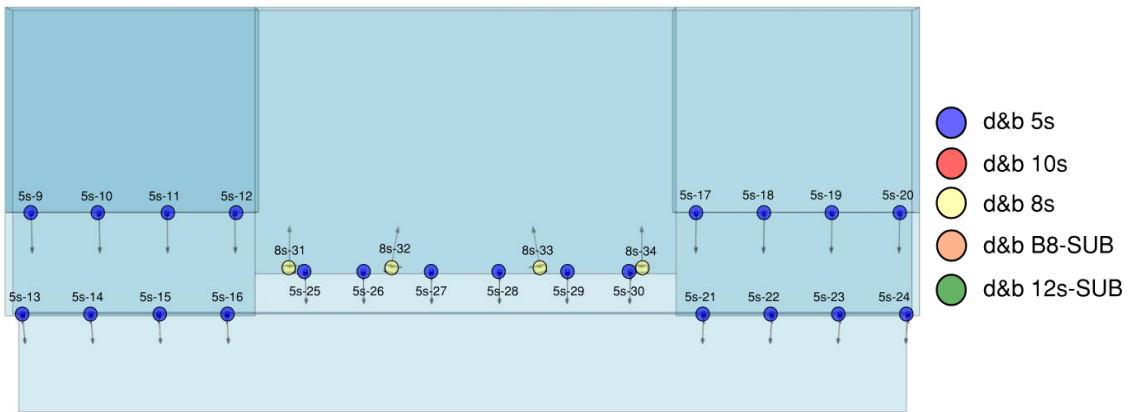


Figure 6 – Ground floor loudspeaker layout

3D Loudspeaker Layout

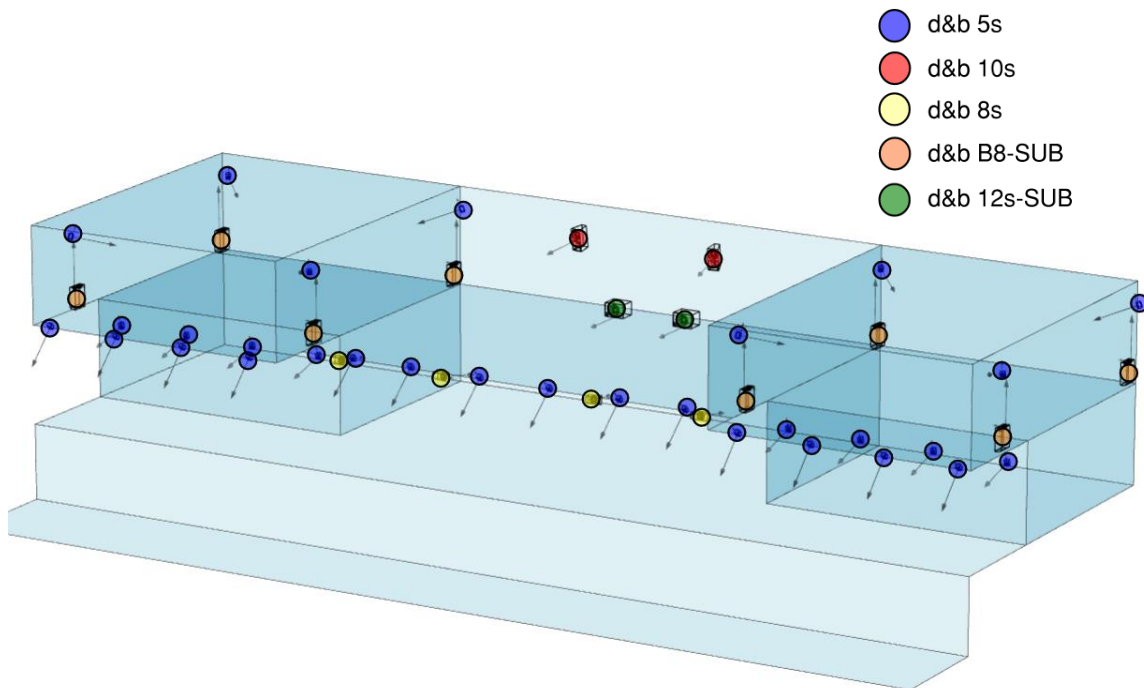


Figure 7 – 3D Loudspeaker layout

Amplifiers

An appropriate location shall be coordinated for the audio amplifier rack. The amplifier rack is required to have a fibre link back to the existing arena to allow integration and control from the arena control room. Refer to schematic and amplifier schedule for amplifier cabling and amplifier output details.

Amplifiers shall be d&b audio 5d amplifiers to all loudspeakers. All audio distribution will be via Dante.

Fibre

Communication between Co-op Live and Canalside control equipment shall comprise of fire rated fibre-optic network cabling. The Contractor will provide the required fibre-optic connections between the two areas. It is the responsibility of the Contractor to ensure these are of the required type and coordinate the required number of locations. The fibre from Canalside shall go back to the South PAVA rack room (or whichever has the easiest fibre route).

Switches

Network switches shall be provided with gigabit port connectivity to route and manage network signals to and from Co-op Live to Canalside as well as distributing control and audio signal between the stage and rack location. Primary and secondary network switches shall be provided to provide a level of resilience.

Example product: Cisco 9300 Series

Cabling

Cables between loudspeakers and amplifier output terminals shall be minimum 2.5mm² stranded loudspeaker cable. All cables, regardless of length, shall be minimised to avoid unnecessary signal degradation. All cable types and installation methods shall comply with the site wide requirements for cabling. Where multiple loudspeakers are provided on a single amplifier channel these shall be wired to best maintain a suitable impedance (Eg. Series parallel where 4 loudspeakers are on the same amp channel).

Power Requirements and Cooling

The integrator will be required to ensure appropriately rated power supplies, terminated into dedicated isolators situated local to equipment rack locations.

Allowances have been made for power supply to the rack as shown in Table 3. The Contractor is required to confirm the adequacy of these supplies and provide detailed load information regarding electrical requirements to the Client’s representative. Power assumptions shown in Table 3 are allowances used for preliminary design purposes only. It expected that each of the racks will not exceed 13A power draw.

The stage rack shall be sized to appropriately house the required equipment with space for vents between to assist cooling. The rack shall be located appropriately to an area which is designed to keep an even temperature and humidity and be as dust free as possible.

Rack Location	
Control Rack	5A
Amplifier Rack	13A

Stage Rack

A stage rack shall be provided to allow input to the audio system. This should be located near to the stage as possible to allow easy input of incoming artists and instruments. Dante will be used to transport audio to the amplifiers. The rack mounted mixer will allow connection to a tablet device. The integrator shall ensure appropriate wi-fi is provided for the remote IPAD interface and rack mixer. An allowance for a wireless microphone system has been included to allow for presentation and communication. No other back-line provision has been included as part of this specification.

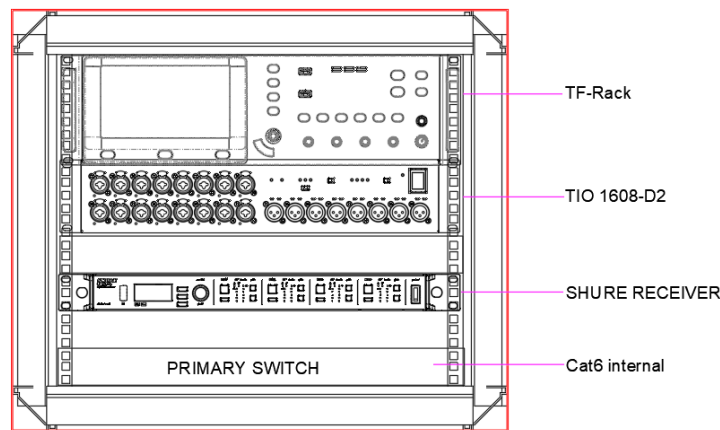


Figure 8 – Control rack

- Yamaha TF-Rack
- Apple iPad
- Yamaha Tio1608-D2 I/O Rack
- Network Switch
- Shure ULXD4Q

Amplifier Rack

A suitable location shall be coordinated for the amplifier rack. This will house the amplifiers and a routing matrix to allow connectivity to a wall controller.

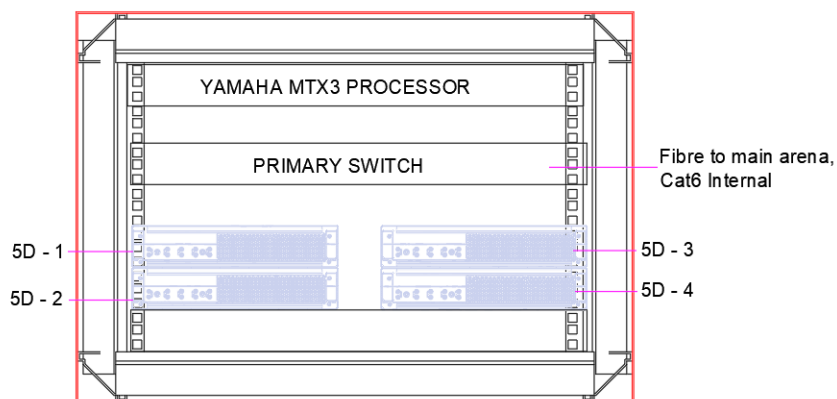


Figure 9 – Amplifier package rack

- d&b 5D amplifiers x 4
- Network Switch
- Yamaha MTX3 Processor

Control and monitoring of amplifiers will be through d&b R1.

Local Inputs

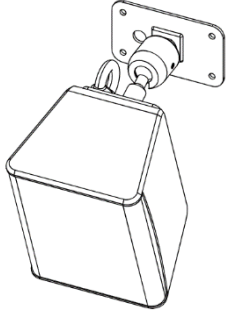
A local input shall be provided at the bar. This shall allow for a minimum of Bluetooth and Mini-jack input to the system.

A Local wall controller shall be provided for simple volume control using the Yamaha MCP1 wall-mount controller. This shall allow for individual control of the indicated zones as a s minimum.

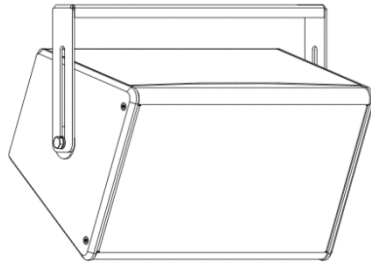
Mounting Details

The final mounting details will need to be coordinated with the interior finishes. The loudspeakers will be mounted using the manufacturers supplied fittings. Stage subwoofers will be placed on the ground, with the B8 subs fixed back to the walls in a vertical orientation (or to the ceiling in a horizontal orientation). Loudspeakers will have adjustable tilt from the supplied bracket to ensure the required angles can be provided.

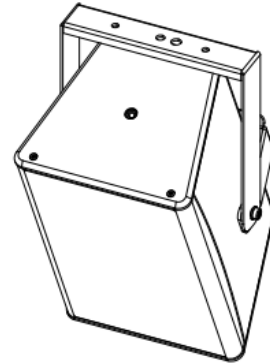
Manufacturer brackets for 5s, 8s and 10s loudspeakers.



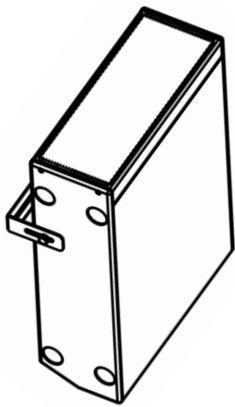
5S - Z5422 Wall mount



8S - Z5408 Wall mount



10S - Z5404 Wall mount



Z540 B8 Sub mount

Monitors

A stage monitor shall be provided with flexibility to be moved or removed. This will be cabled back to the amplifier rack. A local wall or floor input panel shall be provided for the Monitor loudspeaker using an NL4 connector.

The monitor loudspeaker shall be a d&b audio M6 loudspeaker and can be run in passive mode.

Integration

The integration with the main arena shall enable music to be sent from the arena to the Canalside over Dante. This shall also allow for announcements or messages to be sent from the arena to the Canalside. This scope of works shall include any programming on the arena side to ensure the required operation.

Racks

The AV integrator shall use metal-framed equipment racks approved by the client as required. Consideration must be given to the ventilation of equipment if solid side panels are to be used.

Equipment rack-mounting shall conform to the industry standard of $1\frac{3}{4}$ " = 1 rack unit (RU).

The AV contractor shall implement a general ventilation scheme, passive or fan powered as required, for all equipment racks and consoles in the installation.

All equipment racks shall have rear rack rails, or approved alternate mounting system. The rear rails shall be parallel to and square with the front rails and shall conform to current industry standard 19" racks. These rails are to be used for equipment items that require rear rack support or for any rear mounted equipment and connector panels. Cable lacing bars to be fitted as standard in all racks.

The AV integrator shall provide blank filler panels in all rack openings not occupied by equipment or vents. For the sake of future re-configuration of the racks blank filler panels should not exceed three rack units (3RU) in size. Perforated panels may be used to aid ventilation. Brush strips to be used for any racks that use front fitted RJ45 or fibre connection panels.

Sufficient space should be allowed for the installation of any free issued equipment.

All devices within equipment racks shall be mounted to the equipment rack. No devices shall be resting on top.

Frequently used devices should be mounted at the optimal distance from the floor for operator monitoring and use.

Schedules

Amplifier schedule

LOUDSPEAKER	AMPLIFIER CHANNEL
10S-LEFT-36	1-1
10S-RIGHT-37	1-2
12S-35	1-3
12S-38	
8S-31	1-4
8S-32	
8S-33	
8S-34	
5S-1a	2-1
5S-2a	
5S-3a	
5S-4a	
5S-5a	2-2
5S-6a	
5S-7a	
5S-8a	
B8-1b	2-3
B8-2b	
B8-3b	
B8-4b	
B8-5b	2-4
B8-6b	
B8-7b	
B8-8b	
5S-9	3-1
5S-10	
5S-11	
5S-12	
5S-13	3-2
5S-14	
5S-15	
5S-16	
5S-17	3-3
5S-18	
5S-19	
5S-20	

5S-21	3-4
5S-22	
5S-23	
5S-24	
5S-25	4-1
5S-26	
5S-27	
5S-28	
5S-29	4-2
5S-30	

Performance Area Loudspeakers

Type	Quantity
d&b audio 10S loudspeaker	2
d&b audio 12S subwoofer	2

Table 2 – Performance area loudspeakers schedule

Background Area Loudspeakers

Type	Quantity
d&b audio 8S loudspeaker	4
d&b audio 5S loudspeaker	30
d&b audio Bi8 subwoofer	8

Table 3 – Background area loudspeakers schedule

Amplifiers

Type	Quantity
d&b audio 5D amplifier	4

Table 4 – Amplifier schedule

Control and Amplifier racks

Type	Quantity
Yamaha TF-Rack	1
Yamaha TIO 1608-D2	1
Network Switch	3
Shure ULXD4Q Wireless receiver	1
Shure B58A Wireless Microphone	1
Shure ULXD1 bodypack and CVL Lavalier Microphone	1
Shure UA874 antenna	1

Apple iPad	1
Yamaha MTX3 Processor	1
Wall controller	1

Table 5 – Control and Amplifier rack schedule

Appendix A

Schematic

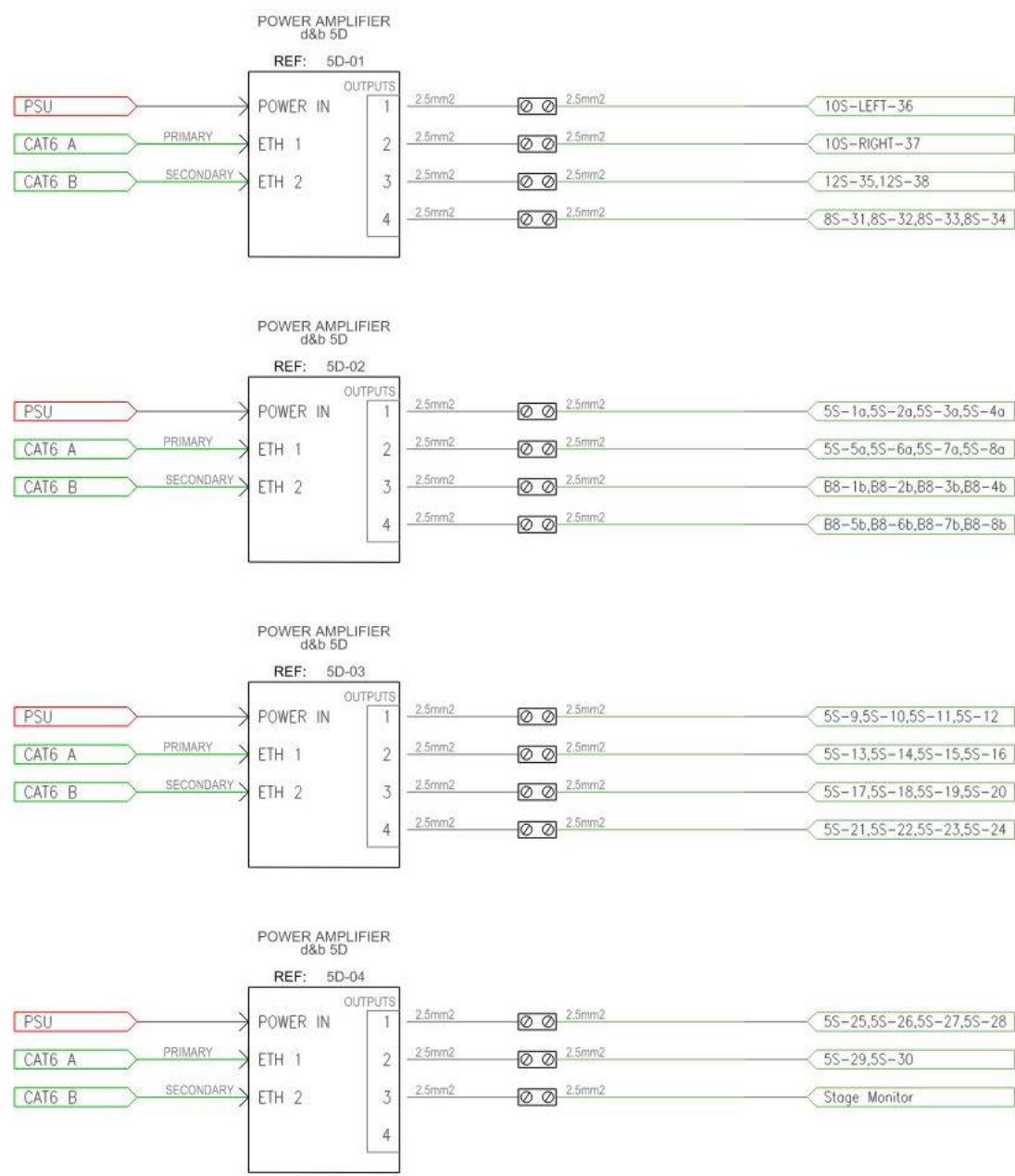


Figure 10 – Canalside schematic

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