

EVERYTHING UNDER ONE ROOF – TOURING OUR TAMPINES HUB

A glimpse into the future or simply an efficient use of land created by a consortium of 12 stakeholders with a vision, Our Tampines Hub became Singapore's first-ever integrated lifestyle hub in August 2017. The ambitious project led by the People's Association was conceptualised in 2011 to create a comprehensive range of services and facilities for its community. Some 15,00 local residents all played a part in its creation, and their feedback has already made a distinct visual and social impact within eastern Singapore.

Located on the site of the former Tampines Stadium and Sports Hall, the six-level facility occupies a site measuring seven football fields and includes an 800-seat hawker centre, 20 badminton courts, a one-stop centre to access government agency services and a community kitchen. Additionally, there's a gym, karaoke and bowling facilities, a five-storey library, eco-community garden, a sports and recreation park, and a swimming complex with six pools including a 10-lane, 50m competition pool. Designed to bring Esplanade Theatre concepts to the heartlands, a 400-seat Festive Arts Theatre serves as a dedicated performance arts space for hosting live music, drama, theatre and cinema.

Incorporating a water fountain at its heart, Festive Plaza is an outdoor performance space that regularly hosts live music and streamed cinema on a large LED screen. This hub allows news agencies such as Mediacorp to report live courtesy of I/O floor and wall panels integrated into the architecture. The broad pedestrian alleys on levels one and two are occupied by more than 100 retail outlets, where a cooling breeze created by architecturally designed air-flow and overhead fans combine to reduce the air temperature by a further three degrees.

Having demolished the previous 3,000-seat capacity football stadium, Tampines Rovers can now accommodate 5,800 fans to watch their Stags S.League home games in the covered Town Square stadium. The two-star FIFA football pitch is also used for numerous other sports events and community-centric programmes, including mass exercises, recreational events and national celebrations.

Green issues are a foundation for the Hub, which practices sustainable lifestyle habits such as aiming to generate zero waste. Using an advanced food-waste recycling system, 700 tonnes of daily food waste is currently being converted to fertiliser, liquid nutrients and non-potable water.

General contractor Hexacon Construction worked with a large roll-call of sub-contractors to create the bold vision, including mechanical and engineering specialist Shinryo Corporation and Mingcon, which in turn drafted in voice evacuation and A/V systems integrator Willowglen Services and Electronics & Engineering

(E&E) respectively. Acoustic consultant Acvicon also played a leading role in designing the audio-visual aspects of the Hub.

Willowglen Services was called upon to install the emergency voice evacuation and public-address paging system into Our Tampines Hub. Working closely under the guidance of mechanical and electrical engineering contractor, Shinryo Corporation, and general contractor, Hexacon Construction, a TOA SX-2000 matrix was selected on account of its proven reliability and ease of operation that allows it to facilitate individual evacuation zones.

Two SX-2000SM system managers operating in slave and master mode assign 48 input channels fed by four SX02199AI audio input matrices to four SX-2000A0 8-channel audio output busses. Each are receiving feeds from an EV-700 digital announcer, CD and AM/FM tuner sources. In addition to controlling the audio signal routing and priorities, it also allows the input and output controls to be managed on a PC, where a log of all the recorded events and failures can be viewed. An EVC-DR-320 digital recorder is capable of playing back the evidence.

TOA engineers assembled the equipment racks off site before terminating the cabling. ‘The Hub’ somewhat sophisticated building structure and variable ceiling heights made EASE measurements very challenging,’ says TOA project engineer, Tom Ho. ‘Some of the speaker locations were in excess of 1,000m from the ELV racks, so we had to run 4mm cables that would avoid significant loss of signal, such as those used in the library. The system was racked up and tested in our workshop before delivery to site, where we conducted a series of tests to ensure the system was working properly and audio could be clearly heard throughout the entire site.’ The library is outfitted with a standalone VX-2000 system manager that serves as an inout matrix unit providing paging in addition to BGM.

Interfaced to the SX-2000SM system, 20 LS-2010 surveillance panels serve as the output matrix section, assigning audio signals to 196 individual zones, including two basement levels for parking of up to 1,400 vehicles. A further 20 SS-2010 AS source selectors allow technicians to switch between BGM and paging announcements in any of the zones at the touch of a button. However, an RM-200SF fireman’s microphone located in the main fire command centre takes priority status should an emergency evacuation announcement need to be made. Further USB microphones located in the information kiosk, office and service centre can perform basic paging.

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The retail and F&B outlets located throughout the six-level complex, in addition to the gymnasium and library, are served with an extensive ceiling mounted solution consisting of 2,979 TOA PC-658R 6-inch speakers. A further 291 SC-615M horn speakers have been wall-mounted in the outdoor area running tracks and back-of-house areas such as the car park, while a further 572 BS-633A box speakers adorn the fire escape staircases. Integrated with a resin panel and speaker frame, the PC-658R ceiling speaker features a spring clamp mechanism, which can be easily mounted to the ceiling, and input impedance can be switched by changing the tap position on the transformer. The 800-seat hawker centre, sports hall, indoor running track and rooftop gardens are installed with 263 waterproof TZ-206BWP column speakers.

The entire speaker system is powered by 12 DA-500FH multichannel amplifiers. Amperes AX3800 auto-fault and changeover units monitor and detect amplifier channel malfunctions, automatically assigning redundant amplifiers. In case of a power cut, four VX-2000DS power supplies ensure the audio system operates for a further two hours or until the power returns to normal.

Having clustered its services together in a purposeful manner for the benefit of the community, the A/V systems within OTH are purely standalone and localised. This was a benefit to E&E, which was initially called to site in March 2016 to lay the various cabling infrastructures as rooms became available following construction. Following the feeding of cabling conduits during each of the three project phases, equipment was installed and terminations carried out. Having placed orders well in advance of the works, all of E&E's suppliers delivered prior to the installation dates.

Although the scale of the OTH project for E&E can be summarised in a 78-page bill of quantity, the company's thoroughly documented the plans simplified the installation process on site. The multiple function and meeting rooms, together with the six-level library, wellness centres and other areas, bear the same A/V hallmarks as the more iconic rooms. Crestron control is the common element that ties the Extron and Kramer video paths with the Symetrix audio DSP for playback on Remaco screens and EAW speaker systems.

'When you're working as part of a team on a large site such as this, product training and good coordination is vital,' explains Mr Tay. 'We maintained good communications with all the other contractors on site so that our team members fully understood the tasks ahead.'

The Festive Arts Theatre primarily serves as a dedicated live performance, music and drama venue. Capable of seating up to 400 guests in its lower stalls and upper balcony areas, the venue's cinema credentials have been enabled with the addition of Barco 4K projection and JBL surround-sound systems. Owing to the complexity of its design and the multipurpose nature of this room, E&E prioritised ease of use by integrating a Crestron AV3 control system at its heart, allowing one-touch room operation. From an 8.9-inch Crestron panel or Apple

iPad, audio settings stored in the Symetrix Jupiter 8 audio processor, lighting scenes created in the ETC Ion-1000 consoles and HDMI devices connected to an Extron DTP CrossPoint 84 switcher can be configured according to the desired mode.

Audio presentations and lectures are reinforced through the EAW CIS400 ceiling speaker system, whereas live music and theatrical performances are mixed on a Yamaha CL3 digital console and output through EAW QX596i L-C-R speakers fitted above the stage. The control room situated at the rear of the theatre features custom furniture specifically created to hide the immense cabling infrastructure connecting the audio, video and lighting inputs to the outputs via control surfaces. On stage, performers can utilise Shure QLX-D wireless handheld, lapel and headworn microphones together with Mackie 300z monitor speakers.

The Symetrix Edge audio DSP receives eight channels of AES digital audio from the Yamaha CL3 for live music and theatrical audio, which are routed to the L-C-R, sub-bass, front-fill and supplementary outputs via the respective amplifiers of the particular zone. When configured to live music and theatrical (non-cinema) mode, audio channelling to the other zones as the theatrical surround-sound system or BOH areas are routed to the Symetrix Radius 12x8 audio DSP via a Dante digital audio network. The Dolby CP750 cinema processor receives its audio input from a Barco DP4k-19B Alchemy projector. A Symetrix 12x8 audio DSP processor is fed with eight channels of AES digital audio, which are then decoded, converted to analogue and output to the respective amplifiers and loudspeakers. Finally, the main L-C-R channels are routed to the Symetrix Edge processor via the Dante digital audio network.

The Dante network promotes the low-latency audio transmission from the Yamaha RIO stage boxes to the CL3 48-channel console, Powersoft amplifiers and Symetrix processors. With the addition of Pro Tools recording software and a Dante Virtual Soundcard installed in the control room PC, 64-track audio recordings can also be performed via the Dante network. Like the room it's installed in, the Barco DP4K-19B Alchemy projector has a diverse job description that is not exclusive to cinema screenings but also for presentations on the Remaco screens and for orchestral performances.

The HDMI and VGA input signals from the Blue-Ray players, Panasonic PTZ cameras and PC are converted before being sourced through an Extron DTP CrossPoint 85 switcher and output to one of two Remaco motorised screens. E&E's specialist skills were called upon when confronted with the addition of two Robert Juliat follow spots. 'We had to ask the builder to create two recesses for the follow spots on either side of the control room,' explains project manager, Tay Seng Chuah. 'However, there wasn't enough room in which to properly manoeuvre the apparatus during a performance, so our workshop was used to create bespoke reinforced metal mounting brackets, allowing them to swing out when required.'