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LEGENDS ALIVE



'THE BEST SOUNDING COUNCIL IN CANADA'

TACKLING MISSISSAUGA'S DOME

THE CITY OF MISSISSAUGA'S COUNCIL CHAMBERS POSED A TOUGH ACOUSTICAL CHALLENGE FOR NOVITA, WITH A DEMAND FOR HIGH INTELLIGIBILITY IN A ROOM 70' ACROSS AND FOUR STOREYS HIGH. WORDS BY ALAN HARDIMAN, PHOTOS BY ROY TIMM

Put 165 loudspeakers and 30 microphones into a well 70' in diameter and four storeys high, top it off with a domed ceiling, and then make it all work. While this might sound like some sort of twisted penance meted out by the demons from audio hell, in reality it was the central challenge facing Novita Techne Ltd. and Westbury National Show Systems Ltd. in refitting the City of Mississauga, ON's council chambers with a new, state-of-the-art conferencing and A/V system. The structure itself was a given. Mississauga's City Hall was completed in 1987 by Toronto firm Jones and Kirkland Architects, who had beat out 245 other submissions in an international design competition for this iconic building.

One of the central features is its council chambers, a large round room designed in a neoclassical style – including a domed ceiling. It might easily be mistaken, however, for a large, squat silo. In 2006, the City of Mississauga decided to upgrade the 20-year-old A/V system in the Council Chambers as part of an overall building renovation. And while they were at it, the retrofit afforded an opportunity to build in significant additional capability, including a new digital conference system capable of allowing participants to address council, hear each other talk, and vote; a comprehensive visual projection system; and a full-featured A/V streaming system for broadcast, web cast, and archival purposes.

The city engaged Novita's A/V multimedia consulting division to design and specify appropriate systems. Novita's team, consisting of Project Lead and Senior A/V Designer Christian Bechard, Partner-in-Charge David Jolliffe, and Senior Designer Jim Boutilier, tackled the project, working closely with the City of Mississauga's A/V systems specialist, Tony Biagi, to ensure the systems were well suited to the city's requirements. Westbury National Show Systems won the bid for the contract. Project Manager for Westbury, Doug Wildeboer, and Westbury's installation team have since



Installed by Westbury National Show Systems, a digital conferencing system was matched to Renkus-Heinz ICONYX digitally steerable arrays and a network of sonically matched SSL 4-2 4" coaxial pew-back drivers





by Alan Hardman, Photos by Roy Timm

Hear an audio sample from the podium at www.renkus-heinz.com/applications/venues/auditoriums/mississauga/mississauga.html

successfully completed the installation of the new systems, which were fully commissioned in January of 2007.

In the renovated chambers, the mayor and 12 councilors sit at a horseshoe-shaped desk on a dais at the front of the room. Facing them is a long straight desk that can accommodate eight staff members as required. Directly below and in front of the mayor's seat is the clerk's desk, with four seats. At the rear of the room, eight rows of pews provide seating for some 200 observers, raked up bleacher-style at about a 30-degree angle. Just above and behind this public seating area, but still out in the open, sits the A/V cockpit, the nerve centre of the operation. An enclosed rack room is behind the cockpit.

The business of City Council is facilitated by a DCS 6000 Digital Conference System from Danish Interpretation Systems (DIS). Twelve DM 6560F delegate stations for the councilors and one CM 6560F chairman station (with delegate-off button) for the mayor, plus another 12 for the staff and clerk's desk, each with a loudspeaker, a "push-to-talk/request" button, and a gooseneck mic.

SOUND REINFORCEMENT SYSTEM

A sound reinforcement system was required to amplify spoken word and program audio from stereo sources, such as a DVD player. Due to the echo and sound focusing problems presented by the domed ceiling within the Council Chambers, Novita specified ICONYX digitally steerable array systems to direct the sound towards the audience but not into the ceiling.

Westbury programmed the digital processors using BeamWare to properly aim the beams and prevent potential feedback

"BeamWare lets you map the position of the speaker in the room, the position and slope of the seating areas, and the distance from the speaker to the last seat," Wildeboer explains. "You can define all those parameters and specify how many beams you want to emanate from the ICONYX line array, the level and down angle of each beam, and the acoustic centre of that beam within the column. It's really quite astounding to be able to control that. So if you have multiple seating areas, such as a ground floor and a balcony, you can create beams that go specifically to those areas and not the areas in between, which is unique and quite unlike a standard loudspeaker. The software will show you the resulting frequency response and SPL as well".

"We got in there with a Smaart system to adjust the delays and EQ curves and so forth. The existing pew-back loudspeakers were replaced with 104 Renkus Heinz SSL 4-2 coaxial 4" transducers which are the exact same drivers as in the IC-8s and a sonic match to the main system. For the people in the pews, the system now gives the sense that the sound is coming from the front of the room and not from the loudspeaker on the back of the pew in front of them. Novita's Senior A/V Designer Christian Bechard says, "The Council Chambers' ceiling is dome-shaped, and as a result the room has a serious flutter echo problem. We had worked with ICONYX in several other venues and chose the ICONYX to



'Being able to map the position of each loudspeaker in the room, define all the parameters and the acoustic center of each beam is astounding' – Doug Wildeboer, Westbury



steer the sound directly to the audience without any splashing into the ceiling." An additional benefit is that the beams significantly reduce feedback from open mics directly in front of them.

A pair of active subwoofers was specified to add warmth to the sound reinforcement system. They were built into the staff table millwork, but to avoid unwanted vibrations the subwoofer enclosures were isolated from the table millwork.

In addition to the DIS microphones in the digital conference system, the sound system includes three Shure MX-412 podium microphones for the public lecterns along with two Shure SLX Wireless microphones to afford freedom of movement for people making presentations. Line level media feeds are also available via wall plates located near the A/V cockpit and along the staff table millwork. A ClearOne AP 400 telephone hybrid is used to broadcast the meetings out to a conference bridge number for people to listen to the proceedings. A Phonic Ear StarSound 400 Infrared Assistive Listening System was included to help those with hearing difficulties, as required by the Ontario Building Code.

This project is unique in the integration of its many facets. "It's more than the sum of its parts, which is a bunch of great gear – it's making all that great gear work harmoniously together with a simple user interface. That's where customization comes in," Wildeboer says. "Because of the building's unique architecture, a single clap from the podium in the centre of the room is repeatedly echoed back. This challenging environment is what drove the use of every design trick available: steerable Renkus Heinz line arrays to focus the acoustic energy where needed, matching Renkus Heinz pewback loudspeakers to



Above, from left: Paul Forbes, Westbury National Systems; Doug Wildeboer, Head Integrator; Bill Coons, Director, Contact Distribution; Gary Plavin, President, Projection Design USA, whose DLP projectors feature; Tony Biagi, City of Mississauga A/V Systems Specialist

'It's absolutely incredible... I think we have the best council chambers in Canada right here in Mississauga' – Tony Biagi, City of Mississauga AV Systems Specialist

help add vocal clarity where needed without placing excess acoustic energy into the room, DIS delegate stations each with its own loudspeaker to ensure that the councilors and public can hear the other participants. The careful use of level, delay, and EQ has provided an intelligible system in a very difficult room. And the cautious use of the subwoofers enables the room to be used for full-range audio when playing back video programs and music."

"We worked closely with the clients, who told us how they like to control the room and how meetings are run and the things that make it work for them. Tony Biagi had very clear ideas of how he wanted it to work, and we worked closely with him and hit the mark in the end. He worked very closely with Novita in the early stages to communicate what he was looking for, and Novita did a

great job integrating that into a design and equipment list, which works well with the difficult acoustics of the room, and providing the video backbone," Wildeboer says.

What can other consultants and contractors learn from this experience? "Learn to ask the right questions of your client." Biagi suggests – and being on the client side of this project, he should know. "An educated client is one of the best things to have. Push that education on them in terms of knowing what they should be asking – for example, dial-in ability or full matrix ability? Ask the questions for your client. Don't just walk in and say, 'What do you want?' Try to push them to the edge, don't limit them. Get them future-ready."

Bechard notes that "the most important thing when designing a system is to keep the end user in mind. It is our firm belief that if we really listen to the users, the systems will meet their needs and skill levels, and they will be happy. When we have a user as technically inclined as Tony Biagi, the design process becomes very collaborative, and the systems can be more complex.

"Regardless of how complex the system becomes, it must still be easy to use, and we felt strongly that Doug and Westbury went out of their way to make a very complex system as user-friendly as possible. For this project we were very happy with the results and felt comfortable that the city of Mississauga ended up with the options and the control over the system it needed."

The last word goes to the client. "It's absolutely incredible," Biagi says. "I've seen some other government facilities in regions and cities, but I think we have the best council chambers in Canada right here in Mississauga."