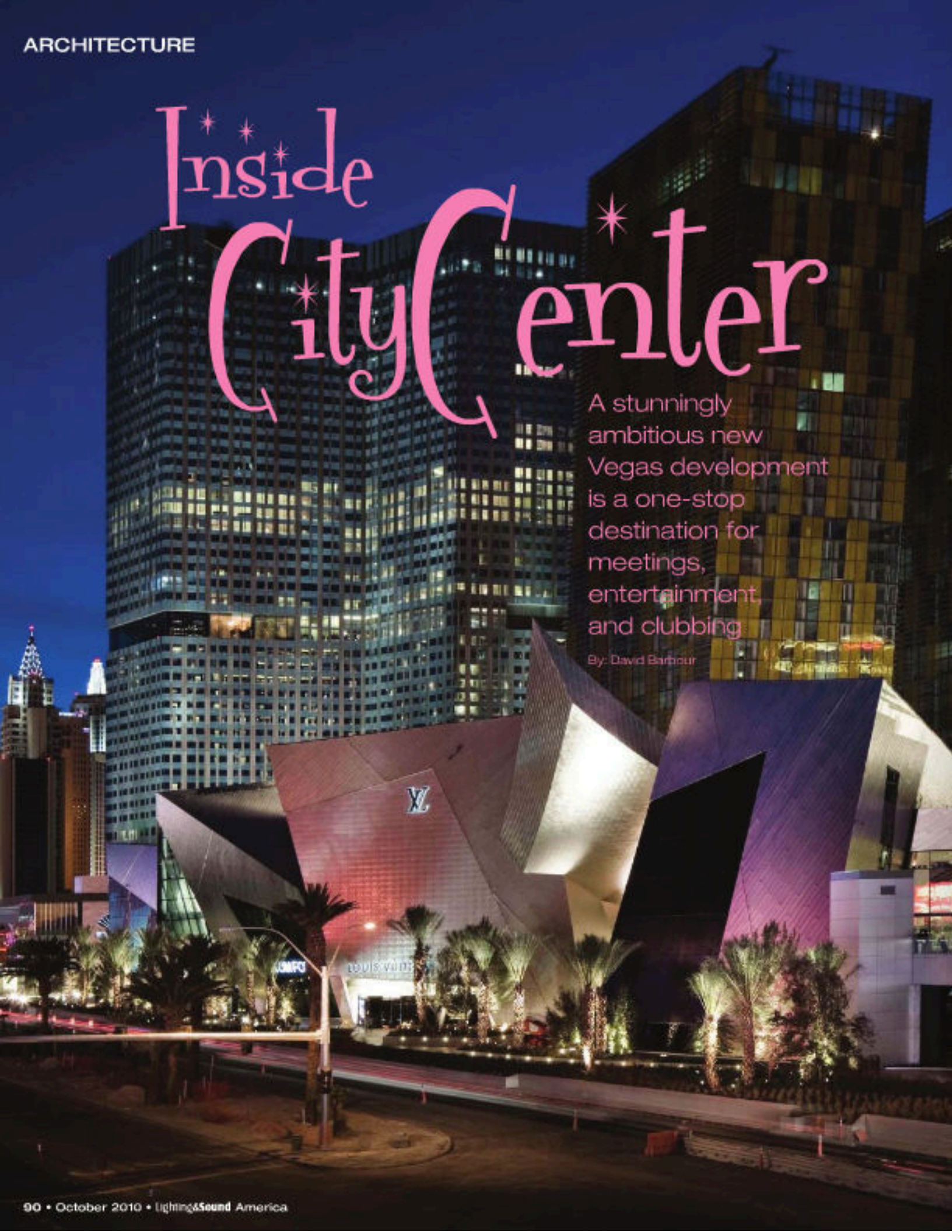
Inside CityCenter

A stunningly ambitious new Vegas development is a one-stop destination for meetings, entertainment, and clubbing

By: David Barbour



Even if one fully appreciates the tear-it-down-and-build-it-up-again ethos that prevails along the Strip, it's hard to grasp the scale and ambition of CityCenter Las Vegas. Others build resorts, casinos, and nightclubs; CityCenter is a major act of urban renewal. Located on 67 acres between the Bellagio and Monte Carlo resorts, CityCenter—a joint venture between MGM Resorts International and Infinity World Development Corp, a subsidiary of Dubai World—takes in the Aria resort and casino, Vdara hotel and spa, Crystals restaurant and entertainment district, Mandarin Oriental resort, and a residential area. It's a kind of city-within-the-city; one could conceivably spend an entire visit there without seeing the rest of Vegas.

Designed by the architectural firm Pelli Clarke Pelli, Aria—the focus of this story—consists of two curvilinear steel and glass towers; it contains 4,004 rooms, including 588 suites offering floor-to-ceiling glass windows. Other features include a 215,000-sq.-ft. pool deck, 150,000-sq.-ft. casino, an 80,000-sq.-ft. spa, 300,000 sq. ft. of convention space, ten bars and lounges, many restaurants, large-scale public art works by the likes of Jenny Holzer and Maya Lin, and a theatre featuring the latest Cirque du Soleil spectacular, *Viva ELVIS*. Put it all together and you have the largest privately funded development in the US. It's also the world's largest green complex, having earned LEED certification from the US Green Building Council.

A major player in the realization of CityCenter is Auerbach Pollock Friedlander, Performing Arts/Media Facilities Planning and Design (APF), which, working with a number of collaborators, provided consulting services on the Viva Elvis Theatre, convention center, and nightclub known as Haze. A sibling firm, Auerbach Glasow French, Architectural Lighting Design, was also involved in the Viva Elvis Theatre. It all adds up to a trilogy of projects that are unusual for their ambition, scale, and for the way in which they challenge the prevailing Las Vegas style.

Above and opposite: CityCenter makes a glittering addition to the strip.

"We essentially had three clients with the owner," says S. Leonard Auerbach, president of Auerbach Pollock Friedlander and Auerbach Glasow French. "Each project had its own timeline; we had three different teams in-house, with many key principal consultants overlapping. The architect of record, HKS, and the executive architect, Gensler, were the same, but with different management teams for each project.

"We started working on *Viva Elvis* first," Auerbach adds, "and were well along with it when HKS and MGM asked us to step in on the convention center. Much later, we were approached to consult on Haze. It was really a case of having three separate projects with the same target opening, although, from our point of view, the Viva Elvis Theatre was on a much earlier deadline, to be finished for Cirque du Soleil's move-in, so it could mount the production." Overall, he adds, "It functioned as three separate stand-alone projects."

Elvis has returned to the building

Regular readers will recall *LSA*'s feature story on *Viva Elvis* in the May 2010 issue. The 1,840-seat theatre housing the show is the seventh permanent venue for Cirque du Soleil (CDS) in Vegas. (The others are *Mystère*, *O*, *Zumanity*, *KÀ*, *The Beatles LOVE*, and *Criss Angel Believe*.) APF collaborated with Cirque, Pelli Clarke Pelli, the MGM Mirage Design Group, Gensler, JaffeHolden and HKS to coordinate the technical systems to be integrated into the building, implementing the theatre concept created by Johnny Boivin, of CDS, as well as systems involving stage machinery, theatrical lighting, and audio/video.

In some ways, the theatre is a throwback to the showrooms of Vegas in its glamorous 1950s heyday, with curving aisles, rose woodwork, and side wall drapery. The use of banquette seating in the center of the room is designed to facilitate a communal experience for the audience. It's appropriate for a show that celebrates one of the greatest stars of Vegas' golden era.

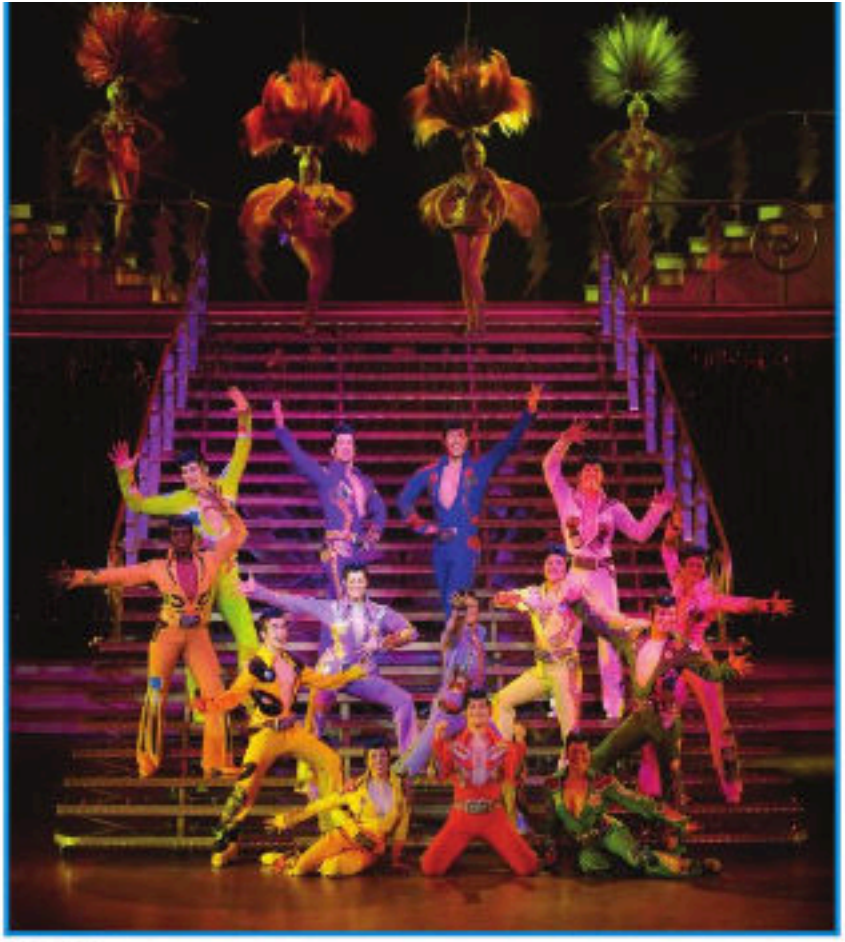
As is often the case with CDS shows, the scale is enormous. The show unfolds on the 19,200-sq.-ft.

Photos: Courtesy of CityCenter Vegas

cruciform stage, which has been engineered to accommodated scenic elements weighing up to 60,000lbs. The rear and side stages are the full height of the 104' grid. The stage's 80'-wide proscenium opening required the largest curved fire curtain in the world, supplied by Brooklyn-based rigging and drapery specialist Pook Diemont & Ohl.

To accommodate the show's effects, APF developed an infrastructure that includes 17 stage lifts, covering a total surface area of 3,726 sq. ft. The largest, which weighs about 265,000lbs and measures 1,350 sq. ft., can travel at 1' per second; it supports eight additional stage lifts, which can also travel at the same speed. The 20' by 20' center lift travels at 2' per second; it is fitted with a horizontally traversing cover, known as "the sloat," allowing scenery to be reconfigured in the basement area while new scenery is revealed directly above it.

The rigging system was conceived on a similar scale: Five motorized overhead trolleys, integrated with wireless control to travel at a speed of 6' per second, transport both scenery and performers. The trolleys are fitted with vertical hoists as well as a rotational axis; one trolley unit consists of four vertical hoists and one trolley rotating assembly, so performers or scenery can rotate while moving horizontally and vertically. A six-panel motorized LED screen traverses upstage of the scenery; the six separate projection surfaces are deployed and retracted as needed—in *Viva Elvis*, large dimensional scenic pieces and projected visual imagery often work together. In addition, eight fixed winch assemblies are positioned on the grid surface to assist with the movement of a 60,000lb scenic element in and out of the space. Ten motorized lighting trusses deliver lighting gear to the proper elevations and positions. Twenty-one motorized multi-line winches are used for moving scenic elements.



Viva ELVIS.

The stage lifts, traps, and sliding covers were supplied by Show Canada; the winches, tracks, and trolleys came from Stage Technologies. The automation system, also by Stage Technologies, includes four of the company's Nomad control consoles. The structural support systems for the automated rigging were developed in conjunction with Thornton Tomasetti Engineers, and control of the rigging system noise was by JaffeHolden.

In addition, the auditorium features an extensive network of technical catwalks located over the seating area, to support the front-of-house technical systems. The control suite features 1,450 sq. ft. of booth space and 102 linear feet of glass, providing a clear view of the onstage action.

It's an incredibly complex network of systems, yet, says Auerbach, "We started the project with only a vague idea about the production." Surprisingly, he suggests, in projects of this nature, its not uncommon for the consultants to begin work before the show concept has been fully realized. In situations like this, he adds, "Major stage configurations, which may need to accommodate extensive machinery, require bold decisions and faith in the consultant, with CDS' approval, to ensure that, later on, the design intent will not be impeded. With *Viva Elvis*, we received input from Gilles St. Croix, CDS' executive producer, and Stéphane Mongeau, the VP of production, because we had very limited knowledge of what [the production designer] Mark Fisher would be doing, and, at that time, the show's creative team was not fully on board. We worked closely with Don MacLean, CDS' technical project manager, to set the general scope of the project, with certain 'placeholders' that would allow Mark Fisher to have the design freedom he needed. We were then able to design the stage machinery, automation, and lighting and sound systems to fit the production without obstruction."

APF has a long history with CDS, which certainly must help. For example, Auerbach says, "The acrobatic rigging concept for *Viva Elvis* carried forward developments we had provided for *KÀ*, *LOVE*, and *ZAIA* [a CDS spectacle in Macao]. The size of *Viva Elvis'* stage and the desire for faster acrobatic tracking and hoisting pushed us away from previous approaches using cog belts and cable drives. This evolved from early criteria, given to us by CDS, requiring tracking systems that crossed one another." Tom Neville, a project principal, says, "We worked with Stage Technologies to develop a traversing hoist carriage with friction drive, which used motors on each of six friction drive wheels, much like a light rail train, and enabled the tracking carriage to still have drive purchase and complete position accuracy while moving over the gap of an intersecting track. The intersecting tracks were eliminated, but we were able to take real advantage of the new development for a quiet, precisely controlled carriage with rotating multiple high-speed hoists."

The production's lighting package, Auerbach notes, reflects a gradual shift at CDS to an ever more concentrated use of moving lighting. The lineup of gear, specified with the production's lighting designers, marc brickman and Martin Lebrecque, includes 110 Philips Vari*Lite VL3500 FX units, 28 VL3000 Spots, 67 VL3500 Spots, 24 Syncrolite Syncro MX4s, 170 Elation TriPARs, 26 Martin Atomic strobes with scrollers, 36 Solaris Quasar 15K strobes, one Solaris T-Light 85K strobe, twenty-five T8 Technologies Lumapanels, six Robert Juliat Cyrano followspots, two Clay Paky Alpha Spot 700 HPEs, 90 ETC Source Fours in various models and degree sizes, 25 James Thomas PAR 20s, 30 Altman StarPAR CDMs, 75 Altman PAR 64s, and 154 Altman short-nose PAR 62s. Lighting is controlled by a grandMA console, from MA Lighting, with ETC Sensor dimming and an ETC Net3 network. Wireless Solution's W-DMX Blackbox S2000 transmitters and R512 micro receivers send DMX to six roving VL300s and some LED units, as well as rope light, MR16s, and red beacons on stage.

Volumes of sound

Mark Holden, of JaffeHolden, the theatre's acoustician, notes that, in some ways, the project's biggest challenge was its sheer size. "One can think of a couple of backstage areas that are bigger," he muses, "but this theatre just blows your mind. The room is such a gigantic volume; you have to find a way to absorb that natural energy on stage. How do you make a room like that sound bright and clear and intelligible while making sure it has some character to it?

"The designers wanted the room to have big poly columns on the side walls, with cutouts built into them," Holden adds. "That could have been an acoustic disaster but, working with them, we cut big openings in the columns, with drapes, scrims, and acoustic treatments behind them, all of which created a layered acoustic effect. On the column exteriors, we have curved wood reflectors that bounce sound around the room to give it a sense of brightness and clarity.

"Behind the scrim, which is acoustically transparent to let sound and light come through, are gigantic acoustic baffles hanging from the ceiling to the floor. They're 4' wide and 2-3" thick. In the corners of the room's attic, we created giant bass traps, some of the largest ever built. They're almost 20' high, 20' deep, and 20' on the side, and are located in the room's four corners. They are there to totally soak up the low-frequency sound without affecting the room's clarity. We partnered with Jonathan Deans [*Viva Elvis'* sound designer] to create a sound that is very clear and precise. It's the opposite of the wall-of-sound effect; we want you to hear each single instrument."

Interestingly, Holden adds, "The huge backstage area is less of a concern; we filled it up with as much sound-absorbing material as we could. The real trick is how to put the right sound in the auditorium. Also, Cirque du Soleil's offices are located just below the audience seating; there are some subwoofers built into the floor, so we created acoustic enclosures to contain the sound, keeping it from spilling into the offices below."

Like the APF team, Holden had to deal with the fact that the show was not fully conceived. "It wasn't clear if there was going to be an offstage band or not," he says. "Therefore, there are music rooms at stage right and left; they're totally sound-isolated, with a kind of box-in-a-box construction." Because the band is on stage for most of the show, however, he adds, "their function evolved. They rooms are now used for the monitors and the radio monitor mix for the musicians."

APF's responsibility also includes the design of sound, video, and communications system, which was developed in concert with Deans, and it reflects his preference for certain key brand names, notes Paul Garrity, APF's principal sound designer. The primary front-of-house sound reinforcement and effects playback is handled by a computer-controlled audio matrix and processing system, drawing on a Meyer Sound/Level Control Systems Cue Console, including an LX-300 frame, DSP modules, CueStation software, Wild Tracks hard disk playback, Apple Mac Pro, and Mac Mini computers and Cinematic monitors for primary playback. The system controls 168 sources into 176 matrix outputs. Modular control surfaces are deployed for sophisticated live mixing and routing control of microphones and multi-track audio playback. A secondary 168 by 176-channel audio matrix and processing system provides performer in-ear and stage

loudspeaker monitoring. (See pg.122 to learn about the Optocore 512-channel fiber-optic redundant audio transport system.)

The main loudspeaker system of arrays and overhead boxes consists of Meyer Sound MICA, MTS-4A, CQ-1, and UPJ units. The subwoofer component includes Meyer M3Ds and 700-HPs, along with Danley Sound Labs TH-115 boxes. The surround system includes Meyer MSL-4s, UPQ-1Ps, UPJ-1Ps, UPJuniors, M'elodies, M1Ds, and Innovox FS-V2 units. More M1Ds are found on the stage edge, with Meyer SB-2s functioning as stage monitors. Portable speakers include UPJ-1Ps, UPQ-1Ps, and M1Ds. Signal processing is handled by Meyer's Galileo and Waves MaxxBCL. Providing power where needed are Crown MA-12000i and CTs 4200 amplifiers. Monitoring is provided by Meyer's RMS (remote monitoring system) with iLon Ethernet adapters. The sound gear package was supplied by Montreal-based Solotech.

A wireless performer tracking system, supplied by TiMax, provides real-time three-dimensional performer positioning. The information is sent to the front-of-house reinforcement system for automated panning across all channels. The microphone system includes 36 channels of wireless mics, 26 channels of stereo in-ear monitoring, two channels of IFB (interruptible foldback), with 40 wireless receivers. Sennheiser EM3732 dual UHF receivers with SK5212 body packs and SKM5200 handheld transmitters are used.

All spaces, including rehearsal halls, technical offices, training rooms, dressing rooms, shoe and costume maintenance, greenrooms, and the technical grid are connected with sound, video, and communications systems from the stage area. An 80-port Clear-Com Eclipse Median 80 digital matrix intercom system, interconnected with a digitally controlled Clear-Com TCVS-2700 eight-channel analog matrix, is capable of switching 288 stations into eight party lines. The system provides 20 channels of wireless intercom feeding 40 wireless belt packs. In addition to the Clear-Com RS-601 and RS-602 belt packs and KB-7-2 loudspeaker stations, there are Telex BRT-800 wireless base stations and TR-800 belt packs. Backstage monitoring and paging is controlled by a Dynacord ProAnnounce system feeding over 135 Electro-Voice 409-8T and EVID4-DT loudspeakers and allowing for paging from portable stations or digital matrix intercom systems. A Listen Technologies LT-800-216 wide-band wireless FM assistive listening system is available for the hearing-impaired. Middle Atlantic racks are use throughout the venue to store equipment.

More than 20 Panasonic AW-E560 and CP480 production fixed-focus and AW-560 remote-controllable color video cameras are routed through a 26-channel modulated video system for monitoring of performers, musicians, and critical backstage systems.

Lighting the auditorium and lobby

Auerbach, noting that the look of the theatre and the lobby were the work of Johnny Boivin, CDS' architectural designer, says, "His intent was to create a harmonious audience environment with comfortable seating, so that intimate groups could sit together. We worked with him and the interior designer, Cleo Design, to develop a custom seat that functioned well and met the building code. We also had mock-ups built to confirm the ergonomics and mechanical functions for the banquette seat."

As the audience arrives in the showroom, the house lighting, designed by Auerbach Glasow French (AGF), includes theatrical ellipsoidals with circle pattern templates to provide general illumination via a soft patterned light. Downlights mounted between the architectural ceiling panels supplement the pattern lighting without washing out the pattern effect. Pathway illumination is provided by low-level LED lighting and fluorescent aisle lighting. High-intensity color-changing LED fixtures are incorporated into side wall openings, lighting the room's draperies. Before show time, the side wall lighting is restrained, complementing the rest of the architecture. As the show starts, the side walls burst into color, surrounding the audience with pulsing color changes.

The showroom lighting makes use of ETC Sensor dimmer racks, SmartSwitch relay panels, Cisco fiber-optic and Ethernet switches, an ETC Emphasis console, ETC Net3 gateways, MA Lighting grandMA NSPs and replay units, Creston TMPC-SX wireless handheld-touch-screen controllers, and a Doug Fleenor Design 1211 optical isolation amplifier.

Speaking of the theatre's spectacular lobby, Auerbach adds, "Johnny Boivin's concept included a dynamic lighting wall that sprung from an idea that envisioned sculptured glass and changing light sources. Our architectural lighting department [AGF] was also architectural lighting designer for the lobby."

The outer entry lobby features a curving glass soffit internally illuminated by more than 6,000 RGB color-changing LEDs. The soffit changes color throughout the day, with changes becoming more frequent and vivid as show time approaches. The inner lobby features a 44'-high ceiling; located 12' above the theatre entries is a 150'-long glass wall, internally illuminated by 357 RGB fixtures made up of 5,355 LEDs. The glass wall, referred to as the Diamond Wall, is comprised of lenticular lenses behind fluted vertical glass panels. The lenses' teardrop forms move in juxtaposed images with the angle of view, creating an effect of color and movement behind the lenses.

Photo: Jeff Aurich

The *Viva Elvis* auditorium recalls the showrooms of Vegas' early glory days.

Mirrors line the opposite wall, reflecting the images created in the glass wall; Holden notes that the mirror wall consists of 5mm-thick Mylar stretched over acoustical panels. "It looks like a hard piece of glass, but it isn't; it's a sound transparent skin over fuzz," he says. "It controls the sound in the lobby, which otherwise consists of hard surfaces."

Also, says Matthew Ezold, APF's sound project manager, "To provide pre-show music and announcements in the reverberant, high-ceilinged lobby while concealing the loudspeakers, we broke the system into two segments. Overhead directional ceiling loudspeakers and subwoofers provide the higher SPL desired to get the audience excited, and a second set of loudspeakers, at head height hidden behind the lobby's decorative finishes, increases intelligibility and pulls the audience toward the theatre entrance." The lobby effects system includes a Digigram hard disk and Tascam CD playback; the loudspeaker rig includes Electro-Voice C4.2 and V10.1, Innovox FS-V2, and Atlas Sound FA136T87 loudspeakers, along with Crown CTs 12000 CTs 2000, CTs 4000, and CTs 8200 amplifiers. Control and digital signal processing are via a BSS BLU system, with a Calypso Systems Pro I/O with touch panel.

Lighting gear in the lobby and auditorium include Alko undercounter fluorescent task lights; Bega compact fluorescent steplights; a Bruck flexible track system, ETC ellipsoidals; Kurt Versen MR16 downlights, compact fluorescent downlights, and T4 downlights; Light Control fluorescent wall slots; Lightolier pendants and MR16 downlights; Lumiere surface-mounted MR16 downlights; Philips Color Kinetics RGB LED fixtures and LED white cove units; Q-trans low-voltage transformers; Sisternalux Iguzzini LED recessed steplights; and Tivoli LED undercounter task lights.

Many others were involved in the project. From CDS, key personnel included Anik Patry, director, theatre projects; Jean-Francois Lavalée, assistant director, theatre projects; Ray Forton, administrator, theatre projects; Nathalie Thibeault, project manager, theatre design; Jean-Nicolas Rousseau, project manager, theatre development; Danah Abarr, project manager, theatre construction, architecture; Steve Dubuc and James Tomlinson, project managers, theatre construction, TSE; Carol Rexhouse, construction supervisor; Stéphane Lemay, technical support director; Robert Levac, sound and video communications and projections technical advisor; Éric Bouchard, lighting technical advisor; and Michel Demers and Jeremy Hodgson, automation technical advisors. Also from APF, Howard Glickman handled lighting system design. From AGF, Patty Glasow was project principal and Marlene Lieu project manager.

By all accounts, *Viva Elvis* looks like another CDS hit; interestingly, the show, which celebrates Vegas' gaudy past, is an anchor of fun in the middle of its city's newest place to eat, sleep, and play.

Two views of the lobby, with the color-changing wall.