

# A Place of Earth and Sky

The Wagner Noël  
Performing Arts  
Center is a striking  
addition to the  
West Texas  
landscape

By: Mel Lambert





The main theatre at the new Wagner Noël Performing Arts Center, located on the University of Texas of the Permian Basin campus, was designed to be a thing of earth and sky. According to informational materials supplied by Boora Architects, “The architecture is formed conceptually by the two elements—strata and sky. The walls of rough-hewn limestone dramatically rise from the earth like heaving rock layers, while gleaming volumes containing the performance venues are clad in stainless steel to reflect and merge with the colors and patterns of the dynamic sky. The result is a structure that looms on the horizon with a scale responsive to the powerful West Texas landscape.”

Inside, the Wagner Noël Performing Arts Center is designed to accommodate touring Broadway shows, popular entertainment, dance, and a broad range of music programming, in addition to student recitals and local symphony concerts. The project, which opened in November 2011, occupies some 109,000 sq. ft. of performance and support spaces and cost a reported \$81 million, including \$65 million for construction. San Francisco-based Auerbach Pollock Friedlander oversaw all theatrical-design elements, with Steve Pollock as principal in charge and Kenneth R. Fause as audio-video systems principal. JaffeHolden, of Norwalk, Connecticut, oversaw the facility’s various acoustic designs, with Mark Holden as principal in charge and Carlos Rivera as project manager.

The design team was led by Portland-based Boora Architects, with Rhotenberry Wellen Architects of Midland, Texas, as the local consulting architect, Shah Smith and Associates of Houston as the MEP engineer, Houston-based Walter P Moore as the structural engineering firm, and Dallas-based Hunt Construction Group of Dallas.

The Wagner Noël project came to

Auerbach Pollock Friedlander through a long-term connection with Boora Architects. “We pursued the RFP for the project with Boora,” Pollock recalls. “Having worked on many projects with the Portland architects, we enjoy long-standing relationships with their leadership, especially principals Tom Pene [now retired] and Stephen Weeks.” JaffeHolden’s long history with University of Texas performing arts projects made the firm a perfect partner for the team.

The new performing arts center is comprised of the 1,819-seat Wagner Noël Theater, 189-seat Rea Greathouse Recital Hall, and Rea Music and Academic Center. “First and foremost, we developed a compelling program and an exciting, affordable performing arts center on a site geographically central to the communities of Midland and Odessa, Texas,” Pollock states. “Just as the cities were able to develop a joint-use high school football stadium for both communities, it was quickly demonstrated that there were donors in both communities—Cy Wagner in Midland and Ellen Noël in Odessa—whose lead gifts supplemented state money and led the way to a successful fundraising partnership between the neighboring Permian Basin cities.

“The original desire was to have a regional performing arts center that would provide a suitable setting for touring Broadway and popular entertainment, with only 15% or so utilization anticipated for acoustic music, largely for local symphony and UT Permian Basin’s fledgling music department. Music facilities, including the recital hall, have been immensely popular among students in the region. The Wagner Noël Theater has been very successful in its first season.”

The interior of Wagner Noël is unusual, Pollock says, “since it combines traditional, classical room elements—dual balconies, side galleries, and a highly-organized social environment—with more

abstract architectural features, especially the stratified wall design and overhead star fields, which recall the geology of the west Texas 'oil patch' and the broad night sky that frames the building itself."

Aside from popular entertainment and Broadway shows for the main theatre, the Rea Greathouse Recital Hall serves the music department's needs as a smaller public assembly for music and seated events. "Both halls have variable-acoustics systems, primarily relying on less-costly traveler drapery systems and also a series of wide, overhead banners that dry the acoustical response in the Wagner Noël Theater," Pollock says. "The orchestra shell has been designed to strike quickly using a series of mobile towers that carry each ceiling and its support truss intact for temporary storage along the upstage wall on dedicated rigging. Our relationship with Midland's Tomcat—a local company that since has gone international—was a determining factor in opting for significant support using aluminum trussing and chain hoists, as it was a well-understood option for local riggers," he says.

"In addition to providing audio-video design services, we made all necessary accommodations for live-performance capture and recording, with an adjacent recording studio, and for the rehearsal hall and practice/instruction rooms in a comprehensive and hands-on environment that the students could learn to run themselves," he says.

### **Modeling the physical space and acoustical envelope**

Given the weighting of the acoustical design for amplified speech and music, it was critical to first model the needs of the physical space and determine the acoustical envelope, and then select line array systems that would minimize undesirable reflections off sidewalls and ceilings—problems

that can result in poor intelligibility for rooms in which amplification has been added for music theatre and concerts. Working closely with Holden, APF's audio-video designers Fause and Vene Garcia developed sound systems for both venues that would accommodate a range of productions.

"The Wagner Noël's acoustically flexible auditorium is terraced, with two balconies and stacked side boxes," Pollock explains. "Sightlines are excellent from all areas. The technical stage support areas include a full fly tower and forestage gridiron, with both motorized and manual rigging systems and an orchestra pit lift with seating wagons. A custom-designed orchestra shell with a comprehensive mover system allows the ceilings to be removed from the rigged loft area when the space is required for touring Broadway shows."

For the various sound-absorbent systems installed in the main theatre, "cost was the key factor, as well as ease of installation and operation," Pollock adds. "Using a similar approach employed with Boora and JaffeHolden in our work for the acoustical renovation of the Bass Hall PAC at [The University of Texas at Austin], we relied on an affordable mix of variable sidewall masking and significant amounts of absorptive drapery and banners at the catwalk level, all sewn and installed by Texas Scenic, the project-rigging contractor. This approach allows the room to be as 'wet' as necessary for natural acoustics, while being sufficiently 'dry' for amplified events that lead Wagner Noël's programming."

"The computerized theatrical lighting and sound systems are road-friendly, with front-of-house sound mix and lighting control positions tucked under the shallow balcony overhang at the back of the parterre seating. For visiting productions, cableways from the mix to the dock are easily accessed." The performance stage measures 100' wide and 44' deep,

with an adjustable 49.5'-by-30' proscenium. Entrance and performer support services, with two floors of dressing rooms, are located directly behind the stage, which also features internal and external crossovers.

Stage scenery, draperies, stage lighting, and audio-video equipment can be attached to and hung on any of the 54 stage battens, each with a scenery/lighting load capacity of one ton. The gridirons—some 69' above the stage and forestage area—allow technicians to rig additional hanging points and to store stage scenery elements and the ceiling for the orchestra shell.

### **Variable acoustic tuning**

According to Holden, who oversaw the facility's various acoustic designs, "The university wanted a concert hall but did not need it exclusively for their use. The design required a large acoustic volume with massive concrete block walls and concrete ceiling surfaces. We specified large vertical acoustic banners, with traveling horizontal acoustic drapes in the ceiling and on the upper rear walls. The design was derived from the very successful Long Center in Austin, [Michael & Susan Dell Hall], but modified for the tight budget and the lack of an operatic component.

"The hall was stripped down to just exactly what is needed acoustically, but no less. The wall elements are designed like oversized bricks that modulate in depth and size to provide mid- and high-frequency diffusion but end at the ceiling line. Above the ceiling—in reality, a curtain of glowing LEDs that define a 'star field'—the flat masonry walls are simply triple-painted to seal the block. The ceiling structure, drape pockets, forestage grid, and large, round return air ducts provide the diffusion in this zone, shifting from wall treatments below the ceiling to suspended in-space diffusion elements above. Ceiling reflectors are another area where only



The interior of the 1,819-seat Wagner Noël Theater features a wood orchestra shell and acoustic systems for a wide range of users.

the minimal ceiling needed was used; no surface was there simply for architectural form or conceit. The ceiling netting of LED lights is acoustically transparent, hung from the catwalks.

“Over 5,000 sq. ft. of acoustic banners and drapes are positioned in the upper volume of the hall and on the upper rear wall of the balcony, to control both overall acoustic energy and control the reverberation time. We knew that the hall would want to be in its most reverberant mode for classical symphony and choral music—an RT60 of two seconds, or

more,” Holden says.

“We prefer to start tuning the hall with all the acoustic drapes deployed to see how the room reacts—how the energy from the stage fills the room—which allows us to hear the direct sound more clearly with less ‘cover’ from the reverberant field. We believe that leaving some banners and drapes deployed to simulate the ‘audience condition’ for rehearsals is vital. Often the upper-balcony seats can be a bit too reverberant, and so several upper-rear drapes might be deployed—even in concert mode with an audience.

Here we don’t expect 1,800 patrons for the symphony—800 is more typical—and so a small amount of acoustic control is desirable,” he says.

The vertically deployed acoustical banners located in the center of the room change the hall’s sound in a different way than the horizontally deployed drapes along the side or rear walls. “The double-sided wool serge for the banners—with a 6” air gap between the two layers—is an efficient, full-range absorbing system, located in the center of the ceiling volume,” Holden continues. “Their



The interior of the Grand Lobby, which is fully functional for receptions, dinners, and weddings

location means that the free path before a sound reflection strikes the banners is very short—sound will strike the banner from all sides—and will therefore divide the space into smaller volumes, thereby increasing the actual efficiency of the banner beyond the documented specifications. The acoustic drapes on the upper side walls are thick, 24oz.-per-sq.-yd. velour, mounted 12" away from the walls. Adding the air space behind the drapes offers increased low-frequency absorption; by locating them along the upper side walls and proscenium, we absorb lateral energy modes and the reverberation that is developed between large upper-parallel surfaces.

"For many events, such as

symphony concerts, the rear drapes are useful to compensate for the lack of an audience in the upper reaches of the hall. Often, we find that to provide the orchestra floor with the correct level of reverberation—energy level, not time duration—results in the upper balcony having a higher level of reverberation in relation to the direct sound and the early reflections. Thus, the local velour acoustic drapes at the rear of the balcony."

Tuning a hall is like tuning a piano, Holden says. "The piano tuner begins by forcing the string out of tune and then brings it into tune. In our unique process, we start with the drapes deployed, knowing that the hall will never be used in this configuration. Then we gradually store each group

of drapes and listen to differences in sound in all parts of the hall—increased reverberation, but also timbre differences, the sense of surround and balances between low and high registers."

Manufactured and installed by San Antonio-based Texas Scenic Company, the variable-acoustics system comprises ten double-layer, motorized roman shade-type banners, six motorized traveler draperies, a single manual traveler drapery, and programmable preset motor control.

#### Audio systems for Wagner Noël Theater

Installed by AVI-SPL's Dallas office, the main left and right line arrays

consist of nine self-powered JBL VerTec VT4888DP-AN mid-sized loudspeakers and two JBL VT4882DP-AN subwoofers per side, with a center array of ten VT4887ADPN-AN compact cabinets. Seven d&b audiotechnik E3 loudspeakers installed at the stage lip make up the front-fill system, powered by a pair of d&b D6 amplifiers, while the under-balcony delay system comprises 18 JBL Control 328CT loudspeakers powered by two Crown CTS2000 power amplifiers. Two Bag End QUARTZ-R loudspeakers are available as portable stage subwoofers. A Yamaha PM5D-RH 56-channel digital console handles the front-of-house with a redundant power supply and an AVY16-ES100 AuviTran EtherSound network card. Outboard gear includes a CD-01U PRO CD player and CD-RW901SL CD recorder/player, both from Tascam.

According to Fause, “The VerTec family is accepted on many technical riders, and the directivity proved to be a close fit to the room. The self-powered version allowed the project team to eliminate a separate amplifier room with dedicated cooling—which represented a significant cost savings. The center array is intended for spoken word and vocals, as well as a cinema center. The VT4887 series provided an excellent timbre match to the VT4888, with a smaller size that met the design objectives of the architectural and orchestra canopy.

“The d&b loudspeakers installed at the stage lip were selected to meet a significant space constraint; they produce the required level to match the main speakers and sound excellent. Modeling indicated that a small amount of HF fill would likely be required for the under-balcony delay system; the Control 328 offers a combination of high sensitivity and power handling that the delays need to produce for musical peaks

matching the mains.”

“System inputs are managed with connection panels located throughout the performance space and with an on-stage analog microphone splitter capable of feeding up to three mixing consoles,” Pollock says. “The main house mix position is located at an open ‘sound porch’ at the rear of the parterre seating and is large enough to accommodate the house digital mixing console and up to two additional guest consoles.” House mixing consoles and digital signal processing systems are networked using EtherSound for simplicity and low latency. The left and right speaker arrays can be removed to accommodate guest production companies.

A Yamaha M7CL-48 digital mixer with MBM7CL meter bridge handles stage monitor mixing, connected to six self-powered JBL VP7212MDP stage cabinets, two JBL VP7215/95DP side fills, a JBL VPSB7118DP subwoofer, and four JBL EON10 G2 effect loudspeakers. “Yamaha monitor and FOH consoles are rider-friendly and familiar to the local and regional sound operators,” Fause says. A total of eight Whirlwind SPC83LUNT passive microphone splitters and one SPC83 passive line-level splitter are also available, together with Whirlwind custom I/O panels and fan out audio snakes. A Shure ULX two-channel wireless microphone system with a pair of handheld and two belt-pack transmitters includes remote active antennas. A Listen LT-800 stationary RF transmitter with an LA-122 remote antenna connects to LR-300 receivers for assistive listening and language interpretation.

A multichannel production intercommunication system and backstage monitoring and paging systems support stage-management requirements. A Clear-Com Eclipse Easi-PiCo digital intercom matrix with expansion frame features a two-wire audio interface and connects to a

Clear-Com ICS-1016E matrix remote intercom station and an HME PRO850 wireless intercom base station with four belt packs.

### **Custom orchestra shell walls and ceiling**

The design of the custom orchestra shell walls and ceiling was carefully coordinated with the architect and acoustician to both complement the audience chamber finishes and provide the necessary acoustic performance for live unamplified music. The modular orchestra enclosure from Wenger Corporation of Owatonna, Minnesota, comprises a single 10'-by-30' articulating tower with three 8.25'-by-50' folding/flying ceilings designed to accommodate ensembles and orchestras of all sizes. Over-stage ceiling reflector panels, equipped with integrated orchestra performance lighting, were mounted to their own permanent trusses, allowing them to be removed efficiently as large single elements. “It was important that changes from concert performances to Broadway productions be cost-effective,” Pollock says. “Removal of all three ceilings is easily managed within 45 minutes by a crew of four.”

The main theatre’s rigging system, manufactured and installed by Texas Scenic, comprises 53 single-purchase counterweight line sets, two single-purchase counterweight light ladders, three motorized speaker winches, a motorized forestage reflector, a motorized fire curtain, and a motorized capstan winch. The left and right line arrays are each rigged from two Columbus-McKinnon chain motors with Polar Focus pivot beams and dead-off wire ropes. Texas Scenic also supplied the 68'-by-32' house curtain, rigged to bi-part and guillotine, with a 68'-by-16' valance, ten masking legs, five masking borders, and a cyclorama. Manufactured and installed by Theatre Solutions, Inc., of



The 189-seat Rea Greathouse Recital Hall's sculpted plaster walls are key to the room's acoustic performance.

Quakertown, Pennsylvania, the fixed audience seating includes customized Teatro theatre chairs with matching loose armchairs for the boxes.

The Serapid orchestra pit lift has a lifting capacity of up to 16 tons and can be set at stage, audience, orchestra pit, or storage level. At audience level, upholstered seating wagons can be moved into place quickly to provide additional seating for dance, drama, or lectures. At stage level, it can be used as an extension to the stage to form a forestage apron. A permanently installed, large, perforated projection screen can be flown in for cinema presentations or film festivals.

### **Theatrical control lighting system**

A full-width forestage rigging grid above the orchestra lighting canopy

provides a work platform for installing touring lighting trusses in the Wagner Noël Theater, as well as a support and service area for all of the front-of-house motorized rigging, including the loudspeaker line arrays and an articulating architectural eyebrow. Loudspeakers can be stored out of audience view by raising them on individual hoists and lifting the center array through a notch in the architectural ceiling.

"As always for touring venues, it's a matter of specifying lighting systems that work for the local operators, in addition to demanding out-of-town users," Pollock says. "Given the local expertise with rock-and-roll touring at Tomcat, we opted for flexibility in lighting that would allow a workable 'house hang' as well as easy setup and strike of touring events, which required ample power

for moving lights and effects as well as a sufficient complement of conventional dimmed circuits."

Close to 600 individually controllable theatrical lighting circuits are provided throughout the stage, with front-of-house lighting positions available for theatre, concert, and house lighting, including the overhead LED star field between the lighting catwalks. Additional switched power is distributed throughout the space for moving lights and accessories. "The lighting control system allows concert performances and lectures to be run from simple touch-screen panels, and fully staged productions are run with the computer lighting control consoles," Pollock says.

The lighting system includes seven ETC Sensor SR48+ module rack, seven ETC Sensor CEM+ control electronics modules, 488 ETC 2.4kW

Sensor dimmers, 13 ETC 6kW Sensor dimmers, 37 ETC 2.4 kW HR Sensor dimmers, 20 ETC 2.4 kW relays, two LC&D GR 2400 twenty-four single-pole DMX controlled relay panels, and an ETC Eos lighting control console, plus an ELTS 620-120 emergency-lighting transfer system and an ETC Unison system for house lighting and work-light control. Also available: a custom portable cue light station, a custom portable architectural control station, and custom Ethernet patch panels. ETC lighting fixtures include 315 ETC Source Fours in various degree sizes, plus 30 L&E Echo 6551 cyc lights (ten with floor trunnions), 12 Altman Lighting Q-Lite Jrs, and a pair of Strong Entertainment Lighting Super Trouper IIs.

### Rea Greathouse Recital Hall

The 189-seat recital hall features a versatile, flat floor space with telescopic seating by Jezet, allowing quick setup and storage with very little staffing while accommodating a range of configurations appropriate for small and large recitals, lectures, receptions, or social functions. A computerized lighting control system; a Texas Scenic variable acoustics system with motorized traveler draperies; and an audio-video system for media presentations, recording, and amplification address the hall's various technical needs. An adjacent recording room supports surround-audio recording of events in the recital hall and provides sufficient space for class observation and participation.

AVI-SPL installed the left/right main house system, which consists of two JBL VP7212/95DP two-way integrated loudspeakers, two JBL LSR2328P monitor loudspeakers, a JBL LSR2310SP subwoofer, and a



The UTPB music faculty's large rehearsal room features box-in-box sound isolation and tunable acoustic drapes.

Soundcraft FX16ii 16-channel analog console.

"The Soundcraft console offers a clear signal flow that is approachable by students as a teaching tool and sounds good," Fause says. "The left and right arrays provide a good directivity match to the room, require minimum infrastructure, and feature rated rigging hardware. The axial and power responses are closely related, which was important in a live room."

The room acoustics in both spaces are excellent, Fause says. "This is a double-edged sword—if there is anything wrong with the sound system, there is nowhere to hide! For the main hall, we came to the site prepared to spend the best part of a day tuning the mains...not so. The JBL VerTec setup wizard works well, and the V4 tunings proved to be quite neutral. Gone is

the JBL voicing of old; we used remarkably little system EQ. The finished system proved to be neutral and appropriate over a broad range of programs, ranging from speech and female pop vocal, through classical and cinema music to contemporary Broadway and country. The Recital Hall also required very little system EQ."

At press time, the Wagner Noël Performing Arts Center is set to host a variety of entertainments. "This is Odessa and Midland's building," executive director Carol Roberts-Spence says. "My goal is to have people drive from Dallas and have to be here for an eight o'clock curtain call because they couldn't see [the attraction playing here] in Dallas." She now has the venue; with canny programming, she may meet her goal. 📶

