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David Geffen Hall

Renovating a Storied Concert Venue

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David Geffen Hall finally hits all the right notes

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By: David Barbour



fter only 60 years, but they've finally gotten it right. "It" is David Geffen Hall, the building on the north side of Lincoln Center Plaza that, through many names and configura-

tions, has long been the home of the New York Philharmonic. Opening in 1962 as Philharmonic Hall, the building, designed by Max Abramovitz, was quickly charged with being acoustically flawed; several renovations followed, none of which fully satisfied. Patrons found the space uninviting and the sound of the orchestra remote; musicians complained that they couldn't hear each other onstage. That one of the world's great orchestras had to occupy a substandard home was a major embarrassment. And yet, despite many attempts at fixing it, success remained elusive.

Now, a \$550-million renovation, sparked by a gift from entertainment mogul David Geffen, appears to have cracked the code. It's a major change in every way. "It's not just a simple renovation where we repainted the walls and put down new carpet and chairs," Deborah Borda, the Philharmonic's president and chief executive, told the *New York Times*. "The whole space is transformed. It's an entirely new hall and an entirely new feeling." *Times* music critic Zachary Woolfe wrote, "A mighty improvement is already obvious...Now the sound, like the whole experience of being there, is far more immediate and warmer."

The long road to Geffen Hall's triumphant reopening was traveled by a team that includes hall architect Diamond Schmitt (DSAI), theatre consultant Fisher Dachs Associates, acoustician firm Akustiks, and many others, including Tod Williams Billie Tsien Architects (TWBTA, designers of the public spaces) and architectural lighting designer Fisher Marantz Stone.

Given the importance of the New York Philharmonic, the amount of money involved, and the project's wellpublicized false start (about which more later), it's hard to imagine a more high-stakes proposition. But everyone involved learned from the failures of the past; indeed, there was an abundance of them to study.

The road to renovation

"Lincoln Center Assumes Role in City Cultural Life" read the *Times* headline on September 24, 1962, about the debut of Philharmonic Hall; It was a glittering affair, attended by a bevy of boldface names, including Jacqueline Kennedy, Dean Rusk, Nelson Rockefeller, Mayor Robert Wagner, and Adlai Stevenson among others. Leonard Bernstein conducted a program that included "The Star-Spangled Banner"; Beethoven's "Missa Solemnis" in D Major, Op. 123, featuring soloists Eileen Farrell, Jon Vickers, and Shirley Verrett; and "Connotations," a premiere by Aaron Copland.

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Hopes were high, but reviews were mixed. *Times* music critic Harold C. Schonberg noted the back of the hall was like "a high-fidelity outfit with the bass control out of the circuit." By November, an unhappy Bernstein was complaining to acousticians Bolt Beranek and Newman that the sound of the hall was not sufficiently enveloping, with horns and woodwinds dominating over other instruments. Over the next few years, several proposals were made, including adjusting the hall's acoustical panels, adding a wooden shell onstage, removing carpeting and overly upholstered seating, and adding curved reflecting surfaces that would aid in reverberation. The later adjustments were overseen by the German acoustician Heinrich Keilholz. In 1969, it was announced, the renovation of the hall was complete.

Except it wasn't; in 1975, a gut renovation of what by then was known as Avery Fisher Hall was proposed, with Cyril M. Harris as acoustician and Philip Johnson as architect. It reopened in 1976 to great fanfare and a better review from Schonberg, although he added, "Dr. Harris says, and the musicians agree with him, that the Philharmonic is going to have to learn to accommodate itself in the new hall. In the past, because of the acoustic deadness, they had to force. Now they must learn to take it easier, to listen to themselves more carefully and to develop a more chamber music kind of ensemble."

In fact, the musicians still had trouble hearing each other, a situation that remained unaddressed until 1992, when curved sound reflectors were added to the walls and ceiling. Then, in a startling twist, the Philharmonic, under executive director Zarin Mehta, announced that, rather than pursue a \$260-million renovation, it was moving to Carnegie Hall, its home base from 1891 to 1962. Reynold Levy, then the CEO of Lincoln Center, seemed (at least publicly) amenable to the move, telling the *Times*, "We have this fabulous facility. We need to fix it up and aesthetically and acoustically improve it, but I have no doubt we can discharge our responsibility to the city and to the public."

In any event, the move didn't happen, and a plan to have the famed architect Sir Norman Foster renovate the hall went nowhere. In 2015, the project got a new lease when Geffen donated \$100 million to make it happen. Heatherwick Studio and Diamond Schmitt Architects were hired, along with Fisher Dachs and Akustiks. Some anxiety was expressed that Heatherwick—whose eccentric projects include Little Island, the artificial park in downtown Manhattan, and The Vessel, the giant vase-like construction in Hudson Yards—lacked experience with public buildings; more reassuring was the fact that Diamond Schmitt had designed more than 40 performing arts venues.

But progress was halted when Deborah Borda, the Philharmonic's president and executive director, and Debora L. Spar, president of Lincoln Center, decided the new plan was too costly and time-consuming. As the *Times* reported, "Ms. Borda said that the turning point



came when the construction and design teams said in recent months that they could not guarantee that the work would be done fast enough for the orchestra to lose its hall for only two seasons. Suddenly there was talk of construction dragging on into a third Philharmonic season, which posed a real danger to an orchestra that, like most of its peers, is already losing its subscription base and can ill afford to spend a lengthy period in temporary housing. 'This was news—this was a genuine surprise,' Ms. Borda said. 'For the Philharmonic, the issue of being out of the hall for three years was simply profound'."

Diamond Schmitt, Williams and Tsien, Fisher Dachs, and Akustiks came up with a new plan that addressed everyone's concerns at a lower price point. Then the pandemic put the Philharmonic out of commission, allowing time for the renovation to be completed. Still, Gary McCluskie, of Diamond Schmitt, quotes Paul Scarbrough, of Akustiks, calling the building "an acoustician and consultant's graveyard." He adds, "We knew the stakes were high."

Wu Tsai Theater

"We started again in 2018," McCluskie says, "working on the master plan with Paul [Scarbrough] and Josh [Dachs,



The stage has been brought forward by 25', bringing the musicians much closer to the audience. The auditorium's walls and tiers are composed of molded solid beech wood paneling that improves reverberation, bass response, and sound differentiation at all frequencies.

of Fisher Dachs]. In a couple of weeks, we were convinced there was a really good concert hall that could be built inside the original envelope. We kept the floor; most of the walls, everything else, was reconfigured. The outside master plan—the lobby spaces, etc.—was completely rethought; we retooled it in terms of customer engagement and being part of the plaza life."

Scarbrough notes that the desire for a more intimate auditorium evolved in part from the format of Lincoln Center's Mostly Mozart concerts, which, some years ago, in consultation with Fisher Dachs, "moved the orchestra into the room and created temporary seating on the sides." He adds that the idea "hearkened back to Pierre Boulez's 'rug concerts' of the 1970s; he had them take out seats from the front part of the hall, putting in carpets for people to sit on. It created a different experience for the audiences."

The concept of intimacy, McCluskie says, was part of "the overarching priority: how to get a great acoustic hall." Inside what is now known as the Wu Tsai Theater, seating can vary from 2,032 to a maximum capacity of 2,300, reduced from the original 2,738. The standard orchestral

mode seats 2,158. (McCluskie: "Paul said, 'Look at the volume of great concert halls of the world,' noting that, in the contemporary version of audience seating, 1,800–2,200 was the sweet spot.") The orchestra rake angle has been adjusted from 4.9" to 7.5"; the second and third seating tiers have also been re-raked. "In 1962, a well-designed orchestra floor rake was installed," Dachs says. "The sightlines were pretty good; in 1976, for reasons that are not clear, another, shallower rake was put on top of it. The sightlines were terrible." The new rake, he adds, "isn't like the original. It's a little steeper in the back. But the orchestra is now playing on risers; where there's a solo, you can see the player." Robert Campbell, also of Fisher Dachs, says, "We staggered the seats, which hadn't been done before. It introduced a geometry that works better."

Equally important, the stage has been brought forward by 25'. "Both in the acoustics and sightlines, we made sure that fundamental connection to the musicians was there," McCluskie says. "We eliminated the proscenium, bringing everyone together in one space. After reducing the audience size and making sightlines better, that was the big



The lobby's most eye-catching feature is the 8'-high-by-52'-long high-resolution programmable dynamic display.

move. Beyond that, it was Paul advising us on shapes. We went back and forth with him on the balconies and rake of the main orchestra level, which needed to be steeper."

Moving the musicians forward also allowed for a modified vineyard seating configuration. Dachs says, "We laid out famous surround halls and they didn't fit in the building's envelope. But we could have seats surround the stage by bringing it forward and wrapping rows around the sides and rear. It was hard work to get two rows along the stage sides because the orchestra platform could not lose any more space. Given where the original walls were, we only had room for one seating row on the sides, which would feel sparse. We presented the idea of demolishing an additional piece of wall on both sides of the stage and reworking the structure to carve out a little area to provide the second row. This required changes to the exit walls and fire



The Welcome Center. A fixed coffee bar, located nearby, offers espresso drinks, coffee, pastries, and other refreshments.

stairs on both sides." The flexible seating parterre behind the orchestra is connected to the audience tiers on either side of the auditorium; it can be used for audience seating or for choral performances.

The auditorium's walls and tiers are composed of a molded solid beech wood paneling that improves reverberation, bass response, and sound differentiation at all frequencies. McCluskie cites the wood's hardness and "a refined, warm, honey quality to the grain." Scarbrough, describing the acoustical implications of the walls' curved features, says, "It's about striking the right balance between flat and articulated surfaces. We've studied the great concert halls of Europe and, in the US, [Boston's] Symphony Hall has a fairly large percentage of flat wall spaces-approximately 70%; the rest is more heavily articulated, ranging from round and half-round moldings to much more substantial features like pilaster and coffer beams with 18" of depth. I gave that information to Garythe degrees of articulation and where they were needed and he came up with the idea of sinewaves. We worked back and forth, making sure they did what was needed acoustically."

The side boxes have also been reconfigured. "There were three tiers; we now have two and a half in somewhat similar positions," McCluskie says. "Paul said, 'Those tiers are harming us acoustically,' so they were completely rebuilt. He was looking for more height and more space between them, to get reflections out into the space." Also, the seating in the tiers which previously faced out into the hall, are now aimed at the stage, resulting in greater comfort and better sightlines. "In the previous iteration," Scarbrough says, "the side tiers stepped down as they came from the back of the room. We flattened them out so there's a subtle slope, not an aggressive stepping. It necessitated completely rebuilding the side tiers and walls. Because we're not stepping them, they rise to a higher point by the time you get to the orchestra onstage. We need the reflections from under the first tier to get that sense of envelopment on the orchestra floor."

Ten acoustical reflectors have been installed over the stage: six running horizontally and four running up and downstage. Scarbrough says, "The cross-stage reflectors adjust the balance between the energy for the audience and that for the musicians, allowing them to hear themselves. The side reflectors primarily promote the right amount of energy across the stage. The old ceiling over the stage was really low, particularly at the back, near the upstage wall; it drove so much sound energy back to the musicians, making it impossible for them to hear in the room. It's important to get early energy, but also to help with pitching, intonation, balance, and blend." Some reflectors can be angled to create different acoustical effects.

The entire hall includes many variable acoustic devices that can change the overall character of the room. "There are 35 acoustical banners that drop down behind the first, second, and third tiers," Scarbrough says. "Also, some acoustical panels can be set along the walls at the orchestra level to create a really dry environment. At the stage, there are 30 acoustical banners that drop down along the side walls. Many of these banners and panels were custom-built by Wenger's JR Clancy division. Located along the side tier walls behind the seating are another 40 popup acoustic panels that raise up from the floor-a custom element that Wenger/Clancy developed specifically for this project; in other locations are drop-down and roll-down acoustic banners. For the ten over-stage reflector panels, Wenger/Clancy provided the motorization, rigging, and framework; the materials, consisting of FRP, were made by Kreysler and Associates." Overall, he adds, "We have a



The Music Box, on the northeast corner above the Sidewalk Studio, is one of two double-height lounges imbued with warm materials and outfitted for smaller performances and mingling of pre- and post-show audiences.

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great ability to adjust the resonance of the room from the live natural acoustics for the orchestra to something dryer for film and amplified concerts."

Onstage, 22 motorized stage lifts can reconfigure the size and location of the stage and provide risers for performers. Joe Mobilia, of Fisher Dachs, noting that the lifts were supplied by Gala Systems, says, "Almost everything is new, except for the shaft for the center lift, which we kept from the old system to allow the lift to go from stage to storage several levels below. It's an unusual installation, in that we sometimes have smaller lifts on top of larger ones." He adds that, in another flexible adaptation, seating wagons not required for certain configurations store on a "double decker" lift. Within the platform system, Gala provided two articulating stepped lifts to allow performer access from offstage to the stage platform lifts at 40" high. Also, the parterre seating behind the orchestra can be removed from the stage, utilizing two larger upstage lifts and nine large seating wagons, another custom solution from Gala. With this system, Campbell notes, the stage platform depth can be expanded to accommodate events ranging from larger concerts to network upfronts.

The audience seating, designed in collaboration with Diamond Schmitt, Williams Tsien, and Fisher Dachs, was supplied by Series Seating. The rose petal fabric pattern for the seating was designed by both DSAI and TWBTA to complement wall fabric patterns in the front lobby. The custom CNC-milled walnut end panels vary in design to emulate the balcony front patterns at the side tiers. Series also fabricated the custom bench-style seats in the rear parterre that have retractable arms to allow for larger groups during choral concerts.

Because Geffen Hall hosts the New York Film Festival each autumn, along with other major film premieres across the year, a retractable film booth has been added to allow for an ideal projection angle. "The booth is located at the back of the second tier," Campbell says. "We can take out two center rows of seating, then two large doors open and the facing wall pushes forward to create a soundproof control/projection booth."

Lighting, rigging, and AV systems

"Having a great acoustic was number one," McCluskie says. "But we needed a space for the 21st century," meaning, among other things, up-to-date lighting, rigging, and AVL systems. Dachs says, "The need was for more technology to do a wider array of events. The Philharmonic has a tradition of doing concert stagings of Broadway musicals with scenery, platforming, and lighting. It always took them three to three-and-a-half weeks to do it, and you had to budget for it. A lot of things were made impossible by how difficult they were in terms of rigging accommodations and a lack of stage lighting circuits."

But before new systems could be installed, the space



One level above the lobby, the 21,500-sq.-ft. Grand Promenade features concessions for concerts and adaptable features for performances and event rental with access to the terrace overlooking Josie Robertson Plaza.

had to be cleaned out, removing the gear and cabling installed across several decades. "It was a long, arduous process," says Scott Madaski, of Fisher Dachs. "We took out the old grid, replaced it with an upper and lower working grid floor, and kept the two original ceiling catwalks because they stayed out of the way of the lighting. We took out the old rigging, stage ceiling, and reflectors. We took out everything but the original 'Aztec' ceiling over the audience, which was kept so the acoustics could get a bounce to the back of the room."

After that, Madaski says, "We put in new rigging overhead in the house and at the front-of-house lobby. We also motorized the architectural lighting system pipes. The old way of getting access to the architectural lighting bars was a hand-cranked winch. All of the rigging was coordinated to fit within the new expanded metal ceiling."

The rigging was part of Wenger/JR Clancy's brief. "Wenger is proud to take part in the David Geffen Hall renovation for another collaboration with Turner Construction," says Mike Murphy, project consultant with Wenger. "The timing and customization of this hall was truly remarkable. Our team at Wenger took the equipment designs and specifications from FDA and created unique solutions including customized rigging systems, motorized Fireflies [a hall lighting feature], acoustic reflectors provided by Kreysler, as well as custom pop-up and roll-down acoustical banners and other variable elements to allow Akustiks the flexibility to tune the hall."

Aaron Bowersox, of Fisher Dachs, notes that the auditorium has a new lighting system consisting of ETC Source Four LED Series 3 units and High End System Solaframe Theatres, which are relatively quiet. "All units are colorchanging," he adds, "and all are LED. We have six lighting bars upstage and two at the front of house, all fed by cables with reels supplied by Wenger/Clancy." Bowersox adds that lighting is controlled by an ETC Apex 10 console. Lighting infrastructure was supplied and installed by Barbizon Lighting, with fixtures, consoles, accessories,



The Sidewalk Studio, located on the northeast corner once occupied by offices, is a multipurpose space for performances, lectures, classes, screenings, and community meetings.

and cables supplied by 4Wall Entertainment.

To meet the needs of the various events held in the space, three sound systems were installed, says Sam Brandt, senior consultant at Akustiks. A system of d&b audiotechnik 16Cs and T10s, bolted to the walls "is intended for basic public address on those occasions when they don't want to see large speakers in the room," he notes. The second system, consisting of EAW Anna line array elements and Otto subwoofers, "is larger and more robust, for highly amplified events." A cinema sound system features J7-95 speakers from Danley Sound Labs, more d&b T10s, Fulcrum Acoustics RX699 surround boxes, and d&b 44s units. Amps include nine QSC DPA-4K8Qs and two Danley DNA20Ks. Speaker processing is by QSC.

Brandt adds that the EAW gear, designed for live events, is removable; most of the cinema speakers are mostly embedded in the architecture, although the Danley speakers are deployed behind the retractable Strong Vista cinema screen when needed. Installed in the previously mentioned booth are two NEC projectors.

The EAW speakers, Brandt says, "were proposed because they offer a clean, straight hang, not a J-shape line array," which might be distracting. "Also," he says, "you can electronically steer the EAW speakers if certain parts of the room aren't being seated." The Fulcrum Acoustics gear, he notes, "came about when looking for a speaker that would fit within the constraints of the construction-the depth of the wall and so on-without us having to get into a custombuilt product," which might raise supply chain issues. The Danley boxes, were chosen for "high SPL and high fidelity in relatively compact enclosures." Allowing that having three audio rigs in one room makes a crowd, Brandt adds, "but they're treated fairly independently. The EAW is really a stand-alone system; it doesn't go through any of the rack equipment. We're relying on the processing in the cabinet and on the console for artistic EQ." Two Yamaha Rio3224-D2 consoles are available, along with a portable QL10 for events elsewhere in the building.

Brandt adds, "We have a redundant network that handles all of the Dante and QSC traffic as well as the intercom system. In the case of the EAW gear, the console and the speakers are connected to the Dante network. The announcement system and processing are controlled through Q-SYS, which comes with Dante cards so we can bridge to that if we need to." At one of the inaugural concerts, one selection was the world premiere of *Oyá*, a piece for light, electronics, and orchestra by the Brazilian composer Marcos Balter. "In that case," Brandt notes, "we used the main EAW system and also mixed audio into the surround speakers."

In addition, 480 QSC AD-C6T-LP ceiling speakers are distributed through the building. "They're highly zoned," Brandt says. "They're in all the dressing rooms and musicians' rooms and are individually addressable, allowing the paging of individual rooms if needed. The lobby is also highly zoned." For communications, Brandt specified Clear-Com's Acadia Central station, which integrates with both wired and wireless products. "It gives us three different options," he says. "We have a standard, traditional partyline connection, then wireless FreeSpeak and HelixNet, with Acadia acting as the glue that holds everything together. It gives us the flexibility to cover a lot of needs.

"The entire hall has a Williams induction loop system for hearing assistance," Brandt notes. "It's something that very few performance facilities in New York have. It is augmented by four channels of FM assisted listening. The loop is the primary system, but the FM's multiple channels can be used for sight description for the visually impaired. The induction loop system is also carried out to the lobby and other areas in the building. In the hall, the loop system is zoned so we can turn off certain areas around the stage. For example, a loop can cause interference with the electric and bass guitars, in which case we can turn off a zone without affecting the rest of the room."

In addition to the cinema system, other projection setups are available. "We installed a front-projection system to be used for pops concerts and by various groups renting the theatre," Brandt says. "It features two Panasonic [PT-RQ35K] projectors in the followspot projection booth at the top of the room" along with another Strong Vista screen. A rear-projection system features a pair of Panasonic PT-RQ35K units located in the organ loft, delivering images to a Draper Stage Screen. This system is especially useful given the new trend of orchestras performing classic film scores accompanying screenings. Recently, the Philharmonic has done this with *Jurassic Park* and *Harry Potter and the Chamber of Secrets*.

Video is everywhere in the building, run on a fiber optic cable. "Everything is 4K-capable," Brandt says, noting that video is distributed using a PESA FP-576F router. "The size of the router is dictated by the cabling in the building, to reduce the need for excessive patching. Yes, it's the



The view from the stage on opening night, September 23, 1962.

home of the Philharmonic but they might have orchestra one night, another type of presentation the next day, and something else that night. It needs to be flexible and



The view from the audience, October 1963.

change over quickly. We have plugs in many different areas for cameras that might do broadcasting or webcasting. There's something on the order of 3,400 AV cables in the system and 2,800 strands of fiber optic. We've got the hall itself, a front-of-house position in the audience chamber, the control booth at the top of the room, and three alternate boxes backstage to set up a video village.

"One reason the video router is so large is that all the dressing rooms and back-of-house areas are fed by SDI video over fiber, to minimize any video delay," he continues. "Key locations, including those immediately off the stage and the control room, are using broadcast-level video displays in a further effort to reduce any type of video lag or delay. In concert halls, especially, there's a sensitivity about any disconnect between what you're seeing and hearing, so we're keeping the video as quick as possible. There's no processing at all, to reduce any latency. If there are musicians offstage, or a video display, it needs to be synchronous with the conductor." AV gear was supplied and installed by AVI-SPL, with added gear from Sound Associates. ADCO served as electrician. Other staff members from Akustiks include acoustician Christopher Blair, Anthony Nittoli (AV project management), Jordan Lytle (AV design), and Michael Umile (AV documentation).

More amenities

Moving the stage forward created increased backstage space, adding a new crossover, additional instrument storage areas, and two expanded backstage conductor/soloist suites (both ADA-accessible). Other additions include new practice rooms and artists' green rooms. In terms of HVAC improvements, demand control ventilation has been implemented throughout the building, allowing for precise control of ventilation rates in response to zone CO² concentrations. Substantial improvements have been made to air filtration and indoor air quality using MERV 8 pre-filters and electrostatic final filters. Additional improvements were developed using recommendations from CDC, OSHA, and ASHRAE (American Society of Heating, Refrigerating and Air Conditioning Engineers).

Adding a theatrical touch are the "Fireflies," hanging globe lamps that retract, dramatically, into the ceiling before the concert begins. "That's our design concept," McCluskie says. "We think of those elements almost as notes hovering in space. We worked them out with Fisher Dachs and Fisher Marantz. Each unit is individually motored and dimmed." The concept, he notes, recalls the moment at each performance of the Metropolitan Opera, when the auditorium's "snowflake" chandeliers rise just before curtain time. The units' movement was programmed by Anne Militello, of California-based Vortex Lighting.

Public spaces

Tod Williams Billie Tsien Architects were instrumental in the development of the interior design of the new lobbies. A major goal of the renovation, in keeping with the overall redo of Lincoln Center's plaza a few years ago, was to make Geffen Hall more welcoming to a broader section of the public. One sign of this is the 9'-high-by-16'-long Renlita garage-type glass door, at the center of the South Façade, that opens to Josie Robertson Plaza.

In addition, the ground floor lobby area includes features that do not require a concert ticket. The Welcome Center is



Philharmonic Hall, 1970. The addition of curved reflecting surfaces was designed to aid in reverberation, replacing the overhead reflectors seen in the previous photos.

a 1,680-sq.-ft. space in the southeast corner that can be accessed via an ADA-compliant ramp. A fixed bar, located nearby, offers espresso drinks, coffee, pastries, and other refreshments. Also featured is a 5.5'-high by 48'-wide programmable dynamic digital display, which informs visitors about attractions at all Lincoln Center venues.

Perhaps the biggest masterstroke in reimagining the public areas involved the removal of the entrance ticket booths and relocation of the escalators to the perimeter, yielding nearly twice as much usable square footage to 12,500 sq. ft. "By shifting the escalators to the sides of the building, we could open up the whole front of the hall and connect to the plaza," Dachs says. "And moving the box office recaptured another 22' of public space; from the east façade to the west, it is all public space."

The most eye-catching feature is the 8'-high-by-52'long high-resolution (42 million pixels) programmable dynamic display. Selected concerts will also be streamed



Avery Fisher Hall, 1976. Note the new tiered side boxes.

on the screen, offering a free experience of the Philharmonic. The space is also outfitted for performance with acoustic plaster, embedded QSC speakers, and adjustable spot units in the ceiling cove, in addition to three rows of architectural downlights. (Shure mics are available to anyone making a presentation.) Couches and club chairs are scattered throughout, which, combined with free Wi-Fi, are intended to create a casual, livingroom atmosphere. A 3,000-sq.-ft. restaurant, Tatiana, features Afro-Caribbean foods.

The Sidewalk Studio, located on the northeast corner once occupied by offices, is a multipurpose space for performances, lectures, classes, screenings, and community meetings. It features a LED display and a theatrical pipe grid and is acoustically tuned with vertical ceiling baffles above the pipe grid and acoustical panels between LED strip lights. A permanent projector is installed on a motor-



Avery Fisher Hall, 1992. An entirely new set of curved side reflectors is added.

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ized lift coupled with a motorized projection screen. The perimeter is outfitted with deployable privacy/blackout roller shades, speakers, wiring for microphones, and dedicated Internet. Fisher Dachs specified rigging and lighting for the public spaces. Available for the lobby are 30 ETC Source Four Series 3 Lustrs, 55 High End Systems Solaframe 1000s and a Gio@5 console. The Sidewalk Studio features 25 ETC ColorSource Spot Jrs (Deep Blue), 25 ETC ColorSource PARs (Deep Blue), and 25 ETC ColorSource Cycs, plus an Eos XE 20 console.

One level above the lobby, the 21,500-sq.-ft. Grand Promenade features 13 permanent deployable perimeter box trusses for theatrical lighting, rigging, banners, and general event choreography. Deployable pick points allow the installation of up to seven temporary box trusses for theatrical lighting and event choreography. A 25'-tall deployable solar veil/curtain filters harsh sunlight and deflects heat on the south, east, and west facades during the day. The curtain pattern includes 14.5 miles of silver thread and 20,300 hand sewn paillettes that sparkle in the light; it is controlled by an automation system from Wenger/Clancy, using track by Triple E (distributed in the US by Rose Brand). The curtain was designed by TWBTA and produced by Erik Bruce and Création Baumann.

The Grand Promenade can accommodate up to 750 seats for a gala dinner; 250 seats for concerts, lectures, and performances; and standing room for 2,200. Two ornamental stairs on either side are clad with 35,500 handmade Orsoni Italian tiles.

The concert-level tiers have increased space from the removal of glass smoke screens. "On the Grand Promenade," McCluskie says, "about 10' in front of the hall was a wired glass screen with doors; it created an outer area through which you entered the hall. It was a curious piece of safety planning; they were using the 1938 fire-safety code in 1962." Scarbrough adds, "In rebuilding the rear and side walls, we tried to improve the isolation to the lobby spaces; we've installed proper sound and light locks."

On the First Tier, two 500-sq.-ft. overlooks flank the eastern and western sides of the Grand Promenade, offering views of Broadway and the Lincoln Center campus. Eight bronze petal motif "chandeliers" by Brooklyn-based designers Kai Williams + Chen Chen adorn the structural suspension cables of the overlooks. From the Grand Promenade to the Third Tier, the walls are clad with 520 yards of neverrepeating custom felt with a rose petal motif of blue, red, orange, and fuchsia. The pattern, designed by TWBTA and produced by Liora Manne, evokes petals falling from the sky; it is continued on the seats of the hall, designed by textile designer Emily Neal, and produced by Maharam.

The Music Box, on the northeast corner above the Sidewalk Studio, is one of two double-height lounges imbued with warm materials and outfitted for smaller performances. On the northwest corner is the expanded double-height Ackman Family Patron Lounge.

David Bianciardi, principal of the firm AV&C, developed the system that drives the video displays in the building. To him, the challenges were many; "How do you introduce monumental digital iconic moments without polluting a carefully tuned set of interiors? How do you make sure the right amount is coming out of the LED?" The solution, he says, came through careful collaboration with the client and other members of the creative team.

The video, Bianciardi adds, is controlled almost entirely by one centralized platform "going across all the touchpoints in the building, running our software that is tied back to a central content management system. The people who program these screens need a tool set that allows them to pull in from events calendars and subject the information to rigorous design language." The media servers can also introduce live sources, he notes, for example, when live concerts in Wu Tsai Theater are simulcast to the main lobby screen. "The building has an incredible set of tie lines," he says. "We can take ten or more feeds from the hall. We can also tie into the Lincoln Center campus fiber and, say, take a feed from the Metropolitan Opera."

The lobby screen is Silicon Core Camellia, with images delivered by APEXX T4 custom build media servers controlled by Z6 PRO Super Controllers with processing by Analog Way Aquilon C+ units. The Sidewalk Studio display is a custom product from 5TEN Visuals driven by APEXX T4s, controlled by a MegaPixel Helios Jr.

It seems clear that the project's success has to do with strong communication between the members of the creative team, all of whom have much experience working together. "It's such a good group," McCluskie says. "Josh is the icon in the industry. Paul has worked on so many great rooms. And we've done enough not to be put off by the challenge." Scarbrough says, "It was a great collaborative relationship. We all very quickly came to a consensus on what the key moves should be and how to articulate them."

Dachs recalls with particular satisfaction the "hard hat" concert, which the Philharmonic played for the workers who had labored through the pandemic and their families: "Deborah Borda came out and said, 'You made this great hall. I want you to hear what it can do.' They did a program, and everyone was hollering with delight. Deborah said, 'I want you to listen for the basses, in the old hall, you couldn't hear them play.' They did a piece by Respighi, and she said, 'Listen for the clarinet.' Finally, she said, 'We have a surprise for you.' It was the theme from *Star Wars*, and it blew everyone's socks off. It was the first time the hall was being used and there was such excitement about the way it sounded. That moment was really special for all of us."