Consolidating the Opera

By: Mel Lambert

The Diane B. Wilsey Center concentrates San Francisco Opera's support spaces under one roof

Opera, with its specific requirement for staging and acoustics, is often the stepchild of the performing arts. Fold into the equation a need to offer flexible rehearsal areas, dressing rooms, and support facilities for large ensembles and the situation often stresses even the most flexible of environments. For a number of years, San Francisco Opera (SFO) has suffered from a lack of suitable facilities, with its performance, rehearsal, and related areas spread across several remote locations across the city.

That creative dilemma was rectified earlier this year with the opening of the newly christened Diane B. Wilsey Center for Opera, a $21-million project

Dianne and Tad Taube Atrium Theater.

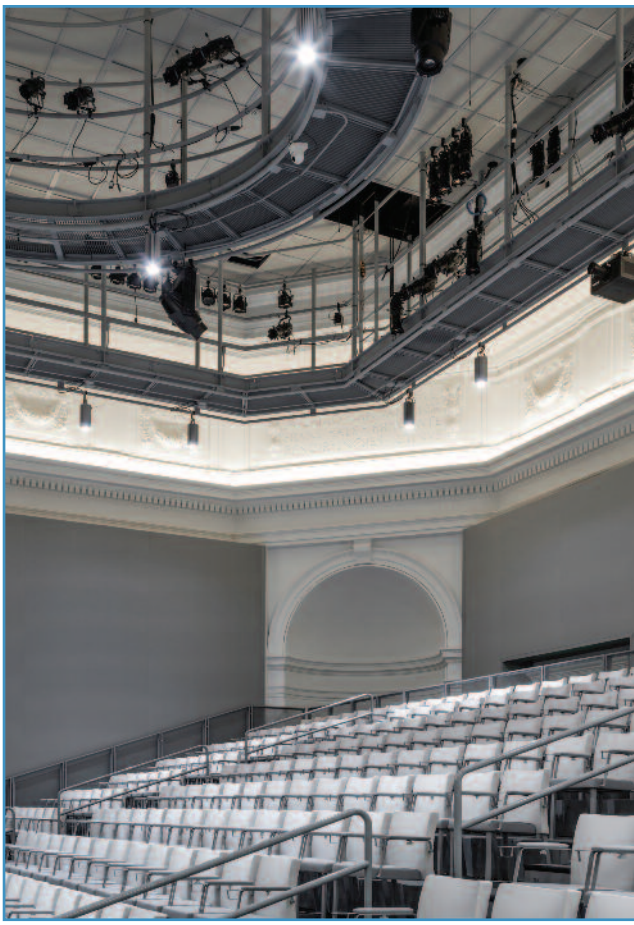
that resulted in the extensive renovation of areas within the elegant Beaux-Arts-style Veterans Building. After serving for six decades as the first home of the San Francisco Museum of Modern Art/SFMOMA, for several years the Veterans Building's fourth floor remained an under-utilized space for city offices and a law library. Having recently completed an extensive seismic retrofit, the historic Civic Center landmark now houses the 38,000-sq.-ft. Wilsey Center, which comprises the 299-seat Dianne and Tad Taube Atrium Theater on the fourth floor, along with the John M. Bryan Education Studio, Anderson Norby Costume Studio, and Edward Paul Braby San Francisco Opera Archive; the opera also leases space in the basement for storage and a workspace for the costume studio.

The five-year project has realized San Francisco Opera's goal of consolidating many operations into one location adjacent to the current opera house; instead of dark spaces, the new areas contain refurbished glass ceilings, open columns, and once-dormant galleries that now feature exhibitions of the company's archival collection. Mark Cavagnero Associates served as architect of record on the venue's transformation into a state-of-the-art theatre and education/rehearsal studio, working with theatrical designers Arup, general contractor Webcor Builders, and the city's formal representative, D. R. Young & Associates. Felicia Dunham, from Mark Cavagnero, was the project architect, with Webcor's John Evans as project manager; Joshua Cushner served as Arup's project director and co-designed the acoustics with Kurt Graffy, who was also lead technical systems designer, while Robert Young, of Arup, coordinated theatre systems design. SFO was represented during the renovation project by its CFO, Michael Simpson, and director of production Daniel Knapp, associate technical director Ryan O'Steen, head stage technician Chris Davis, head of sound Doug Mitchell, and resident lighting designer Gary Marder. AV systems were installed by Santa Rosa, California-based PCD, with Gordon Barnes serving as project engineer.

SFO Lab's new season at the Taube Atrium Theater started on March 11, with the West Coast premiere of *Winterreise*, Franz Schubert's immortal song cycle, featuring German baritone Matthias Goerne accompanied by pianist Markus Hinterhäuser, followed by Ana Sokolovic's *Svadba–Wedding*; ChamberWORKS, curated by the San Francisco Opera Orchestra; Benoît Charest's *The Triplets of Belleville Cine-Concert*; and Deborah Voigt's *Voigt Lessons.*

One notable feature of the new Taube Atrium Theater is the inclusion of a Meyer Sound Constellation acoustic system, custom-programmed to create a variety of acoustic environments to support operatic performances. According to general director David Gockley, SFO is the first opera company to rely upon Constellation, which, he says, "provides the ultimate flexibility by creating the different acoustic environments we need for our variable programming." By realizing on-demand acoustics, the new system will enable SFO to expand from traditional theatre-style seating to cabaret settings with café tables and in-the-round performances or even more advanced audience configurations.

As Felicia Dunham recalls: "The project came to our office [at Mark Cavagnero Associates] because we were the only architect recommended by two separate searches: one by the City of San Francisco and the other by SF Opera. Our overarching programmatic goals were five-fold. In addition to providing the SF Opera with a flexible theatrical space where they can perform smaller productions, chamber opera, and experimental works to engage an audience in an intimate setting not possible in the larger opera house, we wanted to offer an acoustically appropriate space near the opera house that could accommodate an 80-piece orchestra rehearsal space [within the Bryan Education Studio]. We were also looking to develop a flexible assembly space to support the SF Opera's educational programs while consolidating the costume studio and some administrative offices that were previously dispersed in various locations. Finally, we needed to create a space for the new opera archive."



Arup designed a catwalk system that was incorporated into the overall room design.

Built in 1932, the War Memorial Veterans Building was designed initially for veterans and arts organizations; it also provided administrative offices for the San Francisco War Memorial and Performing Arts Center. "The fourth floor, now the Diane B. Wilsey Center for Opera, was designed originally as a museum," Dunham contin-

Photos: Tim Griffith Photography. Courtesy of Mark Cavagnero Associates

A screenshot of Meyer Sound's Constellation software.

ues. "It was the home of SFMOMA from its founding in 1935 until it moved to its current location in 1995. The floor features tall galleries with arched plaster ceilings and glass lay lights providing day-lit spaces throughout most of the floor. Our primary design goals were to provide spaces that satisfied the opera's technical requirements for acoustic separation, room acoustics, lighting, and AV, while respecting and preserving the historic fabric of the building. The shape and configuration of the theatre and other spaces was largely defined by the historic architecture; working within that framework presented a number of challenges."

"The project went through an initial schematic design phase with a different set of acoustic, AV, and theatre consultants," says Arup's Cushner. "When SF Opera decided to change consultants, Arup was interviewed and awarded the project. The organization wanted to create an intimate second venue to produce smaller-budget productions, and a studio for education programming. The initial design for the 299-seat Dianne and Tad Taube Atrium Theater presented to Arup included retracting acoustic banners over the walls to vary the room acoustics. We conducted extensive studies of the room to determine the value of this approach versus an active architecture system. In the end, we proposed a room design that flattens the acoustic response of the room—thereby making it sound very neutral—and which allows the Meyer Sound Constellation system to perform. All acoustic treatments to the room are blended into the architecture—either behind the wall fabric, ceiling panels, or acoustic plaster elements that integrate with the solid plaster finishes."

Since the Taube Atrium Theater is located directly above the current Herbst Theatre, "acoustic separation between the two spaces was essential to the success of the project," Dunham adds. "This goal was accomplished by installing an isolated concrete slab throughout the Atrium Theater, with isolated furring walls sitting on the slab to help keep sound vibrations from transferring into the structure. The proportions of the room were also challenging for acoustics."

Early in the renovation project, Arup utilized its proprietary SoundLab evaluation process to determine how to best acoustically separate the Taube Atrium Theater from the Herbst Theatre. "Given the age of the building, it was necessary to evaluate the cost benefit of different options, including concrete floating floors," Cushner says. "Extensive testing in the building, recording of events in the Herbst and simulation of future operatic performances in the Taube Atrium allowed Arup to work collaboratively with SF Opera to make this decision. The final outcome included a technically complex custom wall build-out and floating acoustic floor." (Arup's SoundLab process is also described in the June issue of *LSA,* in an article on University of Minnesota's Northrop Auditorium.)

The John M. Bryan Education Studio is also located on the fourth floor, directly above a green room that

John M. Bryan Education Studio.

Photos: Tim Griffith Photography. Courtesy of Mark Cavagnero Associates

is rented by the city for receptions and weddings. For added sound separation between these two spaces, an acoustically isolated plywood floor assembly and full-height acoustic walls were added to the studio. In addition, acoustic treatments in furred walls and in the attic above the translucent ceiling create a space that can accommodate the large volume of sound produced in a full orchestra rehearsal with little sound bleed into the offices on the other side of the wall. A 26'-tall glass acoustic wall at the north end of the space ensures separation for circulation within the reception space, while the historic vaulted ceiling remains visually uninter-

The David Gockley Gallery, named after San Francisco Opera's general director.

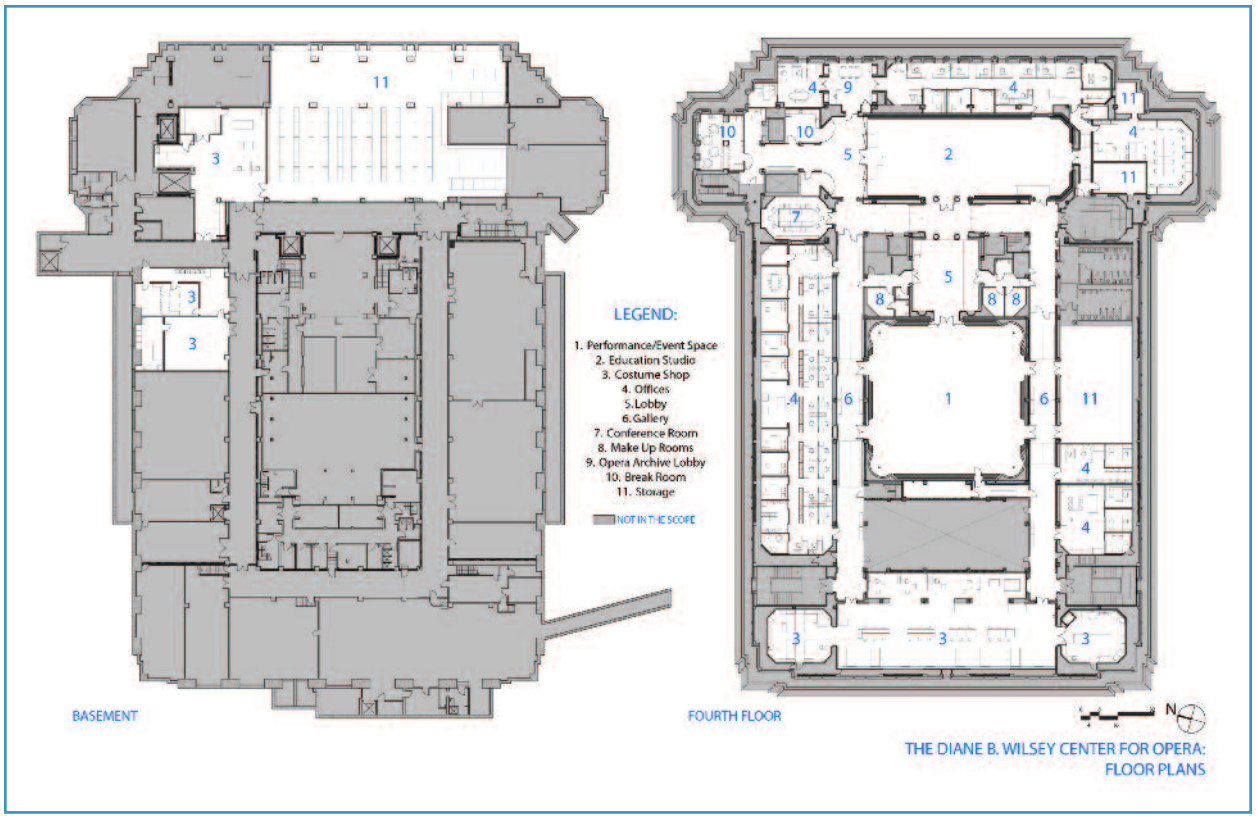
rupted overhead.

"Arup worked with the SF Opera to optimize the layout of the costume shop, which has been a great success," Cushner continues. "We also studied the Education Studio to determine its viability as an orchestra rehearsal space. After benchmarking off-site rehearsal facilities used by SF Opera, as well as other purpose-built facilities designed by Arup, we presented a design option that appropriately balances sound quality and loudness, although the room is only one-third the size of a purpose-built rehearsal space. We have received very positive feedback from the opera and ballet orchestras after using the space."

Meyer Sound Constellation

"SF Opera elected to install a Meyer Sound Constellation System to compensate for the constraints of the Taube Atrium Theater," says Dunham. "The system can digitally manipulate the room acoustics, which provides the opera with greater flexibility in the types of performances they produce. One of the biggest challenges was to develop the structural and theatrical support systems to accommodate ri,ging, lighting, and projection requirements for the theatre."

"In terms of staging and seating," Cushner states, "a few standard configurations were designed, allowing a completely modular system [by Staging Concepts] to be configured for end-stage and corner configurations. The modular pieces also allow for a wide variety of staging possibilities. From the outset, SF Opera was clear that all scenic elements would be by projection only, with the walls serving as screens. We tested various wall fabrics for both acoustic performance and projection quality. [SFO's] director of production, Daniel Knapp, worked with Arup to design a catwalk system that was integrated by Mark Cavagnero Associates into this historic space. By combining the overhead catwalk and the [Constellation] active architecture system with modular staging and seating, SF Opera is able to create fully customizable productions in terms of staging, seating, room acoustics, and scenography. It is quite



The floor plan of the Wilsey Center.

an amazing combination, and allows for intimate performance. In many cases, the singers walk right by the seated participants during a performance."

Constellation hardware installed in the Taube Atrium Theater comprises a Meyer Sound D-Mitri digital audio platform linked to a total of 24 cardioid ambient microphones and Meyer loudspeakers arrayed within the space. A total of 28 UP-4XP and 26 MM-4XP self-powered loudspeakers, together with 21 Meyer MM-10XP subwoofers and 10 MPS-488HP IntelligentDC power supplies, handle sound playback.

According to Steve Ellison, Meyer Sound's applications director for digital products, the Constellation system has been invisibly integrated into the theatre's physical architecture. "The room's adjustable active acoustics ideally support ensembles both large and small, and of varying repertoire," he considers. "New productions can take advantage of all of the Constellation's immersive audio capabilities, including multi-channel playback and SpaceMap surround panning, which can, quite literally, bring the walls and ceiling to life."

At the push of a button, the theatre's acoustics can be changed from "dry black box to opera house, chamber music hall, cathedral, or any number of other options," the applications director states. "Constellation augments the artistic experience for performers and audiences alike; the system's 'whole-room' approach to room acoustics helps performers hear each other, and audiences to experience optimal acoustics from any seat."

Serving as the processing engine for Constellation, the D-Mitri digital audio platform hosts the firm's patented VRAS acoustical algorithm, which, in this installation, is connected to 24 widely distributed microphones and 75 small, self-powered loudspeakers mounted discreetly within the theatre walls and ceiling. "There are 28 UP-4XP loudspeakers distributed within the overhead catwalk, 26 MM-4XP loudspeakers installed around the walls, and a total of 21 MM-10XP subwoofers—eight mounted on the walls and 13 suspended overhead," says Ellison.

"To function properly," he advises, "Constellation needs a good, stable acoustic that is flutter-free, quiet, and sonically transparent. Arup did a marvelous job of providing a neutral environment in which Constellation can shine in a variety of room configurations, ranging from a flat seating layout to one with risers on one side of the room, or arranged in a corner. The room's steep risers are solid and absorbent; they can change the effective room volume and level of sound absorption. Constellation's eight user parameters—comprising overhead length; lateral length, height, and width; overhead strength; lateral strength; brightness; and warmth—can

be used to dramatically change the perceived acoustics within the auditorium. We worked closely with Arup to develop an initial set of 12 pre-programmed settings that can be recalled from scene to scene, as required; these can be extended, if necessary."

Staging, sound, lighting, and video systems

Staging Concepts was selected to fabricate flexible audience risers and stages that would meet two primary configurations (end-stage and corner) and allow for many variations while also tucking away into limited storage space. To facilitate fast setup and tear-down, the company's SC2000 seating riser support system was chosen; it is an accordion-style structure that folds in and out for the nine-tier seating riser system. The riser understructure is power-coasted black to disappear into the darkness, and is also closed off with custom steel mesh closure panels. The company says the panels transition seamlessly into custom raker guardrails, engineered to meet the loading criteria of the International Building Code; they can also be installed quickly by allowing the rails to lock directly into the platform frames. The closure panels, guardrail, handrail, platform frames, and stairs are powder-coated gray to blend in with the walls of the theatre. The custom gray carpet was selected to match the room's aesthetics and to dampen performance reverberations and footfall. LED lighting was integrated into the step units to mark the aisleways. Custom seats, purchased from the Italian manufacturer Segis, are designed so that empty chairs have the same acoustical characteristics of an occupied chair.

Dimming and control systems for the Taube Atrium Theater were designed by Arup and installed by Decker Electric; the lighting-system supplier/integrator was Holzmueller Productions. Gary Marder, resident lighting designer, specified the new fixtures, which were purchased directly by SFO. They include a pair of ETC Sensor3 dimmer racks with ThruPower modules, an ETC Gio 4000 lighting control console, and an ETC Paradigm architectural control processor with touch-screen controllers. Video and projection systems were also specified by SFO.

According to assistant lighting designer Mark Thomas, the Sensor3 racks include 83 TR20AF ThruPower modules, 13 R20AF relay modules, and three ELV-10S electronic low-voltage modules. "We also have an ETC SmartSwitch for our moving lights and projectors," he says. "The Gio 4000 is used with an ETC Ion 3000 with a universal fader wing as a backup. We also have an existing ETC Paradigm wall-mount and Paradigm portable touch screen, in addition to eight ETC two-port portable and two ETC four-port rack-mount DMX gateways. Since we are running Ethernet in both the Taub Atrium Theater and Educational Studio, we use the two-port gateways throughout the system." Prior to joining the opera staff, Thomas served as the project's ETC system commissioning technician.

"To allow the room to be lit flexibly for either a string quintet recital or a late night dance party," he continues, "in the Taub Atrium Theater we have 20 Chroma-Q Inspire LEDs as our houselights. These are also tied into our DMX emergency bypass controller and ELTS—emergency lighting transfer switch—so we can use them as egress in case of an emergency, along with work lights and additional architectural lighting."

The existing fixture package includes four Philips Vari*Lite VL1100 TS units, six ETC Source Four LED Series 2 Lustrs, six ETC Desire D60s, eight ETC Selador Lustrs, 54 ETC Source Fours of varying barrel types, 12 Source Four PARs, 12 Source Four PARNels, and four Altman 6' three-circuit MR16 Zip Strips.

"We were approached by Webcor Builders for an AV scope of work at the renovation," recalls Bill Graham, PCD's director of operations, who was assisted by Christian Velasquez and Gordon Barnes. "At the time, we were doing AV renovations downstairs at

the San Francisco War Memorial and Performing Arts Center; it made sense to all parties that PCD be part of the bid process for the opera renovation project."

Arup provided PCD with "an equipment list and a general set of design schematics," Graham adds. "We took that and made a very detailed and specific set of plans. Our installers pulled thousands of feet of wire from all over the building to the equipment racks. They also built dozens of custom structures to mount the 75 Meyer Sound Constellation speakers in the ceiling and walls [of the Taube Atrium Theater]. After we wired the racks and got all the equipment functioning as specified [by Arup], Meyer Sound came in and spent over a week configuring and tuning the Constellation system.

"For the Bryan Education Studio, we added an SF Opera-furnished projector," continues Graham. "The existing video system is based on an eight-input Extron MLS 608D switcher, Denon Blu-Ray player, and a couple of user-accessible inputs. Audio is reinforced with Shure ULX-S wireless mics with Beta 58A capsules mixed with outputs from the video switcher to a Meyer Sound Galileo processor and eight Meyer Sound self-powered UPJunior-XP loudspeakers mounted in the ceiling above the fabric tiles. Because of the speaker placement, and the fact that they point straight down, there are limited reflections off the wall and enhanced intelligibility. The tone is warm and full, with plenty of gain before feedback. It's a pretty phenomenal-sounding space."

One installation challenge resulted when a motorized projection screen for the Education Studio had to be redesigned. "The original screen case would have encroached into the catwalk that borders the ceiling lay-light grid on all sides," Graham states. "Originally, [SFO] wanted an image size of 213" x 120", but, since the screen case is mounted above the lay-light grid at about 25' from the floor, a substantial amount of black drop was required. Because of the hourglass shape of the tensioned screen, the longer it becomes, the wider the batten needed to be at the bottom of the screen. We were limited to about 235" between the edges of the lay-light grid, thereby restricting the overall width of the image size. After much debate and correspondence, we ended up with screen image of 207" x 116.5", and a screen case that barely fit between the catwalks.

"Then we had to get the screen to the fourth floor of the recently refurbished historical building—the screen case was about 20' long and weighed over 700lb! It wouldn't fit into the elevator and was too heavy and long to carry up the stairs. To solve this dilemma, we rented a crane and angled the screen over a decorative rail and through a fourth-floor window, with a custom ramp being temporarily constructed so that, once through the window, it could be controlled. It was successfully accomplished!" PCD bolted the case into place and Webcor rewelded the lay-light grid, apart from a small opening for the screen.

Positive feedback from opera staff and initial audiences

"Because we really wanted this project to be a gateway for new audiences and an exciting place for new ideas, the Wilsey Center had to be state-of-the-art," emphasizes Gockley. "Top on my list was a Meyer Sound Constellation system to anchor our acoustic foundation. Not only could we guarantee terrific acoustics for now, but we would also leave a legacy for future generations to dream in ways we cannot presently imagine."

"Feedback from the first season of SF Opera Lab has been very positive," Cushner states. "The experience of the space is such that the sound quality matches that of a great opera house, but with the visual intimacy for the audience of being onstage. This new facility will allow SF Opera to experiment in ways they could never imagine in the War Memorial Opera House."

"Mark Cavagnero Associates and

A San Francisco Opera ChamberWORKS concert in the Taube Atrium Theater.

the SF Opera worked with a team of theatrical, acoustical, AV, structural and MEP consultants to develop the different approaches implemented throughout the spaces, all with the goal of providing a blank canvas for whatever SF Opera might envision for the space," Dunham states. "It was a challenge to develop a space for productions and staging that [SFO] had not yet conceived. The final design provides a great deal of flexibility—the opera has already started using the space in ways we had not anticipated."

Mel Lambert has been intimately involved with production industries on both sides of the Atlantic for more years than he cares to remember. He is principal of Content Creators, a Los Angeles-based copywriting and editorial service, and can be reached at mel.lambert@content-creators.com; 818.558-3924. He is also a 40-year member of the UK's National Union of Journalists.

Photo: Stefan Cohen. Courtesy of San Francis Opera.