



This page: The interior of the Watchung Hills Regional High School auditorium. Opposite: Inside the auditorium at Darien High School.

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# Education

Say goodbye to the gymnasium, as two new projects reveal the state of the art in secondary school theatre design.

By: John Calhoun

Two of Charles Cosler Theatre Design's recent projects are \$7 million-plus houses with variable acoustic design for flexible use, and state-of-the-art sound, lighting, and rigging systems. They also happen to be high school theatres. In the secondary school realm, the new auditoriums at Watchung Hills Regional High School in New Jersey and Darien High School in Connecticut are not that unusual. "In most of our high school projects, the bar has been raised," says Cosler, whose firm has designed a number of such facilities. "It's no longer the high school auditorium that we grew up in. They are bumping up to the level now of performing arts centers, and they're even calling them that."

That's partly because both the Watchung and Darien theatres are intended to serve their larger communities. "There are no facilities like this in either town, or in the surrounding area," says Cosler. "So they become de-facto venues for booking in

events or having meetings. That means these facilities have to do music well, they have to do drama well, they have to have projection capabilities for PowerPoint and things like that. And there's a lot that goes into making them flexible for those different uses."

There are key differences between the projects. The 1,000-seat Watchung theatre, which opened in September 2006, replaces a much smaller space that more closely resembled the auditoriums of the past. "It was built in the 1950s or '60s, and it had a tiny little stage," says Cosler. "That facility was held onto, and they're using it as a practice area for the dance and drama departments." Although additional construction projects are underway at Watchung Hills Regional High School, the new theatre is the most ambitious undertaking on campus.

The 1,200-seat facility at Darien, on the other hand, is part of a brand-new \$100-

million high school facility. “The project was on the scale of a small town,” says Cosler of the construction, which took place on the site of the old school. “The amount of earth moving and civil engineering that went into this project was tremendous.” The new, technologically equipped theatre, which opened in 2005, replaces an auditorium of comparable size that accommodated outside productions. “It wasn’t a very good auditorium, but it was large, and they had a community concert program,” the consultant says. The new venue is just one piece of a grand 21st-century plan for the school; related items include a black-box theatre and TV studio, also developed under Cosler’s supervision.

**Taking the Wright approach**

Cosler says that his company’s design role on the Watchung project extended further, from the architectural lighting to the finishes. “We were hired directly by the school district to work with an architect, Feitlowitz and Kosten, who had not designed a theatre of this complexity before. So we basically took the lead in the design of the auditorium. It was our idea to go with this sort of [Frank Lloyd] Wright-ian idea of having a necklace that frames the room.” A perimeter shelf extends around the side and back walls of the space; along with the auditorium’s reverse fan shape, it serves an acoustical function. “You start out with a sort of megaphone in front,” says Cosler, “and then the back walls are tipped in, because the acoustician asked us to pinch the back. You basically have the sending end of the room and the receiving end of the room, and you’re bringing the walls in to try to capture as much of that energy as possible before it decays completely.”

Cosler subcontracted the Watchung acoustical design to Dan Clayton, of Clayton Acoustics Group,



The reverse fan shape of the Watchung auditorium has acoustical benefits. The room’s design is influenced by the work of Frank Lloyd Wright.

provide an absorption-reverberant cap. The lower set of curtains has a zigzag design that echoes the shaping of the portals around the proscenium. “Rather than have a single plane at an angle from the edge of the proscenium out to the side walls,” says the acoustician, “there are bands at right angles that step out. That sends lateral sound very quickly back into the audience.”

Cosler designed the proscenium portal with adjustable tormentors and teasers for maximum flexibility. “The problem with most high schools is you have to have a fairly wide proscenium to get the band or orchestra on the stage,” he says. “That’s why, when you see most high school auditoriums, you’ve got the wide opening with a low height, and it looks like this funny horizontal window rather than the proper proportion. Here, we were able to get a nice high stage, about 48’, with a 24’ high proscenium, and the portal with separately adjustable header and legs, so you can vary the aperture. You can bring it down for drama or open it up for music, so the shell is forcing all the sound into the auditorium, not containing it in that stage house.” The stage also has an adjustable orchestra shell that can accommodate a variety of sizes and types of musical performances. “It comes in multiple pieces, and you can play a lot of games with the height and angle of how the ceiling pieces are set,” says Clayton.

Cosler says that it’s common in high school projects to have a grid at just under 50’, “because you don’t have to do all the fire protection in the stage house—the

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who worked with Chris Brooks, of Orpheus Acoustics, on the project. “The reverse fan is a very good acoustical element, and it adds some drama to the visual perspective,” says Clayton. As for the perimeter shelf, “it gives us some very good side wall lateral reflections, and it also hides the fact that there are 20’ or more of

auditorium above, holding the lighting catwalks, HVAC duct work, and so on.” A forestage reflector of the same design and material as the shelf, although twice as deep, helps to project sound into the house. Clayton specified variable acoustic curtains for the side walls, with one set placed below the shelf and one above to



Above: Cosler got 1,200 seats into the Darien auditorium by placing two rows of seating along the sides of the theatre on two levels. Opposite: The Darien exterior.

fire curtain, the smoke hatches, the sprinklers—that you need if you’re over that height.” The stage is equipped with 29 single-purchase counterweight linesets that include pipes for lighting. There are also a number of lighting positions on the catwalks over the auditorium, as well as a set of fixed concert lighting and focused spots, all controlled by a dimmer-per-circuit system. “The control booth is at the back on the orchestra level, which is something I like to do rather than putting it up high, because of all the traffic back and forth,” says Cosler. “There’s also the ability to plug in lighting and sound control consoles in the cross aisle during rehearsals and productions, and have it even closer if you want.” Pook Diemont and Ohl was the rigging and drapery trade contractor for the project.

The cross aisle connects with ramps that give full access to the stage and all parts of the house for persons with disabilities. A pit lift can extend the stage, provide an orchestra pit, or increase audience capacity with removable chairs. As

for the character of the space, Cosler says, “They wanted a warm, glowing luminous interior, which is what everybody wants these days.”

Returning to the Wright influence, he continues, “I like his Craftsman style, and I thought a modern take on that for this auditorium would be right. The panels in the ceiling have a certain asymmetry to them.” So do the lighting units on the perimeter shelf, which are designed as translucent acrylic boxes broken up by metal frames. Blue accents on the ceiling and proscenium portal provide an appealing alternative to black, he adds: “You get more life and interest if you put some color up there.”

**Thinking big in Connecticut**

Cosler’s experience with the Darien High School project was different, because he was subcontracted by Herbert S. Newman and Partners, an architectural firm with substantial theatre design credentials. “Herb talked about coming up with surfaces and planes to define the room, and I could see Sarah Martin, who was working with me at the time, eating it up,” the designer recalls. “I said, ‘You should enjoy this, because you don’t often get an architect talking about design in pure, theoretical terms.’” He

explains that he was consulted about finishes at Darien, but Newman and his associate, Jim Elmasry, were responsible for those treatments.

“When we came onboard, the box was defined,” says Cosler of the Darien theatre. “How the theatre was laid out in the box had not been defined. Our first pass was about getting all the seats in, because they wanted to accommodate 1,200. The thing was to get everybody as close and tight to the stage as possible, and yet not have a big balcony overhang.” Cosler’s solution was to ring two rows of seating along the sides of the theatre, on both the orchestra and balcony levels; the design fits in more seats and, at the same time, gives the house an enveloping feeling. “Normally, you don’t have people there, but we did it to increase the capacity and to energize the side walls of the theatre with people. We did the architectural lighting on this space as well, so we washed those walls with lighting.”

David Greenberg, of Creative Acoustics, was in charge of the room’s acoustical design, which includes a tracking curtain system completely covering the side walls, unlike the partial treatment at Watchung. “That’s a fairly large area,” says Greenberg. “So the difference between when they’re fully in and fully out, between the reverberant and the dry end, is significant.” The acoustician cites the Darien auditorium’s forestage reflector as a vital piece of the acoustical design, especially since the stage does not have an orchestra shell. “It’s shaped in such a way that it supports the performers on the forestage whether they’re on a stage extension or in the pit, which is more of a depression in the floor than in a pit in this case. The reflector helps with communication from musicians to actors and singers on the stage, it projects sound from the stage into the audience, and it projects some of the audience sound in an overhead direction back to the

performers, which can be useful.”

As it happens, Creative Acoustics subcontracted Darien’s sound system design to Dan Clayton, who specified a range of equipment, including Audio Technica and Shure microphones, a Mackie 1604VLZ mixing console, Shure P4800 signal processing, QSC CX-series power amplifiers, Electro-Voice FRX+940 loudspeaker clusters, and Atlas FA-series under-balcony fill loudspeakers, along with an intercom system, AC power distribution, and other elements. Cosentini Associates took on a similar role for Watchung Hills High School, providing a system design that will be implemented in the future.

The lighting gear in the Darien facility includes Strand CD80SV dimmers, a

Lycian followspots.

As for the Darien stage, Cosler says, “It does have a portal, although we didn’t get as high a proscenium as we did at Watchung; still, it’s not as bad as you sometimes see.” The stage size and technical systems are similar to those at Watchung, with a dimmer-per-circuit system and 30 single-purchase linesets. Cosler was also involved in designing the facility’s black-box space, which is to the side of the main auditorium, along with a band room, shop, and other support spaces. “We have a pipe grid in there, a lighting system, and chairs and platforms,” he says of the black box, which



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Strand 300 console, and 59 Strand SL Series ellipsoidal lighting fixtures, 18 Altman 6” Fresnels, 21 Altman 8” Fresnels, seven Strand Iris 3 cyclorama wash units, and two Lycian followspots. The gear package for Watchung includes three ETC Sensor SR48+ dimmer racks with 500 micro-second rise time dimming modules, ETC Emphasis server with Express ECS control console, ETC Unison architectural lighting control system, 112 ETC Source Four ellipsoidals, 24 ETC Source Four PARs, 24 Altman 8” Fresnels, 18 L&E Mini-Strips, and two

serves as a drama lab for students. “We also have a window with blackout shades, which I suggested, because trying to teach class in a black room all day can get really depressing.” The designer also specified a lighting system for the TV studio, which is in another building on the campus.

**The community plays a role**

Watchung and Darien’s theatre projects were funded respectively by local referendum and state money, but, in both cases, the

community partnering placed the facilities on a different scale. In the case of Darien, says Cosler, “The state was only going to fund 800 seats, but the community wanted the additional 400 seats because of their strong community concert association and presenting organization. They already had their presenting apparatus in place, so the minute this thing got built, it was used by the concert association, by dance schools, and by various other outside people.” At Watchung, “They’ve hired a technical director, and also a person who’s in charge of the overall fine arts department for the school. They’ve been charged with forming agreements, renting the facility, and operating it on a zero-sum basis. The money they bring in goes back in to fund the maintenance of the facility, and the budgets required for the school to mount their own productions.”

It indeed is a far cry from the school auditoriums of yesterday or, as Clayton, recalls, “the gymnasium where we built our own intercom system out of car batteries.” What’s driven the change? “A lot of things,” says Cosler. “People expect a certain level of production values now. To deliver on that, you’ve got to have a facility that will allow you to put in moving lights and data control.” He also thinks that “the general evolution of every generation wanting something better for their children” plays a role. “In these wealthier communities, having their own facility and being able to do their own productions is an amenity. They’re really getting maximum use out of it, because it’s being used for the school, it’s being used for the community, it’s where a big portion of the community comes together because of the children being in school. If you were going to try to build something like this to stand alone, you would probably never be able to get approval. So it makes a lot of sense.”