Recognized for having one of the top theater departments in the United States, California State University at Fullerton takes pride in its performing arts. Since first opening its doors in 1960, the university's performing arts department has churned out its fair share of Broadway, opera and movie stars.

For years, Cal State Fullerton's performing arts students have conducted all of their musicals, plays, concerts and classes in the school's outdated and traditional, box-shaped theater. However, amidst a campus-wide construction initiative brought on by the school's rapid population growth, university officials recently decided to build a new performing arts center that would better service their top-notch program. Construction began in March 2003 and finished in January 2006, with the school officially opening the building to its students this fall.

Loaded with the latest technologies and world-class amenities, the new performing arts center features an 800-seat concert hall, a 250-seat thrust-stage theater, a 150-seat black-box theater and a host of support, classrooms and studios. The building’s exterior is a showcase of architectural wonder, the most obvious feature being an astonishing multi-pitched metal roof. Utilizing varying slopes that range from 3:12 to 9:12, the roof on the new fine arts building truly stands out on the campus of this southern California university.

The distinctive roof consists of standing-seam zinc sheets, a natural material that architect Bill Murray specified because of its long service life and architectural beauty. “Zinc roofs have been used in Europe forever,” said Murray, principal at Los Angeles-based Pfeiffer Partners, an architectural firm with a reputation for superior theater designs. “They have been known to last for more than one hundred years and they offer a richness that you just do not get with traditional metal roofs.”

Similar to other metal roofs, however, zinc becomes extremely hot when it is exposed to excessive sunlight. In order to maintain the integrity of the roof and ensure a long service life, a special waterproofing underlayment had to be installed under the zinc that could withstand the extreme temperatures from the California sunshine.

Murray and Gary McKee, a representative from the zinc roofing manufacturer, Rheinzink, approved a Carlisle Water and Ice Protection (WIP®) roofing underlayment to be installed under the metal roof sheets. “We looked at a number of underlayment and Carlisle’s WIP 300HT was compatible with the Rheinzink material,” said Murray.

**CSU at Fullerton Performing Arts Center**

**Project Location:**
Fullerton, CA

**Product Used:**
Carlisle’s WIP 300HT Roofing Underlayment
WIP 300HT is a high-tensile-strength, rubberized asphalt underlayment specifically designed to withstand temperatures up to 240°F. The rubberized asphalt is laminated to an impermeable polyethylene film layer, making WIP 300HT a superior waterproofing underlayment that provides dual-barrier moisture protection. Unlike other underlayments, Carlisle’s WIP 300HT will not melt or become brittle, even under the most extreme weather conditions.

“Weisle’s WIP 300HT offers permanent roof protection and low life cycle costs,” said Tim Eorgan, technical services manager with Carlisle Coatings & Waterproofing Incorporated. “This underlayment will not crack, dry out or rot, resulting in long term waterproofing performance that will continue for the life of the roof.”

After the bulk of the performing arts center was constructed, R&J Sheet Metal, Inc., a local contractor from Huntington Beach was subcontracted to install the unique roof system. Having used Carlisle waterproofing underlayments for more than eight years, R&J is quite familiar with WIP 300HT.

“We’ve used a lot of other underlayments in the past, but WIP 300HT and the rest of Carlisle’s underlayment product line are our favorites,” said Mike Stuver of R&J Sheet Metal. “Carlisle waterproofing underlayments are easy to install and competitively priced.”

Before R&J installed the WIP 300HT and zinc roofing they had to mount rigid polystyrene insulation on top of eight-inch lightweight concrete that covers the building’s steel deck. Coupled with the lightweight concrete, the insulation helps provide superior acoustical performance inside the building by drowning out any exterior noise.

R&J installed the insulation between Z purlins that were attached to the lightweight concrete and ran along the entire length of the roof. The purlins were placed 24 inches apart, on center, and stood two inches above the concrete. The polystyrene insulation and the purlins created a level surface for the application of the WIP 300HT.

Because the 40-mil WIP 300HT membranes are self-adhering, R&J installed them directly to the insulation and purlins without the need
for additional primers or adhesives. Starting at the bottom of the roof and working toward the top, R&J simply peeled the easy-to-remove backing off of the 67-foot by 3-foot membranes and adhered the WIP 300HT membranes, maintaining the specified overlaps with each subsequent sheet to ensure a watertight seal.

The varying degrees of slopes on the building’s roofs created a number of ridges and valleys that may have caused problems for traditional underlayments. The WIP 300HT easily maneuvered around the valleys, fully adhering to the substrate in all areas and leaving no gaps where a sharp object could puncture the membrane and create a hole.

The ease and simplicity associated with Carlisle’s self-adhering underlayment allowed R&J to install the product in a timely fashion. Along with the self-adhering quality, WIP 300HT membranes also feature a unique skid-resistant surface that helps create a safer and speedier installation.

Before the Rheinzink sheets could be installed, R&J had to top the WIP 300HT membranes with a quarter-inch nylon woven mesh. The mesh is responsible for holding the zinc sheeting away from the WIP 300HT, creating a dead air gap between the two materials. According to Stuver, zinc roofs need to have a back coating or incorporate the nylon mesh in order for the product to provide its best performance. For this job, both were used to extend the life of the roof.

The mesh was installed concurrently with the zinc roofing material using two-piece floating clips that allow the roof to expand and contract. The clips sit a quarter-inch higher than the height of the panel and were installed onto the Z purlins with two screws.

WIP 300HT membranes feature a self-sealing quality, allowing them to seal around the screws that punctured them when the woven mesh and clips were installed. All Carlisle underlayments come standard with this self-sealing feature, ensuring a waterproof roof.

The clips were installed along the zinc panel seams and were concealed by the adjacent standing seam. To create a more aesthetically pleasing rooftop the plans called for altering the size of the zinc sheets at the roof edges to stagger the seams.

“The varying seams scaled down the size of the large roofs,” said Murray. “They took a large space and made it appear smaller.”

According to Cal State Fullerton’s Dean of the College of the Arts, Jerry Samuelson, the school couldn’t be happier with the building or its roof. “The building is absolutely stunning and the roof is its signature element,” Samuelson said.
About Carlisle WIP Products

As a division of Carlisle Construction Materials, Carlisle WIP Products manufactures premium construction products for steep-slope and low-slope residential and commercial applications.

For more information about the products and services offered by Carlisle WIP Products, call 888.717.1440 or visit their web site at www.carlislewip.com.