Georgia-Pacific Gypsum

Building Reputations Together™

PROJECT PROFILE

University of Tennessee
Allan Jones Intercollegiate Swim Facility
Knoxville, Tennessee

Design Architect
HNTB Architecture Inc., Bruce Nachtsheim

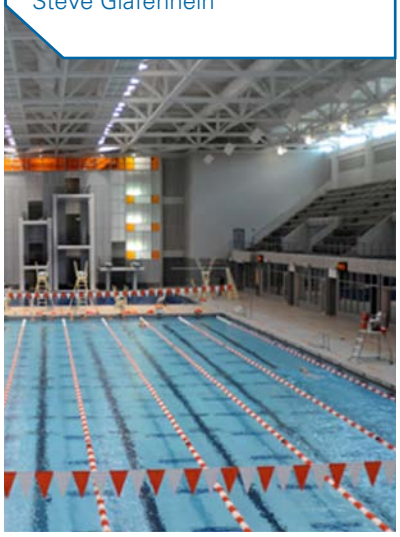
Associate Architect
Lindsay & Maples Architects, Inc., Richard Lindsay

General Contractor
Blaine Construction Corp., Keith Buckney

Roofing Contractor
Dixie Roofing Inc., Larry Rosson

SOPREMA® (Roofing Product)
John Frye

Project Manager
University of Tennessee, Steve Glafenhein



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DensDeck® Prime Roof Boards Help Swimmers Make a Big Splash at University of Tennessee*

When the University of Tennessee wanted to build a world class aquatic facility at the Knoxville campus, they went for a world-class roof—one designed for long life and high weather resistance. Two separate layers of DensDeck® Prime Roof Board from Georgia-Pacific Gypsum are key components in the design of a roof system that deals with some unique challenges.

The $24.3 million Allan Jones Intercollegiate Swim Facility at University of Tennessee, Knoxville, supplants an existing facility that the Athletic Department had long outgrown, and the new building is destined to bring world class swim events to the campus. The new center includes an outdoor and indoor 50-meter pool as well as a separate competition diving well featuring five platforms and six springboards. The center provides permanent seating for 1,800 with space on the pool deck to accommodate up to 1,000 additional people. "This facility is state of the art and positions the university swim and diving programs to host major aquatic events," according to HNTB's Bruce Nachtsheim.

The 98,000 square feet (9,104 m^2) structure also includes training facilities, a conference room, locker rooms, offices for coaches, a multipurpose room, and an elevated timing booth. The roof of this impressive facility covers a building with a footprint of 322′x170′ (98 m x 52 m), which is somewhat larger than a football field.

Unusual Challenges: Acoustics and Interior Moisture

Besides the usual issues of maintenance traffic stress and wind-uplift resistance with a roof of this size, the roof system deals with two additional challenges: interior moisture and noise. Much of the underside of the roof is exposed to high humidity from the vast amount of water in the indoor pools. In addition, the roof is designed to help dampen acoustic reverberation above the pools.

The roofing system was installed by Dixie Roofing, working under general contractor Blaine Construction, following HNTB's design. Designers addressed the reverberation issue with a special fluted metal deck designed for sound control. The perforated deck with acoustical insulation inserts deliver the desired

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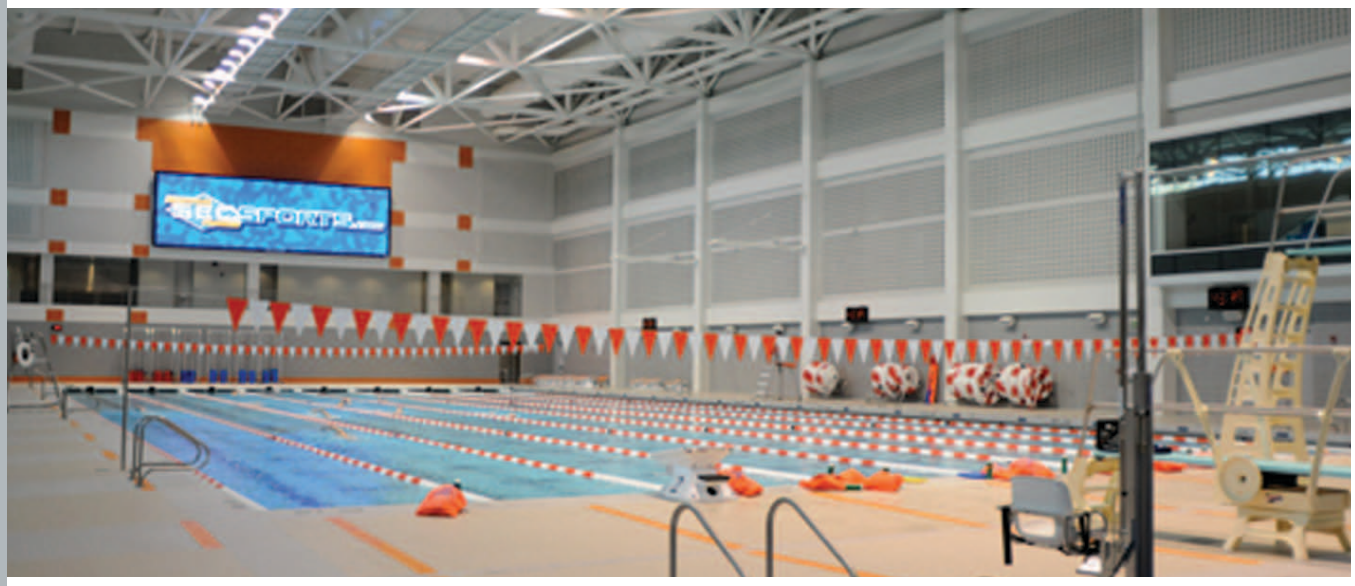

acoustical properties. Support for the roof assembly above the flutes in the deck was a key design issue due to these inserts. The design intent was to provide a barrier to adhere the insulation to the metal deck and span the flutes without having to penetrate the special sound deck with fasteners. Spanning of the flutes was critical.

The solution was to install a layer of 5/8″ (15.9 mm) DensDeck® Prime Roof Boards, which is one of the strongest roofing substrates available, above the deck. The specially treated gypsum core and fiberglass mat facings of DensDeck Prime provide the strength needed to carry the roof assembly as it spans the flutes in the decking.

DensDeck® Prime Resists Moisture and Mold

The DensDeck Prime technology also has the moisture and mold resistance the application calls for. The heated swimming pools ensure that there will be a constant supply of water vapor impinging on the roof system.

DensDeck Prime acts as a support for the vapor retarder installed on top of it, and its gypsum core provides resistance to the moisture exposure on the inside. The vapor retarder keeps the humid air from reaching the cooler layers of the roofing system, where it could condense to a liquid.

Using fiberglass mat DensDeck Prime eliminates traditional paper faced gypsum board from the roof system. This reduces the long-term risk of moisture related mold problems from organic paper components which could potentially feed the growth of mold inside the roof. DensDeck Prime products have scored a 10 the highest level of performance for mold resistance under the ASTM D 3273 test method.

Torching Polypropylene to DensDeck Prime Roof Board Creates Monolithic Barrier

The next material layer above the 5/8″ (15.9 mm) DensDeck Prime is a polyester-reinforced SBS sheet, which is torched to the roof board. This torching provides a strong bond because the fibers of the fiberglass mat face are encapsulated in the coating. DensDeck Prime is coated with a non-asphaltic compound that enhances bonding in both adhered and torch-applied applications.

The result is a monolithic vapor-retardant barrier intended to prevent water vapor from reaching the ISO insulation from below. A two-part adhesive, instead of the traditional use of plates and fasteners, is used to bond a 4″ (102 mm) layer of ISO insulation to the SBS membrane.

DensDeck® Prime Roof Boards Protect Insulation

Above the ISO insulation, designers specified a second layer of ¼″ (6.4 mm) DensDeck® Prime. The same two-part adhesive is used to bond the DensDeck Prime to the ISO. DensDeck Prime is recommended for adhered applications because its controlled absorption provides a uniform spreading of the adhesive with a strong bond.

This second layer of DensDeck Prime Roof Boards acts as a cover board that provides mechanical protection for both the ISO insulation under it and the two-ply roofing membrane above it.

On large roofs like the Allan Jones Intercollegiate Swim Facility, foot traffic and maintenance equipment generate loads that compress unprotected insulation and threaten the membrane with stretching and punctures.

Without a protective cover board, impact from hail and foot traffic can damage both the insulation and the membrane. The rigid cells of low-density insulation foam don't recover from impact compression, so crushing reduces the R-value and damages the bond with the insulation boards' facing layer. Insulation compression also forces the membrane to stretch, which makes it more vulnerable to puncture.

Traffic damage comes first during installation of the roof itself, then from installation of HVAC, antenna systems and other roof-top equipment. After construction, routine building maintenance can further stress the insulation. DdensDeck Prime Roof Boards protect the fragile insulation layer from the construction traffic and hail, plus add durability to the entire assembly.

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DensDeck® Prime Roof Boards Support also Protects Membranes

Installed between the membrane and the insulation, the fire-resistant gypsum core of DensDeck® Prime also contributes to the roof's fire rating. Additionally, the two-ply SBS membrane system provides high resistance to the thermal stress of daily and seasonal cycling and is very durable.

Strength Enhances Wind-Uplift Resistance

The fully adhered attachment is further enhanced with the stainless steel mechanical fasteners to provide even better wind-uplift resistance. If a roof membrane is bonded directly to a fragile, low-density insulation layer, uplift forces can literally pull the insulation apart. The strength of the DensDeck Prime, installed between the membrane and the insulation, can prevent this.

"This roof is designed to be durable under the impact of maintenance traffic and extreme weather," says John Frye, SOPREMA® district manager for Tennessee and Alabama. "It's an extremely high-performance system with a long life expectancy. DensDeck Roof Boards play an important role in that performance."

U.S.A.– Georgia-Pacific Gypsum LLC
Canada – Georgia-Pacific Canada LP

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Technical Information
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