

# Stadium design is changing. Just the only LEED Platinum stadium in the green systems that are changing the

Story by Chris Allsop  
Photography by Daryl Shields



ask HKS. The architects behind country take us inside to explain the sports-design playbook.



**SEA OF GREEN.** Any University of North Texas fan could tell you: as exciting as the football games are, Apogee Stadium is equally riveting. The world-famous field makes use of wind power, retention ponds, recycled-rubber turf, and about every other green-play in the book. It's LEED Platinum and might as well be known as "The King of Stadiums."

It may no longer be called “Mean Green Stadium,” but the **University of North Texas’s Apogee Stadium** retains the distinguished honor of being the only LEED Platinum structure of its kind in the country.

**B**ehind the project is Dallas-based **HKS**, a top-five international firm dedicated solely to architectural design and a company that has a history of designing stadiums of all types. **Bryan Trubey**, design principal for Apogee Stadium, has masterminded facilities the world over; his CV includes the Dallas Cowboys Stadium, the Liverpool FC Stadium, and venues for the 2014 FIFA World Cup in Brazil. Working with him on the Apogee project was HKS chief sustainability officer **Kirk Teske** and sustainability director **Chris Mundell**.

“We differentiate our firm by focusing on the long-term sustainability of the structure,” Trubey says. “Can that building remain sustainable from a revenue and experience standpoint over a period of 30, 40, 50 years? That’s where we spend our time—looking at future use scenarios for properties, and from a sustainability standpoint, it’s a much more holistic view.”

This sensibility was a perfect match for HKS’s environmentally conscious client, the **University of North Texas (UNT)**, which is working toward a climate action plan with a carbon-neutrality goal by 2040.

“A primary driver for this design was to meet their environmental and climate action plan goals,” Teske says of the university. “While they had completed LEED certification on some of their prior facilities, this was their first Platinum-level project.”

Perhaps the most visible green element at Apogee Stadium is its three Northern Power 100 wind turbines, installed by **Cascade Renewable Energy**. This particular model was chosen for its durability, low maintenance—it’s designed for power production in the Arctic—and for the fact that it’s domestically manufactured (American Recovery and Reinvestment Act funding stipulates a domestic product). “They’re prominent,” Mundell says of the turbines, “but they’re also the right scale for the location and work well with low to medium wind speed—perfect for the site.”

**Project**

**LOCATION** Denton, TX  
**Size** 340,000 ft<sup>2</sup>  
**Completed** 2011  
**Capacity** 30,850

**Team**

**ARCHITECT** HKS Sports & Entertainment Group  
**Owner** University of North Texas  
**Construction Manager** Manhattan Construction Company  
**Structural Engineers** Walter P Moore and Associates, Rogers Moore Engineering  
**Mechanical Engineer** Smith Seckman Reid  
**Electrical Engineer** Aguirre Roden  
**Civil Engineer** Jaster-Quintanilla  
**Interior Designer** HKS Commercial Interiors  
**Landscape Architect** Caye Cook & Associates  
**Wind Turbine Installation** Cascade Renewable Energy  
**Commissioning** Henneman Engineering

**Green**

**CERTIFICATION** LEED Platinum  
**Turf** PowerBlade HP by Shaw Sportexe conserves water and reuses repurposed tire rubber  
**Wind** Northern Power 100 turbines supply renewable energy  
**Site** Stadium built into an existing slope, preserving existing trees  
**Water** Retention ponds manage storm water onsite, central chilled water system conserves energy  
**Mechanical** Systems include an enthalpy recovery wheel and outside air economizers



These retention ponds allow all storm water to be managed onsite. Combined with efficient landscaping, maintenance costs are significantly lowered.





**SITE MATTERS.** Built on a restored park, Apogee Stadium rests lightly on its site while taking advantage of existing retention ponds.

**“We differentiate our firm by focusing on the long-term sustainability of the structure, ... looking at future-use scenarios for properties. From a sustainability standpoint, it’s a much more holistic view.”** Bryan Trubey, Design Principal, HKS

The wind turbines at UNT’s Apogee Stadium were installed by Cascade Renewable Energy, part of family-owned Cascade Engineering, based in Grand Rapids, MI. Cascade Renewable Energy’s turnkey systems helped HKS and the entire project team achieve a true industry first: the first LEED Platinum-certified stadium in the country.

Though there’s no hiding wind turbines, part of the architects’ strategy was to minimize disruption to the site and any existing trees. To this end, the stadium was built into the slope of the site, minimizing the amount of excavation required. The site was previously a golf course but master-planned to be restored as a park. This provided HKS with storm-water-retention ponds (100 percent of storm water is managed on site), and after landscaping the site with native vegetation, the new design costs UNT less to maintain than the previous setup.

“The unique thing about stadia is that they don’t operate all the time,” Teske says, “so it’s more difficult to justify high-performance equipment, especially as you’re not using that equipment between events.” UNT, however, opted for the more efficient option of a central chilled water system

Chris Mundell

Kirk Teske

Bryan Trubey

## Q&A What's most impressive about Apogee Stadium?



### Chris Mundell

Sustainability Director, HKS

“Having an integrated team really made the difference. We started from day one talking about LEED and sustainability alongside the owner’s vision. The design team was able to pull it all together; the contractor finished it properly. **LEED Silver was the only requirement when we started, and we finished Platinum.**”

### Kirk Teske

Chief Sustainability Officer, HKS

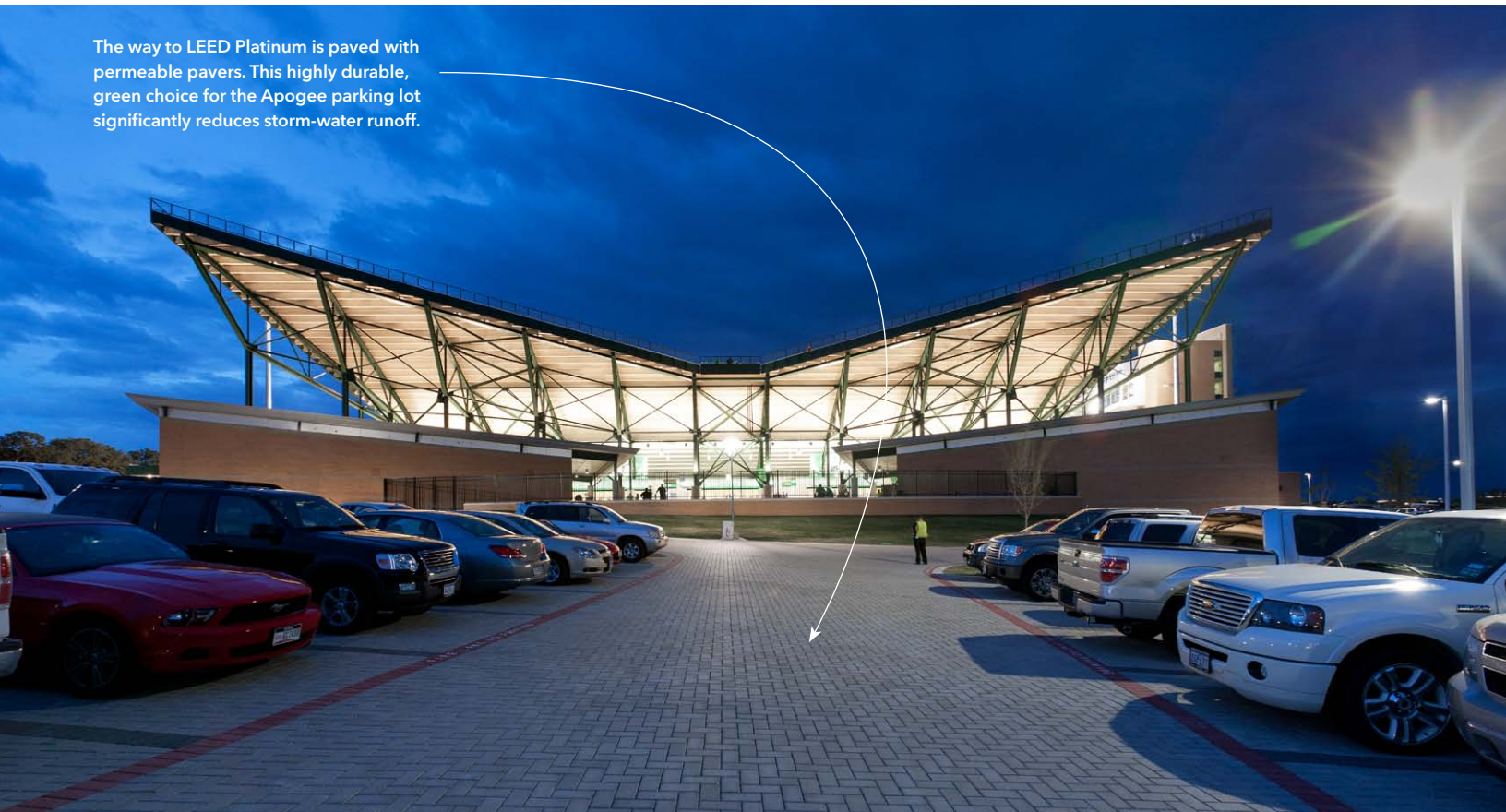
“**We reduced the carbon emissions of this stadium by 750,000 tonnes a year,** through increased building energy efficiency and the addition of both offsite and onsite renewable energies. That’s a 68-percent reduction.”

### Bryan Trubey

Design Principal, HKS

“[In] the club-level environment there, or the private suites, you’re going to find the **same fit and finish that you will [at the] Cowboys Stadium.** Some firms have a different design group for minor-league projects, college, etc., [but] we have the same designers working across all our sports facility projects. It’s a different approach: We’re not a volume practice. We just like to make the highest-quality products.”

The way to LEED Platinum is paved with permeable pavers. This highly durable, green choice for the Apogee parking lot significantly reduces storm-water runoff.





(choosing the Smardt Model WA-240 chillers for the system), as opposed to rooftop units.

UNT didn't stop with water; it installed a full enthalpy recovery wheel on the exhaust and return air streams, with 100-percent outside air economizers by **Trane** to cool the suites and club spaces (the air handling unit is the TSCX008 and the remote terminal unit is the CS1A030 and CSIA080). **Smith Seckman Reid** served as the mechanical engineer for the Apogee project, and project manager **David Ballard** says, "These Trane units were selected because of their ability to deliver high-performance, two-inch double-wall, foam-injected construction, which have ultra-low leakage rates and provide a true thermal break to prevent heat loss through the casing. In addition, each unit is provided with multiple variable-speed direct-drive plenum fans with premium efficiency motors to exactly match building load and minimize fan energy use."

"The payback is longer but still within a 20-year period," Teske adds. "A lot of our clients will make decisions on a ten-year-or-less time frame. UNT took the longer view to shape some of their decisions."

Fortunately, the project itself didn't take a proportionate time to complete, starting in February 2002 and being complete by September 2011—or, more pertinently, as Teske observes: "Just in time for football season." **gb&d**

### LEED Scorecard

Certified Platinum

Site	●●●●●●●●●●○○
Water	●●●○○
Energy	●●●●●●●●●●○○○○
Materials	●●●●●●●●○○○○
Air Quality	●●●●●●●●●●○○
Innovation	●●●●●
<b>TOTAL</b>	<b>53</b> <b>C</b> <b>S</b> <b>E</b> <b>P</b>

TESKE PORTRAIT: BLAKE MARVIN; PHOTOS: DARYL SHIELDS

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