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Qatar World Cup Stadiums Promise Eco-Friendly Soccer Utopia

By Kyle Stack ✉ December 6, 2010 | 3:00 pm | Categories: Venues

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FIFA's decision to pick Qatar to host the 2022 World Cup has been locked in controversy since the choice was made last week. While the answer to whether Qatar is the better option instead of the runner-up United States won't be known until the tournament rolls around 12 years from now, what we know is that Qatar has an ambitious plan, particularly with its plethora of planned stadiums.

Above:

Sports City Stadium

Sports City Stadium, located along the Persian Gulf in the eastern coastal city of Doha, should be the most versatile of the 12 stadiums to be built in Qatar's proposed $57 billion plan. The stadium's primary components are literally retractable — its roof, its seats, even its field.

Dan Meis, an architect with the Kansas City-based architecture firm Populous who led the stadium's

design, explained that he wanted the venue to have a lasting effect. "Often countries will build stadiums for the events, and they have difficulty utilizing the building afterwards," Meis told Wired.com, citing the Bird's Nest, constructed for the 2008 Beijing Olympics, as an example.

His vision to incorporate versatility meshed perfectly with a key element of Arabian culture. Much of the structure's architectural inspiration was drawn from a bedouin tent, traditionally used by the Bedouin tribe, an Arabian ethnic group. The tents have a simple architectural design which enables them to adapt to their environment. "The notion of these tents that were flexible and could grow depending on the number of people utilizing them was really interesting," Meis said.

The partially-retractable roof, which opens and closes in roughly 15 to 20 minutes, has a design element that sets it apart from others: It's large enough to hold people *within* it. Meis saw an opening within the depth of the trusses that support the roof where people could walk around and look down onto the field. "That's something I played around with in other stadiums but had never built," Meis said.

It adds to the 47,560-seat occupancy of the stadium, which can be adjusted downward for concerts, exhibitions, and other non-soccer events. Meis said the technology to adjust seating draws on Saitama Stadium in Saitama, Japan. Large seating blocks move on trucks, similar to train tracks. They can slide back and be moved elsewhere to open up space. In that regard, they're similar to the retractable field, which can be moved to an adjacent site. It's similar to what's used at University of Phoenix Stadium in Glendale, Arizona, where the field is moved off-site to accommodate other events.

There's also an in-stadium cooling system to keep players and spectators from overheating in a climate where temperatures surpass 100 degrees. Every venue is expected to take part in a country-wide zero carbon emissions plan. An off-site solar farm transfers energy to a city grid. Solar collectors use the sun's power to heat up water, which is then transported an on-site water storage tank, which keeps the water's high temperature.

When the venue needs to use its cooling system, the hot water runs through an absorption chiller that chills the water and sends it into another tank which pumps the 64-degree air at the ankle and neck level in each row of seats. The air is distributed throughout the stadium and ultimately produces an 80-degree temperature near the soccer pitch.

That cooling system will combine with the stadium's retractable roof, whose reach extends beyond the pitch to plazas outside the venue to create an oasis-like feel in the desert. And in that way, Qatar plans to mesmerize the world in 12 years by showing how the world's most popular sport can be played in one of the globe's hottest climates.

Read on for more descriptions and photos from Qatar's successful World Cup bid.