Tune in, Sports Fans

Themed concourses, an array of concessions and flashy video keep fans entertained beyond action on the field.

By Barbara Horwitz-Bennett, Contributing Editor -- Consulting-Specifying Engineer, 6/1/2006 1:00:00 AM

Whether it's snazzier, concession-laden concourses, more premium seating options or just more in-seat services, the latest line of sports stadiums and arenas are doling out the works.

"The sports business is strong, and facilities are an important component of that," says David Murphy, AIA, principal, Crawford Cannon Design.

The Kansas City, Mo. firm is in the midst of a number of high-profile sports projects, including the design of a new stadium for the Minnesota Vikings, a recently completed arena for Boston University and $8 million worth of renovations to the Seattle Seahawks' four-year-old Qwest Field.

The Qwest Field project really reveals the state of the industry: Even though just about every professional franchise has built a new stadium or arena in the past 20 years, the drive to create new revenue streams and keep things exciting for fans has led to a continuous stream of renovations, according to Randy Bredar, AIA, vice president and national director of sports architecture with HNTB, Kansas City.

And, according to Murphy, it's just not the pros. "The business philosophy of colleges toward stadiums has become more professional, which has redefined the market and fueled this explosion of growth," he says.

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HNTB's docket certainly bears this out, with work that includes a new arena for the University of Southern California and stadium renovations for Michigan State, Oregon State and the universities of Illinois, Michigan and California-Berkeley. "The rate of turnover [and renovation] is amazing, as technology and trends change so quickly in the sports world," observes David Miller, AIA, vice president, Cannon Design, St. Louis. "For example, the arena in the city of Miami was only eight years old when they started planning to replace it."

The fan experience

As for what's happening in the stadiums, jazzing up creature comforts is where it's at. Thus, stadium concourses have taken on an entirely new look through the use of higher-grade finishes, specialty lighting and graphics that create Disney-like themed experiences.

"As opposed to the traditional racetrack-type facility with toilets and concessions, the presentation of advertising, signage and interiors is being used to make the concourses feel like someplace special with a unique identity," explains Jon Niemuth, principal, Ellerbe Becket, Kansas City.

For example, Ellerbe Becket's recent design of FedEx Forum, home of the Memphis Grizzlies, is a re-creation of the town's historic Beale Street, showcasing Memphis' rich history of music—a theme that is continued via concession, restaurant and restroom decor throughout the concourse.

Similarly, SmithGroup's design of the Detroit Lions' Ford Field uses interior brick walls, wall-washed lighting and indoor cobblestone streets to simulate local Detroit thoroughfares.

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Yet another example is the historic jerseys and signed baseballs that decorate the suite walls of the St. Louis Cardinals' new Busch Stadium, designed by HOK Sports+Venue+Events, Kansas City, which opened this spring.

Basically, the upshot is that it's all about dazzling and entertaining the fans to keep them engaged.

"These days, going to the game has become more than just watching the game. It's about the entire game-day experience," explains Dennis Wellner, senior principal with HOK. "We're adding high-end restaurants, bigger team stores, kids' play areas—anything extra that can draw fans in and add to their experience at the stadium.

Wellner says it's paramount that these kinds of amenities be included if they wish to operate a successful venue.

Among the major projects HOK is working on are the new stadium for the National Football League's Arizona Cardinals, opening this summer; the design of new ballparks for the New York Mets, New York Yankees and Washington Nationals; and a new arena in Kansas City.

Basic comforts

Of course, these added amenities mean little if fans are not kept satisfied and comfortable in other ways. And this is where M/E systems come in. For example, with more and more Internet services being offered and approximately half of the fans in a stadium carrying cell phones, a robust telecommunications infrastructure is essential. Similarly, when fans want to have the ability to throw open the windows of their suites, the HVAC system must be able to respond.

And now that dining facilities are using wood-fired ovens, major display cooking kitchens and outdoor dining terraces, these upscale features necessitate more sophisticated M/E equipment, notes Niemuth.

"And we're not just talking about food service equipment, but big-screen TVs and other entertainment features as well. This has required more coordination between the architects and M/E/P engineers," says DeVolder.

Another significant coordination issue is dealing with changing energy codes, especially being that stadiums are such big power consumers. "With many locations implementing strict energy codes regarding consumption and performance, meeting the prescribed requirements takes additional thought, operational planning and/or capacity to be designed into the project," Niemuth points out.

Another big issue is redundant power, especially considering the large amount of revenue generated

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by a single stadium event. "With much more of a focus on return on investment, there is much more at stake now. So we are seeing a trend of great investment in backup power," observes Miller.

At the same time, a full redundant system is considered to be cost-prohibitive, so strategic decisions must be made as to where to put the backup power.

"Key stadium and arena features with backup power include the life-safety systems, the building management system front end, an ice plant and the A/V system," says William J. Larwood, P.E., LEED AP, senior vice president, Syska Hennessy Group, Los Angeles. "Also, flexibility is often built into the electrical design, providing the ability to quickly an effectively bring in generator back-up."

Still, some developers are hesitant to invest significantly in redundant power due to the fact that electrical systems should be able to handle the load.

"It's really unlikely that the entire stadium would go dark," says Ann Carey, senior vice president, Jones Lang LaSalle, Chicago. "Systems are constantly checked between games and during the off-season. In addition, building staff is on hand on game day to quickly address any issues."

Think sustainable

Although large facilities such as stadiums and arenas naturally leave a large environmental footprint, HOK's DeVolder points out that with effort and focus, the converse can be true as stadiums also have the ability to make a positive impact.

Consequently, a few of the sustainable experts at 360 Architects are now organizing and applying a green stadium/arena portfolio standard to three current projects. The goal is to encourage owners and provide them with guidelines to increase the sustainable elements in their facilities, which, according to Larwood, range from landscape design, to brownfield redevelopment and stormwater management to even waterless urinals.

But these facilities have unusual operation schedules, so he says it's not always about paying a premium for more efficiency, but rather implementing effective technology that increases systems efficiencies, such as VFDs on motors, lighting controls and, of course, applying commissioning.

Also key for sports facilities is lots of designed-in flexibility. "Stadiums will have brief, very intensive periods of maximum occupancy, followed by extended periods when no one is in the building. Consequently, M/E systems have to be very flexible and centrally controlled," notes Miller.

But even though sustainability is being considered and implemented to a certain degree, it has yet to reach the point where professional stadium owners are seeking LEED accreditation. At the same time, according to Nieumuth, the opposite is the case in the collegiate market, as universities are

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really leading the charge. For example, the University of Connecticut is opening a LEED-certified football training facility this summer.

Sports lighting

A final facet of sports facility M/E design is lighting, which is constantly changing due to ever-advancing media technology. In general, John Saad, managing principal, R.G. Vanderweil Engineers, Boston, explains that TV broadcasts require 100 to 150 foot candles on the field to respond to television requirements. Typically, quick re-strike metal-halide lighting schemes are utilized for clarity and color control.

But now, because of high-definition television, Crawford Cannon's Murphy adds that cameras require different angles and adjusted lighting, while at the same time still accommodating traditional analog digital broadcasting. And even though advances in lens technology require less light, there is now a greater need to prevent shadowing. Consequently, lighting placement and angles must be more strategically set up.

Another request lighting designers often must address is an owner's interest in having instant and total control of both the sports and concourse lighting. Consequently, shutters and shades are commonly used, according to Larwood.

Other advances in the arena of lighting include more sophisticated lighting control systems. For example, according to Joe Trusk, P.E., chief electrical engineer with SmithGroup, Detroit, for halftime and pre-game shows, as well as different events, "stadiums have access to all kinds of devices and specialty lighting controls—for example, pre-set lighting for a football game, business exposition, boat show, etc."

Yet another consideration is the fact that dozens of camera locations, including an overhead robotic cam, must be supported.

"These sky cams are actually supported by cables, so they can run up and down the field or court, so now we're having to figure out how to support that as the camera needs to be up high enough," explains Devolder. "For example, sometimes we have to erect a specific structure, such as a lighting pole, to attach one of the cables to."

The future is now

Integrating camera and wireless technology, state-of-the-art franchises are beginning to offer premium seating amenities such as the ability to tap into different camera angles and call up instant replays from an LCD right at one's seat, according to Miller.

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Even in general seating many teams do e-blasts of stats and game-related information to fans with Internet-enabled devices. "Other teams have even begun to explore text messaging to the scoreboard or building message boards to create another level of fan interaction," says Niemuth.

Similarly, high-definition "hi-tech" scoreboards are a big tactic to cater to video game-crazed adolescents, who often spend more time watching the scoreboard than the game itself, claims Wellner.

As far as what's on the horizon, Carey describes "smart seats," which would enable patrons to purchase concessions from mechanisms in their seats. Fans will also be able to buy pre-loaded, concessionaire-specific cards that could be used in place of cash.

Anticipating such advances, some stadiums, such as Ford Field, are gearing up. Although the stadium currently operates on a wired network, wireless nodes have been installed at various points of sale and ticket areas, notes Trusk.

Keep 'em coming

But whether its wireless services, fancy concessions or something else, the bottom line is providing an outing that goes beyond the ball game. "The new stadiums are looking to create a total experience that begins with shopping and dining, culminating with a sporting or stage event, creating a destination for the public throughout the year—not just on Sundays or during home games," observes Larwood.

Similarly, Murphy concludes that such amenities seek to reinforce the team's brand, and reflect an effort to keep up with retail and mixed-use developments. "The ultimate goal is to keep people coming back."

Water Conservation

When 50,000 people use the restroom over the course of three to four hours, this has quite an impact on the water supply, as well as on the load created for the sanitary sewer infrastructure. Assuming each person uses the restroom once—a conservative assumption—even at 1.6 gallons per flush, this adds up to 80,000 gallons of fresh and wastewater, not including the water used for sinks and food service. Consequently, the use of waterless urinals, low-flow fixtures and infrared flush valves are needed to significantly reduce the demand on water supply. And a graywater system, which takes the wastewater from the sinks to flush the toilets, can reduce the amount of

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wastewater generated. Add to this a rainwater catchment system, as the amount of water captured from the roof alone in an arena with just 1/2-in. of rain is significant, and the facilities water usage almost becomes a non-factor.

Another general consideration is transportation. An average of 20,000 cars will be used to transport people on a game day. Thus, the pollution generated is significant. As a result, carefully considering the location of new facilities so that they can be adjacent to public transportation—bus, light rail and commuter rail—can also save money for the project. The more public transportation is utilized, the less of a need there is for parking on site. And as gas prices continue to climb, this option becomes more and more appealing to owners, operators and fans.

Yet another design aspect to consider is providing stadium employees with a work environment that is both healthy and encourages top performance. This means considering the use of low-impact finishes such as paint, carpeting and adhesives that do not outgas chemicals, the introduction of daylight to work spaces, proper fresh air ventilation and the ability to individually control air and light at the work space.

If the building operates at a high level while reducing its overall impact, the return on investment of the site, the building and the occupants —both employees and fans—will far exceed the owner's expectations through reduced operational costs, improved worker performance and hopefully, a better product on the field, court or ice.

In short, it isn't just about water conservation. Stadiums and sports arenas offer designers many opportunities to put their sustainable design ideas into practice.

A New Breed of Premium Seats

Constantly innovating and catering to fans, the sports facilities market has seen the introduction of a new breed of premium seats that falls somewhere between traditional club seats and suite offerings.

Dubbed "loge-seating," the seats can be bought in blocks of two or four along a row. Patrons typically sit comfortably in a high-end office

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chair in a bar-like setting, with access to shared lounge amenities.

This product appears to have hit the sweet spot in the high-end seating market, according to Jon Niemuth, a principal with Ellerbe Becket, as it provides a more attractive offering than a traditional club seat, but still less than the cost of a full-blown suite investment.

"Loge-seating has become quite popular in cities with multiple sports facilities where not everyone can afford or even wants a suite at each of those stadiums," explains Chris DeVolder, project architect, director of sustainable design, 360 Architecture, Kansas City. "You can also rent these seats for a few games per season and not be locked into a long-term suite. Consequently, it's easier for the stadium to sell more of these seats."

Of course, it remains a challenge to determine specifically what the premium seating market in a particular city can absorb. "How many suites should I build? The answer is one less than I can sell to increase the value of that commodity," says David Miller of Cannon Design.

For example, because the market in Seattle was already quite saturated, David Murphy of Crawford Cannon Design says they deliberately decided not to build out all the premium seating areas at the new Seahawks stadium, but rather designed in the capacity to expand in the future when the market is ready.

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