

News

Let it Blow

New Broadcast Facility Built to Withstand Extreme Weather

By Sheila Bacon

Not hurricane-force winds, daunting floods or even the wrath of the fabled Big Bad Wolf are likely to rattle the new Fox Sports Broadcast Center in The Woodlands, Texas.

Design and construction of the network broadcast center complies with the stringent hurricane-resistant standards set forth in the building code of Florida's Miami-Dade County – home of some of the most ferocious hurricanes in the country.



Although use of Dade County's standards wasn't required by local codes, it was a decision made by project leaders after a great deal of consideration.

“The building is a mission critical broadcast facility that needs to survive severe weather, including predicted wind gusts for this region,” says Monte Kuklenski, Los Angeles-based senior vice president of facilities and staging services of Fox Network Engineering and Operations.

The 184,000-sq-ft, two-story, precast concrete building is located on a 30-acre greenfield site – of which 16 acres are currently developed – 27 mi north of downtown Houston. The remainder of the site is available for future expansion.

Substantial completion of the Fox Sports Broadcast Center is expected in October, and the building's broadcast operations will be complete and on-air by early 2008.

The facility will serve as the cable sports operations center for Fox Networks Group. Fox Sports Net-Houston and Fox Sports Net-Southwest are the two local Fox networks.

Fox officials would not disclose the new broadcast center project's cost.

The facility's major components are its broadcast rooms, broadcast equipment and transmission rooms, network control rooms, tape vaults and media management center. An adjacent "antennae yard" features seven, nine-meter transmit dishes and 21 receive dishes.

The equipment in the new building will receive live feeds from major sporting events, says Kuklenski. Once the feeds are received at the center, graphics and commercials will be added to the video and the events will then be broadcast out across the country.

A "mission-critical" central plant with robust power and HVAC systems will allow the facility to operate uninterrupted in the event of a power failure, says Tim Sweeney, senior vice president and general manager of Fox Network Engineering and Operations.

"Basically, this building will be Grand Central Station for Fox throughout the U.S." says Sweeney.

Sweeney is based at Fox's current broadcast center in central Houston. The new facility in The Woodlands will replace Houston's operations, which are located in a leased metal building built in 1967. Although plans were already in the works to replace the existing center with a more fortified facility, minor damage sustained as a result of 2001's Tropical Storm Allison drove home the need for an updated facility.

Four years later, Hurricane Rita grazed Houston, pummeling the broadcast center with high winds and rain and rattling the aging building's tenants.

The new facility will have a 24-hour attended gated entrance and other on-site security personnel. The facility will employ approximately 500 people, roughly split between 125 managerial staff and 375 technical personnel. Many of the current 300-plus employees already have made tentative plans to move into the local area, and Fox estimates hiring another 100 to 200 people from the surrounding area rather than going out-of-state. This will include everything from entry-level positions to management.

The new location was chosen after extensive research of 147 properties throughout the Houston area, Sweeney says. It takes the new broadcast center to a geographically safer area with fewer flood concerns. The location is far enough outside Houston to avoid interference with competing broadcast signals, and the heavily forested property provides a certain amount of privacy from surrounding roadways, says Sweeney.

Wind Studies

Before design even began, detailed wind analyses were performed on the site to determine historical weather patterns. Further analyses included wind tests on a scaled model of the facility.

Even though the highest wind force ever recorded at the property was 99 mph, the structure was designed and built to withstand minimum wind loads of 120 mph. Precast panels are 9 in. thick, and mechanical penetrations are specially designed to resist water intrusion, says Neil Adams, project executive with Houston's Gilbane Building Co., the project's general contractor.

A ground-face masonry block wall is built behind the front lobby's glass curtain wall, so even if the glass is compromised, the secondary structure will protect the building's interior, says Richard Hoffman, partner and principal of design firm Archcentric PC, based in Greenwood

Village, Colo.

Construction of the building's roof is unique, says Adams. The only penetrations are two, well-sealed roof hatches. Mechanical equipment is located at ground level and vented out the sides of the building to minimize the potential of any equipment blowing off the roof and damaging the structure or the nearby antennae yard. High parapet walls diminish the roof's uplift.

If, by chance, heavy winds or other natural disasters do manage to cause a power outage, a number of safeguards have been put in place to protect the structure, says Raymond Chiu, project manager with EYP Mission Critical Facilities Inc. in Los Angeles, the project's MEP design firm.

“This is a robust building as far as its infrastructure is concerned,” Chiu adds.

Designers have integrated enough generator capacity and onsite fuel to carry the building for six days without utility power. Three 2,000-kilowatt generators and two 30,000-gallon underground fuel tanks are part of this beefed-up emergency power system, and there is capacity for a fourth generator and a third fuel tank in the future, Chiu says.

Theoretically, if fuel delivery continued, the generators could operate the structure indefinitely in the event of a sustained power outage, Chiu adds.

In addition, a state-of-the-art, uninterruptible power supply, or UPS, system configured in a fully redundant manner is incorporated in the design to provide seamless backup power to critical broadcast equipment during the transfer from utility to generators. Each UPS system is capable of supporting all critical loads in a transparent manner in case one of the two systems fails, says Chiu.

The building's chilled water plant utilizes energy-efficient, water-cooled chillers as the primary system with a fully redundant air-cooled chiller plant as the backup plant, Chiu says.

The building's architectural design takes its cues from the facility's critical components.

“The driving force was the antennae yard,” says Hoffman. “The desire was to visually shield and protect that area.”

As a result, the structure appears to wrap itself around the satellite dishes at the rear of the building.

The property retains a great deal of existing pine trees, a request of both Fox and The Woodlands. The pine trees serve two purposes: they help visually minimize the impact of such a large-scale development while also providing a natural barrier between Fox's operations and competing broadcast signals.

The 18-month job was not fast-tracked, but construction took on some qualities of the fast-track method, Adams says. Subcontractors were brought on board as drawings were being completed, and Gilbane's project leaders solicited significant input from subs and suppliers throughout the project.

“We worked through a lot of issues as a team,” Adams adds. “We knew these subs from previous jobs and we knew they could add to the process.”

Project team

Owner: Fox Sports Net, Houston

General contractor: Gilbane Building Co., Houston

Architect: Archcentric PC, Greenwood Village, Colo.

Structural engineer: Martin/Martin Inc., Lakewood, Colo.

MEP engineer: EYP Mission Critical Facilities Inc., Los Angeles

Mechanical consulting engineer: Alan Kaplan, P.E., Coral Springs, Fla.

Civil engineer: Vogt Engineering LP, Shenandoah, Texas

Landscape architect: Kudela & Weinheimer, Houston, Texas

Wind engineering consultant: CPP Inc., Fort Collins, Colo.

Major Subcontractors:

Steel Fabricators of Monroe, Monroe, Texas

Joslin Construction Company Inc., Porter, Texas

Baker Concrete Construction Inc., Houston, Texas

Keystone Sitework, Houston, Texas

Humphrey Company, Ltd., Houston, Texas

Keystone Concrete Placement, Houston, Texas

KenMor Electric Company LP, Houston, Texas

American Waterproofing, Houston, Texas

Steel Masters, Inc., The Woodlands, Texas

Chamberlin Houston Ltd., Houston, Texas

Simplex Grinnell, Houston, Texas

American Marble & Mosaic Co., Houston, Texas

Pemco, Inc, Pearland, Texas

Marek Brothers Systems, Houston, Texas

McCoy Floor Specialty Products, Houston, Texas Grant Sheet Metal, San Antonio, Texas