Straight Talk

Athletic Facilities At The Right Price

In times like these, with demands for space constantly growing, it's important to investigate three cost-effective building strategies. Air-supported fabric structures, tension-supported fabric structures, and pre-engineered buildings have been around for decades, and as technology continues to improve, colleges as well as high schools are increasingly utilizing them as long-term solutions to facilities needs.

By definition, air-supported structures use air pressure to maintain the shape of their domed roofs. Tension-supported buildings also use fabric as a major structural element, but instead of utilizing air pressure, their roofs are held in place by a metal framework that provides constant tension. Pre-engineered buildings, which can be made with or without fabric roofs, rely on a modular metal substructure that allows them to be mass-produced in factories, transported in sections, and erected on site.

All three are far less expensive than brick and mortar construction, and all have distinct advantages of their own. Here is a look at how each type of structure is assembled and the advantages they offer.

Air-Supported Structures

"In an air-supported structure, there are no columns and no beams, so athletic departments have 100 percent free interior space to do whatever they want," says Jason Abbott, International Sales Representative at Yeadon Domes, which has built domes at Boston College, Harvard University, and the University of Toronto. "All the space inside a dome is usable. You can divide it and have two sports practicing at one time. You can hang netting for golf. And because of the open floor plan, whenever it's not being used by the athletic department, it can be rented to community groups and campus organizations."

Air-supported structures, or structures with air-supported roofs, are an inexpensive way to erect a new athletic practice facility. They can be designed as temporary, semi-permanent, or permanent structures, and can come with airlock doors, sensors to measure pressure outside the bubble, and computer-controlled blowers to maintain air pressure and temperature inside the bubble.

They come with a backup system to keep roofs inflated in case of power outages, and for greater energy efficiency, can be installed with added insulation. They're all custom designed and built, with some structures large enough to hold multiple football fields and others small enough to be taken down when warm weather arrives every spring.

"Along with being affordable, long-term facilities, Yeadon Domes also provide their athletic departments with specific seasonal applications," says Abbott. "A lot of colleges have great artificial turf fields, but if they're not covered during the winter, athletes are unable to use them. Adding an air-supported structure is the best, most cost-effective way to take that practice field and turn it into a year-round facility."

Tension-Supported Structures

Like air-supported structures, tension-supported structures can safely span broad, open areas, which makes them ideal for multi-purpose, multi-use buildings. At Mesa State College, where the student center was being replaced with an entirely new building on the same site, administrators needed a quick solution to their space problems. How could they continue to provide services to their students while the new building was under construction?

WeatherPORT, which has been designing fabric tension buildings for more than 40 years—including structures in Antarctica and Greenland—had the answer. Within weeks, the student center was functioning inside the new Maverick Pavilion, a movable, multi-purpose, tension-supported fabric structure that houses a cafeteria, bookstore, lounge, study area, and fast food restaurant. It's a bright, open, comfortable space, and once construction is finished on the new student center, the pavilion will begin its second life. After being dismantled, the structure will be moved across campus and repurposed as an athletic practice facility.

"It's a quick, simple bridge between Mesa's old and new facilities," says Gene Bollig, Vice President of Marketing at WeatherPORT. "At one time, they had used cargo containers to do some of the same job, which makes our structure a very big improvement. The Maverick Pavilion feels as substantial as a traditional building, but costs far less. It's aesthetically appealing, structurally substantial, and versatile enough to cover a wide variety of functions. Including site preparation, it took only 12 days to erect and was fully operational within four weeks.

"We build everything stronger than we need to," continues Bollig. "That's our philosophy, and because our structures are engineered and certified to meet all state and local codes, they're as safe as any building out there."

As in other WeatherPORT structures, the framework for the pavilion is made of steel and aluminum, and the fabric is a ripstop vinyl that can last 10 to 20 years. The company builds canopies as well, which can be as small as 10 feet wide, as large as 40 feet wide, or combined into a series of structures that will hold as many as 200 people. At Western State College of Colorado, WeatherPORT canopies are being used for tailgating, concession stands, and ticket booths, complete with custom graphics, branding, and four-color digital printing. In another development, WeatherPORT is designing a tension-supported batting cage to provide entry into a new market.

In another alternative to conventional construction, Sprung Instant Structures manufactures pre-engineered, relocatable buildings they call "stress membrane structures." The substructures are made of a high-strength aluminum, which provides the tension for a multi-layered architectural membrane that comes complete with fiberglass insulation and polyurethane coating.

Vice President Jim Avery points to Redemption World Outreach Center, a church in Greenville, S.C., that recently opened a 48,000 square-foot facility for its sports ministry as an example. The Imagine Center, a 120x300-foot facility, includes three hardwood basketball courts, spinning studios, free weight areas, a full cardio theater, a state of the art conference room for corporate retreats, and a second story with a 1/5-mile running track.

"It's very energy efficient, and costs substantially less than a conventional building of the same size," says Avery. "It's designed to provide better performance, with skylights in the roof and a futuristic wave pattern on the outside. The customer liked the fact that it was put up in four months, and the kids love it because it's got such a 'wow' factor. It's the wave of the future, dovetailing between permanent construction and new technology."

Sprung structures are built in 120-foot units, with an aluminum alloy that gains strength as it ages. They can easily be

attached to existing buildings, equipped with heating and air conditioning, and come guaranteed for 30 years, with membranes designed to withstand high winds and shed snow.

Universal Fabric Structures (UFS) is responsible for the Philadelphia Eagles and Baltimore Ravens training facilities in addition to a multi-sport facility at the University of Maryland and others at Caesars Palace, Bolletieri Tennis, and Disney World. In the business for over 26 years, UFS is ISO 9001 certified, and hangs its hat on its ability to offer short construction timeframes and its superior after-sale service.

"Our structures are also cost effective and energy efficient," says Marketing Manager Jeff Bowman. "Our buildings have virtually zero operating costs and 22- to 24-ounce premium PVC coated fabric that allows for natural lighting options holds up for 20 years. We offer a 25-year warranty on frames."

UFS assembles structures as small as 50-feet wide and as big as 350-feet wide—to any length. All models, whether free-standing or merged with another type of structure, are air and water tight, and require virtually no maintenance besides the routine cleaning and oiling of moving door parts.

Steel-System Structures

Steel-system construction buildings, also know as Pre-engineered buildings, are essentially designed once on a computer, where they can be effectively stressed, tested, and certified before being manufactured in quantity. From there, smaller, site-specific modifications can easily be made to fit the building to the client, but that initial computer-design process accounts for much of the cost-effectiveness of the structures, which can then be shipped and erected absolutely anywhere.

"From concept to completion, a steel-system construction building can typically be done 30 percent quicker than a conventional building, because the computer drawing and approval process is so much shorter," says Jim Peckham, Manager of Marketing at Varco Pruden (VP) Buildings, which has built practice facilities for Brigham Young University, Colorado State University, and the Green Bay Packers. "You get the advantage of having a long-term, low-maintenance facility with a lot of built-in flexibility.

"You can use metal, wood, brick, glass, concrete, or a combination of all of them," Peckham continues. "You can achieve LEED status. You can efficiently insulate to manage your heating and air conditioning costs. You can include anything you'd get from bricks and mortar. And you can easily erect a pre-engineered structure with a low initial cost and then expand it 10 years down the line."

VP Buildings manufactures about 6,000 buildings a year, ranging from 1,200 square feet to more than 1,000,000 square feet under a single roof. The company has been around since the post-war days of Quonset huts—they own the brand name—and has a network of 1,000 local, independent builders who are trained and authorized to erect their pre-engineered structures.

"When you're talking about sports like football, you need a building with open spaces and wide plans," says Peckham. "With a metal engineered system like ours, it's no problem to fit two football fields into one building, plus all the offices, services, and everything else you need to run a football program. Rather than thinking of these buildings as temporary, they actually represent a very flexible, effective, expandable, cost-effective, long-term solution."

University of Maryland

Need: A building for football, lacrosse, field hockey, and soccer that could be erected quickly

Solution: Universal Fabric Structures provided a cost-effective solution to meet the school's needs—a 120' x 250' steel fabric structure for multiple sports that was in place and ready for use just a few weeks after purchase.

Key features:

- All UFS buildings are designed to withstand winds of at least 90 mph
- Company is ISO 9001-certified

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