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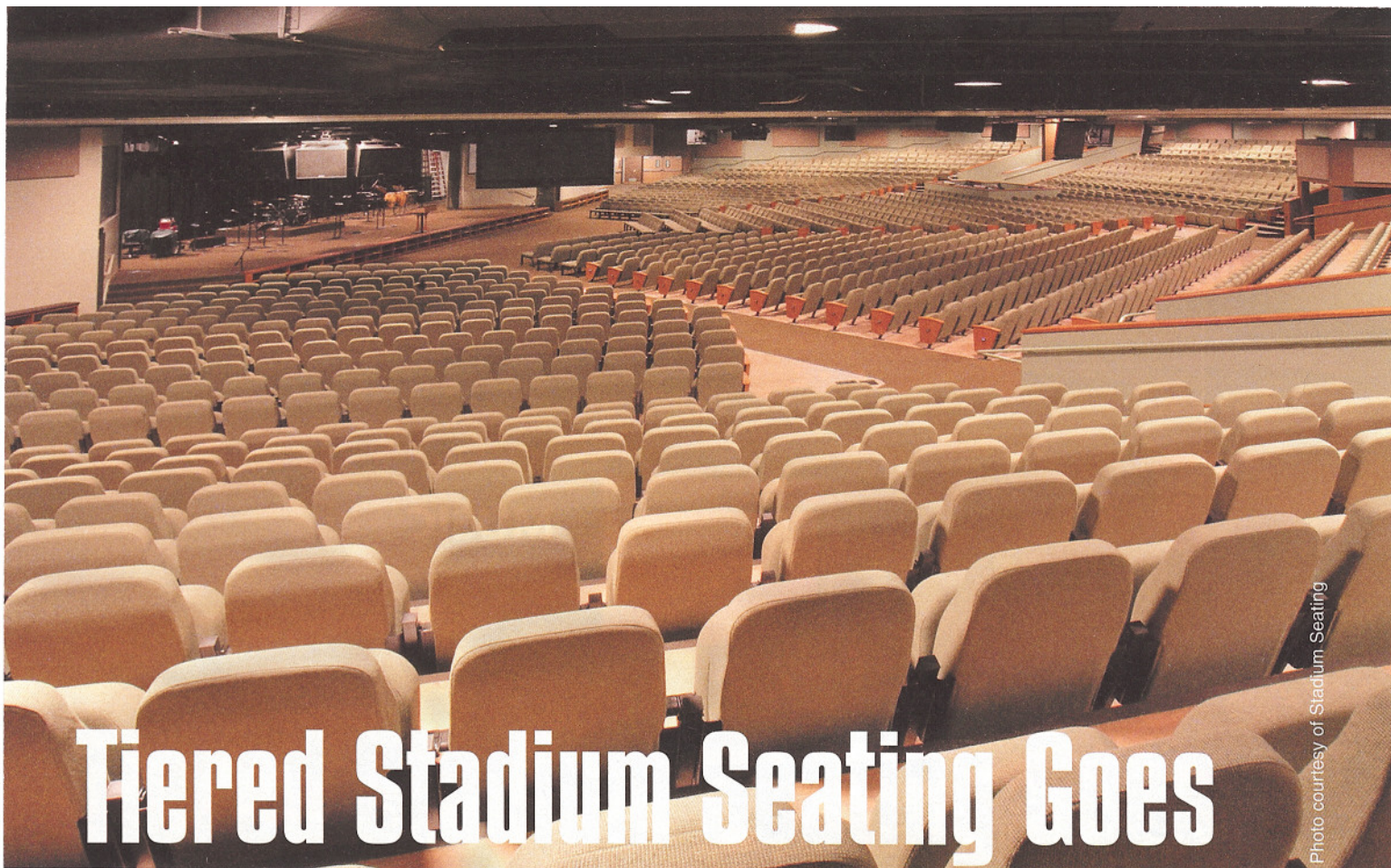


Photo courtesy of Stadium Seating

Tiered Stadium Seating Goes “GREEN”

By Frank Moson

There is little debate if the incorporation of tiered seating into your worship center design is something that enhances the experience of your parishioners. The question today is how architects and builders should best apply “sustainable design principals” into the design and construction process for this component of the building.

Until recently, compacted dirt fill, structural steel, precast concrete or structural light gauge metal framing were the only methods of constructing tiered stadium seating risers in assembly spaces. Today, there is a relatively new and innovative approach to constructing the tiered seating risers that is not only more efficient and economical than the traditional methods, but it is also an environmentally responsible, “green” solution that uses recyclable material as the “building blocks” for the tiered seating risers.

This article addresses one aspect of modern-day worship facility design and construc-

tion—the design and selection of this environmentally friendly tiered stadium seating. This innovative system uses Expanded Polystyrene (EPS) blocks as the structural fill material to support the tiered seating platforms. The blocks are easily factory and field-cut for installation in virtually any configuration necessary and provide excellent acoustic quality. More importantly, the use of EPS in the stadium seating system as well as its use as an insulation material in the overall construction of the building meets many of the criteria necessary for LEED certification. For the tiered seating risers, it is similar to stacking “Lego-type” blocks made of EPS to form the tiered seating platforms.

SUSTAINABLE BUILDING PRACTICES

As conscientious stewards of our world concerned with the environment and the quality of life on earth, many of the leading companies in the design and construction industries have taken a fresh approach to protecting the build environment and employing sustainable

building practices.

Over the past few years, the design and construction professions have turned their focus to the “Greening of America.” Designers, architects, contractors, and material suppliers have taken on the challenge of determining how to build and furnish building interiors with materials that are:

- Resource Efficient
- Made with Recyclable Material
- Environmentally Friendly
- Energy Efficient
- Able to Reduce Greenhouse Gas Emissions

The U.S. Green Building Council has developed a nationally accepted system to rate the design, construction, and operations of buildings. The USGBC’s leadership in Energy and Environmental Design (LEED) is a standard that recognizes the life-cycle cost of construction and helps guide the performance of projects. The LEED rating system allows owners to acquire credits by meeting certain

conditions pertaining to the use of sustainable, energy-efficient and environmentally friendly products and systems.

The use of EPS in design and construction addresses each of these criteria and provides a product that is both environmentally responsible and a cost-efficient solution to installation of tiered stadium seating riser systems in churches.

RESOURCE EFFICIENT

- EPS manufacturing uses minimal energy and creates nominal pollution. Steam is the primary component in the manufacturing process of EPS, and the water from this process is collected and reused numerous times.
- With hundreds of manufacturing facilities throughout North America, EPS is manufactured in close proximity to most building projects, minimizing the distribution radius.
- Because EPS is very lightweight, transportation costs are minimized.

MADE WITH RECYCLED MATERIAL

- EPS building products can be made with recycled material content. In 2004, more than 57 million pounds of EPS was recycled.
- Tiered stadium seating systems are typically made with approximately 10 percent recycled content.

• At the end of a building's useful life, tiered stadium seating systems constructed with EPS fill material can easily be removed and recycled. More than 90 percent of the material in an EPS tiered stadium seating system is comprised of recyclable EPS block material.

ENVIRONMENTALLY FRIENDLY

- EPS does not contain harmful formaldehydes, CFCs or HCFCs. The American Lung Association's Health House guideline acknowledges that EPS is a safe material for insulation and structural support in construction.

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Tiered Stadium Seating Goes "GREEN"

OUTFITTING THE SANCTUARY

- EPS has a high degree of resistance to moisture absorption controlling humidity and air infiltration, thus reducing the development of mold.

- The use of EPS in tiered stadium seating design reduces vibration and reverberation and virtually eliminates "drumming" associated with deep base in musical performances. By minimizing audio interference and feedback, speakers are more easily heard and understood in large sanctuary spaces.

ENERGY EFFICIENT

- According to the U.S. Green Building Council, using EPS in building construction helps reduce energy consumption.
- EPS blocks for tiered stadium seating systems can be placed directly on compacted fill, thus eliminating the need for a concrete slab under the stadium seating risers. Because of the characteristics of EPS, it minimizes thermal transfer, inhibits mold growth, and is resistant to insects.

REDUCTION IN GREEN HOUSE GAS EMISSIONS

- EPS, unlike Extruded Polystyrene (XEPS), has never utilized any greenhouse gases in the manufacturing process, and the manufacturing process itself does not result in emissions of greenhouse gases.

In addition to the energy and environmental benefits inherent in the use of EPS, there are a large number of efficiencies that can be realized using the EPS System as a construction solution for tiered stadium seating.

One of the distinct advantages of this type of tiered seating riser system is the fact that it is pre-engineered, custom prefabricated and delivered to the site ready to be installed late in the construction sequence, following the stud and drywall completion of the auditorium's demising, back and side rake walls. Because the general contractor can work on a floor unencumbered by scaffolding, the ability to get the auditorium "tiered seating ready" proceeds much more efficiently than was pre-

viously realized using traditional methods of constructing tiered stadium seating platforms.

In a typical installation, 90 percent of the EPS block is delivered to the project site pre-cut to the dimensions of the seating risers, including any necessary ramps and landings. Consistent with the supplier's shop drawings, blocks are pre-marked for direct placement on the auditorium floor. Each of the EPS blocks is marked by area designation, platform level, row and block location in each row of the tiered stadium riser system.

By the afternoon of the first or second day of installation, typically the work crew is busy installing the gauge metal steel riser plates and connecting strap hardware. The riser plates not only serve to finish the face of the platform riser, but also serve as a form for pouring the 4" horizontal concrete platform deck. They are held securely in place with connecting straps placed every 30" on-center.

Once the gauge metal steel risers and the connecting hardware are in place, the intermediate step forms are attached to the face of the risers to complete the platform assembly. At that point, the platform is ready for the one continuous concrete pour of the horizontal platform surface. This approach will typically save weeks off the installation schedule and reduce overall costs by as much as 15 to 20 percent compared to traditional methods.

The incorporation of this system not only more cost efficient, but it is also an environmentally responsible, sustainable, "green" approach to design and construction of tiered stadium seating risers. **RPN**

RESOURCES

EPS Molders Association

"EPS Recycling," "Improved Indoor Environmental Quality," "EPS Green Building Credits"

Insulfoam LLC

"The Green Choice" and "Insulfoam and LEED."

Frank Moson is president and chief executive officer of Stadium Seating Enterprises, Inc. He has more than 32 years of experience in architecture and construction.