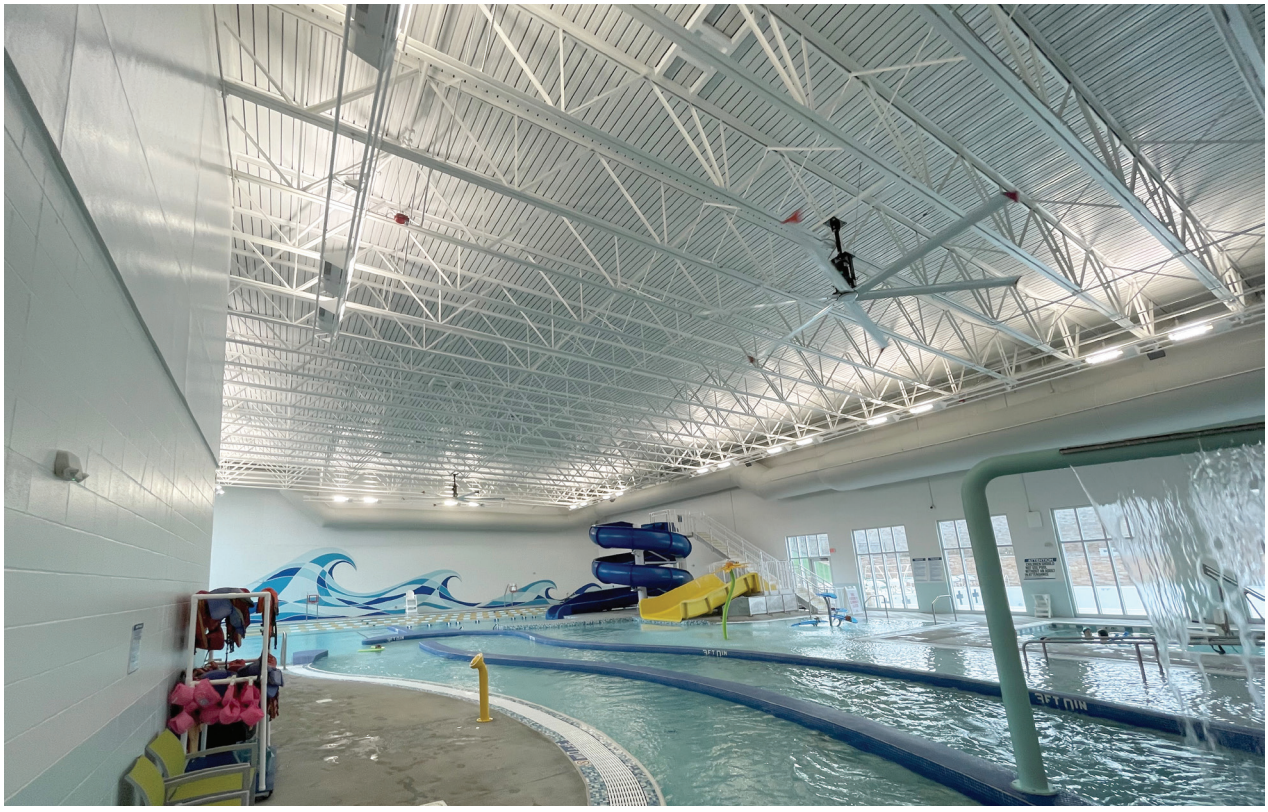
Steel Joists and Deck Stand Up to Natatorium Conditions



Indoor pools, or natatoriums, are a staple in communities nationwide because of their year-round usability. There is much to like about being able to swim during inclement weather conditions.

In an ironic twist, an indoor facility housing hundreds of thousands of gallons of water creates its own demanding atmosphere: an enclosed microclimate that introduces unique challenges for building design teams and contractors alike.

While keeping budget and appearance in mind, a natatorium design needs to consider two fundamental issues: 1) humid, corrosive environments that need to house complex mechanical systems and exposed building materials, and 2) acoustics and ambient noise control in spaces that act as giant echo chambers.

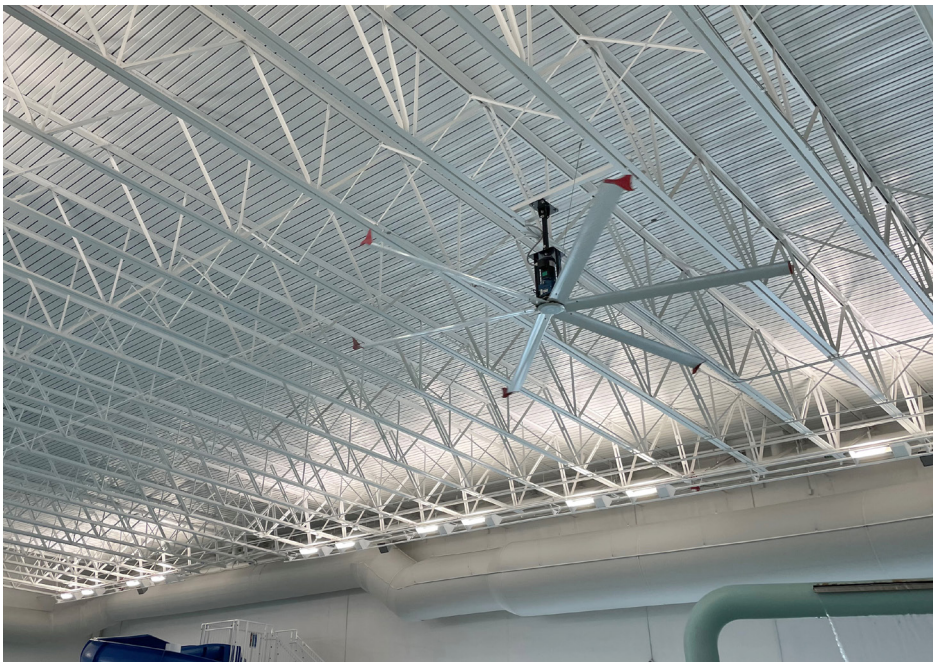
Successful indoor pool design and construction must address these challenges.

When designing a natatorium, long-span acoustical steel deck, joist and beams facilitate efficient, long-lasting construction. The resulting structure requires nominal maintenance and achieves the aesthetic appeal communities seek by creating open and spacious pool environments. High-caliber coating systems further enhance this design and are recommended for providing long-term protection for structural steel in natatoriums.

Resisting the Effects of Humidity

The roof-ceiling assembly is vital to the long-term success of a natatorium project. Long-span steel deck

can clear spans from 8 feet up to 30 feet, which can allow for the creation of a grand and open natatorium space that users enjoy. A long-span steel roof deck such as Versa-Dek® or Deep-Dek® Cellular with acoustical insulation further contributes to the ambience of a large and open natatorium space. The geometry of these types of long-span steel decks provides the ability to conceal roof fasteners, which further contributes to a crisp and clean appearance.



Steel joists are light and flexible. They can be designed into many architectural shapes—including arch, bowstring, scissor and gable—to achieve aesthetic goals. The open webbing of a steel joist also allows ductwork, mechanical or electrical components to pass through unimpeded, increasing the finished ceiling height and adding to the open feeling of the natatorium.

To maintain their appearance and structural effectiveness, steel joists and steel roof deck must be able to withstand the humid environment. Substrate and surface treatments are essential to joist and deck design for natatoriums, addressing the major concern of corrosion. In a caustic environment, steel deck should be specified at G90, a thicker galvanization than a typical G60 substrate. As with joists, deck surface treatments vary, but the goal is the same: a robust, multi-layered finish coating system is needed to protect the steel.

The most-recommended option for treating steel is for the deck manufacturer to spray-apply the first coat of paint. This scenario involves G90 deck with an oven-cured epoxy coil coat, along with a polyester coating on the unexposed back side. Once installed, the deck and joists receive a field-applied topcoat to ensure maximum performance.

When design specifications call for powder coating as a solution, the bare galvanized deck may require treatment before receiving the powder coat. Powder coating is a process by which the already-fabricated steel deck is electrically charged. A dry paint is then statically applied in a powder form and baked.

When a finish topcoat is applied in the field, the initial factory procedure may go as follows: factory pre-treatment of the galvanized steel, then factory application of an oven-cured epoxy coil primer prior to shipment to the job site. In the field, one or more coats of a hydrophobic paint—designed for natatoriums—is applied.

For the best corrosion protection, coatings must be considered in relation to the accompanying roofing systems, fasteners and deck attachments, all of which can impact the coating.

Mitigating Ambient Noise

In aggressive pool environments, encapsulated acoustical batts placed in the cavities of Versa-Dek or Deep Dek Cellular significantly reduce noise, creating a more-welcoming atmosphere and allowing for more-enjoyable swim sessions. PVC-wrapped acoustical batts are clear, plastic-encapsulated fiberglass strips that lay within the deck cavity. The PVC wrapping lessens the potential for humidity or condensation affecting the fiberglass acoustical insulation.

Standard acoustical batts are yellow, but brown "eco-batts" are available for projects that require avoiding products on the Red List. "Eco-batts" are dark brown and do not affect the NRC rating.

Putting It Together in One Big, Beautiful Space

Successful natatorium building designs address corrosion, acoustics, aesthetics and budget.

The team behind the award-winning Merriam, Kansas, Community Center called upon New Millennium Building Systems to supply Versa-Dek® steel roof deck for its $30 million project. To support the architect, New Millennium supplied Versa-Dek® 3.5 Acoustical roof deck. New Millennium worked with the design team to provide an exposed steel solution with a high-performance coating. The result is a true destination for the residents of Merriam who enjoy swimming, socializing and exercising in the open and welcome natatorium.

New Millennium has extensive experience in supplying joist and deck for natatorium and recreation center projects. Our steel joist and deck components, skilled specialists and range of product offerings make us the ideal partner for your aquatic project. II