



SPECIAL PRINT | PRECAST CONCRETE ELEMENTS
Custom stadium formwork



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Custom stadium formwork

Formwork for precast/prestressed concrete products for stadium and arena projects can be tricky. To be practical, the number of individual forms required for the project is determined by the number of different products called for, the quantity of each and the delivery schedule. While some high volume products require a dedicated form, others can multitask with simple additions and modifications such as inserts, fillers or risers. This is especially cost effective and practical for low volume products.

With nearly one hundred stadium and arena projects from coast to coast to its credit, Hamilton Form, based in Fort Worth, Texas, is an experienced company in custom design and manufacture of prestressed steel forms for this application.

Form Meets Function

For precast concrete producers, a stadium contract is both exciting and challenging. With stadium design and construction becoming increasingly more competitive, the key is to bring together an expert team whose individual talents complement the others and add value to the project.

Most stadium projects utilize a number of different precast structural elements. Almost all stadium risers for seating are made of prestressed concrete. Increasingly, prestressed structural elements, including columns and raker beams, are also being used. Precast/prestressed stairs, ramps and vomitories are common. And, as stadium desi-

gners push the envelope in pursuit of eye-popping impact and style, architectural concrete is also playing a greater role.

As the number of different precast/prestressed elements used in stadiums grows, so too does the demand for a greater investment in formwork. Because formwork has a significant impact on the success of the project, it has never been more important to secure the expertise of a company with proven experience in the field. Hamilton Form has designed and produced hardworking precast/prestressed concrete steel forms for nearly one hundred of the United States' most significant stadium and arena projects in recent history, including Reliant Stadium (home of the NFL Houston Texans), Cleveland Browns Stadium, M&T Bank Stadium (home to the NFL Baltimore Ravens), LP Field (home of the NFL Tennessee Titans), the Sprint Center in Kansas City and the New Orleans Sports Arena.

Currently, Hamilton Form is building custom steel formwork for several other even more high profile projects, including the futuristic Dallas Cowboys Stadium, which will be the largest and most expensive stadium in the NFL when it opens in 2009. Other assignments include Lucas Oil Stadium (home to the Indianapolis Colts), opening later this year, the new Minnesota Twins ballpark, and the Intrust Bank Arena in Wichita, Kansas.

Hamilton Form's extensive experience in designing and building formwork for increasingly complicated stadia projects can provide a competitive edge for the precast concrete producer.

Formwork is Key

The number of forms needed for a stadium depends on the number of different cross sections and the quantity of each cross section required. Some stadiums call for relati-



Adjustable curved stadia form



Triple riser stadia form for Indianapolis Colts



Colts stadia form at Coreslab Indianapolis

very few forms while others may require as many as eight, twelve or even more unique forms. Construction sequence must also be factored into the plan to ensure that delivery schedules are met.

Higher volume products may require a dedicated form, while it may be advantageous to design some forms that can be adjusted with the use of fillers and risers to produce two or three different cross sections. Prestressed stadium forms, as with all self-stressing forms, require jacking end plates to transfer the prestress load into the form. When fillers and risers are used to produce multiple products in a single form, strand patterns move further away from the base of the form. This changes the load paths and greatly complicates the structural design of the form. That's why most stadia forms produce no more than two or three different cross sections.



Form for Cowboys Stadium at Heldenfels Enterprises



Double L Riser for Intrust Arena at Prestressed Concrete, Inc

Formwork for smaller stadiums is often very tricky. Smaller stadiums usually have the same – or even more different cross sections than some of the larger stadiums. Because the investment in forms has to be applied over fewer pieces, the forms need to work harder. Smaller stadiums often utilize forms with more adjustability so they can cast a number of different products. Adjustments increase set-up time at the plant and make the forms more complicated, but can pay for themselves by reducing the overall cost of the project.

An outstanding example of Hamilton Form's modular formwork was created for the twelve thousand-seat Intrust Bank Arena in Wichita, Kansas. To maximize the precasters' investment, Hamilton Form designed a pair of self-stressing Double L riser forms that each cast about a dozen different cross sections with the use of fillers and risers. Two double hammerhead forms are used for eleven more set-ups, and a single form was designed to cast both the upper and lower tub sections. This practical approach limited the number of different forms that the precaster needed to purcha-

se and helped trim capital expense. Another example of an innovative solution for a complex design is a front faced adjustable double riser stadia form recently produced for an arena being built on the east coast. This arena features seating sections with curved faces. To facilitate this design, the radius of each precast concrete section changes slightly as it curves around the arena. The radius also changes on each row from the lower to the higher sections. Hamilton Form designed an adjustable form that can be easily modified for each curve change. The form has hangers and steel shims to allow the radius to be adjusted in one-sixteenth inch increments. Riser and fillers were built to adjust the height of the product. The back pan also has both vertical and horizontal bolted adjustments. Without an adjustable form, it would not have been practical to use precast concrete for this project.

Conclusion

As the leading precast/prestressed form manufacturer in the United States, Hamilton

Form Company – based in Fort Worth, Texas – has designed and built formwork for nearly one hundred stadiums and arenas nationwide. And while each project is unique, Hamilton Form brings more than forty years of design innovation, proven performance and value engineering to the planning table. The end result is economical, multi-purpose forms that are easy to work with and modify for different products, bringing value to the project. ■

FURTHER INFORMATION



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