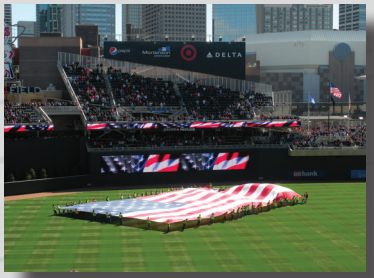

Target Field

Location:	Minneapolis, MN
Submitted by:	AMSYSCO, Inc.
Owner:	Minnesota Ballpark Authority
Architect(s):	Populous and HGA
Engineer(s):	Walter P Moore
Contractor:	Mortenson Construction
PT Supplier:	AMSYSCO, Inc.

Project Overview:

Target Field was unique because of the multiple applications of post-tension construction on the same project. Typically, a single project applies the cables in the same manner, and the construction team is able to gain efficiencies from the repetition. Target Field required much closer coordination between the design and construction teams to ensure a high level of quality control for each different application. In fact, because of the complexity of the design caused by the site constraints, the Construction Manager used building information modeling (BIM) technology to model the post-tension cables and standard reinforcing—a level of detail that is not often required.

One of the greatest benefits of post-tension construction at Target Field was along the third base line over the railroad corridor. The post-tension design reduced the amount of concrete volume, eliminated the need for reshoring through the rail corridor, and enabled the Construction Manager to coordinate a complicated sequence of construction. In one specific 100 x 100 ft area in the northwest quadrant of the project, the design necessitated standard pan-and-joist, cantilevered PT girders, precast double tees, precast plank, and conventional PT girders—almost inconstructable without the flexibility of post-tension construction.

Due to the heavy loading in Target Field, the largest concrete girders required 5805 kip of prestressing force to support the main concourse. More than 200 1/2 in. diameter tendons were used for these post-tensioned girders. To avoid cracking caused by reverse tensile stresses, some girders required stage stressing of tendons because the concrete gained strength and the upper levels added more dead load to the structure. Because some girders had 15 times more post-tensioning than a typical beam in a parking structure, the construction team was concerned about potential conflicts between post-tensioning anchors and materials from other trades. Furthermore, the post-tensioned girders were built before the perpendicular joists to speed up the construction schedule. Accordingly, concrete block-outs/sleeves were embedded into the girder to allow the transverse beam post-tensioning and mechanical, electrical, plumbing (MEP) piping to run through the girders.

Before construction started, BIM was used to coordinate structural design drawings with post-tensioning shop drawings. The detailed three-dimensional (3-D) environment illuminated several problem areas that subsequently were solved by revising the installation drawings. The strong collaboration of the construction team was one reason the project was completed 3 months ahead of schedule.

Jury Comments:

- The use of PT facilitated a complex construction schedule and allowed the design/construction team to deal with challenging site conditions.
- Used highly variable cross sections of structural elements to meet challenging geometric requirements.
- Use of PT contributed to the project achieving a LEED Silver rating.