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Winchester Parking Structure – Case Study

The $7.68 million Winchester Parking Structure is the City of Winchester, Virginia's fourth downtown parking structure; adding 540 new parking spaces in the heart of its historic district. Although The Shockey Precast Group has constructed more than 400 parking structures in the Mid-Atlantic region, the Winchester Parking Structure was the first Shockey parking garage to use AltusGroup's CarbonCast C-GRID® carbon fiber reinforcing (rather than conventional steel mesh) in its double tees.

The 170,000 square-foot, five-story Winchester Parking Structure is situated between Kent and Cameron Streets adjacent to the recently renovated George Washington Hotel. The parking structure includes an architectural thin-brick façade, accented with precast concrete features that mimic stacked limestone to complement the neighboring buildings. An enclosed, elevated pedestrian walkway connects the parking structure with the Frederick County Office Complex. The Winchester Parking Structure is comprised of 532 precast components, including 204 precast double tees reinforced with CarbonCast C-GRID® carbon fiber. Production of the precast components began in May 2008 at The Shockey Precast Group's Winchester manufacturing facility. Precast erection began in October 2008 and was completed in January 2009. A total of 25 million pounds of concrete was used in the PPEA project.

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"The precast members employ some unique technology," states Gary Ball, project manager with Howard Shockey & Sons, general contractor for the Winchester Parking Structure project. "The precast includes C-GRID® reinforced double tees that help make the structure lighter and stronger. Stainless steel fasteners are being used on the project. Both the carbon fiber and the stainless steel are non-corrosive, thus eliminating what is often a parking garage owner's biggest maintenance headache – problems relating to corrosion."

C-GRID® carbon fiber reinforcing grids are an innovative breakthrough in precast concrete technology. Their use provides owners with parking structures that reduce corrosion, weigh less, and last longer than conventional cast-in-place concrete or steel-reinforced precast parking garages. The end-result is a parking structure with exceptional durability, longevity, and economy. C-GRID®'s unmatched durability and economy made it a superior choice for The Shockey Precast Group. The decision to use C-GRID® carbon fiber reinforcing also enabled the Shockey team to provide an

aggressive construction schedule that satisfied the Winchester Parking Authority's architectural vision and kept costs within budget.

For The Shockey Precast Group, site logistics and limited accessibility presented the greatest challenge during the project. The project's location in the historic downtown area of Winchester demanded careful planning and coordination by Shockey to ensure a smooth precast erection process and minimum disruption to local traffic patterns. The project site was situated between two existing buildings, which created additional challenges in maneuvering of the 300 Demag crawler crane for erection of the precast components. Working property line to property line and moving east to west, Shockey's erection crew followed a very precise plan in order to maximize utilization of the available site space. Approximately 12 precast pieces were erected per day.

Although the project was not designed toward specific green technology, the site contractor was able to "recycle" the site waste to another building site and use it as fill for that project. As a result, none of the site waste from the Winchester Parking Structure went to the local dump. The use of a KONE traction elevator on site contributed to the project's environmentally-friendly practices by eliminating the risk of a hydraulic oil spill on the site.

The project team was comprised of: City of Winchester, Owner; Design Concepts, of Winchester, architect; Blue Ridge Design, Winchester, engineer; Howard Shockey & Sons, Winchester, general contractor; and The Shockey Precast Group, Winchester, precaster.