

Parking Plans



Alan H. Simon, P.E.

A parking structure using the Hybrid™ framing system quickly added parking capacity for a shopping mall renovation in University Heights, OH.

The reconstruction of a suburban Cleveland shopping mall in University Heights, OH, used steel to solve a parking problem. An existing two-level May Company department store was situated in the middle of approximately 10 acres of surface parking. In a unique public-private partnership, developer Starwood Wasserman worked with the city to create a retail “power center” by repositioning the store and adding significant density to the complex. The parking needs could not be met with traditional surface parking alone, and a 2,500-car parking structure was required to satisfy the tenants and the zoning requirements of the community. The real technical challenge was to create a design that enabled phased construction so the May Company store could remain in operation until a new retail space and parking lot was built. Further, substantial additional

parking was required to serve the 2002 holiday shopping season.

The developer engaged Hybrid Parking Solutions™, Inc. during the planning phase of the project to determine if the Hybrid™ system could be incorporated to the project’s advantage. Hybrid melds the benefits of a modular, pre-manufactured steel frame design and a precast concrete deck system into a durable, economical turn-key parking solution. Hybrid originated the design concept of integrating paired steel columns, steel girders, and precast double tee decking. The proprietary self-stabilizing design goes up faster, with greater certainty in both cost and schedule.

Hybrid’s engineers considered the key factors of the prefabricated modular system to accommodate phased construction. Starwood Wasserman had seen numerous examples of Hybrid structures and concluded that this approach would facilitate the phasing



A two-level department store was relocated to make way for the steel-framed parking structure.

while providing an economical alternative to conventional methods of constructing parking structures.

The project had an aggressive schedule from inception, given the phasing requirements and the duration of the procurement process. The developers were told the schedule was not achievable and pursued alternative solutions. The owners decided that the best way to meet the schedule was to employ creative solutions through a design/build process similar to one they had used in the past. The developer retained Hybrid for consulting services to review the parking layouts and design criteria with the Hybrid system in mind. Alternative structural systems were bid, based on the project footprint and schedule requirements. Hybrid's initial bid was nonconforming, but the benefits of the accelerated schedule and the cost savings on the project attracted the attention of the owners. The owner and construction manager reviewed the proposal and awarded Hybrid the job.

The structure was classified as a type 2C open parking structure because it would be open on all sides. The structure would have 13 pedestrian bridges connecting to the retail center of the big box stores.

The steel frame facilitated the phased construction. Only one bay of parking and a dedicated ramp was constructed adjacent to the existing store. The structure was erected to full height and the Hybrid system's self-stabilizing nature allowed the phasing to occur naturally. The steel frame allowed for installation of temporary steel barrier cables as a cost-effective

pedestrian and vehicular barrier along the phasing line. The first phase of the structure provided parking for approximately 275 cars as well as parking for the construction workers. The structure was erected and presented to the owner in less than six weeks to meet lease requirements, despite frigid January temperatures.

Beating the accelerated schedule and winter weather challenges was daunting, but the next phase was the real challenge. Once the existing store was demolished and the site backfilled, Hybrid needed to install new caissons and spread footings to the hardpan below, and erect the superstructure of more than 2,200 parking spaces within four and a half months. Additionally, the construction of the remaining stores limited site access for deliveries. Nevertheless, working with Suffolk Construction Company, Inc., Hybrid was able to achieve the owner's schedule and quality requirements.

The Hybrid framing system of paired steel columns and steel girders was constructed with a precast double tee deck. The structural steel framing totaled about 2,230 tons of conventional framing. The steel was blast-cleaned to SSPC SP6 specifications, coated with a Tnemec zinc-rich urethane-based primer, and then top coated with urethane. AISC-certified steel fabricator Megquier and Jones, Inc., who has fabricated more than a dozen Hybrid projects, produced all the structural steel.

The standard Hybrid system of steel framing utilized all moment connections, which reduced the dependency on diaphragms in the precast deck and

facilitated the phasing of the project. This approach allowed the owner to reposition the entire center without losing a vital anchor tenant, while at the same time increasing the value of the real estate holding by adding parking capacity.

The prefabricated system and the speed of erection meant that project phasing, neighborhood constraints, economic requirements and an accelerated schedule could all be satisfied. ★

Alan H. Simon, P.E. is vice president of Hybrid Parking Solutions, Inc., Watertown, MA.

DESIGN/BUILDER

Hybrid Parking Solutions, Inc.,
Watertown, MA

ENGINEERING SOFTWARE

RISA-3D

OWNER/DEVELOPER

Starwood Wasserman, Providence, RI

STEEL FABRICATOR

Megquier & Jones, Inc.,
South Portland, ME (AISC member)

COATINGS

Tnemec Company, Inc.
Wilmington, MA