



# Parking *with* Class

Parking structures at Yale University (see photos this page) and Bentley College have successfully demonstrated the economic and timesaving benefits of Hybrid Parking Solutions' steel frame/precast concrete deck approach to structured parking.



Alan H. Simon, P.E.

Recently completed parking structures at Bentley College and at Yale University have once again proven the benefits of the proprietary steel frame/precast deck parking solution pioneered by Hybrid Parking Solutions™. The advantages of the Hybrid System that appealed to these universities and that ultimately led to the selection of Hybrid for these projects included:

- lower capital costs
- lower operating and maintenance costs
- rapid implementation
- exceptional durability
- natural security with an open design

## **PARKING AT BENTLEY COLLEGE**

Bentley College in Waltham, MA had expanded its campus considerably over the past

10 years, including the addition of new dormitories and a new student center to enhance the residential character of its campus. Existing surface parking was at capacity, and the need for additional buildings on campus forced the college to explore alternative parking options, such as remote surface parking lots with or without shuttle service, as well as structured parking.

Remote surface parking proved to be the least-cost option, but campus planners decided to pursue structured parking on the main campus with Hybrid to minimize the inconvenience to users and to reduce the impact on open space on campus. Hybrid's steel/precast solution, for Bentley's required 530 spaces, was the most cost effective structured parking system.

*Top right:* The facade of the parking structure at Bentley College was detailed to blend with the classic colonial architecture of the campus.

*Middle right:* A close-up view of a galvanized seat, used to attach the precast facade panels to the galvanized steel framing.

*Bottom right:* Interior column. Note the precast concrete tees rest on galvanized steel girders, which are bolted to a twin-column assembly.



Parking had to be built quickly during the summer “slow down” since the structures were being constructed over existing surface lots. Prime Steel erected the entire parking structure, including precast concrete façade spandrels, in one week. Masonry piers and mechanical systems were installed after erection allowing for the parking structure to open concurrently with the renovated dormitory for first-year student orientation on campus.

The structure required approximately 400 tons of hot-dipped galvanized steel, and included a 25-year warranty provided by Duncan Galvanizing. The successful track record of the Hybrid system, including several parking structures in the Northeast, gave the owner the confidence that its choice of a steel and precast structure would be essentially maintenance-free with minimal ongoing operations costs.

Openness of the steel structure enabled clear lines of sight through the parking facility, meeting Bentley’s requirement for natural security. Hybrid was also able to meet Bentley’s aesthetic requirements – that the structure blended architecturally with a brick and limestone New England style campus setting.

## **PARKING AT YALE**

In New Haven, CT, local developer/design-builder Clifford Winkel of CDS, LLC, owned a piece of land ideally situated to allow for the expansion of Yale University’s School of Medicine. The School of Medicine Campus



Access to the second level of parking at Bentley College is provided by galvanized steel staircases.

would have exceeded its existing parking capacity with the opening of its new research building in May 2002. Winkel proposed developing a research/office building and 1,000-car parking structure, which would meet the University's increasing parking needs.

Although other solutions for the parking structure were investigated during preliminary design, the Hybrid approach was most cost-effective, both in terms of capital costs and life-cycle costs. Site logistics were key to the erection plan due to the urban location, and prefabrication increased constructibility in winter months as compared to cast-in-place options.

Duncan Galvanizing provided a 25-year, rust-free warranty on the structural steel. The interior columns were too large for the galvanizer's tanks

and, as such, were coated with a three-coat Tnemec coating system. In spite of some initial concerns regarding the reputation of steel-framed parking structures in New Haven's moist climate, the client was convinced by a visit to a Hybrid parking structure in Boston, which was galvanized and coated by Duncan Galvanizing over 20 years ago and remains in pristine condition.

Security and aesthetics were again a primary concern to the developer. The Hybrid design did not require shear walls or cross bracing for the six-story structure, enhancing the open feel of the façade and alleviating security concerns. Herbert S. Newman and Partners P.C. was retained as the architect with aesthetic control over the parking structure's façade and to design the adjoining building. Hybrid worked with

this firm to meet Yale's stringent design standards overseen by a panel of prominent architects.

Overall, these two projects are indicative of how the parking needs for institutional clients can be solved. The steel frame/precast concrete deck structural system pioneered by Hybrid Parking Solutions has unique advantages for the structure's owners, including low initial and ongoing maintenance costs, rapid implementation, and durability, while providing a high level of safety and security to the structure's users.

*Alan Simon, P.E., is Principal for Hybrid Parking Solutions, Inc. in Watertown, MA.*

**BENTLEY COLLEGE,  
WALTHAM, MA**

**Engineer/Architect:** Hybrid Parking Solutions, Inc., Watertown, MA

**Galvanizer:** Duncan Galvanizing, Everett, MA

**Software:** AutoCAD, RISA 3D

**YALE UNIVERSITY, SCHOOL  
OF MEDICINE, NEW HAVEN, CT**

**Construction Manager/Parking**

**Engineer:** Hybrid Parking Solutions, Inc., Watertown, MA

**Architect:** Herbert S. Newman and Partners P.C., New Haven, CT

**Steel Fabricator & Detailer:**

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

**Steel Erector:** Berlin Steel, Berlin, CT (AISC member)

**Galvanizer:** Duncan Galvanizing, Everett, MA

**Software:** AutoCAD, RISA 3D



The Yale University School of Medicine parking structure under construction. Note the use of Hybrid Parking Solutions' prefabricated double-column sections to support precast concrete tees.