



A Chapter of the  
Precast/Prestressed Concrete Institute



## Project Profile

# The Mason Street Parking Deck

The Mason Street Parking Deck is a new 307,000 sf freestanding, five-level parking structure that is the direct result of a Virginia university addressing campus growth and new development in a proactive effort. The university's acquisition of a former hospital campus expanded the northern edge of campus, and a private hotelier/university partnership working to create an on-campus hotel and conference center were the drivers generating demand for structured parking of approximately 1,000 vehicles. An additional requirement was to extend the architectural character of the traditional "bluestone" campus to the new northern edge of campus, reinforcing the university's branding.

A design-build project delivery was employed by the owner, and the contractor's team of designers, precaster, and builder was chosen. The intent of the design-build path was to achieve maximum economy and to meet an unforgiving schedule tied to the academic calendar.

## AT-A-GLANCE

**Location:** Harrisonburg, VA

**Owner:** James Madison University

**Architect:** Glavé & Holmes Architecture

**Engineer of Record:** Walker Parking Consultants

**Contractor:** Donley's, LLC

**Precast Specialty Engineer:** PTAC Consulting Engineers, Inc.

**Precaster:** Metromont Corporation

**PCI Certified Erector:** DLM Contractors, LLC

**Specialty Architectural Precaster:** Seaboard Concrete

**Square Footage:** 307,000 SF

**Freestanding, 5-level parking structure**



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The building site has a 16 foot slope from Mason Street down to the hotel site, allowing vehicular entry/exit from two levels, increasing the parking flow/efficiency.

The campus circulation and hotel guest access require two elevator towers at opposite ends of the deck. Circulation towers at each corner are opportunities to express the campus aesthetic of bluestone veneer and pitched red tile roofs. The arched form at the top spandrel level was another nod to the historic campus, and represented a challenge to the casting, setting, and transport capabilities of the team. At project completion, the facility was delivered within the university's budget, ahead of schedule, and provides a handsome gateway to northern campus.

#### KEY DESIGN CHALLENGES:

**Challenge:** Provide cost-efficient structure.

**Solution:** By employing an all-precast construction, the team could maximize the efficiency of mass-production and just-in-time delivery to provide the lowest cost parking structure.

**Challenge:** Project Schedule with non-negotiable completion date.

**Solution:** BIM design and manufacturing of precast components allowed early fabrication start prior to permitting. Also, since superstructure was erected during winter season, the all-weather installation of precast required no schedule extension due to winter precipitation or freezing temperatures.

**Challenge:** Project Design includes arched spandrel openings and classically designed entry portals.

**Solution:** By re-use of formwork in factory-controlled conditions, precaster could produce unique design elements of consistent quality

#### FINISHES:

57,500 sf of Architectural Mix with sandblast finish and 6,500 sf of formliner





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The all-precast solution was immediately attractive to the design-build team due to the rigid aesthetic, cost, and schedule requirements of the owner.

The university wanted the project to transcend the typical parking deck aesthetic by incorporating design motifs and materials prevalent in the simplified-classical design of their historic bluestone campus. The continuity of design elements was necessary to maintain clear association with campus identification and branding in this “gateway” structure. Precast exterior cladding elements (wall panels and spandrels) could produce consistency of design intent through a factory-controlled process at an affordable cost. Decorative precast entries could have a crisp consistency of color and texture.

Economy was a key driver for the university – the design-build procurement process was cost competitive. The all-precast solution consolidated structural frame, vertical circulation elements, functional floor, and exterior cladding into a single system with proven economic benefits. The precaster was engaged early in the design process, and the BIM engineering platform allowed the design-build team to maximize economy in early design decisions; indeed prior to submission of the bid to the owner.

Closely related to cost concerns was the schedule, which was driven by the requirement to deliver 1,000 new parking spaces by the start of the academic year. The all-precast solution facilitated the team’s exceeding of the owner’s schedule objectives by several means. Beginning

with the “head start” allowed by BIM engineering coupled with the off-site pre-production, panels were ready to set when the site became available. The just-in-time delivery system minimized storage and congestion on the tight site. The all-weather erection process did not require accommodations for freezing temperatures, normal precipitation, work stoppage for “curing time,” or excessive wind bracing/shoring. Decorative precast entry elements could be attached to the precast structure outside of the critical path activity; as could the bluestone veneer accent panels. The project was turned over to the owner for use, approximately two weeks before the owner’s scheduled occupancy.

## PROJECT DETAILS

**Overall: 764 pieces and 6,707 cys**

**Beams: 22”x36” w/ corbels to support DTs**

**Double Tees: Nominally 30” Deep x 12’ Wide x 52’ Long**

**Spandrels: 8-10” Thick with various dimension to meet architectural intent.**

**Columns: 24” Square x 24’ to 52’ Long w/ corbels**

**Wall Panels: 8-14” Thick with various dimensions to meet architectural intent and to retain soil**

**Metrowalls: Nominally 12’ wide x 48’**

**Shearwalls: 12’-13’ Wide x 53’ long**

**Stairs: Typically 5’ wide**



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METROMONT CORPORATION



## How precast concrete was used to meet the high performance goals on this project:

**Aesthetic Versatility** – Designer's expression of three levels of hierarchy was achieved by varying the exterior precast color and finish/texture.

**Structural Versatility** – The precast spandrel panels forming the exterior "skin" are also a load-bearing component of the structural precast floors, beams, and columns working together, which eliminates another system/subcontractor for cladding.

**Open Floor Plate** – The versatility of the precast double-tee system allowed the same depth of structure and appearance for units of differing spans. This maintained openness of floorplate for visibility and natural ventilation.

**Accelerated Construction** – The precaster started double-tee production prior to finalization of exterior design, site prep, and permitting. All-weather erection and just-in-time delivery facilitated the fast-track construction.

**Improved Storm Resistance** – Precast elements form a complete structural system as erection proceeds, minimizing the need for temporary bracing against windstorm. The monolithic exterior panels don't require the veneer drainage of cavity wall systems, minimizing storm effects on the completed building.

**Improved Safety and Security** – The large spandrel openings allow optimum visibility into the deck, a primary component of occupant security. The inherent fire-resistive characteristics (2-hour rated) of the precast structure promotes occupant egress to safety, and structure survival in a fire event.

**Cost-Benefit** – The precast advantages of cost (re-use of formwork, quality of plant-controlled process, and economical color and finish options) coupled with the construction advantages (pre-production, BIM engineering, just-in-time delivery, minimal erection bracing, and all-weather installation) combined to provide the optimum parking structure solution for the project.

