

LIGHT FOR

This summer, the Ann Arbor (Mich.) Downtown Development Authority (DDA) and the City of Ann Arbor held a party to celebrate the grand opening of the new 711-space underground Library Lane parking structure. A disc jockey spun car-related tunes, a variety of vintage cars were on display, and the public was invited to donate items for a time capsule.

Why all the festivities? Because this is one underground garage unlike any other. It's naturally bright and light and inviting inside, and puts innovative green features to work even below grade. Four short years ago, it was just a concept waiting to take shape.

After having success with transportation programs such as free bus passes for downtown employees and squeezing as much efficiency as they could from the public parking system, the DDA was challenged to find a way to meet growing demand for downtown parking. More than 2.7 million square feet of private development had been constructed since the last public parking structure was built in the early 1980s, and the DDA's six structures regularly filled to capacity with patrons. It was clearly time to build a new public parking structure.

More Parking Needed

In early 2008, the DDA and Ann Arbor City Council determined that the city's South Fifth Avenue parking lot, known to locals as the "Library Lot," was a strategic site to add additional parking. It is located midway between the bustling Main Street and University of Michigan Central Campus areas, and immediately adjacent to the downtown library, which draws more than 600,000 people through its doors every year.

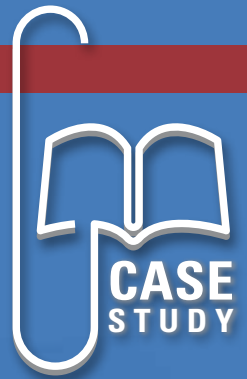
In an unusual move, it was decided that the new structure should be constructed



ALL

An underground parking garage incorporates lots of natural light and environmentally-friendly features to shine.

By Susan Pollay



underground to enable the ground level for future private development that would add jobs and residents to the downtown. The decision was also made to make a number of utility upgrades as part of this project, to further encourage development on this and other nearby surface parking lots.

The primary goals for this ambitious project were to:

- Maximize below grade parking.
- Build a new east-west roadway to create a more pedestrian-friendly block.
- Create a welcoming parking environment that avoided the stereotypical dark and dank below grade parking experience.
- Design for flexibility, including the future construction of a multistory building, the addition of a public plaza, and the ability to connect below ground to adjacent properties including the downtown library.

The DDA selected the design team of Carl Walker, Inc, Luckenbach/Ziegelman Architects, and construction manager The Christman Company (TCC), to meet these goals.



Underneath this deck is a four-story garage that incorporates natural light all the way to the bottom and numerous green features.



The Library Lane garage was constructed four stories underground using more than 5,500 cubic yards of poured concrete.

The structure's 711 underground parking spaces are complemented by an additional 52 parking spaces on the surface parking lot and along the new roadway, which was named Library Lane. The three-bay parking structure includes two side-by-side flat parking bays and a single ramped bay for vertical circulation. The wide parking modules and generous end bays allow comfortable vehicle circulation throughout the facility.

Primary parking access is located off of Library Lane. To provide fast in-and-out options, an express entry lane is located directly off of Fifth Avenue, and an express exit lane accesses Division Street to the east.

To maximize parking space, the parking garage was constructed four levels below grade and extended beneath Fifth Avenue, which is a primary downtown

roadway. The underground parking structure was built in an urban location, with complexities that included a tight site with adjacent buildings, granular soils, and construction below the water table. Those challenges were met through several systems:

- A temporary earth retention system was required to retain the soil loads, resist adjacent building surcharge loading, and reduce dewatering volume requirements.
- A mat foundation system was designed to support a 20-story building, and was more than 10 feet thick in some locations as a result. To complete the installation of the foundation system, de-watering to a depth of up to 15 feet below the static groundwater elevation was required.
- To accommodate the project schedule, TCC completed one of the largest continuous urban concrete pours in Michigan, placing more than 5,500 cubic yards of concrete during two days in February.

An Inviting Design

Traditional underground parking structures can be intimidating. Enclosed stair towers and elevators, structural elements that reduce visibility, artificial lighting, and a lack of visual landmarks to guide pedestrians to their destinations can make the parking experience uncomfortable. We knew we didn't want that for our structure. Furthermore, non-traditional parking structure loads, such as a future 20-story building, roadway bridges at Fifth Avenue and Library Lane, and 60 feet of soil/building surcharge, limited design flexibility.

To promote a sense of safety and security, design features included open stairways, glass-backed elevators, structural bracing, daylighting provisions that project natural light to the lowest underground level, and a creative wayfinding system that guides users to their destinations.

One of our primary goals was to make this facility as comfortable and user-friendly as reasonably possible. To that end, design features include:

- Open stairways. Egress stairs in below-grade parking structures are usually fully enclosed to meet building code requirements. To meet design openness

objectives, fire separation curtains were used for egress stairs, while fully open non-egress stairs were created to welcome natural light all the way to the lowest floor of the parking structure.

- Glass-backed elevators. To accommodate these fire-rated glass enclosures were installed at the elevators' exterior wall.
- Structural bracing. This was used in lieu of concrete shear walls to maximize visibility.
- High ceiling heights and long-span construction. Combined with side-by-side flat parking bays, the high ceiling height and long-span construction provide a surprising sense of openness and improved visibility.
- Lighting. Bright, uniform white lighting was supplemented by natural light where possible.
- Other architectural features. These included curved stairs with interesting stainless handrail detailing and tile landing areas; creative, themed wayfinding to guide users to their destinations; tiled pedestrian walkways that are segregated from vehicular traffic to promote safety; "light canons" above the primary pedestrian walk that project natural light onto the walking path; abundant trees and landscaping at the street level; and architecturally interesting steel and glass canopies at street level vehicle and pedestrian entrances to the parking structure.

Sustainable Design Features

Sustainability influenced important construction and project features throughout the project. Christman re-used excavated sand, recycled asphalt from the demolished surface lot, and used steel rebar with high levels of recycled content. Low-VOC (volatile organic compound) materials were used, and highly durable materials such as stainless steel, high-quality concrete, and concrete waterproofing will reduce long-term repair and replacement costs. All of the stormwater that falls on the site will be detained (far in excess of requirements) and the facility has a stormwater detention tank on the lowest level to control discharge.

The structure opened with six electric vehicle car charging stations in preferred parking locations. Additional conduit runs throughout the deck so it



will be easy to add more units according to future demand. The structure was named a Green Parking Demonstrator Site as a result.

One day, a new development will be built on top of the Library Lane structure. But even now, we have a lengthy list of downtown employees and residents who want monthly parking permits for the new structure. The adjacent downtown library is exploring the construction of a new building that might include features such as large meeting spaces and a small auditorium, which can now be supported by hundreds of new parking spaces. The Library Lane parking structure is already helping the DDA meet its mission of strengthening the downtown area and sparking new private investment.



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