



An attractive new transit station in Chicago provides enhanced access to the city's McCormick Place convention center and surrounding areas.

# TUBULAR Solution

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**CHICAGO'S NEWEST "L" STATION** kills two birds with one stone.

The new \$50 million Chicago Transit Authority (CTA) Cermak-McCormick Place Elevated Green Line Station fills what was a two-mile gap in service on the train line and now provides much-needed access to rapid transit for neighborhood residents and businesses. It also brings an L station a few blocks closer to McCormick Place, the largest convention center in North America, than the previous closest station in nearby Chinatown. (A former station in the same location as the new one opened in 1892 but ceased operations in 1977.) And CTA rail service was maintained during construction of the new station, which was built around live tracks.

The station is comprised of three entrances at street level and two elevators and two stairwells that access a center boarding platform located along the abandoned center track. The station buildings, stairs and elevator towers were built using exposed galvanized steel with glass, polycarbonate and perforated stainless steel cladding to maximize visibility and natural light in the interior spaces.

When it came to design, the largest complication was the tight site constraints. Because the property lines run very close to the elevated structure south of Cermak Road, a center platform design—with both north- and southbound trains sharing a common boarding area—became necessary. Track realignment was not an option, so the existing conditions would only allow for a platform width of approximately 15 ft, much less than CTA's pre-



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◀ The new Cermak station revives the original, which opened in 1892 but closed in 1977.

▲ ▼ The new station's weather-protecting tube stretches over Cermak Road, where the CTA right-of-way is both widest and most visible to the public.



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ferred center platform width of 26 ft. The challenge was to maximize the usable space of the narrow platform to serve a community with anticipated population growth and transit use. The design had to keep the platform as free from obstructions as possible. Ultimately, this translated to canopy columns, the boarding area wind break and signage—all of which traditionally occupy platform space—being pushed to the outside to allow for an obstruction-free platform.

The result is an iconic weather-protecting tube covering the platform, providing

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FH Paschen

- ▲ The tube structure consists of a series of steel ribs, spaced 8 ft apart on center and laced together with diagonal and horizontal bracing; the ribs and bracing are constructed from round HSS.
- ▼ The tube arches were shipped in pairs of two half-arches, with a field splice located at the top of each arch. Up to six arches were assembled at a time on the ground, then lifted into place.



Anna Dukes

an attractive yet functional experience for riders and passersby. The enclosed tube stretches over Cermak Road, where CTA right-of-way is both widest and most visible to the public. Due to the age of the existing elevated track structure, CTA wanted to avoid placing any additional loads on the steel track stringers and steel cross bents. Therefore, a completely separate structural support system, including foundations, was designed for the tube structure.

The tube consists of a series of steel ribs, spaced 8 ft apart on center and laced together with diagonal and horizontal bracing; the ribs and bracing are constructed from round HSS. The tube structure sits on an elevated concrete girder system supported by columns and cross beams, and the outer skin of the tube is a series of 4-ft x 8-ft perforated stainless steel panels in a staggered formation to control exposure to wind and light. The panels were arranged as louvers to allow air flow in and out, and thorough research determined the best perforation patterns that would be closed enough to keep the wind, rain and snow out while permitting natural ventilation and visual transparency. To develop the panel connection to the round HSS, the team developed a stainless steel clip that could be bolted to the structural members and support the panels under wind and snow loads, as well as accommodate thermal movements.

Since heavy lifting was restricted to a limited number of weekend shutdowns, the tube was initially built on the ground in six preassembled sections, then lifted into place and bolted to the elevated concrete girder system running parallel to the tracks.

The general contractor was able to lease land from an adjacent empty lot to use as a lay-down and assembly area for the tube structure. The tube arches were shipped in pairs of two half-arches, with a field splice located at the top of each arch. The heaviest section weighed 33 tons. A 350-ton crane was required to place the sections, and an elaborate rigging system was used to lift the tube sections up at multiple points so that they could be picked up evenly and set down on anchor bolts already cast into the concrete girder.

In keeping with the open platform layout, lighting, cables and signage were suspended from the HSS structure. Light fixtures and



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▲ ▼ The station provides easier access between Chicago's massive McCormick Place convention center and the city's central business district (known as the Loop) and beyond.



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Ross Barney Architects

cables were enclosed in two steel trays clad with stainless steel. Signage, including digital message displays and advertising screens, was supported by steel cross beams, and stainless steel cables were used to support the entire cable tray and sign system.

Beyond the boarding areas, a steel canopy cantilevering approximately 13 ft was implemented. The canopy columns were placed on one side of the platform and followed the shape of the CTA rapid transit train clearance envelope to maximize the clearance on the platform. The unique shape was fabricated out of steel plate welded together at intermittent locations.

Using 550 tons of structural steel, the station accommodates an average of nearly 1,100 passengers a day, filling a gap on the Green Line, providing more convenient access to Chicago's massive convention center and adding a modern icon to the city's already iconic train system. ■

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