

Expanding a Parking Structure's Area

Q Can you increase the area of a free-standing parking structure based upon the allowable area table 406.3 in the 2003 and 2006 *International Building Code*?

A. Yes, a free-standing parking structure's area can be increased, based on section 406.3 of the *International Building Code* (IBC).

Parking structures with sides open on three-fourths of the building's perimeter are permitted to be increased by 25% in area and one tier in height. Structures with sides open around the entire building perimeter can be increased 50% in area and one tier in height.

In each case, IBC defines openness in a different and specific way. For a side to be considered open in these cases, the total area of openings along a perimeter side shall not be less than 50% of the interior area of the side at each tier. Such openings also have to be equally distributed along the length of the tier.

For structures that are not built to the maximum number of tiers, the allowable area per level can be increased, but it cannot exceed the total allowed if constructed to the maximum number of tiers.

In this case, openness is defined as having at least three sides of each larger tier having continuous horizontal openings that are not less than 30 in. in clear height extending for at least 80% of the length of the sides. No part of such a larger tier can be more than 200 ft horizontally from such an opening.

Structures in Type IB and II for 2003 IBC or Type II for 2006 IBC, with all sides open, are unlimited in allowable area where the height does not exceed 75 ft. In this case, for a side to be considered open, the total area of openings along the side cannot be less than 50% of the interior area of the side at each tier. Such openings have to be equally distributed along the length of the tier. All portions of the tiers also have to be within 200 ft horizontally from such openings.

As an example, if the floor is 10 ft 6 in., but the underside of the double-tee to the top of the floor below is 8 ft, the exterior opening needs to be 4 ft. That would limit the spandrel height to 6 ft 6 in.

Using the code handrail height of 3 ft 6 in., and adding 2 in. of camber, a 2 ft 6 in. double-tee would require a dap 4 in. to 11 in., depending on the ledge's height and if washers or curbs were used.

As can be seen, as the openings get bigger, the allowable spandrel height increases.

More Information

This column answers frequently asked questions about designing, casting, and erecting precast concrete components. This issue's response was provided by Harry Gleich, chair of PCI's Parking Structures Committee. If you have a question about precast concrete components, please send it to managing editor Craig Shutt at craigshutt@ameritech.net.



Photo: Nathan Cox Photography.

Parking structures with sides open on three-fourths of the building's perimeter can be increased in area by 25% and one tier in height. Shown: Lehigh University Alumni Memorial Building Parking Pavilion, a 2007 PCI Design Award winner.