

## Tilt-up Concrete Construction for Office Buildings

Tilt up concrete construction uses the building slab as a casting bed for the formation of the load bearing wall panels that are cast in place on site, and then tilted by crane into final position. The system was invented in the 1890s, but use declined markedly after World War II.

The boom in big-box retail in the 1990s then produced a resurgence. Tilt-up was well suited to large buildings, with few windows, doors or other architectural features, located on open suburban lots. Lower cost and shorter construction times were also desirable features.

After 2001, some new buildings were required to resist blasts by terrorists' explosions, and tilt-up construction was explored for office buildings that required more varied and complicated facades. The new engineering of tilt-up structures for both blast resistance and engineered progressive collapse did take time and effort to settle. Office structures have now been constructed to the US Department of Defense (DOD) and Unified Facility Criteria (UFC) standards, so costs can be analyzed. It was found that the addition of the blast resistant features added approximately \$20 per square foot to construction cost of tilt-up construction, but tilt up still maintained its same cost advantage over other competing structural systems such as structural steel frames.

Tilt-up construction is now a possibility that can be considered for building types other than big-box retail and warehouse. The maximum benefit can only be achieved if the site is sufficiently large to permit efficient crane access, and the building width is larger than the building height. But since the casting bed is the first floor, tilt-up might be found economically or practically unfeasible for buildings such as medical office or laboratories that have numerous through-floor electrical and plumbing penetrations.

*Construction Specifier August 2011*

© JF McCarthy 2011