

TOPOLOGICAL TILT WALL



PROBLEM

Tilt-wall construction consists of panels that are cast horizontally on the buildings floor slab to efficiently tilt the panel to its final position. Due to its efficient methodology, tilt-wall is most commonly used for 2 to 4 story industrial and commercial buildings. In Texas, tilt-up accounts for as much as 75% of new one-story commercial building construction. The TCA reports that 15% of all industrial buildings in the U.S. were created using tilt-wall construction. **Tilt-wall is limited to these applications because of its extreme limitations within its methodology.** Deviation from standard construction would need to leverage technology, which will expand the spatial depth of a panel resulting in a topological break away from conventional application.

QUESTION

Is it possible to produce a tilt-wall panel with spatial depth using sustainable methodology while maintaining the economic and volumetric benefits of traditional tilt-wall construction?

- How can exploration of alternate formwork play a role in developing a new strategy for tilt-wall?
- What opportunities arise if CAD/CAM technologies are implemented as the origin of the construction methodology?
- What magnitude of change would be necessary to introduce new categorical applications?
- To what extent is the opportunity for exploration an issue of macro (full panel) or micro (surface articulation)?
- Would higher performance outcomes help to break away from the current categorical application?

HYPOTHESIS

A panel with spatial depth can be constructed by utilizing sand as formwork to manipulate the geometry and create a re-usable formwork..

COMPARISONS

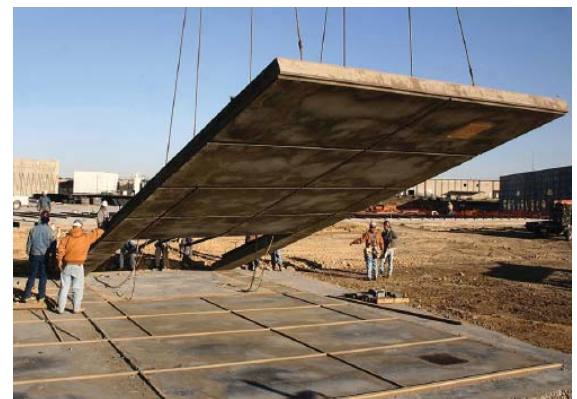
Concrete construction consists of cast-in place, pre-cast, and tilt-wall, all of which have their own strengths and weaknesses. Tilt-wall construction is both economical and widely in use, but it is limited in its type of application. Tilt-Wall provides opportunities in its abilities but must expand from its limitations to release its potential.

INDUSTRY STANDARDS

In tilt-up construction, wall panels are cast directly on the floor slab before being lifted into final position.

Essentially, site-cast tilt-up ensures schedule commitments by eliminating shipping restrictions and manufacturing limitations.

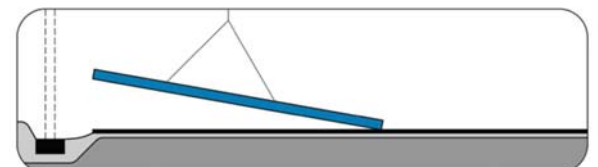
With attributes of value, flexibility, speed and durability, tilt-up construction helps owners meet ever-increasing demands for new facilities.



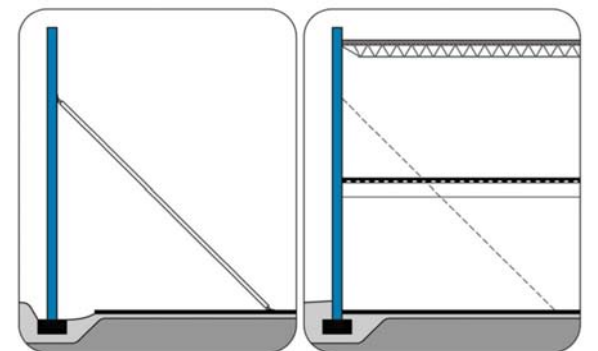
Panel is horizontally casted with wood formwork on floor slab



Crew coordinates with crane to tilt up panel into position



Panel is braced to the slab and connected to adjacent panels



The roof and floor is connected to the walls and bracing is removed

