Continuing Education Course #458
Cast, Lift, and Release: Tilt-Up Concrete Walls
Part 1: Construction

1. (Blanks imply choosing the best answer.) Tilt-up walls are constructed by pouring a series of reinforced concrete panels on the ____ whose sides are formed with ____.
- a. slope, tin
- b. bare dirt, scaffolding
- c. ground, wood

2. Wall panels are often the _____ elements that form the building's perimeter.
- a. cold-weather insulation
- b. load-bearing
- c. solar-collecting

3. Reinforced concrete has 1) the concrete _____ strength to resist axial loads and to provide stiffness, and 2) the strength and ductility of steel reinforcing in _____ to resist bending moments and cracking.
- a. tensile, compression
- b. compressive, tension

4. Tilt-up walls must adhere to the limitations set forth in ____ of ACI 318 (2014 versions and later).
- a. 11.8
- b. 14.8
- c. 7.2

5. One of the main references for tilt-up concrete design is "Design Guide for Tilt-Up Concrete Panels (_____),"
- a. ACI 350.1
- b. ACI 551.2
- c. ACI 221

6. Some of these advantages of tilt-up wall panels are:
- a. only wood and nails are required, panels can be carried by hand
- b. elimination of vertical formwork compared to cast-in-place walls, fast construction time
- c. tall scaffolding required, minimal ground space required to cast panels

7. The construction of the panels for a 100,000 sf one-story building can take place in ___ days or less
- a. 2
- b. 3
- c. 30

8. For buildings using tilt-up panels, these are often _____.
- a. Gleaming, 40-story residential towers
- b. one-story warehouses or one- to two-story office buildings

○ c. parking ramps with continuous openings between floors and a proliferation of spandrel panels that hang from columns

9. Tilt-up concrete involves the use of a crane, which needs _____ space to maneuver
○ a. minimal
○ b. considerable

10. For seismic force resisting systems in building, the code puts limits on the ¬¬¬¬¬¬¬¬¬¬¬_____ of precast shear wall systems, which applies to tilt-up concrete shear walls that fit under the broader definition of precast.
○ a. height
○ b. weight
○ c. length

11. A _____ season may inhibit plans to pour panels, causing costs or delays.
○ a. mild
○ b. sunny
○ c. rainy

12. Challenges arise if a building has interior or exterior _____ that need to be constructed.
○ a. trellises
○ b. pools
○ c. curbs

13. If wall area exceeds ____ of the slab area available, the more likely casting beds will be required, or that stacking panels on site will be necessary. (Choose the best answer):
○ a. 20%
○ b. 50%
○ c. 80%

14. Wall panel thickness typically varies from ____ to ____ inches:
○ a. 5.5 to 10
○ b. 1.5 to 3
○ c. 12 to 16

15. When using a non-composite sandwich panel with insulation and an outside fascia layer, other than self-weight of the fascia, all loads should be resisted by the _____.
○ a. fascia
○ b. structrual wythe

16. Panel finishes include _____ panel surfaces.
○ a. smooth or rough
○ b. only smooth
○ c. only rough

17. Panels are always placed _____ so they can be leveled.
○ a. totally flat against the foundations, forming a perfect fit
○ b. on shims

18. Embed plates use _____ or _____to help transfer load into the concrete wall.
○ a. glue, wooden dowels
○ b. welded headed studs, welded rebar

19. Air holes 3/4" in diameter should be used to allow air to exit from under the plate during _____.

○ a. snow storms
○ b. strong wind events
○ c. consolidation of the concrete with a vibrator

20. _____ is added to increase strength and stability at wall panel opening jambs.
○ a. Reinforcing
○ b. Leave-in -place wood formwork

21. If the axial load at the jamb is sufficiently large, _____are required.
○ a. panel air voids
○ b. ties

22. If the building slab isn't used to pour panels on, temporary slabs known as _____ slabs may be used.
○ a. two-way
○ b. casting
○ c. continuously reinforced

23. General panel construction sequenced: 1) ____, 2) _____, 3) _____.
○ a. 1) Casting slabs, 2) Panel formwork and pouring, 3) erecting and bracing panels.
○ b. 1) Erecting panels, 2) Casting slabs, 3) Panel formwork.

24. When building slabs are used to pour panels and drive cranes on, be aware of the possibility of _____, no matter the amount of planning.
○ a. slab damage
○ b. bumpy slabs

25. With dropped footings, a(n) _____, may be required for the outer ring of slab.
○ a. inflatable mattress
○ b. pour strip

26. To allow the formwork to pull away from the wall panels and to ensure the panels will easily lift off of the slab, _____ are used.
○ a. form release agents
○ b. glues

27. The lifting cables of the crane are attached to cast-in inserts that are normally in the upward facing face of the panel, called a _____.
○ a. facial
○ b. face lift
○ c. Botox treatment

28. Once panels are stood up straight, _____can be attached.
○ a. cameras
○ b. braces

29. The fewer the number of panels, the _____ the erection time.
○ a. greater
○ b. lesser

30. Practical limits for panel weights are in the range of _____.
○ a. 80,000#
○ b. 5,000#
○ c. 300,000#