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Continuing Education Course #393  
Concrete Slabs-on-Grade  
From the Ground Up

1. Which of the resources below are useful for designing slabs-on-grade (more than one answer possible)?
  - a. ACI (Airports Council International) – Centerlines Magazine
  - b. ACI (American Concrete Institute) 302.1 – Guide for Concrete Floor and Slab Construction
  - c. ACI (American Concrete Institute) 360 – Design of Slabs-On-Ground
  - d. b and c
  - e. a, b and c
2. True or false? Slabs-on-grade, otherwise known as slabs-on ground, are directly supported by the soil below.
  - a. True
  - b. False
3. The stiffness of the ground below the slab-on-grade impacts which aspect of the slab (more than one answer possible)?
  - a. Ability of the slab to distribute load to the soil more effectively
  - b. Downward movement and bending of the slab under loading
  - c. Moisture content of the concrete
  - d. a and b
  - e. a, b and c
4. Which is the better subgrade soil to build a slab on grade on?
  - a. Saturated mud
  - b. Clay that expands when soil becomes wetter, and shrinks when it dries
  - c. Well-drained sand with a gravel base
5. The structural engineer of record should be aware of the following when reviewing the site conditions for the slab-on-grade pour (more than one answer possible):
  - a. Compaction requirements of subgrade and subbase
  - b. Soil stiffness values
  - c. Recommendations for soil preparation by the geotechnical engineer, and whether the soil was prepared as recommended
  - d. All of the above
6. The compaction of the soil may be performed using what kind of equipment?
  - a. Roto tiller
  - b. Sheepsfoot roller
  - c. Excavator with a clamshell bucket
7. What acts as a barrier to moisture penetrating from the soil into the slab on grade and impacting moisture-sensitive flooring?

- a. Organic material in the soil
  - b. Concrete itself is impenetrable to moisture hence no protection is necessary
  - c. Vapor barrier
8. To prevent unwanted cracking in slabs-on-grade, what methods are commonly used to induce joints in concrete slabs (more than one answer possible)?
- a. Allowing cracks happen on their own in random locations and directions
  - b. Sawcutting
  - c. Tooling
  - d. b and c
  - e. a, b and c
9. Leveling the surface of wet concrete after pouring is called:
- a. Screeding
  - b. Polishing
  - c. Curing
10. For normal mixes, concrete volume \_\_\_\_\_ over the first 28 days after pour.
- a. Expands
  - b. Shrinks
  - c. Does not change
11. Cracks in concrete are commonly caused by \_\_\_\_\_
- a. Tension resulting from restrained shrinkage
  - b. Small compressive forces in the concrete
12. True or False? Concrete is a very pliable substance, and bends easily without cracking
- a. True
  - b. False
13. What activates, or hydrates, the cement in a concrete mix?
- a. Sand particles
  - b. Aggregates
  - c. Water
14. Consolidating or vibrating wet concrete can help prevent what kind of problem?
- a. Honeycombing
  - b. Freezing of concrete
  - c. Carbonation of concrete surface due to carbon dioxide from heaters
15. Where a smoother concrete finish is required after striking the concrete level, what type of equipment is used?
- a. Vibrator
  - b. Sheepsfoot roller
  - c. Power trowel
16. Typical concrete shrinks by what amount with respect to volume?
- a. 10 to 15%
  - b. 2 to 3%
  - c. 0.5 to 0.7%
  - d. 0.04 to 0.08%
17. What type of shrinkage occurs after curing?

- a. Plastic shrinkage
  - b. Autogenous shrinkage
  - c. Drying shrinkage
18. True or false? The sawcut for a control joint needs to extend through the entire depth of slab
- a. True
  - b. False
19. Dividing a slab up into separate pours on different days due to the large size of a slab area is achieved by the use of \_\_\_\_\_ joints.
- a. Control
  - b. Construction
  - c. Dominant
20. In the absence of effects from temperature, rain, or the sun, most slabs on grade tend to shrink first on the \_\_\_\_.
- a. Top of the slab
  - b. Bottom of the slab
21. Which of these tend to increase the shrinkage of concrete slabs (more than one answer possible)?
- a. High cement content
  - b. High water content
  - c. Using aggregate that is very stiff such as quartz
  - d. a and b
  - e. a, b and c
22. One method of providing a means of transferring vertical load across a construction joint is:
- a. Square plate dowel
  - b. Oil applied to the face of the concrete
  - c. Vapor barrier
23. It is better to have a \_\_\_\_ range of sizes of stone aggregates in slabs, such as \_\_\_\_.
- a. wide, a good blend from pea size through 1-1/2" aggregate
  - b. narrow, 3/4" clear stone only.
24. Which one of the following is critical to the installation of large ceramic tile?
- a. Steel reinforcing
  - b. Floor flatness and levelness
  - c. Entrained air
25. True or false? In typical commercial buildings, it is absolutely necessary for slabs-on-grade to rely on steel reinforcing (rebar) to handle everyday loading such as light duty shelving and small equipment.
- a. True
  - b. False

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