



## GEOTECHNICAL AND FOUNDATION ENGINEERING

1. The foundation depth represents:

- a. the level difference between the lower and the upper part of the foundation
- b. the level difference between the lower part of the foundation and the natural or arranged ground surface, depending on the situation
- c. both options are correct

2. The frost depth influences the minimum foundation depth by the following correlation:

- a.  $D_{f,\min} = h_i + 10 \dots 20 \text{cm}$
- b.  $D_{f,\min} = h_i - 10 \dots 20 \text{cm}$
- c.  $D_{f,\min} = h_i$

3. The frost depth represents:

- a. the maximum depth of the location for the  $0^\circ\text{C}$  isotherm, on the site of interest
- b. the average depth of the location for the  $0^\circ\text{C}$  isotherm, on the site of interest
- c. the minimum depth of the location for the  $0^\circ\text{C}$  isotherm, on the site of interest

4. The foundation depth for the external foundations of a new construction, closely located to existing constructions is recommended to be:

- a. at the same level
- b. at a higher level
- c. at a lower level

5. The foundation depth for a shallow foundation in a corresponding foundation soil is recommended:

- a. to be minimum 50 cm above the underground water level
- b. to maximum 50 cm under the underground water level

6. The foundation depth for a retaining wall is selected depending on:

- a. the ground level, in front of the wall
- b. the ground level of the supported soil, at the back of the wall

7. The presence of the underground water near the ground surface signifies that:

- a. the site should be avoided for that construction
- b. drainage works are required

8. The foundation solution is influenced by:

- a. the minimum foundation depth
- b. the maximum foundation depth
- c. the foundation solution is not influenced by the foundation depth

9. The bearing capacity of the foundation soil has the significance of:

- a. an action
- b. a resistance
- c. a pressure at rest

10. What is the correlation regarding the plastic pressures for two shallow foundations of identical footing area, supported by the same foundation soil, at depths  $D_{f1} > D_{f2}$  :

- a.  $p_{p1} < p_{p2}$
- b.  $p_{p1} = p_{p2}$
- c.  $p_{p1} > p_{p2}$

11. When is it possible that the bearing capacity of site 1 is larger than on site 2, regarding two foundations at the same depth and identical footing area, displayed on two sites, identified as 1 and 2, with the same soil profile:

- a.  $\phi_1 < \phi_2$
- b.  $\phi_1 = \phi_2$
- c.  $\phi_1 > \phi_2$

12. When is it possible that the bearing capacity of site 1 is larger than on site 2, regarding two foundations at the same depth and identical footing area, displayed on two sites, identified as 1 and 2, with the same soil profile:

- a.  $c_1 < c_2$
- b.  $c_1 = c_2$
- c.  $c_1 > c_2$





24. In the relation:  $p = k y$  (Winkler's hypothesis)

- a.  $k$  is a rigidity characteristic of the structure;
- b.  $k$  is a rigidity characteristic of the foundation;
- c.  $k$  is the subgrade modulus of the soil.

25. The necessary area of the footing, for a spread foundation loaded by a vertical force  $P = 500$  KN and a bending moment  $M_x = 45$  KNm on the ground of bearing capacity for the deformation limit state  $p_{pl} = 180$  KPa is of:

- a.  $(1,50 \times 2,0) \text{ m}^2$
- b.  $(1,70 \times 2,2) \text{ m}^2$
- c.  $(1,20 \times 1,8) \text{ m}^2$

26. The structural longitudinal reinforcement for foundation beams is displayed:

- a. at the inferior part of the beam cross section, on the support;
- b. at the superior part of the beam cross section, in the field;
- c. both at the superior and inferior part of the beam cross section.

27. When a deep foundation is conceived, the composing elements are:

- a. both piles and caissons
- b. either piles or caissons

28. Precast piles are driven into the ground by means of a hammer or a vibratory force generator in order to:

- a. ensure the load transfer from the superstructure to the surrounding soil layers
- b. compact soft, cohesive soil layers
- c. drain the water from the soil voids

29. Large diameter bored piles are:

- a. displacement piles
- b. compaction piles

30. The earth pressure diagrams on a retaining wall supporting a homogeneous soil profile with no overload on the ground surface may be represented by:

- a. a triangle
- b. a rectangle
- c. a trapezium