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## Examination for Use of Geogrids in Pavement Construction

### CHAPTER 1

1. Which of the following is not listed as an existing commercial geogrid product?
  - a) Welded geogrid
  - b) Reinforced geogrid
  - c) Geogrid composite
  - d) Extruded geogrid
  
2. What is the primary function of geogrids in pavement?
  - a) Stabilization
  - b) Separation
  - c) Reinforcement
  - d) Drainage
  
3. For pavements with a design base thickness of 14 inches or greater, the geogrid should be placed where?
  - a) At the bottom of the base
  - b) In the middle of the base course layer
  - c) Directly on top of the subgrade
  - d) Directly on top of the separation geotextile
  
4. Which of the following has ultimately been identified as the primary reinforcement mechanism?
  - a) Lateral restraint reinforcement
  - b) Improved bearing capacity
  - c) Vertical stress distribution
  - d) Tensioned membrane effect
  
5. What is the test method for the coefficient of direct shear in geogrids?
  - a) ASTM D 4595
  - b) GRI GG5
  - c) ASTM D 5321
  - d) Direct measure

6. What is the minimum geotextile specification requirement for trapezoid tear?
- a) 0.05 sec.
  - b) <0.43 mm
  - c) 250 psi
  - d) 80 lbs.

## CHAPTER 2

7. What method can be used to measure directly the in situ subgrade shear strength?
- a) California Bearing Ratio
  - b) Vane shear devices
  - c) Grain-size distribution
  - d) Dynamic Cone Penetrometer
8. What is the approximate shear strength of a subgrade with a cone index value of 90 mm?
- a)  $C = 1.0$  psi
  - b)  $C = 4.8$  psi
  - c)  $C = 9.5$  psi
  - d)  $C = 11.5$  psi
9. For aggregate-surfaced pavements where the subgrade CBR strength is 2.0 or less, aggregate thickness cannot be reduced?
- a) True
  - b) False
  - c) Not enough information for a specific answer
  - d) Too many variables for a specific answer
10. How much should aggregate thickness be increased for HET traffic 5,000 pass designs?
- a) 10 percent
  - b) 20 percent
  - c) 30 percent
  - d) 40 percent
11. What is the bearing capacity factor for a geotextile separator and geogrid reinforcement?
- a)  $N_c = 6.7$
  - b)  $N_c = 4.1$
  - c)  $N_c = 5.0$
  - d)  $N_c = 2.8$

12. What is the required aggregate depth for a 20,000 lb. dual wheel load where the subgrade bearing capacity ( $CN_C$ ) is equal to 7?

- a) 43 inches
- b) 35 inches
- c) 32 inches
- d) 27 inches

### CHAPTER 3

13. At which design subgrade CBR strength range should the Webster's aggregate thickness equivalency chart be used to determine the required reinforced base thickness?

- a) Less than or equal to 0.5
- b) Greater than 0.5 to less than or equal to 2.0
- c) Greater than 2.0 to less than or equal to 4.0
- d) Greater than 2.0 to less than or equal to 8.0

14. What is the pavement design index number for a class C road with traffic category VI, 10/day?

- a) 8
- b) 7
- c) 6
- d) 5

15. What is the required flexible pavement thickness for subgrade CBR strength of 5 and using the pavement design index number from question 14?

- a) 25 inches
- b) 23 inches
- c) 20 inches
- d) 19 inches

16. What is the equivalent reinforced thickness for an unreinforced aggregate thickness of 13?

- a) 9.5 inches
- b) 15.3 inches
- c) 6 inches
- d) 10 inches

### CHAPTER 4

17. Which of the following has not demonstrated success in reinforcing AC overlays?

- a) Fiberglass grids
- b) Geogrids
- c) Geosynthetic composites
- d) Geotextiles

## **CHAPTER 5**

18. Which of the following is not listed as an indirect cost benefit of using geogrid reinforcement?

- a) Improved ease of construction
- b) Decreased pre-construction engineering time
- c) Reduced aggregate haul costs
- d) Increased site mobility

## **CHAPTER 6**

19. What is the minimum geotextile overlap distance?

- a) 4 feet
- b) 2 feet
- c) 1 foot
- d) 3 feet

20. Geogrid should be placed in the middle of the aggregate layer for design aggregate thicknesses in excess of what?

- a) 14 inches
- b) 12 inches
- c) 5 inches
- d) 24 inches

21. Full design aggregate thickness should be placed in one lift for subgrade CBR strengths of what?

- a) Less than 1.0
- b) From 1.0 to 3.0
- c) From 3.0 to 5.0
- d) Greater than 5.0

## **APPENDIX A: Design Examples**

22. Which of the six examples has the highest design subgrade CBR?

- a) Example A.2.1
- b) Example A.1.1
- c) Example A.2.3
- d) Example A.2.2

23. Which is the only example to identify the design vehicle as an HET?

- a) Example A.1.1
- b) Example A.2.1
- c) Example A.1.3
- d) Example A.2.2

24. Which example has the highest estimate of potential traffic passes?

- a) Example A.2.3
- b) Example A.2.2
- c) Example A.1.3
- d) Example A.2.1

25. Which example has the thickest unreinforced design thickness?

- a) Example A.1.3
- b) Example A.2.2
- c) Example A.1.1
- d) Example A.2.1



Answer Sheet for Use of Geogrids in Pavement Construction  
 TPDH-00017

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