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Examination for Roller-Compacted Concrete

CHAPTER 1 - INTRODUCTION

1. The American Concrete Institute defines RCC as what?
 - a) “rolled concrete compaction”
 - b) “concrete compacted by a roller and that, in its hardened state, will support a roller”
 - c) “concrete compacted by roller compaction; concrete that, in its unhardened state, will support a roller while being compacted”
 - d) “a process for compacting concrete using a roller, often a vibrating roller”

2. What is the approximate cost per cubic meter for 35,000 cubic meters of RCC (1998 price level)?
 - a) Approximately \$35 per cubic meter
 - b) Approximately \$50 per cubic meter
 - c) Approximately \$65 per cubic meter
 - d) Approximately \$30 per cubic meter

3. What factor most encourages the high production rates of RCC construction?
 - a) Aggregate stockpile locations
 - b) A near continuous placement of material
 - c) Reduced administration costs
 - d) Deletion of diversion facilities

4. What factor may make RCC gravity dams more environmentally acceptable?
 - a) Smaller volume of the dam
 - b) Shorter construction period
 - c) The demand for water will be less
 - d) The borrow source will be considerably smaller

5. At what stage should a detailed thermal study be performed?
 - a) During the preconstruction engineering and design phase
 - b) During the feasibility stage
 - c) During construction
 - d) Immediately after RCC placement

CHAPTER 2 - INVESTIGATION AND SELECTION OF MATERIALS

6. What type of investigation should emphasize production and placement rates?
 - a) A materials investigation
 - b) A site investigation
 - c) An availability investigation
 - d) A feasibility investigation

7. What material is most commonly used as a pozzolan or mineral filler in RCC?
 - a) Type II Portland cement
 - b) Ground slag
 - c) Class C fly ash
 - d) Class F fly ash

8. What is the typical nominal maximum size of aggregate (NMSA) particle used in USACE RCC construction?
 - a) 100 mm (4 in.)
 - b) 200 mm (8 in.)
 - c) 75 mm (3 in.)
 - d) 50 mm (2 in.)

9. Compared to conventional concrete, admixture quantities required for RCC are typically what?
 - a) Smaller
 - b) Larger
 - c) Equivalent
 - d) Not enough information for answer

10. According to CRD-C 87 - ASTM C 494, what types of water reducing or retarding admixtures should be considered for any RCC placement?
 - a) Type B or D
 - b) Type C or D
 - c) Type B or E
 - d) Type C or E

CHAPTER 3 - MIXTURE PROPORTIONING

11. What method is typically used to measure the air content of RCC?
 - a) The method described in ASTM C 138
 - b) The method described in ASTM C 231
 - c) The method described in ASTM C 132
 - d) The method described in ASTM C 381

12. Why is a slump test not a meaningful way to test RCC workability?
 - a) Correct RCC mixtures have very high slump rates
 - b) Correct RCC mixtures have no slump
 - c) RCC test sections are too large
 - d) Slump forms cannot support a roller

13. At what stage are mixture-proportioning studies necessary?
- The feasibility stage
 - The construction coordination stage
 - The material availability investigation stage
 - The preconstruction engineering and design stage
14. After proportions are established, how is the workability and strength of an RCC mixture verified?
- By field testing
 - By engineering calculations
 - By trial batching in a laboratory
 - By comparison to conventional concrete
15. When a mixture is too dry or too wet, adjustments should be made how?
- By adding or deleting water-reducing admixtures
 - By adding or deleting water in the mixture
 - By adding or deleting aggregate in the mixture
 - By adding or deleting fly ash in the mixture

CHAPTER 4 - PROPERTIES

16. Strength of RCC is measured using the identical methods employed for CMC?
- True
 - False
 - Not enough information for answer
 - Too many variables for specific answer
17. Compressive strength is used as a gauge of what?
- Design loading
 - Compaction achieved
 - Overall strength
 - Aggregate quality
18. What are the weakest locations in RCC?
- Facing systems
 - Lift joints
 - Membranes
 - Drainage systems
19. What is considered to contribute to the strain in calculating the normal load rate modulus of elasticity?
- Only the deformation which occurs after sustained loading
 - The deformation which occurs during and after loading
 - Only the deformation which occurs before loading
 - Only the deformation which occurs during loading

20. True/False: Poisson's ratio for RCC is the same as for CMC?
- a) True
 - b) False
 - c) Not enough information for answer
 - d) Too many variables for specific answer
21. Creep is defined as what?
- a) Time-independent deformation due to sustained load
 - b) Time-dependent deformation due to sustained load
 - c) Time-dependent deformation due to static load
 - d) Time-independent deformation due to static load
22. Tensile strain capacity (TSC) is defined as what?
- a) The change in length that can be sustained in concrete after cracking
 - b) The change in length per unit length that can be sustained prior to deformation
 - c) The change in length per unit length that can be sustained in concrete prior to cracking
 - d) The change in length that can be sustained in concrete prior to loading
23. Where does autogenous volume change occur?
- a) In the face of a large mass of concrete
 - b) At the edges of a large mass of concrete
 - c) In the interior of a large mass of concrete
 - d) In the lift joints of a large mass of concrete
24. Compared to conventional concrete, the coefficient of thermal expansion is usually what?
- a) Slightly larger
 - b) Slightly smaller
 - c) Significantly smaller
 - d) Equivalent
25. What is the expected abrasion/erosion percent loss for workable RCC mixtures?
- a) 3 to 15 percent
 - b) 18 to 28 percent
 - c) 32 to 38 percent
 - d) 40 to 45 percent

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Answer Sheet for Roller-Compacted Concrete
 TPDH-00003

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