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Examination for Shotcrete Chpt 5-8

**CHAPTER 5 – PRECONSTRUCTION TESTING AND EVALUATION**

1. Final approval of ACI certified nozzlemen must be contingent on what?
  - a) Submittal of nozzleman certification
  - b) Completion of a general shotcrete knowledge written exam
  - c) Completion of a specific application knowledge written exam
  - d) Successful demonstration of abilities
  
2. How much lead time is often required for on-site trial batching?
  - a) None
  - b) 14 to 28 days
  - c) 28 to 45 days
  - d) In excess of 45 days
  
3. What should the minimum thickness be for a preconstruction test panel?
  - a) 3 inches
  - b) 4 inches
  - c) 8 inches
  - d) 15 inches
  
4. How many cubes or cores should be extracted from the interior of each panel for testing?
  - a) No more than 3
  - b) At least 5
  - c) At least 6
  - d) No less than 8
  
5. When should the testing of the suitability of the nozzleman and process take place?
  - a) Within 3 to 5 days
  - b) Sooner than 7 days
  - c) At 7 or 14 days
  - d) At 28 days

6. Beams must be sawn from the interior of test panels at what distance from any edge?
- a) No more than 3 inches
  - b) Not closer than 4 inches
  - c) 4 inches maximum
  - d) 6 inches minimum
7. What is the best method for determining the uniformity of the shotcrete?
- a) Visual examination of sawn surfaces
  - b) Standard laboratory testing
  - c) Load deflection testing
  - d) Evaluation of application techniques
8. Correlated strength development will allow the determination of mixture performance at what age?
- a) At 1 to 3 days
  - b) At 3 to 5 days
  - c) At 14 days
  - d) At 28 days

#### **CHAPTER 6 - PLACEMENT**

9. When repairing deteriorated concrete surfaces, feather edging should be used?
- a) True
  - b) False
  - c) Not enough information for a specific answer
  - d) Too many variables for a specific answer
10. Concrete being repaired behind reinforcing steel should be removed to what depth?
- a) 1.5 inches
  - b) 3 inches
  - c) Not less than 2 inches
  - d) Not less than 1 inch
11. Wire fabric reinforcement may be used in sections as thin as what?
- a) 1/4 inch
  - b) 1/2 inch
  - c) 3/4 inch
  - d) 1 inch
12. At least one layer of wire fabric is used for how many inches of shotcrete?
- a) 2 inches
  - b) 3 inches
  - c) 4 inches
  - d) 5 inches

13. Horizontal reinforcement should be placed at what distance from the ground or floor slab?
- a) Less than 3 inches
  - b) Not less than 3 inches
  - c) Not less than 6 inches
  - d) Not less than 12 inches
14. When using a small drum mixer at the jobsite, mixing times should not be less than what?
- a) 1 minute
  - b) 2 minutes
  - c) 3 minutes
  - d) 4 minutes
15. What is the optimum moisture content, by dry mass, for dry-mix fine aggregate fraction?
- a) 1 to 3 percent
  - b) 3 to 6 percent
  - c) 6 to 10 percent
  - d) 10 to 15 percent
16. How should the nozzle be held when gunning horizontal surfaces?
- a) Horizontal
  - b) Vertical
  - c) At a slight angle from vertical
  - d) At 30 degrees from vertical
17. What is the optimum distance between the shotcrete nozzle and the surface being shot?
- a) 1 foot
  - b) 2 feet
  - c) 3 feet
  - d) 4 feet
18. When a steady elliptical movement of the nozzle across the surface is employed, what is the distance of motion from top to bottom?
- a) 3 to 6 inches
  - b) 6 to 9 inches
  - c) 9 to 18 inches
  - d) 18 to 36 inches
19. When gunning vertical surfaces, shotcrete should be applied how?
- a) From left to right
  - b) From right to left
  - c) From the top down
  - d) From the bottom up

20. Which of the following work surfaces has the highest percent of rebound from conventional shotcrete?
- a) Floors or slabs
  - b) Overhead work
  - c) Sloping / vertical walls
21. When compared to other mixtures, the rebound of silica-fume shotcrete may be what?
- a) As little as 10 percent more
  - b) Up to 50 percent less
  - c) Up to 50 percent more
  - d) A little as 30 percent less

### **CHAPTER 7 – QUALITY CONTROL**

22. Which of the following is not listed as a preproduction submittal?
- a) Contractor's QC plan
  - b) Admixtures and curing compounds
  - c) Nozzleman certification
  - d) Accelerator compatibility test
23. According to table 7-1, testing for rebound should be performed at what interval?
- a) Per batch
  - b) Per shift
  - c) Daily
  - d) Per 50 ft<sup>2</sup>
24. Cores taken from per-shift test panels are used to verify what?
- a) The nozzleman's workmanship
  - b) The flexural strength of fiber-reinforced shotcrete
  - c) The compressive strength of non-fiber reinforced shotcrete
  - d) The curing time required for in-place shotcrete

### **CHAPTER 8 – QUALITY ASSURANCE**

25. What document should be followed in preparing a QA Plan?
- a) EM 1110-2-2000
  - b) ER 1180-1-6
  - c) CRD-C 625
  - d) CRD-C 103



Answer Sheet for Standard Practice for Shotcrete Chapters 5-8  
 TPDH-00013

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