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Examination for Evaluation and Repair of Concrete Structures Part 4
Chapters 7 & 8-4

CHAPTER 7 – MAINTENANCE OF CONCRETE

1. If a stain cannot be identified, what should be the first cleaning material tried?
 - a) Acid
 - b) Reducing bleach
 - c) Organic solvent
 - d) Oxidizing bleach

2. Which method is generally good for removing chewing gum?
 - a) Flame cleaning
 - b) Abrasive blasting
 - c) Chemical cleaning
 - d) Steam cleaning

3. Which two chemical cleaners have a caution associated with them that they will bleach colored clothing and are corrosive to metals?
 - a) Trichloroethylene and glycerol
 - b) Sodium hypochlorite and Javelle water
 - c) Sodium orthophosphate and acetone
 - d) Acetone and phosphoric acid

4. What is the single most important step for successful surface coating?
 - a) Proper coating material application
 - b) Proper coating material selection
 - c) Proper concrete surface preparation
 - d) Proper waste material handling

5. What types of elastomer coatings will bridge narrow cracks (<0.8 mm)?
 - a) Epoxy polyesters and latexes
 - b) Polyurethanes and acrylics
 - c) Latexes and urethanes
 - d) Epoxy phenolics and acrylics

CHAPTER 8 – SPECIALIZED REPAIRS

8-1 Lock Wall Rehabilitation

6. What percentage of the Corps' navigation lock chambers were built prior to 1940 and in areas of relatively severe exposure to freezing and thawing?
- Approximately 50 percent
 - More than 37 percent
 - Approximately 62 percent
 - More than 75 percent
7. Typical dowel spacing center to center in both directions is what?
- 0.3 m (1 ft)
 - 0.6 m (2 ft)
 - 0.9 m (3 ft)
 - 1.2 m (4 ft)
8. For cast-in-place, concrete cover over mats of reinforcing steel is usually what?
- 50 or 75 mm (2 or 3 in)
 - 75 or 100 mm (3 or 4 in)
 - 100 or 127 mm (4 or 5 in)
 - 127 or 150 mm (5 or 6 in)
9. Shotcrete overlays can contribute to the deterioration of existing concrete?
- True
 - False
 - Not enough information for a specific answer
 - Too many variables for a specific answer
10. Compared to conventional concrete, the cost of preplaced-aggregate concrete can be what?
- As much as one-fourth higher
 - As much as one-third higher
 - As much as one-third less
 - As much as one-half less
11. Which of the following lock wall rehabilitation methods is particularly susceptible to damage by barge impact and abrasion?
- Shotcrete
 - Precast concrete
 - Thin overlays
 - Cast-in-place concrete

12. A typical precast concrete panel designed for lock wall rehabilitation weighs approximately what?
- a) 3 tons
 - b) 5 tons
 - c) 7 tons
 - d) 8 tons
13. Where was the initial application of the precast-concrete stay-in-place forming system for lock chamber resurfacing?
- a) Lock 22, Mississippi River
 - b) Lock No. 5, Monongahela River
 - c) Troy lock, Hudson River
 - d) Lockport lock, Illinois Waterway
14. What was the typical panel thickness used at Troy lock in 1991?
- a) 12 inches thick
 - b) 1 ft 8-1/2 inches thick
 - c) 4-1/2 inches thick
 - d) 7-1/2 inches thick

8-2 Repair of Waterstop Failures

15. Polyvinyl chloride (PVC) is the most widely used material for rigid waterstops?
- a) True
 - b) False
 - c) Not enough information for specific answer
 - d) Too many variables for a specific answer
16. What is the typical sawcut depth when the “caulked joints” method is used?
- a) 1/2 inch
 - b) 1/8 inch
 - c) 1-1/2 inches
 - d) 2 inches
17. Tests indicate that grouted/caulked joint repairs begin to leak at joint movements of what?
- a) Over 10 mm
 - b) Between 1.3 and 2.5 mm
 - c) From 5 to 10 mm
 - d) Between 2.5 and 5 mm

8-3 Stilling Basin Repairs

18. In the Old River Control Structure case history, at the time of the second inspection how many modules total had sustained damage?
- a) 16 total
 - b) 7 total
 - c) 11 total
 - d) 9 total
19. In the Pomona Dam case history, how much debris was removed from the debris trap during the inspection 10 years after repair?
- a) 3 cu m
 - b) 1 cu m
 - c) 4 cu m
 - d) 2 cu m
20. How much were the basin walls raised in the 1987 repair of the Nolin Lake Dam?
- a) 1 foot
 - b) 3 feet
 - c) 4 feet
 - d) 2 feet
21. In the Kinzua Dam case history, what is the most significant contributing factor to the continued problems with debris in the stilling basin?
- a) The addition of silica-fume into the concrete overlay
 - b) Nonsymmetrical operation of the structure
 - c) Cracking of the concrete during construction
 - d) Installation of the downstream debris trap
22. How thick was the sill that was placed as a rock trap at Dworshak Dam?
- a) 5 feet thick
 - b) 10 feet thick
 - c) 15 feet thick
 - d) 20 feet thick
23. Repairs at the Chief Joseph Dam were subjected to peak discharge flows in what year?
- a) 1966
 - b) 1967
 - c) 1970
 - d) 1974

24. What was the estimated percentage of epoxy mortar that failed at the Dworshak Dam?

- a) 10 percent
- b) 15 percent
- c) 20 percent
- d) 25 percent



Answer Sheet for Evaluations and Repair of Concrete Structures Part 4
 TPDH-00023

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