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Continuing Education Course #092  
Dredging and the Environment - Part 3  
Beach Nourishment & Wetland Restoration

1. The greatest sources of beach degradation/ erosion are?
  - a. Burrowing marine life.
  - b. Storms
  - c. Wave action and Near Shore Currents.
  - d. None of the above.
  
2. The most active area of beach erosion is what part of its profile?
  - a. From 2 feet above Mean High Water to the Mean High Water Line
  - b. From the Mean High Water Line to the Mean Low Water Line
  - c. From the Mean Low Water Line to 2 or more feet below Mean Low Water
  - d. All of the above
  
3. What is the most ideal type of beach nourishment sand?
  - a. Rounded "pea gravel"
  - b. Large grain size – and angular shape
  - c. Very Fine Sand
  - d. None of the above
  
4. What dredging method naturally lends itself to most beach nourishment projects?
  - a. Mechanical dredging and material barges
  - b. Hopper Dredges
  - c. Hydraulic Dredges
  - d. None of the above
  
5. The factors that most inhibit the use of Mechanical Dredges as beach nourishment tools are?
  - a. Dependence on trucking from upland sources
  - b. Shallow water depths near beach nourishment areas
  - c. Need to work during High Tidal cycles only
  - d. All of the above
  
6. The practical distance limit for pumping sand from the borrow source to the nourishment site is limited to 5 miles using most dredges under 24" (pipe size).
  - a. True
  - b. False
  
7. When designing the beach nourishment fill profile, the ideal and most durable beach slope would be no steeper than \_\_\_%?
  - a. 1.0%
  - b. 6.0%

- c. 2.0%
- d. None of the above
8. The best source of sand borrow for beach nourishment would be \_\_\_?
- a. Top Layers of a navigation channel Maintenance Dredging project
- b. Upland sand borrow pits
- c. Navigation channels near the point where the navigation channel crosses a beach line
- d. All of the above
9. Soil borings of potential sand borrow sites are generally not required as part of a preliminary beach nourishment project investigation.
- a. True
- b. False
10. The shrinkage factor of sandy fill on a beach nourishment project from the in-place measure in the borrow area to the finished fill elevation on the beach is about \_\_\_?
- a. 1.1:1
- b. 3.0:1
- c. 1.5 to 2.0:1
- d. None of the above
11. What is one of the disadvantages of using temporary dikes to retain sand on a beach nourishment project (assuming the quality of the sand is suitable for direct placement on the beach)?
- a. Soft, muddy sediment from the fill tends to collect in pools rather than naturally spreading it.
- b. Sand dikes tend to erode during wind storms
- c. They are a waste of sand – which would be better used in the beach fill areas
- d. None of the above
12. Grading of the newly placed beach fill offshore of the Mean Low Water line is usually unnecessary as the sand usually flows naturally to the proper grade.
- a. True
- b. False
13. What are normally the best initial slope grades for newly reconstructed dunes?
- a. 1:1 to 2:1
- b. 4:1 to 6:1
- c. 10:1 to 12:1
- d. None of the above
14. Strong winds tend to bend and follow the natural curvatures of waterways creating waves that take up the same patterns.
- a. True
- b. False
15. The greatest causes of wetland degradation (loss) is:
- a. Wave action – especially winter storms
- b. Wakes from passing boats
- c. Waterway pollution that damaged and accelerates decay of plant root systems
- d. All of the above
16. One of the important functions of providing reconstructed beaches on the waterfront periphery of newly reconstructed wetland projects is that they provide a natural area for wave energy absorption.

- a. True
- b. False

17. Establishment of the finished grades of a wetland restoration, as well as determining long term settlement is a critical component of wetland design.

- a. True
- b. False

18. Physical data required for a successful wetland reconstruction project are:

- a. Obtaining current topographic and hydrographic data for the site
- b. Investigation for potential local sites to obtain fill
- c. Obtaining geotechnical borings of the restoration site and the potential borrow areas
- d. All of the above
- e. None of the above

19. If sand is available within a reasonable distance of a restoration site some of the advantages to using it for wetland reconstruction fill are:

- a. It naturally has lower levels of contamination
- b. It settles less after placement
- c. It consolidates more quickly making replanting easier
- d. All of the above

20. When reconstructing a wetland fill and a sand cap is being used – what minimum thickness of sand should be applied?

- a. 6” to 12”
- b. 2” to 4”
- c. 2 feet to 4 feet
- d. None of the above

21. In wetland restoration - one of the most critical factors in placement of sand capping over soft sediment is uniform placement in relatively thin layers.

- a. True
- b. False

22. Some of the ways that the COE protects newly constructed wetland “coastal banks” from wave erosion are:

- a. Rock or concrete block revetments
- b. Geotube bags filled with sand
- c. Wood Bulkheads
- d. All of the above

23. Two factors in determining the design parameters for design a coastal bank protection system are routine storm conditions as well as severe storm conditions.

- a. True
- b. False

24. A rule of thumb for determining maximum wave height in a given area of waterway – or flooded wetland is:

- a. Wind speed divided by 5
- b. Wind fetch distance in feet divided by 10,000
- c. Still water depth times 0.7
- d. None of the above

25. The function of Filter Cloth in the design of a coastal revetment is:

- a. To act as a barrier to keep the rocky layers from working their way into the underlying sand
- b. To keep grass from growing between the rocks
- c. To act as a structural barrier between layers of rocks
- d. All of the above

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