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Continuing Education Course #023  
Marina Site Analysis

1. In all of the Wave Formulas used in this text the term “H” or “Hs” is used to define what characteristic of a wave form?
  - a. The height of a wave measured from the bottom of the water body to the Mean Still Water Level.
  - b. The Depth of Water measured from the bottom trough of the wave to the bottom of the water body.
  - c. The height of the wave measured from the trough to the crest.
  - d. None of the above.
  
2. Generally speaking if a site is subjected to waves in excess of two feet during any significant portion of the boating season, some form of Wave Attenuation should be considered.
  - a. True
  - b. False
  
3. In Figure 2 of the course material, if a new Fetch Line were drawn in half way between Fetch A and Fetch B; and the MLW water depths across the Fetch were 11, 39, 21 and 12 feet respectively, and all other factors remained the same. What would be the “Base Elevation Water Depth” for determining wave height at the Example Site?
  - a. 20.75 feet
  - b. 39.00 feet
  - c. 12.00 feet
  - d. 26.35 feet
  
4. In Figure 2 of the course material, when considering wave calculations along Fetch “D” - the opening in the breakwater would have no effect on wave heights within the study area.
  - a. True
  - b. False
  
5. Since strong wind conditions can occur at any tidal condition or river stage, when designing a marine structure – the factor “d” (water depth) in Wave Height Calculations over the Fetch Distance must include:
  - a. The speed of sound in water.
  - b. The water depth at the highest predicable tide or stage.
  - c. The speed of and currents flowing in the area.
  - d. The highest estimated hurricane storm surge.
  
6. In the Example Site that is given within the course materials – what is the estimated maximum “Still Water” elevation (SWE) for the Example site Based on Mean Lower Low Water (MLLW) Datum?
  - a. 15.5 feet
  - b. 16.5 feet
  - c. 14.0 feet
  - d. None of the above
  
7. What is the best and most comprehensive source for storm surge and flood elevation data?

- a. The US Weather Service
- b. The US Government Printing Office
- c. FEMA
- d. NOAA

8. On a local FEMA flood map, where an area of the map is designated as “AE-15 (El 13)”, the term “13” in the designation refers to what component of a wave’s anatomy?

- a. The Still Water Elevation
- b. The Wave Height
- c. The water depth at that location
- d. The estimated wave crest elevation at that location

9. Mean Low Water (MLW) Datum and NGVD are usually equal and interchangeable values when considering site elevations.

- a. True
- b. False

10. FEMA flood map flooding elevations are presently given in what vertical datum?

- a. Mean Low Water (MLW)
- b. Mean Sea Level (MSL)
- c. National Geodetic Vertical Datum (NGVD)
- d. Mean High Water (MHW)

11. In performing wind/wave calculations - if the Air Temperature is 10o F, and the Water Temperature is 30o F, what will the Factor  $R_t$  be for determining Wind Stress?

- a. 1.18
- b. 0.82
- c. 0.78
- d. 0.90

12. Using the  $R_t$  Factor obtained from the Q11, compute the Wind Stress “UA” for a “U(10)” of 70 MPH wind speed.

- a. 86 mph
- b. 134 mph
- c. 81 mph
- d. 96 mph

13. Using the Wave Charts in Appendix 3, determine the significant Wave Height for a water depth of 30 feet, a UA of 100 mph and a Fetch of 2.84 miles.

- a. 3.5 feet
- b. 4.6 feet
- c. 2.4 feet
- d. 5.5 feet

14. Using the Wave Charts in Appendix 3, determine the significant Wave Period “T” for a water depth of 30 feet, a UA of 100 mph and a Fetch of 2.84 miles.

- a. 3.5 seconds
- b. 4.6 seconds
- c. 2.4 seconds
- d. 5.5 seconds

15. When using the Formulae 3 & 4 to calculate wave height and period, it is important that the units for Wind Stress “UA” be in Knots, in order to achieve correct results.

- a. True
- b. False

16. Given a "Saffir-Simpson" Hurricane Scale wind speed for a Category 1, of 95 mph, what would the approximate average 1 hour wind speed be for use in Wave Calculations?

- a. 118.75 mph
- b. 95.0 mph
- c. 76.0 mph
- d. Not enough information

17. Assuming a one hour average wind speed measured 10 meters above ground ( $U(10)$ ) of 80 mph, and an air temperature of 75 degrees F, and a water temperature of 60 degrees F, what would the  $R_t$  factor be for wind stress calculations?

- a. .83
- b. .78
- c. 1.20
- d. 1.18

18. Assuming the  $U(10)$  given in the previous problem and an  $R_t$  factor of 0.80, what would the adjusted wind speed ( $U$ ) be for use in calculations for Wind Stress?

- a. 80.0 mph
- b. 64.0 mph
- c. 100.0 mph
- d. None of the above

19. Assuming a wind speed adjusted for temperature correction ( $U$ ) of 70 mph, calculate the adjusted Wind Stress Factor ( $U_A$ ) for use in the Wave Formulas.

- a. 109.54 mph
- b. 160.66 feet/sec
- c. 132.05 mph
- d. 48.96 meters/sec

20. Assuming an adjusted wind speed ( $U_A$ ) of 100 mph, and an average still water depth across the fetch distance of 15 feet, and a Fetch distance of 4.0 miles, using the charts in Appendix 3, what would the expected approximate wave height of the fully arisen sea state be?

- a. 5.0 feet
- b. 3.7 feet
- c. 4.5 feet
- d. 2.5 feet

21. In the above question assuming all factors remain the same, what would the expected Wave Period ( $T$ ) be?

- a. 5.0 seconds
- b. 3.7 seconds
- c. 4.5 seconds
- d. 2.5 seconds

22. When doing a site soils investigation for a marine structure that is situated within 100 feet offshore of the Low Tide Line, one can drill soil samples up to 50 feet in an upland direction from the Low Tide Line and usually obtain suitable soil data indicative of the conditions for the offshore structure.

- a. True
- b. False

23. Driving Test Piles using the blow-count method and performing a “Lateral Load Tests” is a reliable method for assessing the suitability of submarine soils for most recreational and light commercial pile supported structures.

- a. True
- b. False

24. When using a “Vibracore” sampling device to obtain subsurface soil data, it is important to record blow counts continuously.

- a. True
- b. False

25. When taking Split Spoon samples from a floating platform, if one uses the existing bottom elevation as a reference point, it is not necessary to record the tides during the sampling process.

- a. True
- b. False

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