

Frequency responses of immersing tunnel element under wave actions^(PDF)

《船舶与海洋工程学报》[ISSN:1002-2848/CN:61-1400/f] 期数: 2009年01 页码: 18-26 栏目: 出版日期: 2009-03-25

Title: Frequency responses of immersing tunnel element under wave actions

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关键词: immersed tunnel; motion response; frequency domain; linear potential theory

分类号: -

DOI: -

文献标识码: A

摘要: The immersion of large-scale tunnel elements is one of the most important working procedures in the construction of an underwater immersed tunnel. To investigate the dynamic characteristics of tunnel element in the process of immersion, based on the twin-barge immersing operation method, the frequency-domain analysis of the tunnel element motions under wave actions was made. The linear wave diffraction theory and the three-dimensional source distribution method were applied to calculate the wave loads and motion responses of the tunnel element under different incident wave conditions. In the study, movement of the two barges in the water was assumed to be small and was ignored. Cable tension was computed by the static method. On the basis of the above theories, a computer program was made, and two cases were taken to check the validity of the program. The results showed that wave loads acting on the immersed tunnel element are relatively large near the water surface, and they decrease with the increase of immersing depth of the tunnel element. Wave loads first increase, then decrease, with the increase of wave period. The motion responses of the tunnel element are also generally large near the water surface and decrease as the immersing depth increases.

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更新日期/Last Update: 2010-05-14