

Flushing Model for Artificial Islands in the Persian Gulf

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Abstract : A flushing numerical study has been performed for intended artificial islands on the Persian Gulf coast in Abu Dhabi, UAE. The island masterplan was tested for flushing using the DELFT 3D hydrodynamic model, and it was found that its residence time exceeds the acceptable PIANC flushing Criteria. Therefore, a number of mitigation measures were applied and tested one by one using the flushing model. Namely, changing the location of the entrance opening, dredging, removing part of the mangrove existing in the near vicinity to create a channel, removing the mangrove altogether, using culverts of different numbers and locations, and pumping at selected points. The pumping option gave the best solution, but it was disregarded due to high capital and running costs. Therefore, it opted for a combination of other solutions, including removing mangroves, introducing culverts, and adjusting island boundaries and types of protection.

Keywords : hydrodynamics, flushing, delft 3d, Persian Gulf, artificial islands.

Conference Title : ICCOE 2024 : International Conference on Coastal and Ocean Engineering

Conference Location : Paris, France

Conference Dates : September 16-17, 2024