

EXSPERIMENTAL STUDY OF THE EFECTIVENESS OF BROKEN STONE TYPE BREAWATER ON WAVE DUMPING “CASE STUDY OF RAJA KECIK MUNTAI BARAT BEACH ”

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ABSTRACT

Raja Kecik Beach in Muntai Barat has experienced significant coastal erosion due to strong wave action and soft, easily eroded soil. To address this issue, a rubble mound breakwater was constructed as a form of shoreline protection. This study aims to evaluate the effectiveness of the rubble mound breakwater in reducing wave energy. Laboratory experiments were conducted using physical scale models, with variations in water levels (normal and high tide) and slope inclinations (1:1.67 and 1:2.5). The results show that the breakwater performs effectively under normal tidal conditions, with wave transmission coefficients (K_t) ranging from 0.33 to 0.40. However, under high tide, its performance decreases significantly, as K_t increases to 0.77 and 0.89. The wave run-up is also influenced by the slope of the breakwater; gentler slopes result in lower run-up values. The highest run-up was recorded at a 1:1.67 slope with 1.89 m, while a 1:2.5 slope resulted in only 1.26 m. These findings suggest that optimizing both the height and slope of the breakwater based on maximum tidal conditions is essential to enhance its effectiveness in dissipating wave energy.

Keywords: *breakwater, transmission coefficient, wave run-up, ocean waves, slope inclination, tidal variation.*