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Paper Title: 3D Physical model study for proposed remedial works to the Port of Richards Bay breakwaters

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3D Physical model study for proposed remedial works to the Port of Richards Bay breakwaters

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The Port of Richards Bay is frequently subjected to extreme storm events where recorded wave heights can easily exceed five meters. Over the last two decades, these storms have caused significant damage to the port's breakwaters. A 3D physical model study was commissioned with the objective to assess and verify the stability of four different strategies to repair and enhance the structural integrity of these structures. Results from this study showed that both breakwaters will ultimately fail if no major improvements to these structures are made. The repair options tested for the main breakwater included a comparison of two different toe designs, as well as comparing the performance of two different armour unit types. The outcome indicated that the repairs to the main breakwater will most likely entail a trenched toe design and an armour layer comprising of very large cubic-type blocks. While the repair options tested for the lee breakwater mostly entailed placing additional or larger armour units of the same type, it did allow the opportunity to optimise both the armour unit size and the coverage for an improved overall outcome.

Keywords: Port of Richards Bay, Physical modelling, Breakwater stability