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Wave impact on walls with/without parapets[1] JANNETTE FRANDSEN, OLIVIER TREMBLAY, REGIS XHARDE, University of Quebec, INRS-ETE — This work is concerned with coastline protection. The usage of vertical walls is examined for various wave trains. The effect of parapets is further studied to minimize overtopping. The results presented are based on large scale flume experiments (Quebec) with a geometric scaling of 1:4. The beach has a slope 1:10. The beach material is highly absorbing and contains a mix of sand-gravel-cobble. Steel plates are mounted locally at the beach top to eliminate effect from local scour. The critical cases found relates to the plunging breakers breaking directly impacting the wall. Entrapped air-pocket(s) under the breaking wave contribute to the run-up energy through compressibility effects and bubble burst physics even from relatively small air-pockets. Highly localized wall pressures greater than 1 MPa and 10 m run-up are easily developed even with moderate amplitude waves at the inlet. The max. peak pressure on the wall identified caused either by water or entrained air pressure is typically greater than 1 MPa occurring in the order of 0.1 ms. The pressure distributions contain either single, double or triple peaks occurring typically above/at mean flume water depth and at around the local water depth in front of the wall. Furthermore, it was identified that the cases with maximum pressure on the wall does not necessarily give the maximum jet velocity (equivalent to vertical force considered in design of parapets).

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