

The Water Research Laboratory's wave basin measures approximately 29 m in length, 16 m in width, and 0.7 m in depth. The walls of the basin are constructed of rendered brickwork, and the permanent floor of the basin is constructed of concrete. Site specific bathymetry is reproduced in the wave basin using recycled road base capped with concrete.



**Physical modelling of Barrow Island LNG plant materials offload facility**

Two piston type wave paddles are used to generate waves within the basin, and are hydraulically driven by a 55 kW pump located in a separate building. Each wave paddle measures approximately 7.25 m in length and just over 1 m in height. The wave paddles and actuators are mounted on steel frames which are bolted to the concrete floor of the wave basin during tests. The paddles are movable and able to be rotated to produce waves of varying approach angles to the model experiment. During testing, wave paddles are able to be operated simultaneously, to produce a uniform 14.5 m wave front, or individually to produce multiple wave fields. The system is capable of generating both monochromatic and irregular wave spectrums, as well as producing user defined pre-recorded wave sequences. Control signals for the wave paddle are produced and controlled using the Canadian Hydraulics Centre (CHC) GEDAP/NDAC software package. When required, temporary guidewalls and wave dissipaters are available to assist refraction of waves and reduce reflections within the basin.

A range of data is able to be collected during experiments in the wave basin, including wave heights, wave runup, overtopping rates and depths, forces, and pressures. All electronic sensor units are typically logged using the GEDAP/NDAC software package. Wave height and water level measurements are made using capacitance wave probes, which are available in a range of lengths from 200 mm to 1500 mm. Overtopping analysis is typically undertaken by volumetric collection, or with the use of capacitance wave probes and/or ultrasonic sensors. Force measurements are taken using load cell units, available in a range of capacities. Pressures are measured using pressure transducer units, available in a range of capacities up to 125 kPa.