

<b>Name of organization</b> IIHR – HYDROSCIENCE & ENGINEERING (University of Iowa)		<b>Year of information updating</b> 2020
<b>Year established</b> 1847		<b>Year of joining the ITTC</b> 1994 or earlier
<b>Address</b> 300 S. Riverside Drive Iowa City, IA 52242		<b>Status in the ITTC</b>  Member
<b>Contact details</b> (phone, fax, e-mail) Troy Lyons, Director of Engineering Services <a href="mailto:troy-lyons@uiowa.edu">troy-lyons@uiowa.edu</a> , 319-335-5319		<b>Website</b> <a href="https://www.ihr.uiowa.edu/">https://www.ihr.uiowa.edu/</a>
<b>Type of facility</b> Wave Basin, Towing Tank	<b>Year constructed/upgraded</b> WB: 2010; TT: 1954	
<b>Name of facility</b> Hydraulics Wave Basin Facility, IIHR Towing Tank	<b>Location</b> (if different from the above address)	
<b>Main characteristics</b> (dimensions of tank/basin/test section; for simulators: full mission, part task or desk top)		
<b>Wave Basin:</b>		
<ul style="list-style-type: none"> <li>• 40 m x 20 m x 3 m.</li> <li>• Six (6) plunger-type wave makers at one end, each 3.3 m long.</li> <li>• Energy-absorbing beach for ocean conditions.</li> <li>• Alternate beach for surfzone/breaking wave conditions.</li> </ul>		
<b>Towing Tank:</b>		
<ul style="list-style-type: none"> <li>• 3.05 m x 3.05 m x 91.44 m.</li> <li>• Plunger-type wave maker, variable speed.</li> </ul>		
<b>Drawings of facility</b>		
See attachment.		

**Detailed characteristics** (carriages, wave/current/wind generators, instrumentations, etc.)

**Wave Basin**

- Aluminum double truss instrumentation carriage with electric drive and optical position tracking for free-running or captive tests.
- Maximum carriage speed 2 meters/second.
- 6DOF optical tracking system for free-running or captive tests.
- Regular and irregular wave generation.
- Permanent beach details:
  - fixed-slope porous matting over solid surface.
  - 20 m wide by 6 m long.
- Alternate beach details:
  - Fixed-slope solid surface for surfzone conditions.
  - 20 m wide by 13.3 m long.
- Remotely controlled adjustable wave dampers along both sides of basin.
- Trimming channel for preparing experiments.
- Overhead cranes to lift heavy objects in and out of tank.
- Swing table to experimentally measure model moments of inertia.

**Towing Tank**

- Electric-drive carriage with front and back detachable trailers.
- Maximum carriage speed: 3 meters/second with 0.1% regulation.
- Planar motion mechanism (PMM) mounted to towed carriage with integrated load cell.
- Removable floor panels in main carriage for mounting experiments.
- Additional towed wind carriage.
- Towed underwater tomographic PIV systems for local flow mapping.
- INSTRUMENTATION: PC based A/D with 50,000 samples/sec throughout, Pitot probes, force, pressure, wave height, motion control, and 6DOF motion tracker.

**Applications** (Tests performed)

**Wave Basin and Towing Tank**

Basic research studies. Captive and free-running ship model testing (sea-keeping, added resistance, stability, etc.). Launch and landing performance of unmanned amphibious vehicles in surfzone conditions. Performance and energy capture efficiency of wave energy converters.

**Published description** (Publications on this facility)



