

INTERNATIONAL TOWING TANK CONFERENCE CATALOGUE OF FACILITIES
TOWING TANKS, SEAKEEPING AND MANOEUVRING BASINS

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<p>TOWING CARRIAGE NO. 3 (1941) - MODIFIED 1973-74</p>					
<p>Schematic Plan View of High Speed Basin (Carriage Not Shown)</p>	<p>Elevation View of Shallow End of High Speed Basin & Carriage III</p>				
<p>DESCRIPTION OF BASIN UNDER TOWING CARRIAGE NO. 3: This indoor rectangular high speed basin with a total length of 904 m (2968 ft) comprises two adjoining sections:</p> <ul style="list-style-type: none"> • DEEP-WATER section 4.9 m (16 ft) deep, approx. 514 m (1687 ft) long and 6.4 m (21 ft) wide. • SHALLOW-WATER section 3 m (10 ft) deep, approx. 356 m (1169 ft) long and 6.4 m (21 ft) wide. <p>A pneumatic wavemaker is located at one end and a wave absorbing beach at the other, 3 large underwater viewing windows at different elevations are set into the wall about mid-length.</p>					
<p>DESCRIPTION OF CARRIAGE: In plan view the carriage frame is triangular in shape, in effect a monorail structure with two outrigger idle wheels supporting the light side of the carriage frame, four drive wheels & 4-opposed pairs of horizontal guide wheels operate in tandem on the main rail, carriage will function equally well when towing in either direction.</p> <p>TYPE OF DRIVE SYSTEM & TOTAL POWER: Electro-hydraulic drive & regenerative braking system with 4-drive wheels each direct coupled to an in-line axial piston type hydraulic motor receiving oil from hydraulic pumps driven by a constant speed AC synchronous motor.</p> <ul style="list-style-type: none"> • TOTAL POWER: One electric motor, 149 kW (200 hp) <p>MAXIMUM CARRIAGE SPEED: 16.5 m/s (54.0 ft/s, 32 knots) (uniform to within 0.01 knot, total variation); maximum average acceleration rate is about 0.07 g in either direction.</p> <p>OTHER CAPABILITIES:</p> <ul style="list-style-type: none"> • Planar motion mechanism (PMM) can produce sinusoidal pitch, roll, yaw, or sway oscillations; or a compound yaw & sideslip motion. • Motorized work platforms are mounted under the carriage & can be extended out in front of the carriage 3.3 m (11 ft) to facilitate model changes with the carriage located anywhere along the basin. • A "U"-shaped observation/camera platform attaches to the front of the carriage & spans the basin ahead of the model to allow viewing & photography from many angles while tests are in progress. • An air-conditioned instrument room (7 m (23 ft) long by 3 m (10 ft) wide by 2.1 m (7 ft) high) houses all the computerized data acquisition equipment. 					
<p>WAVE GENERATION CAPABILITY: (with water level lowered 0.76 m (30 inches) below the normal water height)</p> <ul style="list-style-type: none"> • Regular waves from 0.9 to 12.2 m (3 to 40 ft) in length with corresponding maximum heights of 64 to 610 mm (2.54 to 24 in.). • Irregular waves with a spectrum resembling typical ocean wave patterns with appropriate scale reductions. 					
<p>WAVEMAKER TYPE & EXTENT: Pneumatic type, the 6.4 m (21 ft) wavemaker dome is connected to a centrifugal type blower driven by a direct coupled variable speed DC electric motor rated at 75 kW (100 hp), 1150 rpm.</p>					
<p>BEACH TYPE & LENGTH:</p> <ul style="list-style-type: none"> • The wave absorber spans the full width of the basin at the shallow end opposite the wavemaker dome, the absorbers are a discontinuous 20 deg slope type made up of 7 permeable layers of rectangular precast concrete bar panels resting on an impermeable concrete slab supported by a structural steel framework. • Extending along the walls on each side of the basin are "U"-shaped steel wave absorber skimming troughs with their upper edges set about 6 mm (0.25 inch) below the normal water level surface. 					
<p>WAVE MEASUREMENT: Ultrasonic transducers mounted on the towing carriage</p>					
<p>INSTRUMENTATION: 6-component force balance dynamometers (2-units), transducers for measuring model acceleration, pitch, roll, yaw, heave, & cushion pressure; ultrasonic transducers for wave height measurements, high speed photographic & video tape systems on carriage observation platform & at underwater viewing windows, minicomputer & magnetic tape systems for data collection & on-line analysis, solid state variable frequency 3-phase power supplies for model fan motors: (1) 5.4 kVA, 0-400 hz, 0-200 volts AC, 13.5 amps; (2) 2.75 kVA, 60-400 hz, 30-200 volts AC, 8 amps (2-units).</p>					
<p>MODEL SIZE RANGE: 1.2 to 6.1 m (4 to 20 ft)</p>					
<p>TESTS PERFORMED:</p> <table border="0"> <tr> <td>(1) resistance, self-propulsion & static stability in calm water</td> <td>(3) planar motion experiments</td> </tr> <tr> <td>(2) seakeeping & propulsion evaluations in head or following waves</td> <td>(4) simulated broken ice in channel experiments</td> </tr> </table>		(1) resistance, self-propulsion & static stability in calm water	(3) planar motion experiments	(2) seakeeping & propulsion evaluations in head or following waves	(4) simulated broken ice in channel experiments
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<p>PUBLISHED DESCRIPTION: None</p>					