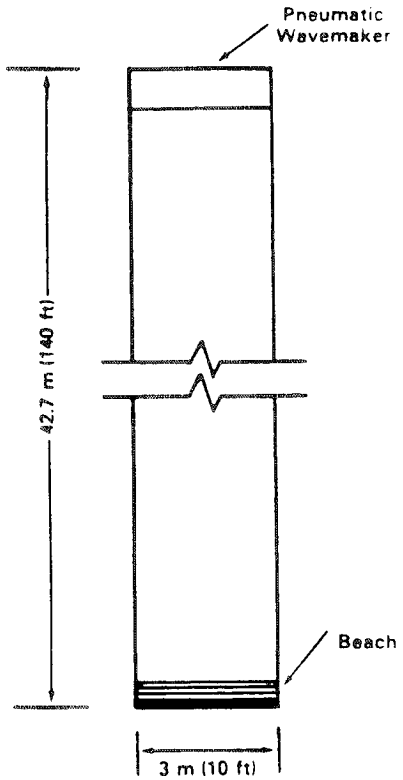
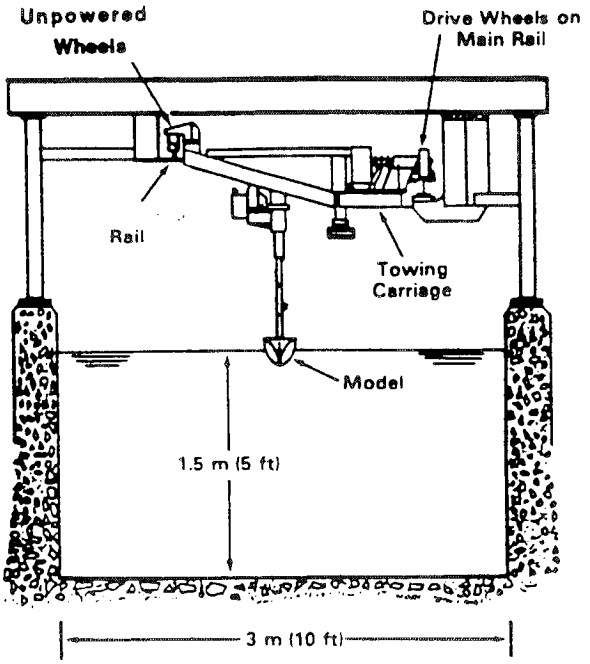
DAVID TAYLOR MODEL BASIN, Carderock Division, NSWC — UNITED STATES
BETHESDA, MD 20084-5000, Phone: (301) 227-1578, FAX: (301) 227-3679

140-FOOT TOWING BASIN (1941)



Schematic Plan View of 140-foot Basin (Carriage Not Shown)



Elevation View of 140-foot Basin & Towing Carriage

DESCRIPTION OF BASIN: This indoor rectangular basin is 1.5 m (5 ft) deep, 42.7 m (140 ft) long, & 3 m (10 ft) wide, a pneumatic wavemaker is located at one end & a wave absorbing beach at the other. A 5-micron filter system maintains optically clear water.

SPECIAL ADDITIONAL CAPABILITY: Free surface studies of submerged models can be conducted with no surface piercing struts by means of a removable underwater track & cable/pulley towing system located along the bottom centerline of the basin.

DESCRIPTION OF CARRIAGE: In plan view the carriage is rectangular in shape, approx. 2 m (6.7 ft) long by 3 m (10 ft) wide. The back side of the carriage can be extended for another 2.1 m (7 ft) as needed. On one side of the carriage, two drive wheels and four pairs of guide wheels operate in tandem on the main rail. On the other side of the carriage, two unpowered outrigger weight supporting wheels ride on a precision flat rail surface. The carriage can operate in either direction.

TYPE OF DRIVE SYSTEM & TOTAL POWER: Driving force is provided by two wheels driven through gear reducers & two DC electric motors each rated at 7.4 kW (10 hp) and 1750 rpm. Normal braking is by regenerative action. Shock absorbers are installed at both ends of the basin to provide a backup safety braking system.

MAXIMUM CARRIAGE SPEED: 3.2 m/s (10.3 ft/s, 6.1 knots)

WAVE GENERATION CAPABILITY: Regular waves from 0.6 to 4 m (2 to 13 ft) in length with corresponding maximum heights of 25 to 191 mm (1 to 7.5 inches).

WAVEMAKER TYPE & EXTENT: Pneumatic type, the 3 m (10 ft) wavemaker dome is connected to a centrifugal type blower driven by a "varidrive" motor (438-1750 rpm), 5.6 kW (7.5 hp). (NOTE: this wavemaker was constructed in 1953 as a developmental model of the 15.5 m (51 ft) wavemaker subsequently constructed at one end of DTMB's East Deep Basin).

BEACH TYPE & LENGTH: Two variable sloped honey comb sheets, 15 cm by 1.2 m by 3 m (6 inches x 48 inches x 120 inches) with 0.25 inch cell openings span the full width of the basin as wave absorbers to dampen either surface or internal currents.

WAVE MEASUREMENT: Ultrasonic transducers.

INSTRUMENTATION: Particle Displacement Velocimetry (PDV) laser system, force balance dynamometers, ultrasonic transducers for wave height measurements, photographic lights, model motor variable voltage DC power supply, 1.5 kW (2 hp), 0-240 volts, 8 amps max.

MODEL SIZE RANGE: 1.5 to 3 m (5 to 10 ft)

TESTS PERFORMED:
(1) quantitative flow visualization with Particle Displacement Velocimetry (PDV)
(2) resistance tests on bare hull models
(3) seakeeping evaluations in head seas
(4) canal lock studies
(5) ship passing experiments in restricted channels

PUBLISHED DESCRIPTION: none