



# Facility Factsheet

## Free Surface Water Tunnel (FSWT)

**Description:** The Free Surface Water Tunnel consists of the intake plenum, the test section and the exit plenum. The intake plenum starts with a perforated pipe that sprays jets of water into the settling chamber. The flow continues through a set of honeycomb straighteners and anti-turbulence screens, and then through a 4:1 contraction. The intake plenum is followed by the test section, 24 in. x 18 in. x 108 in. (0.46m x 0.6m x 2.7m), which has glass on the sides and bottom, with the top open. After the test section, the flow enters the exit plenum, which consists of a set of horizontal and vertical turning vanes, followed by a “hopper” connecting to the return piping. Primary customers are military science and technology development programs.

### Capabilities:

#### Test Conditions:

Flow Velocity (0.13 to 1.64 ft/sec, 0.04 to 0.50 m/sec)

#### Test Capabilities:

Pump Flow or Tow Tank Operation

Angle-of-Attack Range ( $-45^{\circ} < \alpha < +45^{\circ}$ )

3-side optical access plus downstream viewing window

PC Based Data Acquisition System

#### Flow Diagnostics :

Particle Image Velocimetry, streamline tracing with color dye.



**Examples of Current/Past Programs:** Full Scale, Reynolds Number matched Micro-UAV testing, Nonlinear Fluid Dynamics, Test Technique Development

**Cost/Scheduling Information:** To be determined on case by case basis.

**Contacts:** Primarily in-house and related DoD contractor research. Other U.S. Government agency, DoD contractor and commercial customer programs upon request. Contact: 937-713-6678

