

TECHNICAL REPORT AD00374

WIND & WATER TUNNEL  
INSTALLATIONS  
IN  
AUSTRALIA

Boeing Australia

Contractor Report

Defence Science & Technology  
Organisation

AUGUST 2001

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<i>NAME OF FACILITY</i>	<b>High Reynolds Number Boundary Layer Wind Tunnel</b>
<i>LOCATION OF FACILITY</i>	University of Melbourne Walter Bassett Laboratory Parkville, VIC 3010
<i>CONTACT NAME</i>	Professor M.S. Chong
<i>CONTACT TEL</i>	03 8344 6742
<i>CONTACT E-MAIL</i>	<a href="mailto:chong@mame.mu.oz.au">chong@mame.mu.oz.au</a>
<i>WEB PAGE</i>	<a href="http://www.mame.mu.oz.au/fluids/">http://www.mame.mu.oz.au/fluids/</a>
<b>TUNNEL CHARACTERISTICS</b>	
<i>TEST SECTION SHAPE</i>	Rectangular
<i>TEST SECTION SIZE</i>	0.9m high x 1.8m wide x 27m long
<i>MAXIMUM VELOCITY</i>	30m/sec (planning to upgrade to 40m/sec)
<i>MODEL SUPPORTS</i>	Stepper motor traverse in Y & Z plane
<i>TUNNEL LAYOUT</i>	Open return
<i>MEASURING EQUIPMENT</i>	Two-channel hot-wire anemometer MKS "Baratron" (type 698) pressure transducer 16 Channel Data Acquisition system 140 Channel Scanivalve pressure transducer

<i>NAME OF FACILITY</i>	<b>Large Yellow Wind Tunnel</b>
<i>LOCATION OF FACILITY</i>	University of Melbourne Walter Bassett Laboratory Parkville, VIC 3010
<i>CONTACT NAME</i>	Professor M.S. Chong
<i>CONTACT TEL</i>	03 8344 6742
<i>CONTACT E-MAIL</i>	<a href="mailto:chong@mame.mu.oz.au">chong@mame.mu.oz.au</a>
<i>WEB PAGE</i>	<a href="http://www.mame.mu.oz.au/fluids/">http://www.mame.mu.oz.au/fluids/</a>
<b>TUNNEL CHARACTERISTICS</b>	
<i>TEST SECTION SHAPE</i>	Octagonal
<i>TEST SECTION SIZE</i>	1.3m high x 1.68m wide x 6.5m long (slotted)
<i>MAXIMUM VELOCITY</i>	20m/sec
<i>MODEL SUPPORTS</i>	Stepper motor traverse in Y & Z plane
<i>TUNNEL LAYOUT</i>	Closed return
<i>MEASURING EQUIPMENT</i>	Two-channel hot-wire anemometer MKS "Baratron" (type 698) pressure transducer 16 Channel Data Acquisition system 140 Channel Scanivalve pressure transducer

<i>NAME OF FACILITY</i>	<b>Rotating Wind Tunnel</b>
<i>LOCATION OF FACILITY</i>	University of Melbourne Walter Bassett Laboratory Parkville, VIC 3010
<i>CONTACT NAME</i>	Professor M.S. Chong
<i>CONTACT TEL</i>	03 8344 6742
<i>CONTACT E-MAIL</i>	<a href="mailto:chong@mame.mu.oz.au">chong@mame.mu.oz.au</a>
<i>WEB PAGE</i>	<a href="http://www.mame.mu.oz.au/fluids/">http://www.mame.mu.oz.au/fluids/</a>
<b>TUNNEL CHARACTERISTICS</b>	
<i>TEST SECTION SHAPE</i>	Rectangular
<i>TEST SECTION SIZE</i>	0.6m high x 0.3m wide x 1.8m long
<i>MAXIMUM VELOCITY</i>	15m/sec
<i>MODEL SUPPORTS</i>	Stepper motor traverse in Y & Z plane
<i>TUNNEL LAYOUT</i>	Open return
<i>MEASURING EQUIPMENT</i>	Two-channel hot-wire anemometer MKS "Baratron" (type 698) pressure transducer 16 Channel Data Acquisition system 140 Channel Scanivalve pressure transducer

<i>NAME OF FACILITY</i>	<b>Green Boundary Layer Wind Tunnel</b>
<i>LOCATION OF FACILITY</i>	University of Melbourne Walter Bassett Laboratory Parkville, VIC 3010
<i>CONTACT NAME</i>	Professor M.S. Chong
<i>CONTACT TEL</i>	03 8344 6742
<i>CONTACT E-MAIL</i>	<a href="mailto:chong@mame.mu.oz.au">chong@mame.mu.oz.au</a>
<i>WEB PAGE</i>	<a href="http://www.mame.mu.oz.au/fluids/">http://www.mame.mu.oz.au/fluids/</a>
<b>TUNNEL CHARACTERISTICS</b>	
<i>TEST SECTION SHAPE</i>	Rectangular
<i>TEST SECTION SIZE</i>	0.37m high x 0.9m wide x 5m long
<i>MAXIMUM VELOCITY</i>	30m/sec (zero pressure gradient configuration)
<i>MODEL SUPPORTS</i>	Stepper motor traverse in vertical plane
<i>TUNNEL LAYOUT</i>	Open return
<i>MEASURING EQUIPMENT</i>	Two-channel hot-wire anemometer MKS "Baratron" (type 698) pressure transducer 16 Channel Data Acquisition system 140 Channel Scanivalve pressure transducer

<i>NAME OF FACILITY</i>	<b>Large Flow Visualisation Wind Tunnel</b>
<i>LOCATION OF FACILITY</i>	University of Melbourne Walter Bassett Laboratory Parkville, VIC 3010
<i>CONTACT NAME</i>	Professor M.S. Chong
<i>CONTACT TEL</i>	03 8344 6742
<i>CONTACT E-MAIL</i>	<a href="mailto:chong@mame.mu.oz.au">chong@mame.mu.oz.au</a>
<i>WEB PAGE</i>	<a href="http://www.mame.mu.oz.au/fluids/">http://www.mame.mu.oz.au/fluids/</a>
<b>TUNNEL CHARACTERISTICS</b>	
<i>TEST SECTION SHAPE</i>	Rectangular
<i>TEST SECTION SIZE</i>	0.89m high x 1.22m wide x 5.4m long
<i>MAXIMUM VELOCITY</i>	3.5m/sec
<i>MODEL SUPPORTS</i>	Stepper motor traverse in Y & Z plane
<i>TUNNEL LAYOUT</i>	Open return
<i>MEASURING EQUIPMENT</i>	Two-channel hot-wire anemometer MKS "Baratron" (type 698) pressure transducer 16 Channel Data Acquisition system 140 Channel Scanivalve pressure transducer 5 Watt argon-ion laser Flying hot-wire (2m/sec - 8m/sec)

<i>NAME OF FACILITY</i>	<b>Calibration Tunnel</b>
<i>LOCATION OF FACILITY</i>	University of Melbourne Walter Bassett Laboratory Parkville, VIC 3010
<i>CONTACT NAME</i>	Professor M.S. Chong
<i>CONTACT TEL</i>	03 8344 6742
<i>CONTACT E-MAIL</i>	<a href="mailto:chong@mame.mu.oz.au">chong@mame.mu.oz.au</a>
<i>WEB PAGE</i>	<a href="http://www.mame.mu.oz.au/fluids/">http://www.mame.mu.oz.au/fluids/</a>
<b>TUNNEL CHARACTERISTICS</b>	
<i>TEST SECTION SHAPE</i>	Rectangular
<i>TEST SECTION SIZE</i>	0.27m high x 0.2m wide x 0.45m long
<i>MAXIMUM VELOCITY</i>	50m/sec
<i>MODEL SUPPORTS</i>	
<i>TUNNEL LAYOUT</i>	Open return
<i>MEASURING EQUIPMENT</i>	Two-channel hot-wire anemometer MKS "Baratron" (type 698) pressure transducer 16 Channel Data Acquisition system Dynamic calibrator for hot wires



<i>NAME OF FACILITY</i>	<b>DSTO Low Speed Wind Tunnel</b>
<i>LOCATION OF FACILITY</i>	Aeronautical & Maritime Research Laboratory 506 Lorimer Street Fishermans Bend VIC 3207
<i>CONTACT NAME</i>	Dr Neil Matheson
<i>CONTACT TEL</i>	03 9626 7450
<i>CONTACT E-MAIL</i>	<a href="mailto:Neil.Matheson@dsto.defence.gov.au">Neil.Matheson@dsto.defence.gov.au</a>
<i>WEB PAGE</i>	
<b>TUNNEL CHARACTERISTICS</b>	
<i>TEST SECTION SHAPE</i>	Octagonal
<i>TEST SECTION SIZE</i>	2.74m wide x 2.13m high x 4.1m long
<i>MAXIMUM VELOCITY</i>	100m/sec
<i>MODEL SUPPORTS</i>	Pylon - <i>Pitch &amp; Yaw</i> Column Sting - <i>Pitch, Roll, Vertical</i> Ground-board - <i>Fixed</i>
<i>TUNNEL LAYOUT</i>	Continuous Circuit (Closed Return)
<i>MEASURING EQUIPMENT</i>	Strain Gauge balance Solid-state pressure transducers Scanivalve

<i>NAME OF FACILITY</i>	<b>DSTO Transonic Wind Tunnel</b>
<i>LOCATION OF FACILITY</i>	Aeronautical & Maritime Research Laboratory 506 Lorimer Street Fishermans Bend VIC 3207
<i>CONTACT NAME</i>	Dr Neil Matheson
<i>CONTACT TEL</i>	03 9626 7450
<i>CONTACT E-MAIL</i>	<a href="mailto:Neil.Matheson@dsto.defence.gov.au">Neil.Matheson@dsto.defence.gov.au</a>
<i>WEB PAGE</i>	<a href="http://www.dsto.defence.gov.au/corporate/publicity/brochures/twt.html">www.dsto.defence.gov.au/corporate/publicity/brochures/twt.html</a>
<b>TUNNEL CHARACTERISTICS</b>	
<i>TEST SECTION SHAPE</i>	Square
<i>TEST SECTION SIZE</i>	0.806m x 0.806m
<i>MAXIMUM VELOCITY</i>	1.2 Mach (398m/sec) 1.4 Mach (464m/sec) with additional nozzle
<i>MODEL SUPPORTS</i>	Main Support - <i>Pitch, Roll, Vertical</i> Store Support - <i>Yaw, Pitch, Roll, Axial, Side, Vertical</i> Sidewall Support - <i>Pitch</i>
<i>TUNNEL LAYOUT</i>	Continuous Circuit (Closed Return)
<i>MEASURING EQUIPMENT</i>	

<i>NAME OF FACILITY</i>	<b>CSIRO NATA Wind Tunnel</b>
<i>LOCATION OF FACILITY</i>	CSIRO Atmospheric Research 107-121 Station Street Aspendale VIC 3195
<i>CONTACT NAME</i>	Dr Tom Beer
<i>CONTACT TEL</i>	03 9239 4691
<i>CONTACT E-MAIL</i>	<a href="mailto:Tom.beer@dar.csiro.au">Tom.beer@dar.csiro.au</a>
<i>WEB PAGE</i>	<a href="http://www.dar.csiro.au/tunnel/default.htm">www.dar.csiro.au/tunnel/default.htm</a>
<b>TUNNEL CHARACTERISTICS</b>	
<i>TEST SECTION SHAPE</i>	Rectangular
<i>TEST SECTION SIZE</i>	0.7m high x 1.25m wide x 3.2m long (standard) 0.7m high x 0.7m wide x 1.7m long (higher velocity)
<i>MAXIMUM VELOCITY</i>	15m/sec (standard), 27.5m/sec (higher velocity)
<i>MODEL SUPPORTS</i>	Ground-board (fixed)
<i>TUNNEL LAYOUT</i>	Open return
<i>MEASURING EQUIPMENT</i>	Laser-Doppler anemometer

<i>NAME OF FACILITY</i>	<b>PYE Laboratory Wind Tunnel</b>
<i>LOCATION OF FACILITY</i>	CSIRO Land & Water Division Clunies-Ross Street Acton, ACT
<i>CONTACT NAME</i>	Dale Hughes
<i>CONTACT TEL</i>	02 6246 5584
<i>CONTACT E-MAIL</i>	<a href="mailto:Dale.Hughes@cbr.clw.csiro.au">Dale.Hughes@cbr.clw.csiro.au</a>
<i>WEB PAGE</i>	<a href="http://www.cbr.clw.csiro.au/pyelab/tour/tunnel2.htm">http://www.cbr.clw.csiro.au/pyelab/tour/tunnel2.htm</a>
<b>TUNNEL CHARACTERISTICS</b>	
<i>TEST SECTION SHAPE</i>	Rectangular
<i>TEST SECTION SIZE</i>	1.8m wide x 0.9m high x 16m long
<i>MAXIMUM VELOCITY</i>	20m/sec
<i>MODEL SUPPORTS</i>	Ground-board (fixed)
<i>TUNNEL LAYOUT</i>	Open return
<i>MEASURING EQUIPMENT</i>	Laser-Doppler anemometer

<i>NAME OF FACILITY</i>	<b>No 1 Boundary Layer Wind Tunnel</b>
<i>LOCATION OF FACILITY</i>	The University of Sydney Department of Civil Engineering Wind Engineering Services NSW 2006
<i>CONTACT NAME</i>	Prof. Kenny Kwok
<i>CONTACT TEL</i>	02 9351 2122
<i>CONTACT E-MAIL</i>	<a href="mailto:K.Kwok@civil.usyd.edu.au">K.Kwok@civil.usyd.edu.au</a>
<i>WEB PAGE</i>	<a href="http://www.civil.su.oz.au/wes/wes.htm">http://www.civil.su.oz.au/wes/wes.htm</a>
<b>TUNNEL CHARACTERISTICS</b>	
<i>TEST SECTION SHAPE</i>	Rectangular
<i>TEST SECTION SIZE</i>	2.4m wide x 1.8m high x 15m long
<i>MAXIMUM VELOCITY</i>	15m/sec
<i>MODEL SUPPORTS</i>	
<i>TUNNEL LAYOUT</i>	Open ended
<i>MEASURING EQUIPMENT</i>	Hotwire anemometer Scanivalve Scanner Force Balance

<i>NAME OF FACILITY</i>	<b>No 2 Boundary Layer Wind Tunnel</b>
<i>LOCATION OF FACILITY</i>	The University of Sydney Department of Civil Engineering Wind Engineering Services NSW 2006
<i>CONTACT NAME</i>	Prof. Kenny Kwok
<i>CONTACT TEL</i>	02 9351 2122
<i>CONTACT E-MAIL</i>	<a href="mailto:K.Kwok@civil.usyd.edu.au">K.Kwok@civil.usyd.edu.au</a>
<i>WEB PAGE</i>	<a href="http://www.civil.su.oz.au/wes/wes.htm">http://www.civil.su.oz.au/wes/wes.htm</a>
<b>TUNNEL CHARACTERISTICS</b>	
<i>TEST SECTION SHAPE</i>	Rectangular
<i>TEST SECTION SIZE</i>	1.6m wide x 1.2m high
<i>MAXIMUM VELOCITY</i>	12m/sec
<i>MODEL SUPPORTS</i>	
<i>TUNNEL LAYOUT</i>	Open ended
<i>MEASURING EQUIPMENT</i>	Hotwire anemometer Scanivalve Scanner Force Balance

<i>NAME OF FACILITY</i>	<b>Snowdrift Wind Tunnel</b>
<i>LOCATION OF FACILITY</i>	The University of Sydney Department of Civil Engineering Wind Engineering Services NSW 2006
<i>CONTACT NAME</i>	Prof. Kenny Kwok
<i>CONTACT TEL</i>	02 9351 2122
<i>CONTACT E-MAIL</i>	<a href="mailto:K.Kwok@civil.usyd.edu.au">K.Kwok@civil.usyd.edu.au</a>
<i>WEB PAGE</i>	<a href="http://www.civil.su.oz.au/wes/wes.htm">http://www.civil.su.oz.au/wes/wes.htm</a>
<b>TUNNEL CHARACTERISTICS</b>	
<i>TEST SECTION SHAPE</i>	Rectangular
<i>TEST SECTION SIZE</i>	1.2m wide x 0.9m high
<i>MAXIMUM VELOCITY</i>	10m/sec
<i>MODEL SUPPORTS</i>	
<i>TUNNEL LAYOUT</i>	Closed-circuit
<i>MEASURING EQUIPMENT</i>	Hotwire anemometer Scanivalve Scanner Force Balance

<i>NAME OF FACILITY</i>	<b>Water Tunnel</b>
<i>LOCATION OF FACILITY</i>	University of Melbourne Walter Bassett Laboratory Parkville, VIC 3010
<i>CONTACT NAME</i>	Professor M.S. Chong
<i>CONTACT TEL</i>	03 8344 6742
<i>CONTACT E-MAIL</i>	<a href="mailto:chong@mame.mu.oz.au">chong@mame.mu.oz.au</a>
<i>WEB PAGE</i>	
<b>TUNNEL CHARACTERISTICS</b>	
<i>TEST SECTION SHAPE</i>	Square
<i>TEST SECTION SIZE</i>	0.3m high x 0.3m wide x 1.4m long
<i>MAXIMUM VELOCITY</i>	0.1m/sec
<i>MODEL SUPPORTS</i>	
<i>TUNNEL LAYOUT</i>	Closed circuit, horizontal
<i>MEASURING EQUIPMENT</i>	Laser Doppler anemometer



<i>NAME OF FACILITY</i>	<b>Flow Visualisation Water Tunnel</b>
<i>LOCATION OF FACILITY</i>	Aeronautical & Maritime Research Laboratory 506 Lorimer Street Fishermans Bend VIC 3207
<i>CONTACT NAME</i>	Dr David Thompson
<i>CONTACT TEL</i>	03 9626 7453
<i>CONTACT E-MAIL</i>	<a href="mailto:David.Thompson@dsto.defence.gov.au">David.Thompson@dsto.defence.gov.au</a>
<i>WEB PAGE</i>	
<b>TUNNEL CHARACTERISTICS</b>	
<i>TEST SECTION SHAPE</i>	Rectangular
<i>TEST SECTION SIZE</i>	0.5m wide x 0.38m deep x 1.52m long
<i>MAXIMUM VELOCITY</i>	0.3m/sec
<i>MODEL SUPPORTS</i>	Platform-mounted
<i>TUNNEL LAYOUT</i>	Recirculating
<i>MEASURING EQUIPMENT</i>	Scani-valve with pressure transducers

<i>NAME OF FACILITY</i>	Cavitation Tunnel
<i>LOCATION OF FACILITY</i>	Australian Maritime College P.O. Box 986, Launceston Tasmania, Australia, 7250.
<i>CONTACT NAME</i>	Dr Paul Brandner
<i>CONTACT TEL</i>	03 6335 4832
<i>CONTACT E-MAIL</i>	<a href="mailto:P.Brandner@mte.amc.edu.au">P.Brandner@mte.amc.edu.au</a>
<i>WEB PAGE</i>	<a href="http://www.amc.edu.au/mte/">http://www.amc.edu.au/mte/</a>
<b>TUNNEL CHARACTERISTICS</b>	
<i>TEST SECTION SHAPE</i>	Rectangular
<i>TEST SECTION SIZE</i>	0.6m wide x 0.6m deep x 2.6m long
<i>MAXIMUM VELOCITY</i>	12m/sec
<i>MODEL SUPPORTS</i>	Sting-mounting
<i>TUNNEL LAYOUT</i>	Recirculating
<i>MEASURING EQUIPMENT</i>	6-component balance Scani-valve with pressure transducers

<i>NAME OF FACILITY</i>	<b>AMC Towing Tank</b>
<i>LOCATION OF FACILITY</i>	Launceston, Tasmania
<i>CONTACT NAME</i>	Gregor Macfarlane
<i>CONTACT TEL</i>	03 6335 4880
<i>CONTACT E-MAIL</i>	<a href="mailto:G.Macfarlane@mte.amc.edu.au">G.Macfarlane@mte.amc.edu.au</a>
<i>WEB PAGE</i>	<a href="http://www.amc.edu.au/mte/">http://www.amc.edu.au/mte/</a>
<b>TUNNEL CHARACTERISTICS</b>	
<i>TEST SECTION SHAPE</i>	Rectangular
<i>TEST SECTION SIZE</i>	3.55m wide x 1.5m deep x 60m long
<i>MAXIMUM VELOCITY</i>	4.1m/sec
<i>MODEL SUPPORTS</i>	Traversing Platform
<i>TUNNEL LAYOUT</i>	Tank
<i>MEASURING EQUIPMENT</i>	Multi-Video System Custom Signal Conditioner (Sampling Rate: 1-500Hz) In-House Data Acquisition & Analysis software

<i>NAME OF FACILITY</i>	<b>Flume Tank Facility</b>
<i>LOCATION OF FACILITY</i>	Australian Maritime College P.O. Box 21, Beaconsfield Tasmania, Australia, 7277
<i>CONTACT NAME</i>	
<i>CONTACT TEL</i>	03 6335 4424
<i>CONTACT E-MAIL</i>	
<i>WEB PAGE</i>	<a href="http://www.amc.edu.au/mte/">http://www.amc.edu.au/mte/</a>
<b>TUNNEL CHARACTERISTICS</b>	
<i>TEST SECTION SHAPE</i>	Rectangular
<i>TEST SECTION SIZE</i>	5.0m wide x 2.5m deep x 17.2m long
<i>MAXIMUM VELOCITY</i>	1.5m /sec
<i>MODEL SUPPORTS</i>	Sting-mounting
<i>TUNNEL LAYOUT</i>	Recirculating
<i>MEASURING EQUIPMENT</i>	6-component balance Scani-valve with pressure transducers

<i>NAME OF FACILITY</i>	<b>Bldg 208 Water Tunnel</b>
<i>LOCATION OF FACILITY</i>	CSIRO Building Construction & Engineering Graham Rd, Highett Victoria 3190
<i>CONTACT NAME</i>	Richard Mannaseh
<i>CONTACT TEL</i>	03 9252 6340
<i>CONTACT E-MAIL</i>	<a href="mailto:Richard.Mannaseh@dbce.csiro.au">Richard.Mannaseh@dbce.csiro.au</a>
<i>WEB PAGE</i>	None existing
<b>TUNNEL CHARACTERISTICS</b>	
<i>TEST SECTION SHAPE</i>	Variable (Rectangular to Square)
<i>TEST SECTION SIZE</i>	0.3m wide x 0.3m high (max) x 1.2m long
<i>MAXIMUM VELOCITY</i>	Variable depending on volume - Av 1.5m/sec
<i>MODEL SUPPORTS</i>	Pylon mount
<i>TUNNEL LAYOUT</i>	Recirculating
<i>MEASURING EQUIPMENT</i>	Force Balance Laser Doppler velocimeter Phase Doppler particle analyser Hydrophones