



## Industrial Research Services

Materials Science & Engineering, Graham Road (PO Box 56), Highett, Victoria, Australia 3190

Telephone: 61 3 9252 6000 Facsimile: 61 3 9252 6244 Email: tiles@csiro.au Web: <http://www.cmse.csiro.au>

Registered Testing Authority - CSIRO

17 December 2009

Our Ref. EN13 / 1774 03/0212

### TEST REPORT No. 5194s-1

Requested by: Quayclean  
Contact name: Sash Petrevski  
on (date): 17 December 2009  
On-site address: RACV, 501 Bourke St. Melbourne

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This test report consists of 4 pages

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**THIS REPORT DETAILS THE RESULTS OF ON-SITE SLIP RESISTANCE TESTING**  
**The tests were carried out in accordance with AS/NZS 4663:2004 -**  
**Slip resistance measurement of existing pedestrian surfaces.**

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## SLIP RESISTANCE MEASUREMENT OF EXISTING PEDESTRIAN SURFACES

TEST CARRIED OUT IN ACCORDANCE WITH  
AS/NZS 4663:2004

Test Date: 16 December 2009

Operator: Peter Westgate Slider: Pendulum = Four S rubber - conditioned with grade P400 paper, dry

SITE DESC 1: RACV, 501 Bourke St. Melbourne  
SURFACE TYPE: Ceramic tiles (profiled surface) 300mm x 300mm

### LOCATION DESCRIPTION/CONDITIONS:

Temperature: 0 C

Loc	Description	Slope °	Surface Condition	Surface prep.	Direction of Testing
1:	Pool deck - outside female change room	0	Clean	Deionized water	Direction giving lowest BPN
2:	Pool deck - new tile outside storeroom	0	Clean	Deionized water	Direction giving lowest BPN
3:	Pool deck - outside steam room doorway	0	Clean	Deionized water	Direction giving lowest BPN
4:	Pool deck - slow lane entry	0	Clean	Deionized water	Direction giving lowest BPN
5:	Pool deck - eastside of pool near drain	0	Clean	Deionized water	Direction giving lowest BPN

### RESULTS:

WET PENDULUM (Appendix A)  
Test Device: Stanley (S/N: 7829, calibrated 17/11/08)

Loc	BPN Mean (last 3 swings)	Reported BPN Mean
1:	47.7	50
2:	54.0	
3:	53.0	
4:	46.0	
5:	47.0	
Mean:	49.5	

CURRENT MAINTENANCE PRACTICE:  
Cleaning contract held by Quayclean

COMMENTS:  
Swimming pool tiles are clean, no body fats evident.





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REPORT NO: 5194s-1  
ISSUE DATE: 17 December 2009  
ON-SITE ADDRESS: RACV, 501 Bourke St. Melbourne

### INTERPRETATION OF THE WET PENDULUM RESULTS (from Table 1, AS/NZS 4663:2004)

Pendulum (see Note 1) mean BPN		Contribution of the floor surface to the risk of slipping when wet
Four S rubber	TRRL rubber	
>54	>44	Very low
45-54	40-44	Low
35-44	-	Moderate
25-34	-	High
<25	-	Very high

**NOTES:**

- 1: While either of these test methods may be used, the test report shall specify which slider was used.
- 2: It is expected that these wet surfaces will be more slip resistive when dry.

### INTERPRETATION OF INDIVIDUAL AND MEAN DRY FLOOR FRICTION RESULTS (from Table 2, AS/NZS 4663:2004)

Floor friction tester value	Contribution of the floor surface to the risk of slipping when dry
$\geq 0.4$	Moderate to very low
$< 0.4$	High to very high

### SUMMARY

The slip resistance requirements of a swimming pool surround according to Australian Standards handbook HB197 Table 3 is Wet Pendulum - Class W or 45 to 54 BPN. The RACV swimming pool surround achieved an average of 50 BPN or Class W. This result achieves the requirements of the Australian Standard for swimming pool surrounds.

Consulting services are available if further detailed analysis of the test results are required.





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Date and Place

17 December 2009, Highett, Vic

Name, Title and Signature:

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**Consulting services are available if further detailed analysis of the test results are required.**

PR:W171209-09:20:48



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**Registered Testing Authority - CSIRO**

3 April 2009

Our Ref. EN13 / 1774 03/0212

### **TEST REPORT No. 4799s**

Requested by: Quayclean  
Contact name: Sash Petrevski  
on (date): 30 March 2009  
On-site address: RACV 501 Bourke St, Melbourne 3000

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## SLIP RESISTANCE MEASUREMENT OF EXISTING PEDESTRIAN SURFACES

TEST CARRIED OUT IN ACCORDANCE WITH  
AS/NZS 4663:2004

Test Date: 2 April 2009

Operator: Peter Westgate Slider: Pendulum = Four S rubber - conditioned with grade P400 paper, dry

SITE DESC 1: RACV - Swimming pool surround, pool deck

SURFACE TYPE: Ceramic tiles (profiled surface)

### LOCATION DESCRIPTION/CONDITIONS:

Temperature: 23 C

Loc	Description	Slope °	Surface Condition	Surface prep.	Direction of Testing
1:	Pool deck, Change room - Technique 1	0	Clean	Deionized water	Direction giving lowest BPN
2:	Pool deck, Spa - Technique 2	0	Clean	Deionized water	Direction giving lowest BPN
3:	Pool deck, Under windows - Technique 3	0	Clean	Deionized water	Direction giving lowest BPN
4:	Pool deck, Wading pool - Technique 4	0	Clean	Deionized water	Direction giving lowest BPN
5:	Pool deck, Wading pool - Technique 5	0	Clean	Deionized water	Direction giving lowest BPN
6:	Pool deck, Under windows - Technique R10	0	Clean	Deionized water	Direction giving lowest BPN

### RESULTS:

#### WET PENDULUM (Appendix A)

Test Device: Munro-Stanley (S/N: 9234, calibrated 13/09/07)

Loc	BPN Mean (last 3 swings)	Reported BPN Mean
1:	44.7	
2:	37.7	
3:	44.0	
4:	42.3	
5:	35.7	
6:	25.3	
Mean:	38.3	38

### CURRENT MAINTENANCE PRACTICE:

New cleaning treatments





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## INTERPRETATION OF THE WET PENDULUM RESULTS (from Table 1, AS/NZS 4663:2004)

Pendulum (see Note 1) mean BPN		Contribution of the floor surface to the risk of slipping when wet
Four S rubber	TRRL rubber	
>54	>44	Very low
45-54	40-44	Low
35-44	-	Moderate
25-34	-	High
<25	-	Very high

### NOTES:

- 1: While either of these test methods may be used, the test report shall specify which slider was used.
- 2: It is expected that these wet surfaces will be more slip resistive when dry.

## INTERPRETATION OF INDIVIDUAL AND MEAN DRY FLOOR FRICTION RESULTS (from Table 2, AS/NZS 4663:2004)

Floor friction tester value	Contribution of the floor surface to the risk of slipping when dry
$\geq 0.4$	Moderate to very low
$< 0.4$	High to very high

## SUMMARY

Previous testing of the RACV pool indicated that the swimming pool deck was classified under Table 2 of Australian Standard AS4586 Wet Pendulum test as a Class Y. Under the handbook associated to this standard HB197 the swimming pool surround is required to be a Class W. Quayclean has prepared 4 test pads for cleaning. Each test pad has either a particular chemical concentration, a different scrubbing pad or both.

Cleaning Technique No.1 test pad is located on the pool deck by the Ladies Change Room sign. The average of the wet pendulum testing is 45BPN. The wet pendulum classification under Table 2 of AS4586 is Class W. The "Cleaning Technique No.1" satisfies the requirements of the Handbook HB197 for swimming pool surrounds. Cleaning Technique No.2 test pad is located on the pool deck by the spa exit rails. The average of the wet pendulum testing is 38BPN. The wet pendulum classification under Table 2 of AS4586 is Class X. The "Cleaning Technique No.2" does not satisfy the requirements of the Handbook HB197 for swimming pool surrounds. Cleaning Technique No.3 test pad is located on the pool deck under the external windows. The average of the wet pendulum testing is 44BPN. The wet pendulum classification under Table 2 of AS4586 is Class X. The "Cleaning Technique No.3" does not satisfy the requirements of the Handbook HB197 for swimming pool surrounds. Cleaning Technique No.4 test pad is located on the pool deck by the wading pool. The average of the wet pendulum testing is 42BPN. The wet pendulum classification under Table 2 of AS4586 is Class X. The "Cleaning Technique No.4" does not satisfy the requirements of the Handbook HB197 for swimming pool surrounds.

Test Pad No.5 was not a speciality cleaning site. The site was of my choosing on the swimming pool deck. The test site was by the wading pool near the storage bay. The average of the wet pendulum testing is 36BPN. The wet pendulum classification under Table 2 of AS4586 is Class X. This site does not satisfy the requirements of the Handbook HB197 for swimming pool surrounds. Test site No.6 is the slip resistance pad prepared by R10 Plus. The site is under the external windows at the wading pool end of the swimming pool deck. The average of the wet pendulum testing is 25BPN. The wet pendulum classification under Table 2 of AS4586 is Class Z. The "R10 Plus Technique" does not satisfy the requirements of the Handbook HB197 for swimming pool surrounds.

All of the Quayclean test pads have improved the slip resistance rating from the previously rated Class Y to either Class X or Class W. The R10 Plus test pad has lowered the rating to Class Z. Quayclean Cleaning Technique sites No.1, 3 and 4 are very similar in BPN average. Site No.1 achieves the required rating of Class W. After a number of treatments I would expect all three test pad sites would achieve Class W. It is my experience that repeat cleaning with the same technique improves from the initial one off cleaning test pad preparation. This is due to the body fats being slowly drawn out of the unglazed surface. It is my recommendation that the RACV pool deck have repeat cleaning to Techniques 1, 3 and or 4.

Consulting services are available if further detailed analysis of the test results are required.





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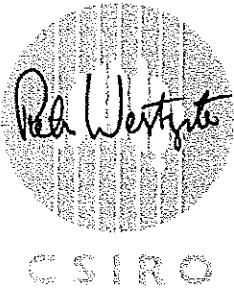
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Date and Place 3 April 2009, Highett, Vic

Name, Title and Digital Signature:



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Project Leader

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**Consulting services are available if further detailed analysis of the test results are required.**

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