

**Pedestrian Slip Resistance testing to  
AS/NZS 3661.1: 1993 for Equus.**

**Wet Condition Pedestrian Slip Resistance Testing  
to AS/NZS 3661.1: 1993**



*Central Laboratories Report 10-527919.85*

# **Pedestrian Slip Resistance testing to AS/NZS 3661.1: 1993 for Equus.**

**S.M. Potter**

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Opus International Consultants  
Central Laboratories  
138 Hutt Park Road  
PO Box 30845  
Lower Hutt

Telephone: 04 587 0600  
Facsimile: 04 587 0604

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Test Report 10-527919.85

**WET CONDITION  
PEDESTRIAN SLIP RESISTANCE TESTING:**

Tested by Shirley Potter

Checked by Tiffany Lester

Equus  
P.O Box 38636  
Wellington Mail Centre  
Wellington

Contact:  
Ioasa Peseta  
Ph 576 0333

**Sample** Lower Hutt Railway Station

<b>Sampled by</b>	Random areas in sample	<b>Client</b>	Equus
<b>Number of areas</b>	5	<b>Material type</b>	Duracon
<b>Specimen size</b>	1000 x 500mm	<b>Manufacturer</b>	Equus
<b>Substrate</b>	Concrete	<b>Common name</b>	Duracon
<b>Date Tested</b>	8.9.10	<b>Colour</b>	White
<b>Sample number</b>	N/A	<b>Surface finish</b>	Anti Slip
<b>Project number</b>	527919.85	<b>Surface coating</b>	Duracon BC

**TESTING**

**Test** AS/NZS 3661.1: 1993 Slip Resistance of Pedestrian Surfaces - Requirements  
Appendix A Method for the Measurement of the Coefficient of Friction of Wet Surfaces

<b>Preparation</b>	A5 for in situ testing	<b>Date of test</b>	8.9.10
<b>Type of test</b>	Fixed	<b>Location of test</b>	Lower Hutt Railway Station
<b>Surface</b>	Wet	<b>Air temperature</b>	20°C
		<b>Relative humidity</b>	41 percent

**TEST REQUIREMENTS**

AS/NZS 3661.1 requires that when tested wet the pedestrian surface shall have a mean coefficient of friction not less than 0.4, and no specimen in that sample shall have a mean coefficient of friction less than 0.35. Compliance with the slip resistant performance of NZBC D1.3.3(d) may be verified by referring to the acceptable solution (AS 1) of that clause which cites this test standard and acceptable values.

**Further background to the testing and requirements is given on following pages.**

**TEST RESULTS**

Specimen number	1	2	3	4	5
Mean coefficient of friction	<b>0.63</b>	<b>0.71</b>	<b>0.67</b>	<b>0.72</b>	<b>0.74</b>
<b>SAMPLE MEAN WET COEFFICIENT OF FRICTION</b>					<b>0.69</b>

**COMMENTS**

**This information is provided so as to direct users to the appropriate standards and Building Code clauses when using the pedestrian slip resistance testing results.**

**AS/NZS 3661.1: 1993**

The testing that was applied was in accordance with the joint Australian and New Zealand standard AS/NZS 3661.1: 1993 "Slip Resistance of Pedestrian Surfaces - Requirements". The scope of the standard states that these test methods are appropriate to determine the characteristics of surface materials either in the laboratory, under conditions in which the surface materials are intended to be installed, or in situ following installation.

The test method is selected on the basis of whether the material is to be used in either a wet or dry area. The "Method for the Measurement of the Coefficient of Friction of Wet Surfaces" is set out in Appendix A of the standard. Testing for the wet surface condition uses the pendulum friction tester.

The TRRL Pendulum (pendulum friction tester) has a rigid swinging arm, approximately 450mm long, which contacts the surface with a spring loaded slider, about 75 by 20mm in size, at a speed of about 2m/sec. The slider is of a specially designed rubber material (Simulated Standard Shoe Sole, the 4S rubber) so that the instrument delivers, as far as possible, a response that is representative of a "typical" pedestrian wearing suitable footwear. This instrument is regarded as equating the action of pedestrians walking in unconstrained level spaces. It is believed it replicates the aquaplaning effect that can be particularly pronounced when smooth or highly glazed surfaces are wet.

The requirements of AS/NZS 3661.1: 1993 and the test methods have been incorporated in Clause D1 (Access ways) of the New Zealand Building Code.

Friction requirements of surfaces as defined in AS/NZS 3661.1: 1993 are:

**Coefficient of friction: Wet**

When tested in accordance with the method set out in Appendix A, the pedestrian surface shall have a mean coefficient of friction of not less than 0.4 and no specimen in that sample shall be less than 0.35.

**Coefficient of friction: Dry**

When tested in accordance with the method set out in Appendix B, the pedestrian surface shall have a mean coefficient of friction of not less than 0.4 and no specimen in that sample shall be less than 0.35.

Note: It would generally be expected that surfaces that have been shown to comply with the wet requirement would also comply with the dry requirement.

**Ramps and other sloped areas:**

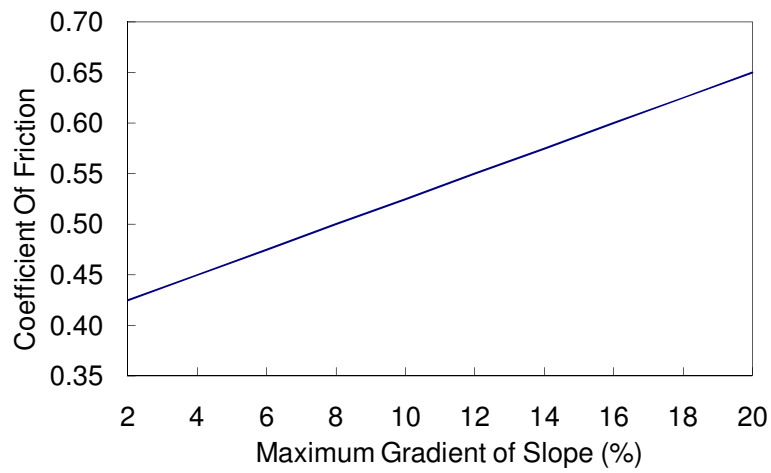
For all sloped or graded surfaces with a gradient not less than 2 percent, the minimum required value for the coefficient of friction of either wet or dry surfaces as specified above shall be increased in accordance with the following equation, expressed to an accuracy of 0.01:

$$\mu_m = \frac{100\mu + M}{100 - M\mu}$$

where  $\mu_m$  = coefficient of friction required for a sloped surface  
 $\mu$  = coefficient of friction obtained on a horizontal surface  
 $M$  = maximum gradient of slope, in percent

This equation is represented in graphical form below:

**Coefficient of Friction Required for a Sloped Surface. Calculated for  $\mu = 0.4$**



For example, a surface with a slope of 8% would require a coefficient of friction of 0.5.