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TEST REPORT

Ceram Reference:	122333 (QT20722/1/LC)/Ref. 1.0
Project Title:	On Site Slip Resistance Testing of Grip top D400 Access Covers
Client:	Saint Gobain PAM UK
For The Attention of:	Mr Paul Thompson
Author(s):	Miss Lisa Cobden
Report Date:	21 May, 2012
Purchase Order No.:	4500280579
Work Location:	Ceram UK

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Reviewer

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Project Manager

CONTENTS

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1 INTRODUCTION

On site slip resistance testing of Grip Top access covers was requested by Mr Paul Thompson of Saint Gobain PAM Ltd. The access covers were positioned at various locations around the road system of Bristol city centre. The access covers had been in-situ for approximately five years and an independent assessment of the covers was required to determine if the slip resistant characteristics of the surface had changed as a result of weathering and wear. The covers chosen for test were felt to present the worst case scenarios as they were all positioned such that they were in the wheel track of the road.

The slip resistance measurements took place on Monday 14th May 2012 and were carried out by Ms L Cobden of Ceram. Also present during the testing was Mr Paul Thompson of Saint Gobain PAM Ltd and Mr Mike Brewer of Bristol City Council.

2 TEST METHOD AND AREAS

All testing was carried out using the pendulum apparatus and the test method was based on that in BS 7976:2002 and BS EN 13036-4:2011. The apparatus is shown in the Appendix. This apparatus and test method is strongly recommended by the Health and Safety Executive and such a test would be carried out by them in the event of a skid or slipping accident.

The results are obtained from averaging five values at a given point. Three points on the surface are measured (horizontally vertically and diagonally) this is to ensure that the slip values are not influenced by the effects of any directional surface characteristics. The measurements are normally conducted in both the wet and dry condition however due to the inclement weather it was impossible to obtain a true dry reading. However, it is widely acknowledged that wet and contaminated surfaces give the worst case scenario and surfaces that give good values in the wet will at least perform as well and usually better in the dry condition. The measurements were undertaken using Ceram pendulum No.669 Calibration Certificate CN16 and Rubber Sliders No.121, 122 and 21.

The four locations for test were as follows:

- Area 1 Eastbound Carriage Way Junction with Bond Street and York Street
- Area 2 Eastbound Carriage Way Bond Street (Bupa Building)
- Area 3 Eastbound Carriage Way Junction with Bond Street and Pritchard Street
- Area 4 Eastbound Carriage Way Bond Street South (Phoenix House).

The areas were tested using two rubber sliders, test slider 55 which is a softer rubber and a slightly harder rubber slider 96.

The rubber sliders was pre condition as described in BS 7976-2:2002 Section 5.2.2.2

The covers were measured in the “as found condition” with no pre-preparation prior to test.

It is normal during testing to take surface roughness measurements using a surtronic duo roughness meter, however, on this occasion the surface roughness was found to be very high and outside the measuring parameters of the machine.

A Skid Resistance Value of 55 is recommended by the Design Manual for Roads and Bridges (DMRB) as a minimum for high risk situations.

The minimum level of slip resistance value, measured on the pendulum that is deemed to be safe for pedestrians as set by the HSE, is **36** in the worst foreseeably contaminated condition.

Furthermore the UK Slip Resistance Group, a body set up in 1986 and made up of flooring manufacturers, representatives of the Health and Safety Executive (HSE), test houses, and forensic engineers who all have long experience of slip resistance testing, identify the following categories of slip:

Slipping Potential	SRV
High	0–24
Moderate	25–35
Low	36+

Reference: Modified from UKSRG Guidelines Issue 3 2005, page 20, Table 5.

3 RESULTS

3.1 Pendulum Test Values

Table 1 – Area 1

Pendulum Position/Condition	Pendulum Test Values						Slip Potential
	1	2	3	4	5	Average	
Wet (Horizontal) (Slider 55)	80	80	80	80	80	80	LOW
Wet (Vertical) (Slider 55)	83	83	83	83	83	83	
Wet (Diagonal) (Slider 55)	80	81	80	81	81	81	
Wet (Horizontal) (Slider 96)	76	76	76	76	74	76	
Wet (Vertical) (Slider 96)	74	74	75	74	75	75	
Wet (Diagonal) (Slider 96)	76	77	74	77	74	76	

Table 2 – Area 2

Pendulum Position/Condition	Pendulum Test Values						Slip Potential
	1	2	3	4	5	Average	
Wet (Horizontal) (Slider 55)	84	84	83	83	83	83	LOW
Wet (Vertical) (Slider 55)	83	84	84	84	84	84	
Wet (Diagonal) (Slider 55)	80	81	81	81	81	81	
Wet (Horizontal) (Slider 96)	74	74	74	80	75	75	
Wet (Vertical) (Slider 96)	74	72	74	74	76	74	
Wet (Diagonal) (Slider 96)	76	75	74	75	74	75	

Table 3 – Area 3

Pendulum Position/Condition	Pendulum Test Values						Slip Potential
	1	2	3	4	5	Average	
Wet (Horizontal) (Slider 55)	74	74	75	75	74	75	LOW
Wet (Vertical) (Slider 55)	73	78	74	75	74	75	
Wet (Diagonal) (Slider 55)	74	74	74	74	74	74	
Wet (Horizontal) (Slider 96)	69	70	69	70	70	70	
Wet (Vertical) (Slider 96)	69	69	72	74	71	71	
Wet (Diagonal) (Slider 96)	69	71	69	69	69	69	

Table 4 – Area 4

Pendulum Position/Condition	Pendulum Test Values						Slip Potential
	1	2	3	4	5	Average	
Wet (Horizontal)) (Slider 55)	80	80	80	81	81	80	LOW
Wet (Vertical)) (Slider 55)	83	81	81	80	80	81	
Wet (Diagonal)) (Slider 55)	80	80	80	80	80	80	
Wet (Horizontal) (Slider 96)	72	70	70	70	71	71	
Wet (Vertical) (Slider 96)	72	72	72	73	72	72	
Wet (Diagonal) (Slider 96)	71	71	73	73	73	73	

Test Conditions
Temperature: 11°C
Weather: Rain

Average PTV Reading using slider 55 was found to be 80.

Average PTV Reading using slider 96 was found to be 73.

4 CONCLUSIONS

All of the covers tested were found to have a low potential for both skidding and slipping. The values obtained were in excess of the 55 recommended by the Design Manual for Roads and Bridges (DMRB) as a minimum for high risk situations and were also in excess of the 36 required by the HSE as a minimum for pedestrian safety.

The covers have maintained their slip resistant characteristics with little or no deterioration over the 5 year period of service.

NOTE: The results given in this report apply only to the samples that have been tested.

END OF REPORT

APPENDIX - Plates

Pendulum Test Apparatus

Test Surface

Example of Test Location