



Date of Issue: 05.08.2013

**Leiths (Scotland) Ltd  
Rigifa  
Cove  
Aberdeen  
AB12 3LR**

**TS 2010  
PRODUCT PROPOSAL  
STAGE 1**

***Laboratory Validation  
Of  
Necessary Properties***

<b>Mixing Plant:</b>	<b>Blackhills Quarry, Cove, Aberdeen (Kishorn Aggregate)</b>
<b>Mix Designation:</b>	<b>RIGAGRIP SMA 8 surf (Nypol 103, 0.3% fibres)</b>

## Constituents

### Aggregates

SIZE	SOURCE	TYPE
6,3/8mm	Kishorn Quarry	Crushed Rock
4/6,3mm	Kishorn Quarry	Crushed Rock
0/4mm	Kishorn Quarry	Crushed Rock

### Binder

TYPE	GRADE
Nypol 103	75/130 / 75 PMB

### Filler

TYPE	SOURCE
Crushed limestone	Highland Lime, Torlundy, Highlands.

### Fibre

TYPE	SOURCE
Viatop	J Rettenmaier

### List of attached information

<b>Property</b>	<b>Test method / procedure</b>	<b>Comments</b>
Coarse aggregate – particle Density	BS EN 1097 – 6: 2000	See CE certificate
Coarse aggregate – resistance to polishing	BS EN 1097 – 8: 2009	See CE certificate
Coarse aggregate – resistance to abrasion	BS EN 1097 – 8: 2009, Annex A	See CE certificate
Coarse aggregate – resistance to fragmentation	BS EN 1097 – 2: 2010	See CE certificate
Coarse aggregate – resistance to wear	BS EN 1397 – 1: 1996 Micro Deval method	See CE certificate
Air voids content	BS EN 13108 – 20: 2006	See attached report
Binder content	BS EN 12697 – 1:2005	See attached report
Binder penetration	BS EN 1426: 2007	See attached product information sheet
Binder softening point	BS EN 1427: 2007	See attached product information sheet
Grading	BS EN 12697 – 2: 2002	See attached report
Binder drainage	DD 232	See attached report
Resistance to permanent deformation	BS EN 12697 – 22: 2003	See attached report

**DECLARED TARGET GRADING AND TARGET COMPOSITION LIMITS**

MIX	<b>RIGAGRIP SMA 8 surf (Nypol103) TS 2010</b>
SPECIFICATION	BS EN 13108 - 5 / PD 6691 / TS 2010
SUPPLIER	Leiths (Scotland) Ltd
SOURCE	Blackhills Coating Plant, Aberdeen.

SIEVE SIZE (mm)	DECLARED TARGET GRADING (% PASSING)	LIMITS FOR COMPOSITION (TS 2010: Table 2.1A)
11,2	100	100
8	100	93 - 100
5,6	54	35 - 55
2	24	20 - 32
0,71	17	-
0,125	12	
0,063	9.0	8 - 12

Binder Content (%)	6,9	6,7 - 7,1
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0086-CPD-515164



**Leiths (Scotland) Ltd**  
**Kishorn Quarry**  
**Nr Strathcarron**  
**Ross-shire**  
**IV54 8XF**  
**Telephone: 01224 876333**  
**Fax: 01224 876332**

**12**

**EN 13043**

**Aggregates for Bituminous Mixtures**

Aggregate Type	Declared	Crushed Rock
Particle shape	Category	Fl <sub>25</sub>
Particle size	Designation	6/8mm G <sub>C</sub> 85/20
	Tolerance Category	G <sub>20/15</sub>
Fines Content	Category	f <sub>4</sub>
Particle density	Declared Value	2.68 Mg/m <sup>3</sup>
Resistance to Fragmentation /Crushing	Category	LA <sub>20</sub>
Resistance to Polishing/ Abrasion/Wear		
Polished stone value	Declared Value	PSV <sub>60</sub>
Aggregate abrasion value	Category	AAV <sub>10</sub>
Resistance to Wear of Coarse Aggregate	Category	M <sub>DE</sub> 15
Durability against Freeze/Thaw	Category	MS <sub>18</sub>
	Category	WA <sub>24</sub> 2



0086-CPR-595350



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Blackhills Quarry, Cove, Aberdeen. AB12 3LR  
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13  
Certificate No. BLKQ-B833

TS 2010  
Stone Mastic Asphalt  
B833 RIGAGRIP [SMA 8 surf HFS (Nypol 103) TS2010] - Blackhills Asphalt Plant  
(Kishorn Aggregates)

General requirements

Temperature of the mixture		150 °C to 200 °C
Grading (passing)	16 mm test sieve	100 %
	11,2 mm test sieve	100 %
	8 mm test sieve	100 %
	5,6 mm test sieve	54 %
	2 mm test sieve	24 %
	0,063 mm test sieve	9,0%
Binder content		$B_{min\ 6,8}$ (6,9%)
Water Sensitivity	BS EN 12697 – 12: 2008	$ITSR_{90}$
Binder Drainage	BS EN 12697 – 18: 2004	$D_{0,3}$
Resistance to permanent deformation		
- small size device: wheel tracking slope	BS EN 12697 – 22: B in Air	$WTS_{AIR\ 0,05}$ (0,04mm)
- small size device: proportional rut depths	BS EN 12697 – 22: B in Air	$PRD_{AIR\ 1,5}$ (1,3%)

Leiths (Scotland) Ltd confirms that the asphalt concrete referred to in this certificate complies with the requirements of TS 2010

Authorised by:	 <i>N. Anderson. Group Technical Director</i>
Date Valid from	01/03/2013
Date Valid to	Currently Valid
Date of Certificate Issue	27 May 2014

Client: Leiths (Scotland) Ltd.  
Rigifa  
Cove  
Aberdeen  
Attn: Neil Anderson

Authorised Signatories  
N. Anderson   
Technical Manager  
A. Trickett – Bell   
Laboratory Manager

**DETERMINATION OF AIR VOIDS CONTENT**

<b>Report No.: P.44.BLACKHILLS.P14938</b>		Sample Ref.: P14938	
<b>Scheme / Site:</b>	<b>SMA 8 surf TS 2010 Specification</b>		
Client:	Leiths (Scotland) Ltd.		
<b>Material:</b>	<b>RIGAGRIP [SMA 8 surf PMB (Nypol 103) TS 2010]</b>		
Specification:	TS 2010		
Source:	Leiths – Blackhills Coating Plant		
Location:	N/A		
Test Method:	BS EN 12697 – 8		
Date Sampled From:	01.08.2013	Date Received:	01.08.2013
Date Sampled To:	01.08.2013	Date Tested From:	01.08.2013
Sampled By:	Lab Staff	Date Tested To:	02.08.2013
Sample Type:	Bulk	Certificate Received:	Yes

TEST RESULTS

Sample No.	Bulk Density (kg/m <sup>3</sup> )	Air Voids Content (%)	Mean Air Voids Content (%)	Specification
P14938/1	2315	3.5	3.5	V <sub>min3.5</sub> ; V <sub>max4</sub>
P14938/2	2314	3.5		
P14938/3	2316	3.6		

REMARKS

Sample complies with the requirements.

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TECHNICAL SERVICES



UKAS Group  
Accreditation  
1908

Client: Leiths Technical Services  
Rigifa  
Cove  
Aberdeen

Attn: Neil Anderson

Authorised Signatories

N. Anderson   
Technical Manager  
A. Trickett – Bell   
Laboratory Manager

**DETERMINATION OF BINDER DRAINAGE**

<b>Report No.: P.11.BLACKHILLS.P14938</b>		Sample Ref.: P14938	
<b>Scheme / Site:</b>	<b>SMA 8 surf TS 2010 Specification</b>		
Client:	Leiths (Scotland) Ltd.		
<b>Material:</b>	<b>RIGAGRIP [SMA 8 surf PMB (Nypol 103) TS 2010]</b>		
Specification:	BS EN 13108 – 5 / PD 6691 / TS 2010		
Source:	Leiths – Blackhills Coating Plant (Kishorn Aggregate)		
Location:	Laboratory Trial		
Test Method:	BS DD 232: 1996		
Date Sampled From:	01.08.2013	Date Received:	01.08.2013
Date Sampled To:	01.08.2013	Date Tested From:	01.08.2013
Sampled By:	Lab Staff	Date Tested To:	02.08.2013
Sample Type:	Bulk	Certificate Received:	Yes

TEST RESULTS

<b>BINDER DRAINAGE @ 6.9% Bitumen</b>	<b>0.0%</b>
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REMARKS

Empty box for remarks

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**LEITHS (SCOTLAND) LIMITED**

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www.leiths-group.co.uk





TECHNICAL SERVICES



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Client: Leiths (Scotland) Ltd.  
Rigifa  
Cove  
Aberdeen  
Attn: Neil Anderson

Authorised Signatories  
N. Anderson   
Technical Manager  
A. Trickett – Bell   
Laboratory Manager

**DETERMINATION OF MAXIMUM DENSITY**

<b>Report No.: P.11.BLACKHILLS.P14938</b>		Sample Ref.: P14938	
<b>Scheme / Site:</b>	<b>SMA 8 surf TS 2010 Specification</b>		
Client:	Leiths (Scotland) Ltd.		
<b>Material:</b>	<b>RIGAGRIP [SMA 8 surf PMB (Nypol 103) TS 2010]</b>		
Specification:	BS EN 13108 – 5 / PD 6691 / TS 2010		
Source:	Leiths – Blackhills Coating Plant (Kishorn Aggregate)		
Location:	Laboratory Trial		
Test Method:	BS EN 12697 – 5: 2002: Method A		
Date Sampled From:	02.08.2013	Date Received:	02.08.2013
Date Sampled To:	02.08.2013	Date Tested From:	02.08.2013
Sampled By:	Lab Staff	Date Tested To:	02.08.2013
Sample Type:	Bulk	Certificate Received:	Yes

TEST RESULTS

Sample No.	Maximum Density (kg/m <sup>3</sup> )	Mean Maximum Density (kg/m <sup>3</sup> )
P14938/1	2396	2397
P14938/2	2398	

REMARKS

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**NYNAS UK AB**  
**Technical Service Report**  
**Leiths SMA 8mm surf Nypol 103 (P14938) testing**

**Background**

Leiths requested that Nynas assist them in testing a 8mm SMA using Nypol 103 for wheeltracking and water sensitivity.

**Results**

***Sensitivity to Water (to BBA/HAPAS method)***

The specimens for water sensitivity were supplied already made up by Leiths. The specimens were then assessed for water sensitivity using the BBA/HAPAS method of 3 cycles of 6 hours at 60°C, overnight at 5°C, and ITSM at 20°C.

**ITSM at 20°C (MPa)**

Specimen Ref	Initial	Cycle 1	Cycle 2	Cycle 3
J	417	422	443	351
H	609	546	662	587
K	355	316	340	320

**% Retained ITSM at 20°C**

Specimen Ref	Initial	Cycle 1	Cycle 2	Cycle 3
J	100%	101%	106%	84%
H	100%	90%	109%	96%
K	100%	89%	96%	90%
<b>Average</b>	<b>100%</b>	<b>93%</b>	<b>104%</b>	<b>90%</b>

***Resistance to Permanent Deformation (BS EN 12697-22 Small device procedure B)***

The aggregates for wheeltracking were supplied pre-blended, with the slabs produced using Nypol 103 at a binder content of 6.9% to a density of 2.30Mg/m<sup>3</sup> and fibres at 0.3%. The slabs were produced 40mm thick and tested for 10,000 cycles at 60°C.

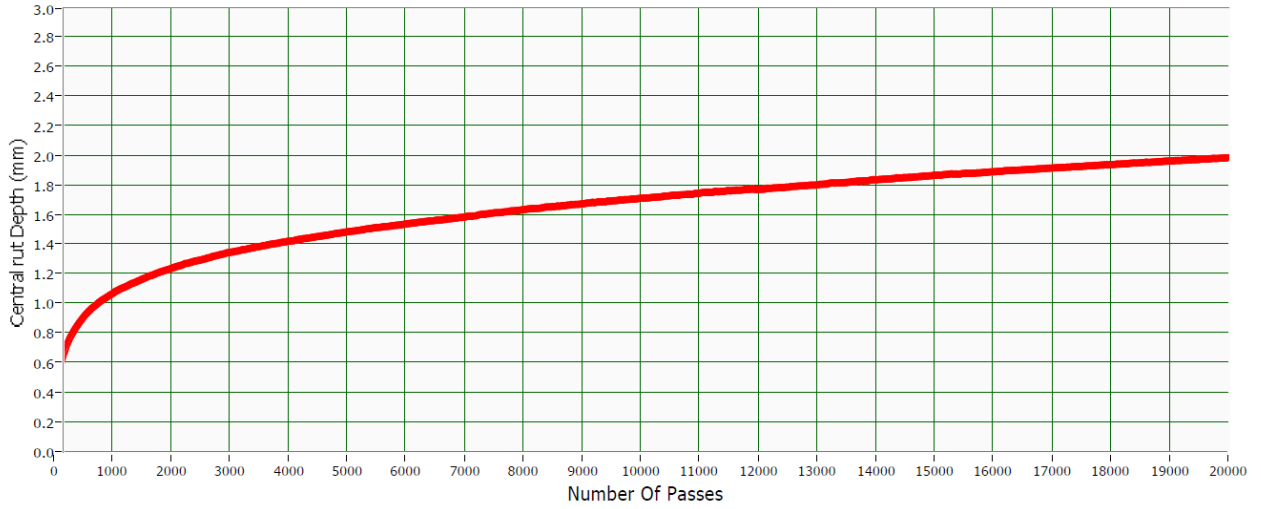
	Rut depth at 10,000 cycles (mm)	Proportional rut depth at 10.000 cycles	Wheeltracking slope (mm/1000cycles)
Run 1	2.0	0.03	0.07
Run 2	1.7	0.02	0.04

I M Lancaster 25-03-12

## Wheeltracker EN 12697-22

TEST REFERENCE   
Rut Profile Data

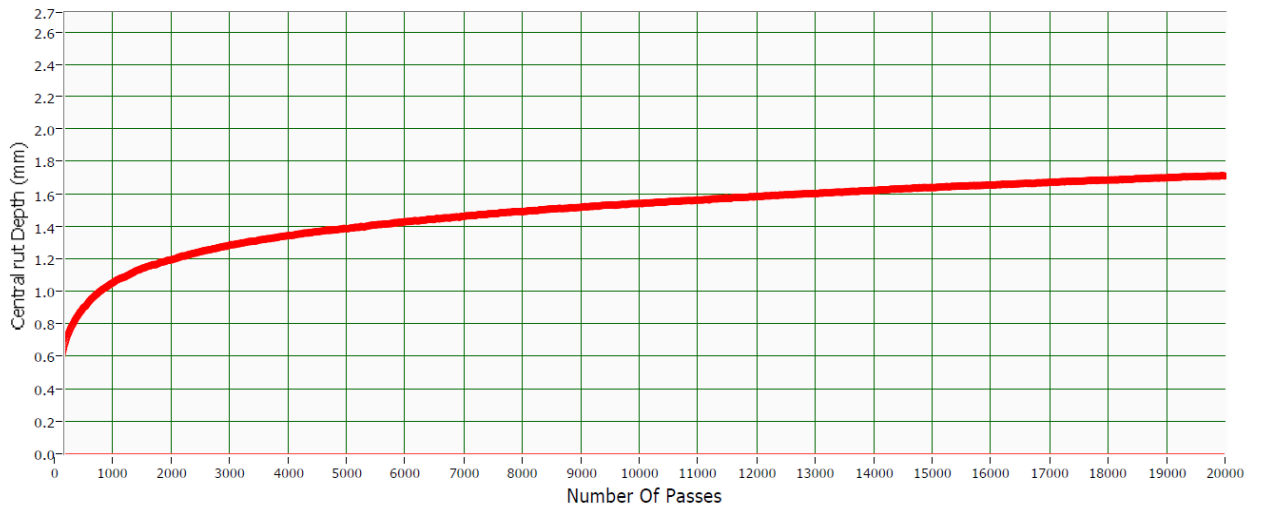
Final Rut Depth  (mm)  
Rut Rate  (mm/1000 Passes)  
 (mm/1000 Cycles)



## Wheeltracker EN 12697-22

TEST REFERENCE   
Rut Profile Data

Final Rut Depth  (mm)  
Rut Rate  (mm/1000 Passes)  
 (mm/1000 Cycles)



# Nypol 103

Previous name : Nynas Nypol 200

Nypol 103 is a highly modified elastomeric binder with exceptional resistance to permanent deformation and cracking. It is a versatile binder suitable for most types of asphalt mixtures and a wide range of paving applications. It complies with EN 14023 and the Nynas sales specification.

## PMB 75/130-75

**Table 1 : Specification information**

	Test description	Method	Unit	Min	Max	Class
Consistency at intermediate temperature	Penetration at 25°C	EN 1426	0.1mm	75	105 <sup>2</sup>	7
Consistency at elevated service temperature	Softening Point	EN 1427	°C	75	95 <sup>2</sup>	3
Cohesion	by Force Ductility at 5°C	EN 13589	J/cm <sup>2</sup>	3	-	2
Durability	Change in mass	EN12607-1	%-wt	-	1.00	5
Resistance to hardening EN 12607-1	Retained Penetration	EN 1426	%	55	-	6
	Increase in softening point	EN 1426	%	-	8	2
Other characteristics	Flash Point	EN ISO 2592	°C	250	-	2

**Table 2 : Additional information**

	Test description	Method	Unit	Min	Max	Class
Safety & Handling *	Minimum pumping temperature	-	°C	140	-	-
	Typical handling temperatures	-	°C	170	185	-
	Maximum safe handling & storage temperature	-	°C	-	190	-
Technical characteristic	Fraass breaking point	EN 12593	°C	-	-20	9
	Elastic recovery at 25°C	EN 13398	%	80	-	2
	Storage stability	EN 13399	°C	-	5	2
	Difference in softening point	EN 1427				
	Typical density at 25°C	EN 3838	g/cm <sup>3</sup>	1.020 <sup>1</sup>	-	-
Solubility in toluene	EN 12592	%	99	-	-	

\* For specific information on binder handling and storage please refer to the Product Information and Safety Data sheets.

<sup>1</sup> Typical value

<sup>2</sup> Nynas specification

# VIATOP®

VIATOP® premium is a pelletized blend of 90 % by weight ARBOCEL® ZZ 8 - 1 and 10 % by weight bitumen.

## Characteristics of the pellets

grey, cylindrical pellets

content ARBOCEL® ZZ 8 – 1	approx. 90 %
average pellet length	2 mm - 8 mm
average pellet thickness	4 mm +/- 1 mm
bulk density	470 g/l - 540 g/l
sieve analysis: finer than 3.55 mm	max. 10 %

Non-toxic and physiologically safe.

## Characteristics of ARBOCEL® ZZ 8 - 1

grey, fine fibrilled and long-fibred cellulose.

basic raw material	technical raw cellulose
cellulose content	80 % +/- 5 %
pH-value (5 g/100 ml)	7.5 +/- 1
average fibre length	1100 µm
average fibre thickness	45 µm

## Characteristics of the bitumen used

Road construction bitumen according to DIN EN 12591.

Needle penetration (according to DIN 52 010) at 25 °C in 1/10 mm	approx. 50 - 70
Softening point (ring and ball, according to DIN 52 011) in °C	46 - 54



J. Rettenmaier & Söhne GmbH + CO  
Fibers designed by Nature  
Holzmuehle 1  
D-73494 Rosenberg

Telephone: +49 79 67/1 52 - 0  
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0702



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**Leiths (Scotland) Ltd  
Rigifa  
Cove  
Aberdeen  
AB12 3LR**

**TS 2010  
PRODUCT PROPOSAL  
STAGE 2**

***Product Mix Trial***

<b>Mixing Plant:</b>	<b>Blackhills Quarry, Cove, Aberdeen.</b>
<b>Mix Designation:</b>	<b>RIGAGRIP SMA 8 surf (Nypol 103, 0.3% fibres)</b>

## Constituents

### Aggregates

SIZE	SOURCE	TYPE
4/8mm	Kishorn Quarry	Crushed Rock
0/4mm	Kishorn Quarry	Crushed Rock

### Binder

TYPE	GRADE
Nypol 103	75/130 – 75 PMB

### Filler

TYPE	SOURCE
Crushed limestone	Highland Lime, Torlundy, Highlands.

### Fibre

TYPE	SOURCE
Viatop	J Rettenmaier

### **List of attached information**

<b>Property</b>	<b>Test method / procedure</b>	<b>Comments</b>
Air Voids in mat	BS 594987: 2010: Annex G	See attached report
Binder Content	BS EN 12697 – 1:2005	See attached report
Grading	BS EN 12697 – 2: 2002	See attached report
Texture	BS 598 – 105	See attached report



Client: Leiths (Scotland) Ltd.  
Rigifa  
Cove  
Aberdeen

Attn: B Lund

Authorised Signatories  
N. Anderson   
Technical Manager  
A. Trickett – Bell   
Laboratory Manager

**BITUMINOUS ANALYSIS TEST REPORT**

Test Method: BS EN 12697 – 1: 2000 (Soluble binder content – by difference)  
Test Method: BS EN 12697 – 2: 2002 (Particle size distribution)

<b>Report No.: P.02.WESTBURN.R37148</b>		Sample Ref.: R37148 / R37149 / R37153 / R37154	
<b>Scheme / Site:</b> Client:	<b>Westburn Road, Aberdeen</b> Leiths (Scotland) Ltd.		
<b>Material:</b> Specification:	<b>RIGAGRIP [SMA 8 HFS surf (Nypol 103) TS 2010]</b> BS EN 13108 – 5 / PD 6691 / BS 594987		
<b>Source:</b> Location:	Leiths – Blackhills Coating Plant (Kishorn Aggregate) Southbound.		
Date Sampled From:	04.08.2013	Date Received:	04.08.2013 to 6.08.2013
Date Sampled To:	06.08.2013	Date Tested From:	04.08.2013
Sampled By:	Lab Staff	Date Tested To:	07.08.2013
Sample Type:	Bulk	Certificate Received:	Yes

**TEST RESULTS**

Results are in Tabulated Form

**REMARKS**

Tolerances applied to the declared target grading in accordance with BS EN 13108 – 21: Table A.1 Individual Samples.

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**TABULATED TEST RESULTS – RIGIFA LABORATORY**

SCHEME / SITE: WESTBURN ROAD, ABERDEEN

MATERIAL: RIGAGRIP [SMA 8 HFS surf (Nypol 103) TS 2010]

SPECIFICATION: BS EN 13108 – 5 / PD 6691

SOURCE: BLACKHILLS COATING PLANT, COVE. (KISHORN AGGREGATES)

Sieve Size (mm)	11,2	8	5,6	2	1	0,710	0,250	0,125	0,063	Binder	Remarks	
Target Grading	100	100	54	24		17		12	9.0	6,9		
Tolerance	98 – 100	92 – 100	47 – 61	19 - 29		13 – 21		8 - 16	7.0 – 11.0	6.7 – 7.1		
Sample No.	Date Made											
R37148	04/08/2013	100	99	56	25	19	18	15	13	10.0	6.9	
R37149	04/08/2013	100	100	53	23	18	17	12	12	8.9	6.9	
R37153	06/08/2013	100	100	55	21	16	15	13	11	8.8	6.7	
R37154	06/08/2013	100	100	60	25	19	18	14	12	9.2	7.0	
<b>Average</b>		<b>100</b>	<b>100</b>	<b>56</b>	<b>24</b>	<b>18</b>	<b>17</b>	<b>14</b>	<b>12</b>	<b>9.2</b>	<b>6.9</b>	
SD		0.0	0.5	2.9	1.9	1.4	1.4	1.3	0.8	0.5	0.1	

= Denotes non-compliance (if present)

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Client: Leiths (Scotland) Ltd.  
Rigifa  
Cove  
Aberdeen  
Attn: Neil Anderson

Authorised Signatories  
N. Anderson   
Technical Manager  
A. Trickett – Bell   
Laboratory Manager

**DETERMINATION OF AIR VOIDS CONTENT**

<b>Report No.: P.12.BKQ TAIT.R37153</b>		<b>Sample Ref.: R37153</b>	
<b>Scheme / Site:</b>	<b>RIGAGRIP [SMA 8 surf (Nypol 103) TS 2010] TAIT Stage 2</b>		
Client:	Leiths (Scotland) Ltd.		
<b>Material:</b>	<b>RIGAGRIP [SMA 8 surf (Nypol 103) TS 2010]</b>		
Specification:	TS 2010		
Source:	Leiths – Blackhills Coating Plant (Kishorn Aggregate)		
Location:	Westburn Road		
Test Method:	BS EN 12697 – 8		
Date Sampled From:	06.08.2013	Date Received:	06.08.2013
Date Sampled To:	06.08.2013	Date Tested From:	06.08.2013
Sampled By:	Lab Staff	Date Tested To:	07.08.2013
Sample Type:	Cores	Certificate Received:	Yes

TEST RESULTS

Sample No.	Bulk Density (kg/m <sup>3</sup> )	Air Voids Content (%)	Mean Air Voids Content (%)	Specification
R37153/1	2270	5.3	5.3	V <sub>min2</sub> ; V <sub>max6</sub>
R37153/2	2263	5.6		
R37153/3	2275	5.1		

REMARKS

Sample complies with the requirements.  
Air Voids calculated by using maximum density in report no. P.11.BLACKHILLS.P14938  
Cores taken to determine offset for NDG apparatus

  
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 Date of Issue: 19.08.2013

Client: Leiths (Scotland) Ltd  
Rigifa  
Cove  
Aberdeen

Attn: N Anderson

Authorised Signatories  
N. Anderson   
Technical Manager  
A. Trickett – Bell   
Laboratory Manager

**DETERMINATION OF TEXTURE DEPTH – SAND PATCH METHOD**

<b>Report No.: R.04.LTS.R37153</b>		Sample Ref.: R37153	
<b>Scheme / Site:</b>	Westburn Road, Aberdeen		
Client:	Leiths		
<b>Material:</b>	RIGAGRIP [SMA 8 surf (Nypol 103) TS 2010]		
Specification:	Proprietary Mix		
Source:	Blackhills Coating Plant (Kishorn Quarry)		
Location:	See below		
Test Method:	BS 598: Part 105: 2000: 4		
Date Sampled From:	N/A	Date Received:	06.08.2013
Date Sampled To:	N/A	Date Tested From:	06.08.2013
Sampled By:	ATB	Date Tested To:	06.08.2013
Sample Type:	N/A	Certificate Received:	N/A

TEST RESULTS

LOCATION	TEXTURE DEPTH (mm)
Slow Lane N/S wheel track	1.5
Slow Lane O/S wheel track	1.3
Fast Lane N/S wheel track	1.3
Fast Lane O/S wheel track	1.3
AVERAGE	1.3

REMARKS

Surface Condition: Dry
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**Leiths (Scotland) Ltd  
Rigifa  
Cove  
Aberdeen  
AB12 3LR**

**TS 2010  
PRODUCT PROPOSAL  
STAGE 3**

<b>Mixing Plant:</b>	<b>Blackhills Quarry, Cove, Aberdeen.</b>
<b>Mix Designation:</b>	<b>RIGAGRIP SMA 8 surf (Nypol 103, 0.3% fibres)</b>

## Constituents

### Aggregates

SIZE	SOURCE	TYPE
4/8mm	Kishorn Quarry	Crushed Rock
0/4mm	Kishorn Quarry	Crushed Rock

### Binder

TYPE	GRADE
Nypol 103	75/130 – 75 PMB

### Filler

TYPE	SOURCE
Crushed limestone	Highland Lime, Torlundy, Highlands.

### Fibre

TYPE	SOURCE
Viatop	J Rettenmaier

### List of attached information

<b>Property</b>	<b>Test method / procedure</b>	<b>Comments</b>
Air Voids in mat	BS 594987: 2010: Annex I	See attached report
Binder Content	BS EN 12697 – 1:2005	See attached report
Grading	BS EN 12697 – 2: 2002	See attached report
Texture	BS 598 – 105	See attached report
Grip Test Number	BS 7941 – 2: 2000	See attached graph

Client: Leiths (Scotland) Ltd.  
Rigifa  
Cove  
Aberdeen

Attn: B Lund

Authorised Signatories  
N. Anderson   
Technical Manager  
A. Trickett – Bell   
Laboratory Manager

**INDIRECT DENSITY GAUGE TEST REPORT**

Test Method: BS 594987: 2007: Annex G

<b>Report No.: P.02.WESTBURN.R37230</b>		Sample Ref.: R37230	
<b>Scheme / Site:</b>	<b>Westburn Road, Aberdeen.</b>		
Client:	Leiths (Scotland) Ltd.		
<b>Material:</b>	<b>RIGAGRIP [SMA 8 surf (Nypol 103) TS2010]</b>		
Specification:	TS2010 clause NG 2.4.2 paragraph 2		
Source:	Leiths – Blackhills Coating Plant (Kishorn Aggregate)		
Location:	Eastbound.		
Date Sampled From:	04.08.2013	Date Received:	04.08.2013 to 07.08.2013
Date Sampled To:	07.08.2013	Date Tested From:	04.08.2013
Sampled By:	Lab Staff	Date Tested To:	06.08.2013
Sample Type:	Bulk	Certificate Received:	No

**TEST RESULTS**

Results are in Tabulated Form

**REMARKS**

Void content calculated using maximum density of 2397 kg/m<sup>3</sup>  
The results have been re-calculated in accordance with a rolling mean of 3 consecutive results.

Issued By:   
Date of Issue: 08.07.2013



## INDIRECT DENSITY GAUGE TEST REPORT

Scheme / Site:	Westburn Road	Report No.: P.02.WESTBURN.R37230	
Location:	Eastbound, Slow Lane.	Sample No.:	R37230

Chainage	Wheel Track (N or O)	In-Situ Density (kg/m <sup>3</sup> )	In-Situ void content (%)	Average 3 readings (%)
	N	2243	6.4	
	O	2267	5.4	
	N	2272	5.2	5.7
	O	2228	7.1	5.9
	N	2250	6.1	6.1
	O	2287	4.6	5.9
	N	2275	5.1	5.3
	O	2265	5.5	5.1
	N	2274	5.1	5.2
	O	2291	4.4	5.0
	O	2272	5.2	4.9
	N	2297	4.2	4.6
	O	2260	5.7	5.0
	N	2266	5.5	5.1
	O	2266	5.5	5.5
	N	2244	6.4	5.8
	O	2348	2.1	4.6

Chainage	Wheel Track (N or O)	In-Situ Density (kg/m <sup>3</sup> )	In-Situ void content (%)	Average 6 readings (%)

**INDIRECT DENSITY GAUGE TEST REPORT**

Scheme / Site:	Westburn Road	<b>Report No.: P.02.WESTBURN.R37230</b>	
Location:	Eastbound, Slow Lane.	Sample No.:	R37230

Chainage	Wheel Track (N or O)	In-Situ Density (kg/m <sup>3</sup> )	In-Situ void content (%)	Average 3 readings (%)
	O	2274	5.1	3.6
	N	2273	5.2	5.1
	O	2321	3.2	4.5
	N	2271	5.3	4.5
	O	2272	5.2	4.5
	N	2283	4.7	5.1
	O	2265	5.5	5.2
	N	2266	5.5	5.2
	O	2260	5.7	5.6
	N	2284	4.7	5.3
	O	2336	2.5	4.3
	N	2335	2.6	3.3

Chainage	Wheel Track (N or O)	In-Situ Density (kg/m <sup>3</sup> )	In-Situ void content (%)	Average 3 readings (%)

Client: Leiths (Scotland) Ltd.  
Rigifa  
Cove  
Aberdeen

Attn: B Lund

Authorised Signatories  
N. Anderson   
Technical Manager  
A. Trickett – Bell   
Laboratory Manager

**BITUMINOUS ANALYSIS TEST REPORT**

Test Method: BS EN 12697 – 1: 2000 (Soluble binder content – by difference)  
Test Method: BS EN 12697 – 2: 2002 (Particle size distribution)

<b>Report No.: P.02.WESTBURN.R37148</b>		Sample Ref.: R37148 / R37149 / R37153 / R37154	
<b>Scheme / Site:</b> Client:	<b>Westburn Road, Aberdeen</b> Leiths (Scotland) Ltd.		
<b>Material:</b> Specification:	<b>RIGAGRIP [SMA 8 HFS surf (Nypol 103) TS 2010]</b> BS EN 13108 – 5 / PD 6691 / BS 594987		
<b>Source:</b> Location:	Leiths – Blackhills Coating Plant (Kishorn Aggregate) Southbound.		
Date Sampled From:	04.08.2013	Date Received:	04.08.2013 to 6.08.2013
Date Sampled To:	06.08.2013	Date Tested From:	04.08.2013
Sampled By:	Lab Staff	Date Tested To:	07.08.2013
Sample Type:	Bulk	Certificate Received:	Yes

**TEST RESULTS**

Results are in Tabulated Form

**REMARKS**

Tolerances applied to the declared target grading in accordance with BS EN 13108 – 21: Table A.1 Individual Samples.

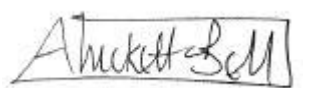
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**TABULATED TEST RESULTS – RIGIFA LABORATORY**

SCHEME / SITE: WESTBURN ROAD, ABERDEEN MATERIAL: RIGAGRIP [SMA 8 HFS surf (Nypol 103) TS 2010] SPECIFICATION: BS EN 13108 – 5 / PD 6691  
SOURCE: BLACKHILLS COATING PLANT, COVE. (KISHORN AGGREGATES)

Sieve Size (mm)	11,2	8	5,6	2	1	0,710	0,250	0,125	0,063	Binder	Remarks	
Target Grading	100	100	54	24		17		12	9.0	6,9		
Tolerance	98 – 100	92 – 100	47 – 61	19 - 29		13 – 21		8 - 16	7.0 – 11.0	6.7 – 7.1		
Sample No.	Date Made											
R37148	04/08/2013	100	99	56	25	19	18	15	13	10.0	6.9	
R37149	04/08/2013	100	100	53	23	18	17	12	12	8.9	6.9	
R37153	06/08/2013	100	100	55	21	16	15	13	11	8.8	6.7	
R37154	06/08/2013	100	100	60	25	19	18	14	12	9.2	7.0	
<b>Average</b>		<b>100</b>	<b>100</b>	<b>56</b>	<b>24</b>	<b>18</b>	<b>17</b>	<b>14</b>	<b>12</b>	<b>9.2</b>	<b>6.9</b>	
SD		0.0	0.5	2.9	1.9	1.4	1.4	1.3	0.8	0.5	0.1	

= Denotes non-compliance (if present)

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Client: Leiths (Scotland) Ltd  
Rigifa  
Cove  
Aberdeen

Attn: N Anderson

Authorised Signatories  
N. Anderson   
Technical Manager  
A. Trickett – Bell   
Laboratory Manager

**DETERMINATION OF TEXTURE DEPTH – SAND PATCH METHOD**

<b>Report No.: R.04.LTS.R37153</b>		Sample Ref.: R37153	
<b>Scheme / Site:</b>	Westburn Road, Aberdeen		
Client:	Leiths		
<b>Material:</b>	RIGAGRIP [SMA 8 surf (Nypol 103) TS 2010]		
Specification:	Proprietary Mix		
Source:	Blackhills Coating Plant (Kishorn Quarry)		
Location:	See below		
Test Method:	BS 598: Part 105: 2000: 4		
Date Sampled From:	N/A	Date Received:	06.08.2013
Date Sampled To:	N/A	Date Tested From:	06.08.2013
Sampled By:	ATB	Date Tested To:	06.08.2013
Sample Type:	N/A	Certificate Received:	N/A

TEST RESULTS

LOCATION	TEXTURE DEPTH (mm)
Slow Lane N/S wheel track	1.5
Slow Lane O/S wheel track	1.3
Fast Lane N/S wheel track	1.3
Fast Lane O/S wheel track	1.3
AVERAGE	1.3

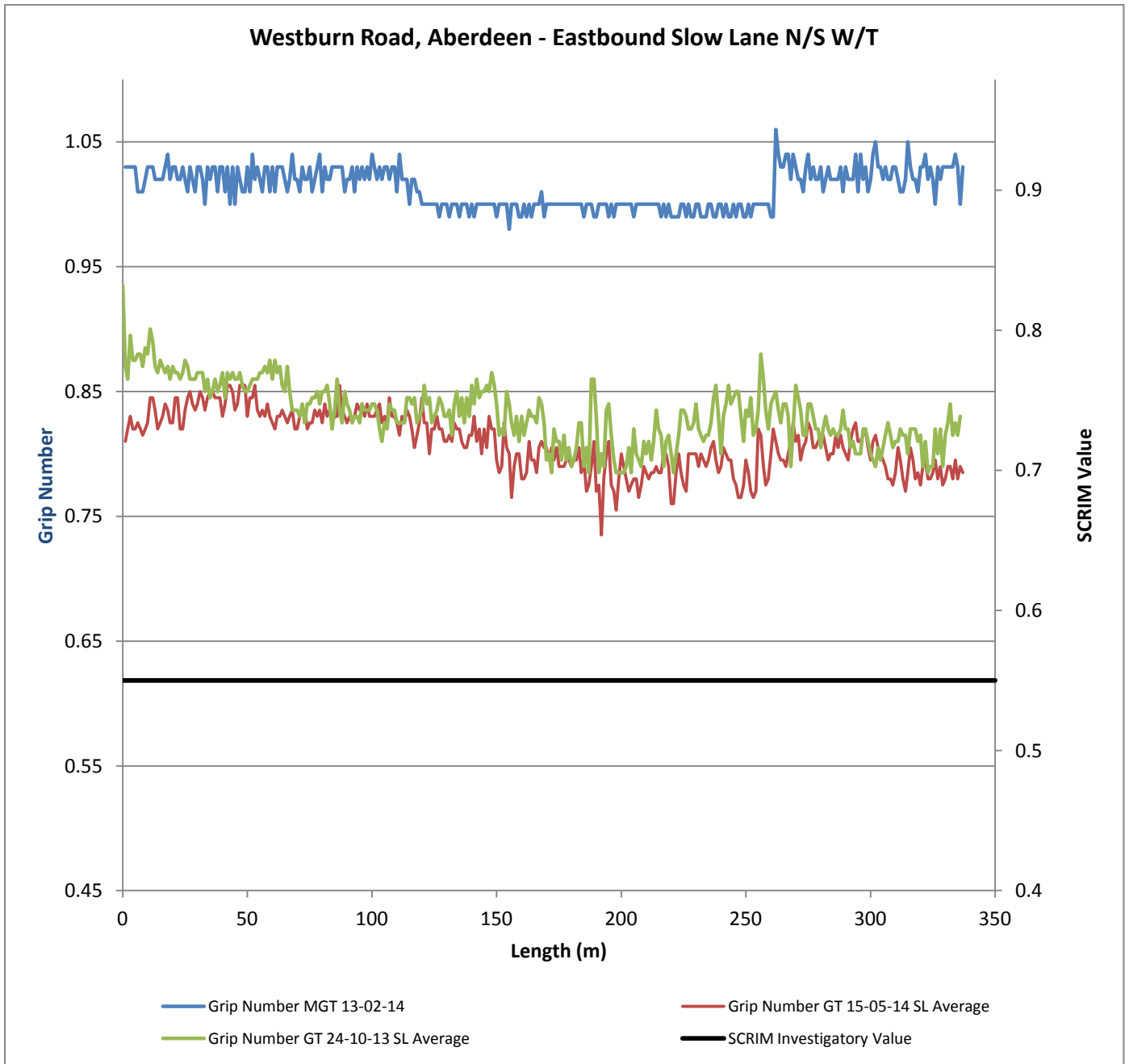
REMARKS

Surface Condition: Dry
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## RIGAGRIP [SMA 8 surf (Nypol 103) TS 2010]



MGT = Portable Micro Grip Tester

GT = Trailer-Mounted Grip Tester

SCRIM Investigatory Value for site categories Q, K, G2 and S2 (DMRB Vol. 7: Section 3: Part 1 HD/04: Table 4.1)