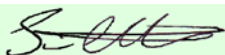


COMBINED CONFORMITY CERTIFICATE																																																																										
Regen Ground Granulated Blastfurnace Slag Produced at		PURFLEET		Works																																																																						
Sample Period		November 2016																																																																								
Certificate of Conformity of Regen GGBS to EN 15167-1:2006			Certificate of Conformity of Combinations of Regen GGBS and CEM I Portland Cement to Annex A of BS 8500-2:2015																																																																							
Spot samples of Regen GGBS were taken and tested to determine conformity to the autocontrol requirements of EN 15167-1:2006 "Ground granulated blastfurnace slag for use in concrete, mortar and grout" following the methods given in that standard. The values reported are mean values for the monthly production period.			Portland Cement Source: TARMAC : ABERTHAW																																																																							
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Results</th> <th style="width: 20%;">Product</th> <th style="width: 50%;">EN Limit</th> </tr> </thead> <tbody> <tr> <td colspan="3" style="text-align: center;">Regen GGBS ONLY</td> </tr> <tr> <td>Fineness m²/kg</td> <td style="text-align: center;">502</td> <td>min. 275</td> </tr> <tr> <td>Magnesia MgO %</td> <td style="text-align: center;">8</td> <td>max. 18</td> </tr> <tr> <td>Sulfate SO₃ %</td> <td style="text-align: center;">0.15</td> <td>max 2.5</td> </tr> <tr> <td>Sulfide S²⁻ %</td> <td style="text-align: center;">1.01</td> <td>max 2.0</td> </tr> <tr> <td>Chloride Content Cl⁻ %</td> <td style="text-align: center;">0.02</td> <td>max 0.10</td> </tr> <tr> <td>Moisture Content %</td> <td style="text-align: center;">0.26</td> <td>max 1.0</td> </tr> <tr> <td>Alumina Al₂O₃ %</td> <td style="text-align: center;">13.4</td> <td>to 1 dec</td> </tr> <tr> <td colspan="3"> Note: If the value is ≥ 14.5% the '+SR' restriction will be exceeded if the C₃A of the CEM I is >10%. </td> </tr> <tr> <td colspan="3" style="text-align: center;">Alkalis as Na₂O equ. (acid soluble)</td> </tr> <tr> <td>Guaranteed Alkali limit %</td> <td style="text-align: center;">≤ 1.0</td> <td></td> </tr> <tr> <td>Certified Average Alkali (Last 25) %</td> <td style="text-align: center;">0.80</td> <td></td> </tr> <tr> <td>Declared Mean : Mean last 25 + (SD last 25 x 1.64) %</td> <td style="text-align: center;">0.88</td> <td></td> </tr> <tr> <td colspan="3" style="text-align: center;">COMBINATION OF 50% LABORATORY STOCK CEM I PORTLAND CEMENT AND 50% Regen GGBS</td> </tr> <tr> <td>Initial Setting Time min.</td> <td style="text-align: center;">225</td> <td>not > than 2 x PC</td> </tr> <tr> <td rowspan="2">Activity Index %</td> <td>7 days</td> <td style="text-align: center;">63</td> </tr> <tr> <td>28 days</td> <td style="text-align: center;">85</td> </tr> <tr> <td colspan="3" style="text-align: center;">LABORATORY STOCK CEM I PORTLAND CEMENT ONLY</td> </tr> <tr> <td colspan="3"> <i>The stock CEM I Portland cement used in these tests was supplied by Hanson Ribblesdale works and the following results were obtained from that sample</i> </td> </tr> <tr> <td>Initial Setting Time min</td> <td style="text-align: center;">140</td> <td></td> </tr> <tr> <td rowspan="2">Compressive Strength N/mm²</td> <td>7 days</td> <td style="text-align: center;">47.7</td> </tr> <tr> <td>28 days</td> <td style="text-align: center;">59.9</td> </tr> <tr> <td colspan="3"> The Regen GGBS contained no additional materials other than those permitted. The above results and other tests demonstrate the conformity of the material sold during the month to the requirements of EN 15167-1:2006 </td> </tr> </tbody> </table>			Results	Product	EN Limit	Regen GGBS ONLY			Fineness m ² /kg	502	min. 275	Magnesia MgO %	8	max. 18	Sulfate SO ₃ %	0.15	max 2.5	Sulfide S ²⁻ %	1.01	max 2.0	Chloride Content Cl ⁻ %	0.02	max 0.10	Moisture Content %	0.26	max 1.0	Alumina Al ₂ O ₃ %	13.4	to 1 dec	Note: If the value is ≥ 14.5% the '+SR' restriction will be exceeded if the C ₃ A of the CEM I is >10%.			Alkalis as Na ₂ O equ. (acid soluble)			Guaranteed Alkali limit %	≤ 1.0		Certified Average Alkali (Last 25) %	0.80		Declared Mean : Mean last 25 + (SD last 25 x 1.64) %	0.88		COMBINATION OF 50% LABORATORY STOCK CEM I PORTLAND CEMENT AND 50% Regen GGBS			Initial Setting Time min.	225	not > than 2 x PC	Activity Index %	7 days	63	28 days	85	LABORATORY STOCK CEM I PORTLAND CEMENT ONLY			<i>The stock CEM I Portland cement used in these tests was supplied by Hanson Ribblesdale works and the following results were obtained from that sample</i>			Initial Setting Time min	140		Compressive Strength N/mm ²	7 days	47.7	28 days	59.9	The Regen GGBS contained no additional materials other than those permitted. The above results and other tests demonstrate the conformity of the material sold during the month to the requirements of EN 15167-1:2006			For combinations of Regen GGBS supplied from the above works with the above CEM I Portland cement the permitted proportions conforming to the requirements given in annex A of BS 8500-2:2015 are:	
Results	Product	EN Limit																																																																								
Regen GGBS ONLY																																																																										
Fineness m ² /kg	502	min. 275																																																																								
Magnesia MgO %	8	max. 18																																																																								
Sulfate SO ₃ %	0.15	max 2.5																																																																								
Sulfide S ²⁻ %	1.01	max 2.0																																																																								
Chloride Content Cl ⁻ %	0.02	max 0.10																																																																								
Moisture Content %	0.26	max 1.0																																																																								
Alumina Al ₂ O ₃ %	13.4	to 1 dec																																																																								
Note: If the value is ≥ 14.5% the '+SR' restriction will be exceeded if the C ₃ A of the CEM I is >10%.																																																																										
Alkalis as Na ₂ O equ. (acid soluble)																																																																										
Guaranteed Alkali limit %	≤ 1.0																																																																									
Certified Average Alkali (Last 25) %	0.80																																																																									
Declared Mean : Mean last 25 + (SD last 25 x 1.64) %	0.88																																																																									
COMBINATION OF 50% LABORATORY STOCK CEM I PORTLAND CEMENT AND 50% Regen GGBS																																																																										
Initial Setting Time min.	225	not > than 2 x PC																																																																								
Activity Index %	7 days	63																																																																								
	28 days	85																																																																								
LABORATORY STOCK CEM I PORTLAND CEMENT ONLY																																																																										
<i>The stock CEM I Portland cement used in these tests was supplied by Hanson Ribblesdale works and the following results were obtained from that sample</i>																																																																										
Initial Setting Time min	140																																																																									
Compressive Strength N/mm ²	7 days	47.7																																																																								
	28 days	59.9																																																																								
The Regen GGBS contained no additional materials other than those permitted. The above results and other tests demonstrate the conformity of the material sold during the month to the requirements of EN 15167-1:2006																																																																										
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Strength Class</th> <th style="width: 35%;">Not Less Than**</th> <th style="width: 35%;">Not More Than**</th> </tr> </thead> <tbody> <tr> <td>52.5L</td> <td style="text-align: center;">6</td> <td style="text-align: center;">37</td> </tr> <tr> <td>42.5L</td> <td style="text-align: center;">6</td> <td style="text-align: center;">73</td> </tr> <tr> <td>32.5L</td> <td style="text-align: center;">62</td> <td style="text-align: center;">80</td> </tr> </tbody> </table>		Strength Class	Not Less Than**	Not More Than**	52.5L	6	37	42.5L	6	73	32.5L	62	80	<table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td>Conformity Evaluation Period (if less than 6 months)</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">month(s)</td> </tr> <tr> <td>Combination Designation (Table 1 BS 8500-2:2015)</td> <td colspan="2"></td> </tr> <tr> <td>CIIS</td> <td style="text-align: center;">6</td> <td style="text-align: center;">35</td> </tr> <tr> <td>CIIIA</td> <td style="text-align: center;">36</td> <td style="text-align: center;">65</td> </tr> <tr> <td>CIIB</td> <td style="text-align: center;">66</td> <td style="text-align: center;">80</td> </tr> <tr> <td></td> <td colspan="2" style="text-align: center;">** % GGBS</td> </tr> </tbody> </table>		Conformity Evaluation Period (if less than 6 months)	n/a	month(s)	Combination Designation (Table 1 BS 8500-2:2015)			CIIS	6	35	CIIIA	36	65	CIIB	66	80		** % GGBS																																										
Strength Class	Not Less Than**	Not More Than**																																																																								
52.5L	6	37																																																																								
42.5L	6	73																																																																								
32.5L	62	80																																																																								
Conformity Evaluation Period (if less than 6 months)	n/a	month(s)																																																																								
Combination Designation (Table 1 BS 8500-2:2015)																																																																										
CIIS	6	35																																																																								
CIIIA	36	65																																																																								
CIIB	66	80																																																																								
	** % GGBS																																																																									
Results of tests in accordance with BS EN 196-1 for 50% Regen GGBS in combination with 50% CEM I Portland cement shown above																																																																										
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Age</th> <th style="width: 35%;">7 Days</th> <th style="width: 35%;">28 Days</th> </tr> </thead> <tbody> <tr> <td>Compressive Strength N/mm²</td> <td style="text-align: center;">30.8</td> <td style="text-align: center;">51.6</td> </tr> </tbody> </table>		Age	7 Days	28 Days	Compressive Strength N/mm ²	30.8	51.6	The samples of the Regen GGBS and the CEM I Portland cement were bulk average monthly samples for the works specified																																																																		
Age	7 Days	28 Days																																																																								
Compressive Strength N/mm ²	30.8	51.6																																																																								
																																																																										
1333 – CPD – 00133																																																																										

Signed:



S C Chudley National Technical Manager

Issue 2