



Certificate of CONFORMITY SUMMARY																																																																																																																																																							
Aboño	Sample Period	March 2020																																																																																																																																																					
Summary of All Cements																																																																																																																																																							
<p>1. Combinations of GGBS supplied from LKAB Minerals in combination with the CEM I Portland cements listed below conform with the requirements of BS 8500-2:2015 over the indicated range of proportions.</p> <p>The compressive strength results are for tests following the procedure given in EN 197-1 with 50% GGBS in combination with the indicated CEM I Portland cement.</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr style="background-color: #0070C0; color: white;"> <th rowspan="3" style="text-align: left;">Portland Cement Source</th> <th colspan="2" style="text-align: center;">Compressive Strength N/mm²</th> <th colspan="6" style="text-align: center;">GGBS Percentage Range</th> </tr> <tr style="background-color: #0070C0; color: white;"> <th colspan="2"></th> <th colspan="2" style="text-align: center;">52.5 L</th> <th colspan="2" style="text-align: center;">42.5 L</th> <th colspan="2" style="text-align: center;">32.5 L</th> </tr> <tr style="background-color: #0070C0; color: white;"> <th style="text-align: center;">7 day</th> <th style="text-align: center;">28 day</th> <th style="text-align: center;">Min</th> <th style="text-align: center;">Max</th> <th style="text-align: center;">Min</th> <th style="text-align: center;">Max</th> <th style="text-align: center;">Min</th> <th style="text-align: center;">Max</th> </tr> </thead> <tbody> <tr><td>Platin 52.5N</td><td style="text-align: center;">29.7</td><td style="text-align: center;">51.5</td><td style="text-align: center;">6</td><td style="text-align: center;">37</td><td style="text-align: center;">6</td><td style="text-align: center;">75</td><td style="text-align: center;">45</td><td style="text-align: center;">80</td></tr> <tr><td>Limerick 52.5N</td><td style="text-align: center;">29.5</td><td style="text-align: center;">49.5</td><td style="text-align: center;">6</td><td style="text-align: center;">28</td><td style="text-align: center;">6</td><td style="text-align: center;">64</td><td style="text-align: center;">44</td><td style="text-align: center;">80</td></tr> <tr><td>Lägerdorf 52.5N</td><td style="text-align: center;">31.8</td><td style="text-align: center;">51.8</td><td style="text-align: center;">6</td><td style="text-align: center;">35</td><td style="text-align: center;">6</td><td style="text-align: center;">72</td><td style="text-align: center;">60</td><td style="text-align: center;">80</td></tr> <tr><td>Tunstead 52.5N</td><td style="text-align: center;">29.1</td><td style="text-align: center;">51.8</td><td style="text-align: center;">6</td><td style="text-align: center;">20</td><td style="text-align: center;">6</td><td style="text-align: center;">67</td><td style="text-align: center;">49</td><td style="text-align: center;">80</td></tr> <tr><td>Padeswood 52.5N</td><td style="text-align: center;">29.9</td><td style="text-align: center;">51.0</td><td style="text-align: center;">6</td><td style="text-align: center;">30</td><td style="text-align: center;">6</td><td style="text-align: center;">64</td><td style="text-align: center;">44</td><td style="text-align: center;">79</td></tr> <tr><td>Ribblesdale 52.5N</td><td style="text-align: center;">30.8</td><td style="text-align: center;">50.1</td><td style="text-align: center;">6</td><td style="text-align: center;">22</td><td style="text-align: center;">6</td><td style="text-align: center;">62</td><td style="text-align: center;">44</td><td style="text-align: center;">78</td></tr> <tr><td>Ketton 52.5N</td><td style="text-align: center;">29.1</td><td style="text-align: center;">48.5</td><td style="text-align: center;">6</td><td style="text-align: center;">32</td><td style="text-align: center;">6</td><td style="text-align: center;">67</td><td style="text-align: center;">45</td><td style="text-align: center;">80</td></tr> <tr><td>Rugby 52.5N</td><td style="text-align: center;">28.5</td><td style="text-align: center;">50.3</td><td style="text-align: center;">6</td><td style="text-align: center;">16</td><td style="text-align: center;">6</td><td style="text-align: center;">65</td><td style="text-align: center;">47</td><td style="text-align: center;">79</td></tr> <tr><td>Cauldon 52.5N</td><td style="text-align: center;">30.3</td><td style="text-align: center;">50.8</td><td style="text-align: center;">6</td><td style="text-align: center;">30</td><td style="text-align: center;">6</td><td style="text-align: center;">72</td><td style="text-align: center;">52</td><td style="text-align: center;">80</td></tr> <tr><td>Hope 52.5N</td><td style="text-align: center;">31.1</td><td style="text-align: center;">52.7</td><td style="text-align: center;">6</td><td style="text-align: center;">21</td><td style="text-align: center;">6</td><td style="text-align: center;">67</td><td style="text-align: center;">51</td><td style="text-align: center;">80</td></tr> <tr><td>Cookstown 52.5N</td><td style="text-align: center;">28.6</td><td style="text-align: center;">49.7</td><td style="text-align: center;">6</td><td style="text-align: center;">27</td><td style="text-align: center;">6</td><td style="text-align: center;">60</td><td style="text-align: center;">46</td><td style="text-align: center;">80</td></tr> <tr><td>Cimpor 52.5R</td><td style="text-align: center;">31.6</td><td style="text-align: center;">51.4</td><td style="text-align: center;">6</td><td style="text-align: center;">35</td><td style="text-align: center;">6</td><td style="text-align: center;">63</td><td style="text-align: center;">54</td><td style="text-align: center;">78</td></tr> <tr><td>Secil 52.5R</td><td style="text-align: center;">30.8</td><td style="text-align: center;">51.1</td><td style="text-align: center;">6</td><td style="text-align: center;">38</td><td style="text-align: center;">6</td><td style="text-align: center;">67</td><td style="text-align: center;">53</td><td style="text-align: center;">80</td></tr> </tbody> </table> <p style="font-size: small; margin-top: 5px;">These combinations count fully towards the cement content in concrete to BS 8500.</p>										Portland Cement Source	Compressive Strength N/mm ²		GGBS Percentage Range								52.5 L		42.5 L		32.5 L		7 day	28 day	Min	Max	Min	Max	Min	Max	Platin 52.5N	29.7	51.5	6	37	6	75	45	80	Limerick 52.5N	29.5	49.5	6	28	6	64	44	80	Lägerdorf 52.5N	31.8	51.8	6	35	6	72	60	80	Tunstead 52.5N	29.1	51.8	6	20	6	67	49	80	Padeswood 52.5N	29.9	51.0	6	30	6	64	44	79	Ribblesdale 52.5N	30.8	50.1	6	22	6	62	44	78	Ketton 52.5N	29.1	48.5	6	32	6	67	45	80	Rugby 52.5N	28.5	50.3	6	16	6	65	47	79	Cauldon 52.5N	30.3	50.8	6	30	6	72	52	80	Hope 52.5N	31.1	52.7	6	21	6	67	51	80	Cookstown 52.5N	28.6	49.7	6	27	6	60	46	80	Cimpor 52.5R	31.6	51.4	6	35	6	63	54	78	Secil 52.5R	30.8	51.1	6	38	6	67	53	80
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<p>2. Combination Designation (Table 1 BS 8500-2:2015)</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr style="background-color: #0070C0; color: white;"> <th rowspan="2"></th> <th colspan="2" style="text-align: center;">Percentage GGBS</th> </tr> <tr style="background-color: #0070C0; color: white;"> <th style="text-align: center;">Not Less Than</th> <th style="text-align: center;">Not More Than</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">CIIA-S</td><td style="text-align: center;">6</td><td style="text-align: center;">20</td></tr> <tr><td style="text-align: center;">CIIB-S</td><td style="text-align: center;">21</td><td style="text-align: center;">35</td></tr> <tr><td style="text-align: center;">CIIA</td><td style="text-align: center;">36</td><td style="text-align: center;">65</td></tr> <tr><td style="text-align: center;">CIIB</td><td style="text-align: center;">66</td><td style="text-align: center;">80</td></tr> </tbody> </table>											Percentage GGBS		Not Less Than	Not More Than	CIIA-S	6	20	CIIB-S	21	35	CIIA	36	65	CIIB	66	80																																																																																																																													
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<p style="font-size: x-small;">The 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</p>																																																																																																																																																							

Signed: _____
 L Bontoft -Technical Manager GGBS