

## Appendix WCW5

### Distinctiveness of the Building Stone Industry & National Data

#### Structure

A5.1 There are between 335 and 378 active / intermittent quarries in England and Wales and 51 in Scotland. Almost all dimension stone quarries are small in comparison with most crushed rock aggregates quarries in terms of area and output. 90% of quarries have outputs of less than 2000 m<sup>3</sup>/yr. About 70% of output is produced by the largest 10% of quarries and 10% of companies (22 firms). Half of all production comes from 9 operators and 15 sites. This means that with a national production level of about 1 Million tpa, a large company (often with more than one site) would supply about 32,000 tpa (about 80,000 m<sup>3</sup>pa). Whitewall supplies up to 10,000 m<sup>3</sup>pa.

#### Products

A5.2 The industry offers a wide range of products in the following categories (unfortunately no figures available)

- Walling & paving account for the largest end use.
- Masonry, cladding & internal flooring are the next most important.
- Majority of sales are to new build (inc replication of traditional styles in conservation areas)
- Repairs to historic buildings represent a very small proportion of total output.
- Dressed and undressed stone.

A5.3 Use is dictated by the historical pattern of uses/sales, current demand & fashion. Historical use is important for many quarries who have built up a reputation for a certain type of stone, which is sought after for its unique characteristics both for repairs and new build. Some quarries are the only source for the repair of important historic buildings such as Cathedrals. However, repair contracts tend to be sporadic. Local planning polices can greatly influence the level of demand for some stones by requiring new build in sympathetic materials to blend in with existing buildings. This may account for up to 30% of demand in some areas. Higher value products go to large cities like London and Manchester. The South East is reputedly the largest market for dimension stone. Whilst some quarries produce small quantities for a local market, the majority of products do not have a 'local' market. Therefore, it is

important to recognise that some stone resources are of national importance and are used well away from their traditional quarrying areas e.g. Portland and 'York' stones.

- A5.4 Fashions go in five or ten year cycles particularly in interior flooring. Some very well known stones are exported but in small quantities. Roofing stone is almost entirely produced in different quarries to other dimension stones. Many sources are closed because the poor economics of producing roofing slates with low and uncertain demand. Some stone is company branded whilst others are registered as a 'heritage' product.

### **Nature of Resource and Processes**

- A5.5 Suitable stone may only be available in parts of a quarry and in certain horizons. In many cases a particular type of stone will be limited to one locality. Many quarries have no processing facilities on site and produce unworked blockstone which is then sent elsewhere for processing. Most operators need to operate on a larger scale to develop their business and crucially, need longer term reserves in order to plan for investment and to convince customers of the longevity of supplies for future repairs and maintenance.
- A5.6 The working of a building stone quarry is distinguished by producing stone to suit short contractual time scales and to standards of environmental practice common to the minerals industry. The drive towards low production costs to maintain viability means that the majority of quarries have had to find new markets to exploit the whole resource. Having created new markets it then becomes necessary to have adequate supplies. The BGS report that *"...It is often 2 years or longer between a material being specified and production details being supplied. The ability to satisfy orders in such circumstances requires considerable flexibility in planning where stone extraction is to take place."*<sup>1</sup>
- A5.7 About two thirds of building stone operations (210 sites) produce aggregates as a by-product from overburden or waste or both. As a rule of thumb 60%-80% of excavated material is classed as waste, although in some operations, the wastage level is even higher. This means that a majority of the small operations producing less than 2000m<sup>3</sup> /yr may produce up to 25,000 tonnes of aggregates. The largest

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<sup>1</sup> Mineral Profile: Building and Roofing Stone, BGS, November 2005

operations may however, produce aggregates in quantities similar to a purely aggregates operation.

- A5.8 It is reported that some stone which might be suitable as dimension stone, but for which there is currently no demand is either backfilled or crushed as aggregates. Small scale quarries have much less impact on the environment than aggregates operations. The set-up of a typical building stone quarry is different to a typical aggregates operation, in size, production levels and in numbers employed.
- A5.9 Prospecting for dimension stone is extremely expensive and may involve the use of cored drilling. Consequently, operators prefer to extend their workings into existing faces, rather than seek new sites. However, there is no guarantee that suitable resources will be found in extensions since dimension stone is by its very nature specific to a locality and can vary over short distances.

#### **Location/Environment**

- A5.10 E&W production comes from predominantly two rock groups – Carboniferous Sandstone (e.g. York Stone) with 119 quarries, and Jurassic Limestones (e.g. Bath/Portland Stone) with 77 quarries. These units represent nearly 60% of dimension stone quarries in E&W. Consequently, most production is concentrated where these rocks outcrop as the following table shows,

#### **Breakdown of Building Stone Quarries by Region & Production (E&W)**

Source: adapted from Symonds Report

<b>Region</b>	<b>No. of Quarries</b>	<b>Typical Output (m3) in 2000</b>	<b>Percentage</b>
South West	97	100,873	34.5%
Yorkshire	63	34,940	12.0%
Wales	46	35,698	12.2%
North West	40	50,185	17.2%
East Midlands	37	50,446	17.3%
North East	23	10,183	3.5%
South East	15	6,293	2.2%
West Midlands	10	3,332	1.1%
East England	4	260	0.1%
<b>Total</b>	<b>335</b>	<b>292,210</b>	<b>100%</b>

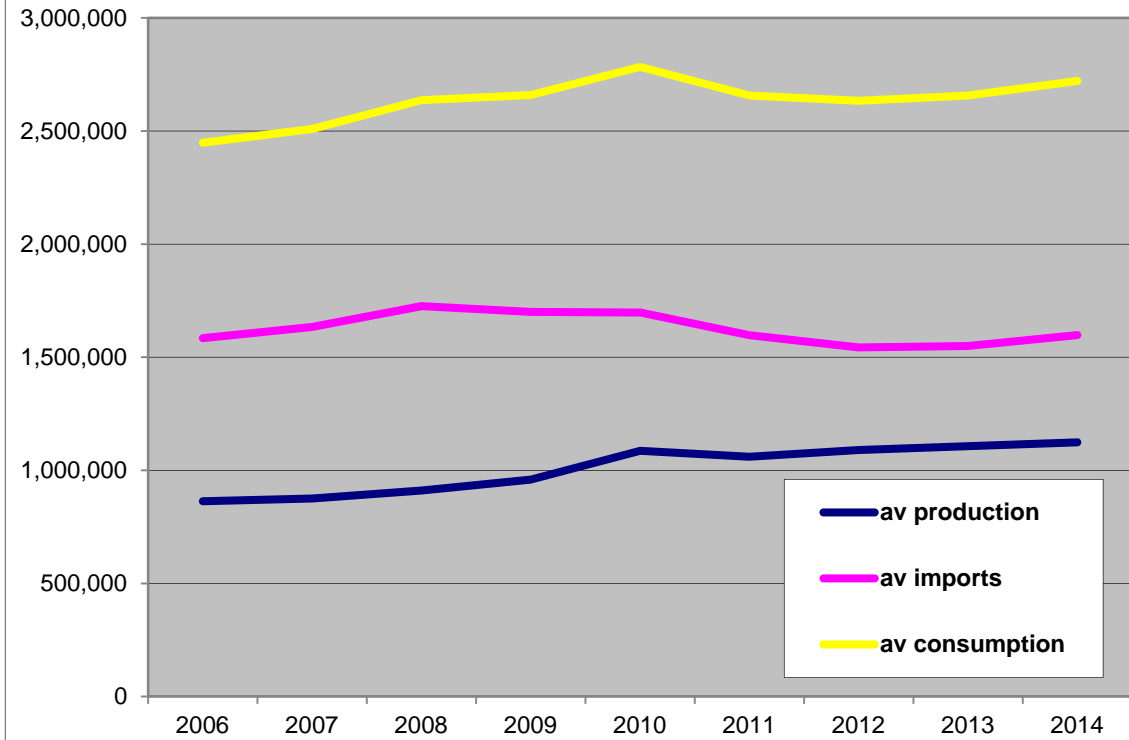
A5.11 Since the South West contains both these major rock types it figures highly in the concentration of production. Over 80% of production is attributed to this region plus the North West, Yorkshire and the East Midlands. Many sites are either within or close to (100m) international (12 sites) or nationally designated conservation areas (123 sites [37% of total]). The number and proportion of units affected in this way is greatest in the South West (52%), the East Midlands (51%) and North West (48%). If the radius of environmental effects around designations is increased to 500m, the proportion of quarries affected rises from 37% to 70%.

A5.12 In terms of rock types affected, 89% of Lower Cretaceous sandstones are affected by environmental designations, 83% of Portland & Purbeck stone and 75% of Bath Stone sites. Large numbers (27 out of 119) of Carboniferous sandstone sites are affected by environmental designations. Some rock types' relationship to designations is determined by their traditional location within National Parks. Some areas do not have quarries because none have been permitted, not because the rock might be unsuitable. There are indications that potential sources of dimension stone are also affected by major designations. Larger operators complain that many very small sites are under enforced for planning, environmental and health and safety legislation (if at all) leading to unfair competition through avoiding costs that professional operators must bear.

**Table 1: National UK Data for Building Stone 1997-2014 in tonnes (source: UK Minerals Yearbook, BGS)**

<b>UK Production</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000 est</b>	<b>2001 est</b>	<b>2002 est</b>	<b>2003 est</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
Dolomite	10,000	10,000	14,000	15,000	34,000	9,000	7,000	8,000	8,000	3,000	1,000	2,000	1,000	1,000	0	0	0	0
Sandstone	256,000	287,000	455,000	239,000	268,000	297,000	327,000	439,000	470,000	434,000	419,000	499,000	722,000	741,000	333,000	365,000	281,000	286,000
Igneous	189,000	138,000	184,000	206,000	479,000	217,000	212,000	189,000	150,000	150,000	50,000	279,000	408,000	600,000	200,000	165,000	165,000	159,000
Limestone	218,000	295,000	301,000	305,000	220,000	191,000	208,000	226,000	589,000	379,000	320,000	307,000	300,000	700,000	204,000	487,000	477,000	585,000
<b>Total</b>	<b>673,000</b>	<b>730,000</b>	<b>954,000</b>	<b>765,000</b>	<b>1,001,000</b>	<b>714,000</b>	<b>754,000</b>	<b>862,000</b>	<b>1,217,000</b>	<b>966,000</b>	<b>790,000</b>	<b>1,087,000</b>	<b>1,431,000</b>	<b>2,041,000</b>	<b>737,000</b>	<b>1,017,000</b>	<b>923,000</b>	<b>1,030,000</b>
<b>UK IMPORTS</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Unworked</b>																		
Marble	13,995	9,571	8,473	29,015	9,985	12,708	18,565	29,890	63,046	32,609	37,404	37,444	26,787	21,339	20,655	17,548	13,660	10,338
Granite	883,546	736,462	1,045,451	865,710	1,781,220	1,656,235	1,145,887	1,643,091	1,331,520	491,438	442,911	1,058,054	361,043	270,991	282,548	996,992	1,189,686	1,937,720
Sandstone	1,515	2,091	10,705	13,800	17,202	50,214	72,589	129,148	193,793	255,732	322,530	264,202	202,831	201,490	223,664	226,709	283,669	297,327
Other	2,056	109,746	148,015	5,228	9,857	259,070	300,324	29,224	28,138	116,986	68,726	54,415	48,823	63,655	62,604	58,822	52,779	92,460
<b>Sub total</b>	<b>901,112</b>	<b>857,870</b>	<b>1,212,644</b>	<b>913,753</b>	<b>1,818,264</b>	<b>1,978,227</b>	<b>1,537,365</b>	<b>1,831,353</b>	<b>1,616,497</b>	<b>896,765</b>	<b>871,571</b>	<b>1,414,115</b>	<b>639,484</b>	<b>557,475</b>	<b>589,471</b>	<b>1,300,071</b>	<b>1,539,794</b>	<b>2,337,845</b>
<b>Worked</b>																		
Marble	22,951	53,489	53,639	32,425	64,637	48,237	60,473	69,876	77,698	100,555	111,039	114,870	100,648	92,078	88,210	99,130	87,454	82,157
Granite	23,809	24,541	25,961	34,928	37,533	57,885	76,177	81,545	88,916	114,802	114,967	115,495	94,003	95,792	93,900	90,446	91,555	99,354
Other	4,659	8,984	12,018	17,839	21,256	27,063	31,600	42,078	42,395	41,470	64,610	61,324	98,462	87,152	49,219	29,748	31,410	32,294
Paving/flagstones	17,104	16,361	20,874	41,589	47,501	75,640	88,509	188,204	168,548	220,005	297,099	176,448	136,981	181,584	167,497	126,670	107,253	141,694
<b>Sub total</b>	<b>68,523</b>	<b>103,375</b>	<b>112,492</b>	<b>126,781</b>	<b>170,927</b>	<b>208,825</b>	<b>256,759</b>	<b>381,703</b>	<b>377,557</b>	<b>476,832</b>	<b>587,715</b>	<b>468,137</b>	<b>430,094</b>	<b>456,606</b>	<b>398,826</b>	<b>345,994</b>	<b>317,672</b>	<b>355,499</b>
<b>TOTAL</b>	<b>969,635</b>	<b>961,245</b>	<b>1,325,136</b>	<b>1,040,534</b>	<b>1,989,191</b>	<b>2,187,052</b>	<b>1,794,124</b>	<b>2,213,056</b>	<b>1,994,054</b>	<b>1,373,597</b>	<b>1,459,286</b>	<b>1,882,252</b>	<b>1,069,578</b>	<b>1,014,081</b>	<b>988,297</b>	<b>1,646,065</b>	<b>1,857,466</b>	<b>2,693,344</b>
<b>UK EXPORTS</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>Unworked</b>																		
Marble	4,580	7,332	6,084	8,668	4,140	4,853	6,203	2,362	2,126	1,549	2,227	1,019	728	822	698	402	437	563
Granite	3,961	1,111	983	1,594	1,558	931	1,369	1,804	1,974	2,394	7,634	8,629	5,722	36,657	91,172	6,633	5,708	7,167
Sandstone	263	734	4,445	5,974	4,998	5,789	6,424	4,920	5,683	5,426	1,081	354	243	259	221	296	2,175	4,329
Other	620	355	0	809	281	1,168	932	490	784	638	8,928	888	276	540	251	164	1,358	178
<b>Sub total</b>	<b>9,424</b>	<b>9,532</b>	<b>11,512</b>	<b>17,045</b>	<b>10,977</b>	<b>12,741</b>	<b>14,928</b>	<b>9,576</b>	<b>10,567</b>	<b>10,007</b>	<b>19,870</b>	<b>10,890</b>	<b>6,969</b>	<b>38,278</b>	<b>92,342</b>	<b>7,495</b>	<b>9,678</b>	<b>12,237</b>
<b>Worked</b>																		
Marble	915	601	622	839	526	946	1,072	1,636	2,905	4,068	4,740	2,934	1,603	1,332	965	1,224	919	1,367
Granite	115	101	85	713	53	732	290	489	607	517	429	786	1,904	1,449	709	1,128	749	1,025
Other	2,079	1,633	1,475	1,401	3,596	3,820	4,602	3,685	5,688	5,958	7,022	7,372	2,797	2,591	3,534	2,914	2,500	2,825
Paving/flagstones	3,139	3,730	4,328	3,168	5,029	5,057	4,980	4,688	6,709	6,669	3,716	2,483	3,321	4,640	12,467	4,745	7,469	8,830
<b>Sub total</b>	<b>6,248</b>	<b>6,065</b>	<b>6,510</b>	<b>6,121</b>	<b>9,204</b>	<b>10,555</b>	<b>10,944</b>	<b>10,498</b>	<b>15,909</b>	<b>17,212</b>	<b>15,907</b>	<b>13,575</b>	<b>9,625</b>	<b>10,012</b>	<b>17,675</b>	<b>10,011</b>	<b>11,637</b>	<b>14,047</b>
<b>TOTAL</b>	<b>15,672</b>	<b>15,597</b>	<b>18,022</b>	<b>23,166</b>	<b>20,181</b>	<b>23,296</b>	<b>25,872</b>	<b>20,074</b>	<b>26,476</b>	<b>27,219</b>	<b>35,777</b>	<b>24,465</b>	<b>16,594</b>	<b>48,290</b>	<b>110,017</b>	<b>17,506</b>	<b>21,315</b>	<b>26,284</b>

**Figure 1: Dimension Stone UK - Long Term Running Averages Production, Imports & Consumption 2006-2014**



**Figure 2: UK Building Stone Imports - Worked & Unworked Stone Trends**

