



Corsehill Sandstone

Technical Data Sheet

Corsehill Sandstone

Annan, Dumfriesshire, Scotland

Dunhouse Quarry Works, Staindrop Darlington,

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This data sheet was compiled by the Building Research Establishment (BRE). It is based on data from tests carried out by Sandbergs (1994), Stangers (1986), collated BRE data and from current tests at BRE. The data sheet was compiled in May 2000. The work was carried out by BRE Environment as part of a Partners in Technology Programme funded by the Department of the Environment, Transport and the Regions and Dunhouse Quarry Co. Ltd and does not represent an endorsement of the stone by BRE.

General

The quarry, near Annan, was reopened in 1982 having closed in 1946. There are good stocks of stone. Prior to closure Corsehill had been used throughout the last century. Stone is extracted from a 15m face and is available at depths of up to 1.2m on bed although 900mm is the average size. Exceptionally good lengths of up to 3m are obtainable.

Petrography

1) Macroscopic

Corsehill is from the New Red Sandstone of Triassic age. It is a fine-grained stone, pale red-brown, slightly calcareous, slightly calcareous sandstone.

2) Microscopic

The stone is composed of detrital quartz, opaline silica, feldspars and occasional mica crystals all with a reddened feruginous clay coating. Iron minerals are abundant as both black and brown haematite. The rock fragments are dominated by polycrystalline chert and mudstone grains. Some samples show altered quartz grains with iron oxide and other alteration products in the pore spaces. Coarser samples appear to be less altered with silica cement more prominent.

Expected Durability and Performance

It is important that the results from the from individual tests are not viewed in isolation. They should be considered together and compared to the performance of the stone in existing buildings and other uses. Sandstone from the New Red Sandstone series are traditionally acknowledged as generally being a very durable building and paving stone and have been used extensively in many towns and cities in the UK. Corsehill sandstone appears to be a durable stone that is not effected by acid rain or air pollution. However, the moderate weight loss in the sodium sulphate crystallisation test indicates limited resistance to salt damage under normal conditions and the high weight loss in the harsher saturated sodium sulphate test indicates susceptibility to salt damage in harsh environments (for example in coastal locations or from de-icing salts). The compressive strength of the stone is towards the lower end of the range for sandstone but is comparable with stronger limestones. The flexural strength is towards the lower end of the range for sandstone and if used for paving then the units may need to be thicker than those for some other sandstones.

Overall, Corsehill should be suitable for use in most aspects of construction including flooring, paving, load bearing masonry and cladding caution should be used in areas where a long service life is needed and there are high salt concentrations.

Test Results – Corsehill

Safety in Use		
Slip Resistance <small>(Note 1)</small>	84	Wet Values > 40 are considered safe.
Abrasion Resistance <small>(Note 1)</small>	Not Tested	Values <23.0 are considered suitable for use in heavily trafficked areas

Strength under load		
1) Compression ^(Note 2)	67.6 MPa	Loaded perpendicular to the bedding plane ambient humidity
2) Bending ^(Note 1)	5.7 MPa	Loaded perpendicular to the bedding plane ambient humidity
	Not Tested	Loaded perpendicular to the bedding plane ambient humidity
Porosity and Water Absorption		
1) Porosity ^(Note 3)	28.8%	
2) Saturation Coefficient ^(Note 3)	0.66	
3) Water Absorption	10.1 % (by wt)	
4) Bulk specific gravity	1888kg/m ³	

Resistance to Frost		
Flexural strength after Freeze/Thaw Test ^(Note 1)	8.6 MPa	Loaded perpendicular to the bedding plane ambient humidity
Resistance to Salt		
Sodium Sulphate Crystallisation Test ^(Note 3)	3.83% Mean wt loss	
Sodium Sulphate Crystallisation Test ^(Note 14) (saturated)	92% Mean wt loss	
Resistance to Acidity		
Acid Immersion Test ^(Note 4)	Pass	

(Test methods Note 1 = EN1341, Note 2 = EN 1342, Note 3 = EN 1341 /BRE 141, Note 4 = BRE 141, Note 5 = based on earlier BRE data)

Tests were carried out at BRE in 1997. N.D. = not determined