



Stoke Ground Limestone

Technical Data Sheet

Stoke Ground Limestone

Hayes Wood Mine, Limpley Stoke, Wilts

Compiled September 1997

This data sheet was compiled by the Building Research Establishment (BRE). Where possible, data collected in earlier surveys has been used to help interpret the test results. The data sheet was compiled in September 1997 using the results of tests carried out to the proposed European Standards. The work was carried out by BRE as part of a Partners in Technology Programme funded by the Department of the Environment and the Bath Stone Group and does not represent an endorsement of the stone by BRE.

General

The mine is in Midford Lane, Limpley Stoke, just off the A36 south of Bath. The mine closed in 1940 and reopened at the beginning of 1982. There are plenty of reserves of stone.

Petrography

Stoke Ground Stone is an oolitic limestone from the Great Oolite of middle Jurassic age. The stone is mined approximately 15m below ground but access is relatively easy. There are two different beds available – the Base Bed and Top Bed.

Expected Durability and Performance

It is important that the results from the sodium sulphate crystallisation tests are not viewed in isolation. They should be considered with the results from the porosity and water absorption tests and the performance of the stone in existing buildings. Stone from Stoke Ground is traditionally acknowledged as being less durable than stones such as Portland Whit Bed but it has been used extensively where a faster rate of weathering is acceptable or where its working qualities were required. The crystallisation test results show the Base Bed stone to be Class D and the Top Bed to be Class E which BRE Report 141 suggests that it is suitable for plain walling and cladding. The results from the other tests suggest that the soundest stone may well perform better than these classes in the current environment. This is particularly true of the Base Bed. When using Stoke Ground Stone it is especially important that the detailing of the stonework is designed to offer the maximum protection to rainwater and rainwater runoff. Based on current research it seems likely that the stone would weather at a rate of between 3 and 4 mm per 100 years but it could be greater in severe exposures or on the edges of stonework.

Test Results – Stoke Ground Limestone

Safety in Use		
Slip Resistance ^(Note 1)	80 (Base) 80 (Top)	Values > 40 are considered safe
Abrasion Resistance ^(Note 1)	28.2 (Base) 34.5 (Top)	Values <23.0 are considered suitable for use in heavily trafficked areas
Strength under load		
1) Compression ^(Note 2)	22.5 MPa (Base) 13.8 MPa (Top)	Loaded perpendicular to the bedding – ambient humidity
2) Bending ^(Note 1)	5.4 MPa (Base) 3.7 MPa (Top)	Loaded perpendicular to the bedding – ambient humidity
Porosity and Water Absorption		
1) Porosity ^(Note 3)	21.5% 26.9%	(Base) (Top)

2) Saturation Coefficient ^(Note 3)	0.67	(Base)
	0.82	(Top)
3) Water Absorption	7.4%	(by wt) Base
	11.6%	(by wt) Top
4) Bulk specific gravity	2126 kg/m ³	Base
	1988 kg/m ³	Top
Resistance to Frost		
Freeze/Thaw Test ^(Note 1)	Not determined	
Resistance to Salt		
Sodium Sulphate Crystallisation Test ^(Note 3)	Mean: 28.9% wt loss	(Base)
	55.0% wt loss	(Top)

(Test methods Note 1 = prEn1341, Note 2 = prEN 1342, Note 3 = prEn 1341 /BRE 141, Note 4 = BRE 141)

Tests were carried out at BRE in 1996