



Freestone
Purbeck
Limestone

Technical Data Sheet

Freestone Purbeck Limestone

Swanage Quarry

Panorama Road, Swanage, Dorset, BH19 2QS

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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 January 2000 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, Transport and the Regions and J Suttle Swanage Quarries and does not represent an endorsement of the stone by BRE.

General

The quarry is in Swanage in the south-west part of the town off Panorama View. The quarry is up beyond the caravan park but there is an office in Panorama Road. The quarry is large with a number of faces and at least 10 different beds. There are plenty of reserves. The stone is used for walling and paving. The depth of the stone varies between beds but most are between 250mm and 750mm with the Freestone around 1000mm deep but with individual beds within this around 200mm deep.

Petrography

The stone worked at the quarry is Purbeck Limestone from the Middle Purbeck division of Jurassic age. The stone varies in colour with the Freestone being a blue-grey colour with numerous shells.

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 this area is traditionally used as both walling and paving. The crystallisation test results show the stone to be Class A which BRE Report 141 suggest is suitable for all uses and that it should have good resistance to both salt and frost. Based on current research it seems likely that the stone would weather at a rate of between 1 and 2 mm per 100 years but it could be

greater in severe exposures or on the edges of stonework. The strength is towards the top end of the range for limestones.

Test Results -Freestone Purbeck Limestone (Swanage Quarry)

Safety in Use		
Slip Resistance ^(Note 1)	N.D.	Values > 40 are considered safe
Abrasion Resistance ^(Note 1)	N.D	Values <23.0 are considered suitable for use in heavily trafficked areas
Strength under load		
1) Compression ^(Note 2)	93.7 MPa	Loaded perpendicular to the bedding plane ambient humidity
2) Bending ^(Note 1)	10.0 MPa	Loaded perpendicular to the bedding plane ambient humidity

	7.3 MPa	Loaded parallel to the bedding plane ambient humidity
Porosity and Water Absorption		
1) Porosity ^(Note 3)	10.5%	
2) Saturation Coefficient ^(Note 3)	0.60	
3) Water Absorption	2.6% (by wt)	
4) Bulk specific gravity	2428kg/m ³	
Resistance to Frost		
Freeze/Thaw Test ^(Note 1)	N.D.	
Resistance to Salt		
Sodium Sulphate Crystallisation Test ^(Note 3)	-0.4% Mean wt loss	

(Test methods Note 1 = EN1341, Note 2 = EN 1342, Note 3 = EN 1341 /BRE 141, Note 4 = BRE 141)

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