Portland Perryfield Shelly Limestone

Technical Data Sheet
Portland Perryfield Shelly Limestone
Perryfield Quarry
Isle of Portland
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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 March 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 Hanson Bath and Portland Stone and does not represent an endorsement of the stone by BRE.

General

The Perryfield Quarry is one the a group currently being worked on Portland by Hanson Bath and Portland Stone. Perry Shelly is an unusual buff/white stone with an open texture. It derives its name from the numerous shell fragments that are present. It has been used for cladding and decorative features. The maximum block size is 2000 x 2000 x 600mm.

Petrography

The stone is an open textured oolitic limestone from the Portlandian formation (Jurassic). The stone is formed from micrite (fine grained calcium carbonate) ooids with a small quantity of micrite occurring as matrix. There are numerous shell fragments which are elongated to rounded and are typically about 5 – 10 mm across. The stone generally appears to be moderately compacted although the degree of compaction is variable. Most of the areas exhibit a fairly high intergranular porosity with interlinking of adjacent pores.

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 the Perryfield Shelly bed in Perryfield Quarry has not been used in many projects and so there is only limited experience of its performance.

The test results show that it should have good resistance to frost and salt. Based on current research it seems likely that the stone would weather at a rate of between 2 and 3 mm per 100 years but it could be greater in severe exposures or on the edges of stonework.

Test Results – Portland Perryfield Shelly Limestone (Perryfield 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)	36.6 MPa	Loaded perpendicular to the bedding plane ambient humidity
2) Bending (Note 1)	7.3 MPa	Loaded perpendicular to the bedding plane ambient humidity

	N.D.	Loaded parallel to the bedding plane ambient humidity
Porosity and Water Absorption		
1) Porosity (Note 3)	15.8%	
2) Saturation Coefficient (Note 3)	0.63	
3) Water Absorption	4.4 % (by wt)	
4) Bulk specific gravity	2279kg/m^3	
Resistance to Frost		
Freeze/Thaw Test (Note 1)	N.D.	
Resistance to Salt		
Sodium Sulphate Crystallisation Test (Note 3)	11.92% Mean wt loss	

(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 1996-97. N.D. = not determined