BOWERS ROACH®

This technical data sheet was compiled by the Building Research Establishment (BRE) at the request of Albion Stone and is updated by Albion Stone to incorporate current test results. The 866 tests have been carried out in accordance with current European standards by the BRE on Albion Stone's behalf, or by other accredited testing houses. The early test data that pre-dates the introduction of Euro-codes has been included providing the test methods were very similar. The work carried out by the BRE on this technical data sheet has been undertaken as a paid commission and does not represent an endorsement of the stone by the BRE.

This data includes the Lowest and Highest Expected Values (LEV & HEV) using the statistical calculations from the Euro-codes. We are confident that these results give a good indication of the stones value, but as it is a natural material we, like other stone producers, are unable to guarantee individual results for specific stones. Instead, we recommend that an appropriate factor of safety is used to ensure satisfactory performance, Cladding Annex 1 of the Technical Manual provides further information, but we suggest that a suitably qualified stone consultant with geological and testing experience is employed to provide further information.

Petrography

The stone is an open textured oolitic limestone from the Portlandian formation (Jurassic). The stone is formed from ooliths in a micrite (fine grained calcium carbonate) matrix. It is an extremely shelly stone with a large number of holes scattered throughout it. The holes are due to the removal of fossil shells by percolating rain. The finer-grained parts of the stone is very similar to Whitbed.

(For a full Petrographic description of this stone, please contact us on 01737 771772 or email enquiries@albionstone.com)

Strength

Compression - BS EN 1926
Lowest Expected Value 23.96 MPa
Highest Expected Value 75.09 MPa
Average: 44.24 MPa from 32 tests

Flexural Strength - BS EN 13161
Lowest Expected Value 2.02 MPa
Highest Expected Value 6.70 MPa
Average: 3.94 MPa from 140 tests

Breaking Load at Dowel Hole (75mm thick stone) - BS EN 13364
Lowest Expected Value 1,981 N
Highest Expected Value 8,264 N
Average: 4,288 N from 30 tests

Durability

Water Absorption - BS EN 13755
Lowest Expected Value 3.38%
Highest Expected Value 9.71%
Average: 5.99% from 153 tests

Density - BS EN 1936
Lowest Expected Value 1,984 kg/m³
Highest Expected Value 2,491 kg/m³
Average: 2,195 kg/m³ from 213 tests

Porosity - BS EN 1936
Lowest Expected Value 9.73%
Highest Expected Value 28.27%
Average: 17.43% from 267 tests

Saturation Coefficient - BS EN 1936
Lowest Expected Value 0.54
Highest Expected Value 0.88
Average: 0.62 from 173 tests

Salt Crystallisation - BS EN 12370
Lowest Expected Value 1.18%
Highest Expected Value 5.91%
Average: 2.88% from 11 tests

Flooring / Paving

Stone from Bowers and Jordans Mine and Jordans Quarry compared to those collected from buildings, exposure trials and tests on quarry samples collected by BRE during the last 80 years shows that this stone compares very well with the traditional view of Portland Roach.

Abrasion Resistance - EN 14157
Lowest Expected Value 20.29
Highest Expected Value 24.95
Average: 22.50 from 12 tests

Slip Resistance - TRRL Pendulum Test: Grit 120 Filled (Internal Flooring)
Lowest Expected Value 82
Highest Expected Value 88
Wet Average 85 from 48 tests

Internal Flooring

Bowers Roach is suitable for all flooring applications up to intensive use such as shopping centres and airports with estimated visitor numbers of 500,000,000 with a service life without significant wear of 20 years. The dry slip resistance results of over 40 demonstrate that the

stone will be safe in all normal applications.

Technical Summary

Prepared by: Dr T Yates, BRE (Building Research Establishment)

Durability and Weathering

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 Portland Whitbed is traditionally acknowledged as generally being a very durable building stone and it has been used extensively in many towns and cities in the UK. Comparing the results for the Whitbed Stone from Bowers Quarry to those collected from buildings, exposure trials and tests on quarry samples collected by BRE during the last 70 years shows that this stone compares very well with the traditional view of Portland Whitbed. Previous research at BRE has shown that Portland limestone which has a low saturation coefficient (50 years). In all cases it is important that the detailing of the stonework is designed to offer the maximum protection from rainwater and rainwater runoff.

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.

(Weathering rates are based on the BRE interpretation of historical data dating from 1932).