

## **QUATERNARY ANCHIALINE KARST DEVELOPMENT BELOW PRESENT DAY SEA LEVEL IN PLYMOUTH AND ITS EFFECT ON FOUNDATION DESIGN**

*R.P. SMITH, A.M. ROBERTSON AND N. SHELFORD*



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Anchialine cave development occurs at the interface between saline and meteoric groundwater zones in a coastal karstic aquifer. This process has been described in detail for the submerged Blue Holes of the Bahamas, USA and is typified by the concentration of horizontal or shallow dipping solution cavities, which develop independent of structural geological controls. Concentrations of horizontal solution features associated with past sea level stands above 0 m OD have been described for the karstic middle Devonian Brixham Limestone Formation aquifer of Berry Head, Devon. Similar horizontal cavities occur in the coastal aquifer of the Devonian Plymouth Limestone Formation. Analysis of borehole information from three sites along the coastal edge of the Plymouth Limestone Formation indicates that concentrations of solution features can also be identified at various levels below the present day sea level. A number of these levels can be correlated with earlier sea level stands. Interpretation of the geotechnical behaviour of sediments infilling the solution features suggests rapid cave infilling in the last phase of marine transgression during the Holocene. The implications of solution voids on engineering design and construction are significant. Designing engineering solutions for foundations must consider anchialine void levels and characteristics and any change in surface water drainage can result in serious settlement and stability problems.

*John Grimes Partnership Ltd, The Barns, Leonards Road, Ivybridge, Devon, PL210RU, U.K.  
(E-mail: RodS@jobngrimes.co.uk).*

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