

## **Techniques Used for Characterisation of Binder Components for Kalahari Sand Building Block (KSBB) Development**

Z.S. Raditladi, E.U. Masuku  
*Botswana Technology Centre, Gaborone, Botswana*

The need to extend OPC using Morupule fly-ash necessitated identification and measurement of their chemical and mineralogical constituents, as well as determination of their physical properties. Qualitative and quantitative analytical methods employing such techniques as atomic absorption spectroscopy, powder x-ray diffractometry, scanning electron microscopy and electrochemistry were used to identify and measure the constituents.

The latter two techniques were also utilized to determine a number of physical properties. In addition, physical property measurements such as by the 45  $\mu\text{m}$  sieve method, Blaine Apparatus and Le Chatelier Flask were applied.

With % content (m/m) of CaO below 10, Morupule fly belongs to Class F.  $\text{SiO}_2 + \text{Al}_2\text{O}_3 + \text{Fe}_2\text{O}_3 > 70 \%$ (m/m) while  $\text{Na}_2\text{O} + \text{K}_2\text{O} < 15 \%$ (m/m). Silicate compounds are the dominant phase in the fly-ash while calcium magnesium silicates constitute dominant phase in OPC.

Results such as above show that extending OPC with Morupule fly-ash is viable.