TR 10-146-147

R. 504

LUCK BROS., DEVONPORT: BRICK MANUFACTURING TESTS

Sample

A sample of clay stated to be from the Don Road cutting was submitted by the above Company for brick manufacturing tests by pressing and de-aired extrusion.

The sample was partially dried and roll crushed to pass a 5 mesh screen. The required amount of water for each type of manufacturing test was first incorporated by hand mixing followed by several passes through a Rawdon pug mill.

Pressing

Attempts to produce bricks by stiff plastic pressing were not successful. The material exhibits poor cohesive properties but adheres strongly to the die surfaces and specimens cannot be ejected without severe damage due to bowing and plucking. The moisture content required to produce a pug suitable for stiff plastic processing amounted to 28 per cent.

Slightly better results were obtained by reducing the moisture content to 23 per cent. The mix then appears to be in a "semi-dry" condition. The green bricks were still very subject to damage on ejection from the die, but manufacture is possible with this moisture content.

Extrusion

De-aired extrusion of a pug containing 30 per cent moisture resulted in a smooth column of good plasticity with no sign of dog-earing or notching. The column cut smoothly and freely with wire and was of good green strength.

Drying and Firing

The bricks were allowed to dry naturally for several days and were finished by heating in an electric oven at 110°C.

The dried bricks were fired at 950°C in an electric muffle furnace, soaking for two hours at this temperature.

Serious core cracking developed in the extruded bricks during drying and became even more apparent after firing, the fired specimens being extremely fragile.

The dried pressed bricks exhibited a rather porous condition which did not improve after firing. These specimens too, were rather fragile with very easily abraded edges and corners.

The fired bricks were reddish buff in colour.

Test Results

Type of Manufacture	Per Cent				
	Moisture in Green Brick	Contractions			Firing Loss
		Drying 110°	Firing 950°	Total	
Semi-Dry Pressing	22.8	5.0	Nil	5.0	
Stiff Plastic Pressing	No specimens obtained from tests				7.0
De-aired Extrusion	30.3	10.0	1.0	11.0	

Summary

The material as received is not suitable for brick manufacture by any of the methods tested. The ignition loss indicates a clay content in excess of 50 per cent and the addition of suitable reagents and/or blending with other materials modifying the physical condition of the material may render it suitable for brick manufacture by any of the above methods. This aspect has not been investigated.