

Eco-Cement Mud Brick & Mortar Update

Michael Watson

The following pictures are from Michael Watson's Whittlesea Project.



Figure 1 - Whittlesea Mud Bricks Out in the Weather 17/03/05



Figure 2 - The Watson Whittlesea Project Home 15/08/05



Figure 3 - Detail of Corner Watson Whittlesea Project Home 15/08/05

Michael Watson: In spite of being exposed to the weather for 6 months they are going very well!

Mortars

John Harrison initially specified a 1 pc, 2 MgO, 12 sand, however Michael found this a little strong. A 1:2:15 formulation is now being used.

Lance Collins

Lance is building a “muddie” up Buxton way. He reports:

“I made 4 blocks with the Tech-cement and 4 with the Eco-cement at 2,4,6,and 8 percent. With the Tech-cement the mix got progressively stiffer and smoother as I went from 2 to 8 percent. To a lesser extent I got the same effect with the Eco-cement. The dirt I was using had a fair amount of small mud-stone pieces and the soil was a bit lumpy to start with. At 2 percent I couldn't trowel off the blocks smoothly.

I haven't noticed these stiffening effects with Portland cement. There's no obvious effect on the mix when placing into the forms of different proportions of OPC.

I conclude that some chemical reaction is taking place with your cement and my soil.”

Lance is at this stage testing tec and eco-cements (T and E below, the number denotes the percentage added.)



Figure 4 - Lance Collins Testing Cast Mud Bricks.

John Harrison's Comment re Lance Collin's Tests:

Tec and eco-cements introduce a strong shear thinning property and that is why Lance is experiencing a stiffening. There are several reasons for this:

- Interaction between highly charged clay minerals and Mg^{++} which is a small highly charged ion.
- Interaction between Mg^{++} and water which is a polar molecule.

There are also reactions with the aluminium in soils, probably to form magnesium aluminium hydrates.