Improving the Built Environment

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Mr John Harrison
TecEco Pty. Ltd
497 Main Road
Glenorchy
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Dear Mr Harrison,

Review of Magnesium cements

This letter presents a preliminary technical overview of magnesium cements as described in the document entitled "Eco-Cement – Technical Details" prepared by you, but is provided without experimental confirmation.

The scientific concepts for developing a new generation of binders, as outlined in the Document, appear to be sound for a range of construction applications. The theoretical basis of the proposed eco-cement is logical and the economic and environmental benefits appear excellent.

Methods for overcoming the uncertainty in relation to the reaction rate of magnesia are presented in the Document and are described to involve the utilization of wastes, using highly reactive magnesia, air entrainment and blending with other hydraulic cements. These methods seem reasonable, but are yet to be fully proven.

However, the following factors mitigate the uncertainty in relation to hydration rates of magnesium:

- The durability performance of the cement due to the hydration of periclase (unreacted magnesia) and its subsequent induced distress of building components should be of relatively lower concern for low strength applications such as pavers and blockwork.

- Magnesium carbonate binders have the potential to develop adequate compressive strengths as a function of time. With the use of fibre reinforcing in the cement, greater strengths may be achieved.

- There appear to be cost and environmental benefits to be derived in using magnesium – based cements

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Further research and developmental work would need to be directed to validate the durability performance of this class of cement binders, particularly in respect to magnesia particle size distribution required to ensure adequate reactivity and completeness of hydration.

The observations recorded in the Document suggest that there is scope to develop the eco-cement technology. However, rigorous scientific investigation coupled with pilot plant trials would be required to fully quantify the overall benefits of this proposition.

Yours sincerely,

(Dr Kwesi Sagoe-Crentsil)