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To Whom It May Concern:

**Re:** The Future of Offsets.<sup>1</sup>

It is well known that there are enormous potential greenhouse gas savings within the building industry when manufacturing of materials, construction and usage are taken into account.

Presently, it is understood that it would be difficult to quantify and trade these potential benefits given the international focus on carbon sequestration via forestry. This submission suggests that the Australian nevertheless make a policy allowance (or "watch this space") for future offset schemes.

There are various programmes that presently on their way to quantifying the benefits of good design, such as the Five Star energy rating scheme. We believe eventually, life cycle assessment schemes might pave the way to either a linkage of these benefits to the National Emissions Trading Scheme; compliance through other bodies such as Australian Standards/BCA or simply voluntary standards of excellence.

Regardless of how this transition occurs, consideration now may assist shaping greenhouse regulations in Australia enhancing synergies with building industry greenhouse gas initiatives of the future.

Architectural design is well appreciated, but what is an engineering design of a structure? Fundamentally the engineering design makes a building fit for the purpose of interacting with its environment.

As an example of a fundamental design issue facing the nation, Archicentre's 2005 survey of 75,000 homes in Australia found 38% were cracked. We believe significant building damage will occur this year as already reported in Melbourne<sup>2</sup> as we experience one of the driest years in the last 100 years, meaning maximal shrinkage of clay soils beneath external walls and footings. Apart from the repairs, we estimate each year at least \$300 million is invested per annum in preventative strategies using additional concrete and reinforcement (which given Archicentre's survey, are not always successful).

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<sup>1</sup> e.g. "Australian Buildings Not Green Enough", Master Builders Magazine, WA, December 2006 - January 2007, p. 62.

<sup>2</sup> Alexander Roginski, "Domain" cover story: "Faultlines – Melbourne's Cracking Up", The Sunday Age, October 1, 2006.



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A new technology “ClayLock” averts this cracking problem and reduces the amount of work the structure, to resist the movement of clay soils that expand and contract, by stabilising the clay pad beneath. This method was invented by Fellow of the Institution of Engineers and Australian Standards BD25 committee member Mr Peter Airey and is presently tabled with the Australian Standards foundation design committee for consideration in the next revision. It has been used to build a hospital, theatre and council buildings in Western Australia. In anticipation of widespread usage the Australian Institute of Building Surveyors are distributing information nationally to their members.

Preliminary calculations indicate a 0.1 Megatonnes CO<sub>2</sub> (ca. 5% of total construction CO<sub>2</sub>-eq 2004<sup>3</sup>) would be saved per annum on cement contribution alone – a modest but incremental contribution to the total Emissions budget. A lifecycle assessment of our product is a work in progress - easier said than done with simple comparative CO<sub>2</sub>-equivalents of material such as steel, concrete, are not readily accessible. We do know from independent quantity surveys of design comparisons that by volume, the technique saves 20-30% concrete and 40-70% steel reinforcement at a cost of increased polyethylene usage, and one-off water injection. It is applicable to about 20% of all new buildings in Australia and any international clay sites areas experiencing aridity – and can eliminate much of the \$300 million p/a stiffened raft bill. Process-wise we also expect benefits owing to reduced construction complexity.

Saving structural greenhouse and dollar costs is not necessarily a case of “dematerialising” buildings with subsequent poor performance and longevity. It is a case of working with, rather than against natural conditions in order to reduce the structural work (=resistance against environmental and internal forces) required. In the case of ClayLock, moisturisation accelerates natural “mound” formation in 4-6 weeks beneath the building that would otherwise occur over 5-7 years. Extension of the building footprint with polyethylene sheet mimicks a larger building, eliminating edge effects beneath the perimeter of the building. These two features result in passive (i.e. no maintenance) protection of the building.

It is difficult to appreciate the level of streamlined efficiencies within the building industry that offer cost competitiveness to consumers. Ideally for the building industry, “greenhouse” costs (material, process, energy etc) could be incorporated where possible in quantity survey data. Work on alternative structural designs could then be carried out at the same time as design by an existing administrative engine within the industry. This includes architects and engineers, who routinely construct concept and detailed building performance models, and on the materials and process costing side by quantity surveyors. Expertise environmentally could provide a focus on producing and refining the accuracy of quantity survey estimates. This future vision requires leadership from a number of professions that could be catalysed by some of the learned bodies presently investigating life cycle models.

We hope these comments are of interest and contribute to a successful resolution of the draft Scheme.

<sup>3</sup> Australian Government, Department of Environment and Heritage, Australian Greenhouse Office publication “National Inventory by Economic Sector 2004”.