



with Sean O'Neill
The Eco-friendly column



Green Works

Low carbon concrete...ecofriendly cement

USING low carbon concrete (LCC) is the way forward in the construction industry. It will be used to build the convention centre on the River Liffey in Dublin City centre.

By using low carbon concrete for this project the following savings will be achieved: saving of over 6,000 tonnes of CO₂ emissions; saving of quarrying over 10,000 tonnes of natural resources, and saving the energy equivalent of over 1,000 years of electricity use in the average home.

Remember, these savings will be achieved in the building of just one structure!

The National Roads Authority (N.R.A) specify the use of low carbon concrete in the structure of all their new bridges from an environmental point of view and from a structural point of view.

The product will react better to salt spray rising from roads that are gritted in winter, it is claimed. There is no physical difference in the concrete but there is a difference in the way that it is manufactured, the raw material used, the 50 per cent less carbon emissions and the lower profit margin for the manufacturers.

Low carbon concrete is available almost nationwide so ask for it through your local supplier, use it, and reduce the carbon footprint on your new build or extension.

Sustainability: Sustainable development is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

For example, using LCC on a typical three-bed semi-detached house achieves: a saving of over 10 tonnes of CO₂ emissions, saving of quarrying over 18 tonnes of natural resources and saving the energy equivalent of over 1.7 years of electricity use in the average home.

Remember, these savings can be achieved in the construction of just one house.

Low carbon: Low carbon concrete uses eco friendly cement that is made using a waste product from the steel industry leading to a reduced carbon footprint.

Embodied CO₂: The embodied CO₂ in Irish construction projects accounts for between 10 per cent and 15 per cent of all CO₂ emissions in Ireland. The LCC can reduce the embodied CO₂ in concrete by 50 per cent.

By using LCC it can reduce the embodied CO₂ of the average structure by 25 per cent, making it the best available technology for reducing embodied CO₂ in the construction industry

In Ireland, cement manufacture is currently the second largest industrial source of CO₂ and NOx emissions, after the generation of electrical power from fossil fuels. Manufactur-

ing one tonne of Portland cement releases about one tonne of CO₂ into the atmosphere, along with typically 2kg of SO₂ and 3.5kg NOx. In addition, 1.6 tonnes of raw material are quarried for every tonne of cement produced.

Ireland's obligation under the Kyoto Protocol

The Kyoto Protocol on Climate Change commits Ireland to limiting the emissions of global warming gases by the year 2012 to 13 per cent above their 1990 level.

In 2000 Ireland was 24 per cent above the 1990 emission level. We are expected to be over 37 per cent above the 1990 level by 2012 in the absence of corrective measures.

The introduction of emissions trading to comply with the Kyoto Protocol will bring significant penalties to taxpayers and consumers unless these targets are achieved.

The use of low carbon concrete reduces emissions of a range of critical pollutants and allows for significant compliant cost savings. In addition to the highly positive technical characteristics this cement has an important role to play in environmental protection and in the reduction of greenhouse gas emissions for the future.

Other benefits

Fire can reduce the strength of concrete. LCC shows greatly improved strength after fire when compared to concrete made with ordinary cement.

Acids such as those found in farms and water/wastewater treatment plants cause deterioration of concrete.

It is well established, through extensive research, that the cement used in LCC greatly reduces the damage to concrete.

Previously developed sites may contain contaminants in the soil and ground/water which attack concrete causing expansion and cracking, leading to accelerated deterioration.

The cement used in LCC improves the chemistry and reduces the porosity of the concrete, protecting it from sulphates.

Salt on roads and in marine environments can penetrate concrete, attacking the steel reinforcement and causing it to expand. This causes the surrounding concrete to crack, requiring repair and, ultimately, replacement. Using LCC will double the life span of the concrete used in terms of resistance to chloride.

Cracking and voids will lead to significant damage in your concrete so LCC has a major benefit because of its chemistry, and has a much reduced void ratio than concrete made with ordinary cement.

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