

project case study

Stormy Castle, South Wales



overview

Concrete supplied by Hanson has been used as the principal building material to create an award winning Code 5 home. The mix incorporated Regen, which helped the building surpass all its sustainability targets.



**Stormy Castle** replaced an existing house on an elevated site near the remains of a Celtic hill fort in an Area of Outstanding Natural Beauty in Gower, South Wales.



- **product**  
Hanson concrete incorporating Regen
- volume supplied**  
700m<sup>3</sup>
- CO<sub>2</sub> savings**  
98 tonnes



➔ **The brief** was to create a contemporary new building that was integrated into the landscape and which met the client's desire for a low energy, low maintenance and sustainable new home.

Loyn & Co Architects chose concrete as the most suitable building material for the project due to its longevity, low maintenance and aesthetic qualities. It is also widely used in local agricultural buildings.

The initial high carbon input this requires will be recovered by the building over its lifetime due to concrete's durability and its effect on future energy input. The carbon input was also greatly reduced by the use of Regen, which is used as a cement replacement and significantly reduced embodied CO<sub>2</sub> emissions. In total Hanson supplied just over 700m<sup>3</sup> of concrete containing locally sourced aggregates and 50 per cent Regen, which saved 98 tonnes of embodied CO<sub>2</sub> – equivalent to taking 40 cars off the road for a year or 51.7 years of electricity usage in the average home.

The addition of Regen also helps to improve the durability of the concrete, even in aggressive environments, which was particularly important for the areas

cut into the landscape. Regen has a different chemical make-up to ordinary cement which gives it an inherent ability to reduce the permeability of the concrete through secondary hydration.

The house has surpassed all the sustainability targets set. In addition to achieving Code Level 5, it has an EPC certificate A rating after achieving a perfect 100 out of 100 score.

It uses concrete's inherent thermal mass to create a highly insulated building fabric and combines this with a number of technological solutions to achieve its credentials. Photovoltaic solar panels, solar thermal panels, a ground source heat pump, rainwater harvesting, wood burning stoves, low energy LED lighting and MVHR (mechanical ventilation with heat recovery) have all been installed.

The result is a building which had a Target Emission Rate of 22.55kg/m<sup>2</sup> but delivered an Actual Building Emissions Rate of -0.46kg/m<sup>2</sup>.