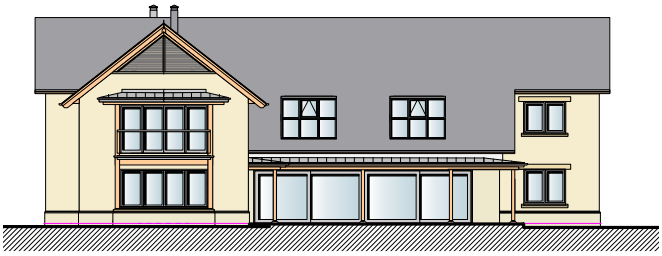
New 'Eco Farmhouse' - Cambridge
Architect's Account - April 2012.



We looked carefully at a number of different construction methods for the clients' new farmhouse, starting with wide cavity masonry walls, then to Integrated Concrete Formwork (ICF) and SIPs construction. There were pros and cons for each method, but after being introduced to Ron Beattie in September 2011, we finally chose the Beattie Passive system as the best solution for this particular project. The Beattie Passive system has a robust timber frame construction method that allows a continuous layer of insulation to pass from floor to wall and wall to roof, providing a complete thermal jacket to the entire building enclosure, eliminating the effects of cold bridging. This is a unique building method yet uses simple 'off-the-shelf' products, providing an economical and quick method of construction. The simple yet unique timber and concrete floor construction proved to be particularly suitable for the highly shrinkable clay ground conditions that existed at the site. The whole structure should reach better than 'Passivhaus' insulation standards, and once erected, with air seals in place, should produce a highly continuous air-tight construction.

The system has proved to be very flexible, and has not compromised the initial design, allowing large spans, large openings, cantilevered construction and ceiling lines to follow the pitch of the roof. The Beattie package includes a detailed three-dimensional structural computer model and with BIM technology allows a quick and accurate method of creating off-site building elements, and once delivered can then be quickly erected on site, eliminating construction waste.

With such high insulation and airtight standards achievable, it was decided the wood chip boiler, which had been originally proposed, was no longer necessary and for it to be substituted for a whole house mechanically ventilated heat recovery system (MVHR) which is currently being designed and installed by Total Home Environment. This plant could be installed in vacant roof spaces, allowing the large room for the wood chip boiler and associated wood chip storage area to become additional useable accommodation for the house. Fresh air for the house will be drawn through a large diameter 40m long 'earth tube', which pre-heats (or cools in hot summer temperatures) the incoming air to the MVHR unit. The unit runs on a small amount of electricity, which will be largely generated by the associated solar PV array installed on the adjacent existing farm building roof.

An initial contract was agreed with Beattie Passive in late October 2011, which enabled an unusually speedy start on site in January 2012 with completion expected in late Autumn 2012. It is anticipated that the house will end up as a highly sustainable and 'negative carbon' construction, and we eagerly await the final testing later this year for the concluding test results.

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