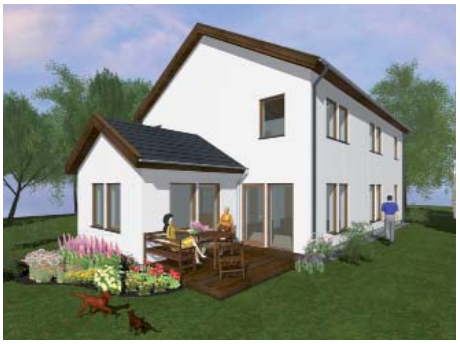
A builder's first day in the Cloughjordan Eco-Village

by Lars Pettersson

It is the 25th of August 2009, a day we had all been looking forward to for a long time, the day we would erect the first Scandinavian Homes passive house in the eco-village of Cloughjordan in County Tipperary. At 07.00 the house kit arrived. Our erection-team from Galway headed by Peter Flaherty and John Goaley and their experienced carpenters had already been on site the evening before to make sure that all preparations were ready.

Our first project

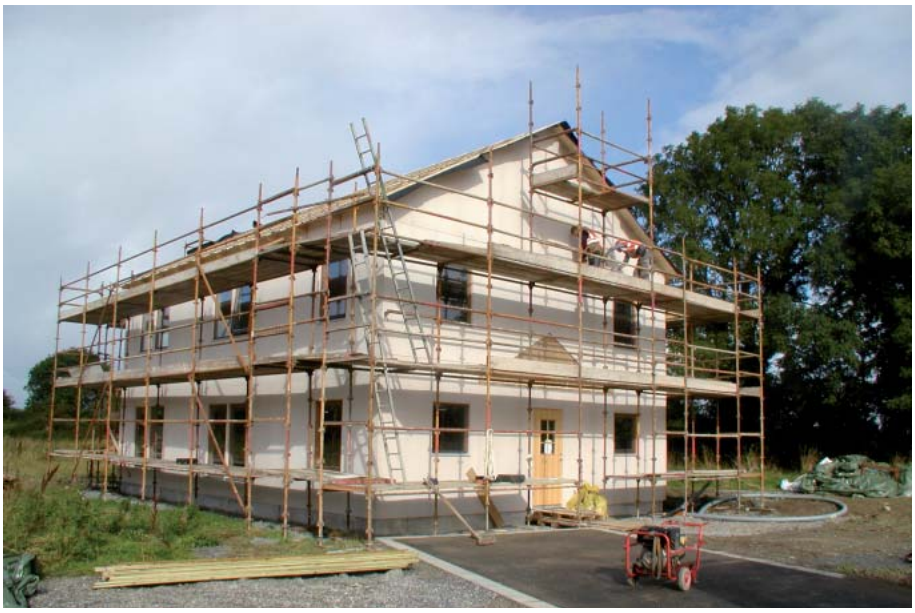
We are so proud of our passive foundation - 155mm perimeter insulation and 280mm under the concrete slab – all environment friendly, simple expanded polystyrene - no nasty cyanides. As always, the foundation was already in place, and in perfect shape, all thanks to James Kearney and his team. James had also installed two 60m long floor-heat pipes in the slab. This is all it takes to support-heat a passive house in the winter months. To be connected to the district heating system of the Village. This house will have no solar collectors on the roof for tap water and no wood burning stove for space heating in the coldest winter days. Great convenience, but sharing a powerful central heating system for a passive house is a bit odd.



CAD perspective of the project

This Scandinavian Homes house is a 216m2 two-storey single family home built to passive specifications. With a beautiful location at the north-west corner of The Village I think this will be a fantastic home for Anthony & Elaine Kelly with their two children when they move in a couple of months. Due to the favourable surface-to-volume ratio of this Stockholm house-type it reaches passive performance with our standard passive wall featuring 215mm of Paroc rockwool insulation.

I often wonder why architects so often complicate the roof construction! A traditional saddle roof and flat ceiling inside is cheap and everlasting! We can easily reach a U-value of less than 0.1W/m2 with 700mm of recycled newspaper insulation blown into the generous attic space. Breathable sarking of solid spruce with our special wind-breakers at the eaves create ventilation of the attic space so that we can be sure of a life-span of several hundreds of years. All natural materials, exactly the same methods as in my Swedish house from 1855, and that is still crisp and clean.



passive two-storey Stockholm 208 after 4 days

The Village is progressing

The Village is finally moving which is great, and about time. There have been many delays in the planning process and some village members have left the project over the years of this phase. However, the planning phase is completed and the building phase is progressing...

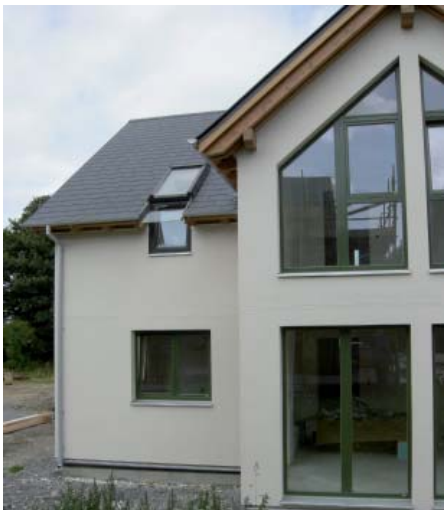
Other CAD perspective of the project

We at Scandinavian Homes had hoped to build many of the houses here, our pas-

Construction of the infrastructure in February 2008

sive and super-passive houses should be ideal in an eco-village. But unfortunately, the requirement to connect to the common district heating system is not so logical for passive houses. Passive houses need so little energy, but still have to pay towards the massive capital costs for the large central system of the Eco-village. The wood-chip and solar-panel propelled district heating system does however help the not so well insulated houses built by local enthusiasts to get clean heat. This has probably made it easier for alternative building methods to pass the ecological charter, and I really think it is great to see the diversity of building methods in the village.

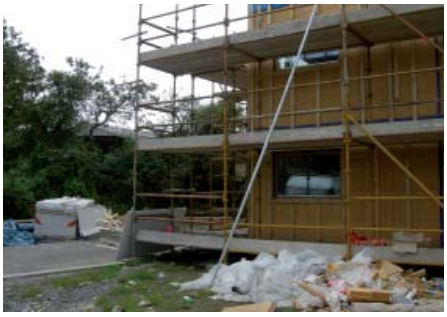
Other house projects



GriffnerHaus project nearby

Seven buildings are now erected. Two high-quality timber-frame houses by Austrian Griffner are almost ready to move into. Another large passive looking house and three interesting houses marrying lime, hemp and timber in various ways. They utilized some radical wall constructions as well. Hemp Lime is a composite of bits of the core of hemp plants (also known as hurd or pith) and lime. It is a light-weight filler, insulation and armour and the lime acts as a binder and preservative. This mix is pumped in between the standard timber-frame with waterproof armoured plasterboard on the inside and temporary shutters on the outside. On completion the external shutter is removed and the mass of hemp-lime is plastered with lime plaster. The end result should be a wall that is extremely hygroscopic and vapour permeable. It will be very interesting to see how this method holds up over time in a maritime climate with driving rain.

Another method used in The Village is a standard timber-frame, externally clad with a relatively low-density 9.2 mm fibreboard called Panelvent. Panelvent is a "UK-product", manufactured by Masonite AB in Sweden with a density of 720 kg/m³ (6.8 kg/m2). It is a softer version of the 8 mm Masonite construction board that we use in Scandinavian Homes with a density of: 950 kg/m³ (7.7 kg/m2). What surprised me was that it seemed to be an un-vented construc-



tion. The hemp-lime mix is applied directly to the medium-density fibreboard. The method is similar to what the Americans call Stucco. This cheap US-method consists of a simple timber frame clad with some type of external sheet and directly onto this the Stucco is applied without a ventilation cavity.

Two-component PUR (Polyurethane/ soy) insulation is used in some of the lime-hemp-timber frame constructions. I suppose that the capacity of poly-urethane insulation to withstand moisture is the main reason for using this type of insulation. Very good insulation properties, but ecologically conscious people usually prefer cellulose insulation or some other natural insulation material.
The spray-on soy based insulation consists of two components:
A-component: Polyol; Biobased soy oil from USA.
B-component: Isocyanide; manufactured by BASF in Belgium.

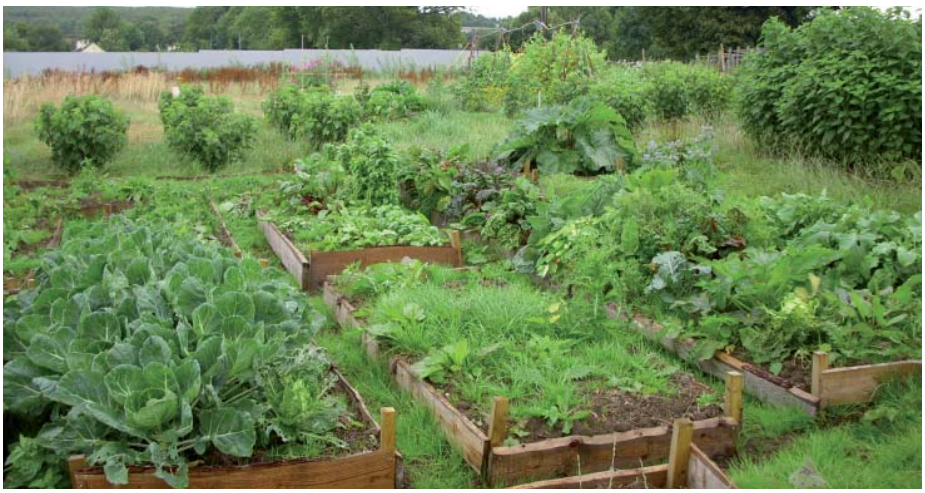
We have always strived to avoid usage of complex chemicals in Scandinavian Homes houses. The following warning text comes from a textbook on toxicology and could be considered: "Exposure to isocyanides is associated with respiratory disorders and may occur during production or processing of PUR. During thermal degradation (fire) of PUR, amines and amino-isocyanides are formed in addition to isocyanides. Some isocyanides and several aromatic amines are sensitizers and listed as carcinogens.

Permaculture and local shops

Some members of the Village have already started permaculture in a corner of the site. Raised beds of: cabbage, beetroot, lettuce, sprouts, beans, black currant, red currant, rhubarb, potatoes. Some permaculture tunnels are already in place as well.

Hopefully, a marketplace can develop that enables local producers to reach the local population. The will among the newcomers certainly seem to be there, and the attitudes among the "old" locals certainly seemed to be positive.

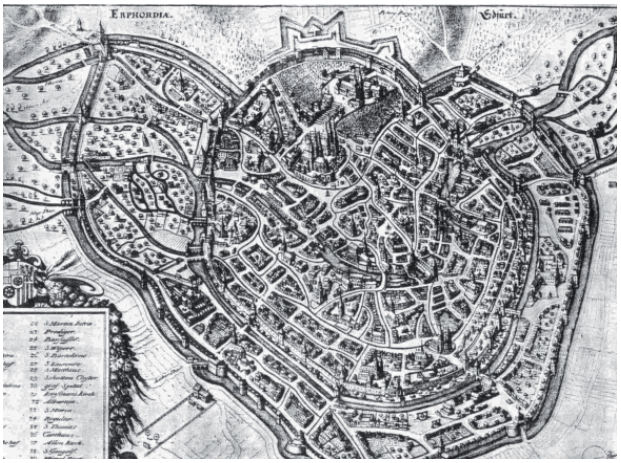
I strayed outside of "The eco-village" into old Cloughjordan village to have a bite to eat. I found Murphy's shop just outside the gates, not the type of place where you can order Italian coffee exactly, but the tea was good! It is fantastic how well the eco-village will connect to the existing village. By connecting to an existing village, it will hopefully reach a critical mass so that various local businesses can thrive. It will all depend on the loyalty of the inhabitants (new and old) to the local traders.
Another great plus for Cloughjordan is the local railroad station. With this within walking distance of the village, it is realistic to live without a car, or with one car shared among several people.



Plenty of fresh vegetables are already growing on sites

Ideal Eco Village

The following are my original thoughts on Eco-villages. I think a true eco-village must be a Passive village. To make it people-friendly, I think it should be modelled on the classical European medieval village. The Village in Cloughjordan certainly ticks many of the boxes – but not all.....



Typical site plan of a European medieval village

Definitely:

- Every building in the village must pass PHPP criteria for a passive house
- Practically no space heating required, tap water from solar
- Walkable compact village with a mix of single houses, terraced and apartments. High density with two and three storey near center
- Walk to local railroad station
- Large enough to support, post office, primary school, shop, pub/ restaurant 120-150 houses
- Traditional village of medieval type radiating from center.
- Central compact park surrounded by shops-fronts
- Compact market square near station and adjacent to village park
- Shared transport – cars allowed but disencouraged. Parking near rr station/market/nursing home/park
- Local Co2 capture and lock-in
- Simple traditional development – low cost infrastructure
- Two stage development : first roads, water, sewage, electrical then sites
- Mixed, work and live, to balance energy demand and to reduce travel
- Solar collectors for tap-water on every building (maybe in conjunction with central pre heated water, see below)

Maybe:

- Dual water supply – cold and pre heated water to all houses
- Central solar system with seasonal store for tap-water. A large group of solar collectors heat a very large under ground heat store. From here all buildings will source their pre-heated hot water. Ambition is to deliver hot tap-water with a minimum temperature of 40° water from this. Each individual building will have small top-up solar collectors optimized for low winter sun, and an extremely well insulated 200 – 300 liter hot water tank.
- Local water works with dual water-supply; potable-water and rain-water supply
- Closed loop: Local waste to energy
- Centrally located nursing-home. Can combine dining with village restaurant
- Waste to food to waste
- Smart metering
- Local 500KW wind turbine
- Zero carbon
- One planet “Eco-footprint”

Not directly applicable:

- District heating
- Bio powered heating plant to support solar
- Biomass CHP in village
- Anaerobic digestion: Wet organic waste
- Pyrolysis: Dry organic waste :