

Replicable and economic deep retrofit of typical Irish semidetached House

Mount Merrion Co Dublin



Before - June 2011



After- June 2012

History of Build: Original 1950's three bedroom 110 m² semidetached solid walled G rated house. Included poor quality flat roofed 1970's back kitchen, living room and converted garage extensions. Core 92 m² house retained and 60 m² new side double story extension providing A2 rated 4 bedroom 152m² house deep retrofitted to EnerPHit standard. The retrofit was not certified by Passive house institute.

Program: House bought in June 2011. Design, planning permission and build completed in 8 months, February 2012.

Inspiration: Construct Ireland magazine (now passivehouseplus) and SEAI Passive house retrofit guidelines.

Biggest doubts and challenge at beginning of Project: Achievability of the EnerPHit target (space heating 25 Kw/hr/m² and airtightness of 1 ACH) with architecturally pleasing layout executed within a limited timeframe of eight months (including planning permission application) and a budget of 150 000 euros ex vat.

Most outstanding and crucial aspect of the project The architectural layout of the extended and retrofitted building, removing existing single storey poor quality extensions, optimising the volume to surface area and increasing solar gain on the south eastern façade. The design provides lots of light to the living areas, located the utility room in the darkest corner of the house and increased the size of the back garden. The side extension high front windows send light penetrating all the way to the rear of the house. The front zinc roof overhang provides shading to prevent overheating in summer.

Project team: The owner as project manager/QS, Green Extension architects and Mcglinn construction main contractor were the main actors on the project. External insulation (Cosihomes), external joinery (Carey glass), MVHR (PROAIR installed Vent Axia system), solar thermal (Ecologics) and attic cellulose insulation (Ecocel).

Airtightness strategy: Concrete replacing suspended timber ground floor, wet plastered external walls, opencell sprayfoamed attic post first fix, tape windows frames to wall plaster, sockets in internal walls mainly.

Most important cost based decisions made during project: The use of external insulation on single leaf block on supergrund raft EPS foundation for the extension structure considered more economic than timber frame. The use of Irish made 'none' passive house certified Aluclad windows rather than European imported Joinery. The use of gas fired low temperature under floor heating with just two towel radiators upstairs combined with solar thermal panels. The heating system is future proofed for the installation of an air sourced heat pump in the future.