

Fire-Safe Concrete

A Good Home For Your Money



Irish Concrete Federation

Concrete Built **is** Better Built



Why Concrete Homes are Better

HOW TO COMPARE DIFFERENT HOUSE TYPES

The main factors to be considered when building or purchasing a new home are Fire, Sound, Thermal Insulation and Durability. Assessing the performance of the house you intend to build or buy under these four headings is essential. Experience in Ireland and worldwide has shown that no other construction method can match concrete construction for all round, proven performance. Discovering afterwards that you have made the wrong choice of house or apartment is a huge disappointment and the decision is irreversible.

RE-SALE VALUE

When you buy a concrete home it will have qualities that you might not consider unless they are pointed out to you. Concrete is a very durable material with incredible physical properties. It will not warp, rust, rot or burn and it also has excellent sound absorption and thermal insulation characteristic. The more concrete elements in your home, the more likely you are to have a home which is strong, durable and fireproof. In addition, your home is more likely to enjoy a high level of soundproofing which is so important in an increasingly noisy environment. Why? - because concrete absorbs sound and is inherently fireproof and durable.

When selling your property, the qualities of a concrete home will immediately be sensed by, or can be demonstrated to prospective buyers – ensuring a premium financial return. A concrete home will have excellent re-sale value and is in every sense ‘a good home for your money’.

FIRE-SAFE CONCRETE

The safety of your family is a primary consideration when building or purchasing a new home. Concrete homes have a much higher level of fire safety than lightweight framed homes, with 4 times longer fire resistance - effectively 2 hours protection compared with 30 minutes for lightweight timber of steel frame construction. Concrete is an incombustible material and it will not produce smoke or in any way add to the fire. Fires which occur in concrete built homes will burn at a lower temperature, the house will retain its structural stability and the structure of the building will almost always remain completely intact. The same cannot be said of lightweight framed homes, where the structural elements become part of the fire, produce higher temperatures and higher smoke levels and the building is frequently completely destroyed, requiring demolition. If you are buying an apartment which is built using lightweight framed construction – check the cost of the insurance premium. Some leading Irish Insurers will not insure lightweight framed apartment buildings above two storeys in height.



Flooding



Fire



SOUND INSULATION

Neighbour to neighbour noise or ‘flanking noise’ is one of the most common complaints in new homes. Noise sources within the house can also be aggravating and sometimes embarrassing. Today we have more televisions, radios and computers in bedrooms and these can be an ongoing source of annoyance, particularly to a member of the family who may be studying or sleeping in an adjacent room. Concrete floors and walls greatly reduce noise between rooms. Applying cork or similar impact reducing material to a concrete floor will further reduce impact noise. Concrete block walls between adjoining rooms offers approximately 50% more sound insulation than a standard timber stud and plasterboard partition. And remember - If you are purchasing a concrete block house you will automatically get a 225mm solid block wall between neighbouring houses. Not so if you purchase lightweight framed homes which invariably have only timber and plasterboard walls between neighbouring houses.

Built Homes

THERMAL INSULATION

From Jan 4th 2006, when selling a property, owners will be required to produce an 'Energy Performance Certificate' to the person purchasing the property. A good energy performance could add to the value of your house, since the purchaser could save substantially on heating bills as fuel costs rise. A concrete house will heat up more slowly than a lightweight framed house, but it will also cool down more slowly. Concrete absorbs heat like a storage heater and returns it back to the room over a period of 6 hours - so your house will be warm, long after the heating is turned off. Because of its ability to store heat, including free heat from the sun's rays, concrete is more thermally efficient than lightweight framed homes, when equal amounts of insulation are used. A recent study by Buro Happold Engineers found that when some basic principles of Thermal Mass are applied, concrete homes can thermally outperform lightweight framed homes by up to 9% in houses and up to 20% in commercial buildings. (See principles of Thermal Mass - overleaf)

DURABILITY

Because we are an island nation, exposed to wind and rain, we Irish have traditionally built using durable materials such as concrete and stone which are long lasting and maintenance free. By so doing, we can avoid dry and wet rot which can greatly reduce the life of a building. Rotting problems can also be caused by flooding, leaks from pipes or water tanks and leaks in wet areas such as around shower bases in bathrooms. In recent years, there have been severe problems in bathroom areas in particular, giving rise to the need to replace floors. Using concrete building components completely does away with durability problems and ensures an extremely long lasting, maintenance free structure.

PRECAST CONCRETE FLOORS

The vast majority of new homes have solid concrete ground floors. This is excellent from the point of view of sound reduction. However, upstairs floors are probably the greatest single source of noise in homes. With many homeowners moving away from carpet finishes to timber floors, the problem has increased significantly. Impact noise through timber floors can be a significant source of irritation, especially when children are playing upstairs. Tests show the airborne sound insulation of a concrete floor to be in the order of 47 to 52 decibels. A standard timber joist floor in a comparative test has a rating of only 30 to 38 decibels. The substantial performance difference has encouraged many self-builders to use precast concrete first floors. Those who do will enjoy the comfort of a quieter, safer home.



225mm concrete block party walls



Durability



Concrete floors



THE ENVIRONMENT

Concrete home building materials, including concrete blocks, have excellent environmental credentials. Compared to one tonne of wood for example, one tonne of structural concrete contains only 10% of the embodied carbon dioxide and only 12% of the embodied energy. A recent independent environmental impact study of alternative house constructions by Chalmers University Gottenburg, Sweden, which was commissioned by the Swedish Department of the Environment, concluded that 'wood is neither better nor worse for the environment than concrete'. However, when the considerable 'fossil fuel transport tariff' incurred in transporting Swedish timber to Ireland is added on, it is clear that locally manufactured concrete building products are the best environmental option in the Irish Context.

Use Concrete's Thermal Mass to Save on Heating Bills

WHAT IS THERMAL MASS?

Thermal mass is a word used to describe the materials in a building that are able to store and release large quantities of thermal energy. These materials are mainly the dense structural elements that form part of the building fabric, mainly the walls and floors. Materials such as concrete and stone are particularly effective.

The heat storing capacity of thermal mass has two effects in a building; it moderates internal temperatures by (averaging day/night extremes) and it delays the time at which peak temperatures occur. The temperatures experienced in a heavyweight building will peak lower and later than those in a lightweight building and temperatures will not drop as much overnight.

THERMAL MASS IN RESIDENTIAL BUILDINGS

The successful implementation of Thermal Mass in residential buildings relies strongly on the principles of passive solar heating. In Ireland's mild climate the sun can make a substantial contribution to space heating requirements.

Passive heating relies on the form and fabric of the building to capture and store surplus solar heat during the day, which can be used to offset heating requirements for later that night. Using even a basic strategy can save up to 9% on heating costs.

The following are some of the key guidelines for achieving the benefits of Thermal Mass.

KEY GUIDELINES

- Use high density materials like concrete walls and floors in the building's construction.
- An externally insulated or cavity insulated masonry wall will provide thermal mass if its interior surface is left exposed. Avoid dry-lining and internal insulation.
- Orientate the building so that its largest glazed facade faces as close to south as possible.
- Locate the building so that it is not overshadowed, providing good solar access.
- Tall windows will allow the sun to penetrate deeper into the building. Windows with a high transmittance and a low-e coating will improve solar heat gain. The area of exposed Thermal Mass to the area of glass should be in the ratio of 6:1
- Use slate coloured (non gloss) floor tiles in sunlit areas rather than carpet floor covering.
- Air infiltration (which accounts for a large percentage of overall heat losses) can be reduced through careful detailing at the design stage and careful supervision of the building construction. A heat recovery system can be used to reclaim up to 80% of the heat that would otherwise be lost in providing adequate ventilation.



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