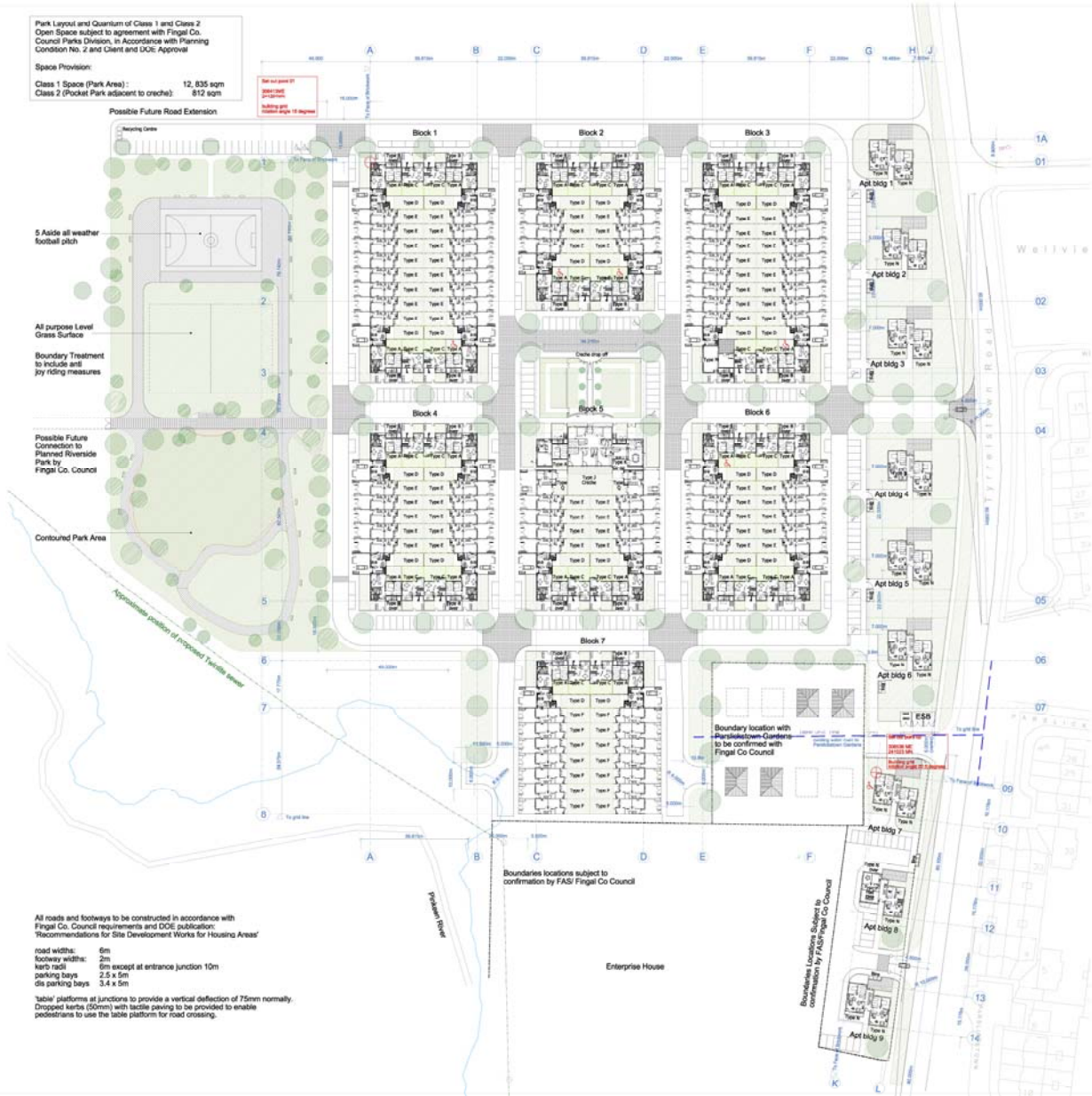


Local project in Dublin - IRELAND



Tyrralstown Housing is a new development of Social Rented, Shared Equity and Affordable Purchase family dwellings by **National Association of Building Co-operatives (NABCo) Society Ltd**, a Government approved Housing Body

The project comprises of the construction of 234 new family homes including both houses and apartments in 2 and 3 storey blocks together with 3 communal welfare facilities including a crèche, community centre, estate management offices and a public park. The site is located to the Northwest of Dublin just outside the M50 perimeter motorway encircling the city.



Site Location



Site Panorama July 2008



Progress Photographs 26 November 2008



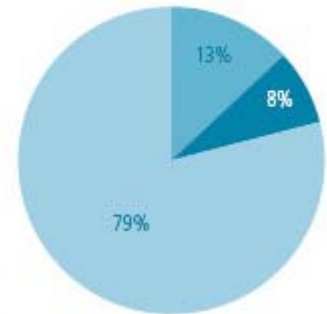
Progress Photographs 09 December 2008

Context

Tenure of Irish Housing

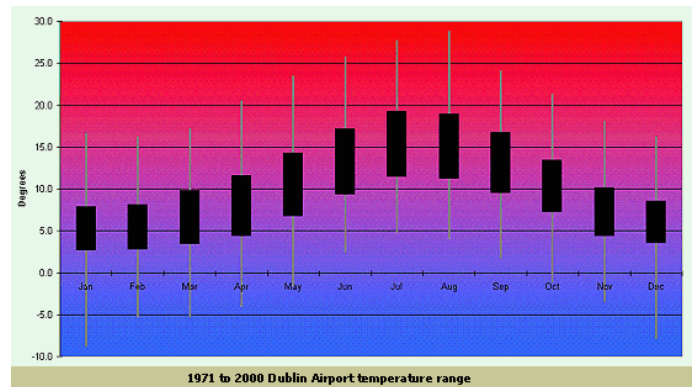
The main providers of Social Housing in Ireland are Local Authorities, with approved, not for profit, voluntary housing associations and cooperative housing societies expanding their role. These approved organisations currently own about 19% of the social housing stock. NABCO is the representation, promotion, advice, information, training and development organisation for the Co-operative Housing Movement in Ireland

79% Home ownership
13% Private rental
8% Social rental



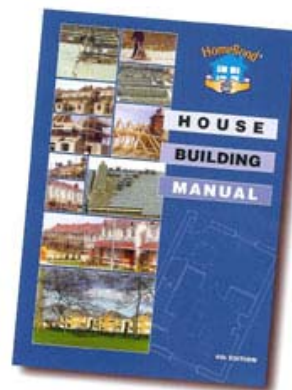
Irish Climate

The dominant influence on Ireland's climate is the Atlantic Ocean. Consequently, Ireland does not suffer from the extremes of temperature experienced by many other countries at similar latitude. In Dublin, summer mean daily maximum is about 19 °C and winter mean daily minimum is about 2.5 °C in these areas. Dublin does however, experience above average strength winds making air tightness relatively more important than in other European countries.



Irish Housing Construction

33% of Irish housing stock has been built in the last 10 years. The most common wall construction currently used in Irish house building is the twin leaf cavity wall with insulation board in the cavity. This is followed by timber frame which has grown in popularity in recent years. Detailing is generally based on guidelines published by two structural guarantee companies in Ireland, most notably Homebond. House builders must comply with these guarantees which purchasers demand.



guidelines to avail of

The Department of the Environment and Local Government has also recently published approved construction details to aid compliance with new energy conservation regulations which focus primarily on reduction of thermal bridging and air leakage.

The Tyrrelstown Housing Project Construction and Energy Performance



Tyrrelstown employs the most typical Irish wall construction method, the twin leaf masonry cavity wall with insulation boards in the cavities. (see photo below). Roofs are a mixture of insulated pitched and flat roofs.



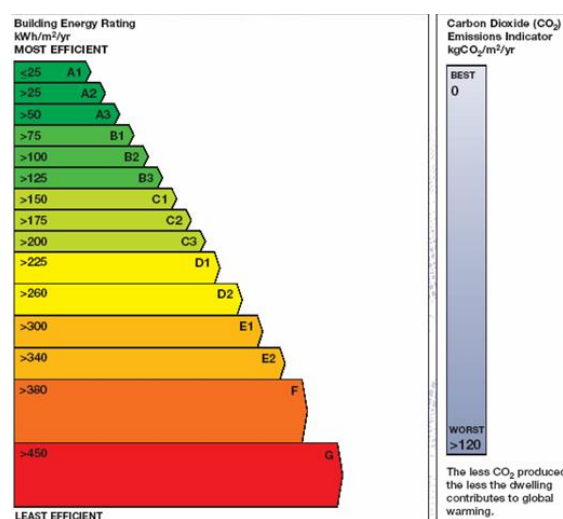
Primary Heating System: Gas fired boilers with distribution system of steel panel radiators.

Secondary Heating System: Solid Fuel open fires (Client requirement due to concerns over fuel poverty)

Energy Ambition

Two challenges present themselves to us at the moment:

The first is to improve the existing design, which was tendered under 2005 Building Regulations to ensure compliance with current Irish 2008 Building Regulations. This requires a reduction of 40% in energy demand and carbon dioxide emissions associated with heating, domestic hot water and lighting compared to the 2005 regulations.



Following that we have the ambition to make further improvements to achieve a reduction in CO₂ emission of at least 25% compared to the 2008 Irish Building Regulations. (Target: B2 Rating)

Summary

Estimated current Primary Energy Consumption per dwelling (2005 Regulations)	150KWh/ m ² a
Target 1: (Compliance with current 2008 Building Regulations) Primary Energy Consumption per dwelling	90KWh/ m ² a
Target 2: ENPIRE (25% improvement on 2008 Building Regulations) Primary Energy Consumption per dwelling	67.5 KWh/ m²a
Estimated CO ₂ emissions per dwelling: (2005 Building Regulations)	30 kg CO ₂ / m ² a
Target 1: (Compliance with 2008 Building Regulations) Estimated CO ₂ emissions per dwelling:	19kg CO ₂ / m ² a
Target 2: ENPIRE (40% Improvement on 2008 Building Regulations) Estimated CO₂ emissions per dwelling:	14.25 kg CO₂ / m²a

Technical Analysis

Preliminary assessments of the dwellings will be carried out using the Irish DEAP software, which measures the primary energy consumption of buildings and has been developed to demonstrate compliance with the European Energy Performance of Buildings Directive. Following these initial assessments University College Dublin's Building Energy Research Group will carry out more detailed analysis using specialist software – details to be confirmed.

Preliminary Ideas for improving energy performance and reducing CO₂ emissions

Building Services	Building Fabric	Other
<ul style="list-style-type: none"> ▪ Improve boiler efficiency ▪ Improve heating system controls ▪ Add solar collectors (Hot Water) ▪ Improve insulation of pipes ▪ Provide Ventilation with Heat Recovery ▪ Provide shower drains with heat exchangers ▪ Add Geothermal heat pumps Type N groups ▪ Preheat incoming air using ground tubes ▪ Provide Low Energy Public Lighting 	<ul style="list-style-type: none"> ▪ Improve U values of windows and doors ▪ Omit fire places and combustion vents or provide sealed stoves ▪ Insulate foundations to eliminate cold bridging ▪ Insulate party walls to landlord's areas ▪ Use full fill insulation and increase cavity widths ▪ Enclose Balconies ▪ Relocate radiators to internal walls ▪ Provide external shutters or insulating thermal blinds 	<ul style="list-style-type: none"> ▪ Investigate CHP/ local wind power generation ▪ Investigate any waste heat available from adjoining industry ▪ Provide Shelter Belt Planting

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