
flagship
Housing Group

Earth Sheltered Homes, Honingham

Greengauge Homes, Lingwood

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The drivers behind the Honingham Earth Sheltered Dwelling Project

- ***Housing need in rural communities and planning conundrum***
- ***The construction labour market and drive towards MMC***
- ***Environmental sustainability/a lighter carbon footprint***
  - ***trajectory towards carbon neutral housing***
- ***A tenants perspective, cost in use and fuel security***

Key Attributes

- ***Passive solar design***
- ***Streamlined construction process***
- ***Reduced carbon emissions***
- ***Affordable***

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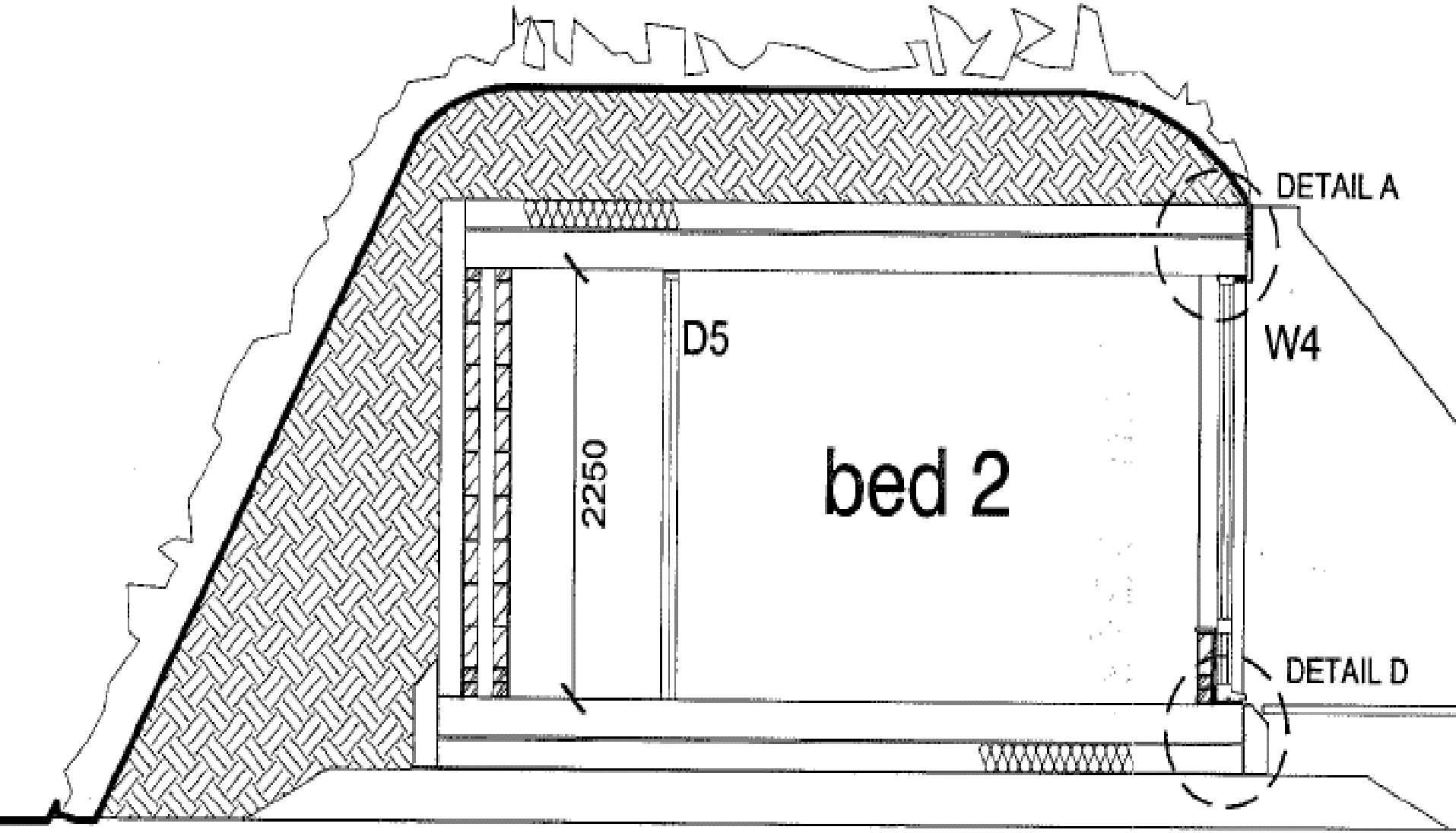

Passive Solar Design

- **Building orientated to maximise solar gains**
- **High thermal mass**
- **Passively heated and cooled**
- **Super insulation**
- **Earth sheltering**

Streamlined Construction Process

- ***Limiting building processes***
- ***Moving away from traditional expectations***

Affordable

- ***Efficient use of resources***
- ***Limiting intrusive operations***
- ***Eliminating traditional construction elements***
- ***Rationalising materials, trades and deliveries***
- ***Reducing waste***

Affordable

- ***Zero heating***
- ***Renewable technologies***
- ***Natural lighting***

Reduced Carbon Emissions

- ***During construction***
- ***During occupation***

Key lessons learnt at the Honingham Earth Sheltered dwelling project

- ***A success in terms of design, construction, cost in use and liveability.***
- ***Limited site applications to rural exception projects.***
- ***Requires a change of lifestyle.***
- ***Ability to role out learning on a much wider basis.***

Waterproofing and insulation

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Earth sheltering

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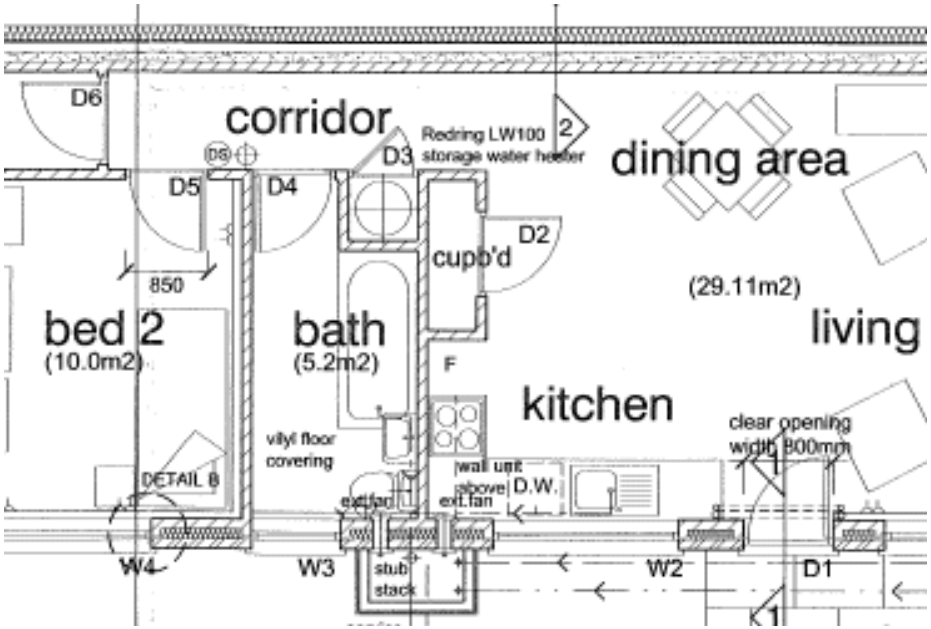
Practical Build Issues



- ***Applying the concept***
- ***Eliminating traditional elements***

Learning through living…

GreenGauge Homes Lingwood

The Brief from Flagship Housing

- *Build using modern methods of construction and sustainable materials*
- *Enable individual dwellings to be designed to suit specific locations and needs*
- *Achieve an "Excellent" Eco Homes rating where possible (currently only 2% of dwellings nationally achieve this)*
- *Reduce running costs for tenants*
- *Promote sustainable energy use*
- *Make Ecologically sound dwellings cost effective to construct and affordable to all*

GreenGauge Home Construction Method

- *Core super-structure to be the ‘Space4’ Modern Timber Frame system.*

  Precision-engineered structural wall panels

  Integral high performance insulation

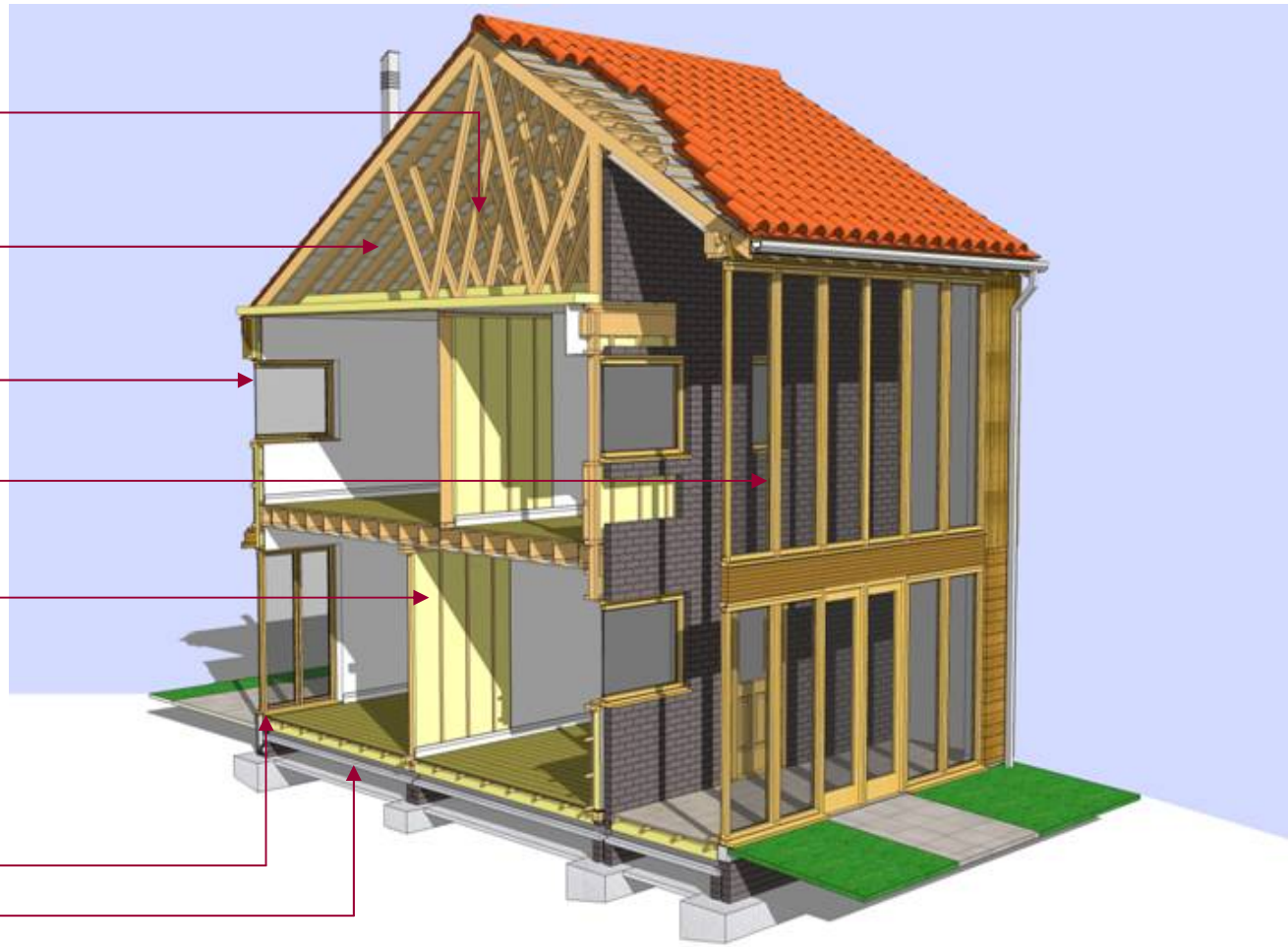
  Fitted external timber doors and windows (optional)

  Accurate and reliable upper floors

  Structural shell typically erected in one day

- *Option to increase insulation values to less than .30W/m2K if required*
- *External European Larch Cladding from sustainable sources*
- *Airtight construction using Pro Clima breather membrane to improve insulation performance and limit CO2 omissions*
- *Flexible construction method that does not rely on ‘specialist’ products or manufacture*

Typical Section Through GreenGauge Home



Current Projects:

School Lane, Lingwood

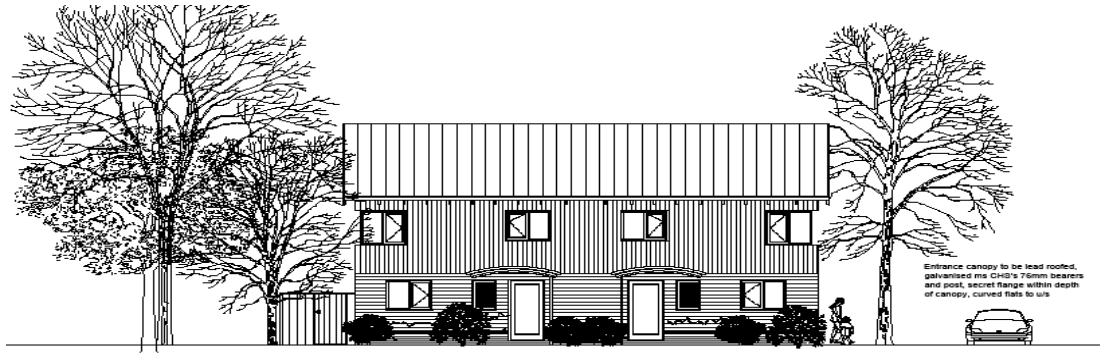
Core Scheme:

- ***15no. 2 and 3 bedroom houses on an exception site for rent and shared ownership***
- ***North -South facing orientation to maximise the use of solar energy options***
- ***Central refuse/ recycling collection points to promote the use of existing and future recycling opportunities through the local authority***
- ***New tree planting/landscape buffer zone with plants chosen to minimise watering and future maintenance***
- ***'Standard' GreenGauge Homes using a variety of renewable energy sources to reduce running costs***
- ***Monitoring of the thermal performance of the different technologies by UEA to enable future***

School Lane,

Lingwood

Plots 1 and 2



FRONT ELEVATION
PLOTS 1 & 2

- ‘*Standard’ Greengauge Home with no ‘enhanced’ renewable technology use*
- *Gas Condensing boiler water and central heating*
- *Electricity use to be monitored by a ‘Smart Meter’ which will show what each appliance is using, how much this costs (including when on standby) and total daily energy use*
- *The ‘control’ for comparison with the other dwellings*

School Lane, Lingwood

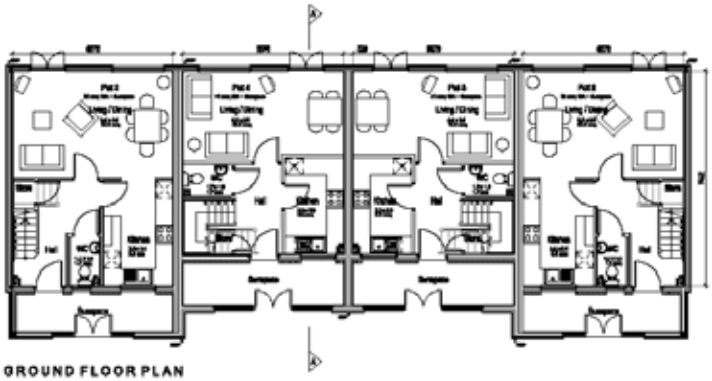
Plots 3 - 6

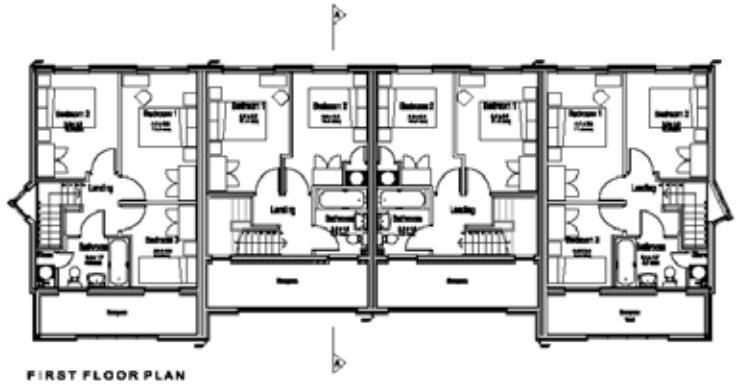
- *'Standard' Greengauge Home using photo-voltaic and solar power for the majority of all energy requirements.*
- *Communal wind turbine to provide all lighting and power.*
- *Solar water heating to provide majority of heating requirement for hot water and central heating, saving approximately 50 – 70% on standard water heating cost.*
- *No gas supply to the dwellings.*


LARCHWOOD CLOSE

School Lane, Lingwood

Plots 7 - 10





- *'Standard' Greengauge Home incorporating a double height conservatory to the south facing elevation.*
- *Facing brick trombe wall to store heat during the day and release into the sunspace during cooler hours.*
- *Heat recovering unit to heat and ventilate all rooms using energy from the sunspace.*
- *Secondary heating by electric underfloor as a back-up.*
- *No gas supply to the dwellings.*

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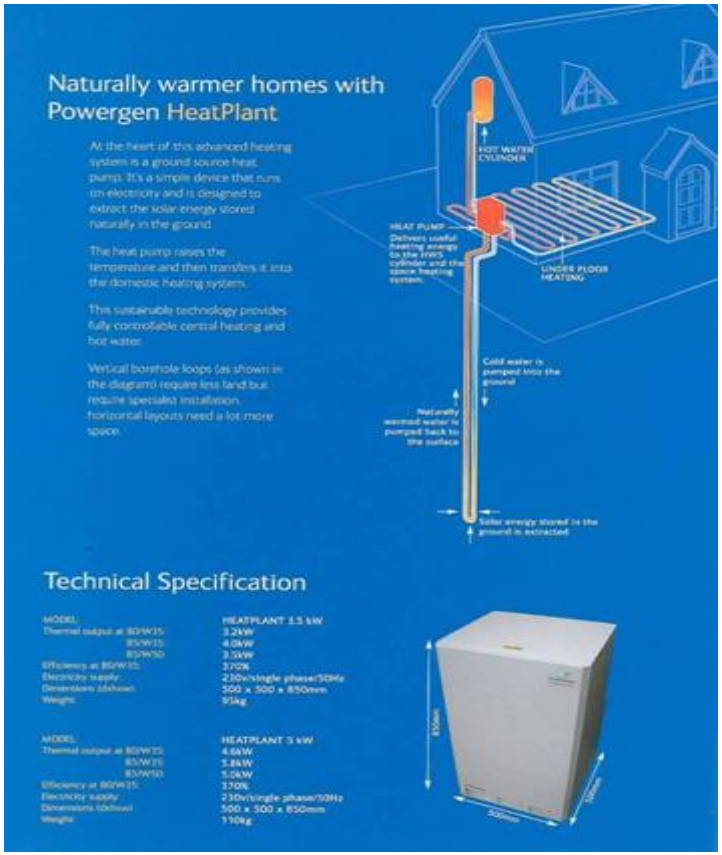
School Lane, Lingwood

Plots 11 - 15



- ***'Standard' Greengauge Home using Ground Source Heat pump for all space heating and domestic hot water.***
- ***Space heating to be standard wall hung radiators with TRV's generally and roomstat in the living room.***
- ***Typical saving of 20% on a standard property using a gas condensing boiler i.e.. Plots 1 and 2 (up to £200 per year at current fuel costs).***
- ***No gas supply for these dwellings.***

EcoHomes 2006 Compliance

Specification Based Credits

- *Improved Insulation values*
- *Limiting CO^2 Emissions*
- *Extensive use of Renewable Energy*
- *Responsible sourcing of materials inc. 100% FSC timber*
- *Reduction in surface run-off*
- *Considerate Constructors and Home User Guide*

Planning and Design Credits

- *Private Space and Security*
- *Day lighting*

Site Location

- *Public Transport and Local Amenities*
- *Ecological Value of the Site*
- *Protection of Ecological Features*