

Case Study | The Maltings

Local Authority:

Kirklees Council

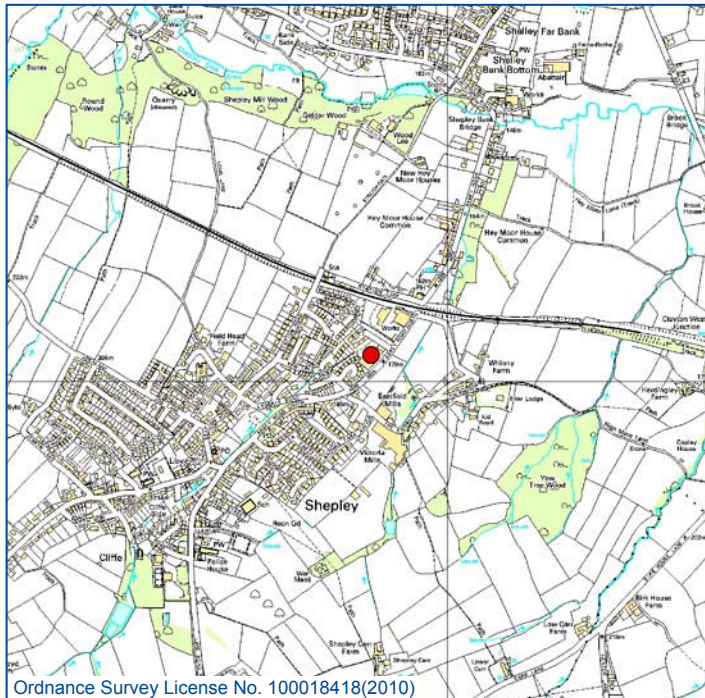
Location:

The Maltings, Abbey Road, Shepley, Huddersfield
HD8 8FA

OS Grid Reference: 419785, 410075

Development type:

Small residential development



Location Plan

Description

The Maltings, Abbey Road is located 8.5 kilometres south east of Huddersfield town centre in the rural-urban fringe settlement of Shepley. Shepley is situated on a high plateau 180m above sea level surrounded by green belt land. The landscape of rolling hills consists of mixed woodland and agricultural fields with traditional stone wall boundaries. The site is on a slope rising to the south and falling to the north. There is a mixture of housing types from small modern housing estates to more traditional stone housing within Shepley. The site is adjacent to the busy A629 and the Penistone railway line lies to the north of the housing development.

The Maltings, is a small housing development built between 2007-2008. The housing development consists of 14, 2 and 3 storey detached houses built from reconstituted stone with grey slate roofs. A high boundary wall surrounds the site along the A629. The site is compact with very limited communal external space. The Maltings site is connected to an older housing development to the north west. The site was previously brownfield land and lies adjacent to a housing development site as set out in the

Kirklees Unitary Development Plan. The development has helped to define and strengthen the character and residential edge of Shepley.



View of the development



Masterplan submitted with planning application (2007/91451)

Technology

The limited space within the development restricts technology choice. 6 of the 14 properties have the potential for their roof space to be used for solar technologies.

Most of the properties have substantial gardens which could be used to accommodate other forms of renewable and low carbon energy such as ground source heat pumps.

Development

Buildings	No. of dwellings	Annual Gas Consumption (kWh/year)	Annual Electricity Consumption (kWh/year)
House - Detached	14	134,386	50,890
Development cost		£1,000,000 - £1,200,000 (2)	

Notes

1. Domestic consumption figures based on standard floor areas per dwelling type (Energy Savings Trust 2005).
2. Build cost based on an indicative cost of £110 per sq ft. Actual costs may vary

Energy requirements, emissions and targets

Estimated total energy requirements	185,276	kWh/year
Total CO2 Emissions (kgCO2/yr)	47,546	kgCO2/year
10% Energy Reduction	18,528	kWhe
20% Energy Reduction	37,055	kWhe

Technology Mix Option 1

Renewable energy technology	Renewable energy contribution (kWh/yr)	No of dwellings	Annual Yield (kWh)	Estimated Installed Cost (£)	FIT/RHI Revenue (£)	10% RE Contribution	20% RE Contribution
Solar HW (4m2)	1,200 (1)	6	7,200	19,200 - 24,000(2)	1,296	39	19
GSHP (5)	17,520 (6)	2	35,040	12,800 - 24,000 (7)	2,453	189	95
Estimated Maximum Totals			42,240	32,000 - 48,000	3,749	228	114

Notes

1. Assume 300kWh/year per m² (Burnley RenewEL 2005)
2. Assume install cost of £800-1000 per m²
3. Assume yield of 750kWh/year per 1kWp installed (Burnley RenewEL 2005)
4. Microgeneration Certification Scheme 2009
5. 8kw domestic ground source heat pump
6. Based on domestic GSHP load factor (Towards Broad Areas for Renewable Energy Development. Report for 4NW. Arup 2008)
7. Assume vertical borehole system. Installed cost £800 - £1,500 (Energy Savings Trust)

Technology Mix Option 2

Renewable energy technology	Renewable energy contribution (kWh/yr)	No of dwellings	Annual Yield (kWh)	Estimated Installed Cost (£)	FIT/RHI Revenue (£)	10% RE Contribution	20% RE Contribution
Solar PV (1kWp)	750 (1)	6	3,000	20,000 - 30,000 (2)	1,083	16	8
GSHP (3)	17,520 (4)	2	35,040	12,800 - 24,000 (5)	2,453	189	95
Estimated Maximum Totals			38,040	42,800 - 69,000	3,536	205	103

Notes

1. Assume yield of 750kWh/year per 1kWp installed (Burnley RenewEL 2005)
2. Microgeneration Certification Scheme 2009
3. 8kw domestic ground source heat pump
4. Based on domestic GSHP load factor (Towards Broad Areas for Renewable Energy Development. Report for 4NW. Arup 2008)
5. Assume vertical borehole system. Installed cost £800 - £1,500 (Energy Savings Trust)

Summary

The Maltings development is a small residential development of 14 detached properties.

Technology Mix Option 1 could exceed a 20% onsite renewable target through installing solar hot water systems on each of the 6 properties suitably orientated for solar technologies. Two borehole based closed loop ground source heat pumps would need to be installed in order to meet the target. This would result in an additional extra over cost in the region of £32,000 - £48,000, a 3% increase in the development cost. Payback based on revenue alone would take between 9 - 13 years.

Technology Mix Option 2 could also meet a 20% renewable energy target through a combination of onsite electricity and heat generation. Two borehole closed loop ground source heat pumps systems could be installed to generate heat and complimented by electricity generated by installing solar PV on the 6 properties suitable for solar energy installation. Development cost would increase by £42,800 - £ 69,000 resulting in a 4-5% increase. Payback of technology capital costs would take between 10 and 17 years based solely on revenue return.