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Title: Sustainability Statement
Location: Croxley Green Watercress Farm and Fisheries
Address: Rousebarn lane, Rickmansworth, Hertfordshire, WD3 3GG
Date: 12 January 2009
Version: 501

Introduction

This proposal is below the required threshold, but the application incorporates the design principles and concepts outlined in this SPD. Although not required to do so an NRIA has been prepared. This development has been designed to optimise energy efficiency.

All NRIAs must be submitted with a completed checklist, whether the NRIA template has been used or not. This information will be used to supplement the details submitted in the earlier sections of the NRIA. Tables 1-3 should be used to calculate the value for questions C1, C3 and C4 and must be submitted as part of the NRIA.

Having completed the checklist the score is 9 out of 11.

			Minimum standard	Preferred standard	Target standard	Score achieved
Energy efficiency:	C1	Residential uses: What is the SAP rating? (See table 1)	SAP 'good' (GS1) 1 pt	SAP 'best' (BS1) 2 pts	SAP 'advanced' (AS1) 3 pts	3
		Non-residential uses: Under criterion 1 of SBEM: what is the relationship of the Building Emissions Rating (BER) to the Target Emissions Rating (TER)?	BER = TER 1 pt	BER is 2% better than TER 2 pts	BER is 5% better than TER 3 pts	
Renewable energy:	C2	What percentage of energy requirements will be produced by on-site renewables?	20% 1 pt	30% 2 pts	40% 3 pts	2
Materials:	C3	What score is achieved in table 2?	4 1 pt	5-7 2 pts	8-11 3 pts	3
Water resources:	C4	What score is achieved in table 3?	1 1 pt	2 2 pts		1
Total checklist score:						9/11

SECTION 2: ENERGY EFFICIENCY

Background and forces for change

- 1.) The new EU directive on the Energy Performance of Buildings is intended to substantially improve energy efficiency in buildings. Key aspects of that directive are for member states to apply a common method for assessing the energy performance of a building and then set minimum standards and to establish a system of building certification along the same lines as those produced for electrical white goods. This will be implemented in UK law through measures including a revision of Part L (Conservation of fuel and power) of the Building Regulations (April 2006), and the development of a National Calculation Methodology (SBEM) on the energy performance of non-residential buildings.
 - a. All building will be built in compliance with the current British Standards requirements.
- 2.) How will the design and layout ensure that energy is used efficiently in the scheme?
 - a. The principle renewable energy sources will be photovoltaic. Energy collection is difficult and limited by this technology. An effective site must rely on the effective and conservative use of energy.

It is very important that energy efficiency is considered from the earliest stages of the design process as several of the measures described below are most effective if considered before detailed plans are drawn up. A thorough analysis of the site and its potential is key to designing a scheme that maximises energy efficiency.

- 3.) *Solar gain*
 - a. Glazing design has been adopted to ensure central atrium light, is provided to living working areas, whilst combining plant growing areas and watercress seedling areas.
- 4.) *Shelter and shading*
 - a. Shading is avoided to ensure maximum benefits of photovoltaics.
- 5.) *Building form*
 - a. Building surface area has been reduced by using wide span supports, adopting a "U" shaped building and using a central glazed atrium to provide growing functions and light wells.
- 6.) *Green and brown roofs*
 - b. Green roofing has been proposed with photovoltaic cells.
- 7.) *Thermal mass*
 - a. Glazed atrium, with water reserve heating systems will be used.
- 8.) *Insulation and air tightness*
 - a. Double layered lined material structures to be used
- 9.) *Glazing*
 - a. Building regulations require the use of double-glazing with low emissivity. Triple glazing has been considered but the plant growth in the atrium eliminates the requirement.

Residential: SAP energy ratings Commercial: Energy Ratings

- 10.) *Heating*
 - a. Reliance will be on solar water heating and reservoir tanks

11.) *Combined Heat and Power*

- a. No CHP as we will use trickle storage systems

12.) *Ventilation*

- a. Automated mechanical ventilation systems will be used to maximise control of plant growth.

39. *Lighting*

Low voltage lights will be used throughout on timerswitches and movement sensors.

Residential: CHP Commercial: CHP

Energy-efficiency questions to be addressed in an NRA

How will the design and layout ensure that energy is used efficiently in the scheme?

1. Has an energy strategy been prepared?
 - a. Yes. No single power point will have a greater than 3kW output
2. How is the development designed to maximise beneficial solar gain? (through orientation, spatial layout and systems design)
 - a. Technical positioning of photovoltaics, and solar water heaters.
3. How will the design of the building make efficient use of energy?
 - a. The building has been built to consider material and process flow
4. What insulation standard will the development be built to?
 - a. Latest BS requirements
5. How is the development designed to minimise unwanted air infiltration?
 - a. High impact sealed units with reliance on automated ventilation systems
6. What glazing standard will the development be built to?
 - a. The use of double-glazing with low emissivity

How will the mechanical and electrical systems of the buildings ensure efficient use of energy and reduce overall energy use?

7. What efficiency standard will boilers be specified to?
 - a. Efficiency A – at least 90% efficient

Commercial: building services

8. Will the development be linked to a combined heat and power plant or to a district heating system?
 - a. No
9. How has the development been designed to maximise controlled natural ventilation?
 - a. Use of central atrium with automated roof ventilation
10. Will any mechanical ventilation to be incorporated be of high efficiency?
 - a. High efficiency thermal ventilation system to be used
11. How has the development been designed to maximise natural daylight?
 - a. Well spaced side windows
12. How will the development incorporate high-efficiency lighting?
 - a. 12 v lighting system throughout
13. How will the development incorporate high-efficiency appliances (where installed)?
 - a. Maximum appliance use limited to 3kW
14. How will the heating, lighting and ventilation systems be controlled?
 - a. Responsive automation system

Checklist question for energy efficiency

Minimum

Residential uses: What is the SAP rating?

SAP at 100 (note: no access for grid sell back)

Non-residential uses: What is the relationship of the Building Emissions Rating (BER) to the Target Emissions Rating (TER)?

SAP "advanced" BER is 5% better than TER

SECTION 3: RENEWABLE ENERGY

How will the design incorporate the use of energy from renewable sources?

15. *Biomass*
 - a. Wood burning boilers will be used when required. Wood will be supplied from on site supply and re-forestation process.
16. *Heat pumps*
 - a. Not applicable
17. *Solar water heating*
 - a. Units to be installed alongside photovoltaic units
18. *Photovoltaic (PV)*
 - a. arrays to be added to roof of building (models shown in main planning application)
19. *Small-scale wind energy*
 - a. Not encouraged by local planning officers
20. *Micro hydro*
 - a. Horizontal in-line systems to be tested across site and used if applicable – water head height is of technical concern

Renewable energy questions to be addressed in an NRIA

How will the design incorporate the use of energy from renewable sources on-site?

21. Will the development incorporate the use of biomass as a fuel?
 - a. Yes. Wood and re-forestation programme
22. Will the development incorporate the use of heat pumps?
 - a. No
23. Will the development incorporate active solar water-heating systems?
 - a. Yes. In the processing building
24. Will the development incorporate solar electricity generation?
 - a. Yes. In the processing building
25. Will the development incorporate wind-energy electricity generation?
 - a. No. Not encouraged by local planning officers
26. Will the development incorporate a micro-hydro scheme?
 - a. Yes. If horizontal in line test prove positive.

Checklist question for renewable energy

Minimum

What percentage of energy requirements will be produced by on-site renewables?
Greater than 30%

SECTION 4: CHOICE OF MATERIALS AND EMBODIED ENERGY

Choice of materials and embodied energy questions to be addressed in an NRIA

How will the materials specified minimise embodied energy, energy in use and environmental impact?

27. How will the materials be specified to ensure a low level of embodied energy?
 - a. Locally sourced, based on good structural design
28. How will the materials be specified to prioritise those with minimal environmental impact?
 - a. Reliance on timber from renewable source
29. Will the materials be sourced locally?
 - a. Yes

30. How will the materials and systems be specified to ensure a good quality internal environment?
 - a. High levels of natural lighting and plant growth in main areas
31. How will the timber be specified to ensure it is from the most sustainable sources?
 - a. FSC certified
32. Will contractors and suppliers be chosen with regard to their environmental management record?
 - a. No – reliance on history is not always an accurate assessment. Current testing will be applied in supplier selection

Minimum

Aggregates use	Some recycled aggregate used on site.	1	Recycled aggregate from off-site sources used for >80% of all aggregate consumed on site	2	Recycled aggregate from on-site demolition used for >60% of all aggregate consumed on site	3
Timber use	Softwoods from temperate managed forests used. No tropical hardwood from non-certified sustainable sources	1	FSC or equivalent certified timber, and/or recycled or reclaimed timber used in <90% of the timber uses on site (by volume). Rest of timber from temperate managed forests	2	FSC certified timber (or equivalent) and/or reclaimed timber used in 90% of timber uses (by volume)	3
Insulation materials	From fossil fuel sources, with no ozone-depleting blowing agents	1	From recycled materials	2	From naturally occurring sources	3
Sourcing strategy			Average distance travelled by materials (by weight) to be <100 miles (Industry average)	1	>50% of materials (by weight) to be sourced from within 35 miles (achieved by BedZed)	2

Table score – 10 points

Minimum standard 4 points
 Preferred standard 5 – 7 points
 Target standard 8 – 11 points

SECTION 5: RECYCLED MATERIALS

How will the buildings be re-used and/or demolition waste be responsibly dealt with?

33. *Re-use/conversion of existing buildings*
 - a. Existing buildings have a reliance on asbestos concrete. Full de-contamination will be required before new construction.
34. *Strategy for re-use/disposal of waste*
 - a. Asbestos cement will be disposed of by a specialist asbestos handling company. Remaining materials will be cleaned and re-used where possible.
35. *Reclaimed/recycled materials*
 - a. The use of reclaimed materials for aggregate is a high priority for the site.

- 36. *Aggregates and soils*
 - a. Soil and aggregate is to be separated. The fields are to be levelled and regenerated over the next 9 years using collected top soil and new compost.
- 37. *Ease of construction in design*
 - a. Foundations will be prepared using where possible reclaimed aggregates with unit constructions arriving in pre-fabricated form principally transported via the canals
- 38. *Future deconstruction*
 - a. The build reliance is principally on timber and other bio-degradable products

How will domestic/commercial waste generated in the development be dealt with?

- 39. *Storage and access to facilities/collection*
 - a. The site is aiming for zero non-recyclable waste
- 40. *Composting*
 - a. Composting organic waste is a key activity on the site and essential for the regeneration of the fields.

Residential: recycling Commercial: recycling

41. How will the development make efficient use of all material resources on site (for example existing buildings, services, infrastructure and topsoil)?

- a. The site has access to natural aquifers, and can sustain itself with timber, energy and food production
- 42. Has a strategy for the minimisation and handling of waste be prepared?
 - a. Yes. *The site* is aiming for zero non-recyclable waste
 - 43. How will the development make maximum use of recycled materials?
 - a. Mainly by organic compost and the feeding of farming top soil
 - 44. How will the development make maximum use of construction and demolition waste arisings?
 - a. Required to assist in landscaping facilities and banking
 - 45. How is the development designed to incorporate materials / elements that will be simple to reuse/ recycle at the end of the building's life?
 - a. Reliance on timber construction

How will domestic/commercial waste generated in the development be dealt with?

- 46. How will provision be made for the storage/collection of waste generated in the development?
 - a. Organic composting heaps, and biodigestors
- 47. How will the development provide opportunities and facilities for home/community composting?
 - a. Managed composting piles for each acreage

SECTION 6: WATER RESOURCES

Background and forces for change

How will water resources be conserved and recycled?

- 48. *Water-saving devices*
 - a. Installing water-saving devices including dry toilets, aerating taps, low-flow shower heads and water-efficient appliances. It is a requirement of the extraction licences that we have water meters.
- 49. *Rainwater collection/harvesting*
 - a. Rain will be collected for agricultural purposes.
- 50. *Grey water recycling*
 - a. Long term planned use for treated grey water on non-edible or not for human farming areas.

Residential: water collection Commercial: water collection

Water resources questions to be addressed in an NRA

How will water resources be conserved and recycled?

51. How will the development incorporate the use of water-saving devices?
 - a. Installing dry toilets, aerating taps, low-flow shower heads and water-efficient appliances. It is a requirement of the extraction licences that we have water meters.
52. How will the landscaping be designed to minimise water consumption?
 - a. Minimal landscaping as the reliance is on farming
53. How will the development incorporate the harvesting and re-use of rainwater?
 - a. Rainwater to be collected and re-directed to farming operations
54. How will the development incorporate the collection, treatment and recycling of grey water?
 - a. Grey water to be used for non-farming applications once treated

Table 3

Table 3 - Water Resources (Use the score achieved to calculate the points achieved in the main checklist table)

	Minimum standard	Score	Preferred standard	Score	Score achieved
Residential	54m ³ /bedspace/year	1	37.5m ³ /bedspace/year	2	1
Offices	9.3m ³ /person/year	1	6.4m ³ /person/year	2	
Schools	3.9m ³ /pupil/year	1	2.7m ³ /pupil/year	2	
Hospitals	1.66m ³ /m ² floorspace/year	1	1.38m ³ /m ² floorspace/year	2	
Further & Higher Education	0.62m ³ /m ² floorspace/year	1	0.4m ³ /m ² floorspace/year	2	
				Total	1/2

Ref: <http://www.oxford.gov.uk/files/seealsodocs/653335/adopted%20NRIA%20SPD.pdf>