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The Sustainable Settlement Extension



THE LONG SUTTON SUSTAINABLE SETTLEMENT EXTENSION (LS SSE)

(Proposed Sustainable Settlement Extension development adjacent 47 Bridge Road, Long Sutton, Spalding, Lincs PE12 9EF)

The Long Sutton Sustainable Settlement Extension (LS SSE) is allied to the Government's vision in the White Paper *'Planning for a Sustainable Future*[1]*'*. This proposal seeks to encourage the implementation of some of the principles expressed in the White Paper by developing an exemplar Sustainable Settlement Extension (SSE) within Long Sutton, one of the District's Area Centres[2], in preparation of a low carbon future.

The proposed development site is close to the defined settlement boundary and is a previously developed site. In identifying the appropriateness of this site, consideration has been given to the experimental nature and the concomitant commercial risks involved in such development. The Long Sutton SSE is designed to act as a catalyst for change within the existing Lincolnshire Market Town of Long Sutton, so as to promote, inspire and inform a low carbon society in anticipation of a time of diminishing availability of finite resources such as oil, coal, natural gas, water, and food. The Long Sutton SSE' is to serve as working model for broader application in the UK and is designed to demonstrate ways in which its residents and visitors can achieve greater levels of autonomy in terms of energy generation, water, waste management *[APPENDIX ITEM 15]*. and food supplies without resort to fossil fuels.

The characteristics of the Long Sutton Sustainable Settlement Extension include:-

- the promotion of low carbon work-life ethic
- the offer of fossil fuel free lifestyle
- the promotion of renewable energy applications
- the delivery of innovative building solutions
- the implementation of living–streets layouts[3]
- application of traditional construction techniques (The Gateway)
- the potential for an increase in the biodiversity of the local landscape
- the operation of a zero-waste policy[4]
- the provision of access to green spaces[5]

Ease of replication is a design principle for all aspects of The Long Sutton SSE development. Innovation is a significant tenet of this development and aims to be technically progressive and experimental in the promotion of environmentally responsible development and aims to offer contributions to knowledge, building on existing bodies of peer-reviewed work.

Exemplfying these tenets, The Gateway entrance to the LS SSE showcases alternative construction techniques using three traditional construction techniques, strawbale, rammed-earth and cob. Their Carbon Mitigation both through construction and occupation will be exemplary.

A rigorous academic research programme in collaboration with a recognised academic institution is soon to be agreed as an integral part of the Design Brief for The Long Sutton SSE.

Intellectual Property Rights derived from this SSE Project are to be shared with SHDC and could be the subject of legally binding agreement with the District Council.

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[1] H.M. Government. 2007. *Planning for a Sustainable Future:* White Paper. May

[2] South Holland. 2006. *Local Plan.* Written Statement Adopted. July

[3] Country Survyeors' Society. 2008. *Travel is Good:* CSS Transport Futures Report. January
[4] Murray, Robin. 2002. *Zero Waste.* www.greenpeace.org.uk/trust. February
[5] Natural England. 2004. *The Countryside in and around towns:* A Vision.

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Project Description

The Long Sutton SSE is a 10.45 acre (4.23ha) development proposal of forty nine dwellings, one office and nine commercial units designed and laid out with the intention of achieving for the residents and businesses a greater level of self reliance over their own resources, than is currently achieved in conventional developments of this scale.

The SSE is to be located at (Grid Reference TF 4452255) the eastern gateway of the Lincolnshire Market Town of Long Sutton and will form part of the largest aggregation of environmentally responsible development in the UK (LSWLP[6], CaNeBuZo[7], LESH[8], GTB[9], see description below)

The Long Sutton SSE is an exceptional form of development that:-

- has been conceived as a ***catalyst for positive environmental change*** within the existing settlement of Long Sutton, so as to promote a low carbon society in anticipation of a time of diminishing availability of finite resources such as oil, coal, natural gas, water, and food.
- is to serve as a ***working model***, designed to demonstrate ways in which homes and businesses can achieve greater levels of autonomy in terms of energy generation, water, waste management *[APPENDIX ITEM 15]*, and food supplies without resort to fossil fuels.
- will achieve ***relative autonomy***[10] over its own resources and enable residents and business to counter the threat of fuel poverty, liberating them from their reliance on the public utility infrastructure (with the exception of the telephone network), whilst giving them the opportunity to reduce the associated costs.
- will place Long Sutton at the forefront of settlements striving to ***mitigate carbon emissions***, putting them in an advantageous position in the fast developing low-carbon economy.
- promotes the implementation of the ***work/life ethic*** espoused at the LSWLP (The Long Sutton Work/Life Project Planning Approval Ref. H06/0018/01) as a key characteristic of sustainable settlements.
- is laid out around a ***'Living-Street'***[11], relegating the dominance of the car within the development while extending the areas of play and general circulation to pedestrian traffic.
- houses are designed to achieve a ***zero heated status, naturally heated and naturally ventilated.*** Each building is of a high thermal mass construction, super-insulated, orientated around the path of the sun with the benefit of micro-climates designed into the garden and site layouts.
- Promoting and exploring the commercial applications of traditional construction techniques for low energy building using rammed-earth, strawbale, cob and mixed medium.

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[6] LSWLP *The Long Sutton Work Life Project, 87/89 Gedney Road, Long Sutton, Spalding, Lincs PE12 9JU Planning Ref* H06/0018/01

[7] CaNeBuZo *Carbon Neutral Business Zone, 96 Gedney Road, Long Sutton , Spalding, Lincs PE12 9JU Planning Ref : H06/0092/06 and H06/0866/06*

[8] LESH *Long Sutton Earth-Sheltered Social Housing Scheme, Adj. 21 Bridge Road, Long Sutton, Spalding, Lincs PE12 9EF. Planning Approval Ref. H11/0585/08*

[9] GTB *Greening-the-Box, 25 Main Road, Long Sutton, Spalding, Lincs PE12 0AA*

[10] The precise meanings of the terms *autonomy* and *autonomous* in an architectural context are debatable. There is a spectrum of definitions, perhaps the most demanding of which is provided by those pioneers of sustainable architecture, Professor Brenda Vale and Dr Robert Vale: *"The autonomous house on its site is defined as a house operating independently of any inputs except those of its immediate environment. The house is not linked to the mains services of gas, water, electricity, or drainage, but instead uses the income-energy sources of sun, wind, and rain to service itself and process its own wastes."* B. Vale and R. Vale, *The Autonomous House: Design and Planning for Self-sufficiency* (London: Thames and Hudson, 1975), p7. Clearly, this degree of independence from mains services would not be allowable in publicly owned houses. However, the LS SSE is designed to give tenants the means to achieve the degree of autonomy from the mains services that suits their life-style. For further reading, please see Brenda and Robert Vale's, *The New Autonomous House: Design and Planning for Sustainability* (London: Thames and Hudson, paperback edition 2002), pp 8 - 10.

[11] 'Living Streets' *aka Naked Streets*

Project Highlights

The LS SSE will be an exemplar development which anticipates our inevitable low carbon future, in achieving this the project espouses many attributes, of which the highlights are;

Autonomy Agenda -	*increasing self reliance over essential measures.*
Fossil Fuel Free -	*no gas, oil or coal applications used.*
Reduced Running Costs -	*buildings operation on up to 75% less energy*
Work/Life -	*facilitate walk to work opportunities*
Mixed Tenure -	*promoting social inclusion of affordable housing*
Food Production -	*twenty five allotments and generous garden areas*
Energy Conservation -	*SAP Ratings in excess of 100*
Open Spaces -	*49% os site area (3.5 acres)* [APPENDIX ITEMS 17 & 18],
Increased Biodiversity -	*24,518 plants of 22 species and 0.43 acres of wetland areas*
New Aesthetic -	*49 individual houses*
CO_2 Mitigation -	*344 tonnes CO_2 every year*

SEArch's Ethos for the LS SSE

SEArch believes that environmentally responsible architecture in the context of social housing will always seek to reduce costs (of whatever kind) to the user to the commissioning authority, and to the environment; but it will also seek in like measure to enhance the lives of those users, the quality of the immediate environment and, given the times, the reputation of the commissioning authority for sustainable policies.

SEArch further believes that the residents are best supported in their domestic circumstances if their housing and immediate environment is so designed as to give them as great a degree of autonomy as is feasible in terms of their energy, water, and waste management [APPENDIX ITEM 15], **minimising above all the threat of fuel poverty, liberating them from reliance on the public utility infrastructure (with the exception of the telephone network), and thus giving them the opportunity to reduce or even eliminate the associated costs - all this at the same time as encouraging self-reliance in terms of the production of green and root vegetables and fruit for domestic consumption.**

The Long Sutton Sustainable Settlement Extension will place South Holland District Council at the forefront of Districts striving to mitigate carbon emissions in its development. It will put the area in a leading position in the fast developing low-carbon economy.

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A RESPONSE to the South Holland Local Plan; Adopted 2006

Chapter 3 –CORE STRATEGIC AND GENERAL POLICIES

POLICY SG1: *General Sustainable Development*

The Principals of sustainable development espoused by the LS SSE:-

The LS SSE espouses the sustainability principles identified within SHDC's Local Plan and the Governments White Paper; *'Planning for a Sustainable Future'*. This is achieved in the following three areas:-

1) ***Enhanced quality of life-***
   - substantially reduced energy bills, water and waste costs.
   - network of footpaths providing, access to the countryside.
   - enlivened building environments with elevated internal natural daylight levels and sunlight levels.
   - allotments for food production and an abundance of fruit bearing trees in the landscape,
   - true mixed tenure building layout, incorporating rented and freehold housing in a random mixture.
   - A 'Living Street' layout extending the residents amenity areas onto the drive.

2) ***Energy and natural resources conservation***
   - integrated renewable energy applications to all buildings eg. photovoltaic's, solar water heating, rainwater harvesting.
   - low technology design applications, simplifying the use of the home.
   - naturally heated and naturally ventilated homes and businesses.
   - consuming in the region of 75% less energy than conventional homes and commercial units.

3) ***Good custodianship of the local character and environment.***
   - a new aesthetic has evolved at LS SSE, in which local vernacular styles and features have been reinterpreted and adapted for incorporation with the delivery of passive solar design techniques.
   - increased bio-diversity through an extensive range of landscaping and water
   - increased wildlife habitats eg. bats and swifts
   - rainfall discharge attenuation

POLICY SG2: *Distribution of Development*

This Long Sutton SSE is to be located at the eastern gateway to this Lincolnshire Market Town and will form part of the largest aggregation of eclectic environmentally sound buildings in the UK. It will also pioneer a mixed tenure housing solution espousing the work/life ethic. In this way it will tackle the growing concerns surrounding the social implications of high-density[APPENDIX ITEM 18] social housing development that foster perceptions of social exclusion.

It will be the first time in the UK that a design solution of this scale offering relative autonomy is implemented for the combined benefit of social housing tenants, open market housing and commercial development. Above all, this design solution will counter the threat of fuel poverty, which is jeopardising the welfare of so many households and the financial viability of business. At the same time, these households, their landlords and the businesses will be able to pride themselves as to the high level of environmental responsibility and the low environmental impact embodied in this development.

1) ***Sequential approach*** - The proposed development site is close to the defined settlement boundary and is a previously developed site formerly operating as a horticultural business. The site currently includes two commercial activities;
   - Advanced Green Fuels – *manufacturers of 100% bio-diesel*
   - Ashtons Bulbs – *pre-packaging cut flowers and bulbs*

   In identifying the appropriateness of this site for development consideration has been given to the experimental nature and the concomitant commercial risks involved in such a project. Eighty percent of the proposed development site is allocated for an 'Affordable Housing' [APPENDIX ITEM 13] and 'Employment Zone'. The remaining 20% of the site is allocated for open market housing. This unusual

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mix of uses would not be financially viable on land identified for Development within the 'Defined Settlement'.

2) ***Efficient use and reuse of land adjacent No. 47 Bridge Road, Long Sutton*** - The 10.45 acre (4.23 ha, 42,289.65 m^2) was formerly operated by two generations of a local family of horticulturalists who combined their horticultural activities with other commercial and agricultural operations on site that included:-

8 acres
- forced cut flowers in two acres of glasshouses
- pre packing flowers and bulbs
- logistical operation – distributing plants internationally

2 acres
- storage of bulbs and flowers in chillers
- agricultural field (formerly daffodil and tulip fields

One glasshouse (half an acre) remains, the pre-packaging, storage and limited distribution activities are still operational.

An additional business operation, Advanced Green Fuels – manufacturers of bio-diesel, (Planning Approval Ref. H11/1425/06), operate from a former implement shed and part of the glasshouse. Part of the operation includes running a collection service and bio-diesel distribution service from the site.

In total the existing commercial premises provide 2,400 m^2 gross floor area of which 1,400 m^2 is currently in use.

It is the intention of Advanced Green Fuels to relocate and expand into one of the new units on the proposed 'Employment Zone' (subject to Planning Permission).

Garden land – the former gardens to No. 47 is 0.4 acres (1,618.74m^2) fronts Bridge Road and is a 45 m wide infill site and forms part of a built up frontage of linear development leading east out of Long Sutton.

3) ***Transport***

The site is:-

a) served by frequent scheduled bus services to King's Lynn, Wisbech, and Spalding with buses stopping at two stops adjacent to and opposite it;

b) adjacent to a prime road network node, the only location in Long Sutton giving direct access to B1359, A17 and A1101;

c) centrally located on one of the longest (c. 5 miles) continuous public footpaths in Long Sutton.

4) ***30mph Speed Zone*** - The existing site entrance is accessed off the B1359 (former A17 main trunk road) at the eastern gateway of Long Sutton inside a 30 mph speed zone. It is this entrance that is intended to continue serving the proposed 'Employment Zone' of 1,262 m^2 floor area (1,262 m^2 less than existing)

Enhanced Service Centre:-

WorkLife

The LS SSE offers a balance between, jobs, affordable housing*[APPENDIX ITEM 13]*and open market housing. It will also provide additional support for local services thus reducing the need to travel further afield out of the area. This Sustainable Settlement Extension is designed to add vitality and viability to Long Sutton and its catchment area. In so doing it will create a type of development that espouses the work/life ethic which in turn reinforces the sustainability of Long Sutton. As a result of the LS SSE the Market Town of Long Sutton would be invigorated particularly by its first 'Employment Zone', enhancing the role it plays as a service centre for the community by encouraging new businesses into the area.

Sequential Test[APPENDIX ITEMS 8 & 9]

A sequential approach in the selection of this site for development as a Sustainable Settlement Extension has been considered in the following ways:-

a) The site is a previously developed area of land on the perimeter of the settlement which is well served by public transport and accessible to local facilities;

b) No other locations within the settlement will be suitable for this type of development on the grounds of cost, opportunity, experimentation, innovation. Given the relatively low density *[APPENDIX ITEM 18]* of development and high percentage of amenity area allocated for each dwelling and the SSE as a whole, the scheme would be cost prohibitive within the Defined Settlement Boundary.

Employment

LS SSE residents will have access to jobs on the new Employment Zone of 9 commercial units (1262 m^2 gross floor areas) within a walk to work distance via a network of footpaths. Access is available into Long Sutton and its social facilities by a range of transport modes including public transport, walking and cycling.

The opportunity to walk to work within the South Lincolnshire Fens where there is a considerable level of reliance on car usage is highly desirable.

Social Inclusion

Reducing the perception of social exclusion is one of the principle features of the LS SSE's design approach to its housing scheme. This it achieves:-

- by providing mixed tenure housing in a random pattern of tenure types through out the scheme.
- no differentiation in design or size of accommodation differentiates either freehold from affordable houses.
- selection of materials specification is consistent with all the buildings.
- SAP Ratings for each building will be exceptional in every case.
- a minimum Code Level 5 (Code for Sustainable Homes) is anticipated to be achieved for every dwelling. [APPENDIX ITEM 18]

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POLICY SG3: *Settlement Hierarchy*

Settlement Hierarchy:-

The LS SSE has been specifically designed to enhance Long Sutton's role as an Area Centre by:-

- providing the towns first '***Employment Zone***' incorporating 9 commercial units totalling 1262 m^2 Gross Floor Area
- increasing ***employment opportunities*** within the town
- increasing the availability of '***Affordable Housing***' [APPENDIX ITEM 13] by providing 49 low energy dwellings of which 25 are open market housing:–

17 No. 2 Bedroom, 3 person – Semi detached terraces, 75 sq m each
Plots 2, 3, 7, 8, 9, 10, 11, 15, 16, 17, 18, 19, 38, 39, 40, 49, 49A

16 No. 3 Bedroom, 5 person – Semi detached houses, 109 sq m each
Plots 5, 6, 13, 14, 21, 22, 25, 26, 28, 29, 34, 5, 44, 45, 46, 47

8 No. 3 Bedroom, 5 person – Detached houses, 109 sq m each
Plots 4, 12, 20, 30, 32, 33, 41, 50

5 No. 4 Bedroom, 6 person – Detached houses, 138 sq m each
Plots 24, 27, 37, 42, 43

3 No. 4 Bedroom, 7 person – Detached houses, 156 sq m each
Plots 23, 36, 48

Site allocated for the social housing scheme is 0.943ha [2.33 acres], open market housing 0.943ha [2.33 Acres] and employment zone 0.701ha [1.732 acres].

The Long Sutton SSE is not without its architectural precedents within the Town. Beginning in 1997 the exceptional portfolio of architectural commissions espousing environmentally responsible development saw its first of four award winning projects granted Planning Approval;-

1997: LSWLP, The Long Sutton Work Life Project
87 and 89 Gedney Road, Long Sutton, Spalding, Lincs, PE12 9JU
The home of the LS SSE's Architect and the offices of SEArch. Collectively the LSWLP has reduced its reliance on fossil fuels to virtually zero. Each building has achieved a zero heating status, (naturally heated) and naturally ventilated, with no requirement for mechanical intervention for either heating or ventilation. The first earth-sheltered building to have won the coveted RICS ***Sustainable Building of the Year Award.***

2006: CaNeBuZo, (Carbon Neutral Business Zone)
96 Gedney Road, Long Sutton, Spalding, Lincs, PE12 9JU
Probably Europe's largest earth-sheltered development of its type and soon to be the home of SEArch, (occupation due September 2009), as well as other businesses. Drawing on data from LSWLP and other SEArch projects, the Business Zone will provide its six commercial tenants with minimal running costs and a concomitant reduction in Carbon Dioxide emission in the region of 87 tonnes CO_2/yr.

2008: LESH, (Long Sutton Earth-Sheltered Social Housing Scheme)
Adjacent 21 Bridge Road, Long Sutton, Spalding Lincs PE12 9EF
A fossil fuel free construction. This is the UK's first near autonomous social housing scheme and consists of six dwellings, (3 x 2 bed and 2 x 3 bed) all of which generate their own electricity, harvest their own water and manage their own waste stream , alleviating the tenants of their reliance on public utilities and the burden of fossil fuel dependency. The properties were occupied in July 2009.

2009: GTB, (Greening-The-Box)
25 Main Road, Long Sutton, Spalding, Lincs PE12 0AA
In a partnership between SEArch South Holland District Council, there are endeavours to undertake the refurbishment of a three bed-roomed semi-detached council house to a near autonomous state for its existing tenants. Some of the techniques to be implemented are to be tried and tested, while others are unique to SEArch's building design ethos, evolved through Dr Jeremy Harrall's Doctoral research through his Practices portfolio of commissions.

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The first 'Greening-the-Box' scheme, www.greeningthebox.co.uk in Ringland near Norwich has recently been completed and occupied. In partnership with Circle Anglia, SEArch has delivered an adaptation of an existing three bedroomed semi-detached house to achieve a near autonomous state to reduce the occupier's reliance on fossil fuels.

To view the articles published in the Ecologist and Inside Housing see links below:-

http://www.theecologist.org/News/news_analysis/282765/lowtech_retrofit_experiment_could_transform_social_housing.html

http://www.insidehousing.co.uk/story.aspx?storycode=6505692

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POLICY SG4: *Development in the Countryside*

The LS SSE is a Sustainable Settlement Extension seeking to deliver on the agenda of autonomy and cannot reasonably be accommodated within the defined settlement limits of Long Sutton. There is not the land available for this scale and type of development within in the Town and such land would be prohibitively too expensive to accommodate affordable housing at 50% allocation , a 4 acre 'Employment Zone' all of an experimental nature with its concomitant financial risks.

The land adjacent No. 47 Bridge Road has operated commercially at a large scale with a variety of business operations.

Long Sutton has been identified in the Local Plan as an Area Centre which will continue to provide housing, employment, and commercial development in support of its role as a service centre for its rural catchment.

It is proposed to site the LS SSE on the mixed use commercial development site close to the Defined Settlement Boundary. The site frontage forms part of a continuous ribbon of development leading (east) out of Long Sutton, and constitutes to a greater extent Brownfield land adjacent residential dwellings, a haulage yard and a former garage in the existing built-up frontage.

The design proposal for the LS SSE is unique in that it is for a mixed commercial and residential development of low-energy buildings designed to achieve a greater level of self reliance than conventional development while mitigating exceptional levels of Carbon Dioxide emissions.

The site in question is appropriate, available and suitable for the proposed development by reason of its physical attributes alone; but more than that, it is also uniquely suitable for this mixed use of commercial units, social housing (50%) and open market housing (50%) development – the first in the UK of this scale to be designed to achieve a degree of autonomy in respect of energy, waste, water, and food production.

Services and facilities

The residents and users of the LS SSE would be adequately catered for in terms of access to the essential provisions to sustain the lifestyle expectations of the 21st Century.

The site is within walking distance of the following services and facilities:-

a) **Schools:-**
- pre-school
- primary (Long Sutton County Primary School)
- secondary schools (The Peele Community College)

b) **The Market Place:-**
- weekly Friday market
- main shopping area, variety of shops i.e. electrical, clothing, hardware, hairdressers, beauty salon, takeaways. Further shopping is offered along Market Street i.e.
- banks i.e. Barclays, Natwest and Lloyds TSB

c) **Health Centre**

d) **Dental surgery**

e) **Veterinary Practice**

f) **Variety of grocery shops:-**
- NISA convenience store
- SPAR convenient store
- Co-operative supermarket

g) **Churches:-**
- Baptist Church
- St Marys Church

h) **Public Houses:-**
- The Olde Ship Public House
- The Crown and Woolpack

i) **Cafes:-**
- Cosey Cafe
- The Dining Rooms
- Co-operative coffee shop

j) **Visitor attractions and recreational facilities:-**
- The Peele Leisure Centre
- Cinder Ash Park
- The Long Sutton Wildlife and Butterfly Park
- Long Sutton Athletic Football Club

k) **Social/entertainment venues:-**
- Conservative Club
- The Parkside Club
- The Long Sutton Market House

l) **The Long Sutton Market House** (a multi use centre providing access to South Holland District Council, IT training with Boston College, Parish Council, Police Surgery, Tourist Information, venue hire of the Friends Room)

j) **Long Sutton Library**

k) **Post Office**

Transport

The site is:-

a) served by frequent scheduled bus services to King's Lynn, Wisbech, and Spalding with buses stopping at two stops adjacent to and opposite it;
b) adjacent to a prime road network node, the only location in Long Sutton giving direct access to B1359, A17 and A1101;
c) centrally located on one of the longest (c. 5 miles) continuous public footpaths in Long Sutton.

Employment

a) Premier Foods: *half a mile*
b) Schools: *one mile*
c) Town Centre: *one mile*
d) Public Transport links to major regional conurbations: *immediate.*

Advertisement

The Long Sutton Sustainable Settlement Extension project represents a unique opportunity for the District Council to lead on Sustainable Development solutions which could inform and perhaps lead the UK's low carbon agenda in the drive to mitigate the effects of global warming on settlements of all scales. The proposed location on Bridge Road will serve to advertise the ethos underlying the Scheme.

POLICY SG7: *Energy Efficiency*
(incorporates policies SG8 – Water Efficiency)

Design Principles

What price autonomy? **The proposed Sustainable Settlement Extension(SSE) at Long Sutton will be the first of its type in the UK and will to strive for autonomy[12].**

Relative autonomy over their energy, water, and waste management [APPENDIX ITEM 15] will enable residents to minimise the threat of fuel poverty, liberating them from their reliance on the public utility infrastructure (with the exception of the telephone network), whilst giving them the opportunity to reduce the associated costs. LS SSE will place SHDC at the forefront of public bodies striving to mitigate carbon emissions in its housing and commercial building stock and put them in a leading position in the fast developing low-carbon economy.

For the first time in the UK a mixed use development of this type will deliver buildings all of which can:-

- achieve zero heating status.
- generate no CO_2 emissions in occupation.
- harvest their own rainwater to provide clean potable water.
- passively ventilated.
- have both their own gardens and their own allotments in which they will be able to grow their own food.

The LS SSE is an evolution of the expanding collection of eclectic environmentally sound buildings in the Lincolnshire Market Town of Long Sutton.

1997 – 2003 ***LSWLP (The Long Sutton Work Life Project)***
87 and 89 Gedney Road Long Sutton, Spalding, Lincs, PE12 9JU
(Planning Approval Ref: H06/0018/01)

South Holland District Council granted Planning Approval for an earth-sheltered home and architects offices in the open countryside, the house of its Architect Dr Jeremy Harrall and his architectural Practice SEArch, (Sustainable Ecological Architecture Limited).

In 1997 only 17 earth-sheltered houses had been built in the UK, while the proposed offices became the first of its kind in Europe. Through design, the Long Sutton Work Life Project buildings are zero-heated, net zero CO_2 emission and are now a fossil-fuel-free undertaking. In recognition of these credentials the project has achieved 12 TV appearances, 7 radio, 63 journals and 6 national and international awards.
These projects have undergone peer review at the highest level as part of its architect's PhD thesis[13]. Amongst other endorsements, LSWLP has received awards from the CPRE[14] and the Green Organisation. Furthermore it was the RICS Sustainable Building of the Year (2005). LSWLP's home and offices have been shown to have enjoyed annual energy consumption rates 75% less than the average UK four bedroom house.

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[12] The precise meanings of the terms *autonomy* and *autonomous* in an architectural context are debatable. There is a spectrum of definitions, perhaps the most demanding of which is provided by those pioneers of sustainable architecture, Professor Brenda Vale and Dr Robert Vale: *"The autonomous house on its site is defined as a house operating independently of any inputs except those of its immediate environment. The house is not linked to the mains services of gas, water, electricity, or drainage, but instead uses the income-energy sources of sun, wind, and rain to service itself and process its own wastes."* B. Vale and R. Vale, *The Autonomous House: Design and Planning for Self-sufficiency* (London: Thames and Hudson, 1975), p7. Clearly, this degree of independence from mains services would not be allowable in publicly owned houses. However, the LS SSE is designed to give tenants the means to achieve the degree of autonomy from the mains services that suits their life-style. For further reading, please see Brenda and Robert Vale's, *The New Autonomous House: Design and Planning for Sustainability* (London: Thames and Hudson, paperback edition 2002), pp 8 - 10.

[13] Harrall, J. 2007. *Demonstrating the Viability and Growing Acceptability of Earth-Sheltered Buildings in the UK.*

[14] Norfolk Campaign to Protect Rural England. 27th October 2004

2004 – Present Day ***CaNeBuZo, (Carbon Neutral Business Zone),***
96 Gedney Road, Long Sutton, Spalding, Lincs, PE12 9JU
(Planning Approval Ref: H06/0092/06 and H06/0866/06)

Following SEArch's success with other earth-sheltered developments South Holland District Council agreed the sale of the contaminated former garage site at Long Sutton to SEArch as the preferred developer.

Planning Approval was granted outside the Development Area Boundary for what has become known as CaNeBuZo, (Carbon Neutral Business Zone), Europe's largest earth-sheltered development of its type. Construction commenced in October 2006 and is due for completion in November 2009.

A self imposed Zero-Waste Policy is in force, a policy implemented at the Long Sutton Work Life Project, where no waste during the deconstruction process has left site and none during construction.

No fossil fuels have been used on the site since it has been under the control of SEArch. No fossil fuels will be used throughout the construction and none in occupation. 100% bio-diesel manufactured in Long Sutton is being used by all plant and machinery.

CaNeBuZo consists of eight units, which includes five offices, a café, classroom and model autonomous dwelling, (achieving Code for Sustainable Homes Level 6).

SEArch have agreed to share with South Holland District Council's the dissemination of all data from the projects research and development. SEArch relocated to their new office on the CaNeBuZo site on the 19th November 2009.

2007 – Present Day ***LESH (Long Sutton Earth-Sheltered Social Housing Scheme)***
Adjacent 21 Bridge Road, Long Sutton, Spalding Lincs PE12 9EF
(Planning Approval Ref: H11/0585/08)

A fossil fuel free construction. This is the UK's first near-autonomous social housing scheme occupied in July 2009 and consists of six dwellings, (3 x 2 bed and 2 x 3 bed), which will generate their own electricity, harvest their own water and manage their own waste stream, alleviating the tenants of their reliance on public utilities and the burden of fossil fuel dependency.

The site includes access to footpaths, a rich bio-diverse landscape, food production areas, (allotments), and additional alternative renewable energy generated on site by a Skyrota vertical axis wind turbine (VAWT [APPENDIX ITEM 14].

2007 – Present Day ***Greening-The-Box,***
25 Main Road, Long Sutton, Spalding, Lincs PE12 0AA

In partnership with SEArch, South Holland District Council are endeavouring to undertake the refurbishment of a three bed-roomed semi-detached council house to a near autonomous state for its tenants. Some of the techniques to be implemented are to be tried and tested, while others are unique to SEArch's building design ethos, evolved through Dr Jeremy Harrall's doctoral research through his Practices building portfolio.

From the data derived from the building in occupation, eg. Life Cycle Energy Analysis and Life Cycle Costing Analysis, the partnership will be able to advise developers and other Local Authorities of the most cost effective solutions for the 'greening' of other existing buildings

Drawing on experience gained from these projects, amendments have been made to their design and specification that have been applied at the LS SSE. Those amendments include:-

- a substantial increase in the levels of insulation
- the integration of renewable energy applications in each building
- larger rainwater harvesting vessels
- supplementary heating from wood burners, both to compliment the back-up underfloor space heating and to provide a virtual hearth for home comfort
- more on-site communal renewable electricity generated by a series of six 6Kw vertical axis wind turbines[15] *[APPENDIX ITEM 14]*
- greater levels of passive cross and stack ventilation

[15] www.limgear.com

Probably unique to the Long Sutton SSE are the combination of other ecological benefits and life-style enhancements such as:-

- allotment allocations on site
- increased biodiversity with hedgerows, trees, and wetland area
- a large scale 'living street' in which traffic is effectively calmed and there will be no on-street parking.
- enhanced living environments with natural ventilation, elevated internal daylight levels and maximum sunlight.
- proximity to a well-served bus route and footpath giving easy access to the Town and local services
- a network of footpaths within the site.

Design Techniques:-

The architectural design solution for all the buildings on the LS SSE has been achieved by adopting the principles of passive solar design.

- ***orientation*** - *Each building is orientated south to maximise receipts of solar gains[16] so as to achieve optimum benefits in terms of space heating, ventilation, solar electricity, solar water heating, and high levels of daylight.*

- ***fenestration*** - *By maximising the areas of glazing on the south elevation of each building, the opportunity for solar gains into the home[17] are optimised.*

  By reducing the glazing areas on the north, east and west elevations, the rate of heat loss from those sides of the buildings most prone to higher rates of heat loss is minimised.

- ***high thermal mass*** – *The internally exposed high-mass structural elements of the LS SSE buildings work to stabilise the internal ambient air temperature by acting as heat-sinks[18]. For instance, the tiled but uncarpeted areas of the floor will, like large storage radiators, re-emit stored heat at times at times when the external air temperature is lower than that inside the building.*

- ***super-insulation*** - *Designing out conventional external cavity walls makes it possible to increase the thickness of insulation to the walls, which reduces the rate of heat loss from the buildings while increasing their capacity for retaining stored heat[19].*

  A continuous envelope of 300mm thick extruded polystyrene creates elemental u-values significantly better than the minimum Building Regulation requirements[20].

- ***passive ventilation*** - *Designing out the requirement for mechanical air extraction reduces the energy demands of the buildings. Instead, passive stack vents are installed in the kitchens, toilets, and bathrooms.*

  The layout of these buildings is designed to enable occupants to encourage passive cross-ventilation by inducing the movement of air through the building from the south side to the north side.

- ***passive heating*** - *A combination of passive solar heat gains[21], human occupation, and secondary heat from household appliances can provide most, if not all, of the heat that these bungalows will require. Heat stored in the super-insulated fabric (floors and walls) of the buildings is evenly re-emitted into the rooms ensuring the maintenance of stable internal ambient air temperatures.*

- ***back-up heating*** – *A thermostatically controlled low-grade electric underfloor heating system is embedded in the concrete floor slab. Neither pipe-work, radiators, switch-gear, boilers, flues, fuel tanks nor the associated fossil fuel emissions are required in these houses[22].*

- ***solar water heating*** - *A flat-plate solar water heating collector (approx 5m^2) is built into each south-facing roof. These will reduce domestic hot water heating costs and the demand for electricity from the grid[23]*

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[16] Sterling, R. 1982. *Earth Sheltered Residential Design,* University of Minnesota. pp153 - 154
[17] Sterling, R. 1982. *Earth Sheltered Residential Design,* Underground Space Centre. pp*75 - 80*
[18] Weber, M.J. Boyer, L.L. Grondzik, W.T. 1980. *Implications for Habitability Design and Energy Savings.* Oklahoma State University. VI p 24
[19] Wendt, R.L. 1982. *An Evaluation of Energy Conservation Potential.* p6.

[20] Building Regulations. Part L. *Conservation of Fuel and Power in New Dwellings.* 2006
[21] Labs, K. 1981. *Earth-Shelter Performance and Evaluation.* 2nd National Technical Conference. P43
[22] Harrall, J. 2007. *Demonstrating the Viability and Growing Acceptability of Earth-Sheltered Buildings in the UK.* P140, para 3.12

- ***rainwater harvesting*** - *Rainwater collected from the bungalow roofs will be stored in a proprietary water tank and pumped into each home at a suitable pressure. After proprietary filtering the tenants will be able to use the purified rainwater, thus reducing metered consumption.*

Site Layout

- ***orientation-*** *Collectively this collection of commercial units and homes are laid out to face south so as to maximise solar receipts*[24].

- ***site Layout*** - the *houses are laid out in strict alignment with the stereographic graph, ensuring each property receives the maximum exposure to the path of the sun. Appropriately the three lanes take their names from the winter and summer solstice and the equinox. Each lane will be identifiable by its radii, length, and associations with their diurnal references.*

- ***microclimate***[25] - *The siting of the building collection forms an enclave around the southerly gardens providing shelter from the northerly winds. Strategic positioning of landscaping, fencing, and garages assist with the provision of shelter necessary for the establishment of effective microclimates at the rear building elevations, helping reduce rates of heat loss from each building*[26]

- ***'living-street'***[27] – *'Living-streets' accommodate both pedestrians and vehicles with compatibility. Two hundred percent off-street parking ensures minimum visitor parking spaces are necessary on the shared drive, freeing it up for recreational and pedestrian use.*

- ***pinch-points'****, surface treatment changes, and the absence of dedicated footpaths, encourages drivers to travel across the road surface with care.*

Energy conservation and CO_2 mitigation are two of the benefits in the implementation of passive solar design techniques.

Using the Energy Saving Trusts 2006 energy consumption data of the existing UK housing stock, we have made comparisons in performance of the LS SSE proposed houses. At the time of writing this Planning Statement, no data from the EST on commercial properties was available.

In the absence of any fossil fuel fired space heating for the LS SSE homes, all the energy consumed on the site will be derived from renewable energy sources either on site or off. Taking into account only that CO_2 displaced from the houses as a benefit of passive solar design techniques (not that derived from renewable energy) the estimated ***Carbon Dioxide mitigated is 144, 256Kg CO_2/yr (144 tonnes CO_2/yr equivalent to 76 hot air balloons).***

Materials specification

Concrete

Similar low-inevasive construction techniques to those developed at the LSWLP and evolved at CaNeBuZo and LESH will be used for the LS SSE buildings. To reduce up to a third of the carbon dioxide emissions in the building construction, all unnecessary subterranean construction will be avoided. Instead a floating concrete slab, built-up on hardcore will replace the requirement for foundations.

An environmentally responsible concrete developed by SEArch in collaboration with Lafarge for the CaNeBuZo development, now being used at LESH is to be exclusively used throughout the LS SSE. Both embodied energy and CO_2 emissions are significantly reduced in this product, which comprises 90% Ordinary Portland Cement (OPC) replacement with a waste slag; 50% aggregate replacement using crushed recycled concrete and 10% replacement sand using ground recycled glass.

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[23] Harrall, J. 2007. *Demonstrating the Viability and Growing Acceptability of Earth-Sheltered Buildings in the UK.* P133, para 3.02.2

[24] Sterling, R. 1982. *Earth Sheltered Residential Design,* University of Minnesota. pp153 - 154

[25] Mulligan, H., Baker, H. 1989. *Landscape Modification and Energy Use.* The Martin Centre. July. pp9 - 10

[26] Mulligan, H., Baker, H. 1989. *Landscape Modification and Energy Use.* The Martin Centre. July. pp9 - 10

[27] Poundbury. 2002. The Duchy of Cornwall.

There is ongoing research between SEArch and Lafarge to develop a 100% OPC replacement concrete that might be available for this development.

Lafarge Aggregates
Granite House
Granite Way
Syston
Leics LE7 1PL

Contact: Peter Keal, External Account Representative - South Lincs Sector
Tel. 0780 395 3904
peter.keal@lafarge.com

Blocks

Reducing the volume of land extracted aggregates used within the construction industry and its products has a concomitant benefit in the reduction of carbon emissions associated with the extraction and subsequent processing.
Next to ready mixed concrete, one of the most used materials in the construction industry is concrete blocks. The LS SSE will use 100% aggregate replacement blocks using recycled aggregates as the major constituent as it has at CaNeBuZo and LESH.
Masterblock and Fyfestone blocks

Aggregate Industries Limited
Marions Way
Coventry Road
Croft
Leicestershire LE9 3GP

Contact: Stuart Jupp
Tel: 01455 285670 or 07771 835984
stuart.jupp@aggregate.com

Insulation

All the LS SSE buildings are to be super insulated (300 mm thick) with DOW Building solutions Styrofoam LS-An extruded polystyrene rigid insulation board. This material uses CO_2 extracted from the air as its blowing-agent instead of the 'green-house' gases that are the norm in this process.

Dow Checmical Company Limited
Diamond House
Lotus Park
Kingsbury Crescent
Staines
Middlesex TW18 3AG

Contact: Jayne Law, Sales Manager - UK and Ireland, Dow Building Solutions
Tel. 0203 139 4124
jaynelaw@dow.com

Carbon Dioxide Mitigation

Any mention of the "greenhouse effect" tends to ignite controversy, while rising atmospheric concentrations of greenhouse gases, especially carbon dioxide are broadly accepted as one of the most pressing of issues today. The LS SSE was conceived directly in response to these issues and offers viable and replicable solutions to mitigate atmospheric pollution associated with new development both through their construction and in occupation.

It is widely accepted that buildings are responsible for over a third of global energy-related carbon dioxide (CO_2) emissions. In the UK this proportion is higher, with a significant share of these emissions being avoidable through cost effective solutions. Improved energy efficiency in our existing buildings and better design for new buildings would reduce significantly greenhouse gas emissions.

How large is this emission reduction potential at the LS SSE and how much will it cost to unlock it?

The LS SSE provides answers to these questions, providing low tech, low cost solutions that eleviate the threat of fuel poverty, reduce reliance on fossil fuels at no extra cost compared to conventional development.. This project also demonstrates that it is possible to cut running costs effectively with concomitant reductions of approximately 54% of building-related CO_2 emissions, far in excess of those reductions achieved through contemporary development. Initial estimates indicate that LS SSE will reduce carbon emissions by ***344tonnesCO_2/yr*** compared to those emissions of the average UK housing stock[28].

> *If this carbon reduction potential is realised, LS SSE would serve as a national exemplar development in which the mitigation of building-related CO_2 emissions could be delivered affordably.*

Standard Assessment Procedure (SAP)

Under a long standing partnering arrangement between SEArch and South Holland District Council progressive development of environmentally sound design has been verified using the Standard Assessment Procedure. The emerging portfolio of projects that are the LS SSE's design precedent, are in the words of the South Holland District Council's Building Control Department, 'exemplary'.[29] [APPENDIX ITEM 1]

> ***An Overview***
> *The SAP[30] is a compulsory assessment that must be carried out on all new building, to show compliance with Part L of the Building Regulations.*
>
> *SAP is used to give a building a rating from 0 to 120 based on the annual energy costs of the building. It also gives a 'Carbon Index', a measure from 0 – 100 (National Energy Rating) for which a certificate can be issued, an indication of the energy needed for space heating and hot water.*
>
> *It is widely accepted that the existing UK housing stock would produce an average SAP rating of between 40 – 50.*
>
> *A prerequisite to achieving the 'zero carbon' house as defined by the Code for Sustainable Homes (CfSH) is a minimum SAP rating of 100.*

More recently a partnering arrangement has been formed between SEArch, South Holland District Council and Elmhurst Energy Services Limited, (SAP software designers), to develop their software with the assistance of SEArch's portfolio and South Holland District Councils on site experience of projects.

Using this now generic specification of SEArch's current portfolio of buildings, the same standard to be used at LS SSE, South Holland District Council undertook a preview SAP on Plot 5 (3bedrooms) Winter Solstice.[APPENDIX ITEM 2] It achieved a SAP Rating of 107A with an estimated energy cost of £43. with a negative value for its emissions of -1.58 tonnes/year.

South Holland District Council Building Control have confirmed this is by far the highest rating SAP they have come across. All the LS SSE properties are designed using the same specification.

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[28] Energy Saving Trust. 2006. *Whole Energy Consumption – Summary.xls* (source Guidelines for Company (sic) Reporting on Greenhouse Gas Emissions, Defra)
[29] Adams, P. 2008. *South Holland District Council's Chief Building Control Officer.*
[30] Building Regulations. Part L. *Conservation of Fuel and Power in New Dwellings.* 2006

Building Regulation Compliance Page 1 of 2

Users Ref: b11 plot 5 winter solisice **Issued on:** 4.December.2008

Prop Type Ref: Winter solistice east

Property: Plot 5, Bridge Road, Long Sutton, Spalding, Lincolnshire **TER:** 22.25

DER: -17.07

SAP Rating:	**107 A**	**SAP Energy Cost:** £43	**CO2 Emissions:**	-1.58 t/year	
EI Rating:	**116 A**	**Energy used:** -18 kWh/m2/year	**Enel:** 0	**ZC:**	0.00

Surveyor: 1056-0016, Michael Charlton, Tel: 01775 764616, Fax: 01775 762937
Address: Priory Road, Spalding, Lincolnshire, PE11 2XE
Client: 3, *Sutainabl* Ecological Architecture, 89 Gedney Road, Long Sutton, Spalding, Lincolnshire, PE12 9JU
Software Version: EES SAP 2005.015.build.0019, April 2008 (*Design System*), BRE SAP Worksheet 9.81
Regs Type: SAP 2005, Regs Region: England and Wales (Part L1A 2006), Construction Type: New Build

Extract from SAP preview for Plot 5, Winter Solstice, LS

Code for Sustainable Homes Assessment (CfSH)

While there is some controversy over elements of the CfSH assessment criteria, SEArch is demonstrating through its portfolio of projects that the perquisites stipulated in the Code can be achieved through the CfSH procedure in combination with parallel appraisals. This has in some instances led to ratings that exceed the Government's targets for reducing carbon emissions.

Again SEArch, South Holland District Council and Elmhurst have formed a partnership to develop each parties knowledge and understanding of CfSH together with assisting Elmhurst in their appraisal of CfSH assessment.

CARBON DIOXIDE MITIGATION DUE TO PASSIVE SOLAR DESIGN APPLICATIONS AT LS 9BE										
			Space and Water Heating		Lights and Appliances		Cooking		CO_2	
Property Type	Bedrooms	No. of units	kWh/yr	$KgCO_2$/yr	kWh/yr	$KgCO_2$/yr	kWh/yr	$KgCO_2$/yr	Total annual CO_2 displaced/house	Total annual CO_2 displaced/house type
Mid Terrace house	2		11,693	2,222	2,109	907	1,008	192		
(Proposed LS 9BE)	2	3	9,400	1,482	1,500	645	1,008	192	1,025	2,050
End Terrace house	2		15,138	2,876	2,117	910	1,008	192		
(Proposed LS 9BE)	2	18	9,600	1,548	1,500	645	1,008	192	1,595	28,709
Semi detached house	3		21,236	4,035	2,992	1,287	1,314	250		
(Proposed LS 9BE)	3	14	4,000	1,720	2,100	903	1,314	250	2,699	37,786
Detached House	3		28,209	5,360	3,572	1,536	1,386	263		
(Proposed LS 9BE)	3	11	4,000	1,720	3,000	1,290	1,386	263	3,880	42,680
Detached House	4		32,549	6,184	4,121	1,772	1,599	304		
(Proposed LS 9BE)	4	9	4,400	1,892	3,500	1,505	1,599	304	4,589	41,031
							TOTAL Kg OF CO_2 DISPLACED BY HOUSES/yr =			144,256

Existing UK average housing stock energy consumption figures taken from Energy Savings Trusts (EST) 2006 data

Contact: Dr Jeremy Harrall
SEArch
89 Gedney Road, Long Sutton, SPALDING, Lincs PE12 9JU
Tel. 01406 364646 molearch@searcharchitects.co.uk

POLICY SG9: *Development and Flood Risk*

A Flood Risk Assessment has been undertaken by Geoff Beel (Chartered Water and Environmental Manager)[SEE APPENDIX ITEM 3] to satisfy the Local Authority Planning Departments requirements and those of Planning Policy Statement 25 (PPS25) – Development & Flood Risk and for approval by the Environment Agency. In undertaking the assessment the following facts where established, the site is;

1. located within Flood Zone 3, of the Environment Agency's Flood Zone Maps.
2. located in the South Holland IDB district.
3. in Fluvial Flood Zone 1 of the Council's Strategic Flood Risk Assessment Map as defended by the Internal Drainage Board system.
4. within a defended floodplain, as defined in Appendix 1 of the Environment Agency's 'Policy for the Protection of Floodplains'

A material consideration in the appraisal of this Planning Application is that a previous Flood Risk Assessment was prepared in April 2008 for an adjoining development (LESH) under planning application ref. No. H11/0585/08 which received approval from the Environment Agency on 13th May 2008 under file ref. No AN/2008/105092.

Flood Risk Assessment Conclusions and Recommendations

As a result of the assessment, the following conclusions have been reached:-

- the proposed development is not in a Functional Floodplain as defined by PPS25. It is located in the Passive Floodplain protected by defences to a 1 in 100 year return period, (1.0%).
- although the site is in Flood Zone 3, the actual risk of site flooding from any Environment Agency river system is very low (less than 0.5%). The site has been identified in fluvial Flood Zone 1 of the South Holland District Council's Strategic Flood Risk Assessment Maps.
- although the site is located within an Internal Drainage District with a minimum standard of drainage of 1 in 50 years, this accords with Defra guidelines for rural development. Freeboard to design water levels of 900 mm to lowest land level is available for events greater than 1 in 50 years providing further storage within the drainage channels.
- on site rainwater from the development with be discharged via a comprehensive sustainable surface water drainage system to attenuate run-off to meet the requirements of the IDB.
- Land Drainage Byelaw Consent will be required from the South Holland Internal Drainage Board for the proposed site entrance drain culverts and also the 6 metre easement to the drains on the development site western boundary.

POLICY SG11: *Sustainable Urban Drainage Systems (SUDS)*

The Long Sutton Sustainable Settlement Extension attenuates surface water run-off to the extent that no precipitation falling on the development site will be directly discharged into neither the IDB Drains nor the Public Stormwater Drains.

Rainfall Run-Off Discharge

All precipitation falling onto the building roofs will be directed to Rainwater Harvesting Tanks. From those tanks, the overflows will feed a Wetland Basin (0.14 ha [0.34 acres]) to the north of the site. In each house the harvested water will feed each properties utility wc's, sinks and washing machines while also providing water for car washing and garden irrigation, reducing their reliance on the mains supply.

Reducing the proportion of impermeable areas onsite is another way in which the LS SSE intends to attenuate the adverse affects of surface water runoff, while mitigating the risk of flooding from the development. Currently the existing 10acre development site has 9,450m^2 of impermeable surface area which represents a quarter of the existing site area.. None of the surface water run-off is discharged to the public storm sewer. At present the existing overflow drains from the glasshouse (2000m^2) and service yards (3,200m^2) discharge directly into the eastern perimeter dyke which in turn discharges into the IDB Hundred Drain north of the site. All other impermeable area run-off discharges into soakaways and cisterns.

There will be no rainfall run-off into the IDB's Drains as a result of the SSE development. Instead, the total proposed impermeable surface area of the SSE will reduce by 75% to 3,746m^2.

As a result of the SSE, rainwater discharge into the IDB will cease, impermeable areas will reduce by three quarters, while all other precipitation run-off will be collected and managed onsite.

1:100yearRainfall Intensity Event

At the LS SSE exceptional provision has been made to attenuate the adverse effects of a 1:100yr Rainfall Intensity Event. Using the Environment Agencies range of rainfall intensity rates over varying timescales there is to be provision at LS SSE of up to a twentyfold catchment capacity.

It is generally accepted that the 60 minute storm intensity rates (38.41mm/hr) are taken as the normal benchmark for calculation purposes. Therefore, assuming the rainwater harvesting vessels are full, all the rainfall run-off from the SSE roofs in a 1:100 yr event would discharge directly to the proposed catchment basin in the form of the Wetland Area. The catchment capacity from the roofs discharge would be 134 m^3 (3.746 m^2 x 0.0384 mm/hr). Below the invert level of the rainwater harvesting outfall (+2.24 m ODN) at the Wetland is a catchment capacity of 262 m^3 twice that calculated as being needed for a 1:100 yr Rainfall Intensity Event.

The provision of an additional catchment area has been designed into the scheme with a capacity of 2,597 m^3 providing a total catchment area (including the Wetland Area) of 2,859 m^3, a twenty fold capacity.

POLICY SG14: *Design and Layout of New Development*

For the purposes of assessing the design and layout of the proposed Long Sutton Sustainable Settlement Extension, the following areas are to be considered:-

1) ***Local Distinctiveness***

Unlike other parts of Lincolnshire (e.g., Stamford, the Wolds, Lincoln City itself) the south Lincolnshire fens lack an easily identifiable local vernacular architecture. In Long Sutton, as in many of the other towns in the area, a large proportion of the built-up areas are dominated by the high-volume house builders' brick boxes of a bland aesthetic.

The LS SSE offers a new aesthetic evolving from SEArch's portfolio of environmentally responsible architecture, eg, LSWLP, CaNeBuZo, GTB and LESH all built or under construction along the B1539; the former trunk road. When completed, the town's collection of eclectic buildings will represent the largest aggregation of buildings of this type in the UK. Collectively these buildings mitigate 141,841Kg CO_2 each year (141 tonnes/yr) the equivalent of 76 hot air balloons.

2) ***The Choice of Materials***

Walls - Some of the perimeter walls of the buildings are to be rendered with lime and painted (colour to be agreed), other walls are to be timber clad, while the remaining are to be a mixture of both.

Fenestration - By maximising the areas of glazing on the south elevation of each building, the opportunity for solar gains into the home[31] are optimised.

By reducing the glazing areas on the north, east and west elevations, the rate of heat loss from those sides of the buildings most prone to higher rates of heat loss is minimised.

Roof - on the south elevations only amorphous silicone and monocrystalline photovoltaic's are to form the roof covering and will provide a significant proportion of the resident's electricity. To the north elevations interlocking tiles (materials to be specified) are to be used.

3) ***The Historic Pattern of Development along Bridge Road***

Existing

Long Sutton's settlement pattern is typical of Fenland market towns. It still retains its historically linear infrastructure layout. Spreading out from the Market Place along the former A17 trunk road in an east-west direction, the pattern of the settlement is one of ribbon development. Bridge Road travels east through the settlement in a straight line through the hamlet of Little Sutton and onwards to Sutton Bridge.

A continuous line of residential development marks the beginning of this road, changing in its make-up heading east with a sporadic mix of residential, commercial and horticultural buildings.

As befits a rural settlement, both north and south frontages of Bridge Road are lined with mature hedgerow and trees (more marked on the north side) with the buildings in some cases set back from the highway by as much as ten meters, particularly on the north side.

Residential curtilages along Bridge Road are substantial in area, typical of rural fenland dwellings

[31] Sterling, R. 1982. *Earth Sheltered Residential Design*, Underground Space Center. pp75 - 80.

where, historically, food production and the rearing of livestock at home was commonplace as a way of supplementing the residents' diet and livelihood. Typical gardens would have included vegetable garden areas, outbuildings, fruit trees, water cisterns, and cesspools. The drive for self-sufficiency was always an imperative.

LS SSE continues the chronological development of architectural styles within the settlement of Long Sutton and adds to the pattern of historical residential development along the northern edge of Bridge Road. The project occupies a previously developed site in the continuous line of ribbon development along the line of what is effectively the settlement of Long Sutton.

LS SSE achieves this accord by:-

a) ***Hedgerow*** – planting a native hedge to the site perimeter with a selection of fruit-bearing trees and hedges.

b) ***Linear frontage*** – the front two LS SSE homes (The Gateway) line up with the pattern of buildings on either side of the site.

c) ***Self-sufficiency*** – the proposed development at LS SSE will give its residents and users the opportunity to achieve a greater degree of independence and self reliance from public services and commercial food suppliers than has hitherto been achieved at this scale in the UK.

LS SSE represents a design solution which gives its residents and uses the opportunity to achieve a more autonomous existence in terms of energy supply, drinking water, waste disposal and processing, and food production. This is in line with the historical pattern of development, albeit in the context of mixed uses.

The LS SSE recognises that households and businesses can also have a need to take control of their consumption, especially of their fossil-fuel energy consumption, at a time when food prices are rising and fossil-fuel energy is becoming prohibitively expensive. Building on the historical precedents, LS SSE applies advanced building design solutions in terms of layout, orientation, and technology to achieve the requirement for self-sufficiency in a contemporary socio-economic context.

The Relationship of the Development to the Character, Form, and Scale of Existing Buildings along Bridge Road

Existing

Existing buildings on Bridge Road vary significantly in their architectural character, form and scale. Of these buildings, the residential dwellings are diverse, ranging from detached, semi-detached, and terraced to bungalows, houses and dormer houses.

Diverse stylistic elements include an array of wall treatments such as painted and natural pebble-dash, painted and natural rough-cast, painted render, full brick elevations, and half brick elevations. Roof finish varieties are equally diverse ranging from slate, clay pantiles, concrete interlocking tiles and plain tiles. Fenestration along Bridge Road is eclectic, with a variety of window styles in wood and plastic. Vertical sliding sash windows in box form and modern spring balanced varieties exist. Casement windows vary from side hung to top hung with some combinations of both. All the windows vary in colour or finish.

Tenure along Bridge Road is mixed, and this contributes to its distinctive character. Council houses are now both rented and owned. Other properties are freehold, some owner occupied and some privately rented.

A considerable proportion of the buildings along the Bridge Road frontage on the north side are obscured from view from the road by the presence of the continuous line of mature hedgerow and trees.

The design solution proposed for LS SSE follows the historical pattern of building development frontage and perimeter along Bridge Road which has led to the current diversity of styles in the street scene. The development proposed at LS SSE continues the tradition of diversity by introducing a new aesthetic which has clearly been obtained historically.

The building type at LS SSE will introduce a new layer of diversity, and the layout of the development allows for the continuation of the line of roadside planting already established by providing:-

a) ***hedgerow-*** a hedgerow of native species is to be planted to the development frontage with a selective variety of trees with relative low mature canopy heights so as not to obscure the penetration of sunlight into the buildings at LS SSE.

b) the treatment of fenestration at LS SSE will contribute to the variety of styles along Bridge Road (not that they will be seen) with a variety of casement windows.

5. ***The Scale, Form, and Height of LS SSE***

Scale

Unlike high-volume, high-density *[APPENDIX ITEM 18]* conventional housing development, LS SSE seeks to achieve an acceptable level of density in which the agenda for autonomy can be delivered while optimising the use of land for the benefit of the residents and businesses. Rainwater-harvesting, renewable energy applications, a 'living-street' environment, and generous communal amenity areas are key parts in the exploration of the LS SSE concept.

Form

The historical pattern of development along Bridge Road is reflected at LS SSE, where the roadside frontage is to be planted with indigenous hedge and selected fructiferous tree species.

The building type proposed for LS SSE not without its architectural and planning precedents in Long Sutton, nor is it without precedent along the former A17. The Long Sutton Work-Life Project (the LSWLP - two buildings: office and house) and the Carbon Neutral Business Zone (CaNeBuZo) (seven commercial buildings and one dwelling) and the Long Sutton Earth-Sheltered Social Housing Scheme are developments along the former trunk road on the western perimeter of Long Sutton and were, because of the highly environmentally responsible type of development they represent, granted planning approval in the open countryside.

Height

The two storey buildings at LS SSE are not more than 6.6 metres in height and only this height at the ridge of the roofs. They are 4.5 metres at the eaves of the roofs, which is comparable to the height of the bungalows (6.6m) as approved and built adjacent to the LSWLP in January 2008.

The buildings of LS SSE will become an integral part of the surrounding landscape by virtue of their abundant planting scheme and generous allocation of ameniety area and allotments to the outer environs of the site.

6. ***Architectural Detailing***

The new emerging architectural aesthetic represented by LS SSE has emerged in response to the widely acknowledged imperatives dictated by climate change. The dictates of the low-carbon economy make it incumbent on designers and developers to deliver low-tech, low energy consumption, high energy conservation buildings. The architectural detailing for the LS SSE building arises directly from these considerations.

The diverse collection of buildings on Bridge Road presents an equally diverse range of architectural detailing which has emerged as each new building has been built. The architectural detail for LS SSE, albeit perhaps more purposeful, follows the historical pattern of development.

7. ***Effect of LS SSE on the Amenity of Neighbouring Residents*** *(in terms of noise, smell, general disturbance, overlooking, and loss of light.)*

Noise and General Disturbance

Historically, development on the northern side of Bridge Road has been predominantly for residential housing interspersed with small and large business operations, which is commensurate with the use intended for LS SSE. Planting is a widely accepted medium for some attenuation of noise and this will afford residents of the houses at LS SSE with a greater than usual level of peace and tranquillity. Endogenous noise will also be attenuated for neighbours by reason of extensive planting and wide perimeter gaps; and street-scene parking will attenuate exogenous noise from the development for both tenants and neighbours.

Overlooking and Loss of Light

Each of the buildings at LS SSE faces directly south towards Bridge Road. All principle rooms have their principle windows in the southerly elevation so as to maximise solar receipts. No windows exist to the west or east on these buildings restricting / eliminating the possibility for overlooking.

All the LS SSE buildings are less than the average height normally built for homes and will cause no loss of light to any neighbouring properties. The distance between each view of houses has been carefully prescribed, so as not to restrict solar gains to the houses behind.

8. ***The Layout of Vehicular Access*** *(parking, and manoeuvring facilities and the provision of facilities for cyclists and pedestrians)* [APPENDIX ITEM 4]

Living-streets, answer the call in the Report of the County Surveyors' Society, *Travel is Good*, published in March 2008, which recommends '*...a revolution in road design and the widespread adoption of the concept of shared-space better known in Britain as naked-streets.*'

- The use of gradually diminishing roadway widths, which provide a subliminal message to drivers that their speed and their priority should be similarly reduced as they progress through the development.
- The use of the series of circular road forms that both resolved the various turning movements at junctions and cause gentle interruption to movement through the site and to the line of sight along the main spine road.
- The inclusion of a tear-like taper on the entry to the central islands of the circular junctions to both guide inbound vehicle movements around the islands and 'steer' outbound drivers towards the Bridge Road junction.
- The omission of footways (along the sides of the roadways) to promote the 'Living Street' ethos.
- The inclusion of linking footpaths/cycle paths throughout the residential areas and between the residential, employment and amenity/recreational areas to reduce the need for car travel. I recall you are also considering the possibility of providing sheltered and secured parking at each of the residential and the employment units, which would further reinforce the message of Sustainable Development.
- The use of porous surfacing to the roadways to minimise the discharge of surface water run-off into the local watercourses.

The drives at LS SSE exemplifies the concept of 'living-streets' (aka naked-streets), in which pedestrians and vehicles are accommodated compatibly. 200% off-street parking ensures that minimum visitor parking spaces are necessary on the drives, freeing it up for recreational and pedestrian use.

9. ***The Needs of Disabled Persons***

By their very nature, 'low-invasive' building types such as those proposed for LS SSE employ single-level internal and external floors at the same level throughout, making for exceptional ease of access and use for the disabled whether in wheelchairs or otherwise.

10. ***The use of Sustainable Materials and Methods of Construction***

The design solution for LS SSE adopts the same rationalised construction process exemplified and peer-reviewed at the Long Sutton Work-Life Project and now being implemented at the Gedney Road Carbon Neutral Business Zone and LESH (Long Sutton Social Housing Scheme), where both the specification itself and the construction processes are streamlined to reduce negative environmental impact in the following areas:-

a) subterranean works
b) material varieties
c) material quantities
d) individual trades
e) construction waste
f) carbon emissions from machinery

A comparative study undertaken by the designing architect to evaluate current traditional construction methodology and those methods employed at the LSWLP showed that the former to be both more expensive to implement and more detrimental to the environment.

11. ***Measures taken to reduce the Potential for Crime and Disorder*** [APPENDIX ITEM 18]

LS SSE espouses the principles of 'Security by Design' to ensure the creation of a safe living environment. These are:-

a) Surveillance – each of the homes at the proposed development at LS SSE is orientated and located to enable its residents to view the communal spaces. Encouraging the use of the communal drive as an amenity space encourages self-policing within the development.

b) Image – the high quality contemporary design proposed will help mitigate the stigma sometimes associated with social housing, particularly in a random layout of mixed tenure.

c) Territoriality – 'Living-Streets' design promotes a feeling of neighbourhood and encourages residents to exercise surveillance over the area of defensible space.

d) Environment – Hedgerow and selective tree species promise to elevate the perception of the immediate environment at LS SSE as a safe place to live. A pinch-point created by the Living Street along the Avenue of the development creates a defined site entrance and sign posting.

The recently completed Unity Gardens (LESH) project adjacent has been certified 'Secured by Design' and as LS SSE follows similar design principles it is anticipated that it will achieve 'Secured by Design'.

12. Cycles *[APPENDIX ITEM 11]*

A network of footpaths and cycle ways weaving in and around the settlement extension cover a distance of 1543.361 metres (1.533km, 0.919 miles). An 8' x 6' timber garden shed is to be provided to each dwelling specifically for the secure provision of cycle storage within the curtilage of each house.

Business Premises

The business premises should each have secure cycle storage for those who work there in accordance with Policy SG15 and Appendix 2 of the Local Plan, together with cycle stands which are convenient for the short-stay needs of visitors.

The Gateway [32] - *An exemplar showcase of alternative construction techniques using traditional materials.*
Plots 1, 2, 3, 49, 49A & 50

The LS SSE residential entrance will provide four distinctive dwellings and an iconic office (Hodnydod) using three traditional (so-called alternative) low-energy construction techniques, providing four distinct building solutions - all of them, by comparison to conventional construction model , achieving a greater level of self-reliance in terms of the resources required for day-to-day living, but without loss of comfort.

These five buildings will set the scene for a new aesthetic, promoting a local identity with a reinterpretation of local vernacular styles and details using local materials, a large proportion of which will be derived from the site.

Five units:-

Plot 1	***Rammed Earth*** - 1 x 4-bed house (four person) 71m^2
Plots 2, 3	***Strawbale*** - 2 x 2-bed semi-detached (four person) 71m^2
Plot 49, 49A	***Cob Block*** - 2 x 2-bed house (three persons) 78m^2
Plot 50	***Mixed Medium*** - 1x office (Hodneydodd)

The LS SSE Gateway buildings will present the opportunity to explore and develop the concept of the low energy consumption buildings, built using traditional materials and construction techniques by deploying the traditional construction techniques of cob, rammed earth, and straw-bale. These buildings will broker financially viable housing solutions by virtue of pragmatic but robust specification. They will provide further insights into the properties and attributes of non-standard but tried and tested materials, thus establishing them in the mainstream of the social housing and open market housing context and promoting them as greener and healthier (more sustainable) alternatives to conventionally used materials.

With appropriate monitoring and record keeping. this collection of homes, which will be unique and could provide datasets for comparative studies in terms of the design, construction, and costing processes, not to mention invaluable occupant feedback.

The Gateway development will express, explore, and evaluate leading-edge thinking in sustainable construction using traditional building techniques. It will play a part in re-introducing the use of traditional sustainable materials to mainstream construction and development and will push the agenda for autonomous social housing.

At LS SSE, the deployment of traditional building techniques using materials derived from the site (subsoil) offers another opportunity to challenge and inform the prevailing wisdom underlying the current design assessment tools used to promote more environmentally responsible construction techniques.

Similar techniques have been used on the Genesis Project at Somerset College, Taunton www.genesis.com. The Genesis Project demonstrates that traditional construction materials and methods can work in harmony with modern materials and techniques to create contemporary buildings.

[32] *hamel* - a small knot of houses outside the main concentration of a settlement

POLICY SG17: *Protection of Residential Amenity*

Effect of LS SSE on the Amenity of Neighbouring Residents *(in terms of noise, smell, general disturbance, overlooking, and loss of light.)*

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Noise and General Disturbance

Historically, development on the northern side of Bridge Road has been predominantly for residential housing interspersed with small and large business operations, which is commensurate with the use, intended for LS SSE. Planting is a widely accepted medium for some attenuation of noise and this will afford residents of the houses at LS SSE with a greater than usual level of peace and tranquillity. Endogenous noise will also be attenuated for neighbours by reason of extensive planting and wide perimeter gaps; and street-scene parking will attenuate exogenous noise from the development for both tenants and neighbours.

The Layout of Vehicular Access *(parking, and manoeuvring facilities and the provision of facilities for cyclists and pedestrians)*

The drives at LS SSE exemplifies the concept of 'living-streets' (aka naked-streets), in which pedestrians and vehicles are accommodated compatibly. 200% off-street parking ensures that minimum visitor parking spaces are necessary on the drives, freeing it up for recreational and pedestrian use.

Living-streets design answers the call in the Report of the County Surveyors' Society, *Travel is Good*, published in March 2008, which recommends '*...a revolution in road design and the widespread adoption of the concept of shared-space better known in Britain as naked-streets.*'

POLICY SG18: *Landscaping of New Development*

The LS SSE is as much an architectural and socially derived scheme as it is a landscaping scheme.

Where possible, selected hedgerow and trees [APPENDIX ITEM 5] have been used to define lanes and footpaths of the development. Copse and holts to the northern site boundaries have been included to provide shelter from the severe northerly winds and to screen the development from the open countryside.

Open space *[APPENDIX ITEMS 17 AND 18]* provision within LS SSE has been carefully considered to provide a broad range of available space and to promote varying recreational activities. See Appendix Item?

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Chapter 4 - HOUSING

POLICY HS9: *Rural Exceptions (including HS1, HS4 and HS8)*

SEArch's proposal for the Long Sutton Sustainable Settlement Extension (LS SSE) is designed to be built on land which it is hoped will be deemed and exception. The site on Bridge Road, Long Sutton, is outside the identified Development Area Boundary but effectively forms part of the settlement and could reasonably be described as part of an established ribbon development.

In compliance with the four conditions set out in SHDC's Local Plan in respect of exceptions sites, the following factors have been considered:-

1) ***Local Need*** – SHDC's Affordable Housing[APPENDIX ITEM 13] Delivery Plan February 2007 places a strong emphasis on increasing the provision of affordable housing in line with the Council's Local Plan, Community Plan, and Corporate Plan. The Council's Housing Needs Survey Update 2004 identifies an affordable housing shortfall in Long Sutton during 2004 – 2009 of in the region of 300 homes.

2) ***Size*** – LS SSE proposes a contribution of 25 exemplar low-energy homes to this identified need.

3) ***Tenancy*** – A Registered Social Landlord (RSL) would select tenants for LS SSE from SHDC's housing register.

4) ***Social Housing in Perpetuity*** – A RSL is by definition a non-profit making charitable association registered with the Charities Commission and governed by the Housing Corporations strict codes of conduct.

5) ***Development Scale and Character*** [APPENDIX ITEM 18]:-

Precedents – LS SSE is not without its architectural precedents in Long Sutton: the Long Sutton Work-Life Project (LSWLP) (planning Ref. H06/0961/98 and H06/0018/01), the Carbon-Neutral Business Zone (CaNeBuZo (H06/1163/04 and H06/0866/06) and the Long Sutton Earth-Sheltered Social Housing Scheme (LESH) (H11/0585/08). There are sixteen low energy buildings either side of the former A17 trunk road and on the perimeter of the town. Each of those developments achieves exceptional environmental standards by virtue of inherent design characteristics which have created a form of development the scale and character of which are unique.

Scale – LS SSE comprises 49 two storey houses and 9 single storey commercial units and an office in a relatively compact site layout which includes a 'living-street', a Wetland Area, renewable energy appliances, amenity areas, footpaths and allotments. Orientation, shelter-belts, microclimate gardens and building forms are an integral part of a design solution that seeks to provide its residents with the opportunity to reduce their dependency on fossil-fuels, whilst relieving them of the threat of fuel poverty.

Character – for the first time in the history of speculative high volume house building in the UK, the proposal for the LS SSE will deliver on the agenda for autonomy, a defining characteristic of this proposal. In order to achieve these aspirations, the building types require a southerly aspect and benefit from being single-room deep. To accommodate LS SSE the site must therefore have specific characteristics. Ideally it should be a wide site facing south with an element of protection from the prevailing south-westerly winds. LS SSE is built on previously developed land which is part of a continuous line of ribbon development on the north side of Bridge Road.

6) ***Sustainability*** *(local services and facilities)*

The LS SSE site is located on the eastern entrance of the settlement of Long Sutton along the former A17 Trunk Road which is now circumnavigated by a bypass. Adjacent to and opposite to LS SSE are two bus stops with regular scheduled services between Kings Lynn, Wisbech and Spalding. Other local services and facilities available to the LS SSE are:-

- Public footpaths on both sides of Bridge Road lead east (for 4 miles) uninterrupted (unusual in the Fen) to Cross Keys Bridge at Sutton Bridge and west (3 miles) through the town to Gedney.
- Long Sutton Market Place is half a mile away and contains all the essential local services expected of a rural settlement with the exception of an independent butcher although the Co-op do supply an adequate selection of meat.
- Ninety metres west is The Ship Public House, one of six licensed premises in the town, none of them more than one mile from this site.

- Employment in Long Sutton is predominantly in the food production sector or in businesses supporting it. Premier Foods' factory, the largest employer in the catchment area of the town, is located half a mile east on the same former trunk road.
- Pre-school, primary and secondary schools are each within one mile of the LS SSE site.
- MacDonald's, Travel Lodge, and the 24-hour petrol station are 200 metres away.

LS SSE's location is securely established as sustainable in terms of local services and facilities, in line with the abiding principles of Sustainable Development.

POLICY HS11: *Open Space in New Residential Developments* *[APPENDIX ITEMS 17 & 18]*

One and a half acres of Open Space provision are to be wrapped around and within LS SSE, representing 21% of the gross site area significantly more than the minimum requirements of 14% cited in the Local Plan. Included in the 'open-space' are a range of provisions;

- network of footpaths
- grassed play area

The LS SSE Management Company will ensure that long term future maintenance of the open spaces provided by the development are secured in perpetuity.

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Chapter 5 - ECONOMY

POLICY EC2: *New Employment Development In Built Up Areas But Outside the Major Employment Areas*

A demonstrable need for business units across South Holland has been identified in a needs analysis report commissioned through Focus Consultants in August 2007[APPENDIX ITEM 6] by South Holland District Council. A shortfall within South Holland's small towns of units less than 3,000 sq ft was one of the report's conclusions. In particular there was shown to be a need for starter units (600 to 1,000 sq ft). The LS SSE's Employment Zone provides 9 commercial units of which four provide 970 sq ft and five 1,660 sq ft gross floor areas.

South Holland's Economic Development Team are more specifically aware of demand for units in Long Sutton of a size between 1,000 and 2,500 sq ft which LS SSE's Employment Zone is designed to facilitate.

New Employment Development In Built Up Areas But Outside the Major Employment Areas

An 'Employment Zone' (Long Sutton's first) of a modest scale (1.732 acres, 0.701 ha) providing 7,009.15 sq m^2 of net usable floor area is proposed as an integral part of the LS SSE. Business (B1) uses including office and light industrial uses will be linked with the new residential area by a network of footpaths and screened from residents by strategically located native trees and hedgerow.

Existing footpaths on the Bridge Road will provide employment opportunities for local people that are accessible by foot or bicycle.

As a result, employment opportunities will be made available within walking distance of both the LS SSE residents and those of the existing town. A combination of reducing travel-to-work movements and integrating landscaping with the business environment it is intended to provide a more economically and socially balanced community.

A range of business types (within the B1 category) are anticipated to move to the 9 business units that make up this unique 'Employment Zone' Each building is designed to achieve:-

- a zero heating status
- generate no CO_2 emissions in occupation
- harvest their own rainwater
- passive ventilation

These building are an evolution of the building type under construction at Long Sutton's CaNeBuZo. At LS SSE a new aesthetic is explored, one more familiar to Business Parks. These buildings include:-

- integrated photovoltaic's to the roofs
- integrated solar water heating
- super-insulated fabric
- high thermal mass superstructure
- orientation about the sun
- south facing fenestration
- rendered and timber clad facades

Reinforcing the uniqueness of this 'Employment Zone', two Vertical Axis Wind Turbines (VAWT) *[APPENDIX ITEM 14]* are sited prominently along the Avenue, celebrating the sites use of renewable energy applications.

An increase in local bio-diversity is encouraged in the presence of extensive landscaping within and around the site and includes:-

- native and fruit bearing hedgerows to sites perimeter
- broad leaf specimen trees to the boundaries
- hedgerow and selected trees to the Avenue and plots
- wetland area with margin plants
- copse to the northern boundary providing a shelter belt

In occupation it is anticipated that businesses operating from these premises will produce no carbon emissions or close to nothing, dependant on their activity and use of resources.

One such business anticipating occupying the site that will achieve zero emissions is Advanced Green Fuels (AGF), the Long Sutton manufacturer of 100% bio-diesel. AGF is a business already located on the site and has been manufacturing there for 3 years. They operate off-the-grid, generating their own electricity from bio-diesel

powered generators and harvest their own water. AGF's product is manufactured from waste, producing no waste. This is a business that produces no carbon emissions through its manufacturing process.

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Chapter 6 – CONSERVATION AND ENHANCEMENT OF THE ENVIRONMENT

POLICY EN2: *Wildlife Corridors and Other Areas* [APPENDIX ITEM 16]

The Long Sutton SSE's landscaping scheme[APPENDIX ITEM 5] includes for the planting of *24,518 plants* of *22 species* over the 10acre site. A mixture of native and Mediterranean plants are selectively specified and strategically located for a desired effect and more specifically to encourage new populations of wildlife onto the site.

Specific habitat creation on the development site include;

Bats[APPENDIX ITEM 7]

With the assistance of the Lincolnshire Bat Group (LBG), bat habitats and feeding corridors have been designed into the LS SSE with the intention of encouraging bats into allocated areas of the scheme in a safe environment. It is considered by the LBG that the VAWT's along 'The Avenue' may possibly be of a threat (not proven) to bats if tree canopy heights immediately adjacent the turbines exceed 3m and are too numerous in number and of a native species.

Therefore, to mitigate the threat of the turbines in anticipation of encouraging a local bat population 'The Avenue' planting scheme has been designed as follows;

- non-native trees (Olive) planted along the Avenue.
- grafted heads onto a grafted root stock restricting its mature height to 3m.
- 8m centres between each of the trees

To encourage populations of bats on the LS SSE development, bat roosts (60mm long x 12mm wide) have designed into the perimeter houses on the west (plots 44,43,42,32,31,24,23) and to the east (plots 22,15,14,7,6). Summer and winter roosts are catered for with habitats built into the front, side and rear of each of the identified properties. Native tree species (hawthorne, blackthorn, hazel and cherry) are to be planted in a dense line running north to south adjacent the bat roosts. These lines of native trees are anticipated to become the feeding grounds for the new population of bats, (Pipistrelles).

Birds

Bird boxes of various forms are designed into the gable ends of all dwellings and business units.

2.5cm hole designed to attract: **Blue Tit, Coal Tit, Marsh Tit, Treecreeper, and very small birds.**

2.8cm hole designed to attract: **Tree Sparrows, Great Tits, and Crested Tit.**

3.2cm hole designed to attract: **Tree Sparrow, Great Tit, Crested Tit, Nuthatch, Pied Flycatcher, Redstarts.**

Open front designed to attract: **Wagtails, Robins, Flycatchers, and Blackbirds, etc.**

*Size:*29.5cm Height x 13cm Width x 13.5cm depth ; Varying hole sizes

Specifications: Exterior quality resin bonded ply, corner drainage holes in floor, manufactured with surface sunk nails to resist rusting, coated with a non-toxic water repellant finish.

The box fully conforms with all RSPB specifications.

A Wetland Area (1,250 m^3) It is intended that the inclusion of a Wetland Area will expand the biodiversity on the site to include other more varied habitats for wildlife, including ducks, fish, frogs, newts. Keeping this area sufficiently supplied with water, besides precipitation will be the overflows from 49 rainwater harvesting vessels. Margin planting including maces, sedge and flag irises will add to the rick bio-diverse flora and fauna proposed.

POLICY EN3: *Renewable Energy*

These high energy conservation performing houses and business units could reduce their annual energy deman by up to 80%. Therefore, the energy contribution made by the renewable energy appliances (PV's, solar wate heating, VAWT) is a significant proportion of each buildings overall energy demand.

Photovoltaics

A range of different types of photovoltaic (PV's) applications using Thin Film (amorphous silicone) an Monocrystaline technologies are to be installed on the dwellings and business units, providing recoverabl performance data for research purposes in terms of comparative outputs for the same location. It is believed tha this large scale mixed application of PV's will be the largest development of its type in the country, potentiall generating up to 56,860kW hrs (0.12MWhrs/yr) of electricity each year. The cash value of the displace electricity from the Grid as at 2010 tariffs (16p per unit) is **£9,098.** each year.

CARBON DIOXIDE MITIGATED FROM PHOTOVOLTAICS IS 24,450kG CO_2 each yea (24.5Tonnes/yr)

Solar Water Heating

Flat plate solar water heating collectors (approximately 5 m^2) are to be installed to the south elevation of eac house and business unit. These panels will reduce domestic hot water heating costs and a concomitant deman for electricity from the National Grid. It is estimated that the total displaced electricity from solar water heatin at the LS SSE will be in the region of 141,600kWhrs each year (0.14 MWhrs/yr). The value of this electricity a at 2008 tarrifs (12p per unit) is **£16,992.** each year.

CARBON DIOXIDE MITIGATED FROM SOLAR WATER HEATING 60,888kg CO_2 EACH YEAR (61 Tonnes/yr)

Vertical Axis Wind Turbines (VAWT) *[APPENDIX ITEM 14]*

Six communal 6kW vertical axis 6 kW wind turbines (VAWT) located along the two Avenues within the sit could generate upto 54,000kWhrs/yr. The electricity generated from the VAWT's is planned for use by th Management Company(MC) for communal lighting and other power requirements. Surplus electricity (most o that generated) will be used by the MC to fund the site maintenance.
The value of the VAWT generated electricity as at 2010 'Feed-in' Tarrifs of 39p/unit is **£21,060.00**

CARBON DIOXIDE MITIGATED FROM VAWT 23,220kG CO_2 each year (23 Tonnes/yr)

Total Renewable Energy Contribution

The renewable energy contribution at the LS SSE has the potential to significantly reduce its residents and users reliance on Grid generated electricity by 252,460kWhrs each year (0.25MWhrs/yr). The value of the displaced electricity as at 2008 tariffs is £39,583. each year

TOTAL CARBON DIOXIDE MITIGATED FROM RENEWABLE ENERGY 108,558kG CO each year (109 Tonnes/yr)

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Long Sutton Sustainable Settlement Extension (LS SSE) - Houses Resources Quantified						
Plots	Floor Area (m²)	Rainwater Harvesting (litres/yr)	PV Generated Electricity (kWhrs/yr)	Solar Water Heating Displaced (kWhrs/yr)	Total Renewable Energy Contribution	CO2 Displacement ($kgCO_2$/yr)
1	68.4	15000	202.75	2400	2602.75	1119.18
2	61.8	7500	402.05	2400	2802.05	1204.88
3	61.8	7500	402.05	2400	2802.05	1204.88
4	86	10600	851.4	2400	3251.4	1398.10
5	86	10200	576.2	2400	2976.2	1279.77
6	86	10200	576.2	2400	2976.2	1279.77
7	61.8	7500	636.4	2400	3036.4	1305.65
8	61.8	7500	636.4	2400	3036.4	1305.65
9	61.8	7500	636.4	2400	3036.4	1305.65
10	61.8	7500	636.4	2400	3036.4	1305.65
11	61.8	7500	636.4	2400	3036.4	1305.65
12	86	10600	851.4	2400	3251.4	1398.10
13	86	10200	576.2	2400	2976.2	1279.77
14	86	10200	576.2	2400	2976.2	1279.77
15	61.8	7500	402.05	2400	2802.05	1204.88
16	61.8	7500	402.05	2400	2802.05	1204.88
17	61.8	7500	402.05	2400	2802.05	1204.88
18	61.8	7500	402.05	2400	2802.05	1204.88
19	61.8	7500	402.05	2400	2802.05	1204.88
20	86	10600	851.4	2400	3251.4	1398.10
21	86	10200	576.2	2400	2976.2	1279.77
22	86	10200	576.2	2400	2976.2	1279.77
23	119.2	15000	1380.3	2400	3780.3	1625.53
24	108.8	13400	733.15	2400	3133.15	1347.25
25	86	10600	851.4	2400	3251.4	1398.10
26	86	10600	851.4	2400	3251.4	1398.10
27	108.8	13400	1274.95	2400	3674.95	1580.23
28	86	10200	576.2	2400	2976.2	1279.77
29	86	10200	576.2	2400	2976.2	1279.77
30	86	10600	851.4	2400	3251.4	1398.10
32	86	10600	851.4	2400	3251.4	1398.10
33	86	10600	851.4	2400	3251.4	1398.10
34	86	10200	576.2	2400	2976.2	1279.77
35	86	10200	576.2	2400	2976.2	1279.77
36	119.2	15000	720.25	2400	3120.25	1341.71
37	108.8	13400	733.15	2400	3133.15	1347.25
38	61.8	7500	402.25	2400	2802.25	1204.97
39	61.8	7500	402.25	2400	2802.25	1204.97
40	61.8	7500	402.25	2400	2802.25	1204.97
41	86	10600	851.4	2400	3251.4	1398.10
42	108.8	13400	733.15	2400	3133.15	1347.25
43	108.8	13400	1274.95	2400	3674.95	1580.23
44	86	10200	576.2	2400	2976.2	1279.77
45	86	10200	576.2	2400	2976.2	1279.77
46	86	10200	576.2	2400	2976.2	1279.77
47	86	10200	576.2	2400	2976.2	1279.77
48	119.2	15000	1380.3	2400	3780.3	1625.53
49	61.8	7500	402.25	2400	2802.25	1204.97
49A	61.8	7500	402.25	2400	2802.25	1204.97
50	86	10600	851.4	2400	3251.4	1398.10
Totals	**4084.6**	**503300**	**33021.35**	**120000**	**153021.35**	**65799.1805**

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SEARCH ARCHITECTS

Long Sutton Sustainable Extension (LS SSE) - Employment Zone
Resources Quantified

Plots	Floor Area (m^2)	Rainwater Harvesting (litres/yr)	PV Generated Electricity (kWhrs/yr)	Solar Water Heating Displaced (kWhrs/yr)	Total Renewable Energy Contribution	CO_2 Displacement ($kgCO_2$/yr)
51	179.1	35000	3354.4	2400	5754.4	2474.39
52	179.1	35000	3354.4	2400	5754.4	2474.39
53	97.8	19000	1766.75	2400	4166.75	1791.70
54	97.8	19000	1766.75	2400	4166.75	1791.70
55	97.8	19000	1766.75	2400	4166.75	1791.70
56	97.8	19000	1766.75	2400	4166.75	1791.70
57	179.1	35000	3354.4	2400	5754.4	2474.39
58	179.1	35000	3354.4	2400	5754.4	2474.39
59	179.1	35000	3354.4	2400	5754.4	2474.39
Totals	**1286.7**	**251000**	**23839**	**21600**	**45439**	**19538.77**

Vertical Axis Wind Turbines -

Six No. 6kW Vertical Axis Wind Turbines, estimated electricity generation each year is 54,000 kWhrs, displacing 23,220 kg CO_2 each year (23 Tonnes/yr)

Total Combined Renewable Energy generated at LS SSE is 252,460 kWhrs/yr (0.25MWhrs/yr)

Total Carbon Dioxide Mitgated is 108,558 kg CO_2 each year (108 tonnes/yr)

Contact: Dr Jeremy Harrall
SEArch
89 Gedney Road, Long Sutton, SPALDING, Lincs PE12 9JU
Tel. 01406 364646 molearch@searcharchitects.co.uk

SEARCH ARCHITECTS

Research

The LS SSE offers the opportunity for comparisons between the performance of a variety of building techniques as applied to low-energy housing designed to alleviate fuel poverty and mitigate Carbon Dioxide emissions. Empirical evidence of this nature is not currently available to the UK market. Therefore by monitoring building performance and resident feedback, SEArch and the SSE's incumbent developer would be able to provide valuable data for the construction industry and general public at large.

Contact: Dr Jeremy Harrall
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Appendix:-

Appendix Item 1 – Letter from South Holland District Council Building Control Manager
Phil Adams, 4th December 2008

Appendix Item 2 – SAP Calculations
Michael Charlton, Principal Building Control Surveyor, South Holland District Council, 4th December 2008, Ref. B11, Plot 5, Winter Solstice

Appendix Item 3 - Flood Risk Assessment
Geoff Beel Consultancy, 1st December 2008, Ref. GCB/Search

Appendix Item 4 – Letter from Lincolnshire County Council's Principal Highways Officer
John Sharpe, 28th November 2008, Ref. D/JPS/PLAN11/vw

Appendix Item 5 – Landscape Schedule
Bettaland Products Limited, November 2008

Appendix Item 6 – Letter from South Holland District Council Economic Development Manager
Bruce Wakeling, Economic Development Manager, 4th December 2008

Appendix Item 7 – Email from Lincolnshire Bat Group
Annette Faulkner, 4th December 2008

Appendix Item 8 – Sequential Site Selection Report
Robert Doughty Consultancy Limited, November 2009, 920-1/SSR/LMS/fv

Appendix Item 9 – Letter from Assistant Development Manager, Cross Key's Homes
Robert Reed 10th December 2009

Appendix Item 10 – 33KV Overhead Electricity Cable
Response to paragraph 6 of C Crew letter dated 2nd February 2009, Planning Application No. H11/1253/08

Appendix Item 11 – PEDALS
Response to paragraph 7 of C Crew letter dated 2nd February 2009 Planning Application No. H11/1253/08

Appendix Item 12 – Anglian Water
Response to paragraph 8 of C Crew letter dated 2nd February 2009, Planning Application No. H11/1253/08 - Anglian Water Pre-development Report dated 20th February 2009, Ref. 0905/SP29(002)

Appendix Item 13 – Affordable Housing Provision
Response to paragraphs 9 and 10 of C Crew letter dated 2nd February 2009, Planning Application No. H11/1253/08

Appendix Item 14 – Vertical Axis Wind Turbine
Response to paragraph 11 of C Crew letter dated 2nd February 2009, Planning Application No. H11/1253/08 – AEL Video, Audio/Sound Level Test Skyrota Wind Turbine, dated 3rd September 2008 REF. 02077

Appendix Item 15 – Domestic Waste and Recycling Collection
Response to paragraph 12 of C Crew letter dated 2nd February 2009, Planning Application No. H11/1253/08.

Appendix Item 16 – Protected Species Report
Response to paragraph 13 of C Crew letter dated 2nd February 2009, Planning Application No. H11/1253/08 – Lapwings Consultants, Ecological Survey, dated March 2009, Ref. 09/02/156.

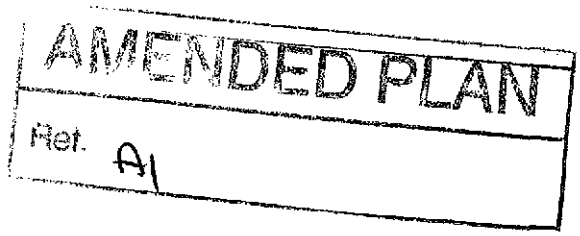
Appendix Item 17 – Public Open Space
Response to paragraph 14 of C Crew letter dated 2nd February 2009 Planning Application No. H11/1253/08.

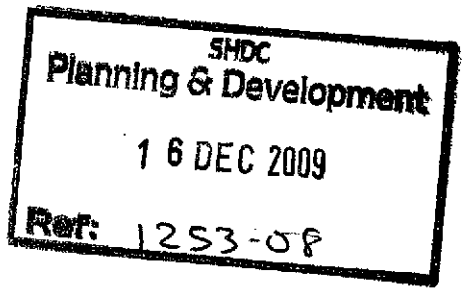
Appendix Item 18 – CABE
Response to CABE's letter of 17th February 2009 to C Crew.

Contact: Dr Jeremy Harrall
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Appendix Item 1 –

Letter from South Holland District Council Building Control Manager
Phil Adams, 4th December 2008





Contact: Dr Jeremy Harrall
SEArch
89 Gedney Road, Long Sutton, SPALDING, Lincs PE12 9JU
Tel. 01406 364646 molearch@searcharchitects.co.uk

SOUTH HOLLAND DISTRICT COUNCIL

Dr J Harrall
89 Gedney Road,
Long Sutton,
Spalding,
Lincolnshire,
PE12 9JU

P. Adams
4th December 2008.

Dear Jerry.
Re: THE LONG SUTTON SUSTAINABLE SETTLEMENT EXTENSION (SSE).

In response to your request for support and technical observation, for the above scheme and in particular to the building control and energy assessment process.

However I wish to start by pointing out that the building control team at South Holland has work in conjunction with you and your team at Search, in how these types of developments can be developed to maximise the potential for buildings of high environmental value. This has been invaluable to all the BC team in developing *our greater awareness of our energy requirements and future technical knowledge* that can be passed on to future projects.
It should be noted that the development and research that has been exercised has been built over a considerable time span and is well in excess of the level of the current building regulations requirements.

In response to the proposal for the above project, this is the first that has been proposed on this large scale any where in the country, there are a number of smaller schemes but this is well in excess of those.
These building are of an exceptional nature in style and should be seen for what they can achieve.

The high level of performance of the building in terms of light, natural ventilation and the need for no reliance on fossil fuel requirements by the use of zero heating status shows that the governments Code for sustainable homes level 6 is well achievable. Where currently there are only a hand full to date that reach this level,
This shows how an exciting venture this is taking account of the number of units proposed.
We have been able to demonstrate by the energy assessments that have been carried out by the BC unit that has shown that very high standards of construction can achieve substantial results in terms of energy performance and this can be shown through proven energy assessment results.
This is why this particular scheme will set this project apart from conventional housing development that is constructed not only in this district but country wide, this will give an example that sustainable homes and commercial premises can be achieved without compromise on usability and provide the end user and the environment with a project that is sound in terms of its environmental impact.

LABC

SOUTH HOLLAND DISTRICT COUNCIL

I wish to support this proposal for its leading edge development and its achievement at reducing the reliance on fossil fuels.

Yours faithfully

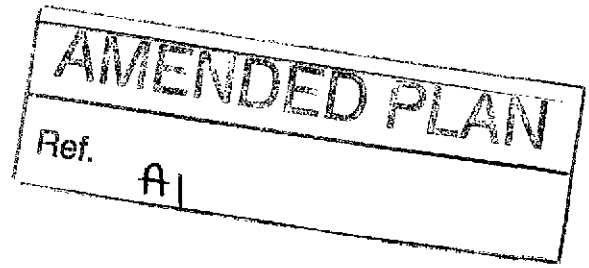
Phil Adams
Building Control manager
South Holland District Council

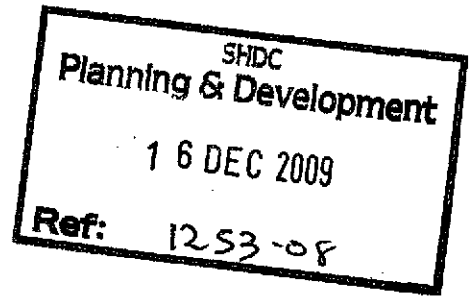
LABC

Appendix Item 2 –

SAP Calculations

Michael Charlton, Principal Building Control Surveyor, South Holland District Council, 4th December 2008, Ref. B11, Plot 5, Winter Solstice





Contact: Dr Jeremy Harrall
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Tel. 01406 364646 molearch@searcharchitects.co.uk

Users Ref: b11 plot 5 winter solisice

Issued on: 4.December.2008

Prop Type Ref: Winter solistice east

Property: Plot 5, Bridge Road, Long Sutton, Spalding, Lincolnshire

TER: 22.25

DER: -17.07

SAP Rating: 107 A **SAP Energy Cost:** £43 **CO2 Emissions:** -1.58 t/year

EI Rating: 116 A **Energy used:** -18 kWh/m2/year **Enel:** 0 **ZC:** 0.00

Surveyor: 1056-0016, Michael Charlton, Tel: 01775 764616, Fax: 01775 762937

Address: Priory Road, Spalding, LIncolnshire, PE11 2XE

Client: 3, Sutainabl Ecological Architecture, 89 Gedney Road, Long Sutton, Spalding, Lincolnshire, PE12 9JU

Software Version: EES SAP 2005.015.build.0019, April 2008 (Design System), BRE SAP Worksheet 9.81

Regs Type: SAP 2005, Regs Region: England and Wales (Part L1A 2006), Construction Type: New Build

CHECKLIST FOR DWELLING AS DESIGNED

Site reference		**Plot reference**		
Builder		**Contact**		**Tel:**
Builder Control body		**Contact**		**Tel:**
SAP assessment by	Michael Charlton	**Contact**	Priory Road	**Tel:** 01775 764616
Evidence of competency:	Elmhurst Energy Systems Accredited Assessor. ID 1056-0016			

No.	Check	Evidence	Produced by	Design OK
1	**Criterion 1: Predicted carbon dioxide emission from proposed dwelling does not exceed the target.**			
1.1	**TER** (kg $CO_2/m^2.a$)	*Main fuel - Renewable energy* *Fuel factor = 1.00* *TER = 22.25*	Authorised SAP Assessor	N/A
1.2	**DER** for dwelling as designed (kg $CO_2/m^2.a$)	*DER = -17.07*	Authorised SAP Assessor	N/A
1.3	Are emissions from dwelling as designed less than or equal to the target?	*DER -17.07 < TER 22.25*	Authorised SAP Assessor	OK
2	**Criterion 2: The performance of the building fabric and the heating, hot water and fixed lighting systems should be no worse than the design limits.**			
2.1	**Fabric U-values** Are all U-values better than the design limits in Table 2?	Element / Average / Highest *Wall 0.10 (0.35) 0.10 (0.70) OK* *Roof 0.09 (0.25) 0.09 (0.35) OK* *Floor 0.08 (0.25) 0.08 (0.70) OK* *Openings 1.86 (2.20) 2.40 (3.30) OK*	Authorised SAP Assessor	OK
	Common areas in buildings with multiple dwellings (where relevant)			
2.2	If the common areas are un-heated, are all U-values better than the limits in Table 2? (If heated, use L-2A)	Schedule of U-values	Builder's submission	N/A
	Heating and hot water systems			
2.3	Does the efficiency of the heating systems meet the minimum value set out in the Domestic Heating Compliance Guide?	Main heating system: *Wood closed room heat, HETAS approved* *Efficiency - Table 4b: 65.0%* *Minimum permitted: 65.0% - OK* Secondary heating: None	Authorised SAP Assessor	OK
2.4	Does the insulation of the hot water cylinder meet the standards set out in the Domestic Heating Compliance Guide?	Cylinder: *No cylinder* Solar Cylinder: *Dedicated solar store volume: 300 litres (separate store) (required: 53 l) - OK*	Authorised SAP Assessor	OK

Users Ref: b11 plot 5 winter solisice

Issued on: 4.December.2008

Prop Type Ref: Winter solistice east

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TER: 22.25
DER: -17.07

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EI Rating: 116 A **Energy used:** -18 kWh/m2/year **Enel:** 0 **ZC:** 0.00

Surveyor: 1056-0016, Michael Charlton, Tel: 01775 764616, Fax: 01775 762937
Address: Priory Road, Spalding, LIncolnshire, PE11 2XE
Client: 3, Sutainabl Ecological Architecture, 89 Gedney Road, Long Sutton, Spalding, Lincolnshire, PE12 9JU
Software Version: EES SAP 2005.015.build.0019, April 2008 (Design System), BRE SAP Worksheet 9.81
Regs Type: SAP 2005, Regs Region: England and Wales (Part L1A 2006), Construction Type: New Build

CHECKLIST FOR DWELLING AS DESIGNED

No.	Check	Evidence	Produced by	Design OK
2.5	Do controls meet the minimum controls provision set out in the Domestic Heating Compliance Guide?	Space heating control: *Appliance thermostats - OK* Hot water control:	Authorised SAP Assessor	OK
2.6	Does the heating and hot water system meet the other minimum provisions in the Domestic Heating Compliance Guide?	Schedule of compliance provisions	Builder's submission	
	Fixed internal and external lighting			
2.7	Does fixed internal lighting comply with paragraphs 42 and 44?	Schedule of installed fixed internal lighting *Light fittings: 11, L.E.L. fittings: 4 = 36.00% > 25% - OK* *L.E.L. fittings required per 25m2 or part of TFA: 4 = 4 - OK*	Builder's submission (see schedule below)	OK
2.8	Does the external lighting comply with paragraph 45?	Schedule of installed external lighting *External lights: Yes, controlled: Yes*	Builder's submission (see schedule below)	OK
3	**Criterion 3: The dwelling has appropriate passive control measures to limit solar gains.**			
3.1	Does the dwelling have a strong tendency to high summertime temperatures?	*Region: East Pennines (15.5)* *Thermal mass parameter = 19.0* *Ventilation rate in hot weather = 8.0* *Overheating risk (Orientation 'N') = Not significant - OK*	Authorised SAP Assessor	OK
4	**Criterion 4: The performance of the dwelling, as built, is consistent with the DER.**			
4.1	Have the key features of the design been included (or bettered) in practice?	*Wall U-value 0.10 < 0.28* *Roof U-value 0.09 < 0.15* *Floor U-value 0.08 < 0.20* *Main Heating Fuel: W Wood logs* *Solar panel* *Photovoltaic Array*	Authorised SAP Assessor	N/A
	Fabric construction			
4.2	Have accredited details been adopted?	Schedule of details used and their reference codes.	Builder's submission	
4.3	Have non-accredited details been used?	Evidence that details conform to standards set out in IP/06.	Builder's submission	
4.4	Has satisfactory documentary evidence of site inspection checks been produced?	Completed pro-formas showing checklists have been completed.	Builder's submission	N/A
4.5	**Design air permeability** ($m^3/(h.m^2)$ at 50Pa)	*Design air permeability = 15.0*	Authorised SAP Assessor	OK

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Users Ref: b11 plot 5 winter solisice

Issued on: 4.December.2008

Prop Type Ref: Winter solistice east

Property: Plot 5, Bridge Road, Long Sutton, Spalding, Lincolnshire

TER: 22.25

DER: -17.07

SAP Rating: 107 A **SAP Energy Cost:** £43 **CO2 Emissions:** -1.58 t/year

EI Rating: 116 A **Energy used:** -18 kWh/m2/year **Enel:** 0 **ZC:** 0.00

Surveyor: 1056-0016, Michael Charlton, Tel: 01775 764616, Fax: 01775 762937

Address: Priory Road, Spalding, LIncolnshire, PE11 2XE

Client: 3, Sutainabl Ecological Architecture, 89 Gedney Road, Long Sutton, Spalding, Lincolnshire, PE12 9JU

Software Version: EES SAP 2005.015.build.0019, April 2008 (Design System), BRE SAP Worksheet 9.81

Regs Type: SAP 2005, Regs Region: England and Wales (Part L1A 2006), Construction Type: New Build

CHECKLIST FOR DWELLING AS DESIGNED

No.	Check	Evidence	Produced by	Design OK
4.6	Has evidence been provided that demonstrates that the ***design air permeability*** has been achieved satisfactorily (see paragraph 56)	Sample pressure test results in comparison to design value.	Builder's submission (see schedule below)	N/A
	Commissioning heating and hot water systems			
4.7	Evidence that the heating and hot water systems have been commissioned satisfactorily	Commissioning completion certificate	Builder's submission (see schedule below)	N/A
5	**Criterion 5: The necessary provisions for energy efficient operation of the dwelling are put in place.**			
5.1	Has all the relevant information been provided?	O&M instructions *SAP = 107*	Builder's submission	N/A

Schedule of supporting competencies

No.	Organisation providing evidence	Telephone	Evidence of competency
2.7			
2.8			
4.6			
4.7			

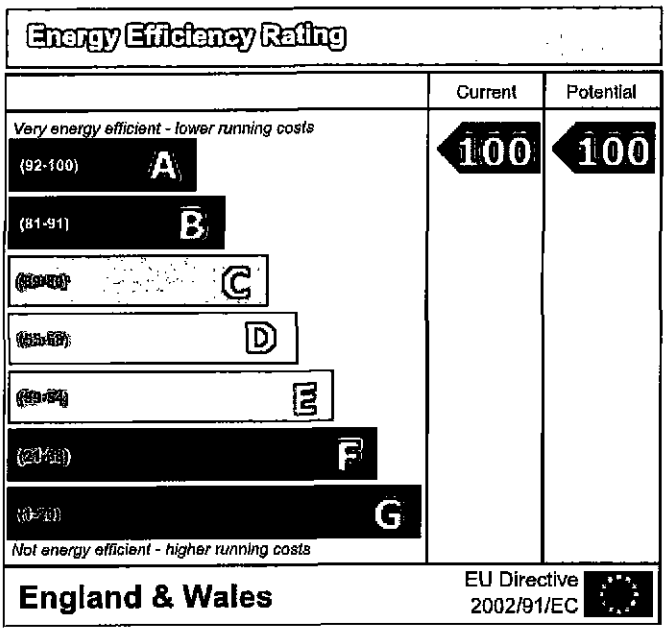
Predicted Energy Assessment

Plot 5, Bridge Road,
Long Sutton,
Spalding,
Lincolnshire

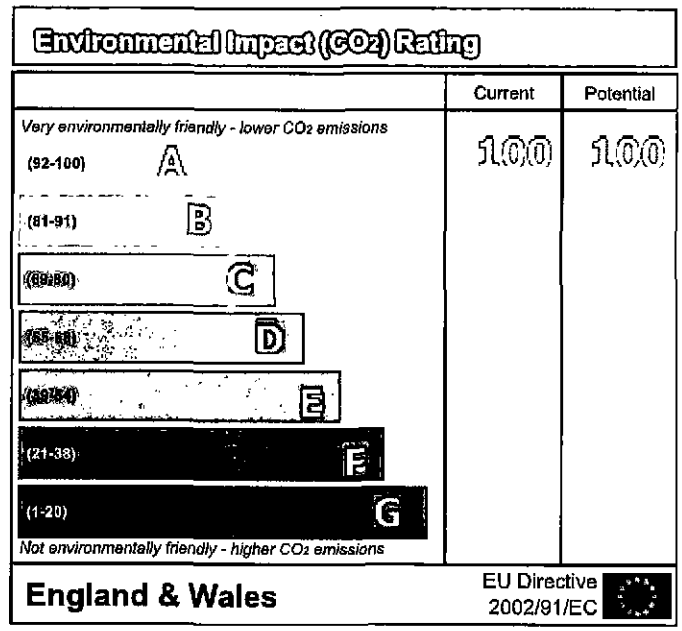
Dwelling type:	Semi-detached house
Date of assessment:	04 December 2008
Produced by:	South holland D. C
Total floor area:	84 mm ^{2}

This document is a Predicted Energy Assessment required to be included in a Home Information Pack for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, the Pack should be updated to include information about the energy performance of the completed property.

Energy performance has been assessed using the SAP 2005 methodology and is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO_2) emissions.



The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.



The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO_2) emissions. The higher the rating the less impact it has on the environment.

UVALUE CALCULATION

Users Ref: b11 plot 5 winter solisice

Issued on: 4.December.2008

Prop Type Ref: Winter solistice east

Property: Plot 5, Bridge Road, Long Sutton, Spalding, Lincolnshire

TER: 22.25

DER: -17.07

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EI Rating: 116 A **Energy used:** -18 kWh/m2/year **Enel:** 0 **ZC:** 0.00

Surveyor: 1056-0016, Michael Charlton, Tel: 01775 764616, Fax: 01775 762937

Address: Priory Road, Spalding, LIncolnshire, PE11 2XE

Client: 3, Sutainabl Ecological Architecture, 89 Gedney Road, Long Sutton, Spalding, Lincolnshire, PE12 9JU

Software Version: EES SAP 2005.015.build.0019, April 2008 (Design System), BRE SAP Worksheet 9.81

Regs Type: SAP 2005, Regs Region: England and Wales (Part L1A 2006), Construction Type: New Build

Calculation method: BS EN ISO 6946, BS EN ISO 13370, BS 5250

Building Elements

Building Element Floor 1

Floor Type: Slab on ground

Area = 42.18 m², Perimeter = 18.80 m, Wall thickness = 500 mm, Soil: Unknown

Horizontal edge insulation: none

Vertical edge insulation: none

Layer	Description	Thickness	λ	R	Fraction
External surface				0.040	
Layer1	**Concrete, medium density**				
	Main construction	250 mm	1.350	0.185	100.00 %
Layer2	**Floormate 200-X**				
	Main construction	100 mm	0.029	3.448	100.00 %
	Corrections - Air Gap: Level 0, Fasteners: None or plastic				
Layer3	**Floormate 200-X**				
	Main construction	100 mm	0.029	3.448	100.00 %
	Corrections - Air Gap: Level 0, Fasteners: None or plastic				
Layer4	**Floormate 200-X**				
	Main construction	100 mm	0.029	3.448	100.00 %
	Corrections - Air Gap: Level 0, Fasteners: None or plastic				
Internal surface				0.170	

Total resistance: Upper limit = 10.530 m²K/W Lower limit = 10.530 m²K/W Average = 10.530 m²K/W

U-value (unrounded) = 0.0000 W/m²K

Slab on Ground floor corrections:

Horizontal delta Psi = -0.0001 Vertical delta Psi = -0.0002 B' = 4.4872 Delta U = -0.00013

Total thickness: 550 mm **U-value: 0.08 W/m²K**

UVALUE CALCULATION

Users Ref: b11 plot 5 winter solisice

Issued on: 4.December.2008

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Software Version: EES SAP 2005.015.build.0019, April 2008 (Design System), BRE SAP Worksheet 9.81

Regs Type: SAP 2005, Regs Region: England and Wales (Part L1A 2006), Construction Type: New Build

Calculation method: BS EN ISO 6946, BS EN ISO 13370, BS 5250

Building Elements

Building Element Wall Main

Layer	Description	Thickness	λ	R	Fraction
External surface				0.040	
Layer1	**Enviroblocks**				
	Main construction	200 mm	1.631	0.123	100.00 %
Layer2	**Syrofoam**				
	Main construction	300 mm	0.031	9.677	100.00 %
	Corrections - Air Gap: Level 0, Fasteners: None or plastic				
Layer3	**Standard cavity**				
	Main construction	50 mm	0.278	0.180	91.67 %
	Corrections - Cavity Unventilated, Emissivity: Normal				
	Bridging - Timber	50 mm	0.130	0.000	8.33 %
Layer4	**Lime Render**				
	Main construction	30 mm	1.130	0.027	100.00 %
Internal surface				0.130	

Total resistance: Upper limit = 10.193 m²K/W Lower limit = 10.185 m²K/W Average = 10.189 m²K/W

U-value (unrounded) = 0.0981 W/m²K

Unheated space: None

Total thickness: 580 mm **U-value: 0.10 W/m²K**

Appendix Item 3 - Flood Risk Assessment

Geoff Beel Consultancy, 1st December 2008, Ref. GCB/Search

AMENDED PLAN
Ref. A1

SHDC
Planning & Development
16 DEC 2009
Ref: 1253-08

Contact: Dr Jeremy Harrall
SEArch
89 Gedney Road, Long Sutton, SPALDING, Lincs PE12 9JU
Tel. 01406 364646 molearch@searcharchitects.co.uk

FLOOD RISK ASSESSMENT FOR PROPOSED RESIDENTIAL AND COMMERICIAL *DEVELOPMENT AT BRIDGE ROAD,* LONG SUTTON, LINCS

FINAL REPORT

GEOFF BEEL CONSULTANCY

DECEMBER 2008

GCB/SEARCH

DISCLAIMER

This document has been prepared solely as a Flood Risk Assessment in support of a planning application for proposed Residential and Commercial Development at Bridge Road, Long Sutton, Lincolnshire. "Geoff Beel Consultancy" accepts no responsibility or liability whatsoever for any use made of this document other than by the client, "Mr H Myers", for the purposes it was originally commissioned and prepared. All comments and opinions made are based upon information available to "Geoff Beel Consultancy" during the necessary investigate process, and the conclusions and recommendations could therefore, differ in the event of material subsequently being found erroneous, incomplete or misleading. "Geoff Beel Consultancy" therefore, accepts no liability should this prove to be the case.

CONTENTS

1.0 INTRODUCTION

2.0 LOCATION

3.0 THE SITE AND SEQUENTIAL TEST

4.0 EXISTING FLOOD ALLEVIATION MEASURES

5.0 POTENTIAL SOURCE OF FLOODING

6.0 EXTENT OF KNOWN FLOODING

7.0 PROBABILITIES AND TRENDS OF FLOODING

8.0 IMPACTS OF FLOODING

9.0 RESIDUAL RISKS – EXTREME EVENTS

10.0 CONCLUSIONS AND RECOMMENDATIONS

Fig 1 - Location Plan – 1:2500
Search Architects Ltd

Fig 2 - Site Survey – 1:500
Search Architects Ltd

Fig 3 - Site Layout – 1:500 Search Architects Ltd

Fig 4 - Strategic Flood Risk Assessment Map
for South Holland District Council

Fig 5 - Location of site in South Holland Internal Drainage
Board district

1.0 INTRODUCTION

1.1 A full planning application is to be submitted by Search Architects Ltd for a proposed residential and commercial development at Bridge Road, Long Sutton, Lincs.

1.2 A Flood Risk Assessment is required to accompany the planning application and meet the requirements of Planning Policy Statement 25 (PPS25) - Development & Flood Risk and for approval by the Environment Agency.

The site, as situated, is located within Flood Zone 3, of the Environment Agency's Flood Zone Maps. The latest Agency Flood Maps have been created as a tool to raise awareness of flood risk with the public and our partner organisations, such as Local Authorities, Emergency Services and Drainage Authorities. The Maps do not take into account any flood defences.

The site is also shown in fluvial Flood Zone 1 of the South Holland District Council's Strategic Flood Risk Assessment Maps.

The site is also located in the South Holland IDB drainage district.

1.3 Geoff Beel Consultancy was appointed on 3rd November 2008 to undertake a Flood Risk Assessment.

A previous Flood Risk Assessment was prepared in April 2008 for an adjoining development under planning application ref. no. H11/0585/08 which received approval from the Environment Agency on 13th May 2008 under file ref. no. AN/2008/105092.

2.0 LOCATION

2.1 The development site is located north of Bridge Road and the Bridge Road Industrial Estate which is on the south side of the road. The National Grid Reference of the central point of the development is TF 44252255.

2.2 The position and extent of the site is shown on Fig 1 – Location Plan at the end of the document.

2.3 The site, located within the South Holland Internal Drainage Board district is shown within Flood Zone 3 as detailed on the Environment Agency Flood Zone Maps and in fluvial Flood Zone 1 of the Council's Strategic Flood Risk Assessment Map as defended by the Internal Drainage Board system.

3.0 THE SITE AND SEQUENTIAL TEST

3.1 The site is currently redundant agricultural land, glasshouses and packing sheds.

3.2 The area of development is approximately 4.18 hectares.

3.3 The proposed site layout consists of 49 residential units with an office and 9 commercial units all accessed from Bridge Road, Long Sutton. A proposed impermeable area of some 0.38 hectare within the total site area of approximately 4.18 hectare whilst the existing impermeable area totals 0.95 hectare.

3.4 The Sequential Test and Exception Test will require to be applied by the Local Planning Authority but the development may be permitted as the site is protected against both the 1 in 200 year return period tidal event and the 1 in 100 year return period fluvial event and located in fluvial Flood Zone 1 of the Council's Strategic Flood Risk assessment Map

4.0 EXISTING FLOOD ALLEVIATION MEASURES

4.1 The site is within a defended floodplain, as defined in Appendix 1 of the Environment Agency's 'Policy for the Protection of Floodplains' and is considered to be passive until such time as a flood greater than that for which the defences were designed occurs. The likelihood of flooding due to overtopping or failure of a flood defence embankment is considered to be small.

The South Holland Internal Drainage Board is protected by a combination of the River Welland tidal defences downstream of Spalding, the River Welland fluvial embankments as well as the River Nene tidal defences downstream of Foul Anchor.

4.2 The site and the surrounding land drains by gravity to Board drains on the immediate south and east boundaries to the Lutton Leam Outfall and hence to the tidal River Nene downstream of the West Lighthouse.

4.3 The existing standard of drainage for the South Holland Internal Drainage Board is 1 in 50 years return period, compatible with the Department of the Environment, Food and Rural Affairs target level of service for rural drainage and flood defence works. Freeboard of 900mm is provided to the lowest land levels. The maximum design flood level of the nearby IDB main drain is 2.26m aOD.

4.4 A length of culverted riparian drain flowing south to north bisects the site and discharges existing surface water run-off.

4.5 Current maintenance standards within the South Holland Internal Drainage Board and of the Environment Agency defences are generally very good.

During the operation and maintenance of its pumping stations, associated structures and channel systems, particularly those that could affect property, the Board seeks to maintain a general standard capable of providing flood protection to its district. A routine maintenance programme is in place to ensure that the Boards assets are commensurate with the standard of protection that is sought. However, bank slips, blocked culverts etc may occur from time to time and these matters are usually dealt with promptly.

5.0 POTENTIAL SOURCES OF FLOODING

5.1 Three potential sources of flooding have been identified as a result of this assessment:

a) local blockages to IDB main drain system.
b) storm return period of 1 in 50 years being exceeded
c) overtopping and breaching of defences of the fluvial River Welland, tidal River Welland and tidal River Nene

5.2 The probability of flooding from source a) is low due to the maintenance standards already achieved and managed by the IDB.

The probability of flooding from b) is also low due to the South Holland IDB main drain design standard incorporating a minimum 900mm freeboard to the lowest land level which provides adequate storage in events greater than 1 in 50 years. Maximum design flood level of nearby IDB main drain is 2.26m as compared with existing land level of varying between 3.40m and 3.96m aOD.

Previous historic rainfall events of 1968 and 1978, estimated to be greater than 1 in 100 year events, caused no flooding to any residential properties at the time and the Boards policy is to provide a standard of drainage which satisfies PPS25 requirements of a 1 in 100 year return period for fluvial protection inclusive of the effects of climate change and developments to the arterial system enables a flexible approach to be adopted and meet the criteria for "sustainable urban drainage".

5.3 The flood embankments to the fluvial River Welland provide a 1 in 100 year return period level of protection in combination with the Crowland and Cowbit Washes. The flood embankments to the tidal River Welland and tidal River Nene provide a 1 in 200 year return period level of protection.

5.4 A sustainable drainage system is to be implemented within the developed site to accommodate the 1 in 100 year rainfall event inclusive of climate change. The South Holland IDB has been involved with pre-planning application discussions to ensure that no increase in surface water run-off is discharged to the IDB main drain system.

The sustainable system will consist of

- rainwater harvesting
- soakaways to BRE365 design requirements
- the existing culverted length of drain will be restored to an open drain for both environmental and drainage benefit
- an attenuation pond will be created at the northern limits of the development site
- a new collector drain excavated to discharge surface water run-off to the attenuation pond on the eastern boundary
- a wetland area with landscaped buffer zone
- allotments and open space either side of the attenuation pond
- permeable access roads

6.0 EXTENT OF KNOWN FLOODING

6.1 During the preparation of this assessment, no evidence was discovered of the site being flooded or of any adjoining properties.

7.0 PROBABILITIES AND TRENDS OF FLOODING

7.1 The probability of this development flooding from localised drainage systems is very low.

7.2 The probability of the site flooding with water from any South Holland IDB main drain is less than 1% because of the standards of the existing flood defence systems, storage within existing drainage channels and the location of the site.

7.3 The probability of the site flooding with fluvial waters from any main river system is less than 1% because of the standards of the existing flood defences and the location of the site.

7.4 If under very extreme events, levels of floodwater from the South Holland IDB main drains or arterial systems rose to such an extent that the site was affected, the situation would not be sudden. It is very probable that sufficient time would be available to take precautionary actions to limit the extent and potential impact of flooding.

7.5 The water levels in the drainage channels will tend to rise as a result of the impacts of climate change. However the existing systems and defences together with the proposed floor levels above existing ground level will be appropriate for the design life of the development (i.e. 100 years).

8.0 IMPACTS OF FLOODING

8.1 No significant impacts of flooding are anticipated.

8.2 Floor levels of the development will be at 4.09m aOD and above existing ground levels which together with the proposed sustainable drainage system will offer additional protection against impacts arising from any extreme short duration, localised events.

8.3 The general location of the site within the catchment is such that if flooding occurred from any of the South Holland IDB main drain systems, then probably 2 to 3 days warning time would be available.

8.4 No displacement of water from the site will affect any adjoining properties. It is intended to provide a sustainable drainage system such that surface water drainage will be attenuated before discharging to the adjoining IDB main drain system at no greater rate than the existing impermeable area run-off.

8.5 Safe and dry access/egress is available to the site from Bridge Road with carriageway level at 4.50m aOD.

9.0 RESIDUAL RISK – EXTREME EVENTS

9.1 The residual risk from extreme events is very low on this site, because of its location, within the South Holland IDB area and its location 4.50 kms from the River Nene tidal defences.

9.2 Although within either fluvial Flood Zone 1 or Flood Zone 3 according to PPS25 classification, the site actually has a very low risk of flooding due to the current standards of drainage and flood defence and land levels. The site is not located within a Functional Flood Plain of any 'main river' or 'main drain' as defined in PPS25. The Environment Agency Flood Zone Maps have been produced irrespective of existing flood defences and standards of protection.

9.3 South Holland District Council in conjunction with the Environment Agency and the local IDB's within the Council area have carried out a Strategic Flood Risk Assessment of the whole District by appointed Consulting Engineers.

The Strategic Flood Risk Assessment has produced more definitive Flood Risk Maps than those published by the Environment Agency and at the same time has analysed flood return periods of all tidal and fluvial defences for years 2002 and 2052 to account for the effects of climate change.

Breach scenarios of embankments failing and/or being overtopped have also been carried out to establish Flood Risk Zones.

9.4 As a result of the Strategic Flood Risk Assessment; the South Holland Main Drain and associated IDB main drains have been determined as providing protection against a 1 in 100 year return period event both in years 2002 and 2052.

9.5 The development site has been identified outside of any Flood Risk Zone from the South Holland Main Drain and associated IDB main drain or the River Welland or the River Nene.

10.0 CONCLUSIONS AND RECOMMENDATIONS

10.1 As a result of the assessment, the following conclusions have been reached:-

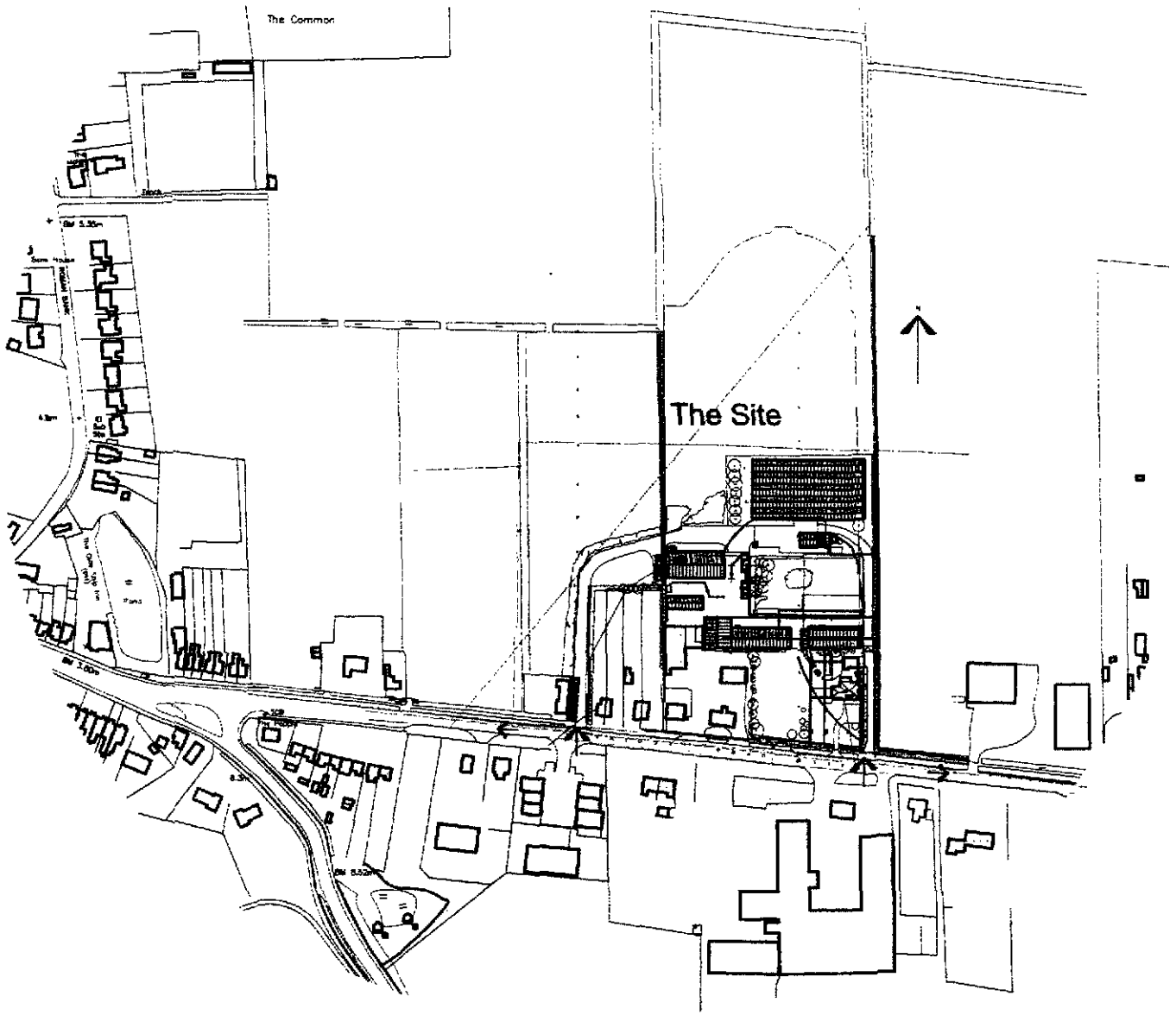
- The proposed development is not in a Functional Floodplain as defined by PPS25. It is located in the Passive Floodplain protected by defences to a 1 in 100 year return period, (1.0%)

- Although the site is in Flood Zone 3, the actual risk of site flooding from any Environment Agency river system is very low (less than 0.5%). The site has been identified in fluvial Flood Zone 1 of the South Holland District Council's Strategic Flood Risk Assessment Maps.

- Although the site is located within an Internal Drainage District with a minimum standard of drainage of 1 in 50 years, this accords with Defra guidelines for rural development. Freeboard to design water level of 900mm to lowest land level is available for events greater than 1 in 50 years providing further storage within the drainage channels.

- On site rainwater from the development will be discharged via a comprehensive sustainable surface water drainage system to attenuate run-off to meet the requirements of the IDB.

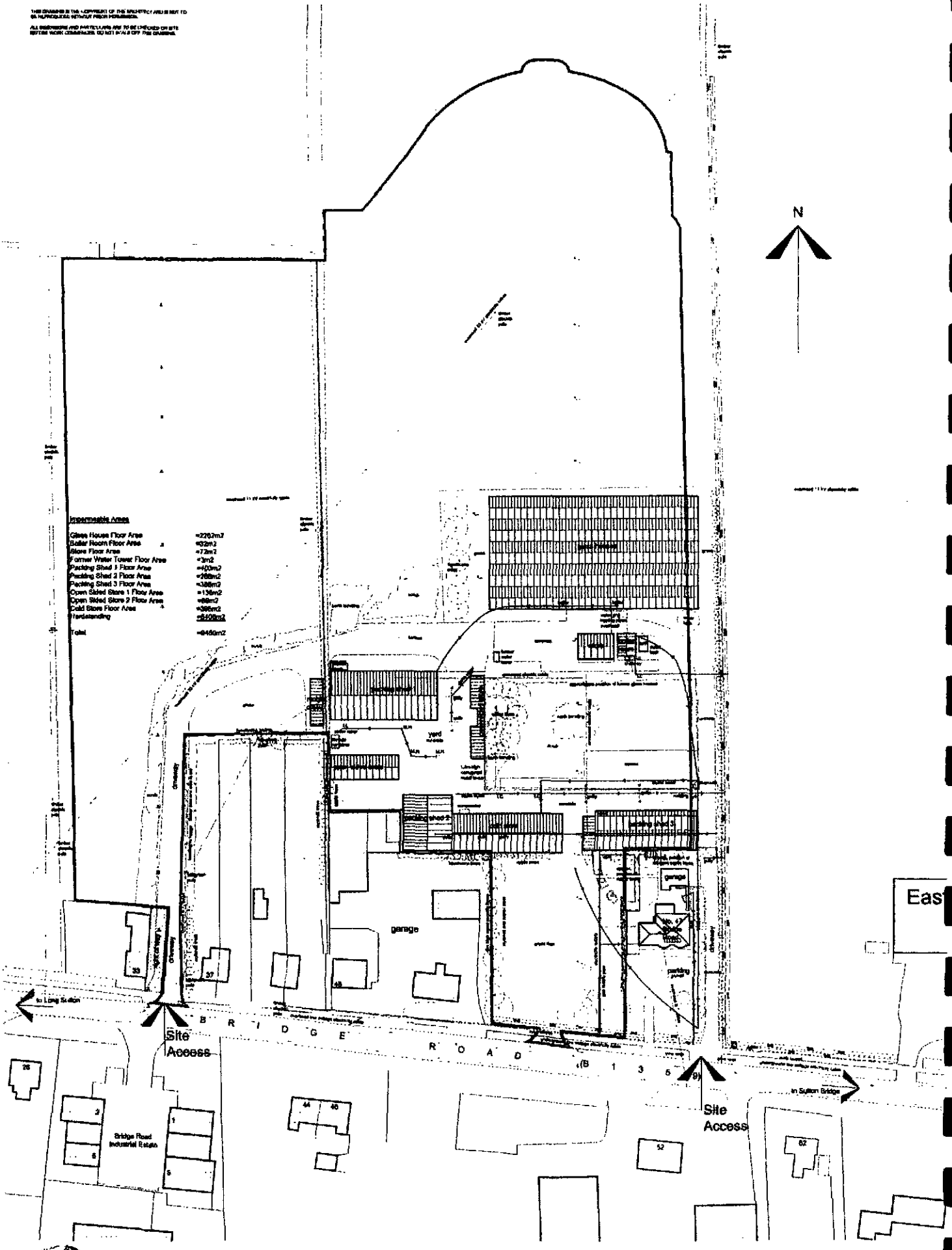
- Land Drainage Byelaw Consent will be required from the South Holland Internal Drainage Board for the proposed site entrance drain culverts and also the 6 metre easement to the drains on the development site western boundary.



LOCATION PLAN 1:2500 @ A3

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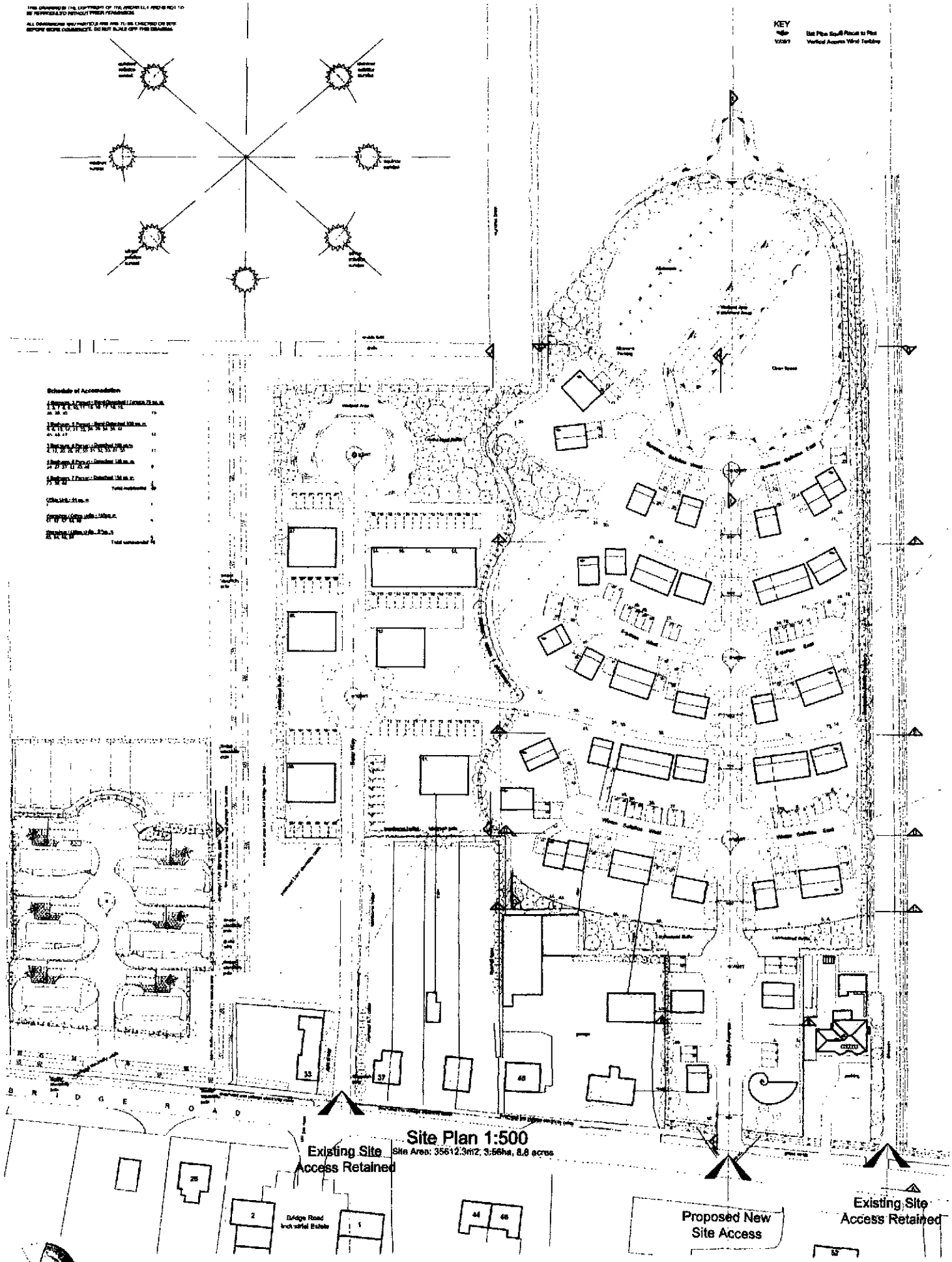


SEARCH ARCHITECTS

Sustainable Settlement Extension to Long Sutton

Land Adjacent No.47 Bridge Road, Long Sutton

Site Survey
1:500 @ A1

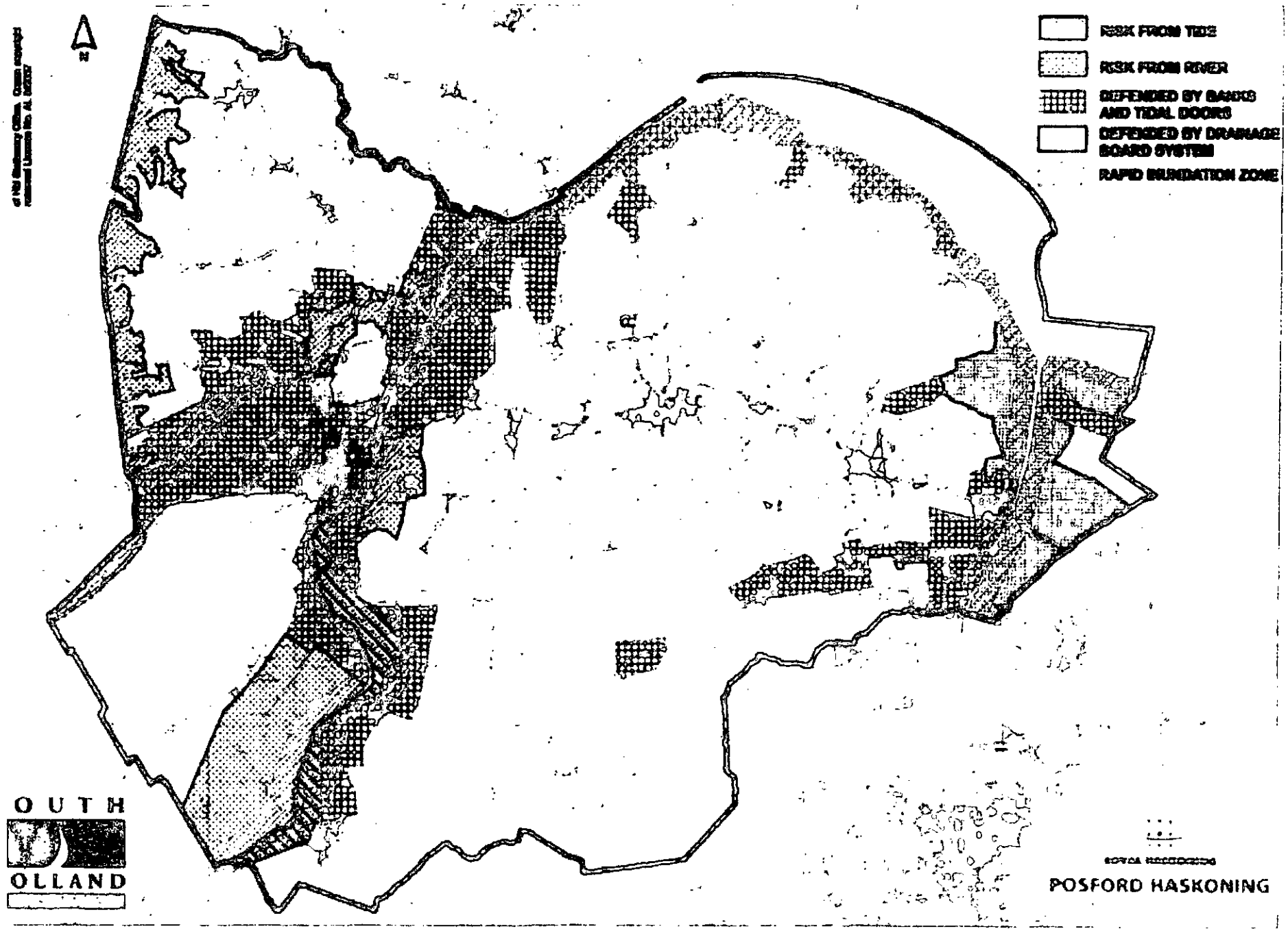


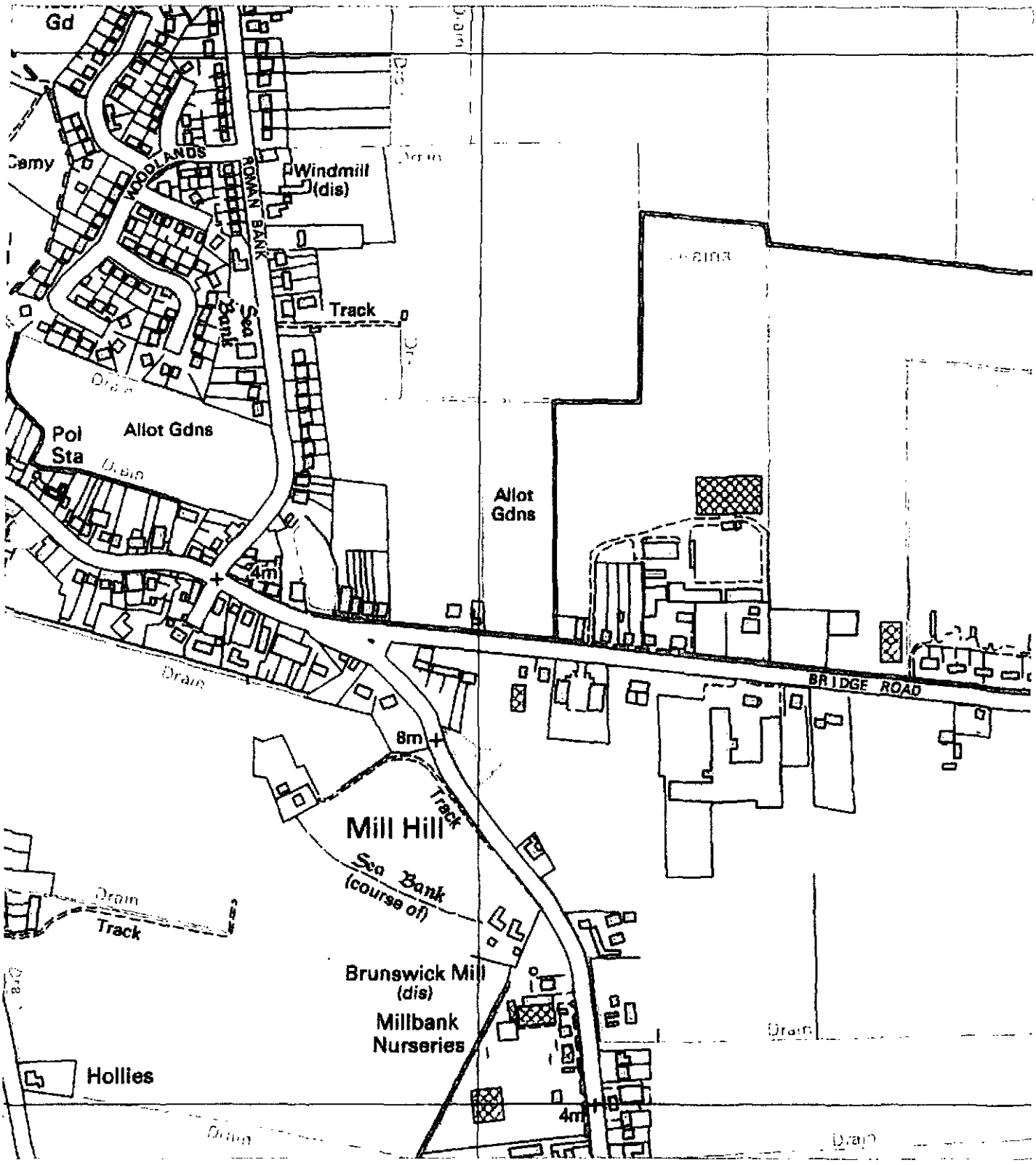
SEARCH ARCHITECTS

Sustainable Settlement Extension to Long Sutton

Land Adjacent No.47 Bridge Road, Long Sutton

Site Layout
1:500 @ A1


RISK FROM TIDE
RISK FROM RIVER
DEFENDED BY BANKS AND TIDAL DOORS
DEFENDED BY DRAINAGE BOARD SYSTEM
RAPID INUNDATION ZONE
OUTH
OLLAND
POSFORD HASKONING



SOUTH HOLLAND INTERNAL DRAINAGE BOARD

Oddfellows, Bridge Road, Long Sutton
Plan showing Board-maintained drains

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Board-maintained Open Drains

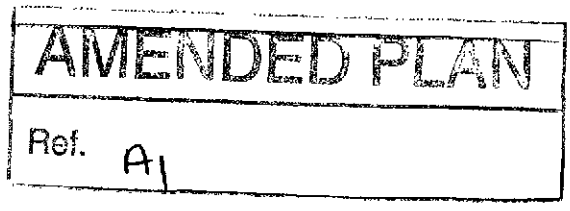
Board-maintained Piped Drains

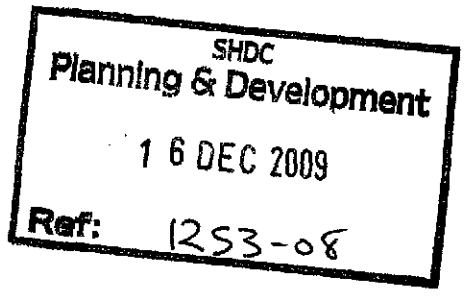
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Date: April 2008
Scale: 1:5000

Appendix Item 4 –

Letter from Lincolnshire County Council's Principal Highways Officer
John Sharpe, 28th November 2008, Ref. D/JPS/PLAN11/vw





Contact: Dr Jeremy Harrall
SEArch
89 Gedney Road, Long Sutton, SPALDING, Lincs PE12 9JU
Tel. 01406 364646 molearch@searcharchitects.co.uk

- The inclusion of a tear-like taper on the entry to the central islands of the circular junctions to both guide inbound vehicle movements around the islands and 'steer' outbound drivers towards the Bridge Road junction.

- The provision of small turning areas at the ends of the spur roads that will accommodate private cars and the use of short spur roads that will require only the minimum of reversing manoeuvres for any larger vehicles that may need to enter the development.

- The omission of footways (along the sides of the roadways) to promote the 'Living Street' ethos.

- The inclusion of linking footpaths/cyclepaths throughout the residential areas and between the residential, employment and amenity/recreational areas to reduce the need for car travel. I recall you are also considering the possibility of providing sheltered and secured parking at each of the residential and the employment units, which would further reinforce the message of Sustainable Development.

- The use of porous surfacing to the roadways to minimise the discharge of surface water run-off into the local watercourses.

Whilst some of these proposals may be considered a little too 'avant-garde' for adoptable highways under the system we currently operate, the opportunity to observe, without risk of un-necessary expenditure to the public purse, the way in which residents, workers and visitors live and operate in this closed environment is something which we would welcome.

I wish you luck with this bold and progressive endeavour and look forward to you sharing with us the positive and indeed any negative experiences.

Yours sincerely

for Director for Development

Appendix Item 5 – Landscape Schedule

Bettaland Products Limited, November 2008

AMENDED PLAN
Ref: A1

SHDC
Planning & Development
16 DEC 2009
Ref: 1353-08

Contact: Dr Jeremy Harrall
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SEARCH ARCHITECTS

Bettaland Products Ltd

Decoy Farm, Crowland
Peterborough
Tel 01733 211666
Fax 01733 211393

Planting plan for Land Adjacent to No. 47 Bridge Road, Long Sutton.
Nov-08

Supply and plant costs for planting within the bare root season of November 1st and the end of March, subject to weather conditions.

Phase 1 Planting within bare root season

	East road avenue (double sided)				**Total plants**
	12-14 trees - 4 m centres	450m		4m centre	90 trees
	Oak		bare root		18
	Alder		bare root		18
	Ash		bare root		18
	Prunus padus		bare root		18
	Sorbus auc Sheerwater		bare root		18
	Tree stake and tie				90
	Bags of Bettaland Compost				135
	Ornamental Cherry (var unkown)	20-25cm girth	rb		12
	Planted opposite the existing larger trees.				
	Hedging 450m - 5plants per m	**% Total**			**2250**
	Crataegus	30	bare root	40-60	675
	Corylus	15	bare root	40-60	337.5
	Acer campestre	10	bare root	40-60	225
	Ilex aquifolium	5	P9	30-40	112.5
	Viburnum opulus	5	bare root	40-60	112.5
	Quercus	10	bare root	40-60	225
	Rosa canina	5	bare root	40-60	112.5
	Prunus spinosa	20	bare root	40-60	450
	Canes and spirals	**100**			**2250**
	Bags of Bettaland Compost				225
	Curve perimeter North side allotments				
	Hedging 153m - 5 plants per linear metre				**765**
	Crataegus	30	bare root	40-60	230
	Corylus	15	bare root	40-60	115
	Acer campestre	10	bare root	40-60	77
	Ilex aquifolium	5	P9	30-40	38
	Viburnum opulus	5	bare root	40-60	38
	Quercus	10	bare root	40-60	77
	Rosa canina	5	bare root	40-60	38
	Prunus spinosa	20	bare root	40-60	153
	Canes and spirals				765
	Bags of Bettaland Compost				77
	12-14 trees - 4 m centres	**153**		**4m centre**	**31**
	Oak		bare root		7
	Alder		bare root		6
	Ash		bare root		6
	Prunus padus		bare root		6
	Sorbus auc Sheerwater		bare root		6

	Tree stake and tie				31	
	Bags of Bettaland Compost				15.5	
	Permiter of area above allotments					
	Hedging 288m - 5 plants per linear metre				1440 total	
	Crataegus	30	bare root	40-60	432	
	Corylus	15	bare root	40-60	216	
	Acer campestre	10	bare root	40-60	144	
	Ilex aquifolium	5	P9	30-40	72	
	Viburnum opulus	5	bare root	40-60	72	
	Quercus	10	bare root	40-60	144	
	Rosa canina	5	bare root	40-60	72	
	Prunus spinosa	20	bare root	40-60	288	
	Canes and spirals				1440	
	Bags of Bettaland Compost				144	
	12-14 trees - 4 m centres	**288**		**4m centre**	**72**	
	Oak		bare root		15	
	Alder		bare root		15	
	Ash		bare root		14	
	Prunus padus		bare root		14	
	Sorbus auc Sheerwater		bare root		14	
	Tree stake and tie				72	
	Bags of Bettaland Compost				36	
	North and West perimiter of Commercial units					
	Hedging 269m - 5 plants per linear metre				1345	
	Crataegus	30	bare root	40-60	404	
	Corylus	15	bare root	40-60	202	
	Acer campestre	10	bare root	40-60	135	
	Ilex aquifolium	5	P9	30-40	67	
	Viburnum opulus	5	bare root	40-60	67	
	Quercus	10	bare root	40-60	135	
	Rosa canina	5	bare root	40-60	67	
	Prunus spinosa	20	bare root	40-60	269	
	Bags of Bettaland Compost				135	
	Canes and spirals				1480	
	12-14 trees - 4 m centres	**269**		**4m centre**	**67**	
	Oak		bare root		14	
	Alder		bare root		14	
	Ash		bare root		13	
	Prunus padus		bare root		13	
	Sorbus auc Sheerwater		bare root		13	
	Tree stake and tie				67	
	Bags of Bettaland Compost				33.5	
	North, South & West of yard					
	Hedging 244m - 5 plants per linear metre				1220	
	Crataegus	30	bare root	40-60	366	
	Corylus	15	bare root	40-60	183	
	Acer campestre	10	bare root	40-60	122	
	Ilex aquifolium	5	P9	30-40	61	
	Viburnum opulus	5	bare root	40-60	61	
	Quercus	10	bare root	40-60	122	
	Rosa canina	5	bare root	40-60	61	
	Prunus spinosa	20	bare root	40-60	244	
	Canes and spirals				1220	
	Bags of Bettaland Compost	0.5 bag per m			122	
	12-14 trees - 4 m centres	**244**		**4m centre**	**49**	
	Oak		bare root		10	
	Alder		bare root		10	
	Ash		bare root		10	
	Prunus padus		bare root		10	
	Sorbus auc Sheerwater		bare root		9	
	Tree stake and tie				49	
	Bags of Bettaland Compost				25	
	Additional costs, plant hire etc					

Maintenance for 6 Months	2 men for one day every two weeks.				
	6 months starts from commencement of planting				

Phase 2 Planting within bare root season

2m clear stemmed Olive central avenue				**Total plants**
Olive	12-14 std		cg	32
Bags of Bettaland compost				16
Entrance				
105metre 4' Variegated Privet	3 per metre	rootball		315
182m small box	4 per metre	bare root		728
2 pyramid, sqre sided	140-160			2
1 Box ball 140cm diameter				1
1 Taxus ball 100cm diameter				1
1 Box ball 70cm diameter				1
Winter Solstice East	**Plants per m**		**Linear metres**	
Buxus sempervirens	4	bare root	220	880
Ligustrum oval Aureum	4	bare root	211	844
8 Rear gardens - Phormium	2per garden			16
Bags of Bettaland Compost				115
Winter Solstice West				
Buxus sempervirens	4	bare root	152	608
Ligustrum oval Aureum	4	bare root	88	352
12 Rear gardens - Phormium	2 per garden			24
Bags of Bettaland Compost				64
Coppice vars as hedge, equal qties	**Area m2**	**3 Plants per sq metre**		
A1	120	bare root		360
A2	308	bare root		924
A3	210	bare root		630
Canes and spirals				1914
Additional costs, plant hire etc				
Maintenance for 6 Months	2 men for one day every two weeks.			
	6 months starts from commencement of planting			

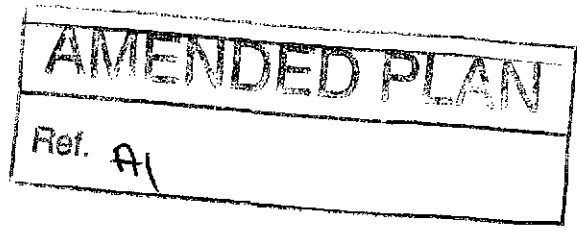
Phase 3 Planting within bare root season

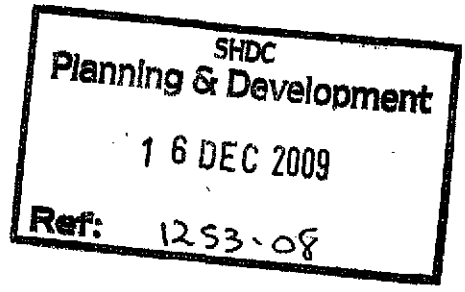
				Total plants
Equinox West				
Buxus sempervirens	4	bare root	162	648
Ligustrum ovalifolium	4	bare root	327	1308
10 Rear gardens - Phormium	2 per garden			20
Bags of Bettaland Compost				130
Equinox East				
Buxus sempervirens	4	bare root	139	556
Ligustrum ovalifolium	4	bare root	116	464
8 Rear gardens - Phormium	2 per garden			16
Bags of Bettaland Compost				68
Summer Soltice East				
Buxus sempervirens	4	bare root	90	360
Ligustrum oval Aureum	4	bare root	92	368
3 Rear gardens - Phormium	2 per garden			6
Bags of Bettaland Compost				49
Summer Solstice West				
Buxus sempervirens	4	bare root	102	408
Ligustrum oval Aureum	4	bare root	221	884

	4 Rear gardens - Phormium	2 per garden			8	
	Bags of Bettaland Compost				86	
	Coppice vars as hedge, equal qties	**Area m2**	**3 plants per sq metre**			
	A4	375	bare root		1125	
	A5	300	bare root		900	
	A6	875	bare root		2625	
	A7	325	bare root		975	
	Canes and spirals				5625	
	Base of turbines	6		3.5m2 each		
	Hedera goldchild	3 per metre2	2L	6 units	60	
	Additional costs, plant hire etc					
	Maintenance for 6 Months	2 men for one day every two weeks.				
		6 months starts from commencement of planting				

Appendix Item 6 –

Letter from South Holland District Council Economic Development Manager
Bruce Wakeling, Economic Development Manager, 4th December 2008





Contact: Dr Jeremy Harrall
SEArch
89 Gedney Road, Long Sutton, SPALDING, Lincs PE12 9JU
Tel. 01406 364646 molearch@searcharchitects.co.uk

date: 04 December 2008

your reference:

our reference:

ask for: Bruce Wakeling

email: bwakeling@sholland.gov.uk

Council Offices
Priory Road
Spalding
Lincolnshire PE11 2XE

tel: 01775 761161
fax: 01775 711253
www.sholland.gov.uk

Dr. Jerry Harrall
SEArch,
89 Gedney Road,
Long Sutton, Spalding,
Lincolnshire PE12 9JU

Dear Jerry,

Industrial Units at Long Sutton and South Holland.

In August 2007 the Economic Development Team at the District Council received a needs analysis report that it had commissioned through Focus Consultants.

The report, which considered both office space and industrial unit demand, identified a strong requirement for industrial units across South Holland. Most of the demand for units of 3,000 sq. ft. and above was currently being met although there were gaps in the supply in the smaller towns. Below 3,000 sq. ft. there appeared to be a shortage mainly because the private sector tended not to build this sized unit, the District Council has a range of 600sq.ft to 1,000 sq. ft units across the district for rent but all of these were taken and there was a waiting list. 44% of businesses surveyed as part of the study thought that there was a requirement for more starter industrial units.

With regard to Long Sutton specifically, the district council does not have any units in the town, Sutton Bridge is the nearest location at which we have units, these are all currently taken. The only privately owned units that I am aware of in Long Sutton are the ones on Bridge Road that were built, I believe, by English Estates, these again are fully occupied. There is therefore no current availability of industrial units in Long Sutton and the allocated employment land in the town, around the Premier Foods site is not currently available for development because of Highways restrictions and the need to construct a new access on to the A17, this would not be economically viable for the construction of a few small industrial units.

We do have evidence of demand for units in Long Sutton from agents in the town. They have identified to us several instances of requests for units of between 1,000 and 2,500 sq. ft. that it has not been possible to meet, at least one of these businesses subsequently moved to Wisbech.

From an economic development viewpoint therefore I believe that there is a requirement for industrial units in Long Sutton and that the lack of suitable units is currently a problem for the district.

For your information the sizes identified as being required in the study were between 1,000 and 3,000 sq. ft. and businesses identified four criteria that were important to them in the selection of units. These were; cost, flexible leasing terms, parking and the availability of on-site storage. Several businesses also identified that they would prefer freehold rather than easehold properties.

I hope that this is useful for you but please do not hesitate to contact me if I can be of further assistance.

Yours sincerely

Bruce Wakeling
Economic Development Manager

Appendix Item 8 – Sequential Site Selection Report

Robert Doughty Consultancy Limited, November 2009, 920-1/SSR/LMS/fv

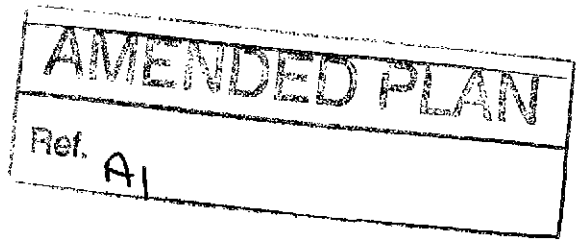
AMENDED PLAN
Ref. A1

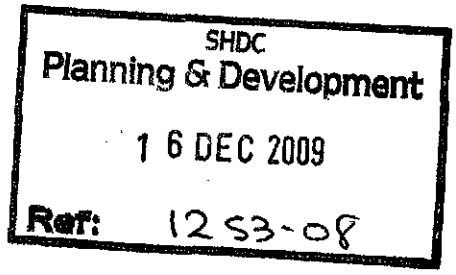
SHDC
Planning & Development
16 DEC 2009
Ref: 1253-08

Contact: Dr Jeremy Harrall
SEArch
89 Gedney Road, Long Sutton, SPALDING, Lincs PE12 9JU
Tel. 01406 364646 molearch@searcharchitects.co.uk

Appendix Item 7 – Email from Lincolnshire Bat Group

Annette Faulkner, 4th December 2008





Contact: Dr Jeremy Harrall
SEArch
89 Gedney Road, Long Sutton, SPALDING, Lincs PE12 9JU
Tel. 01406 364646 molearch@searcharchitects.co.uk

Wendy Thorogood

From: Annette Faulkner [a.faulkner@care4free.net]
Sent: 04 December 2008 15:28
To: Molearch
Subject: Long Sutton application

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Jerry,

Thank you for inviting us to look at your plans and comment on ways to make your new proposal as bat-friendly as possible. We wish more developers would take these beleaguered animals into consideration when planning new developments!

Wind turbines
As we discussed at length when we met you, there are potentially inherent problems with mixing domestic, pole-mounted wind turbines and bat-friendly habitat, as there is clear evidence that turbines in the wrong place can kill bats, since they occupy the same aerial space as the foraging animals and collisions have been recorded, including one bat that was decapitated.

At the same time no research has been done on turbines of this size, what research effort there is being concentrated on the big ones. This is of particular concern with helical turbines, as claims that they are 'bat-friendly' are totally unsubstantiated. In addition there are no national guidelines for distance turbines should be from foraging habitat (although the Eurobats Agreement on the siting of large turbines, to which the UK government is signed up, states 200 metres), but discussion with a local Natural England officer produced a suggestion of a minimum of 25-30 metres.

As far as we know there are only three species of bats to be found in the Long Sutton area out of a possible eleven in the county: soprano and common pipistrelles, and a small (and declining) population of brown long-eared bats. Brown long-eareds forage close to vegetation and are thought to be at less risk from small free-standing turbines, but pipistrelles forage along tree lines, often at some height, and are thought to be at much greater risk. Common pipistrelles in particular are found all over the Fens.

At our meeting we concluded that surrounding the avenue of turbines with low growing, non native, scattered vegetation should make it less attractive to foraging bats, as there *should* be fewer insects. Elsewhere, we agreed that creating a 'bowl' effect, where the taller vegetation is pushed right back, could also draw bats away from the turbine. No shrubs/trees that are going to grow above 1.5 - 2m should be within at least 20m of a turbine. We also concluded that creating linear features away from the turbines on the east boundary and along the dyke, using native forest trees (oak and willows having the greatest number of insects associated with them) should in time create safe foraging habitat.

New roosting opportunities
This is commendable, as many roosts are being lost all the time, in spite of the legal protection. It was thought that by siting suitable niches in the timber boarding of the houses on the periphery of the development, which would provide potential roosts for pipistrelles, should steer them towards the linear 'good' habitat and away from the turbines.

It was also agreed that an element of monitoring should be written in to any contract, for research purposes.

Subsequent to our discussions I have contacted the Bat Conservation Trust for further information and recently had a lengthy discussion with Dr Kate Barlow, who is currently looking into the whole issue of small turbines: working on sites in Scotland they are advocating a minimum distance between turbines and foraging areas of 50m, rather than 25-30m. There are also two independent research projects in the pipeline - if funding can be obtained - which would help to clarify the situation.

We discussed the designing of the roost opportunities in such a way that bats ought to be drawn away from the turbines, but she felt it would be better not to attract them into the site in the first place - pipistrelles from elsewhere will come in to investigate anyway. But she liked the idea of making the habitat surrounding the turbines as un-bat-friendly as possible, and agreed with the research element.

It is a pity to have to give the thumbs down to the roosts proposal, but I feel we have to bow to her greater experience on this issue. With a bigger site there would be more scope for roost creation as well. I'm sure all would agree that 'green' initiatives should never have the potential to put protected species at risk. It rather defeats the object.

With kind regards,

Annette Faulkner
Lincolnshire Bat Group

TABLE OF CONTENTS

1. Introduction 1
2. The Proposal 2
3. Project Cost and the need for a site beyond settlement limits as defined in the adopted South Holland Local Plan 2006 4
4. Availability of other land 7
5. Sites beyond settlement boundaries 8
6. Development Plan 10
7. Physical Relationship with the Town 11
8. Conclusions 12

APPENDICES

A Davis Langdon's Budget Estimate and cover letters October 2009
B C Carters Estate Agents' Valuation Report October 2009
C Applicant's letter December 2009
D Extracts from the Environment Agency's Indicative Flood Maps

1. INTRODUCTION

1.1. This report has been commissioned to assist in the consideration of the above application (LPA ref H11/1253/08) submitted on the 5th December 2008 and, in particular, to address the issues of site selection and the sequential test.

1.2. The site is located just outside the eastern settlement limits of Long Sutton, as defined on the inset plan in the South Holland District Local Plan. Accordingly, as the proposal is located in open countryside for the purposes of the Development Plan, the appropriateness of the chosen location has to be justified when considered against other sites in the district and importantly within settlement boundaries.

1.3. This justification will also enable the LPA to consider whether the Sequential and Exceptions tests have been satisfied in accordance with PPS25 – Development and Flood Risk.

1.4. The main principles of the proposal are as follows.

- Long Sutton is being developed as a centre of excellence for aspirational and exemplar developments in zero carbon development and sustainable living.
- The other examples in Long Sutton are either completed and occupied (affordable housing adjacent to the site) or are well under construction (the industrial/office development to the west of the town on Gedney Road).
- Land within settlement limits as defined in the Local Plan is not available and too expensive rendering the scheme unviable.
- The scheme relies on the careful association of affordable housing, allotments, open space and employment opportunity.
- The site is within walking distance of all the amenities Long Sutton has to offer including the significant employment opportunities along Bridge Road.
- Further opportunities exist around the site to develop initiatives embracing recreation and education.

2. THE PROPOSAL

2.1. A very detailed Design and Access Statement has already been submitted with the proposal which describes the ethos behind the project. There are three other schemes in Long Sutton of a similar nature either complete or in various stages of completion which exemplify the sustainable, self-dependent development now being promoted on a larger scale with this current application.

2.2. The applicant Dr J Harrall lives in an earth sheltered live/work unit in Long Sutton and his work has effectively made the town a centre of excellence in the forefront of low carbon living.

2.3. All the projects that have received planning permission are either complete or under construction to the west and east of the town.

2.4. The six affordable dwellings to the east of the town, adjacent to the current application site are now occupied and SEArch has now moved into its new offices to the west of the town. A wind turbine on each site has also now been commissioned.

2.5. The current proposal is the most ambitious and is designed to take forward the research principles seen in the other projects and develop them on a more commercial basis as an entirely self sustaining live/work community.

2.6. 49 low energy dwellings are proposed and there is the possibility that Cross Keys Homes, a housing association based in Peterborough, may take on the entire housing scheme. Of the 49 units, 25 will be rented and 24 offered as freehold property. The dwellings have private amenity space, together with allotments and open space.

2.7. In addition to the housing element, 9 commercial units are proposed and the site overall is served by renewable energy in the form of several wind turbines. The method of waste recycling, grey water recovery, construction materials and building orientation to maximise the use of passive solar radiation are set out in detail in the Design and Access Statement.

2.8. The construction techniques and overall environmental ambitions of developing a sustainable community have already been described by CABE as exemplar and has applauded the applicant's commitment to develop a sustainable community.

2.9. Following on from the earlier projects, this mixed use development combines the efforts of those earlier schemes on a more commercial basis but in doing so, it has meant looking at a site beyond the established settlement boundary.

2.10. It is imperative that the housing and the commercial element form part of the same development on the same site. Mixed development is at the heart of providing sustainable communities and the fact that this proposal will assist in ensuring the shortfall in affordable housing in Long Sutton and the surrounding parishes will be met. The location of the proposal is also within walking distance of the two significant employment opportunities namely the Bridge Road Industrial Estate and Premier Foods.

2.11. The provision of commercial units on site will give residents of the affordable housing the opportunity to seek employment on their doorstep.

3. PROJECT COST AND THE NEED FOR A SITE BEYOND SETTLEMENT LIMITS AS DEFINED IN THE ADOPTED SOUTH HOLLAND LOCAL PLAN 2006

3.1. The residential element of the project will achieve at least a level 6 rating in the Code for Sustainable Homes. Level 6 is the highest level and represents an aspirational standard, based on zero carbon emissions and high performance across all the environmental categories.

3.2. Similarly, the business units will be constructed to the same environmental standards.

3.3. The estimated build cost of the residential element is £1600 per sqm and is approximately 25% more expensive per sqm than normal construction costs for standard housing.

3.4. It is anticipated that the build cost for the commercial element will be approximately 8% more than if using traditional construction techniques.

3.5. The overall project cost is, therefore 15-20% more expensive to deliver than a comparable scheme, albeit that the majority share of the project construction cost is for the residential element.

3.6. The additional cost of construction and the environmentally friendly design does not mean that the residential development and the commercial development will be worth more in terms of the revenue generated from sales and or rent.

3.7. The applicant has commissioned Davis Langdon LLP to go through in detail the costs of the project and this information is set out at appendix A.

3.8. C Carters Estate Agents has also assessed the market value of the development and this information is set out at Appendix B.

3.9. The applicant has also set out the overall cost of the project in the letter at Appendix C, where it can be seen that if the residential element of the scheme was to be sold at open market value, the land value of the entire site would be in the region of £250,000.

3.10. The applicant anticipates that at least 25 of the 49 dwellings proposed will be available for rent as affordable housing and this will require the assistance of a Housing Association to deliver as these units will be worth considerably less than open market value.

3.11. Within the settlement limits, as defined in the Local Plan, land with planning permission for residential development is currently worth approximately £864,000 per hectare and employment land is worth £110,000.[1]

3.12. This application site covers an area of 4.23 hectares of which 2.62 hectares is residential and 1.61 hectares is for employment. The residential land area includes the open spaces and allotments but these are inextricably linked with the provision of a sustainable community.

3.13. Were there to be land available for the proposal within the settlement boundary of Long Sutton, the cost of the residential development land alone would be in the region of £2.2m. Similarly, if land was available within the settlement limit for the employment element it would cost in the region of £400,000.

3.14. The overall land cost for this project were it to be located within the settlement boundary would, therefore, be in the region of £2.65m, which is over ten times the possible amount that the scheme could stand at its current location on Greenfield land outside the settlement limits.

3.15. The experimental nature of the scheme that incorporates allotment land to aid self-sufficiency means that normal gross densities in line with PPS3 are not applicable and, as such, it would be impossible to locate the project within settlement boundaries where land prices are higher.

[1] Approximate land values obtained from Brown & Co October 2009.

3.16. Land prices in Holbeach are marginally higher and those in Spalding higher still[2].

3.17. The cost of the project is such that land with the benefit of planning permission (allocated land values are much the same) inside any development boundary would render the scheme unviable.

3.18. The modest return from the scheme even with low land values also means that a smaller scheme would not be viable. The smaller housing scheme to the east that is now built and occupied does not have the same level of open space, allotments and variety of construction techniques seen with the current proposal and was entirely underpinned by housing grant assistance.

[2] Approximate land values obtained from Brown & Co October 2009.

4. AVAILABILITY OF OTHER LAND

4.1. Having established that the scheme would not be viable on land that has the benefit of a specific land use allocation and/or with planning permission, it follows that the scheme is only viable on land beyond settlement limits where land values reflect the Local Plan policies of restraint.

4.2. Setting aside the issue of land values for one moment, it must be remembered that the Local Plan does not include mixed land use allocations. The only areas of land of sufficient size either inside development boundaries or allocated for development are either entirely residential or entirely for employment purposes. Developing industrial land for housing would be contrary to Local Plan policy and, in the case of Wingland at Sutton Bridge or the Wardentree Lane area of Pinchbeck as examples, would conflict with existing industrial land uses.

4.3. There is the possibility that subject to compliance with housing policy and the council maintaining a five year housing supply, a mixed use development that incorporated B1 light industrial uses ie those employment uses compatible with residential development, could be accommodated on a site allocated for housing. However, the low density of development, essential as part of this proposal, would not be appropriate on the more sustainable sites in the towns where the density of development required in PPS3 would be more appropriate.

4.4. There are no Brownfield sites in Long Sutton capable of accommodating the development either in part or as a whole.

4.5. The council's Urban Capacity Study published in 2005 and the 2008 Strategic Housing Land Availability Assessment identifies all the possible sites within the towns and larger villages where housing and, therefore, potentially a mixed use development might be possible. This demonstrates that there are no sites available or of sufficient size to accommodate this proposal.

4.6. Having established that there are no sites in the main settlements within the district that could accommodate the proposal, it remains to be considered whether or not there are more sustainable sites beyond settlement boundaries where the proposal might be appropriate.

5. SITES BEYOND SETTLEMENT BOUNDARIES

5.1. There is no land on the periphery of Long Sutton or any of the other four market towns that lies outside Flood Zone 3a. Only Donington has land on the settlement edge outside Flood Zone 3a, however, the settlement is smaller than the other towns in the district with a smaller infrastructure base and limited employment opportunities. In addition, planning permission has recently been granted for in excess of 30 affordable dwellings off Town Dam Lane and, accordingly, the possibility of a further 49 affordable units would represent a disproportionately high number of affordable units when compared with the size of the settlement and the affordable housing needs of Holbeach, Long Sutton, Crowland, Sutton Bridge and Spalding.

5.2. The Maps showing the areas of flood as taken from the Environment Agency's website for each of the main settlements in the district are reproduced at Appendix D.

5.3. Long Sutton is one of the five main towns in the district and, as such, is a sustainable settlement with access to a good range of services and infrastructure.

5.4. The town centre is easily accessible on foot from the site, being approximately 1km to the east along Bridge Road. By comparison, the existing housing allocation on Lime Walk is 0.75km from the town centre. There is also a good bus service into the town and beyond and Long Sutton now falls within the extended Call Connect service. The site lies adjacent to the recently completed affordable housing scheme and it would, therefore, be reasonable to suggest that the council, in approving that relatively recent scheme, considers that site and by close association the current site, is a sustainable one.

5.5. In addition, although the site is a Greenfield one, there are a number of buildings already in existence and, as a consequence, the visual impact on the rural character of this edge of settlement location will be no greater than that which exists at present.

5.6. The availability of other Greenfield sites on the edge of the settlement are, in the main, tied up in option agreements in the hope that future changes in housing policy will release the land for market housing development.

5.7. Notwithstanding this, the other areas of Greenfield land around Long Sutton are merely alternative locations, they do not represent significantly better sustainable locations, or, just as importantly, locations at a lower risk of flooding.

5.8. Similarly, locations round the edges of the other main settlements in the district do not offer more sustainable locations, but merely alternatives. Clearly, there will always be alternative locations for most development, but, in this case, it is whether that alternative is more sustainable and at a lower risk of flood. Reference to the Environment Agency's indicative flood maps at Appendix D shows the areas of land on the edge of the main settlements as all being within Flood Zone 3a and this includes the planned western expansion of Holbeach.

5.9. The Flood Risk Assessment prepared by the Geoff Beel Consultancy and submitted with the application has been prepared using up to date information from the Environment Agency and considers the issue of flood in relation to the development. This assessment includes the impact of climate change and is therefore more up to date than the South Holland District Council Strategic Flood Risk Assessment that was completed in 2002.

6. DEVELOPMENT PLAN

6.1. The Development Plan consists of the East Midlands Regional Plan and the South Holland District Local Plan.

6.2. The Regional Plan contains policies that tackle head-on the issue of climate change.

6.3. In particular, the spatial objectives will seek to;

- "To ensure that the location of development makes efficient use of existing physical infrastructure and helps to reduce the need to travel;
- To promote and ensure high standards of sustainable design and construction, optimising the use of previously developed land and buildings;
- To minimise waste and to increase the re-use and recycling of waste materials; and
- To improve accessibility to jobs and services by increasing the use of public transport, cycling and walking, and reducing traffic growth and congestion,"

6.4. Policy 2 requires that, "The layout, design and construction of new development should be continuously improved, including in terms of reducing CO2 emissions and providing resilience to future climate change..."

6.5. This should be achieved through minimising energy uses, reducing the heat impact on urban areas, improving water efficiency, providing sustainable drainage (SUDS) and management of flood water, reducing waste and pollution, securing energy from decentralised and renewable or low carbon technologies, incorporating sustainably sourced and recycled materials and considering building orientation at the start of the design process.

6.6. It can be seen that the proposal accords with these policies in that the location is a sustainable one, the highest standards of design are being promoted together with the use of low carbon technology and use of renewable energy.

7. PHYSICAL RELATIONSHIP WITH THE TOWN

7.1. Although the application site lies outside the defined limits of the settlement, in visual terms, that part of Bridge Road in the vicinity of the site is evidently part of the built up character of the town.

7.2. The recently completed affordable housing scheme to the west, coupled with the existing historic grain of development effectively creates an otherwise built up frontage.

7.3. This general character is further emphasised by the existing mixed use development (industrial and commercial) to the south of Bridge Road that extends east, well beyond the application site frontage.

7.4. Development in the immediate vicinity of the site is not, however, limited to frontage only; the recently completed affordable housing scheme to the west represents development in depth as does much of the existing development to the south of Bridge Road.

7.5. The application site is currently occupied by a number of buildings which although agricultural in use, will assist in reducing the impact of the proposal and it should be remembered that the scale of the proposed buildings is less than that which exists at present.

7.6. From the junction with West Street, London Road leads into Bridge Road and there is a distinct change in settlement character from the centre of Long Sutton travelling east. There is an appreciable amount of green space, especially north of London Road and Bridge Road and the overall grain of development and density is lower than other parts of the town.

7.7. Gaps appear between dwellings, the roads widen, buildings vary in size and there are trees and green spaces within the built up fabric.

7.8. This character is maintained with the proposal.

8. CONCLUSIONS

8.1. A detailed breakdown of the development costs for the project has been provided and it can be seen that they are in the region of 15-20% higher than if traditional construction techniques were used.

8.2. Having regard to the low density of development necessary to complete the sustainable community, coupled with the high cost of land with the benefit of planning permission for either housing or employment, locating the proposal inside the settlement boundary of any of the more sustainable settlements in the district would render the scheme unviable.

8.3. The site on Bridge Road is well located in terms of access to employment, schools and other day-to-day infrastructure and, as such, other sites around the other towns in the district only amount to alternatives rather than more sequentially preferable locations. In addition, there are no other sites at a lower risk of flooding either in Long Sutton or elsewhere around the periphery of the other main settlements.

8.4. The scale of the development will hopefully enable a modest profit from a scheme that is driven not by commercial incentive, but by an ethos of sustainable living. Accordingly, the project is not one that is likely to be copied elsewhere, albeit it is hoped that the technology and design solutions employed will inform the wider construction industry.

8.5. The project will continue to promote Long Sutton as a centre of excellence for sustainable development in the country and will be monitored by the applicant as part of the other research projects undertaken in the town.

8.6. The proposal, therefore, meets the Sequential and Exceptions Tests as set out in PPS25 Development and Flood Risk.

8.7. Character is an important element of the proposal and the inclusion of open spaces and gaps between buildings capitalises on the existing grain of development in this part of Long Sutton.

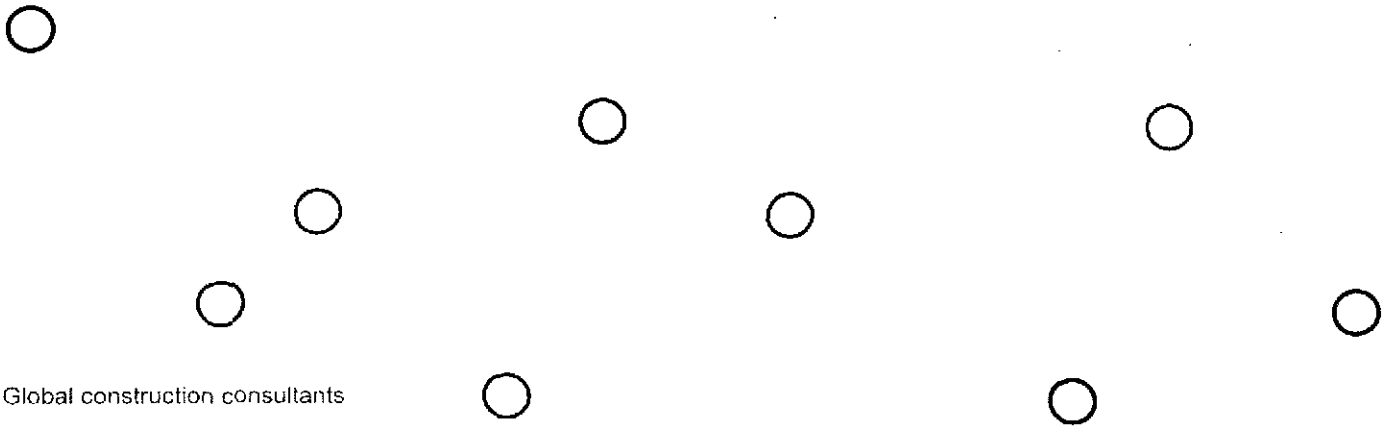
8.8. There is mixed use development (residential and commercial) on both sides of Bridge Road, much of it in depth and the proposal will reflect this character.

Davis Langdon

SEARCH ARCHITECTS

Long Sutton Sustainable Settlement Extension

Budget Estimate Nr 2 | 27 October 2009



Global construction consultants

Project : Long Sutton Sustainable Settlement Extension
Estimate : Number Two
Date : October 2009

CONTENTS

	Page Nr
Introduction	(i)
Exclusions	(ii)
Schedule of Accommodation	(iii)
Schedule of Drawings	(iv)
Summary of Abnormal Costs	(v)
Budget Estimate Summary	1
Details of Budget Estimate	2 - 75

INTRODUCTION

This budget estimate has been prepared to enable Davis Langdon LLP to give Search Architects an indication of cost for the proposed development of forty nine dwellings and nine commercial units at Long Sutton.

This estimate is based upon Search Architects' drawings as detailed on page (iv) and discussions with Search Architects.

The estimate is based on the scheme being a development agreement.

A schedule of the accommodation to be provided is detailed on page (iii).

This estimate is based upon current build costs.

EXCLUSIONS

Please note that no allowances have been included for any of the following:-

1) Abnormal ground conditions other than identified in this report
2) Remediation of contaminated ground.
3) Archaeological investigations.
4) Demolition
5) Service or drainage diversions other than those identified
6) Asbestos surveys and removal.
7) Off-site services and drains.
8) Off-site Highway works.
9) Fees for Consultants employed by Search Architects
10) Site investigation
11) Planning Fees
12) S106 obligations
13) Topographical Surveys
14) Legal expenses.
15) Value Added Tax.
16) Any works associated with the requirements of the Party Wall Act.
17) Future changes in Building Regulations
18) All costs associated with the construction of Plot 1 'Hodnydod' Office
19) Any other works outside the site bondary

SCHEDULE OF ACCOMMODATION

Residential

2 Bedroom 3 Person Semi-Detached House	10 Nr	@	62 m²	=	620 m²
2 Bedroom 3 Person Semi-Detached House	2 Nr	@	75 m²	=	150 m²
3 Bedroom 5 Person Semi-Detached House	*16 Nr*	@	*86 m²*	=	1,376 m²
3 Bedroom 5 Person Detached Houses	13 Nr	@	86 m²	=	1,118 m²
4 Bedroom 6 Person Detached Houses	5 Nr	@	108 m²	=	540 m²
4 Bedroom 7 Person Detached Houses	3 Nr	@	119 m²	=	357 m²
	49 Nr			Total	4,161 m²

Commercial

Warehouse / Office	5 Nr	@	153 m²	=	765 m²
Warehouse / Office	4 Nr	@	85 m²	=	340 m²
	9 Nr			Total	1,105 m²

TOTAL FLOOR AREA **5,266 m²**

SCHEDULE OF DRAWINGS

The following drawings have been used in the preparation of this budget estimate:-

Search Architects

Site Layout
Plots 2 & 3 Nellbury Avenue - Plans & Elevations
Plot 4 Winter Solstice East - Plans & Elevations
Plots 5 & 6 Winter Solstice East - Plans
Plots 5 & 6 Winter Solstice East - Elevations
Plots 7 & 8 Winter Solstice East - Plans
Plots 7 & 8 Winter Solstice East - Elevations
Plots 9, 10 & 11 Winter Solstice East - Plans
Plots 9, 10 & 11 Winter Solstice East - Elevations
Plot 12 Equinox East - Plans & Elevations
Plots 13 & 14 Equinox East - Elevations
Plots 13 & 14 Equinox East - Plans
Plots 15 & 16 Equinox East - Plans & Elevations
Plots 17, 18 & 19 Equinox East - Plans
Plots 17, 18 & 19 Equinox East - Elevations
Plot 20 Summer Solstice East - Plans & Elevations
Plots 21 & 22 Summer Solstice East - Plans
Plots 21 & 22 Summer Solstice East - Elevations
Plot 23 Summer Solstice East - Plans & Elevations
Plot 24 Summer Solstice West - Plans & Elevations
Plots 25 & 26 Summer Solstice West - Plans & Elevations
Plot 27 Equinox West - Plans & Elevations
Plots 28, 29, 34 & 35 Equinox West - Plans
Plots 28, 29, 34 & 35 Equinox West - Elevations
Plot 30, 32 & 33 Equinox West - Plans & Elevations
Plot 36 Equinox West - Plans & Elevations
Plot 37 & 42 Winter Solstice West - Plans & Elevations
Plots 38,39 & 40 Winter Solstice West - Plans
Plots 38,39 & 40 Winter Solstice West - Elevations
Plot 41 Winter Solstice West - Plans & Elevations
Plot 43 Winter Solstice West - Plans & Elevations
Plots 44 & 45 Winter Solstice West - Plans
Plots 44 & 45 Winter Solstice West - Elevations
Plots 46 & 47 Winter Solstice West - Plans
Plots 46 & 47 Winter Solstice West - Elevations
Plot 48 Winter Solstice West - Plans & Elevations
Plots 49 & 49a Nellbury Avenue - Plans & Elevations
Plot 50 Nellbury Avenue - Plans & Elevations
Plot 51 Solar Way - Plans & Elevations
Plots 52, 57, 58 & 59 Solar Way - Plans & Elevations
Plots 56, 55, 54 & 53 Solar Way - Plans
Plots 56, 55, 54 & 53 Solar Way - Elevations

Project : Long Sutton Sustainable Settlement Extension
Estimate : Number Two
Price Date : October 2009

Davis Langdon

Description	Area	Unit	Cost/m2	Total	Notes
49Nr Residential Dwellings	4,148	m2	987.00	4,094,000	
9Nr Commercial Units	1,105	m2	906.72	1,002,000	
External Works and Services				1,495,000	
Drainage				299,000	
Preliminaries	65	w	7,000.00	455,000	
Contingencies				220,000	
Works Cost at September 2009				7,565,000	
Totals				**7,565,000**	

Project : Long Sutton Sustainable Settlement Extension 49Nr Residential Dwellings
Estimate : Number Two
Price Date : October 2009

Davis Langdon

No	Description	Quantity	Unit	Rate	Total	Notes
1	Block of 2Nr 2 Bedroom 3 Person Cob Block Houses				140,410	Plots 2 & 3
2	Block of 1Nr 3 Bedroom 5 Person House				83,315	Plot 4
3	Block of 2Nr 3 Bedroom 5 Person Houses				161,190	Plots 5 & 6
4	Block of 2Nr 3 Bedroom 5 Person House				161,590	Plots 7 & 8
5	Block of 3Nr 3 Bedroom 5 Person House				238,850	Plots 9-11
6	Block of 1Nr 3 Bedroom 5 Person House				83,315	Plot 12
7	Block of 2Nr 3 Bedroom 5 Person Houses				158,190	Plots 13 & 14
8	Block of 2Nr 2 Bedroom 3 Person Houses				132,600	Plots 15 & 16
9	Block of 3Nr 2 Bedroom 3 Person Houses				206,115	Plots 17-19
10	Block of 1Nr 3 Bedroom 5 Person House				81,655	Plot 20
11	Block of 2Nr 3 Bedroom 5 Person Houses				165,300	Plots 21 & 22
12	Block of 1Nr 4 Bedroom 7 Person House				117,730	Plot 23
13	Block of 1Nr 4 Bedroom 6 Person House				99,485	Plot 24
14	Block of 2Nr 3 Bedroom 5 Person Houses				161,735	Plots 25 & 26
15	Block of 1Nr 4 Bedroom 6 Person House				112,190	Plot 27
16	Block of 2Nr 3 Bedroom 5 Person Houses				166,355	Plots 28 & 29
	Carried Forward				**2,270,025**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**2,270,025**	
17	Block of 1Nr 3 Bedroom 5 Person House				81,730	Plot 30
18	Block of 1Nr 3 Bedroom 5 Person House				83,440	Plot 32
19	Block of 1Nr 3 Bedroom 5 Person House				83,365	Plot 33
20	Block of 2Nr 3 Bedroom 5 Person Houses				163,115	Plots 34 & 35
21	Block of 1Nr 4 Bedroom 7 Person House				108,010	Plot 36
22	Block of 1Nr 4 Bedroom 6 Person House				102,980	Plot 37
23	Block of 3Nr 2 Bedroom 3 Person Houses				210,435	Plots 38-40
24	Block of 1Nr 3 Bedroom 5 Person House				83,365	Plot 41
25	Block of 1Nr 4 Bedroom 6 Person House				103,055	Plot 42
26	Block of 1Nr 4 Bedroom 6 Person House				110,765	Plot 43
27	Block of 2Nr 3 Bedroom 5 Person Houses				164,280	Plots 44 & 45
28	Block of 2Nr 3 Bedroom 5 Person Houses				166,355	Plots 46 & 47
29	Block of 1Nr 4 Bedroom 7 Person House				114,010	Plot 48
30	Block of 2Nr 2 Bedroom 3 Person Straw Bale Houses				142,610	Plots 49 & 49a
31	Block of 1Nr 3 Bedroom 5 Person Rammed Earth House				106,555	Plot 50
	Total				**4,094,095**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	62	m2	105.00	6,510	
2	Upper Floors	62	m2	50.00	3,100	
3	Roof	79	m2	120.00	9,480	Cassius Antique Slate
4	Stairs	2	nr	950.00	1,900	
5	External Walls	167	m2	160.00	26,720	Cob Block / Lime render
6	Extra over for bird boxes	2	nr	50.00	100	
7	Windows and External Doors	31	m2	335.00	10,385	
8	Glazed Porch	2	nr	1,500.00	3,000	
9	Party Walls	56	m2	50.00	2,800	
10	Internal Walls	86	m2	30.00	2,580	
11	Internal Doors - single	12	nr	215.00	2,580	
12	Internal Doors - double	8	nr	350.00	2,800	
13	Wall Finishes	451	m2	25.00	11,275	High density particle board
14	Floor Finishes	62	m2	50.00	3,100	Floor Tiles
15	Ceiling Finishes	62	m2	40.00	2,480	
16	Fittings	2	nr	2,500.00	5,000	
	Carried Forward				93,810	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**93,810**	
17	Sanitary Appliances	2	nr	1,500.00	3,000	
18	Disposal Installations	2	nr	500.00	1,000	
19	Heating and Water Installations	2	nr	7,300.00	14,600	Solar water heating / Wood burner
20	Electrical Installations	2	nr	5,100.00	10,200	Underfloor heating / Lighting & Power
21	Ventilation Installations	2	nr	1,100.00	2,200	Passivent
22	Rainwater harvesting	2	nr	3,000.00	6,000	
23	Photovoltaics	2	nr	4,800.00	9,600	
	Total				**140,410**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	43	m2	105.00	4,515	
2	Upper Floors	43	m2	50.00	2,150	
3	Roof	57	m2	120.00	6,840	Cassius Antique Slate
4	Stairs	1	nr	950.00	950	
5	External Walls	141	m2	110.00	15,510	Concrete block
6	Extra over for timber boarding	19	m2	45.00	855	
7	Extra over for Juliette balconies	1	nr	1,000.00	1,000	
8	Extra over for bird boxes	1	nr	50.00	50	
9	Windows and External Doors	24	m2	335.00	8,040	
10	Internal Walls	78	m2	35.00	2,730	100th dense concrete block
11	Internal Doors - single	11	nr	215.00	2,365	
12	Wall Finishes	297	m2	10.00	2,970	Emulsion only
13	Floor Finishes	86	m2	50.00	4,300	Floor Tiles
14	Ceiling Finishes	86	m2	40.00	3,440	
15	Fittings	1	nr	2,500.00	2,500	
16	Sanitary Appliances	1	nr	1,500.00	1,500	
	Carried Forward				**59,715**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**59,715**	
17	Disposal Installations	1	nr	500.00	500	
18	Heating and Water Installations	1	nr	7,300.00	7,300	Solar water heating / Wood burner
19	Electrical Installations	1	nr	6,300.00	6,300	Underfloor heating / Lighting & Power
20	Ventilation Installations	1	nr	1,100.00	1,100	Passivent
21	Rainwater harvesting	1	nr	3,000.00	3,000	
22	Photovoltaics	1	nr	5,400.00	5,400	
	Total				**83,315**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	86	m2	105.00	9,030	
2	Upper Floors	86	m2	50.00	4,300	
3	Roof	108	m2	90.00	9,720	Sandtoft Olympus Clay Tiles
4	Stairs	2	nr	950.00	1,900	
5	External Walls	181	m2	160.00	28,960	300th Dense Concrete Block / Lime render
6	Extra over for timber boarding	37	m2	45.00	1,665	
7	Extra over for bird boxes	2	nr	50.00	100	
8	Windows and External Doors	49	m2	335.00	16,415	
9	Glazed Porch	2	nr	1,500.00	3,000	
10	Party Walls	60	m2	30.00	1,800	
11	Internal Walls	165	m2	30.00	4,950	100 fair faced blockwork
12	Internal Doors - single	9	nr	215.00	1,935	
13	Internal Doors - double	1	nr	350.00	350	
14	Wall Finishes	631	m2	10.00	6,310	Emulsion only
15	Floor Finishes	172	m2	50.00	8,600	Floor Tiles
	Carried Forward				**99,035**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**99,035**	
16	Ceiling Finishes	172	m2	40.00	6,880	
17	Fittings	2	nr	2,500.00	5,000	
18	Sanitary Appliances	2	nr	1,500.00	3,000	
19	Disposal Installations	2	nr	500.00	1,000	
20	Heating and Water Installations	2	nr	7,300.00	14,600	Solar water heating / Wood burner
21	Electrical Installations	2	nr	6,300.00	12,600	Underfloor heating / Lighting & Power
22	Ventilation Installations	2	nr	1,100.00	2,200	Passivent
23	Rainwater harvesting	2	nr	3,000.00	6,000	
24	Photovoltaics	2	nr	5,400.00	10,800	
25	Bat roosts	1	nr	75.00	75	Plot 6 only
	Total				**161,190**	

Project : Long Sutton Sustainable Settlement Extension 49Nr Residential Dwellings
Estimate : Number Two Block of 2Nr 3 Bedroom 5 Person House
Price Date : October 2009

Davis Langdon

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	86	m2	105.00	9,030	
2	Upper Floors	86	m2	50.00	4,300	
3	Roof	108	m2	90.00	9,720	Sandtoft Olympus Clay Tiles
4	Stairs	2	nr	950.00	1,900	
5	External Walls	182	m2	160.00	29,120	300th Dense Concrete Block / Lime render
6	Extra over for Timber Boarding	36	m2	45.00	1,620	
7	Extra over for Juliette balconies	2	nr	1,000.00	2,000	
8	Extra over for bird boxes	2	nr	50.00	100	
9	Windows and External Doors	47	m2	335.00	15,745	
10	Party Walls	60	m2	30.00	1,800	
11	Internal Walls	155	m2	30.00	4,650	100th Fair faced blockwork
12	Internal Doors - single	22	nr	215.00	4,730	
13	Wall Finishes	612	m2	10.00	6,120	Emulsion only
14	Floor Finishes	172	m2	50.00	8,600	Floor Tiles
15	Ceiling Finishes	172	m2	40.00	6,880	
	Carried Forward				**106,315**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**106,315**	
16	Fittings	2	nr	2,500.00	5,000	
17	Sanitary Appliances	2	nr	1,500.00	3,000	
18	Disposal Installations	2	nr	500.00	1,000	
19	Heating and Water Installations	2	nr	7,300.00	14,600	Solar water heating / Wood burner
20	Electrical Installations	2	nr	6,300.00	12,600	Underfloor heating / Lighting & Power
21	Ventilation Installations	2	nr	1,100.00	2,200	Passivent
22	Rainwater harvesting	2	nr	3,000.00	6,000	
23	Photovoltaics	2	nr	5,400.00	10,800	
24	Bat roosts	1	nr	75.00	75	Plot 7 only
	Total				**161,590**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	130	m2	105.00	13,650	
2	Upper Floors	130	m2	50.00	6,500	
3	Roof	158	m2	120.00	18,960	Cassius Antique Slate
4	Stairs	3	nr	950.00	2,850	
5	External Walls	219	m2	160.00	35,040	300th Dense Concrete Block / Lime render
6	Extra over for timber boarding	47	m2	45.00	2,115	
7	Extra over for Juliette balconies	3	nr	1,000.00	3,000	
8	Extra over for bird boxes	3	nr	50.00	150	
9	Windows and External Doors	70	m2	335.00	23,450	
10	Party Walls	121	m2	30.00	3,630	
11	Internal Walls	232	m2	30.00	6,960	100th Fair faced blockwork
12	Internal Doors - single	33	nr	215.00	7,095	
13	Wall Finishes	925	m2	10.00	9,250	Emulsion only
14	Floor Finishes	260	m2	50.00	13,000	Floor Tiles
15	Ceiling Finishes	260	m2	40.00	10,400	
	Carried Forward				**156,650**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**156,050**	
16	Fittings	3	nr	2,500.00	7,500	
17	Sanitary Appliances	3	nr	1,500.00	4,500	
18	Disposal Installations	3	nr	500.00	1,500	
19	Heating and Water Installations	3	nr	7,300.00	21,900	Solar water heating / Wood burner
20	Electrical Installations	3	nr	6,300.00	18,900	Underfloor heating / Lighting & Power
21	Ventilation Installations	3	nr	1,100.00	3,300	Passivent
22	Rainwater harvesting	3	nr	3,000.00	9,000	
23	Photovoltaics	3	nr	6,400.00	16,200	
	Total				**238,850**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	43	m2	105.00	4,515	
2	Upper Floors	43	m2	50.00	2,150	
3	Roof	57	m2	120.00	6,840	Cassius Antique Slate
4	Stairs	1	nr	950.00	950	
5	External Walls	141	m2	110.00	15,510	Concrete block
6	Extra over for timber boarding	19	m2	45.00	855	
7	Extra over for Juliette balconies	1	nr	1,000.00	1,000	
8	Extra over for bird boxes	1	nr	50.00	50	
9	Windows and External Doors	24	m2	335.00	8,040	
10	Internal Walls	78	m2	35.00	2,730	100th dense concrete block
11	Internal Doors - single	11	nr	215.00	2,365	
12	Wall Finishes	297	m2	10.00	2,970	Emulsion only
13	Floor Finishes	86	m2	50.00	4,300	Floor Tiles
14	Ceiling Finishes	86	m2	40.00	3,440	
15	Fittings	1	nr	2,500.00	2,500	
16	Sanitary Appliances	1	nr	1,500.00	1,500	
	Carried Forward				**59,715**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**102,915**	
16	Fittings	2	nr	2,500.00	5,000	
17	Sanitary Appliances	2	nr	1,500.00	3,000	
18	Disposal Installations	2	nr	500.00	1,000	
19	Heating and Water Installations	2	nr	7,300.00	14,600	Solar water heating / Wood burner
20	Electrical Installations	2	nr	6,300.00	12,600	Underfloor heating / Lighting & Power
21	Ventilation Installations	2	nr	1,100.00	2,200	Passivent
22	Rainwater harvesting	2	nr	3,000.00	6,000	
23	Photovoltaics	2	nr	5,400.00	10,800	
24	Bat roosts	1	nr	75.00	75	Plot 14 only
	Total				**158,190**	

Project : Long Sutton Sustainable Settlement Extension 49Nr Residential Dwellings
Estimate : Number Two Block of 2Nr 2 Bedroom 3 Person Houses
Price Date : October 2009

Davis Langdon

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	62	m2	105.00	6,510	
2	Upper Floors	62	m2	50.00	3,100	
3	Roof	79	m2	120.00	9,480	Cassius Antique Slate
4	Stairs	2	nr	950.00	1,900	
5	External Walls	167	m2	160.00	26,720	300th Dense Concrete Block / Lime render
6	Extra over for bird boxes	2	nr	50.00	100	
7	Windows and External Doors	31	m2	335.00	10,385	
8	Glazed Porches	2	nr	1,500.00	3,000	
9	Party Walls	56	m2	30.00	1,680	
10	Internal Walls	86	m2	30.00	2,580	100th fair faced blockwork
11	Internal Doors - single	12	nr	215.00	2,580	
12	Internal Doors - double	8	nr	350.00	2,800	
13	Wall Finishes	451	m2	10.00	4,510	Emulsion only
14	Floor Finishes	62	m2	50.00	3,100	Floor Tiles
15	Ceiling Finishes	62	m2	40.00	2,480	
	Carried Forward				**80,925**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**80,925**	
16	Fittings	2	nr	2,500.00	5,000	
17	Sanitary Appliances	2	nr	1,500.00	3,000	
18	Disposal Installations	2	nr	500.00	1,000	
19	Heating and Water Installations	2	nr	7,300.00	14,600	Solar water heating / Wood burner
20	Electrical Installations	2	nr	5,100.00	10,200	Underfloor heating / Lighting & Power
21	Ventilation Installations	2	nr	1,100.00	2,200	Passivent
22	Rainwater harvesting	2	nr	3,000.00	6,000	
23	Photovoltaics	2	nr	4,800.00	9,600	
24	Bat roosts	1	nr	75.00	75	Plot 15 only
	Total				**132,600**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	90	m2	105.00	9,450	
2	Upper Floors	101	m2	50.00	5,050	
3	Roof	128	m2	90.00	11,520	Sandtoft Olympus Clay Tiles
4	Stairs	3	nr	950.00	2,850	
5	External Walls	261	m2	160.00	41,760	300th Dense Concrete Block / Lime render
6	Extra over for timber boarding	2	m2	45.00	90	
7	Extra over for bird boxes	2	nr	50.00	100	
8	Windows and External Doors	43	m2	335.00	14,405	
9	Glazed Porch	3	nr	1,500.00	4,500	
10	Party Walls	112	m2	30.00	3,360	
11	Internal Walls	129	m2	30.00	3,870	100th fair faced blockwork
12	Internal Doors - single	18	nr	215.00	3,870	
13	Internal Doors - double	12	nr	350.00	4,200	
14	Wall Finishes	695	m2	10.00	6,950	Emulsion only
15	Floor Finishes	186	m2	50.00	9,300	Floor Tiles
	Carried Forward				**121,275**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**121,275**	
16	Ceiling Finishes	186	m2	40.00	7,440	
17	Fittings	3	nr	2,500.00	7,500	
18	Sanitary Appliances	3	nr	1,500.00	4,500	
19	Disposal Installations	3	nr	500.00	1,500	
20	Heating and Water Installations	3	nr	7,300.00	21,900	Solar water heating / Wood burner
21	Electrical Installations	3	nr	5,100.00	15,300	Underfloor heating / Lighting & Power
22	Ventilation Installations	3	nr	1,100.00	3,300	Passivent
23	Rainwater harvesting	3	nr	3,000.00	9,000	
24	Photovoltaics	3	nr	4,800.00	14,400	
	Total				**206,115**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	43	m2	105.00	4,515	
2	Upper Floors	43	m2	50.00	2,150	
3	Roof	57	m2	90.00	5,130	Sandtoft Olympus Clay Tiles
4	Stairs	1	nr	950.00	950	
5	External Walls	141	m2	110.00	15,510	Concrete block / Lime render
6	Extra over for timber boarding	19	m2	45.00	855	
7	Extra over for Juliette balconies	1	nr	1,000.00	1,000	
8	Extra over for bird boxes	2	nr	50.00	100	
9	Windows and External Doors	24	m2	335.00	8,040	
10	Internal Walls	78	m2	35.00	2,730	100th dense concrete block
11	Internal Doors - single	11	nr	215.00	2,365	
12	Wall Finishes	297	m2	10.00	2,970	Emulsion only
13	Floor Finishes	86	m2	50.00	4,300	Floor Tiles
14	Ceiling Finishes	86	m2	40.00	3,440	
15	Fittings	1	nr	2,500.00	2,500	
16	Sanitary Appliances	1	nr	1,500.00	1,500	
	Carried Forward				**58,055**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**58,055**	
17	Disposal Installations	1	nr	500.00	500	
18	Heating and Water Installations	1	nr	7,300.00	7,300	Solar water heating / Wood burner
19	Electrical Installations	1	nr	6,300.00	6,300	Underfloor heating / Lighting & Power
20	Ventilation Installations	1	nr	1,100.00	1,100	Passivent
21	Rainwater harvesting	1	nr	3,000.00	3,000	
22	Photovoltaics	1	nr	5,400.00	5,400	
	Total				**81,655**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	86	m2	105.00	9,030	
2	Upper Floors	86	m2	50.00	4,300	
3	Roof	108	m2	90.00	9,720	Sandtoft Olympus Clay Tiles
4	Extra over for Antique slate to plot 21	54	m2	30.00	1,620	Cassius Antique Slate
5	Stairs	2	nr	950.00	1,900	
6	External Walls	203	m2	160.00	32,480	300th Dense Concrete Block / Lime render
7	Extra over for timber boarding	37	m2	45.00	1,665	
8	Extra over for bird boxes	2	nr	50.00	100	
9	Windows and External Doors	49	m2	335.00	16,415	
10	Glazed Porches	2	nr	1,500.00	3,000	
11	Party Walls	47	m2	30.00	1,410	
12	Internal Walls	165	m2	30.00	4,950	100 fair faced blockwork
13	Internal Doors - single	9	nr	215.00	1,935	
14	Internal Doors - double	1	nr	350.00	350	
15	Wall Finishes	627	m2	10.00	6,270	Emulsion only
	Carried Forward				**95,145**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**95,145**	
16	Floor Finishes	172	m2	50.00	8,600	Floor Tiles
17	Ceiling Finishes	172	m2	40.00	6,880	
18	Fittings	2	nr	2,500.00	5,000	
19	Sanitary Appliances	2	nr	1,200.00	2,400	
20	Disposal Installations	2	nr	500.00	1,000	
21	Heating and Water Installations	2	nr	7,300.00	14,600	Solar water heating / Wood burner
22	Electrical Installations	2	nr	6,300.00	12,600	Underfloor heating / Lighting & Power
23	Ventilation Installations	2	nr	1,100.00	2,200	Passivent
24	Rainwater harvesting	2	nr	3,000.00	6,000	
25	Photovoltaics	2	nr	5,400.00	10,800	
26	Bat roosts	1	nr	75.00	75	Plot 22 only
	Total				**165,300**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	60	m2	105.00	6,300	
2	Upper Floors	60	m2	50.00	3,000	
3	Roof	75	m2	200.00	15,000	Curved Roof. Standing seam zinc
4	Stairs	1	nr	950.00	950	
5	External Walls	163	m2	110.00	17,930	Concrete block / Lime render
6	Extra over for timber boarding	109	m2	45.00	4,905	
7	Extra over for bird boxes	2	nr	50.00	100	
8	Windows and External Doors	42	m2	335.00	14,070	
9	Glazed Porch	1	nr	1,500.00	1,500	
10	Extra over for bullnose window	1	nr	100.00	100	
11	Internal Walls	102	m2	35.00	3,570	100th dense concrete block
12	Internal Doors - single	14	nr	215.00	3,010	
13	Wall Finishes	367	m2	10.00	3,670	Emulsion only
14	Floor Finishes	120	m2	50.00	6,000	Floor Tiles
15	Ceiling Finishes	120	m2	40.00	4,800	
16	Fittings	1	nr	2,950.00	2,950	
	Carried Forward				**87,855**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**87,855**	
17	Sanitary Appliances	1	nr	2,400.00	2,400	
18	Disposal Installations	1	nr	500.00	500	
19	Heating and Water Installations	1	nr	7,900.00	7,900	Solar water heating / Wood burner
20	Electrical Installations	1	nr	8,200.00	8,200	Underfloor heating / Lighting & Power
21	Ventilation Installations	1	nr	1,100.00	1,100	Passivent
22	Rainwater harvesting	1	nr	4,000.00	4,000	
23	Photovoltaics	1	nr	5,700.00	5,700	
24	Bat roosts	1	nr	75.00	75	
	Total				**117,730**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	54	m2	105.00	5,670	
2	Upper Floors	54	m2	50.00	2,700	
3	Roof	69	m2	90.00	6,210	Sandtoft Olympus Clay Tiles
4	Stairs	1	nr	950.00	950	
5	External Walls	144	m2	110.00	15,840	Concrete block / Lime render
6	Extra over for timber boarding	26	m2	45.00	1,170	
7	Extra over for Juliette balconies	1	nr	1,000.00	1,000	
8	Extra over for bird boxes	2	nr	50.00	100	
9	Windows and External Doors	42	m2	335.00	14,070	
10	Extra over for bullnose window	1	nr	100.00	100	
11	Internal Walls	96	m2	35.00	3,360	100th dense concrete block
12	Internal Doors - single	14	nr	215.00	3,010	
13	Wall Finishes	336	m2	10.00	3,360	Emulsion only
14	Floor Finishes	108	m2	50.00	5,400	Floor Tiles
15	Ceiling Finishes	108	m2	40.00	4,320	
16	Fittings	1	nr	2,950.00	2,950	
	Carried Forward				**70,210**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**70,210**	
17	Sanitary Appliances	1	nr	2,400.00	2,400	
18	Disposal Installations	1	nr	500.00	500	
19	Heating and Water Installations	1	nr	7,900.00	7,900	Solar water heating / Wood burner
20	Electrical Installations	1	nr	7,600.00	7,600	Underfloor heating / Lighting & Power
21	Ventilation Installations	1	nr	1,100.00	1,100	Passivent
22	Rainwater harvesting	1	nr	4,000.00	4,000	
23	Photovoltaics	1	nr	5,700.00	5,700	
24	Bat roosts	1	nr	75.00	75	
	Total				**99,485**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	86	m2	105.00	9,030	
2	Upper Floors	86	m2	50.00	4,300	
3	Roof	108	m2	90.00	9,720	Sandtoft Olympus Clay Tiles
4	Extra over for Antique slate to plot 25	54	m2	30.00	1,620	Cassius Antique Clay Tiles
5	Stairs	2	nr	950.00	1,900	
6	External Walls	181	m2	160.00	28,960	300th Dense Concrete Block / Lime render
7	Extra over for timber boarding	37	m2	45.00	1,665	
8	Extra over for Juliette balconies	2	nr	1,000.00	2,000	
9	Extra over for bird boxes	2	nr	50.00	100	
10	Windows and External Doors	49	m2	335.00	16,415	
11	Party Walls	60	m2	30.00	1,800	
12	Internal Walls	165	m2	30.00	4,950	100 fair faced blockwork
13	Internal Doors - single	9	nr	215.00	1,935	
14	Internal Doors - double	1	nr	350.00	350	
15	Wall Finishes	631	m2	10.00	6,310	Emulsion only
	Carried Forward				**91,055**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**91,055**	
16	Floor Finishes	172	m2	50.00	8,600	Floor Tiles
17	Ceiling Finishes	172	m2	40.00	6,880	
18	Fittings	2	nr	2,500.00	5,000	
19	Sanitary Appliances	2	nr	1,500.00	3,000	
20	Disposal Installations	2	nr	500.00	1,000	
21	Heating and Water Installations	2	nr	7,300.00	14,600	Solar water heating / Wood burner
22	Electrical Installations	2	nr	6,300.00	12,600	Underfloor heating / Lighting & Power
23	Ventilation Installations	2	nr	1,100.00	2,200	Passivent
24	Rainwater harvesting	2	nr	3,000.00	6,000	
25	PhotoVoltaics	2	nr	5,400.00	10,800	
	Total				**161,735**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	54	m2	105.00	5,670	
2	Upper Floors	54	m2	50.00	2,700	
3	Roof	69	m2	200.00	13,800	Curved roof. Standing Seam Zinc
4	Stairs	1	nr	950.00	950	
5	External Walls	144	m2	110.00	15,840	Concrete block / Lime render
6	Extra over for timber boarding	108	m2	45.00	4,860	
7	Extra over for Juliette balconies	1	nr	1,000.00	1,000	
8	Extra over for bird boxes	2	nr	50.00	100	
9	Windows and External Doors	42	m2	335.00	14,070	
10	Glazed Porch	1	nr	1,500.00	1,500	
11	Extra over for bullnose window	1	nr	100.00	100	
12	Internal Walls	96	m2	35.00	3,360	100th dense concrete block
13	Internal Doors - single	14	nr	215.00	3,010	
14	Wall Finishes	336	m2	10.00	3,360	Emulsion only
15	Floor Finishes	108	m2	50.00	5,400	Floor Tiles
16	Ceiling Finishes	108	m2	40.00	4,320	
	Carried Forward				**80,040**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**80,040**	
17	Fittings	1	nr	2,950.00	2,950	
18	Sanitary Appliances	1	nr	2,400.00	2,400	
19	Disposal Installations	1	nr	500.00	500	
20	Heating and Water Installations	1	nr	7,900.00	7,900	Solar water heating / Wood burner
21	Electrical Installations	1	nr	7,600.00	7,600	Underfloor heating / Lighting & Power
22	Ventilation Installations	1	nr	1,100.00	1,100	Passivent
23	Rainwater harvesting	1	nr	4,000.00	4,000	
24	Photovoltaics	1	nr	5,700.00	5,700	
	Total				**112,190**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	86	m2	105.00	9,030	
2	Upper Floors	86	m2	50.00	4,300	
3	Roof	108	m2	120.00	12,960	Cassius Antique Slate
4	Stairs	2	nr	950.00	1,900	
5	External Walls	181	m2	160.00	28,960	300th Dense Concrete Block / Lime render
6	Extra over for timber boarding	37	m2	45.00	1,665	
7	Extra over for Juliette balconies	2	nr	1,000.00	2,000	
8	Extra over for bird boxes	2	nr	50.00	100	
9	Windows and External Doors	49	m2	335.00	16,415	
10	Glazed Porch	2	nr	1,500.00	3,000	
11	Party Walls	60	m2	30.00	1,800	
12	Internal Walls	165	m2	30.00	4,950	100 fair faced blockwork
13	Internal Doors - single	9	nr	215.00	1,935	
14	Internal Doors - double	1	nr	350.00	350	
15	Wall Finishes	631	m2	10.00	6,310	Emulsion only
	Carried Forward				95,675	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				95,675	
16	Floor Finishes	172	m2	50.00	8,600	Floor Tiles
17	Ceiling Finishes	172	m2	40.00	6,880	
18	Fittings	2	nr	2,500.00	5,000	
19	Sanitary Appliances	2	nr	1,500.00	3,000	
20	Disposal Installations	2	nr	500.00	1,000	
21	Heating and Water Installations	2	nr	7,300.00	14,600	Solar water heating / Wood burner
22	Electrical Installations	2	nr	6,300.00	12,600	Underfloor heating / Lighting & Power
23	Ventilation Installations	2	nr	1,100.00	2,200	Passivent
24	Rainwater harvesting	2	nr	3,000.00	6,000	
25	Photovoltaics	2	nr	5,400.00	10,800	
	Total				**166,355**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	43	m2	105.00	4,515	
2	Upper Floors	43	m2	50.00	2,150	
3	Roof	57	m2	90.00	5,130	Sandtoft Olympus Clay Tiles
4	Stairs	1	nr	950.00	950	
5	External Walls	141	m2	110.00	15,510	Concrete block / Lime render
6	Extra over for timber boarding	19	m2	45.00	855	
7	Extra over for Juliette balconies	1	nr	1,000.00	1,000	
8	Extra over for bird boxes	2	nr	50.00	100	
9	Windows and External Doors	24	m2	335.00	8,040	
10	Internal Walls	78	m2	35.00	2,730	100th dense concrete block
11	Internal Doors - single	11	nr	215.00	2,365	
12	Wall Finishes	297	m2	10.00	2,970	Emulsion only
13	Floor Finishes	86	m2	50.00	4,300	Floor Tiles
14	Ceiling Finishes	86	m2	40.00	3,440	
15	Fittings	1	nr	2,500.00	2,500	
16	Sanitary Appliances	1	nr	1,500.00	1,500	
	Carried Forward				**58,055**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**58,055**	
17	Disposal Installations	1	nr	500.00	500	
18	Heating and Water Installations	1	nr	7,300.00	7,300	Solar water heating / Wood burner
19	Electrical Installations	1	nr	6,300.00	6,300	Underfloor heating / Lighting & Power
20	Ventilation Installations	1	nr	1,100.00	1,100	Passivent
21	Rainwater harvesting	1	nr	3,000.00	3,000	
22	Photovoltaics	1	nr	5,400.00	5,400	
23	Bat roosts	1	nr	75.00	75	
	Total				**81,730**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	43	m2	105.00	4,515	
2	Upper Floors	43	m2	50.00	2,150	
3	Roof	57	m2	120.00	6,840	Cassius Antique Slate
4	Stairs	1	nr	950.00	950	
5	External Walls	141	m2	110.00	15,510	Concrete block / Lime render
6	Extra over for timber boarding	19	m2	45.00	855	
7	Extra over for Juliette balconies	1	nr	1,000.00	1,000	
8	Extra over for bird boxes	2	nr	50.00	100	
9	Windows and External Doors	24	m2	335.00	8,040	
10	Internal Walls	78	m2	35.00	2,730	100th dense concrete block
11	Internal Doors - single	11	nr	215.00	2,365	
12	Wall Finishes	297	m2	10.00	2,970	Emulsion only
13	Floor Finishes	86	m2	50.00	4,300	Floor Tiles
14	Ceiling Finishes	86	m2	40.00	3,440	
15	Fittings	1	nr	2,500.00	2,500	
16	Sanitary Appliances	1	nr	1,500.00	1,500	
	Carried Forward				**59,765**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**59,765**	
17	Disposal Installations	1	nr	500.00	500	
18	Heating and Water Installations	1	nr	7,300.00	7,300	Solar water heating / Wood burner
19	Electrical Installations	1	nr	6,300.00	6,300	Underfloor heating / Lighting & Power
20	Ventilation Installations	1	nr	1,100.00	1,100	Passivent
21	Rainwater harvesting	1	nr	3,000.00	3,000	
22	Photovoltaics	1	nr	5,400.00	5,400	
23	Bat roosts	1	nr	75.00	75	
	Total				**83,440**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	43	m2	105.00	4,515	
2	Upper Floors	43	m2	50.00	2,150	
3	Roof	57	m2	120.00	6,840	Cassius Antique Slate
4	Stairs	1	nr	950.00	950	
5	External Walls	141	m2	110.00	15,510	Concrete block / Lime render
6	Extra over for timber boarding	19	m2	45.00	855	
7	Extra over for Juliette balconies	1	nr	1,000.00	1,000	
8	Extra over for bird boxes	2	nr	50.00	100	
9	Windows and External Doors	24	m2	335.00	8,040	
10	Internal Walls	78	m2	35.00	2,730	100th dense concrete block
11	Internal Doors - single	11	nr	215.00	2,365	
12	Wall Finishes	297	m2	10.00	2,970	Emulsion only
13	Floor Finishes	86	m2	50.00	4,300	Floor Tiles
14	Ceiling Finishes	86	m2	40.00	3,440	
15	Fittings	1	nr	2,500.00	2,500	
16	Sanitary Appliances	1	nr	1,500.00	1,500	
	Carried Forward				**59,765**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**59,765**	
17	Disposal Installations	1	nr	500.00	500	
18	Heating and Water Insfallations	1	nr	7,300.00	7,300	Solar water heating / Wood burner
19	Electrical Installations	1	nr	6,300.00	6,300	Underfloor heating / Lighting & Power
20	Ventilation Installations	1	nr	1,100.00	1,100	Passivent
21	Rainwater harvesting	1	nr	3,000.00	3,000	
22	Photovoltaics	1	nr	5,400.00	5,400	
	Total				**83,365**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	86	m2	105.00	9,030	
2	Upper Floors	86	m2	50.00	4,300	
3	Roof	108	m2	90.00	9,720	Sandtoft Olympus Clay Tiles
4	Stairs	2	nr	950.00	1,900	
5	External Walls	181	m2	160.00	28,960	300th Dense Concrete Block / Lime render
6	Extra over for timber boarding	37	m2	45.00	1,665	
7	Extra over for Juliette balconies	2	nr	1,000.00	2,000	
8	Extra over for bird boxes	2	nr	50.00	100	
9	Windows and External Doors	49	m2	335.00	16,415	
10	Glazed Porch	2	nr	1,500.00	3,000	
11	Party Walls	60	m2	30.00	1,800	
12	Internal Walls	165	m2	30.00	4,950	100 fair faced blockwork
13	Internal Doors - single	9	nr	215.00	1,935	
14	Internal Doors - double	1	nr	350.00	350	
15	Wall Finishes	631	m2	10.00	6,310	Emulsion only
	Carried Forward				**92,435**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**92,435**	
16	Floor Finishes	172	m2	50.00	8,600	Floor Tiles
17	Ceiling Finishes	172	m2	40.00	6,880	
18	Fittings	2	nr	2,500.00	5,000	
19	Sanitary Appliances	2	nr	1,500.00	3,000	
20	Disposal Installations	2	nr	500.00	1,000	
21	Heating and Water Installations	2	nr	7,300.00	14,600	Solar water heating / Wood burner
22	Electrical Installations	2	nr	6,300.00	12,600	Underfloor heating / Lighting & Power
23	Ventilation Installations	2	nr	1,100.00	2,200	Passivent
24	Rainwater harvesting	2	nr	3,000.00	6,000	
25	Photovoltaics	2	nr	5,400.00	10,800	
	Total				**163,115**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	60	m2	105.00	6,300	
2	Upper Floors	60	m2	50.00	3,000	
3	Roof	75	m2	120.00	9,000	Cassius Antique Slate
4	Stairs	1	nr	950.00	950	
5	External Walls	163	m2	110.00	17,930	Concrete block / Lime render
6	Extra over for timber boarding	28	m2	45.00	1,260	
7	Extra over for bird boxes	2	nr	50.00	100	
8	Windows and External Doors	42	m2	335.00	14,070	
9	Glazed Porch	1	nr	1,500.00	1,500	
10	Extra over for bullnose window	1	nr	100.00	100	
11	Internal Walls	102	m2	35.00	3,570	100th dense concrete block
12	Internal Doors - single	14	nr	215.00	3,010	
13	Wall Finishes	367	m2	10.00	3,670	Emulsion only
14	Floor Finishes	120	m2	50.00	6,000	Floor Tiles
15	Ceiling Finishes	120	m2	40.00	4,800	
16	Fittings	1	nr	2,950.00	2,950	
	Carried Forward				**78,210**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**78,210**	
17	Sanitary Appliances	1	nr	2,400.00	2,400	
18	Disposal Installations	1	nr	500.00	500	
19	Heating and Water Installations	1	nr	7,900.00	7,900	Solar water heating / Wood burner
20	Electrical Installations	1	nr	8,200.00	8,200	Underfloor heating / Lighting & Power
21	Ventilation Installations	1	nr	1,100.00	1,100	Passivent
22	Rainwater harvesting	1	nr	4,000.00	4,000	
23	Photovoltaics	1	nr	5,700.00	5,700	
	Total				**108,010**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	54	m2	105.00	5,670	
2	Upper Floors	54	m2	50.00	2,700	
3	Roof	69	m2	120.00	8,280	Cassius Antique Slate
4	Stairs	1	nr	950.00	950	
5	External Walls	144	m2	110.00	15,840	Concrete block / Lime render
6	Extra over for timber boarding	26	m2	45.00	1,170	
7	Extra over for Juliette balconies	1	nr	1,000.00	1,000	
8	Extra over for bird boxes	2	nr	50.00	100	
9	Windows and External Doors	42	m2	335.00	14,070	
10	Glazed Porch	1	nr	1,500.00	1,500	
11	Extra over for bullnose window	1	nr	100.00	100	
12	Internal Walls	96	m2	35.00	3,360	100th dense concrete block
13	Internal Doors - single	14	nr	215.00	3,010	
14	Wall Finishes	336	m2	10.00	3,360	Emulsion only
15	Floor Finishes	108	m2	50.00	5,400	Floor Tiles
16	Ceiling Finishes	108	m2	40.00	4,320	
	Carried Forward				**70,830**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**70,830**	
17	Fittings	1	nr	2,950.00	2,950	
18	Sanitary Appliances	1	nr	2,400.00	2,400	
19	Disposal Installations	1	nr	500.00	500	
20	Heating and Water Installations	1	nr	7,900.00	7,900	Solar water heating / Wood burner
21	Electrical Installations	1	nr	7,600.00	7,600	Underfloor heating / Lighting & Power
22	Ventilation Installations	1	nr	1,100.00	1,100	Passivent
23	Rainwater harvesting	1	nr	4,000.00	4,000	
24	Photovoltaics	1	nr	5,700.00	5,700	
	Total				**102,980**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	90	m2	105.00	9,450	
2	Upper Floors	101	m2	50.00	5,050	
3	Roof	128	m2	120.00	15,360	Cassius Antique Slate
4	Stairs	3	nr	950.00	2,850	
5	External Walls	261	m2	160.00	41,760	300th Dense Concrete Block / Lime render
6	Extra over for timber boarding	2	m2	45.00	90	
7	Extra over for bird boxes	2	nr	50.00	100	
8	Windows and External Doors	43	m2	335.00	14,405	
9	Glazed Porch	3	nr	1,500.00	4,500	
10	Party Walls	112	m2	30.00	3,360	
11	Internal Walls	129	m2	30.00	3,870	100th fair faced blockwork
12	Internal Doors - single	18	nr	215.00	3,870	
13	Internal Doors - double	12	nr	350.00	4,200	
14	Wall Finishes	743	m2	10.00	7,430	Emulsion only
15	Floor Finishes	186	m2	50.00	9,300	Floor Tiles
	Carried Forward				125,595	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**125,595**	
16	Ceiling Finishes	186	m2	40.00	7,440	
17	Fittings	3	nr	2,500.00	7,500	
18	Sanitary Appliances	3	nr	1,500.00	4,500	
19	Disposal Installations	3	nr	500.00	1,500	
20	Heating and Water Installations	3	nr	7,300.00	21,900	Solar water heating / Wood burner
21	Electrical Installations	3	nr	5,100.00	15,300	Underfloor heating / Lighting & Power
22	Ventilation Installations	3	nr	1,100.00	3,300	Passivent
23	Rainwater harvesting	3	nr	3,000.00	9,000	
24	Photovoltaics	3	nr	4,800.00	14,400	
	Total				**210,435**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	43	m2	105.00	4,515	
2	Upper Floors	43	m2	50.00	2,150	
3	Roof	57	m2	120.00	6,840	Cassius Antique Slate
4	Stairs	1	nr	950.00	950	
5	External Walls	141	m2	110.00	15,510	Concrete block / Lime render
6	Extra over for timber boarding	19	m2	45.00	855	
7	Extra over for Juliette balconies	1	nr	1,000.00	1,000	
8	Extra over for bird boxes	2	nr	50.00	100	
9	Windows and External Doors	24	m2	335.00	8,040	
10	Internal Walls	78	m2	35.00	2,730	100th dense concrete block
11	Internal Doors - single	11	nr	215.00	2,365	
12	Wall Finishes	297	m2	10.00	2,970	Emulsion only
13	Floor Finishes	86	m2	50.00	4,300	Floor Tiles
14	Ceiling Finishes	86	m2	40.00	3,440	
15	Fittings	1	nr	2,500.00	2,500	
16	Sanitary Appliances	1	nr	1,500.00	1,500	
	Carried Forward				**59,765**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**59,765**	
17	Disposal Installations	1	nr	500.00	500	
18	Heating and Water Installations	1	nr	7,300.00	7,300	Solar water heating / Wood burner
19	Electrical Installations	1	nr	6,300.00	6,300	Underfloor heating / Lighting & Power
20	Ventilation Installations	1	nr	1,100.00	1,100	Passivent
21	Rainwater harvesting	1	nr	3,000.00	3,000	
22	Photovoltaics	1	nr	5,400.00	5,400	
	Total				**83,365**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	54	m2	105.00	5,670	
2	Upper Floors	54	m2	50.00	2,700	
3	Roof	69	m2	120.00	8,280	Cassius Antique Slate
4	Stairs	1	nr	950.00	950	
5	External Walls	144	m2	110.00	15,840	Concrete block / Lime render
6	Extra over for timber boarding	26	m2	45.00	1,170	
7	Extra over for Juliette balconies	1	nr	1,000.00	1,000	
8	Extra over for bird boxes	2	nr	50.00	100	
9	Windows and External Doors	42	m2	335.00	14,070	
10	Glazed Porch	1	nr	1,500.00	1,500	
11	Extra over for bullnose window	1	nr	100.00	100	
12	Internal Walls	96	m2	35.00	3,360	100th dense concrete block
13	Internal Doors - single	14	nr	215.00	3,010	
14	Wall Finishes	336	m2	10.00	3,360	Emulsion only
15	Floor Finishes	108	m2	50.00	5,400	Floor Tiles
16	Ceiling Finishes	108	m2	40.00	4,320	
	Carried Forward				**70,830**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**70,830**	
17	Fittings	1	nr	2,950.00	2,950	
18	Sanitary Appliances	1	nr	2,400.00	2,400	
19	Disposal Installations	1	nr	500.00	500	
20	Heating and Water Installations	1	nr	7,900.00	7,900	Solar water heating / Wood burner
21	Electrical Installations	1	nr	7,600.00	7,600	Underfloor heating / Lighting & Power
22	Ventilation Installations	1	nr	1,100.00	1,100	Passivent
23	Rainwater harvesting	1	nr	4,000.00	4,000	
24	Photovoltaics	1	nr	5,700.00	5,700	
25	Bat roosts	1	nr	75.00	75	
	Total				**103,055**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	54	m2	105.00	5,670	
2	Upper Floors	54	m2	50.00	2,700	
3	Roof	69	m2	200.00	13,800	Curved roof. Standing Seam Zinc
4	Stairs	1	nr	950.00	950	
5	External Walls	144	m2	110.00	15,840	Concrete block / Lime render
6	Extra over for timber boarding	108	m2	45.00	4,860	
7	Extra over for Juliette balconies	1	nr	1,000.00	1,000	
8	Extra over for bird boxes	2	nr	50.00	100	
9	Windows and External Doors	42	m2	335.00	14,070	
10	Extra over for bullnose window	1	nr	100.00	100	
11	Internal Walls	96	m2	35.00	3,360	100th dense concrete block
12	Internal Doors - single	14	nr	215.00	3,010	
13	Wall Finishes	336	m2	10.00	3,360	Emulsion only
14	Floor Finishes	108	m2	50.00	5,400	Floor Tiles
15	Ceiling Finishes	108	m2	40.00	4,320	
16	Fittings	1	nr	2,950.00	2,950	
	Carried Forward				**81,490**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**81,490**	
17	Sanitary Appliances	1	nr	2,400.00	2,400	
18	Disposal Installations	1	nr	500.00	500	
19	Heating and Water Installations	1	nr	7,900.00	7,900	Solar water heating / Wood burner
20	Electrical Installations	1	nr	7,600.00	7,600	Underfloor heating / Lighting & Power
21	Ventilation Installations	1	nr	1,100.00	1,100	Passivent
22	Rainwater harvesting	1	nr	4,000.00	4,000	
23	Photovoltaics	1	nr	5,700.00	5,700	
24	Bat roosts	1	nr	75.00	75	
	Total				**110,765**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	86	m2	105.00	9,030	
2	Upper Floors	86	m2	50.00	4,300	
3	Roof	108	m2	90.00	9,720	Sandtoft Olympus Clay Tiles
4	Stairs	2	nr	950.00	1,900	
5	External Walls	203	m2	160.00	32,480	300th Dense Concrete Block / Lime render
6	Extra over for timber boarding	37	m2	45.00	1,665	
7	Extra over for bird boxes	2	nr	50.00	100	
8	Windows and External Doors	49	m2	335.00	16,415	
9	Glazed Porches	2	nr	1,500.00	3,000	
10	Party Walls	47	m2	30.00	1,410	
11	Internal Walls	165	m2	30.00	4,950	100 fair faced blockwork
12	Internal Doors - single	9	nr	215.00	1,935	
13	Internal Doors - double	1	nr	350.00	350	
14	Wall Finishes	627	m2	10.00	6,270	Emulsion only
15	Floor Finishes	172	m2	50.00	8,600	Floor Tiles
	Carried Forward				**102,125**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**102,125**	
16	Ceiling Finishes	172	m2	40.00	6,880	
17	Fittings	2	nr	2,500.00	5,000	
18	Sanitary Appliances	2	nr	1,500.00	3,000	
19	Disposal Installations	2	nr	500.00	1,000	
20	Heating and Water Installations	2	nr	7,300.00	14,600	Solar water heating / Wood burner
21	Electrical Installations	2	nr	6,300.00	12,600	Underfloor heating / Lighting & Power
22	Ventilation Installations	2	nr	1,100.00	2,200	Passivent
23	Rainwater harvesting	2	nr	3,000.00	6,000	
24	Photovoltaics	2	nr	5,400.00	10,800	
25	Bat roosts	1	nr	75.00	75	Plot 44 only
	Total				**164,280**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	86	m2	105.00	9,030	
2	Upper Floors	86	m2	50.00	4,300	
3	Roof	108	m2	120.00	12,960	Cassius Antique Slate
4	Stairs	2	nr	950.00	1,900	
5	External Walls	181	m2	160.00	28,960	300th Dense Concrete Block / Lime render
6	Extra over for timber boarding	37	m2	45.00	1,665	
7	Extra over for Juliette balconies	2	nr	1,000.00	2,000	
8	Extra over for bird boxes	2	nr	50.00	100	
9	Windows and External Doors	49	m2	335.00	16,415	
10	Glazed Porch	2	nr	1,500.00	3,000	
11	Party Walls	60	m2	30.00	1,800	
12	Internal Walls	165	m2	30.00	4,950	100 fair faced blockwork
13	Internal Doors - single	9	nr	215.00	1,935	
14	Internal Doors - double	1	nr	350.00	350	
15	Wall Finishes	631	m2	10.00	6,310	Emulsion only
	Carried Forward				**95,675**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**95,675**	
16	Floor Finishes	172	m2	50.00	8,600	Floor Tiles
17	Ceiling Finishes	172	m2	40.00	6,880	
18	Fittings	2	nr	2,500.00	5,000	
19	Sanitary Appliances	2	nr	1,500.00	3,000	
20	Disposal Installations	2	nr	500.00	1,000	
21	Heating and Water Installations	2	nr	7,300.00	14,600	Solar water heating / Wood burner
22	Electrical Installations	2	nr	6,300.00	12,600	Underfloor heating / Lighting & Power
23	Ventilation Installations	2	nr	1,100.00	2,200	Passivent
24	Rainwater harvesting	2	nr	3,000.00	6,000	
25	Photovoltaics	2	nr	5,400.00	10,800	
	Total				**166,355**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	60	m2	105.00	6,300	
2	Upper Floors	60	m2	50.00	3,000	
3	Roof	75	m2	200.00	15,000	Curved roof. Standing seam Zinc
4	Stairs	1	nr	950.00	950	
5	External Walls	163	m2	110.00	17,930	Concrete block / Lime render
6	Extra over for timber boarding	28	m2	45.00	1,260	
7	Extra over for bird boxes	2	nr	50.00	100	
8	Windows and External Doors	42	m2	335.00	14,070	
9	Glazed Porch	1	nr	1,500.00	1,500	
10	Extra over for bullnose window	1	nr	100.00	100	
11	Internal Walls	102	m2	35.00	3,570	100th dense concrete block
12	Internal Doors - single	14	nr	215.00	3,010	
13	Wall Finishes	367	m2	10.00	3,670	Emulsion only
14	Floor Finishes	120	m2	50.00	6,000	Floor Tiles
15	Ceiling Finishes	120	m2	40.00	4,800	
16	Fittings	1	nr	2,950.00	2,950	
	Carried Forward				**84,210**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**84,210**	
17	Sanitary Appliances	1	nr	2,400.00	2,400	
18	Disposal Installations	1	nr	500.00	500	
19	Heating and Water Installations	1	nr	7,900.00	7,900	Solar water heating / Wood burner
20	Electrical Installations	1	nr	8,200.00	8,200	Underfloor heating / Lighting & Power
21	Ventilation Installations	1	nr	1,100.00	1,100	Passivent
22	Rainwater harvesting	1	nr	4,000.00	4,000	
23	Photovoltaics	1	nr	5,700.00	5,700	
	Total				**114,010**	

Project : Long Sutton Sustainable Settlement Extension 49Nr Residential Dwellings
Estimate : Number Two Block of 2Nr 2 Bedroom 3 Person Straw Bale Houses
Price Date : October 2009

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No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	62	m2	105.00	6,510	
2	Upper Floors	62	m2	50.00	3,100	
3	Roof	79	m2	200.00	15,800	Standing Seam Zinc
4	Stairs	2	nr	950.00	1,900	
5	External Walls	167	m2	160.00	26,720	Straw bale / Lime render
6	Extra over for bird boxes	2	nr	50.00	100	
7	Windows and External Doors	31	m2	335.00	10,385	
8	Party Walls	56	m2	30.00	1,680	
9	Internal Walls	86	m2	30.00	2,580	
10	Internal Doors - single	12	nr	215.00	2,580	
11	Internal Doors - double	8	nr	350.00	2,800	
12	Wall Finishes	451	m2	25.00	11,275	High density particle board
13	Floor Finishes	62	m2	50.00	3,100	Floor Tiles
14	Ceiling Finishes	62	m2	40.00	2,480	
15	Fittings	2	nr	2,500.00	5,000	
16	Sanitary Appliances	2	nr	1,500.00	3,000	
	Carried Forward				**99,010**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**99,010**	
17	Disposal Installations	2	nr	500.00	1,000	
18	Heating and Water Installations	2	nr	7,300.00	14,600	Solar water heating / Wood burner
19	Electrical Installations	2	nr	5,100.00	10,200	Underfloor heating / Lighting & Power
20	Ventilation Installations	2	nr	1,100.00	2,200	Passivent
21	Rainwater harvesting	2	nr	3,000.00	6,000	
22	Photovoltaics	2	nr	4,800.00	9,600	
	Total				**142,610**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	43	m2	105.00	4,515	
2	Upper Floors	43	m2	50.00	2,150	
3	Roof	57	m2	200.00	11,400	Standing Seam Zinc
4	Stairs	1	nr	950.00	950	
5	External Walls	141	m2	200.00	28,200	Rammed Earth / Lime render
6	Extra over for timber boarding	19	m2	45.00	855	
7	Extra over for Juliette balconies	1	nr	1,000.00	1,000	
8	Extra over for bird boxes	2	nr	50.00	100	
9	Windows and External Doors	24	m2	335.00	8,040	
10	Internal Walls	78	m2	35.00	2,730	100th dense concrete block
11	Internal Doors - single	11	nr	215.00	2,365	
12	Wall Finishes	297	m2	30.00	8,910	Lime render
13	Floor Finishes	86	m2	50.00	4,300	Floor Tiles
14	Ceiling Finishes	86	m2	40.00	3,440	
15	Fittings	1	nr	2,500.00	2,500	
16	Sanitary Appliances	1	nr	1,500.00	1,500	
	Carried Forward				**82,955**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				82,955	
17	Disposal Installations	1	nr	500.00	500	
18	Heating and Water Installations	1	nr	7,300.00	7,300	Solar water heating / Wood burner
19	Electrical Installations	1	nr	6,300.00	6,300	Underfloor heating / Lighting & Power
20	Ventilation Installations	1	nr	1,100.00	1,100	Passivent
21	Rainwater harvesting	1	nr	3,000.00	3,000	
22	Photovoltaics	1	nr	5,400.00	5,400	
	Total				106,555	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Type G Warehouse / Office				673,915	Plots 51-52, 57-59
2	Type H Warehouse / Office				328,010	Plots 53-56
	Total				**1,001,925**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	765	m2	105.00	80,325	
2	Roof	892	m2	200.00	178,400	Curved roof. Standing seam Zinc. Glulam beams
3	External Walls	657	m2	110.00	72,270	Concrete block / Lime render
4	Windows and External Doors	169	m2	335.00	56,615	
5	Industrial Garage Door	5	nr	2,500.00	12,500	
6	Glazed Porch	5	nr	2,500.00	12,500	
7	Internal Walls	337	m2	35.00	11,795	100th dense concrete block
8	Internal Doors - single	25	nr	215.00	5,375	
9	Internal Doors - double	5	nr	350.00	1,750	
10	Sliding screen	5	nr	350.00	1,750	
11	Wall Finishes	1,331	m2	10.00	13,310	Emulsion only
12	Floor Finishes	765	m2	50.00	38,250	Floor Tiles
13	Ceiling Finishes	765	m2	55.00	42,075	
14	Fittings	5	nr	1,500.00	7,500	
15	Sanitary Appliances	5	nr	2,500.00	12,500	
	Carried Forward				**546,915**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**546,915**	
16	Disposal Installations	5	nr	600.00	3,000	
17	Heating and Water Installations	5	nr	6,100.00	30,500	Solar water heating / Wood burner
18	Electrical Installations	5	nr	8,850.00	44,250	Underfloor heating / Lighting & Power
19	Ventilation Installations	5	nr	1,100.00	5,500	Passivent
20	Rainwater harvesting	5	nr	4,000.00	20,000	
21	Photovoltaics	5	nr	4,750.00	23,750	
	Total				**673,915**	

Project : Long Sutton Sustainable Settlement Extension
Estimate : Number Two
Price Date : October 2009

9Nr Commercial Units
Type H Warehouse / Office

Davis Langdon

No	Description	Quantity	Unit	Rate	Total	Notes
1	Substructure	342	m2	105.00	35,910	
2	Roof	391	m2	200.00	78,200	Curved roof. Standing seam Zinc. Glulam beams
3	External Walls	136	m2	110.00	14,960	Concrete block / Lime render
4	Windows and External Doors	53	m2	335.00	17,755	
5	Industrial Garage Door	4	nr	2,500.00	10,000	
6	Glazed Porch	4	nr	2,500.00	10,000	
7	Party Walls	88	m2	30.00	2,640	
8	Internal Walls	197	m2	35.00	6,895	100th dense concrete block
9	Internal Doors - single	16	nr	215.00	3,440	
10	Internal Doors - double	4	nr	350.00	1,400	
11	Sliding screen	4	nr	350.00	1,400	
12	Wall Finishes	530	m2	10.00	5,300	Emulsion only
13	Floor Finishes	342	m2	50.00	17,100	Floor Tiles
14	Ceiling Finishes	342	m2	55.00	18,810	
15	Fittings	4	nr	1,500.00	6,000	
	Carried Forward				**229,810**	

No	Description	Quantity	Unit	Rate	Total	Notes
	Brought Forward				**229,810**	
16	Sanitary Appliances	4	nr	2,500.00	10,000	
17	Disposal Installations	4	nr	600.00	2,400	
18	Heating and Water Installations	4	nr	6,100.00	24,400	Solar water heating / Wood burner
19	Electrical Installations	4	nr	5,500.00	22,000	Underfloor heating / Lighting & Power
20	Ventilation Installations	4	nr	1,100.00	4,400	Passivent
21	Rainwater harvesting	4	nr	4,000.00	16,000	
22	Photovoltaics	4	nr	4,750.00	19,000	
	Total				**328,010**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	External Works				1,086,003	
2	External Services				409,104	
	Total				**1,495,107**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Site Clearance	38,964	m2	2.00	77,928	
2	Access Road	6,592	m2	60.00	395,520	
3	Parking Areas	2,626	m2	45.00	118,170	
4	Paths, Paving and Patios	184	m2	25.00	4,600	
5	External Stores - houses	49	nr	500.00	24,500	
6	External Stores - Commercial Units	9	nr	1,000.00	9,000	
7	Boundary Hedging	3,648	m	20.00	72,960	
8	Allotments	1,703	m2	25.00	42,575	
9	Wetland Area	660	m2	150.00	99,000	
10	Gates to rear gardens	49	nr	180.00	8,820	
11	Landscaping	23,724	m2	7.50	177,930	
12	Planting		Item		55,000	
	Total				**1,086,003**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Service Connections	58	nr	2,500.00	145,000	
2	Site Lighting	6,592	m2	12.00	79,104	
3	Diversion of 11kV overhead electricity cables to underground		item		35,000	
4	Vertical Axis Wind Turbines	5	nr	30,000.00	150,000	
	Total				**409,104**	

No	Description	Quantity	Unit	Rate	Total	Notes
1	Drainage				299,360	
	Total				**299,360**	

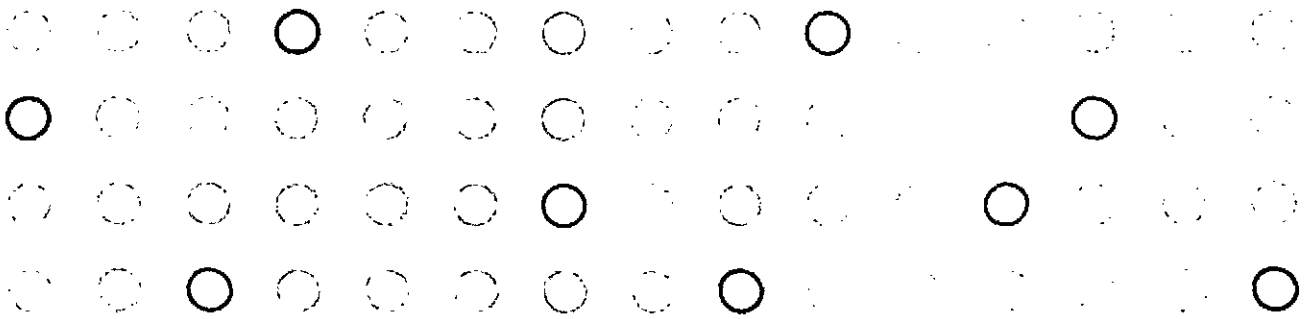
No	Description	Quantity	Unit	Rate	Total	Notes
1	Building Area	5,266	m2	20.00	105,320	
2	Hard Paved Area	9,402	m2	20.00	188,040	
3	Sewer Connections	2	nr	3,000.00	6,000	
	Total				**299,360**	

Submitted by:

Justin Coote
Associate

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Davis Langdon

27 October 2009
P/64638/A/01/NJS

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Dr J Harrall
Search Architects
89 Gedney Road
Long Sutton
Spalding, Lincs
PE12 9JU

Dear Jerry

Long Sutton Sustainable Settlement Extension

We write further to our discussions of 27 October 2009 regarding the anticipated development costs of the scheme in the sum of £7,565,000.00.

In comparing the forecast costs of this development with other similar schemes, recognition must be given to the sustainable design and enhanced environmental considerations. The overall scheme is in the region of 15-20% more expensive to deliver than comparable schemes.

This can be justified when looking at benchmark data. The residential units are in the region of 25% more on a cost per m² comparison. The commercial units have within the costs, about an 8% allowance for environmental enhancements. In addition, the costs for the commercial units include much more of the fit-out items than would be expected in normal speculative developer standards.

Yours sincerely

J Coote BSc (Hons) MRICS
Associate

Enc

Global construction consultants

Cost Management | Project Management | Program Management | Banking Tax & Finance | Building Surveying | CDM-C | Design Project Management Engineering Services | Legal Support | Management Consulting | Mixed-use Masterplanning | Specification Consulting | Value Planning & Risk

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27 October 2009
P/64638/A/01/NJS

Dr J Harrall
Search Architects
89 Gedney Road
Long Sutton
Spalding, Lincs
PE12 9JU

Dear Jerry

Long Sutton Sustainable Settlement Extension

We write enclosing our Budget Estimate Nr 2 in respect of the above, which has been revised to reflect our discussions of 27 October 2009.

The adjustments are centred on the reduction of the required renewable energy sources and are detailed below:-

	£
o Residential Photovoltaics	(173,000.00)
o Commercial Photovoltaics	(43,000.00)
o Wind Turbines	(90,000.00)
o Preliminaries	(33,000.00)
o Contingency	(11,000.00)
	£ (350,000.00)

We trust the above is self explanatory. If you have any queries please call to discuss.

Yours sincerely

J Coote BSc (Hons) MRICS
Associate

Enc

Global construction consultants

Cost Management | Project Management | Program Management | Banking Tax & Finance | Building Surveying | CDM-C | Design Project Management Engineering Services | Legal Support | Management Consulting | Mixed-use Masterplanning | Specification Consulting | Value Planning & Risk

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APPENDIX B

C Carters Estate Agents' Valuation Report October 2009



C. CARTERS
Estate Agents



26th October, 2009

Dr J Harrall
SEArch
89 Gedney Road
Long Sutton
SPALDING
Lincs PE12 9JU

Dear Dr Harrall

RE: THE LONG SUTTON SUSTAINABLE SETTLEMENT EXTENSION DEVELOPMENT ON LAND ADJACENT 47 BRIDGE ROAD, LONG SUTTON

Many thanks for inviting my Company to conduct a marketing appraisal on the above proposed development.

We have compiled a Market Appraisal of the Open Market Value for this mixed residential and commercial development based on prevailing market conditions. An upper range of figures have also been included, reflecting a possible premium, anticipating a strong public interest due to the individual and environmentally sound nature of the properties. Given the unusual nature of the development and the conservative nature of the local housing market, there is a risk the buildings may be too avant-garde for some. If this were the case, the valuations offered would need reassessing accordingly.

This appraisal refers to the detailed descriptions and specifications contained within the Design and Access Statement and detailed scheme drawings as listed below:-

Site Layout
Plots 2 & 3 Nellbury Avenue – Plans & Elevations
Plot 4 Winter Solstice East – Plans & Elevations
Plots 5 & 6 Winter Solstice East – Plans
Plots 5 & 6 Winter Solstice East – Elevations
Plots 7 & 8 Winter Solstice East – Plans
Plots 7 & 8 Winter Solstice East – Elevations
Plots 9, 10 & 11 Winter Solstice East – Plans
Plots 9, 10 & 11 Winter Solstice East – Elevations
Plot 12 Equinox East – Plans & Elevations
Plots 13 & 14 Equinox East – Elevations
Plots 13 & 14 Equinox East – Plans
Plots 15 & 16 Equinox East – Plans & Elevations
Plots 17, 18 & 19 Equinox East – Plans
Plots 28, 29, 34 & 35 Equinox West – Plans
Plots 28, 29, 34 & 35 Equinox West – Elevations
Plots, 30, 32 & 33 Equinox West – Plans & Elevations
Plot 36 Equinox West – Plans & Elevations
Plot 37 & 42 Winter Solstice West – Plans & Elevations
Plots 38, 39 & 40 Winter Solstice West – Plans
Plots 38, 39 & 40 Winter Solstice West – Elevations
Plot 41 Winter Solstice West – Plans & Elevations
Plot 43 Winter Solstice West – Plans & Elevations
Plots 44 & 45 Winter Solstice West – Plans
Plots 44 & 45 Winter Solstice West – Elevations
Plots 46 & 47 Winter Solstice West – Plans
Plots 46 & 47 Winter Solstice West – Elevations
Plot 48 Winter Solstice West – Plans & Elevations

☑ 5 Bridge Street, Wisbech, Cambs. PE13 1AF Tel: 01945 588111 Fax: 01945 588849 Email: carters.ltd@btconnect.com
☐ "Foresters Hall", 6 High Street, Long Sutton, Lincs. PE12 9DB Tel: 01406 363600 Fax: 01406 363683 Email: ccarters.a1@btconnect.com

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Plots 17, 18 & 19 Equinox East – Elevations
Plot 20 Summer Solstice East – Plans & Elevations
Plots 21 & 22 Summer Solstice East – Plans
Plots 21 & 22 Summer Solstice East – Elevations
Plot 23 Summer Solstice East – Plans & Elevations
Plot 24 Summer Solstice West – Plans & Elevations
Plots 25 & 26 Summer Solstice West – Plans & Elevations
Plot 27 Equinox West – Plans & Elevations
Plots 49 & 49a Nellbury Avenue – Plans & Elevations
Plot 50 Nellbury Avenue – Plans & Elevations
Plot 51 Solar Way – Plans & Elevations
Plots 52, 57, 58 & 59 Solar Way – Plans & Elevations
Plots 56, 55, 54 & 53 Solar Way – Plans
Plots 56, 55, 54 & 53 Solar Way, Elevations

The proposal is on a 10.45 acre (4.23 Ha) site which is strategically located on the eastern edge of the Market Town of Long Sutton with good access to a regular public transport network to Spalding, King's Lynn, Wisbech and Peterborough.

Local services i.e. schools, shops and Health Centre are all within reasonable walking distances using an established network of footpaths, with the town's major employer 'Premier Foods' 1 Km away.

Included in the scheme is a wide range of accommodation provision both commercial (150 m^2 to 86 m^2 gross floor area) and residential (2, 3 and 4 bedroom houses).

Parking provision is appropriately generous for a rural settlement, varying from 2 spaces for a 2 bed house and 4 spaces for a 4 bed house.

Commercial parking provision includes for cars, bicycles and adequate deliveries from light service vehicles.

Extraordinary building performance standards are proposed for both the houses and business units, making the development a one-off in terms of its scale in this geographical region.

The business units are designed to achieve the following:-

- Zero heating status
- No CO_2 emissions
- Harvest rainwater
- Passive ventilation

To help achieve a zero heating status, each business unit is to include the following:-

- photovoltaic's to the roof
- solar water heating
- Super-insulated envelope
- High thermal mass fabric
- Orientation about the sun
- South facing glazing
- Rendered and timber-clad facades

The prospect of reduced energy and utility bills and high environmental standards for all the properties is expected to attract interest from businesses and households locally and further afield, outside of the District. Inevitable, future fuel cost rises could make this project an attractive alternative venue for local businesses to relocate providing them with a competitive edge. It could also be attractive for householders giving them the opportunity to be better able to cope with inevitable mortgage interest increases.

Anticipated achievable sale prices for this development in the currently depressed property market have been compiled using recorded current sale figures from www.rightmove.co.uk and C. Carters Estate Agents own database.

SCHEDULE OF ACCOMODATION AND OPEN MARKET VALUES
(Predicted achievable sale prices)

Residential

2 Bedroom 3 person Semi-Detached Houses	10 Nr	@	62 m^2 each £115,000. =	1,150,000.00
2 Bedroom 3 person Semi-Detached Houses	2 Nr	@	75 m^2 each £120,000. =	240,000.00
3 Bedroom 5 person Semi-Detached Houses	16 Nr	@	86 m^2 each £145,000. =	2,320,000.00
3 Bedroom 5 person Detached Houses	13 Nr	@	86 m^2 each £155,000. =	2,015,000.00
4 Bedroom 6 person Detached Houses	5 Nr	@	108 m^2 each £170,000. =	850,000.00
4 Bedroom 7 person Detached Houses	3 Nr	@	119 m^2 each £180,000. =	540,000.00
	49 Nr		**Total =**	**£7,115,000.00**

Commercial

Warehouse/Office	5 Nr	@	153 m^2 each £125,000. =	625,000.00
Warehouse/Office	*4 Nr*	*@*	*85 m^2 each £75,000. =*	*300,000.00*
	9 Nr		**Total =**	**£925,000.00**
			OMV (Open Market Value) =	**£8,040,000.00**

If these business units and houses were to come on the market today, the valuations included in the schedule reflect actual sales figures recorded for buildings in the District of comparable accommodation.

In a better market, one with move movement of properties, there is a possibility that these buildings might attract more interest and as such a potential premium value. If this scenario unfolded, I would not anticipate any greater than a five percent uplift on the valuations given.

Once again, thank you for allowing C Carters to provide you with a Marketing Appraisal for this exciting development – one which I believe will put Long Sutton "on the map"!

If you require any further information or clarification on the predicted values given, please do not hesitate to contact me.

I look forward to hearing from you in the future.

Kind regards

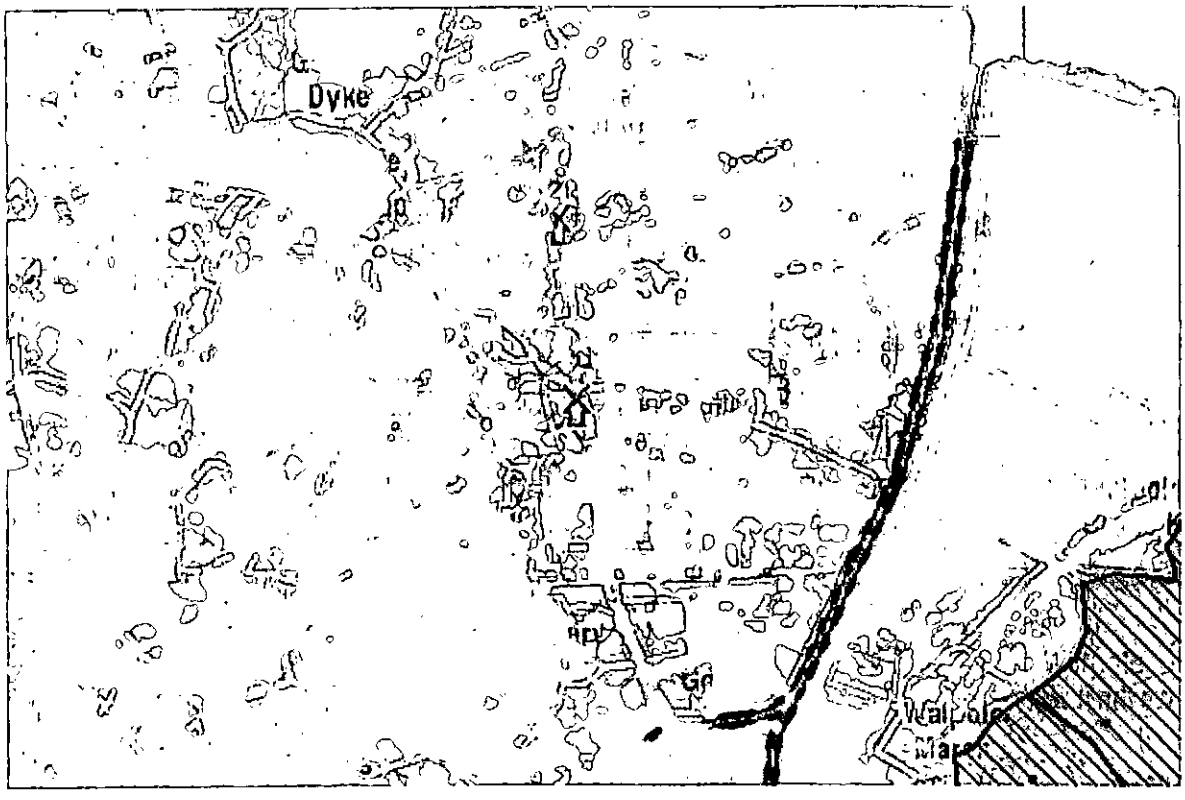
Sharon Carter
Director
C Carters Estate agents

APPENDIX C

Applicant's letter December 2009

APPENDIX D

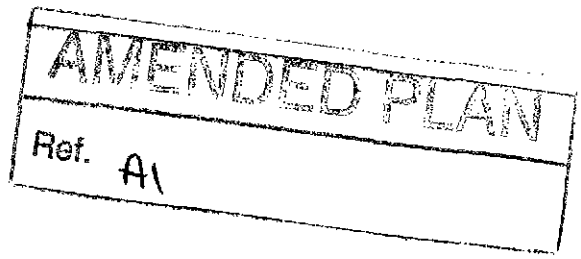
Extracts from the Environment Agency's Indicative Flood Maps

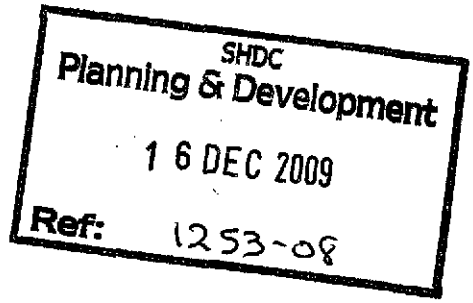


ENVIRONMENT AGENCY FLOOD MAP EXTRACT FOR PE12 9EF

Appendix Item 9 – Letter from Cross Keys Homes

Letter from Robert Reed, Assistant Development Manager, Cross Keys Homes
10th December 2009





Contact: Dr Jeremy Harrall
SEArch
89 Gedney Road, Long Sutton, SPALDING, Lincs PE12 9JU
Tel. 01406 364646 molearch@searcharchitects.co.uk

Telephone: 01733 396438
Please ask for: Robert Reed
Fax: 01733 375981
email: Robert.reed@crosskeyshomes.co.uk
Our ref: ***RR/LS***

Date: December 10, 2009

CROSS KEYS *Homes*
In partnership with
Circle Anglia

Shrewsbury Avenue
Peterborough
PE2 7BZ
Tel: 01733 385000
www.crosskeyshomes.co.uk

Dr J Harrall
SEArch Architects
89 Gedney Road
Long Sutton
Spalding
Lincs
PE12 9JU

Re: Long Sutton Sustainable Settlement Extension

Dear Dr Harrall

SUBJECT TO CONTRACT, BOARD APPROVAL & WITHOUT PREJUDICE

Given the environmental challenges facing the country, the Long Sutton Sustainable Settlement Extension is of considerable interest to the affordable housing sector and in particular Cross Keys Housing Association. Currently all affordable developments must be built to meet the Code for Sustainable Homes Level 3, with this due to increase; by 2016 new affordable units will be built to meet the Energy Performance Standards of Code Level Six.

The low technological approach you have applied to this scheme is of particular interest to us as the construction method should deliver the energy savings at a lower cost and with fewer long term maintenance implications than those of other high level code schemes currently being developed.

We wish you every success at planning and look forward to the possibility of working with you on this scheme in the near future.

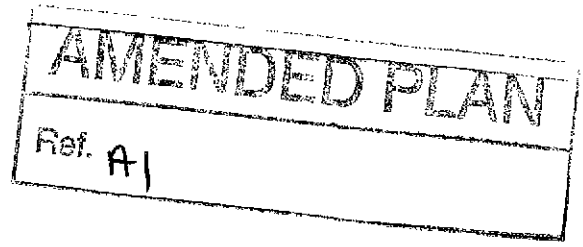
If you require any further information or assistance please contact me on the number above.

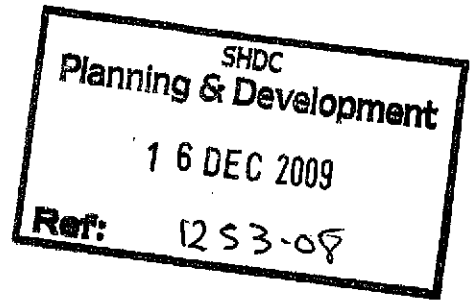
Yours sincerely

Robert Reed
Assistant development manager

Appendix Item 10 – 33KV Overhead Electricity Cable

Response to paragraph 6 of C Crew letter dated 2nd February 2009, Planning Application No. H11/1253/08





Contact: Dr Jeremy Harrall
SEArch
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CENTRAL NETWORKS – 33KVA OVERHEAD CABLE

Central Networks Proximity EMF Engineer Darren Payne (Tel. 07720 555238, Email: darren.payne@central-networks.co.uk) has confirmed that the existing 33KVA overhead cable does not require diverting if the development as proposed, proceeds.[i]

Instead, he has recommended that a 14 metre easement is imposed either-side of the cable, within the residential area of LS SSE. This, we have agreed and have now undertaken the necessary minor adjustments to the proposed scheme layout in accordance with that agreement. It has been established that no change in the easement dimension of 8 metres within the Employment Zone is necessary.

Amended site drawing 627/20 Revision A has been sent to Richard E Smith (Senior Planning Officer, Central Networks) and copied into Darren Payne for their confirmation and records.

Those minor adjustments to the scheme layout, accommodating the increase in the easement dimension, include the following:-

1. ***Relocated Wetland Area***
   To afford a safe working area for future maintenance of the overhead cable, the Wetland Area has been relocated further west towards the site perimeter away from the cable. In its place, the allotments have been sited here. An additional two allotments have been added making 24 in total.

2. ***Relocation of formal Play Area***
   Rearranging both Wetland Area and allotments has facilitated the preferred layout of two formal Play Areas either side of the allotments.

3. ***Adjusted positions of house NUMBERS 25, 30 AND 31***
   Number 25 (3B5P) – moved 7 metres east and attached to number 26.
   Number 30 (3B5P) – same location but orientated 11 degrees further south west.
   Number 31 (3B5P) – relocated to 49(a) within 'The Gateway' and attached to Number 49.

4. ***Creation of new informal Open Space provision***
   Relocating house number 31 has made available a plot of land which has been allocated for additional informal Open Space.

5. ***Adjusted position of Employment Unit 59***
   Commercial Unit 59 (166 m^2) – moved 6 metres northwards and six parking spaces relocated southwards.

[i] East Midlands Electricity. 2001. *'Overhead Line Clearances; Overhead Line Manual Vol.1'.* Feb. PP 21 – 24. Version 2

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Appendix Item 11 – PEDALS

Response to paragraph 7 of C Crew letter dated 2nd February 2009, Planning Application No. H11/1253/08

AMENDED PLAN
Ref. A1

SHDC
Planning & Development
16 DEC 2009
Ref: 1253-08

Contact: Dr Jeremy Harrall
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