LILAC
low impact living
affordable community

project development plan

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Project Development Plan
July 2009
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Acknowledgements

This Project Development Plan was compiled with input from amazonails and CDS Co-operative. It includes information from a Feasibility Study undertaken for LILAC by amazonails. We are extremely grateful for their support. Details of the current Development Group of LILAC who compiled this report are in Appendix 8. We thank UnLtd for funding assistance in setting up LILAC.

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Executive Summary

- LILAC is a pioneering co-housing project based in Leeds.

- It aims to build a member-led housing neighbourhood which will have a low impact on the environment, will be built to the highest ecological standards, will be affordable, maximise social interaction between its residents, and make a positive contribution to its surrounding community.

- LILAC aims to build a community of 20 homes (6 x 1 bed, 6 x 2 bed, 5 x 3 bed and 3 x 4 bed) in the inner-city on a site of around one acre. This land will be managed through a trust or covenant to the project in perpetuity.

- LILAC is a company registered with the FSA. It is a democratically run co-operative company (Industrial and Provident Society) which will build and manage the project.

- There is an urgent need for LILAC for a number of reasons. It is a response to the huge shortage of affordable housing for the intermediate market, to the urgent need for new homes to be more environmentally sustainable, to protect our resources in the face of climate change and energy scarcities, and to build a beautiful, safe neighbourhood where people come first and have direct power over how their neighbourhood is run.

- We aim to work closely with local authority and other partners to meet Leeds' strategic aims and core ambitions as outlined in its Sustainable Community Strategy, Local Area Agreement and Local Development Framework.

- We have already established a demand for this project through our solid and growing membership base.

- LILAC will include a 'co-house' which will include features for residents such as laundry, shared kitchen and meeting space, and will offer facilities for the local community such food co-operative, meeting space, training and advice.

- LILAC will act as a demonstration project for ecological housing and will include open days and demonstration visits. Our ambition is that this project can act as a catalyst for further projects in Leeds and other cities.

- The project will be based on super-insulated design using straw bale construction methods and will draw on self build courses run by a professional training provider for members of the local community and beyond.

- It will meet the AECB Silver Standard with potential to meet its Passivhaus standard, which compares favourably to the Code for Sustainable Homes 5.

- We estimate a total cost of the project of £2,141,987 and a build cost per square metre of £701 using the load bearing strawbale method with an element of self build.

- In view of the pioneering nature of LILAC and the additional benefits it will bring, we hope to acquire land below market value. Where this is not possible, we would pursue a phased purchase on open market prices.

- The project will use an innovative Mutual Home Ownership model where residents are leaseholders which ensures that the project is owned in perpetuity by its members and that it is permanently affordable.

- Under this model, residents will pay 35% of their income to the project towards their allocation of equity shares. The gross household income necessary to make the repayments on equity shares to the value of the build costs affordable is £16,947 for a 1 bedroom property, £23,029 for a 2 bedroom property, £27,190 for a 3 bedroom property and £34,232 for a 4 bedroom property.

- The cost of each home compares favourably with homes in an example area of inner west Leeds. Our estimated costs are £95,000 for a three bed house, while a three bed house on the open market in inner west Leeds is approximately £115,000.

- We will be sourcing development loans from ethical and ecological commercial lenders, as well as funding the project through member deposits, grants and share issues.

- We have the right team and skills in place to deliver this project and have adopted a risk management strategy to identify, manage and reduce risks.

1. The LILAC Initiative

1.1 Purpose of this report

The purpose of this report is to outline the feasibility and details to funders, potential members and local authority partners of building an affordable, ecological cohousing development in Leeds.

1.2 The context

LILAC has emerged in a context of intense interest in how cities can ensure that development is more sustainable as well as inclusive and affordable. We are keenly aware how all future housing development has to play a role in helping national and international efforts to deliver emission reductions in greenhouse gas emissions. Local authorities are rapidly developing climate change strategies and the Nottingham Declaration of which Leeds is a signatory, establishes an agenda in which local authorities can adapt to and mitigate the effects of climate change.

Leeds has embraced this agenda through, for example, CABE's Sustainable Cities initiative which brings together seven cities including Leeds; the Regional Climate Resilience and Adaptation Strategy led by Yorkshire Forward; Leeds City Council's Climate Change Strategy; and the Low Carbon Cities Programme which supports Bristol, Leeds and Manchester. There are also a number of desired outcomes in the Sustainable Community Strategy (The Vision for Leeds), the Local Area Agreement, the Local Development Framework Core Strategy, as well as the most recent Council Plan and Corporate Plan which stress the need to create thriving harmonious places, create safe, clean and green neighbourhoods and promote healthy, fulfilling lives.

Affordability has also become a central concern of government policy as highlighted by the 2004 Barker Review of housing supply and the Planning Policy Statement 3 (PPS3) (2006) which underpins the delivery of the Government's strategic housing policy objectives of decent, affordable homes. Leeds City Council has embraced this agenda through its affordable housing strategy

We also aim to contribute to community empowerment through the process of place shaping and the creation of sustainable, mixed communities. We are particularly aware of the *2007 Sustainable Communities Act* which stressed the need to promote economic, social and environmental wellbeing agendas and the *Empowerment White Paper* (CLG, 2008).

LILAC responds directly to these concerns and opportunities by demonstrating how new housing can be permanently affordable, community-led and can play a key role in tackling climate change.

1.3 Pioneering models for community regeneration: ecovillages and cohousing

Lilac draws upon two well established models of ecologically and community minded neighbourhood schemes: ecovillages and cohousing.

An Ecovillage is defined as follows:

> *Ecovillages are urban or rural communities of people, who strive to integrate a supportive social environment with a low-impact way of life. To achieve this, they integrate various aspects of ecological design, permaculture, ecological building, green production, alternative energy, community building practices, and much more. (http://gen.ecovillage.org/)*

Co-housing projects are a well established model of neighbourhood development which mixes private dwellings and shard facilities and aims to maximise social interaction based around a co-house which contains shared facilities such as communal cooking and eating facilities, laundry, meeting space, play area, office and gym. There is a well established and recognised demand for co-housing projects around the UK which includes established projects in Stroud, Lancaster, Lewes, Dorset, Sheffield, Bradford on Avon and London with at least 15 other prospective projects. These projects build upon the well established international co-housing community with 200 schemes in Denmark and dozens in North America.

1.4 The origins and vision of the project

Leeds Ecovillage has been operating as an idea since early 2007 when a local lecture was organised on the idea of ecovillages by Ezio Manzini, Italian Professor of Industrial Design. The project was officially launched in November 2007 at the University of Leeds when 80 people attended, and was reported in the local media. A workshop the following day to take the project forward was facilitated by the President of the Global Eco-village Network, Jonathan Dawson. Since then, monthly meetings have been held in Leeds city centre.

The original aim of the project, to which we still hold true, was stated as: We aspire to build an ecovillage community in Leeds based on the principles of ecological sustainability, co-operation and inclusivity'. We define our values through the following terms:

> *environmentally sustainable, grassroots, an inspiration and resource, respect, inclusive and affordable, self reliant, a place of learning, a healthy/safe place, connected, diverse (see appendix 10 for more details).*

In February 2009, the project was officially renamed LILAC (Low Impact Living Affordable Community) to more accurately reflect our intentions. It was officially incorporated as a *bona fide* co-operative company in May 2009 as LILAC Mutual Home Ownership Society Ltd'.

The three integrated aspects of the project are all equally key:

a) Low Impact Living
Low Impact living simply means to live as lightly as possible on the earth. Reducing human impact on the ecology of the planet has become an urgent task in face of climate change - and it is this task that starts with everyone of us and how we live.

According to the Carbon Trust, buildings generate 45% of C02 emissions in the UK. The government has set a target of all new buildings to be carbon neutral by 2019, and we respond to this challenge right now. We will work towards the homes being carbon neutral To do this we will prioritise design and materials that minimise energy use and loss over

their lifetime, as well as incorporating grey and black water recycling, and where appropriate solar water heating and PV cells.

Natural and locally sourced building materials are really important to our project. Conventional materials have a huge impact on the planet. For example, 22% of energy produced globally is used to make and move new construction materials. We are committed to cement free building as around 7% of global CO2 emissions are generated from cement production. We are also committed to good design to reduce the need for energy input. 15% of all CO2 in the developed world is generated from heating and cooling homes. The advantages of using materials such as strawbale are clear when we see that in contrast to a conventionally built home which *produces* around 50 tonnes of CO2 during its construction, a home built using straw bale as insulation actually *stores* 12.25 tonnes of Co2.

Equally important to us is how all the residents can work towards low impact living in their daily lives through avoiding unnecessary consumption and travel, excessive energy use around the home, and looking to the local area to provide as many needs as possible. The resident's commitment, understandings and implementation of lowering our ecological footprint, as well as achieving a good design and technological add-ons, will be central to accomplishing our environmental strategy and reducing our ecological footprint. Priorities will be on reducing our carbon footprints which can achieve higher savings than expensive technological add-ons. Sharing resources, such as laundry facilities, are also central to reducing the community's ecological footprint and consumption of energy. The lease agreements and neighbourhood vision document will stress the protocols expected from member leaseholders.

b) Affordable

Building a neighbourhood which is affordable and accessible is a real priority for us. There is much talk of a crisis of affordability in terms of housing. A recent government document highlighted the need to build 70,000 affordable homes each year by 2011. House prices are still much higher than average earnings and the house price to income ratio in the UK is 4.43 (average weekly earnings are £749.93 and average house prices are £172,593).

So what is housing affordability? Affordability is normally defined through the proportion of income spent on housing needs to be no more than 35% of net household income (or in the case of high ecological standards 40%). In these circumstances, Steve Wilcox, in his research for the Joseph Rowntree Foundation (The Geography of Affordable and Unaffordable Housing, 2005) stated the need for creating an intermediate housing market to tackle these problems – where rents are above those of social housing but below market price. Mutual Home Ownership Societies (MHOS) can create an intermediate market that is affordable in perpetuity and sustainable. There is already a large intermediate housing market in Europe. For example in Norway OBOS (Oslo Buildings and Savings Co-operative) provides homes for 214,000 members, and in Sweden HSB Riskforbund provides 375,000 affordable homes. In the context of an absence of 100% mortgages from banks, the MHOS mechanism allows residents to access housing with only a small initial financial commitment and thus has considerable potential to help modest income families access housing.

LILAC will help address the three aims of the Local Housing Strategy: creating decent places, creating decent homes, and tackling housing disadvantage. We aim to do this by

creating an affordable, sustainable mixed neighbourhood. The housing situation in Leeds mirrors the affordability crisis nationally. Earnings have fallen well behind average house prices in Leeds. In 2005 Wilcox (2005) listed that average house prices in Leeds were £134,676 with average monthly gross earnings £2,761 giving a house price to income ratio of 4.06.

To further confound the situation, Wilcox (2005) stated that in Leeds 40% of households fall within the 'broad intermediate housing market' which is defined as the proportion of working households in each area unable to purchase at lower quartile house prices for two- and three-bedroom dwellings. Significant numbers of households in Leeds, then, live in a city where they simply cannot afford to buy a home compared to their wage.

LILAC responds to this situation. We aim to build 20 homes, which will be managed as part of a Mutual Home Ownership Society. A MHOS is a new way of owning a stake in the housing market. See next section for more detail.

C) Community
LILAC isn't just about building houses, it's about building a sense of community. We want all residents to feel they are part of a strong flourishing neighbourhood where they can directly participate and their views matter. Part of building this strong sense of community will be about design. Our design will maximise community interaction, based around the Danish co-housing model which mixes people's needs for their own space in private homes with shared facilities in a co-house.

This co-house will be at the heart of the community and will include communal cooking and eating facilities, laundry facilities, meeting space, play area, office and health space. This space will be regularly open to the wider community for events and access to facilities. The project will create a beautiful living environment which will maximise green spaces, areas for food production and social interaction. Living in the community will provide opportunities for weekly shared cooking and eating, social events and regular community meetings and events.

1.5 Mutual Home Ownership: an innovative new tenure model

Instead of residents owning an individual property, the homes and land will be owned by a Mutual Home Ownership Society (MHOS).

The MHOS is registered as a co-operative controlled by its members. Its members will be the residents who live in the homes it provides. Each member or group of members will have a lease which gives the right to occupy a specified house or flat owned by the MHOS.

Membership of the MHOS will give members involvement in the build and design of their homes and the right to democratically control the housing community in which they will live. The cost of building the homes owned by the MHOS will be financed by two mortgage loans from long term investors such as Ecology Building Society or Triodos, and grants, deposits from members and possible an IPS share issue.

The cost of buying the land and building the homes owned by the MHOS and financed by the mortgage is divided into equity shares. Each equity share, which has a face value of

£1,000 on the date on which it is issued, is owned by a member and financed by the payments members make each month.

The number of shares owned by each member depends on the build cost of their home and what they can afford (these are the number of shares which are financed by 35% of net income). The more they earn the more equity shares they can afford to finance. As their income rises they can buy more equity shares. If their income falls, rather than lose their home, they can sell equity shares if there is a willing buyer or, in specified circumstances such as a sustained loss of employment or disability, convert to a standard rental tenancy.

To ensure sustainability of the project, the value of the equity shares owned by a household must not differ by more than (+ or –) 10% of the build cost. If affordable payments (set at 35% of net income) are above the amount required to finance equity shares of the value of the build cost + 10% the remainder will go into the contingency and future fund.

Under the terms of their lease, each member will make monthly payments to the MHOS which, will pay the interest and capital to the lender, and cover a deduction for management, maintenance, insurance and service costs (such as cleaning, lighting of common parts, and grounds maintenance).

The MHOS is controlled by its members who live in the homes it owns. They elect the Board of Directors which controls the day to day management of the MHOS within the remit set by members in general meeting. If a member moves out and sells their shares before they have lived in the MHOS for three years they will only be able to sell them at their original value (or a lower value if their value, calculated in accordance with the valuation formula, has fallen).

For members who leave after three years the value of the equity shares will principally be driven by references to increases (or decreases) in average incomes for the area. They will get the value of their original shares plus interest at half the rate of increase (or decrease) in average incomes for the area.

Like any other person taking on a loan and repayment obligation the MHOS will need to carry out a credit check and personal financial assessment to ensure that potential members are able to repay the mortgage debt servicing obligations they are taking on. The MHOS will also require members to have advice from an independent financial advisor to ensure that they understand the financial obligations and risks they are taking on.

The initial lease will be granted for a fixed term of 20 years. This gives members a legal interest in their home and the equity shares they own that can be registered with the Land Registry. Longer leases are not possible as a longer fixed term lease would mean members would be able to buy the home and the land it is built on outright (called leasehold enfranchisement). That would mean that it will go into the open market and not be affordable for future generations. This would defeat a key purpose of setting up this MHOS which, as well as giving members an affordable investment in the housing market, is to ensure that the homes in it remain affordable for future generations.

The lease will give members the right to remain in their homes after the initial 20 year term for as long as they want to do so. The right of occupation granted by the lease is legally secure under the terms of the lease contract and cannot be ended other than through a

breach of the lease by the member or by a failure of the Mutual Home Ownership Society to meet its obligations to pay its mortgage. Ultimately, if the Mutual Home Ownership Society fails to meet its financial obligations there is a risk that members may lose their home.

The finances of the MHOS will be structured to maintain reserves to avoid any risk of repayment default. A financial intermediary, the Co-operative Housing Finance Society Ltd (CHFS), will provide the long term investors with a 12 month interest guarantee as security against default. CHFS has been in operation since 1997 and has a track record of monitoring default risk.

Members can move between properties in the scheme as they become available and as their housing needs change as long as all the equity shares can be financed by incoming members.

Under the terms of the lease, members will be responsible for all internal and non structural repairs including any heating appliances, kitchens, bathrooms and other services inside their home. The MHOS will be responsible for structural repairs and for the maintenance of the exterior of the houses.

Members will need to pay a minimum deposit equal to 10% of the equity shares they can afford to finance through their monthly payments. 5% will be paid on joining and the other 5% when land is purchased. It is important that members make a positive personal financial commitment to become a part of the MHOS.

A MHOS guarantees affordability because:

- ‘rental’ charges are geared to 35% of net household income
- members secure a ‘foothold’ on the housing ladder at lower household incomes
- members can buy more shares as their income rises
- transaction costs on buying into and leaving are reduced because homes are not bought and sold
- the linkage - to average earnings - helps reduce risk and retain affordability
- it remains affordable from one generation of occupants to the next

A MHOS is sustainable because:

- the housing remains permanently affordable for the benefit of the local community
- the benefits are recycled from one generation of occupants to the next
- it is easier to finance environmentally sustainable housing
- it encourages active citizenship and community engagement on two levels;

1.6 Organisations who contributed to this Project Development Plan

LILAC: the Mutual Home Ownership Society was set up by the current development group of this project registered with the Financial Services Authority (registration number 30689 R) as a *bona fide* Industrial and Provident Society based on rules developed by CDS Co-operatives. LILAC is a democratic organisation whose membership is open to all sections of the community.

amazonails: amazonails is the leading UK strawbale building company, recognised internationally for their work, and have been involved in the design and construction of these innovative low-impact structures for over 12 years. They are a not-for-profit social enterprise, registered as an Industrial & Provident Society in March 2007 and offer Design, Consultancy, Training & Support in Strawbale building & other sustainable building techniques to Self-builders, Architects, Schools, Community Groups and the Construction industry. amazonails' aim is to encourage everyone to become involved in the construction process through the use of straightforward practical teaching methods: particularly those who have traditionally been denied access to construction, such as women, younger and older people- at least 50% of course participants are women. They also aim to inform and educate the wider industry about the benefits of using sustainable, thermally efficient, natural materials that allow buildings to breathe and create a healthy rather than toxic living environment. They are at the cutting edge of design, having pioneered several types of low-impact foundations through the Building Regulation system in the UK, specialising in designs that use no cement, are self-draining and require no intrusive trenches into the earth: making them accessible to all. They have acted as consultants to clients such as the Ecology Building Society and the National Trust, and have built the first semi-detached strawbale houses in the UK. LILAC undertook feasibility study with amazonails and information from this is incorporated in this Plan.

CDS Co-operatives: is a registered social landlord based in London specialising in the development of housing co-operatives and other forms of mutual housing tenure which has registered LILAC as a co-operative company and has provided strategic advice on the MHO model.

UnLtd: is a charity which supports social entrepreneurs who want to change the world for the better. They offer funding and support, to help these individuals make their ideas a reality. One of the members of the Development group received a Phase 1 grant form UnLtd which helped them establish the company and produce this Project Development Plan.

2. The process of the project development plan

2.1 Demand for the project

The current Management Committee consists of six members all of whom intend to live in the project. In addition, there are 10 prospective members and over 30 official friends/supporters of the project as well as 105 subscribers to our email list. The project will embark upon a further wave of membership when an actual site is confirmed. Since the project only aims to build 20 homes, the project is already heavily subscribed and all units will be filled without too many problems. We are also keen to offer spaces for existing residents of the local community where the project will eventually be situated. Since all residents have to become a member of the IPS and sign a pre-lease agreement and 5% deposit, there are no concerns about voids on completion of the build phase of the project.

The project builds upon established demand for similar projects around the UK as part of the growing co-housing movement which includes established projects in Stroud, Lancaster, Lewes, Dorset, Sheffield, Bradford on Avon and London with at least 15 other prospective projects. These projects build upon the well established international co-housing community with 200 schemes in Denmark and dozens in North America.

In addition, the Community Land Trust movement is growing and includes projects such as Fordhall Farm Community Land Initiative, Cornwall Community Land Trust project, Gloucestershire Land for People, St Minver in Cornwall, London Citizens CLT and Chippings Community Land Trust, Lancashire. All these projects demonstrate the established and growing demand for this kind of project. We intend to do further detailed market research to confirm the exact nature of demand and preferences, and launch the Project Plan in the area of the site purchase to increase membership.

2.2 Land acquisition process

LILAC has undertaken a land search across West Yorkshire amongst public sector and private vendors. Land searches have been undertaken mainly in inner city locations as these areas best represent the aspirations of the project, to both contribute to inner city regeneration and to ensure the project is a pioneering demonstrator in the heart of the city. From these searches, LILAC has currently drawn up a shortlist of suitable sites looked at so far and is actively seeking to draw up a final list of available sites with input from the public and private sectors.

2.3 Design process to date

Two design workshops have been undertaken, one with members of the group and one involving the group and the design team at amazonails. From these workshops, a list of 20 design principles were drawn up and incorporated into the designs appended to this plan. Further design work, especially on landscaping and community layout, will be undertaken once a site is acquired.

2.4 Community participation and engagement strategy

Consultation and community involvement will be a major part of this project. LILAC intends to have a significant role in its local community. We intend to involve the local community in

the build phase through structured courses so that the local residents understand the development and what it will mean for them. We are committed to the wider community understanding more about the project as part of the planning and construction process.

3. Scheme design and environmental benefits

3.1 Introduction to Strawbale Construction

Loadbearing strawbale is a very appropriate technology to use for this affordable housing development. Not only is it easy to build with, but also experience and testing has shown it to be structurally strong and highly efficient at retaining warmth and preventing overheating in summer. In addition, the fire, acoustic and air tightness performance far exceeds the requirement of building regulations. It is very possible to improve on this specification and performance and create a house that requires little or no outside heating (see Appendix 6) but this is outside the scope of this Project Plan. The durability of strawbale houses is the one area where there is little empirical evidence but the oldest strawbale house in Europe was built in 1921 while there are several structures in the US that are around the century mark. If these houses are built to high construction standards and maintained properly they will at least exceed the 50-year design lifetime of most conventional housing.

The preferred method of construction for this development will be “Nebraska” or Loadbearing. In this method, the bales themselves take the weight of the roof; there is no other structural framework. They are placed together like giant building blocks and pinned to the foundations and to each other with hazel pegs. On top of the strawbale wall is placed a “roof plate” which spreads the floor and roof loads across the width of the wall. The roof plate is fastened to the foundations and the bales with hazel pegs and strapping, and the roof is constructed using either prefabricated timber trusses or a traditional cut roof.

Windows and doors are placed inside structural box frames, which are pinned into the bales as the walls go up, or they are fixed into 100 x 100mm uprights attached to the base plate and fed through slots in the wall plate. This is the simplest method as it requires little previous knowledge of wall construction. The majority of straw buildings in the UK are constructed using this method. Owner builders tend to prefer it because of its simplicity, ease of design, minimal use of timber, and the opportunity it affords for community involvement.

Advantages:

- A fast, simple, straightforward, low-cost and accessible building method
- Easy for non-professionals to design, following readily comprehensible basic principles.
- Designs from one room to two-storey homes can be created using a simple, step by step approach.
- Curves and circles are easy to achieve, for little extra cost.
- The straw is very forgiving. Total accuracy in plumb is not a design goal but wide variations can be brought back into shape easily.
- Great versatility of design shape.

Areas for further clarification:

- The straw must be kept dry throughout the whole building process until it is plastered, which can be very difficult on a large building, or one that is being constructed slowly.

- Openings for windows and doors should not exceed 50% of the wall surface area in any wall (but other methods can be used in these cases).

3.2 Design methodology

The proposed designs here draw on the expertise of the design methodology of amazonails. amazonails prides themselves on taking an efficient and effective approach to design, based on 14 years experience in both designing and building in straw. They do this by:

- The overall shape of the building is kept as simple as possible avoiding double corners and use of oddly shaped bales. This reduces the complexity of construction and the use of highly skilled labour.
- All the dimensions of affordable housing obey modular sizes of strawbales as well as sizes of available timber products (e.g. smartply sheets). This reduces the amount of rework that is required on site to cut down and retie bales.

3.3 Proposed designs

The proposed designs consist of 20 units of varying sizes from 58 m^2 to 112 m^2 arranged around a circular common house of around 200 m^2. The units will all be south facing to make as much use of solar gain as possible and will be passively ventilated. Drawings are featured in Appendices 1-4 and include an indicative site layout on a 0.7 hectare site, front elevations and an example layout of a one bedroom studio flat. These were modelled on a potential site in inner west Leeds.

There will be a mixture of housing types and sizes which will allow the development to function as a multi-age, multi-need community. The following sizes of units are set out as follows:

Type	Property type	No.	Area (sq. m)
A1	1 bedroom 2 person flat	6	58
A2	2 bedroom 4 person flat	6	78
B1	3 bedroom 5-6 person house	5	90
B2	4 bedroom 6-8 person house	3	112
	Total	**20**	**1,602**

3.4 Minimising energy in use and production

3.4.1 Overview of Climate Change in Yorkshire

Although the Earth's climate has changed many times over the millennia the term "climate change" usually refers to the changes observed since 1900. In 2007, the Intergovernmental Panel on Climate Change (IPCC), the world's most authoritative body on climate change, concluded that

"*most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic (man-made) greenhouse gas concentrations". (UKCIP, 2009)*

The UK Climate Impacts Programme or UKCIP, an initiative funded by Department for Environment, Food and Rural Affairs, has established a series of possible scenarios through the use of computer modelling to aid in the integration of current understanding about climate change into decision making. These predictions reflect the best state of understanding in 2002. The latest version, UKCIP09, will be available in the summer of 2009 and will reflect the best of current understanding.

It is important to realise that there are significant sources of uncertainty in these models and that they have a number of different emissions scenarios and other variables. Using a medium emissions scenario and over the period to 2050, UKCIP has identified the following likely impacts of climate change in the Yorkshire and Humberside area *(Weathering the Storm*, Yorkshire and Humber Regional Adaptation Study, 2009).

- Annual average daily temperatures rising by almost 2°C;
- Extreme hot temperatures will increase, with summer temperatures more regularly reaching 34°C;
- A reduction in annual rainfall of up to 6%, although by less in upland areas;
- Greater seasonality of rainfall, with increases in winter combined with significant reductions in summer;
- In northern and upland areas an increase in the number of extreme rainfall events;
- Dry spells (over 10 consecutive days without rain) are expected to increase in number;
- Significant reductions in the number of days of frost and snow;
- Marginal increases in winter average wind speeds, although summer and autumn speeds reduce slightly;
- Sea levels will rise by around 0.35 metres.

These impacts can be expected to have a major effect on life in the area. There are large areas of Yorkshire and Humberside, particularly around the centre of Leeds and the East Riding of Yorkshire, that will be prone to river flooding due to increased rain in winter and increased numbers of extreme weather events (Environment Agency floodmap, 2009). This however, merely reflects the potential rise in river levels due to increased rainfall, not the effects of either a rise in sea level or run-off caused by extreme weather events both of which are likely to increase the areas prone to flooding.

Many current houses are not properly insulated as evidenced by winter snowmelt. This lack of insulation not only means that they are cold and unhealthy in winter but also get too hot on the sorts of extremely hot days predicted over the next few years. This sort of situation can lead to heat-related illness or even death in vulnerable people (S. Vandentorren, P. Bretin et al, 2006).

3.4.2 Strawbale design benefits

Strawbale houses have significant benefits over conventional timber frame or masonry houses in areas that will address many of the challenges posed by climate change. The design standards proposed here meet the AECB Silver Standard with potential to meet the

AECB Passivhaus Standard which deliver an 80% reduction in carbon emissions compared to average for buildings. This kind of reduction approaches the standards as set out in the Code for Sustainable Homes Level 5.

a) Insulation values
Insulation or "U" values are difficult to calculate but they indicate the amount of heat lost through one square metre of the material for every degree difference in temperature either side of the material. It is measured in units of watts per metre squared per degree kelvin. The lower the U-value the less heat is being lost through the material thus the more efficient an insulator it is.

The UK Government introduced on 6 April 2006 amendment L1b to the existing Building Regulations in order to improve energy efficiency in buildings. The standard requirements for insulation were doubled in respect to the old regulations. In light of this the following table shows the insulation values of amazonails construction standard (Appendix 6) in relation to how they comply and exceed the new building regulations:

Building Element	**part L1b** (W/m^2K)	**amazonails standard** (W/m^2K)
Wall	0.30	0.14
Windows	1.80	1.80
Roof	0.20	0.12
Floor	0.20	0.20

The specifications regarding houses without any heating or cooling demand take the building insulation requirements much further (Appendix 6 for additional detail on these standards) .

	AECB Silver	AECB Gold / Passive House	BRE Zero Heating House	amazonails standard
Wall (W/m^2K)	0.25	0.15	0.14	0.14
Windows (W/m2K)	1.50	0.85	1.70	1.80
Roof (W/m2K)	0.15	0.15	0.08	0.12
Floor (W/m2K)	0.20	0.15	0.10	0.20

b) Fire Performance
Rendered straw bale structures perform very well in fire situations. Research carried out by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and published in 2008 (V. Apte, G. J. Griffin et al, 2008) showed that exposing rendered strawbales to a heat flux of $50kWm^{-2}$ (approximately 700°C) for forty minutes initiated combustion of the strawbale 24 hours afterwards. By comparison the same tests at the same heat flux performed on gypsum wallboard achieved ignition in 41 to 43 seconds (McGraw, Mowrer, 1999).

This disparity is the result of the density of the strawbale and the consequential lack of oxygen available to the fire in the wall. It is important to note that the UK building regulations specify that for a loadbearing wall the minimum fire rating must be only 30 minutes (UK Building Regulations, Part B, 2006, Pg. 61).

C) Acoustic Performance

Strawbale walls provide very good acoustic insulation properties with low reverberance (King, 2006 p.198). There are two main aspects to this sound insulation, a reduction in airborne noise and a reduction in impact noise.

The reduction in airborne noise is mainly due to the mass of the compressed strawbales and plaster render acting as a solid barrier between rooms, thus reducing the amount of sound energy that is transmitted. The strawbales, by their nature, are also very good at absorbing sound; as they are not a homogeneous mass, sound energy tends to be dissipated rather than transmitted by vibration.

The reduction in impact noise i.e. noise transmitted through structures by walking or moving across surfaces, is largely due to the method of floor construction. The floors are hung from the wall plates which are sandwiched by the strawbales in the walls. Sand is used as a damping agent so that the floors are acoustically decoupled from the hangers and the floor structure. Any vibration that is transmitted to the straw is not transmitted easily as discussed earlier.

Adding to the feeling of quiet, the plastered walls do not present a hard, reflective surface so the level of reverberation is very low.

d) Air tightness
An air tightness test in accordance with BS EN 13829:2001 was carried out on a house built to amazonails standards. The following table shows the comparison of its results with UK Building Regulations and Association of Environmentally Conscious Builders (AECB) Silver Standard (Atkinson, 2008 and Appendix 6):

	Building Regulations	**AECB Silver**	**amazonails standard**
air permeability ($m^3/h/m^2$)	10	3	1.56

In order to achieve this level of air-tightness amazonails' designs pay great attention to details around the frames of all openings in external walls.

e) Passive Solar Gain and Prevention of Overheating
The affordable housing design proposed here makes maximum use of the natural light on site by ensuring the maximum number of windows face south. This has the benefit that during winter months, when it is the most needed, the low level sun penetrates through the windows, deep into the interior, maximising available natural heating and light throughout the whole house.

In summer, it is essential to minimise passive solar heat gain, because summer overheating is the most pronounced problem in super-insulated structures. Our design minimises the use of windows oriented towards east and west while using a large overhang on the south-facing windows. The reason for this is that it is always difficult to avoid unwanted summer heating gain provided by low morning and evening sunrays with east or west facing windows. The end result is that the interior of an amazonails affordable housing stays naturally cool during the summer, and at the same time it offers a naturally warm environment in winter.

f) Passive Stack Ventilation
The staircase void creates a natural chimney which, at its highest point, is connected to a ventilation outlet. Wind passing across the top of the "chimney" pulls fresh air into the building at ground level through windows and doors. Slots in the interior doors connect any room separated from this void to it. The exceptions are bathrooms with separate naturally ventilated systems.

g) Structural Strength
Loadbearing strawbale walls, once covered on the exterior with lime plaster and the interior with lime or clay plaster, may be considered to be analogous to a stressed skin panel (King, 2006 p.66). This type of panel is extremely strong, with the stiffness being provided by the plaster coatings while the mass of the strawbale provides the strength and ductility. A good example of the strength of this method can be found in California where an arched roof has been constructed using loadbearing strawbales and found to be able to withstand three times the seismic loads required under California building codes (Hartman, 2002).

As a comparison, Structural Insulated Panels or SIPs are a very similar construction with a thick layer of foam insulation sandwiched between two layers of Oriented Strand Board (OSB). Although these are structural panels the tensile and compressive strength is provided by the OSB, which in the case of the 225mm thick SIPs panels, is only 15mm thick. (http://www.siptec.co.uk/Siptec%20Structural%20Data.htm accessed 25 June, 2009)

One of main differences between these two examples is that while the SIPs panel is uniform and homogeneous, the strawbale wall is heterogeneous and therefore extremely difficult to mathematically model. Testing and experience has shown, however, that a plastered straw bale wall can easily carry the vertical and lateral loads expected in a one or two-storey house thus rendering a post-and-beam frame redundant (King, 2006 p.61).

3.4.3 Materials choices
There are a wide variety of materials used in the construction of a strawbale building. The table below summarises as many as possible and their embodied energy figures (Hammond, G; Jones, C 2008).

Material	Embodied Energy (MJ/Kg)	Embodied Carbon (Kg C/Kg)
Aggregate	0.10	0.005
Straw	0.24	0.01
Plywood	15.00	0.51
Slates	1.00	0.056
Clay	3.59	-
Timber 2x glazed, argon filled, window	360	18
Lime	5.30	0.74
Wool (recycled) insulation	20.9	-
Paint (2 coats)	20.4	1.06
Rubber	120	42
Sand	0.10	0.005
Rammed earth	0.45	0.023
Softwood	7.40	0.45

Steel	24.4	1.77

The extremely high figure for rubber does not take into account that the car tyres are reused and would otherwise end up in landfill.

In comparison the table below summarises the materials used in the construction of a standard masonry build.

Material	Embodied Energy (MJ/Kg)	Embodied Carbon (Kg C/Kg)
Aggregate	0.10	0.005
Facing Bricks	8.20	0.52
Standard Bricks	3.00	0.22
Softwood	7.40	0.45
Slates	1.00	0.056
Plasterboard	6.75	0.38
Glass fibre insulation (quilt)	28.00	1.35
Gypsum plaster	1.80	0.12
PVC 2x glazed, argon filled, window	2310	118
Concrete	0.95	0.13
Concrete (1:1.5:3 eg in-situ floor slabs, structure)	1.11	0.159
Paint (2 coats)	20.4	1.06
Steel	24.4	1.77
Mortar	1.55	0.213

4. Affordability and project costs

4.1 Material costs

All materials used in the build are natural and preferably locally sourced. This reduces the costs associated with production, transportation and storage.

Costs of constructing a strawbale house with a team of expert builders are in the region of £920 per square metre. This would result in estimated construction costs from £53,000 for the 58 m^2 one-bedroom house to £103,000 for the 112 m^2 three-bedroom property. These costs compare very favourably with both standard masonry and timber-framed with straw infill construction. These costs would reduce if there are significant numbers of training courses. The table below shows the different costs per square metre for the different construction methods.

Comparisons of estimated costs of 90 sq metre terraced house (all figures incl. VAT)

Construction type	**Cost per square metre (£)**	**Total cost for 1,602 metres (£)**
Conventional construction – brick	1037	1,661,274
Timber frame with strawbale infill method	995	1,593,990
Loadbearing strawbale method	920	1,473,840
Loadbearing strawbale method (with discount for self build element)	701	1,123,002

4.2 Self Build

While some of the above comparisons assume that the construction work is carried out using a main contractor and appropriate sub contractors, if there is a significant amount of community involvement in the construction the pictures changes somewhat. It is still essential that skilled roofers construct the roof but the labour costs associated with most other areas will decrease.

Given the potential for decreased costs and increased education opportunities, LILAC intends to use the loadbearing strawbale method with a self build element run by a training provider such as amazonails. Using the costs above the overall cost for the construction of the 200 square metre community co-house building would be £184,000 if constructed by a specialist team or £140,000 if it incorporated elements of self-build. For the whole scheme the construction costs are reduced by about £0.5 million, from approximately £1.6m to £1.1m. This may increase or decrease depending on the complexity of the build, fittings etc.

The aim of the self build courses run by amazonails and others is to engage with those people who are unfamiliar with the building process and allow them to learn in an inclusive and supportive environment. They are particularly interested in encouraging those who, for one reason or another, would not usually be found on a building site such as women, older people and those with disabilities. Courses include a combination of theory and practical construction beginning with an overview of the history of straw bale building. This then leads onto information on standard design details and construction principles. The courses then provide attendees practical experience by building a small strawbale structure.

amazonails training staff provide full and comprehensive Health and Safety training during taught courses, introducing course participants to a wide range of tools and skills associated with straw bale building. Appendix 7 details the costs of the self build courses.

4.3 Financing the project

The project will be financed by payments of 10% of the value of equity shares by members, grants, development loans that later become mortgages and a loanstock issue if necessary.

Each household will pay 5% of the value of the equity shares they can afford to finance on joining and at least another 5% when the land is purchased. This will pay for the initial payment on the land. If they join after the purchase of the land they will pay 10% on joining. Depending on the cost of the land we may need to make a phased purchase with the initial payment from member's deposits and subsequent payments from the development loan.

We intend to apply for funding for various costs during the design and build phase. We have estimated that it is realistic to gain grants covering up to 10% of project costs. We are in negotiations to secure mortgages/development loans from Ecology Building Society and another lender. These will be drawn down in phases during the development to minimise interest accrued in the development phase.

Mortgage repayments are calculated at a rate of 6.65% although we hope to secure a lower rate because interest rates are currently low. We will have an interest guarantee form CHFS, and we will build to high ecological standards. Ecology Building Society have indicated that they would be able to lend up to £1 million. Ecology Building Society offer discounted rates for projects with Code for Sustainable Homes 4, 5 or 6 of up to 1.25% below their normal rate as set out below.

Ecology Building Society interest rates discounts on Ecology C-Change Mortgage

Building Standard	Discount (%)
CSH 4 or AECB Silver	0.75
CSH 5 of AECB Passivvhaus	1
CSH 6 or AECB Gold	1.25

4.4 Affordability targets

We have calculated monthly payments as approximately 35% of net income as this is the widely accepted definition of affordable housing (if we reach a high ecological standard 40% may be affordable).

Based on land costs of £500,000 and build costs of £701 per sq metres (based on amazonails costings) the household income necessary to make the repayments on equity shares to the value of the build costs affordable is **£16,947 for a 1 bedroom property, £23,029 for a 2 bedroom property, £27,190 for a 3 bedroom property and £34,232 for a 4 bedroom property**. As long as incomes are balanced within the community, residents can earn less or more (maintaining the equity shares within the +/- 10% range). Appendix 9 outlines some scenarios for different household types.

The table below details the household incomes required to make equity shares affordable under three scenarios: financing the value of the build cost, the build cost minus 10%, and the build cost plus 10%. Households earning less than the income required for build cost minus 10% would not be able to afford to live in the project unless they had savings to purchase some of the equity shares. Households earning more than the income required for build cost plus 10% could only contribute to equity shares of the build cost plus 10%. If 35% of their net income was more than this, the rest will go into the project contingency and future fund to increase sustainability and affordability.

Household income requirements

Gross household income required	1bed	2bed	3bed	4bed
To finance equity shares of the build cost -10%	£15,277	£20,812	£24,599	£31,007
To finance equity shares of the build cost	£16,947	£23,029	£27,190	£34,232
To finance equity shares of the build cost + 10%	£18,617	£25,246	£29,781	£38,379

4.5 Project costs and monthly outgoings

In view of the pioneering nature of LILAC and the additional benefits it will bring, we hope to acquire land below market value. Where this is not possible, we would pursue a phased purchase on open market prices. The budget in this Plan is based upon the assumption of acquiring land for £500,000 with a phased purchase agreement. Build costs are estimated at £701 per sq metres (based on amazonails costings).

4.5.1 Total costs

The total costs for the design and build phase for a new build project of 20 units and with a common house will be **£2,141,987**. We aim to get grants for at least £206,760 of these costs. We may issue IPS shares to the value of £50,000. Members will pay at least 10% deposit to join the mutual home ownership scheme. The table below summarises the project expenditure and income sources.

Expenditure and income for the design and build phase

Description	Estimated Cost	Mortgage	Shares	Grants	Deposit
Land Acquisition	500,000	285,000	0	0	215,000
Site investigations	5000	0	0	5000	0
Legal body & lease agreement policies	1000	0	0	1000	0
Construction homes	1,118,796	1,040,826	50,000	27,970	0
Construction (cohouse)	140,200	0	0	140,200	0
Professional Fees 14% **(See table below)**	176,259	143,670	0	32,590	0
VAT - nil if newbuild	0	0	0	0	0
Planning	7370	7370	0	0	0
Building Control	4700	4700	0	0	0
Valuation	1000	1000	0	0	0
Stamp duty	26,782	26,782	0	0	0
Interest on development loan	34,980	34,980	0	0	0
Contingency 10%	125,900	125,900	0	0	0
Total	**2,141,987**	**1,670,227**	**50,000**	**206,760**	**215,000**

Professional fees

Item	% of total construction cost
Quantity surveyor	2%
Planning supervisor	0.50%
Structrual Engineer	2.00%
Mech and Elec Engineer	1.50%
Project Manager	1%
Architects Fees	7%

4.5.2 Running costs

Running costs of the total project have been calculated to include mortgage repayments, maintenance, service charges and insurance. Maintenance, service charges and insurance are indexed at 3%. Equity payments will increase in line with income in these projections and has been estimated at 3%. We have calculated running costs for the first five years and in the tables below we show running costs at year 1 and 5.

Running costs	**Year 1**											
	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Income												
Equity payments	12040	12040	12040	12040	12040	12040	12040	12040	12040	12040	12040	12040
Grant	1167	1167	1167	1167	1167	1167	1167	1167	1167	1167	1167	1167
Total	13207	13207	13207	13207	13207	13207	13207	13207	13207	13207	13207	13207
Expenditure												
Mortgage	10722	10722	10722	10722	10722	10722	10722	10722	10722	10722	10722	10722
Insurance	667	667	667	667	667	667	667	667	667	667	667	667
Maintenance	405	405	405	405	405	405	405	405	405	405	405	405
Admin worker	1167	1167	1167	1167	1167	1167	1167	1167	1167	1167	1167	1167
service charge	127	127	127	127	127	127	127	127	127	127	127	127
Total	13087	13087	13087	13087	13087	13087	13087	13087	13087	13087	13087	13087
Balance	119	119	119	119	119	119	119	119	119	119	119	119
Running balance	119	238	358	477	596	715	834	954	1073	1192	1311	1430

Running costs	Year 5											
	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Income												
Equity payments	13551	13551	13551	13551	13551	13551	13551	13551	13551	13551	13551	13551
Grant	1313	1313	1313	1313	1313	1313	1313	1313	1313	1313	1313	1313
Total	14864	14864	14864	14864	14864	14864	14864	14864	14864	14864	14864	14864
Expenditure												
Mortgage	10722	10722	10722	10722	10722	10722	10722	10722	10722	10722	10722	10722
Insurance	750	750	750	750	750	750	750	750	750	750	750	750
Maintenance	456	456	456	456	456	456	456	456	456	456	456	456
Admin worker	1313	1313	1313	1313	1313	1313	1313	1313	1313	1313	1313	1313
service charge	142	142	142	142	142	142	142	142	142	142	142	142
Total	13384	13384	13384	13384	13384	13384	13384	13384	13384	13384	13384	13384
balance	1480	1480	1480	1480	1480	1480	1480	1480	1480	1480	1480	1480
running balance	31091	32571	34051	35531	37011	38491	39971	41451	42930	44410	45890	47370

4.6. Comparison with open market value of properties

The build and design costs for the properties are shown in the table below. These include the divided cost of the co-house and other costs of benefit to the whole community.

House size (beds)	LILAC build cost
1 bed flat	£61,265
2 bed terrace	£81,335
3 bed terrace	£95,067
4 bed terrace	£118,306

For comparative purposes, the current open market values of properties in inner west Leeds (Bramley, Armley) are shown below. These prices are taken from standard brick built terraces ranging in age from 10-100+ years, apart from the one-bed apartment which is in a new three storey development.

House size (beds)	Open Market build cost
1 bed flat	£65,000
2 bed terrace	£85,000
3 bed terrace	£115,000
4 bed terrace	£157,000

Our proposed house costs are less than open market values in inner Leeds, with the additional benefits that they will be built to a higher ecological specification, and have lower heating bills, and have the further added value due to being part of a co-housing community with access to facilities and communal gardens.

For comparison, Springhill Co-housing in Stroud, Gloucestershire, estimate that the value of use of the co-house and living in a community has added at minimum 15-20% to the price of the homes. For example, a five bed house cost £200,000 on completion in March 2004 and sold in 2006 for £405,000, an increase in value of 102.5%. The average increase in house prices in this area of Stroud between 2004 and 2006 was 13% (www.home.co.uk) so for this property the increase was significantly higher. Springhill have a waiting list of people who want to move in to the community, showing a demand for this sort of accommodation and community.

Taking into account the current value of properties in the area, the added value of a high ecological standard of building and being part of a community, we believe that the open market value of our properties would be significantly higher than their build cost. This will ensure adequate value to loan ratios.

5. Membership and outreach

5.1 Membership process

Membership of LILAC is open to those who agree with the project core values, are accepted by the project membership and are willing to give time to the development of the project. Members are expected to help bring the project to fruition and to provide voluntary work according to their ability. Much of the expertise and work in the project will come from its members and friends, and we will have a system of sweat equity to support this through which members can earn credits against future housing cost.

Our current membership structure is based around the following categories of membership:

- **Friends** of the project are people who are interested in and want to support the project and sign up to the project's aspirations. They complete a form and pay a small annual fee (£5), to cover admin costs. The sentence they sign up to is as follows:

  I would like to support LILAC in creating a low impact living affordable community in Leeds based on the principles of ecological sustainability, co-operation and inclusivity. I agree to do this with respect, commitment and cooperation, in a spirit of flexibility and equality.

  Friends are kept up to date with LILAC's progress, invited to socials and some workshops and may be invited to join working groups to help with tasks such as publicity, research etc. To become eligible for membership applicants have to have attended an introductory session and one social event.

- **Members** (>18 years) are those who know they want to live in the project and can commit time and money to the project now. They commit a 5% equity share financial 'deposit' which is dependent on their income as highlighted in section 4. Members are also expected to commit some time to help develop the project. An average of two hours per week is offered as a guide depending on how much work is needed at any one time. Members can be assigned work from the development group or opt in to becoming part of the development group (see below).

- **The development group** are members who are driving the project forward through the pre-development and development phase. They will be the signatories of legal documents and will form the initial board of directors of the project. There are currently five members in the development group, who are working on developing areas of the project such as the financial and legal structure, site development, membership and grants and funding. Members of the development group were the first Founder Members who signed the IPS company rules. New applicants can be admitted to this group. On completion, this group will become the Management Board.

5.2 Values and Ethics

LILAC is committed to being an open and equal project that strives to be as inclusive as possible in all its activities. This commitment is reflected in our core value statements about respect, inclusivity and diversity as well as our Ethical Policy (see Appendix 10 and 11). LILAC is also a project that is as far as possible self-sufficient and self managed, drawing

on community skills to seek pragmatic and empowering solutions to pressing housing and environmental issues.

These values are reflected and expressed in our approaches to membership and the publicity of the project. We have developed membership, consultation and meeting processes that reflect and foster inclusive membership and equality of access. We will also be working hard to create good relations with, and selectively open facilities for, the local community. We aim to include as part of our work activities and facilities that are of benefit to the area around us. We want to be inspirational in our work and to be a resource to the wider community.

5.3 Commitment

5.3.1 Individual/lifestyle commitment

As individuals, members must commit to the following:

- Low impact, low carbon lifestyle
- Treating others with respect
- Working in a horizontal structure
- Engaging with the issues of the wider community as well as the project
- Engaging with communal activities
- Commit to a healthy group process (honesty, fun, caring, commitment and listening)
- Respecting diversity of skills and abilities (from each according to their ability, to each according to their need)

5.3.2 Time Commitment

Members of LILAC are asked to offer a minimum of an average of two hours per week to the development and maintenance of the project. This is a guide and depends on an individual's ability and any area of special interest that they have. Due to differing skills, experience and time some members may be asked to do additional work. This would more than likely be asked by someone from the development group/management board. Members who are in the development group/management board are expected to contribute 4 hours (half a day) a week to the project in the development and occupation phase.

Additional work will be financed through *sweat equity.* The work will be remunerated at a set cost per hour (for example, £10 or £15) and deducted from the final property cost, with an upper limit total sweat equity cost set (e.g. 5% of a household's equity shares). If no homes were built there would be no remuneration. The decision for people to undertake work for sweat equity would be agreed by the management board and regularly reviewed and monitored. A similar system could exist after the development phase, but against service charges for the co-house for example.

5.3.3 Financial commitment

A credit check and personal financial assessment will be required on membership application to ensure that potential members are able to repay the mortgage debt servicing obligations they are taking on. Each applicant needs to meet the pre-agreed minimum average income. The financial assessment will enable the calculation of the number of equity shares each applicant will contribute towards each month once they are living in the project.

5.4 Joining policy – membership process

People can become a friend of the project by filling out a friendship form. This can be obtained by post or via the LILAC website.

Application for membership will occur in waves, announced with a reasonable lead in time, until we have filled all the housing units we have proposed. We will advertise and facilitate these in as open a manner as possible through our website, advertisement, meetings and local consultation. We are very keen to open up this process to members of the community where the land is secured. Applications for membership will involve the signing of pre-lease agreements and a financial investment of a 5% equity share as a deposit.

At regular intervals as agreed by the management board there will be opportunities for friends to become members. We will be having a second wave of membership once the legal and financial structures are in place and a site has been secured. Once the project is full, then applications will be for entry to our waiting pool. When members leave, the vacant homes would be offered to current residents first to allow for fluidity, as people's needs change with time. Vacant homes would then be offered to the waiting pool (see exit policy).

Those who apply to become members of the project will be interviewed and assessed by existing members in consultation with other interested parties, through the medium of waiting lists and interviews. Applicants will be assessed according to the accommodation available and their commitment to the values of the project, get-on-ability, as well as their background and financial viability. We will be proactive about applications from people in the locality of the project, and all recommendations and nominations from other interested parties will be considered on their individual merits. Membership and residency processes will be transparent, consistent and agreed in advance with all interested parties. New members can indicate if they would like to be part of the management board, which needs at all times between 7-15 members. The management board will make decisions on entry of new members to the board in accordance with the company rules.

5.5 Tenancy agreements

All prospective households will have to sign a tenancy (or lease). The tenancy plays a number of roles:

- it shows a legal commitment
- it shows a financial commitment (of 10% of their equity share total by way of a deposit and to pay 35% of their net income to the deposit).
- it allows members to state the size of property they intend to occupy and the equity shares they will take on.
- it shows a time commitment as members agree to a minimum time commitment (2hr/week or 4hr/week for development group/management board)

5.6 Subletting

Subletting is not permitted and houses should only be occupied by those signing tenancies with the company. Short periods of absence where members would like others to occupy their house need to be approved at general meeting.

5.7 Process of membership

Become a friend (£5 per year)

Attend an induction/intro session
Attend social events

Attend presentation, read and be clear about legal and financial structures, core values etc…

Apply for membership
Commitment to living in the project
Commitment to the core values and ethics of LILAC
Financial assessment and credit check

Interview

Sign tenancy agreement:
Financial commitment – 5% deposit on successful application, followed by a further 5%
Lifestyle commitment
Time commitment of 2 or 4hrs/week

Option to be on the development group (management board), taking on one/some of the following responsibilities:-
Membership
Grants and funding
Bank account
Legal structure
Financial structure
Site development

5.8 Meetings and Socials

During the pre-development and development phases of the project, the development group (future management board) meet at least fortnightly to discuss the practical development of the project and to move forward on areas such as financial, legal and land issues. They have financial and legal responsibility and have the consent of the wider group to make decisions autonomously where appropriate. At development group meetings, decision making is by consensus and everybody has an equal right to contribute to decision making.

At the later phase of the project (the occupation phase), LILAC will be managed and run through a two layer process of meetings. General meetings will be quarterly and will be attended by all members. The Development Group/Management Board (who meet once a month) reports back on progress to the general membership and take questions and advice. Working groups will feed back on their activities and ideas. In this way everybody stays in touch and the wider group can feed into the process of continuing to develop the project and make sure it is run according to the core values.

Throughout the pre-development and development phases, we will also hold regular socials and workshops which help with the development of a community of interest and the building of personal and professional relationships. These are advertised on the website and via email to the project email list.

5.9 Exit policy

Once the project is completed, when any householder leaves LILAC will offer the dwelling first to current members to allow for movement within the community, as people's needs change with time. Only after this would the property be offered to people in the waiting pool.

5.10 Choosing to move on

If a member wishes to move out and sell their equity shares before they have lived in LILAC for three years they will only be able to sell their shares at their original value (or a lower value if their value, calculated in accordance with the valuation formula, has fallen). For members who wish to leave after three years, the value of the equity shares will be calculated by references to increases (or decreases) in average incomes for the area.

Those wishing to leave the project are required to give 6 months notice via letter to the management board. Those giving less than 6 months notice (and having lived in the project for more than 3 years) may forfeit the added value of their equity shares.

5.11 Benefits of the model

In line with our consideration of openness and inclusivity, LILAC does not want to be an 'eco-ghetto' or closed community. We want to be directly inspirational, educational, and accessible to those around us. We aim to be an attainable and positive example of sustainable living. We want to show what is possible in a way that is not intimidating or exclusive. We will be building and demonstrating real working alternatives to an energy intensive existence in a contemporary *urban* community. We aim to foster and demonstrate

lifestyles and ways of living that are sustainable, healthy, and equitable. This involves a belief in sharing resources and building community relations, so that resource intensive and socially isolating ways of living can be avoided. We will provide beneficial services for the use of our own community of members as well as the wider community as outlined below.

a) Benefits to LILAC members

Direct benefits to LILAC members are the provision of affordable and low impact housing in a supportive and inclusive community. Members will be able to make use of the common house facilities which will include laundry, cooking and other recreational facilities such as fitness space, computer room and reading area. LILAC shares an interest in providing bottom up, pragmatic solutions to the issue of climate change and this project benefits members in being able to express that interest in a way that will also benefit and inspire others.

b) Benefits to the wider community

Our benefits to the local community are both direct and indirect. Directly, the co-house will have several features open to the local community, including food coop, community shop, café, laundry, library, educational and computing resources, growing and green space, meeting and recreational space and film showings. All of these things could be offered to the local community as appropriate while respecting the privacy of members.

Indirectly we hope we will contribute to the regeneration of an area and to the investment of hope and energy into the future, increasing community safety and local green space. We hope that wherever our project is located, the area will experience a ripple effect from the investment of energy and ideas, money, time, infrastructure and expertise in a project that is forward looking, equitable and open to all who share our vision of a sustainable and just future. It will also act as a catalyst and resource for those interested in ecological and sustainable issues in the city and region, acting as a beacon of good practice and demonstration.

5.12 Outreach/advertising/gaining members

Section 2 outlined the considerable demand for the project. When marketing the project there are several accessible options available.

When we are seeking project members there are several routes. Within our community of interest there are multiple mailing lists and websites for environmental and affordable housing campaigns, both nationally and locally which we will target. There are several co-operative, co-housing and MHOS constituencies who we have web and mail access to. We have created a leaflet which we will distribute through such channels to advertise the project. Our own website is a useful publicity tool and mailshots also possible through these routes where more appropriate. We will also network through existing environmental housing projects. We will also use talks, stalls and leafleting at festivals and green/environmental events/gatherings for marketing purposes, at both a local and regional level.

We will also be considering some of these marketing possibilities for members as fundraising opportunities. Becoming a friend of the project is an accessible way to get involved and only involves a small fee. We are also considering the possibility of a share issue to help raise funds for the project which we will have to market in similar ways.

5.13 Community Engagement

Within the local community and Leeds more widely, we will use local print and broadcast media as an access point, as well as a selection of the approaches outlined above. However our main aim with regard to this area is consultation and awareness raising. Once we know which area we are going to be located in, we will plan a series of public meetings and local consultations which will help us to shape and develop the project considering the needs and concerns of local people. For example the Cashes Green CLT project in Stroud undertook a 'planning for real' event and a series of local consultations. This is also an avenue for attracting local people who may want to live in, financially support or get involved in the project.

We will undertake two consultation meetings with the wider LILAC community and the local community around the development. These forums will be to explain the concepts and designs take any questions and discuss any issues that may arise. They would also serve as an opportunity to discuss the training sessions, community involvement in the build and the principles of low-impact living. This sort of development will be very different to the usual brick houses surrounding it and a vigorous programme of informing the local residents will only improve the success of the final development.

6. Risk management

Risk may be defined as events that may prevent or inhibit the achievement of the company's strategic objectives. Risk Management is the process of identifying risks, evaluating their probability and potential impact and determining suitable methods for reducing, controlling and responding to risk. As an ambitious and pioneering project, that will cost a substantial amount of money, LILAC has to take its risks seriously. At this stage, LILAC is clearly identifying Risk Management as a future priority, whilst doing some initial work on our risk management.

LILAC will look to 'map' each area of risk against certain risk categories and then define mechanisms for response and monitoring. These risk categories are:

Risk Area	**Examples**
Financial	*See below*
Physical	• Natural perils to properties, e.g. Fire, flood, storms
Personal (health & safety)	• Physical safety of residents and visitors. • Liability of directors
Operational	• Non compliance/breach of legal, statutory or audit requirements. • Fraud
Strategic	• Changes in government policy • Deterioration in economic environment
Reputation	• Adverse publicity that affects the image of LILAC and could impact on current or future activities.

6.1 Risk register

Once identified, the risks will be assessed by LILAC to see what effect they may have on its ability to meet our key objectives. We will maintain a "risk register" that scores each identified risk and determines the person(s) responsible for its management. We hope to do this in a participatory and engaging way, that helps members understand our mutual responsibilities but not get bogged down in negative detail. This will be reviewed regularly, by a sub committee appointed to manage risk.

The following is a template for our risk register:

Category	Risk / Consequences	Level of risk	Control / Action	Respon-sibility	Target date(s)	Progress
• Financial, Physical, Operational, Personal, Strategic, or Reputation	5 Catastrophic 4 Major 3 Moderate 2 Minor 1 Insignificant	5 Almost certain 4 Likely 3 Possible 2 Unlikely 1 Rare	Avoidance (eliminate) Reduction (mitigate) Transfer (outsource or insure) Retention (accept and budget)			

6.2 Financial risk management

This is the area of immediate concern and we have identified the following areas for further attention:

Liquidity risk
This is the risk that LILAC will be unable to meet its liabilities as they fall due. This risk needs to be managed using reliable short-term, medium-term and long-term cash flow forecasts backed up with a combination of adequate cash resources, borrowing arrangements and/or overdraft facilities.

Grant risks
Given the current financial situation, there may be problems securing grants. In this scenario, any shortfalls from grant failures will be met through low interest loans from the co-operative sector or additional loan stock.

Interest rate risk
This is the risk that future interest rates will be higher than budgeted or forecast. This risk can be managed through the spreading the loan portfolio across a number of lenders. In particular the Ecology Building Society discount their interest rate for buildings of high environmental specifications, like ours.

Poor budget management
There is the potential for LILAC to make inappropriate financial conclusions and decisions. In the development phase a Finance Committee will manage the financial planning and monitoring. After moving in, the finances will be overseen by Finance & Legal Committee, with the day-to-day finances managed by a dedicated book-keeper. We will seek to use Participatory Budgeting techniques to actively engage all the residents in an annual planning, prioritising and monitoring process. This will be complimented by “budget literacy” to ensure the finances are not an onerous or boring area left to a few in the know.

Risk from people moving out
The repayments come from members paying 35% of their net income. Matters beyond the control of individual members and the MHOS may result in members being unable or unwilling to make their payments. Lilac has a robust plan to deal with this scenario as follows.

1. In the situation where a member is refusing to pay, their membership will be withdrawn following the procedures as set out in the company rules to try and resolve this issue. New occupants will be selected from the waiting pool.
2. In the situation where the income of a household dropped, for example from illness or redundancy, there would be several measures in place to deal with this: • All households will be required to take out the equivalent to mortgage insurance which would make repayments for the first 6 month. • Households whose incomes have increased will be asked to take on further equity shares. • The household would be transferred to a rental only lease for which they could receive housing benefit. Their shares would be frozen. • Money from the contingency and future fund could be used.

- LILAC will have CHFS insurance for the whole scheme, so if the scheme as a whole was unable to make repayments these would be covered for a 6 month period.
- If following all of the above the situation the household was still not able to meet their full payments, the household would be given notice and a new household from the waiting pool would be offered membership.
- If no new members could be found, as the very last resort the property could be sold. This is far from ideal but it is preferable than dissolving the whole project.

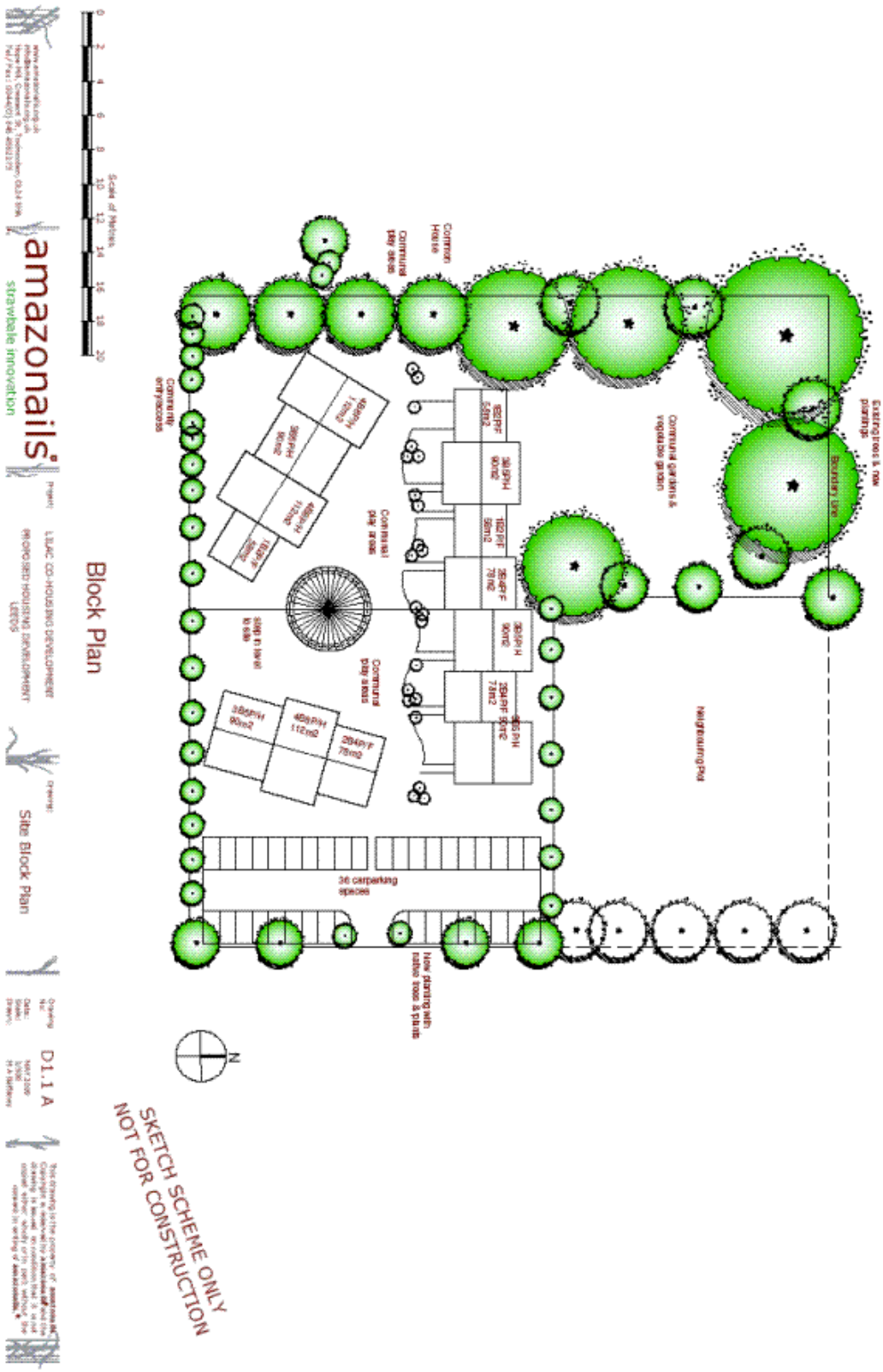
7. Conclusions

This Project Development Plan has outlined the process, design, costings, membership and risk management approach of the LILAC project. On the basis of this Plan, LILAC will be seeking to finalise site and funding options and will be looking to make our project happen on the ground in the near future.

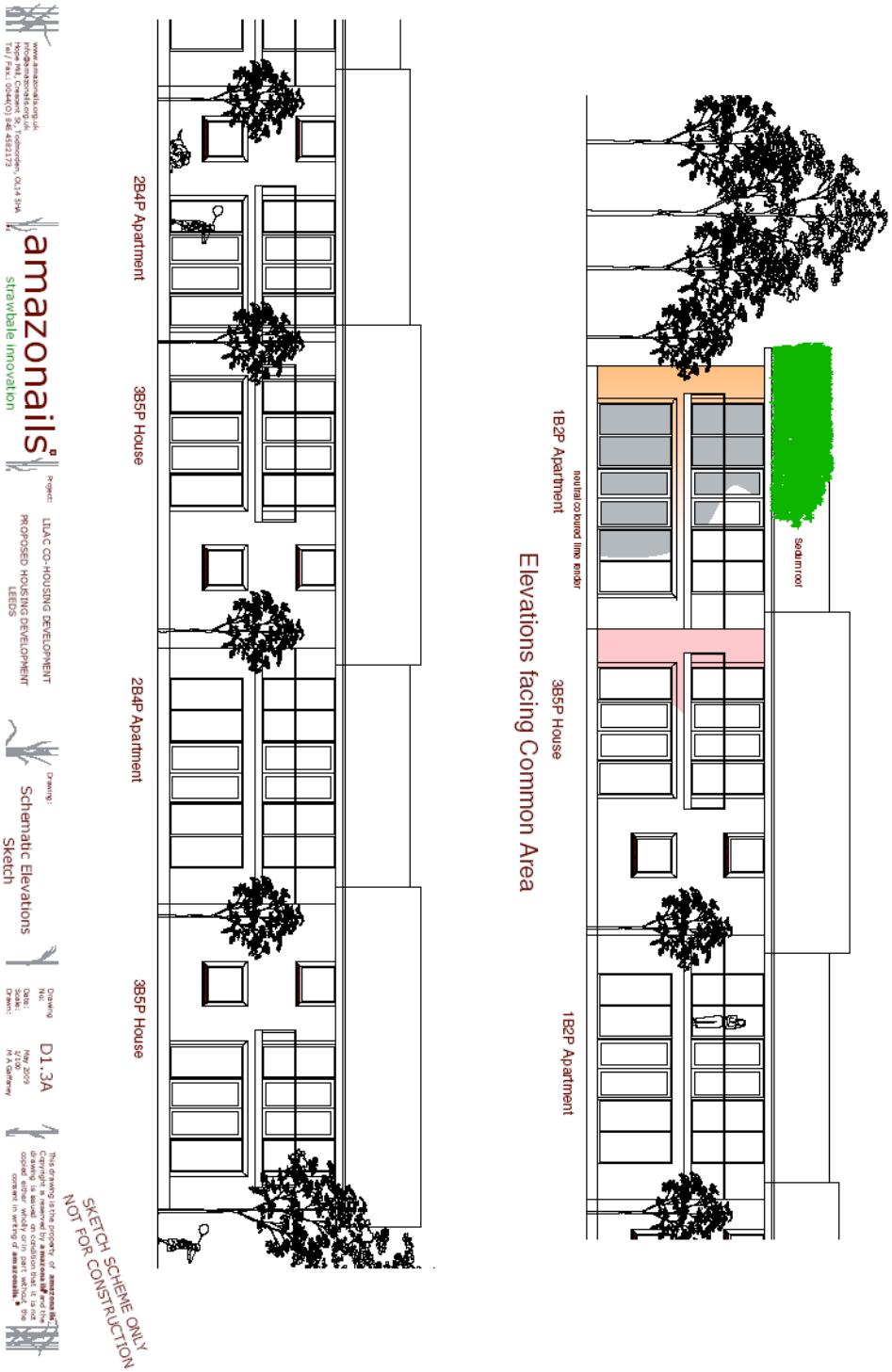
This 20 home co-housing project will be a pioneering addition to Leeds. It will be built to a high ecological standard as shown in the design section, and will be permanently affordable as shown in the costing section. Our membership and outreach policy is democratic, open and inclusive and seeks to make close connections with the community where the project will be located.

We are keen to meet with all those interested to explain the plan in more detail, finalise the details, and discuss ways to help us take this project to the next phase. We look forward to hearing from all those interested in seeing LILAC happen.

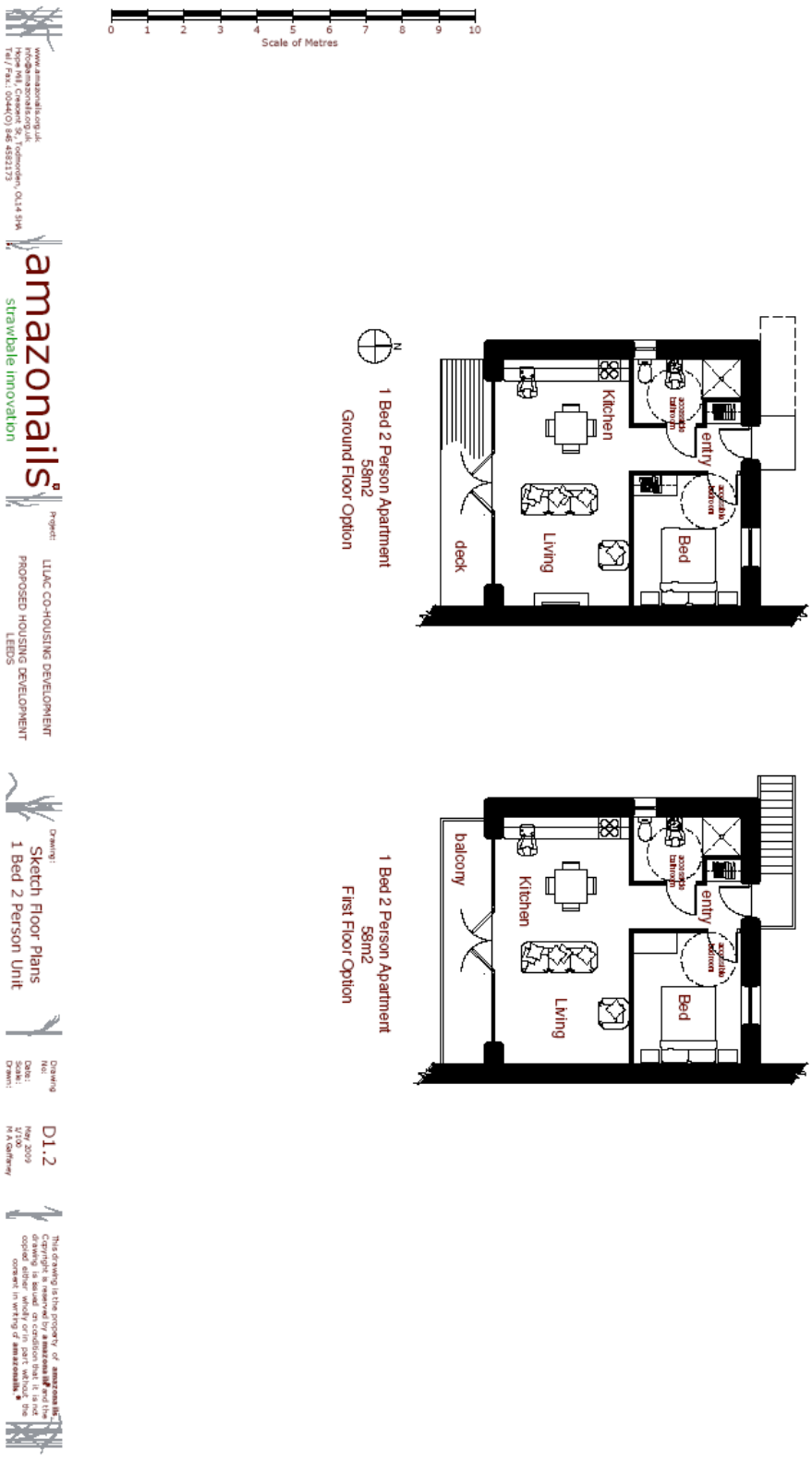
Appendix 1. Example Site layout



Appendix 2. Example front elevations

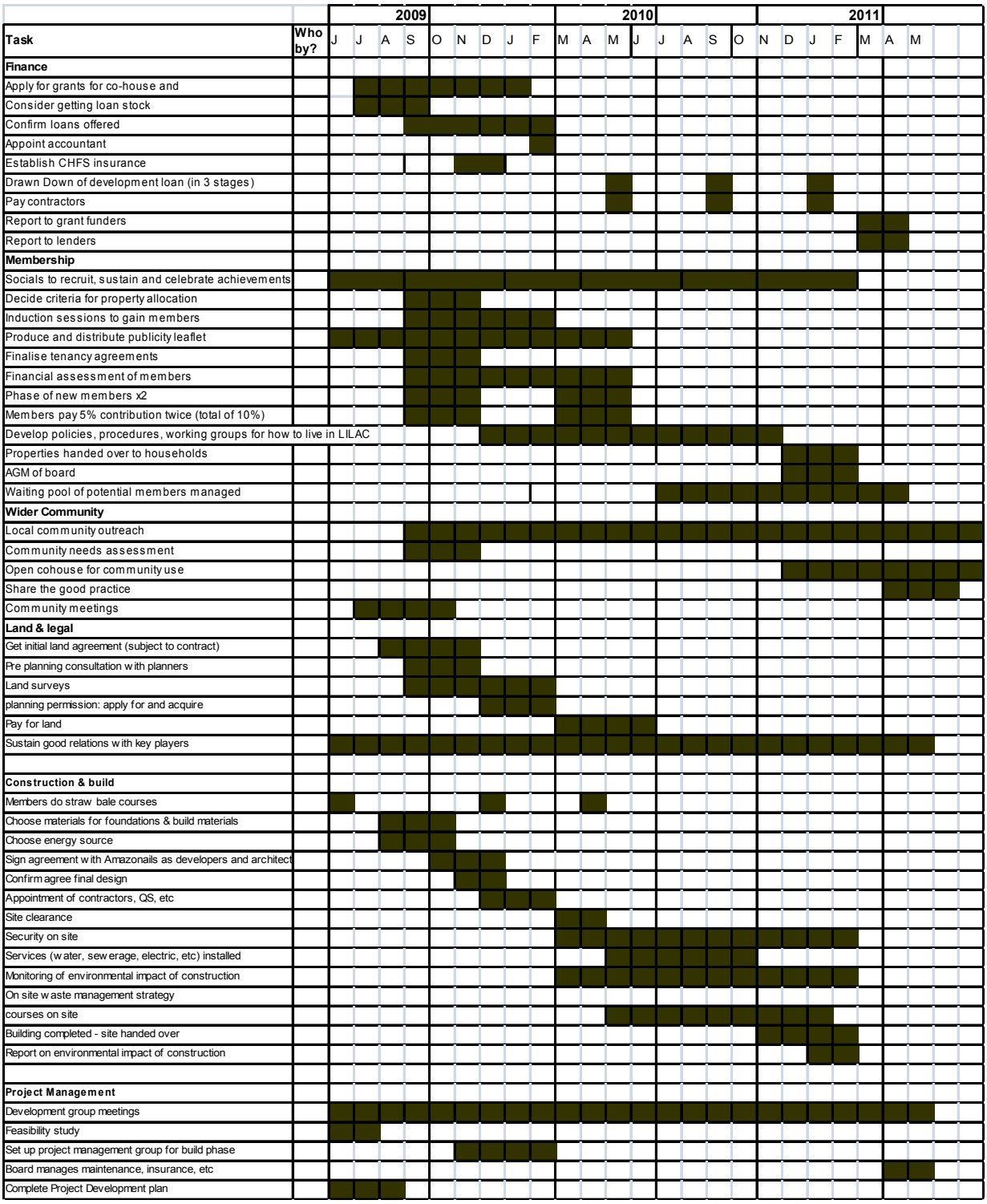


Appendix 3. Example internal layout (1 bed)



Appendix 4. Example site sketch

Appendix 5. Project timeline



Appendix 6. Environmental Specifications

amazonails standard floor specification is based on 200-300mm thick layer of insulation depending on floor type and site constraints. The standard roof design is based upon using 300mm sheepswool with 40mm Pavatex insulating board. The U-values calculated for amazonails standard construction were calculated considering thermal bridging in order to make the figures as realistic as possible (Atkinson, 2008).

amazonails standard can be brought in line with other zero energy specifications by installing additional roof insulation, floor insulation and triple glazed windows. These other standards are:

- The Association of Environment Conscious Builders (AECB) Silver Standard specifies measures that lead to an overall 70% reduction of CO2 emissions compared to the UK average for buildings of each type. This is achieved through a variety of means including medium insulation on walls and roof, passive solar design, low-energy lighting and high-efficiency appliances.
- The AECB Gold Standard aims at reducing overall CO2 emissions by 95% and is almost identical with the passive house standard which describes buildings insulated to such a level that they could be heated by the mere presence of people and have no internal source of heat. In addition, only the highest efficiency appliances and lighting can be used.

  For further information please see:

  http://www.aecb.net/PDFs/carbonlite/AECB_VOL3_EnergyStandard_V6FINAL.pdf
- Building Research Establishment (BRE) Zero Heating House Standard defines a similar goal as the AECB golden standard

Appendix 7. Self build Course details

The courses that would be required for this build are outlined below:

- Foundations (car tyres)
- Strawbale wall building ground floor
- Strawbale wall building 1st floor and gable ends
- Preparation for lime plastering and external first coat
- Preparation for clay plastering and internal first coat
- Second and finish coat lime plaster
- Second coat clay plaster
- Lime washing (5 coats minimum, can be demonstrated as part of 2nd or finish coats and self builders can continue themselves, or we can add a further day to the schedule below).
- Average of 10 people per course (max of 12 people per trainer) @ £450 trainer's day rate

TRAINING COURSE	**COMMENTS**	**DAYS**	**Sub**	**Total**
Car tyre foundations	Site to be prepared, levelled and set out.	4 days	£1800	£1800
Strawbale wall raising ground floor	- at approx. 330 bales	1 x week course 1 x w/e course 1 x w/e course	£2250 £900 £900	£4050
Strawbale wall raising 1st floor& gable ends	- at approx. 220 bales	1 x 3 day course	£1350	£1350
Lime (1) Prep and 1st coat		1 x w/e course 1 x 5 day course	£900 £2250	£3150
Clay (1) Prep and 1st coat		1 x w/e course 1 x 5 day course	£900 £2250	£3150
Lime (2)	Second coat (inc. mixing)	1 x w/e course 1 x 3 day course	£900 £1350	£2250
Clay (2)	Second coat (inc mixing)	1 x w/e course 1 x 3 day course	£900 £1350	£2250
Lime (3)	Finish coat	1 x 3 day course	£1350	£1350
Clay (3)	Finish coat	1 x 3 day course	£1350	£1350
Community presentations		2 x evenings 1 x day	£300 £150	£450
Administration	14 courses @ £100/course			£1400
TOTAL				£22,550

Appendix 8. Development group

Paul Chatterton is from Leeds and is currently senior lecturer in Geography at the University of Leeds. He has 10 years experience of researching and managing projects in the areas of urban regeneration policy and community development. He is a trustee of a local charity (Oblong Resource Centre Ltd) as well as a former director of a local housing co-operative (Xanadu Housing Co-operative Ltd) and community centre (Leeds Social centre Ltd).

Tash Gordon works as a GP in Chapeltown. She volunteers with Medical Foundation for Victims of Torture and practises acupuncture. She has lived in a several housing cooperatives and is a founder member and former director of a Leeds based housing co-operative (Xanadu Housing Co-operative Ltd). Through her role as a Partner in a GP Practice, she has had several years of experience in running a small business.

Frances Lee is a semi retired teacher of children with special needs based in Leeds. She lives in a narrowboat but would like to live in a sustainable community. She actively campaigns and fundraises for the World Toilet Organisation which funds toilets and sanitation projects worldwide. Her current campaign is ensuring there are toilets in schools promoting both sanitation and education.

Alan Thornton works for the national charity Church Action on Poverty, for whom he is the Campaigns Officer, coordinating work with churches across Britain. He also is a founder of the Star & Shadow Cinema, which is a volunteer-run cinema in Newcastle upon Tyne. Alan is also a keen fruit grower, cyclist, campaigner and football supporter. He has been a trustee of several charities and chair of one (Newcastle Healthy City Project).

Kirsty Hughes was brought up in Doncaster. Her two years working as a Maths teacher in Eritrea led her to reflect on the importance of community. She is a trained Clinical Psychologist, specialising in Child & Family. Currently, Kirsty is caring for a new baby while remaining active locally.

Appendix 9. Scenarios

Mr Green has a gross income of £18,000 a year and wants to live in a 1 bed property.
He can finance equity shares of the value of £63,371 (the build cost is £60,697).
He would have to pay a deposit of 10% of the equity shares which would be £6,337.
35% of his net income would be £5,404 per year. This would be paid to LILAC with £523 going towards the insurance, maintenance and service of the project and £4,882 as equity payment.

Ms Purple and Mr Yellow and their 2 children want to live in a 3 bed property. Their household gross income is £35,000. They can finance equity shares of the value of £121,237 but they are only allowed to finance a maximum of the build cost +10% which is £103,604. They would have to pay a deposit of 10% of the equity shares which would be £10360. 35% of their net income would be £10,150 per year. This would be paid to LILAC with £811 going towards the insurance, maintenance and service of the project, £7,981 as equity payment and £1,358 to the sustainability/affordability fund.

Miss Brown, Miss Red, and Miss Black want to live in a 4 bed property. Their household gross income is £65,000. They can finance equity shares of the value of £200,444 but they are only allowed to finance a maximum of the build cost +10% which is £128,930.
They would have to pay a deposit of 10% of the equity shares which is £12,893.
35% of their net income would be £16,450. This would be paid to LILAC with £1,009 going towards the insurance, maintenance and service of the project, £9,932 as equity payment and £5,509 to the sustainability/affordability fund.

Mr Maroon is retired and has a gross income of £7,000 a year and wants to live in a 1 bed property. With this income he can finance equity shares of the value of £23,890, but the minimum value of equity squares that must be financed is the build cost minus 10% which is £54,628. He has savings of over £40,000. He can pay for some of the equity shares in full at the start and then make regular payments towards the rest of the equity shares. For example he could purchase £35,000 equity shares in full and finance the rest through his annual payments and deposit. He would have to pay a deposit of £35,000 and 10% of the equity shares which would be £1,963. He would then pay £2,034 per year £523 going towards the insurance, maintenance and service of the project and £1,512 as equity payments.

Appendix 10. Core values of LILAC

Members must commit to creating a project with the following values which have emerged from several discussions between members. The core values in no particular order of priority are as follows:

- **Environmentally sustainable** – This is a main value and encompasses a broad definition of sustainability and sustainable living balancing economic, social and ecological issues. It also embraces the desire to live low impact, low carbon lifestyles and sees permaculture as a guiding principle to meet these.
- **Grassroots** – the project needs to be people-led, rather than institution led. It aims to be people centred rather than centred on the needs of governments or business. We envision this being done in a horizontal way, for example working groups which are accountable to the wider group, with all decisions made by consensus rather than by a smaller group having been given this power.
- **Inspiration and Resource** – the project will act as a resource in the wider city to address local problems. It also aims to be an inspiration for what can be achieved in terms of building a more socially and ecologically just world. This is particularly important in terms of links with deprived communities in Leeds.
- **Respect** – this is at the heart of how we see people interacting towards each other and their environment. This also includes a strong element of responsibility towards each other and our environment and community.
- **Inclusivity and affordability** – this is particularly important in terms of access and affordability. It is essential that the project is financially accessible to all those who share its values.
- **Self reliance** – members of the project are committed to gaining more control over their lives and resources. The project will aim for self reliance – that is obtaining as many things we need for daily life as possible from the project itself (work, food, energy) rather than complete self sufficiency.
- **Learning** – the project is to be a place of learning. This could be in terms of educational provision on site but also in terms of training in areas such as construction during project set up. Learning will also focus on interpersonal skills and conflict resolution.
- **A healthy, safe place** – the community values the health and wellbeing of all its members and will look to create a protective, nourishing atmosphere in the project.
- **Connections** –LILAC will be a place where a community lives but it will not be a ghetto. Many aspects of the project will reach out beyond the community to share its values with others.
- **Diverse** –LILAC aims to accommodate a diversity of people and in particular aims to be multigenerational and multiethnic. Children will play an important role in the life of the community.

Appendix 11. LILAC ethical policy

In all our involvements/interactions with external institutions, companies, banks etc, including:

- Investments
- Trading
- Financial activities
- Acceptance of loans, grants and donations
- Employing contractors
- Hiring services

We will:

1. Endeavor to work with companies and trading partners who share our values.

2. Not support or benefit from:
- involvement in the nuclear power industry
- manufacture or involvement in animal testing of cosmetic, household products or ingredients
- involvement in the animal fur trade
- involvement in bloodsports
- manufacture or trade of military equipment

3. Try to avoid and minimise our trading with companies that benefit from:
- extraction and production of fossil fuels
- manufacture of polluting chemicals
- involvement in unsustainable forestry and timber trade
- manufacture of tobacco products
- involvement in animal farming
- involvement in genetic modification
- involvement in animal testing for medical purposes
- involvement in exploitative pornography
- involvement in any form of environmental degradation
- exploitative working conditions

4. In assessing our business activities we will uphold the human rights of all and we will only work and trade with organisations and individuals which are tolerant and accepting of all regardless of: gender, sexual orientation, race, disability, class, age.

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