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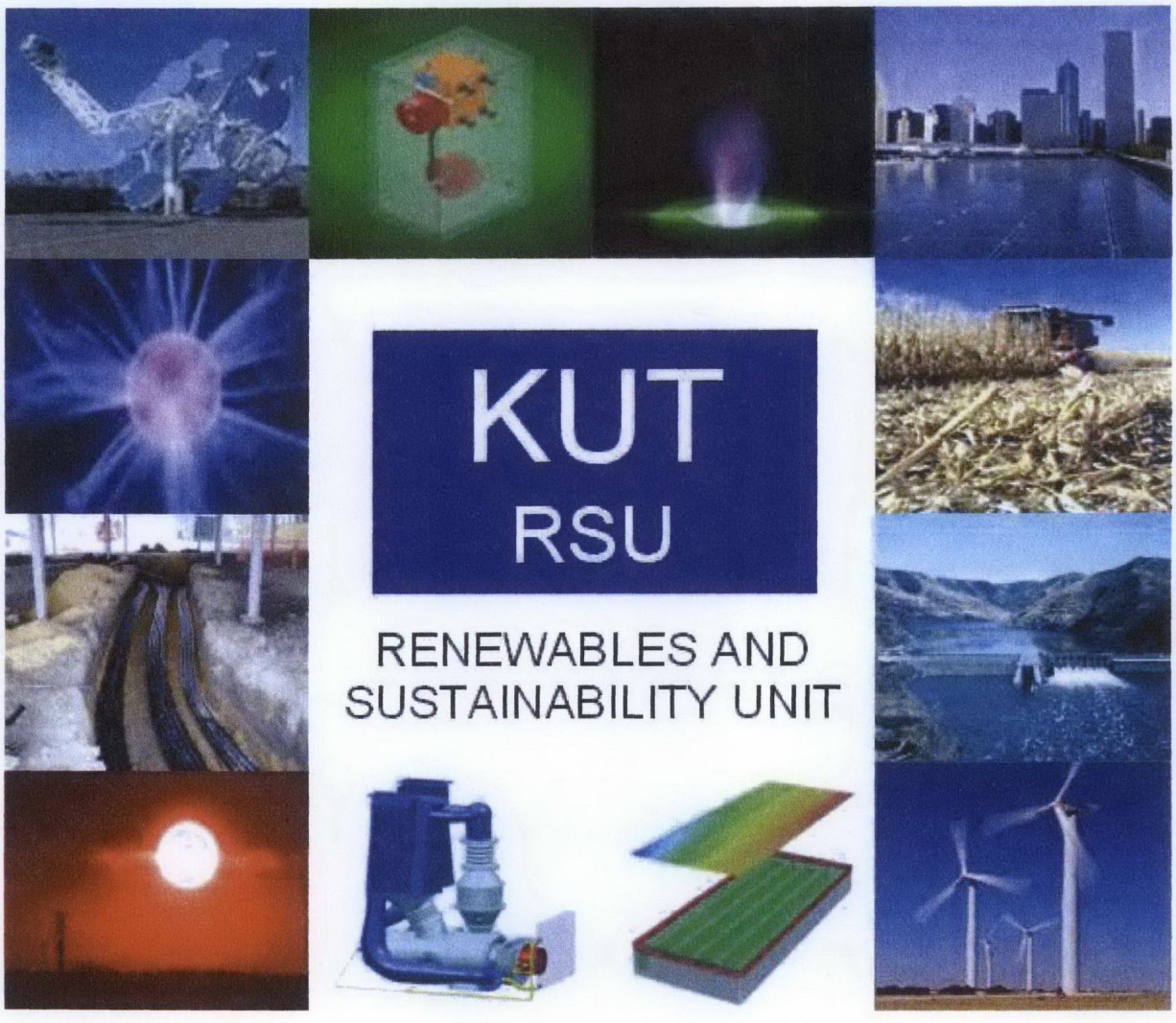
SUSTAINABILITY AND ENERGY STATEMENT



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INTRODUCTION

The following Sustainability and Energy Statement describes the intent of the development proposal to provide a sustainable and energy efficient carbon reducing development.

This statement is in support of the Planning Application for the proposal.

It is noted that there is unlikely to be any specific requirements for carbon reduction and on-site renewables as part of the Planning Permission. However, the applicant and the design team are committed to providing as energy efficient and sustainable a development as possible; all within financial and practical constraints.

The statement indicates how demolition and recycling shall be handled.

Materials used in construction are described in terms of thermal performance and sourcing strategies.

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1. PART ONE – RECLAMATION AND RECYCLING OF MATERIALS

1.1 All materials recovered during the partial demolition shall where practicable be recycled and used on site. Where materials cannot be incorporated into the scheme they shall be sent to reclaim centres/salvage yards.

1.2 Materials to be reclaimed; joists, timber, roof tiles, bricks, windows, glass, sanitaryware, domestic appliances, metal products, plasterboard, rubble, copper pipework and copper cabling.

1.3 Asbestos materials shall be carefully removed from site and disposed of to a registered site.

1.4 Demolition elements shall be carried out in accordance with the requirements of the Planning Permission and Local Authority. A waste management plan indicated below is considered as a starting point toward an agreement of the strategy with the Local Authority.

1.5 SITE WASTE MANAGEMENT PLAN

The Site Waste Management Plan aims at improving materials resource efficiency, by promoting the economic use of construction materials and methods so that waste is minimised. The company's policy also includes re-used, recycling or recovering wastes in alternative ways. The plan also aims at reducing fly-tipping, by restricting the opportunities available for the illegal disposal of waste by ensuring compliance with existing legal controls and providing a full audit trail of any waste that is removed from the construction site.

Our policy towards a site waste management plan is to get involved at the early stage of the project and identify the sub-contractors that would be producing significant amounts of waste and through pre-start and on-going assessments identify the types of waste that will be produced. The assessment process also takes great care to determine how much and when the waste would be produced during the project programme. Where possible we aim at ordering materials that are packaged in reusable or returnable packaging. We take all opportunities available for on-site re-use of material, some material demolishing/concrete crushing on site.

Site setup strategies include setting aside specific areas for the delivery of new materials and a clearly allocated area for the separation and managing of waste products to be carried out. Before the project commences target are set for the different types of waste that are likely to arise from the project.

As the company operates multiple sites, thus allowing surplus materials as well as wastage to be shared, distributed and stored as required. Again, the pre-start and ongoing assessments help identify how materials can be more effectively used for sustainability and economic principles.

1.5.1 Identify your waste

Identify sub-contractors producing significant waste streams.

Assess the types, quantities and timescale for the wastage.

Wherever possible use materials that are housed in reusable/returnable packaging.

1.5.2 Identify your waste management options

Establish storage for new materials and waste management, including separation of different types of waste.

Set targets for different types of waste likely to arise from the project.

Measures and procedures to deal with expected (and unexpected) hazardous waste, as well as strategy for the disposal of liquid wastes such as wash-down water and lubricants.

Agreement with the sewerage company for trade effluent discharge.

Opportunities for re-use of materials on-site and off-sites, as well as between sites.

Materials needed and waste handling

Evaluate materials quantities carefully so that over-ordering and site wastage is cut down.

Identify which unused materials be returned to the supplier or used on another site.

Consider using secondary and recycled materials.

Return unwanted packaging returned to the supplier for recycling or re-use.

Segregate waste materials allow you to get best value from good waste management practices.

Clearly label containers/skips clearly to avoid confusion.

Comply with Duty of Care procedures, including providing transfer notes and checking the authorization of registered carriers, registered exempt sites and licensed waste management facilities.

Informing waste been told about the requirements of the SWMP

1.5.3 Communicate the SWMP

Conduct toolbox talks been planned for all site personnel about waste management on-site.

Ensure Contractors and sub-contractors trained and aware of their responsibilities.

Ensure contractors and sub-contractors understand and agree with the Site Waste Management Plan.

Integrate SWMP into contracts as a requirement.

1.5.4 Measuring and monitoring your waste

Conduct regular checks on the SWMP and making sure that targets are being reached.

Check waste management procedures being monitored on a regular basis.

Ensure reports on waste quantities and treatment/disposal routes and the costs incurred are being regularly produced.

1.5.5 After project completion, review and learn lessons for the future

Complete final report on the use of recycled and secondary materials, waste reduction, segregation, recovery and disposal, with costs and savings identified.

Highlight important waste management issues been for action at future projects.

Build the results into your business to help with competitive bidding that could help the process improve.

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2. PART TWO – BUILDING FABRIC AND MATERIALS

2.1 The thermal efficiency of the building is a major consideration by the applicants and designers.

2.2 It is intended that the 'U' values of the walls, roof, floors, windows, etc. shall be targeted toward being some 25% better than current Building Regulations.

2.3 The use of solar reflecting and low E glass shall be utilised where appropriate/applicable on the development.

2.4 The sourcing of materials shall comply with current Codes of Practice, for example, the sourcing of timber shall be from sustainable sources and shall be FC marked.

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3. PART THREE - SUSTAINABLE AND LOW ENERGY TECHNOLOGIES

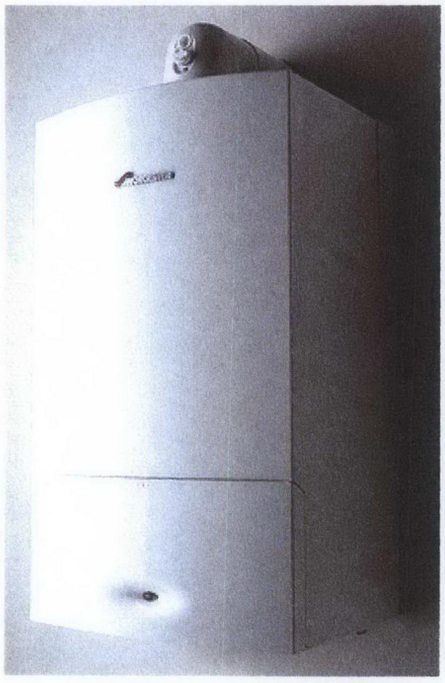
3.1 A dwelling's energy use can be greatly reduced by the employment of low energy and sustainable technologies. These are constantly evolving and the currently available technologies are described below. These will be employed in the proposed scheme subject to planning and feasibility.

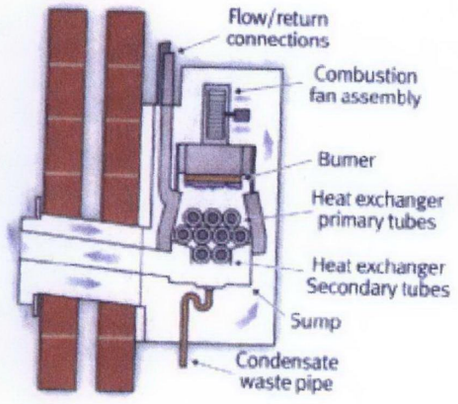
3.2 All the following measures reduce CO2 emissions by reducing the amount of energy needed to service the dwelling.

Below are described the elements most likely to be incorporated into the development proposal.

3.2.1 Condensing boilers

Condensing boilers are more efficient and save energy by recovering heat from the flue gases. The flue gases condense out onto the insides of the boiler and flue, which releases heat that would otherwise be lost.





Cross-section of a condensing boiler

It is proposed that all boilers used for this development will be condensing, with the highest efficiencies commercially available (E.g Baxi, Worcester, Vaillant, Keston et al)

3.2.2 Low NOx Boilers

Gas fired boilers produce NOx gases (oxides of nitrogen) as a by-product, which contributes to pollution and acid rain. The NOx emissions can be reduced by special burners which cause the gas to combust at a lower temperature, reducing the amount of NOx gases produced and improving the efficiency of the boiler.

It is proposed that all boilers used for this development will be low NOx boilers.

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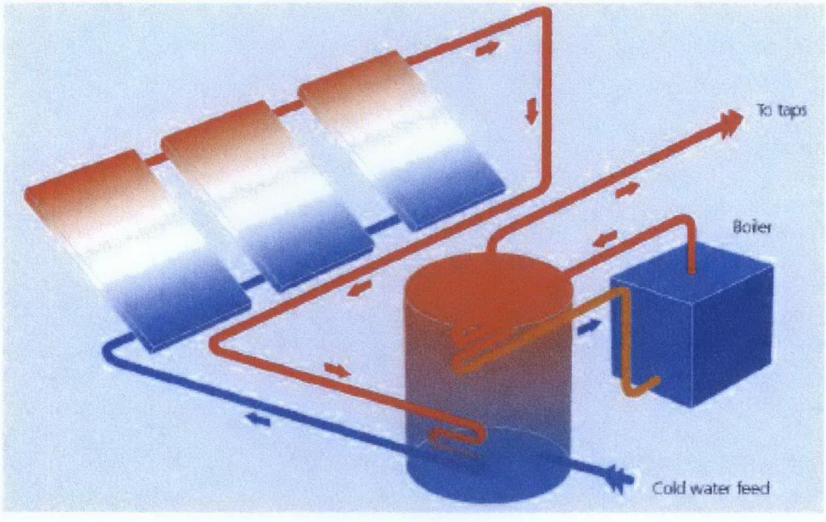
3.2.3 Solar Hot Water Panels

Solar hot water panels are the most likely of the solar technologies to be incorporated. The system shall comprise solar tube panels located at roof level and dual coil cylinders in the plant room. The lower coil is connected to the solar panel to make best use of the available solar energy by heating the largest volume of water. The upper coil is fed by gas boilers as a back-up should additional hot water be required when the solar heated hot water is extinguished.



It is proposed that solar hot water panels will be used for hot water generation, subject to planning, energy calculations and feasibility.

3.2.4 Air Source Heat Pumps

A heat pump uses the refrigeration cycle in reverse to generate heat inside a building by extracting heat from the air outside. Heat pumps are very efficient and have lower emissions than gas boilers when used for heating.

An air source heat pump shall be used within the swimming pool heating and dehumidification process. The heat pump operating at high co-efficient of performance (COP) figures shall be the main source of heating the pool area.

It is proposed that heat pumps will be used for primary or secondary heating in specified areas.

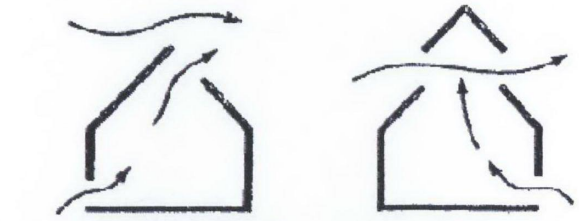
3.2.5 Heat Reclaim from Pool

It is intended to reclaim waste heat from the pool ventilation system to heat incoming air to avoid the need of using boiler or other sources to heat ventilation air. The same energy saving strategy shall be used on a majority of the mechanical ventilation systems.

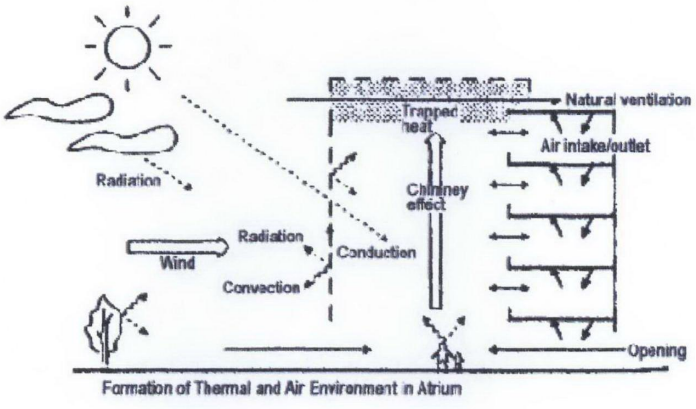
3.2.6 Natural Ventilation

Natural ventilation (or passive ventilation) is a means of ventilating buildings without using electricity as the motive force. Air movement is caused by buoyancy, cross ventilation, wind, changes in air pressure, venture effects, windows, and automatic vents. Sometimes use is made of the thermal mass of a building to get free cooling.

This is a low or zero energy technology and is recognized by the approved documents for building regulations.



Use of wind pressure on building Use of venturi effect



Formation of Thermal and Air Environment in Atrium

It is intended to use natural ventilation wherever possible subject to feasibility and energy calculations.

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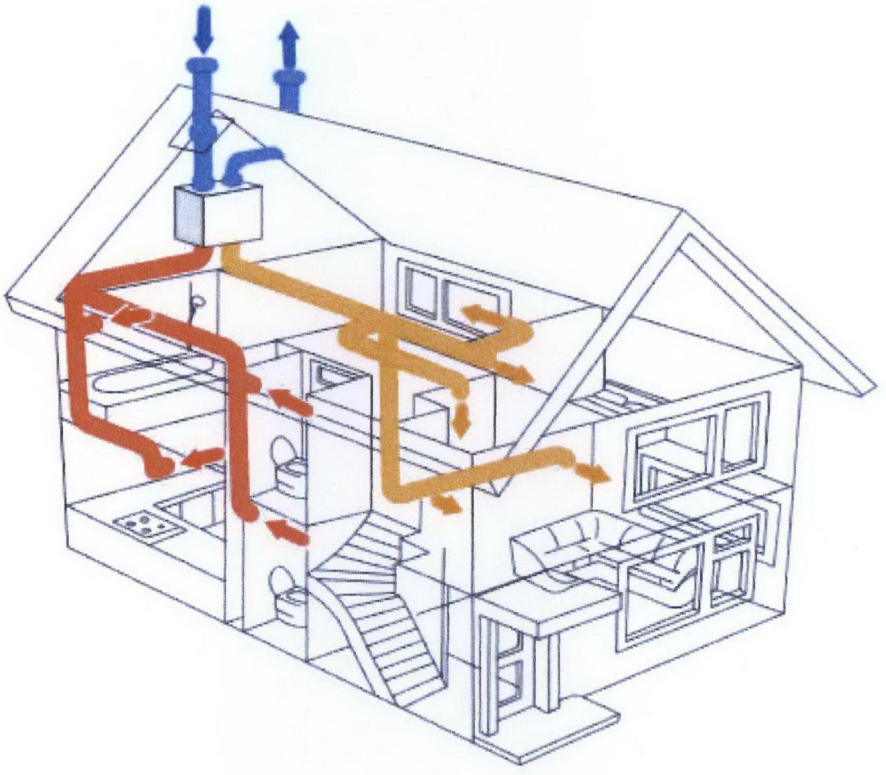
3.2.7 Mechanical Ventilation with Heat Recovery

A ventilation system which draws air in from outside at the same time as extracting air from inside can be provided with a recuperator. This recovers heat energy from the warm outgoing air and uses it to heat the cold incoming air.

This saves the energy which would have been needed to heat the incoming air.



Mechanical ventilation with heat recovery will be used wherever possible subject to feasibility and energy calculations.

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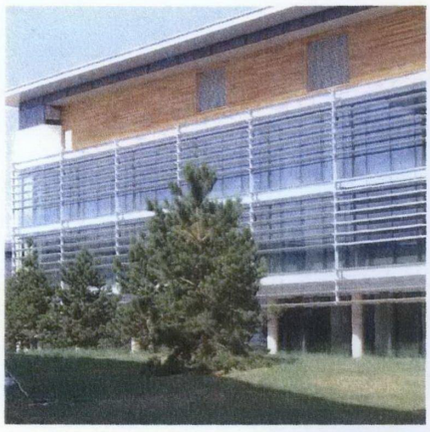
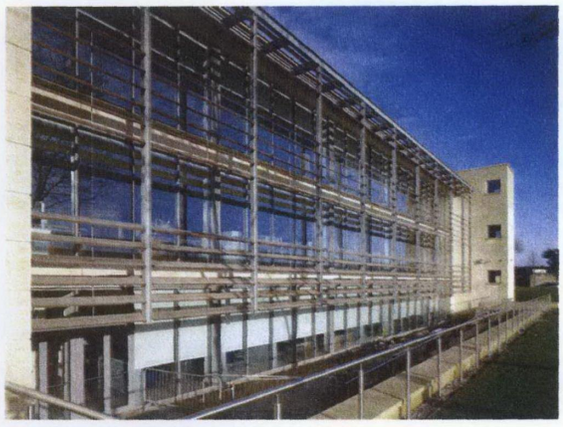
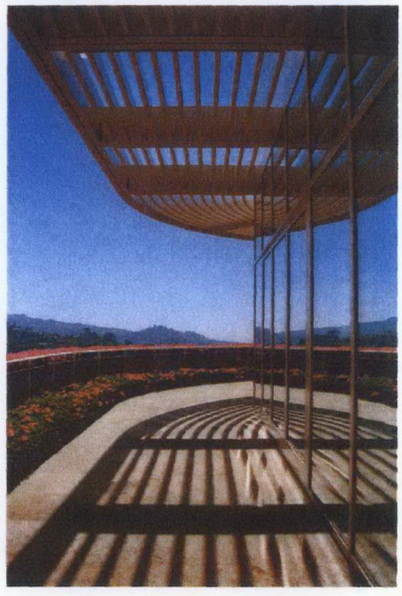
3.2.8 External Shading

A large part of the air conditioning load is due to solar gains. Sun shining in through the window causes the room to heat up, and required the air conditioning to use more energy to cool the room. It is intended that solar gains will be reduced by fitting external shading devices. Consideration will be given to electric solar blinds.







It is proposed that solar shading will be used to reduce energy use, subject to planning, energy calculations and feasibility.

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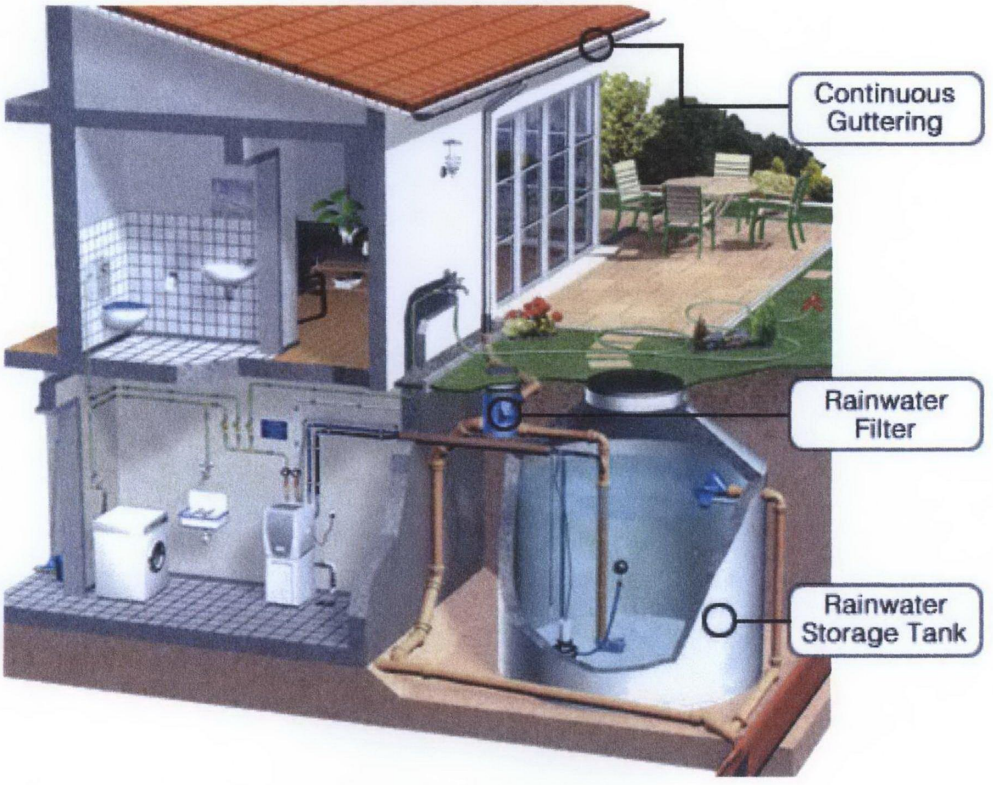
3.2.9 Rainwater Harvesting

Rainwater is a free source of clean water and can be harvested by collecting rain in an underground tank whenever it rains. The water shall be stored until it is needed for the garden irrigation systems.



It is proposed that rainwater harvesting will be used to reduce water consumption, subject to planning, water calculations and feasibility.

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3.2.10 **Low Energy Light Fittings**

One of the largest electrical loads in a building is the lighting load. This can be greatly reduced by the use of low energy light fittings. The choice of fittings is increasing and now includes: LED, fluorescent, sodium discharge and cold cathode.

It is intended on this development to have extensive of low energy lighting.

3.2.11 **Permeable Surfaces**

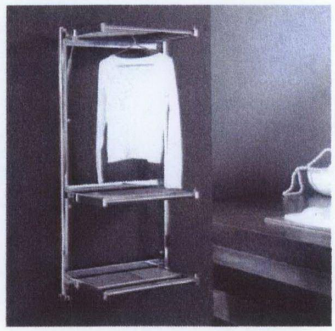
It is intended to use permeable surfaces where practicable, to reduce the amount of rainwater passing into the surface water sewer system.

3.2.12 **Composting Provision**

A dedicated composting point will be provided to recycle vegetable matter and green waste.

3.2.13 **Hanging Space**

Adequate space for hanging washing will be provided internally or externally.

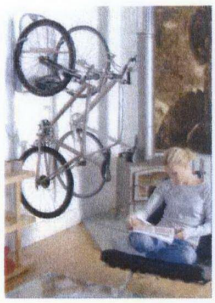


3.2.14 **Home Office**

A dedicated office will be provided to allow home working.

3.2.15 **Cycle Storage**

Dedicated cycle storage will be provided commensurate with a house of this size and occupancy.



3.2.16 **Bin Storage**

External bin storage will be provided commensurate with a house of this size and occupancy. The local authority will be consulted so that adequate numbers and types of bins are allowed for.