OUTLINE DESIGN REQUIREMENTS

FOR

MECHANICAL AND ELECTRICAL

ENGINEERING SERVICES CODE FOR SUSTAINABLE HOMES

AT

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1.0. INTRODUCTION

This outline specification defines the principles to be adopted for the provision of mechanical and electrical services to achieve the Code for Sustainable Homes Levels as indicated.

This is an initial assessment and further advanced / additional services may be required subject to a SAP / SBEM Calculation. The assumptions have been made from previous projects with similar requirements.

Other aspects of the building, its design and operation such as local amenities, transport, health and wellbeing, land use, ecology and pollution will need to be assed with the entire design team to ensure the appropriate code is achieved

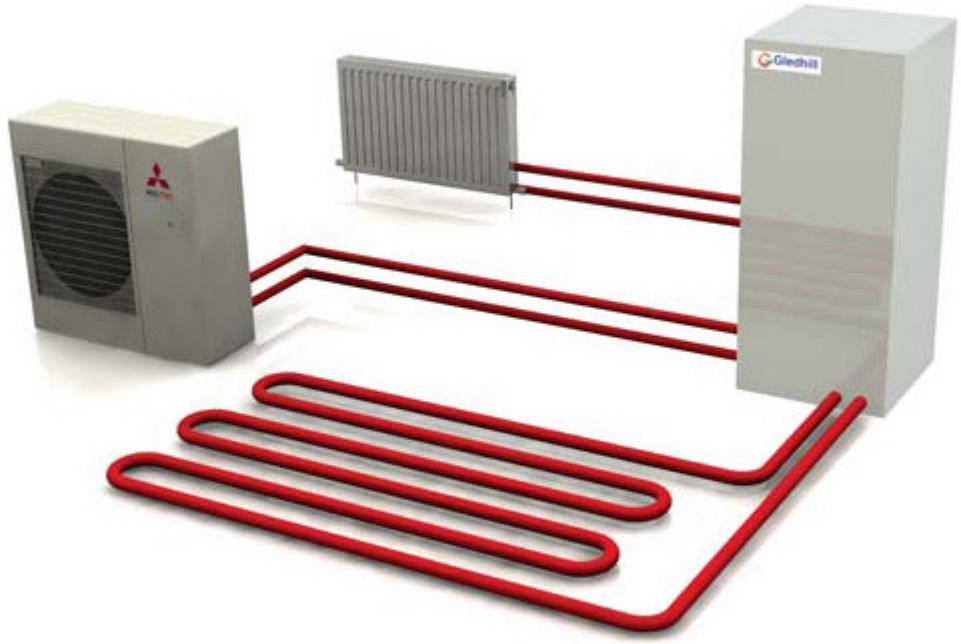
2.0. LEVEL CODE 3

2.1. General

Code for Sustainable Homes level 3 requires a minimum 25% improvement over the TER CO2 emissions calculated in a SAP / SBEM model to achieve this it is likely the following systems will need to be installed.

2.2. Mechanical Services

2.2.1 Heating – It is unlikely that a gas fired boiler with a tradition heating system will achieve a code 3, so therefore alternative options such as an air source heat pump providing LTHW at around 45°C will be required. This will also provide the primary heating for the domestic hot water system.

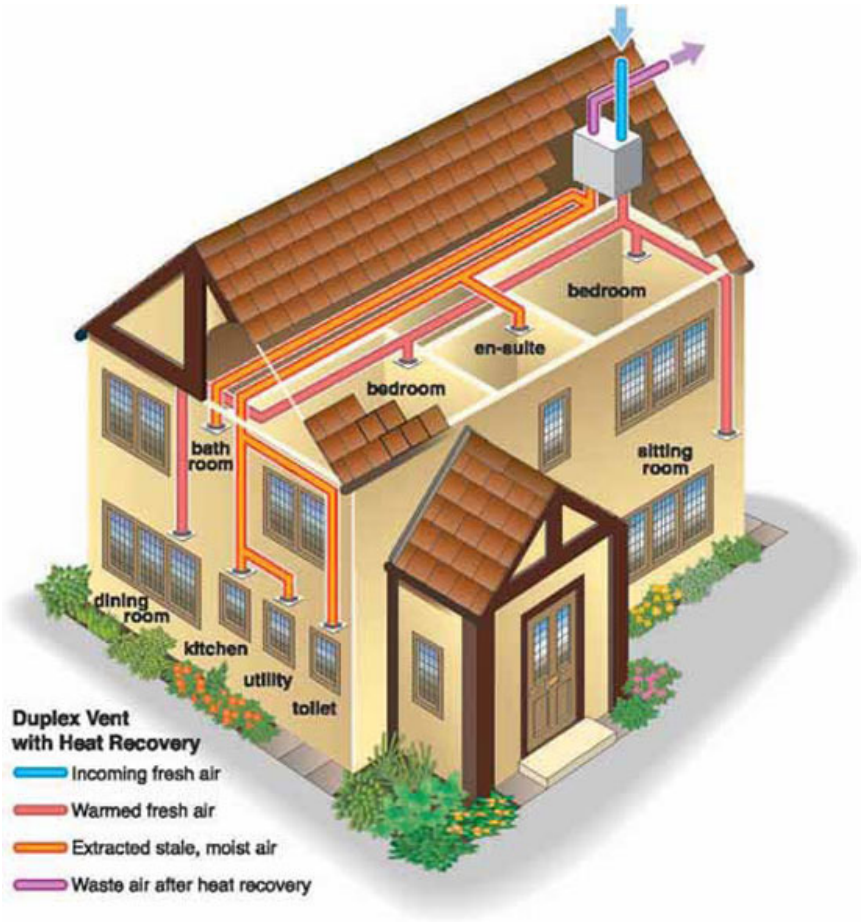


2.2.2 Hot & Cold Water – The home will need to be designed to use no more than 105 litres per person per day. This can be achieved by installing items such as

i. 6/4 dual flush WC
ii. Flow reducing taps
iii. 6-9 l/m shower heads
iv. Smaller shaped bath
v. 18 litre max volume dishwasher
vi. 60 litre max volume washing machine

Solar panels may have to be introduced to provide an LTHW circuit to the hot water cylinder, ensuring that immersion heaters are for back up purposes only and not an primary / secondary heat source for the hot water system.

2.2.3 Ventilation – the use of a supply and extract heat recovery 'whole house' ventilation unit will almost certainly be required to satisfy code 3.



2.3. Electrical Services

2.3.1 Mains and Small Power – additional sub metering may be required, with the possibility of warning devises to ensure 'out of range values' are not occurring on site.

2.3.2 Lighting – 40% of the fixed internal lighting will need to be low energy fittings

2.4. Additional Requirements

- Provide dry space heating (to avoid the use of tumble driers)
- Provide a 'home office'
- Provide dedicated cycle storage
- Reducing the amount of water that runs off the site into storm drains
- Using environmental friendly materials
- Provide recycling capacity either inside or outside the home
- Enhancing the security of the home
- Small rain water harvesting systems may be required such as water butts etc.

3.0. LEVEL CODE 4

To Achieve Code 4, all of the criteria set out in section 2 will need to be met along with some of the items listed in section three. As a comparison:

Code 3 requires 25% improvement over the TER CO2 emissions calculated in a SAP / SBEM model and a further 46.7 points from the Code for Sustainable Homes document

Code 4 requires 44% improvement over the TER CO2 emissions calculated in a SAP / SBEM model and a further 54.1 points from the Code for Sustainable Homes document

Code 5 requires 100% improvement over the TER CO2 emissions calculated in a SAP / SBEM model and a further 60.1 points from the Code for Sustainable Homes document

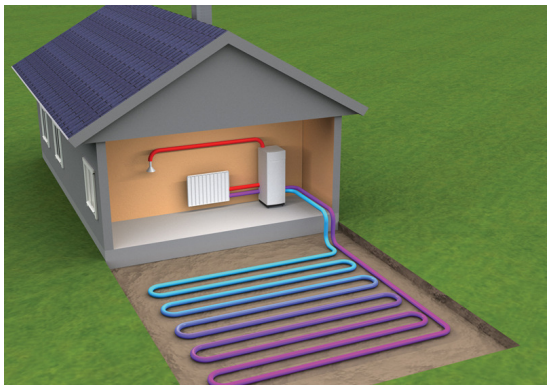
4.0. LEVEL CODE 5

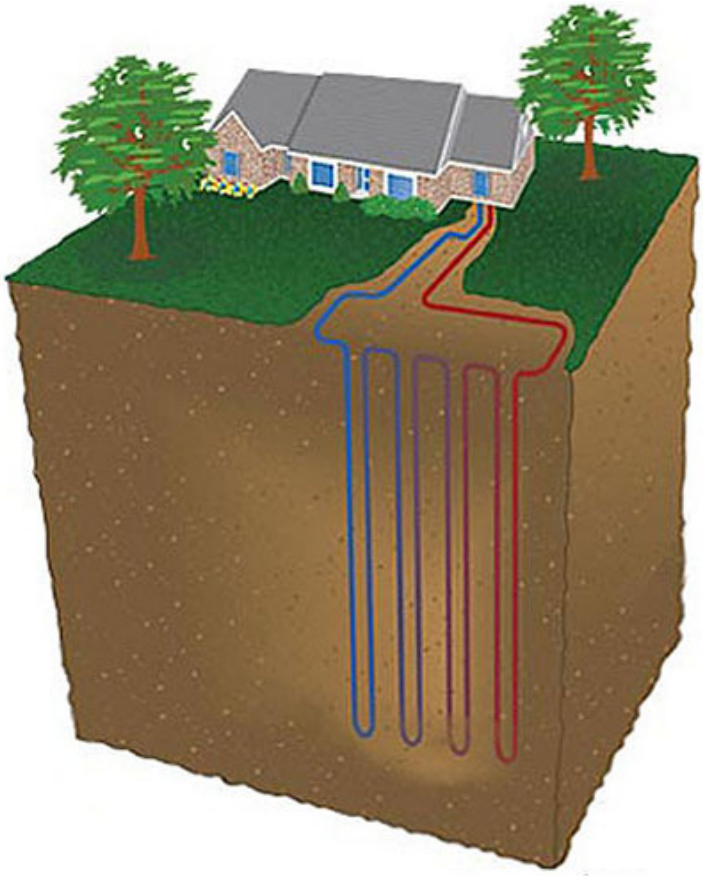
4.1. General

Code for Sustainable Homes level 5 requires a minimum 100% improvement over the TER CO2 emissions calculated in a SAP / SBEM model to achieve this it is likely the following systems will need to be installed.

4.2. Mechanical Services

2.2.1 Heating – either a high efficient air source heat pump (possibly gas fired) or failing that, ground source heat pump will be required to provide the space heating throughout the dwelling. This can be either by oversized radiators or underfloor heating.





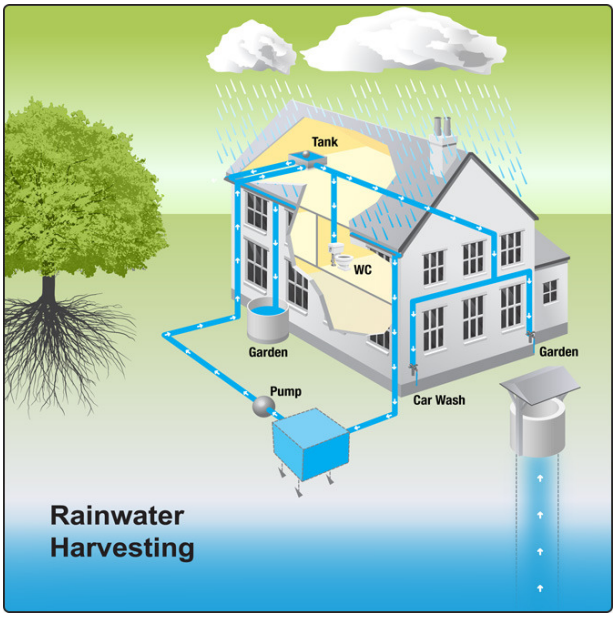
2.2.2 Hot & Cold Water – The home will need to be designed to use no more than 80 litres per person per day. This can be achieved by installing items such as

vii. 6/4 dual flush WC
viii. Flow reducing taps
ix. 6-9 l/m shower heads
x. Smaller shaped bath
xi. 18 litre max volume dishwasher
xii. 60 litre max volume washing machine

Solar panels will have to be introduced to provide an LTHW circuit to the hot water cylinder, ensuring that immersion heaters are for back up purposes only and not an primary / secondary heat source for the hot water system.

2.2.3 Ventilation – the use of a supply and extract heat recovery 'whole house' ventilation unit will be required to satisfy code 5.

2.2.4 Rain Water Harvesting – a rain water harvesting system will need to be provided. This is usually stored and utilised for gardening and irrigation purposes.



2.2.5 Grey Water Harvesting – a grey water harvesting system with appropriate treatment plant and filters will need to be provided. This is usually stored and used for the non-potable sanitary ware items within the house.

4.3. Electrical Services

2.3.1 Mains and Small Power – additional sub metering may be required, with the possibility of warning devises to ensure 'out of range values' are not occurring on site.

2.3.2 Lighting – 75% of the fixed internal lighting will need to be low energy fittings.

External / security luminaires will need to have maximum combined output of 150W and fitted with movement detectors and daylight shut off devices.

2.3.3 Photo Voltaic System – a PV system will almost certainly be required to provide supplementary dedicated electrical supply and a feed in tariff meter if not all of the generated electricity is consumed.

4.4. Additional Requirements

- Provide dry space heating (to avoid the use of tumble driers)
- Provide a 'home office'
- Provide dedicated cycle storage
- Reducing the amount of water that runs off the site into storm drains
- Using highly environmental friendly materials
- Provide recycling capacity either inside or outside the home

- Enhancing the security of the home
- Small rain water harvesting systems may be required such as water butts etc
- Minimising construction waste
- Building to the Lifetime Homes standard
- Assessing and minimising the ecological impact of the construction of the home
- Maximum accessible provision for recycling
- Selecting A+ rated white goods appliances
- Wind turbines may need to be considered
- Considerable improvement on the default / standard air permeability
- Highly efficient double / triple glazed windows
- Considerable improvement to the U-Values for walls, roofs, and exposed floors.