accommodation. (Softened water will ensure optimum energy performance due to limiting scale build up in plant/pipework).

2.7 Domestic Hot Water
Hot water cylinder/generators located in the basement plantroom will be provided with boosted and softened cold water. The hot water generators shall be hot water cylinders complete with a small buffer storage cylinder, hot water cylinder system to be complete with a pumped return system. This combination of system minimises energy losses by not storing a large amount of hot water, yet has the advantage of ensuring that all peak demands will still be met from the CHP plant – maximising efficiency and CHP run time.

Hot water production shall be strictly controlled by weather compensation, timeclock control for occupancy holiday times and maximisation of plant duty. (Softened water will ensure optimum performance due to limiting scale build up in plant/pipework).

All basins, baths and sinks will be protected by TMV2 valves (Thermostatic mixing valves), above the minimum Part 'G' requirements.

2.8 Recycled Rainwater
The rainwater recycling drainage system (see 2.21), will provide recycled rain water for irrigation supplies, pool replenishment and backwashes. This will reduce the reliance on treated mains water.

Filters/ UV unit shall be provided to the system.

2.9 Natural Ventilation
Background habitable room ventilation is generally to be provided by trickle vents incorporated into windows or walls for some of the building.

Rapid ventilation to spaces will be provided by openable windows/continuous ventilation.

Consideration will be given to a PSV (Passive stack ventilation), system to bathrooms (wet areas), with humidity controlled trickle vents to habitable spaces.

2.10 Fresh Air Systems
Fresh air fan units (MVHR's) with thermal heat recovery (90%), are to be provided to some of the basement areas.
To provide ducted fresh air/extract to spaces, to fully comply with Part 'F' of the Building Regulations. Ductwork to be pre-insulated PVC and galvanised steel with insulation or Kool duct.

2.11 Bathrooms, Cloakrooms and Kitchen Ventilation
MVHR supply and extract ventilation units will be provided for the purposes of sanitary accommodation and utility ventilation. These dedicated fan systems shall comprise of isolated (low noise) ducted fan units located either within plant areas and discharge to the main roof areas. Ductwork to be pre-insulated PVC and galvanised steel with insulation or Kool duct.

2.12 Pool Environment
Due to the specialist nature of these spaces, there are very specific requirements when it comes to temperature/ humidity. A separate AHU is to be provided fed from the lead CHP unit for both water and airside heating with 70% heat recovery.

2.13 Plantroom/Store Ventilation
The plantroom will be provided with supply and extract ducts from roof level and or fans suitably sized to provide fresh air and control heat build up.

2.14 Cooling
Firstly, the building has been designed to limit heat gains by; orientation, thermal mass, provision of green roofs, tree shading, semi underground spaces and overhanging slabs/roofs.

Cooling may also be considered to rooms/spaces for peak cooling only.

This is proposed to be via a very high efficiency air source heat pumps (4.23 COP).

The type of cooling for each room will be provided by fancoils mounted either within joinery or false wall/ceiling details.

Pre-insulated discharge ductwork will be attached to these units to discharge through high induction linear grilles incorporated within joinery and wall finishes at high level. The system will have very low noise levels, which is generally to be targeted at NR30 throughout the building.

A refrigerant gas sensor system will be incorporated to provide safety/protection in accordance with FGAS requirements, to all bedrooms and other rooms/spaces. Internal pipework to be copper insulated.

Each room/space will have individual control via a remote room controller to each fan coil, controlled via a discrete room sensor for operation or modification to the set point of the controllers. Cooling and heating will be automatically controlled to ensure no system fighting and undue energy use (interlocked). Overall occupancy and holiday controls to also be provided to ensure efficient energy use and management.

2.15 Automatic Controls
Automatic control systems will be provided for all of the mechanical services. It is anticipated this will be installed as a complete BMS/ DDC electronic system supervised by a touch screen control/PC positioned within the basement plantroom.

The client will also have the facility for zoned overrun of various systems and time switch control separate to the main plantroom, via a PC interlink situated within the study.

Full remote off site access will also be provided via a modem to this system enabling an ongoing maintenance contract to be provided with the system installers and for the occupiers to efficiently control the systems.

The system will have remote interface modules which will allow the client operation of the heating and cooling, lighting and other systems via the audio visual keypads. Where this is not provided, individual room control will be provided with more basic visual/manual controls.

Controls are to be zoned to provide more efficiency, occupancy control and management.

2.16 Above Ground Drainage
The above ground drainage system shall be provided to serve all the sanitaryware accommodation.

It is anticipated that either HDPE acoustic pipe or cast iron pipework will be provided, fully insulated for both thermal and acoustic reasons, with individual local run-outs individual to the sanitary accommodation being in good quality UPVC drainage pipework.
Installation of leak detection systems will be considered to detect leaking water hidden in areas such as voids and shower trays etc. This is being considered to protect the building fabric and internal fixtures and fittings.

2.17 Rainwater Drainage
All rainwater pipes will be routed from roof level to drain points at ground/lower ground floor levels. All roof outlets will be sized to take a rainfall intensity of 108 mm per hour. All pipes shall have access before connecting to underground drains. All external rainwater stacks are to be either aluminium or cast iron and where installed internally. All internal stacks shall be thermally/acoustically insulated.

2.18 Underground Drainage

Underground rainwater harvesting tank/s will be provided within the surface water drainage system to collect water from the main roof areas for recycling for external irrigation and pool backwash replenishment.

The surface rainwater system will not only include these reservoir retention devices but also provide sufficient SUDS storage to limit the outfall to 50% below the rainwater discharge that currently exists for the site.

A surface water retention tank shall be provided as part of the harvesting tank to reduce outflow to the sewer. A hydrobrake will be utilised to limit outflow. It is intended to drain the rear half of the house (RWP's and gullies), to the retention tank, to reduce peak outflows to 50% below the existing level; with 20% factor for climate change based on a 1:100 year storm.

This combined with infiltration trenches/ soakaways, a permeable surface to the front area drive and other pavedareas, green roofs and natural percolation to grassed/ soft areas.

All external drainage shall be Upvc or clayware, cast iron under the building.

Section 3.0

ELECTRICAL SERVICES

3.0 ELECTRICAL SERVICES

3.1 Incoming Utility Supply
A new main incoming TP&N supply connection will be provided to serve the new property which will be sized to suit the anticipated maximum building load.
The incoming supply will be grid tied with the CHP, allowing excess power to be exported to the grid network when not being utilised. The clients' Energy Supplier will install a suitable meter to facilitate energy export of the generated electricity.
The energy usage at the incoming position will be measured and inter-linked to the AV system providing the end-user with accurate power consumption data displayed on a visual display screen. This facility will provide the owner with a user-friendly interface for energy monitoring and management within the house.

3.2 Sub-main Distribution
Sub-main distribution boards will be installed to serve various areas within the building. This will reduce cable material costs and installation time.
The local sub-distribution boards will incorporate suitably rated MCBs and RCBOs to suit the circuit type and loading.
Separate dedicated feeds will be supplied to life safety systems, such as fire alarm equipment in suitable fire rated cabling.
Sub-main distribution cabling will be multi-core armoured with XLPE outer sheath and LSF inner sheath with copper conductors.
Adequate spare capacity will be provided within the distribution network for any future expansion of the system, avoiding the need for any significant re-modification works at a later period.

3.3 Final Circuit Distribution
Final circuit distribution cabling will be multi-core flat twin & earth XLPE/LSF sheathed copper conductors and will not be of the PVC/PVC type.
The XLPE (cross-linked polyethylene) cable material offers superior electrical performance to PVC and the LSF insulation produces 'low smoke and fumes' when exposed to fire.
RCBOs will be used which combine Residual Current and Overcurrent protection within a single device. Consequently each circuit will be individually RCD protected avoiding any nuisance tripping of unaffected circuits as would be the case if a split load distribution arrangement were adopted whereby many circuits are protected by a single RCD.

Either a battery backed UPS system or generator for minor supplies will be installed.

3.4 Small Power Installations
Single and twin 13A Switched Socket outlets will be provided at various positions within the property for general purpose use and to serve fixed electrical equipment.
The outlets will be positioned to offer the greatest flexibility for different interior space planning options and will be mounted at a suitable height for ease of access conforming to the Building Regulation Part M requirements.
Where the room/spaces are used as 'home offices' (e.g. where computers, printers etc. are installed causing potential earth leakage currents) then socket outlets will be of the Dual Earth connection type.
13A switched/un-switched fused connection units with neon lamps will be installed to serve various fixed items of electrical equipment.
All small power faceplate outlets will be sourced from a reputable manufacturer such as 'MK Electric' incorporating the required electrical safety standards and allowing ease of installation.

3.5 Interior Lighting Installations
The lighting scheme will utilise the latest low energy compact fluorescent and long life LED/CFL lighting technologies in order to achieve a minimum of 100% low energy lighting throughout the property, exceeding the requirement as stipulated in the Building Regulations Part L.
Dimming control will be provided to the majority of the lighting systems in the form of pre-set scene setting controlled from individual wall plates in each room/space and via a wireless/ hardwired visual display screen as part of the AV control system.
Consideration is also being given to allow energy usage from the lighting system to be monitored via the AV system.

In room/spaces with sufficient natural lighting, day-linked control of the artificial lighting is also being evaluated. Computational daylight investigation will be carried to principle living areas to ascertain the benefit of day-linked dimming controls.

Room/spaces which are not lit by natural daylight, in particular escape routes, will incorporate emergency standby lighting with up to 3hr battery back-up. Consideration for additional emergency lighting to all escape routes/pool side will be taken.
Special attention will be made to bathrooms and the pool area lighting scheme, ensuring the correct level of Ingress Protection (IP) rating is provided in accordance with the 'zoning' requirements of the IEE Regulations.

3.6 Exterior Lighting Installations
The external lighting installation will comprise of a combination of low energy compact fluorescent, LED, and Metal Halide lamp lighting. (Light outputs will not exceed Regulations).
Luminaires will be building facade mounted for night time perimeter security lighting and will be of the wall-wash type to avoid direct light pollution into the neighbouring community.
Ground recessed and low level ground mounted garden and pool amenity lighting will also be provided which will be limited in numbers to avoid excessive lighting and light pollution.
All external lighting will be daylight-linked via an adjustable external photocell and only switch on during periods of insufficient daylight. Manually adjustable time-clock control will also be provided to allow the occupier to adjust the time period and to switch off the lighting when not required.

3.7 Audio Visual Systems
The Audio Visual installation will generally include the following systems:

1. Lighting control and management via user-friendly wireless/hardwired touch screen visual display panels located throughout building to occupiers requirement.

2. Building energy monitoring via touch screen panels with scope for split monitoring of various loads e.g. lighting & power.

3. Heating, comfort cooling and ventilation control via touch screen panels.

4. Terrestrial and Satellite TV installation and control. For signal reception each TV will receive a single CAT 5e/6 cable input allowing multi-service viewing. Conventional coax cabling will not be installed saving on material and installation cost.

5. Hardwired broadband and telephone service in CAT 5e/6 cabling.

6. CCTV security monitoring around the vicinity of the building in CAT 5e/6 cabling with digital recording facility.

7. Audio and visual access control system to main building entrance(s)

3.8 Security System
A wired intruder alarm system will be provided comprising suitable room/space movement detectors, magnetic contacts to perimeter doors and window/door break glass detection. The system will be linked to a 24hr central monitoring station via a dedicated BT Redcare line and GSM. The design and installation will conform to ACPO policy and DD243 requirements for police response service.

3.9 Fire Detection and Alarm System
The building may come under the requirements of BS5839 Part 6. The final installation design will be agreed with the relevant parties, including the Local Fire Office (Fire Brigade) and Local Council District Surveyor.

To provide the highest degree of life and property protection a 'Type L1' category system may be employed and be appropriately zoned, allowing the local fire brigade to promptly identify the location/source of fire occurrence.

The system will have the appropriate level of standby battery back-up to operate under mains power failure.

All cabling will be fire rated to the appropriate required standard.

Generally smoke detectors, incorporating base sounder units will be installed throughout the premises except within the kitchen area, plant spaces and gallery – these will be heat detectors; to avoid nuisance alarm conditions. The plant room/kitchen areas will also have carbon monoxide (CO) detectors installed.

Consideration will be given to an 'Ion' based (Air sampling), detection system in some principal areas.

3.10 Earthing & Bonding

All extraneous conductive parts will be bonded to the main building earth terminal with main equipotential and supplementary earth bonds as required.
Supplementary earth bonding will be provided to areas of increased electric shock risk including bathrooms, shower rooms, swimming pool area and plant rooms.
A separate additional earth electrode system will be provided for earth bonding of the swimming pool areas as required by the IEE Regulations.

3.11 Lightning Protection

A lightning protection system will be installed to prevent damage to the building structure and mitigate; injury to people, physical damage (e.g. fire, explosion) and failure of internal electrical systems.
The system will be designed to intercept the lightning strike and safely discharge the high voltage current to earth via a network of lightning rods and metal conductors connected to an earth electrode designed to provide a low resistance path to earth.
To protect sensitive electronic equipment within the property from damage and failure resulting from transient over voltages (surges), caused by lightning strikes; a suitable surge arrester will be installed at the main supply intake and on data/phone lines and for sensitive equipment.

3.12 Electrical Appliances & Mechanical System Equipment

Most 'white goods', including the refrigerator/freezer, cooker, microwave oven, washing machine/dryer and dishwasher will be 'A' rated (or higher) energy efficient items under the EU energy label classification.
Other major electrical plant, including condenser units and water booster pumps sets will be selected where available and or practicable to incorporate energy efficient motors and intelligent energy saving controls.

Section 4.0

M&E SUSTAINABILITY ITEMS

4.0 M&E SUSTAINABILITY ITEMS

The main sustainable items are covered under the Code for Sustainable Homes pre-assessment in Appendix (i)

4.1 Daylighting

The proposed house has high levels of natural daylighting due to the glazing areas.

This is specifically covered in the Code for Sustainable Homes (CSH) pre-assessment in Appendix (i), HEA1 (Health and Well Being).

All main habitable rooms (Living rooms, kitchen and study), will achieve the minimum daylight factors and view of the sky for CSH.

4.2 Recyclable Materials

Each product/material for the M&E services shall be evaluated against Environmental impacts and life cycle costing. The following is a typical list of proposed M&E materials/products that will be utilised;

- Water pipework - Copper (Recyclable).
- Drainage pipework - Cast iron/Aluminium (Recyclable).
- Valves - Brass (Recyclable).
- Electrical cables - PVC twin & earth (XLPE/LSF) (Recyclable)
- Pipework insulation - Rock wool (Recyclable)
- Pipework Insulation - Phenolic foam – (Recyclable)
- Concrete - Portland cement based - (Recyclable)
- Light fittings – LED's/compact fluorescent - (Recyclable)

4.3 Salvage/Reuse of Existing Materials

Each existing material/product will be evaluated for possible salvage/reuse when existing items/materials are removed for the proposed works.

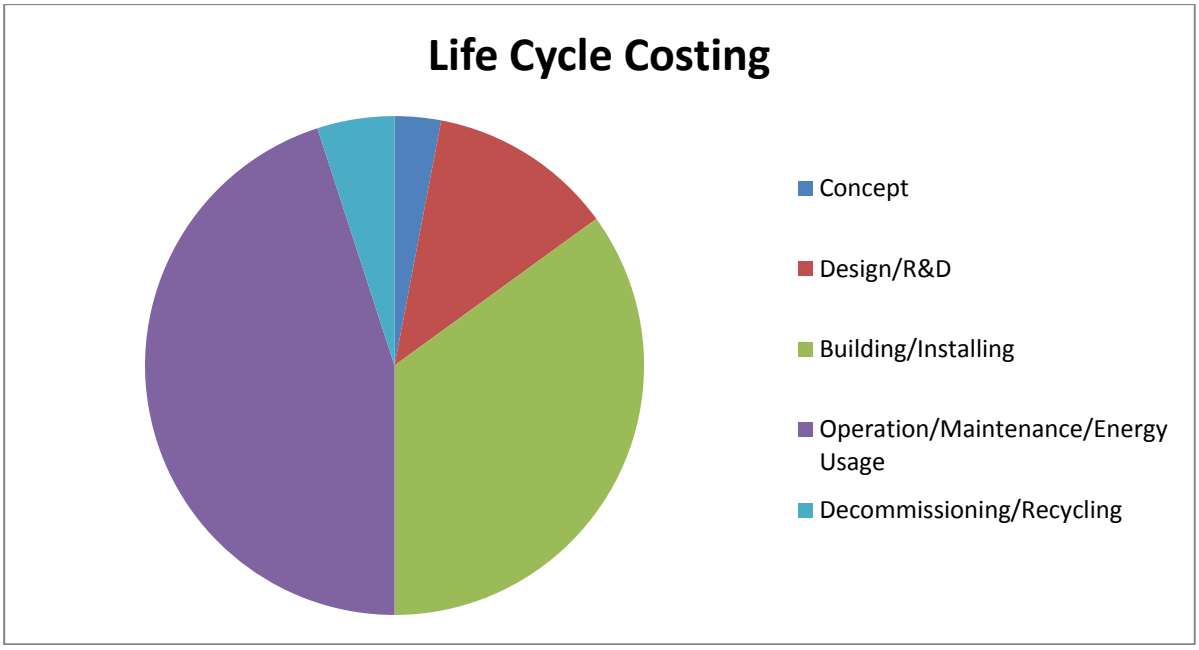
Reuse will have priority over salvage; an economic, viability and safety assessment will be made for each item/material.

4.4 Life Cycle Costing

Each product/material proposed shall be evaluated on a life cycle costing basis. Recyclable materials shall be utilised where possible in preference to non-Recyclable.

The particular areas of the life cycle to be addressed for M&E Services are:
Building & Installing the system/product, Operation/Maintenance, Energy Usage and finally, Decommissioning/Recycling.

Below is a graph indicating the lift cycle phases;



Typically the majority of the life of a material/product is spent in the Operation/Maintenance phase. It is in this phase that it creates the value contribution but also absorbs the vast proportion of the costs through maintenance and energy usage.

Products/materials shall be selected on the basis of particularly reducing the impact of this phase, for example, a pump, by selecting long term reliability and low energy usage over initial cost.

The ease and speed of building/installing different products/systems shall also be compared to reduce this phase.

4.5 Noise & Vibration

Noise and vibration associated with moving mechanical services plant, e.g. Pumps, fans, condensers, pipes/ducts, lifts and boilers shall be limited to acceptable levels as follows;

Pumps: Inverter drives providing slow low impact start/stop cycles, intelligent controls, anti-vibration couplings/supports, dense block wall constructed plantrooms.

Fans/Condensors : Low speed intermittent ventilation fans, flexible duct connections, remote plantroom/cupboard mounting, attenuators and anti-vibration fixings.

CHP units: Low noise units, internally mounted within plant areas with acoustic enclosures, anti-vibration mounts and wall/ceiling acoustic lining.

Boilers: Low noise units and internally mounted within plant areas.

Pipes: Anti-vibration/flexible couplings to plant, expansion joints/anchors and smooth bends/straight lines.

Ducts: Inline attenuators, anti-vibration/flexible couplings to plant, and smooth bends/straight lines.

An Acoustic Consultant shall further advise on noise, vibration and acoustic items.

4.6 Solar Gains

In compliance with the new Part 'L' of the Building Regulations (April 2010 edition) solar gains shall be reduced by the building being designed to limit heat gains by; orientation, thermal mass, provision of green roofs, tree shading, semi underground spaces, overhanging slabs/roofs and higher performance double or triple glazed windows with solar tinting/low emissivity coating and Argon gas filled cavities to the South, East & West Elevations.

Additionally, internal blinds to the South, East & West Elevations may be provided as part of the development for occupiers to assist in compliance with Solar Gains.

APPENDIX (i)

BRE CODE FOR SUSTAINABLE

HOMES LEVEL 4

PRE-ASSESSMENT REPORT AND SCORE

ME7

17 Branch Hill Hampstead
London NW3 7NA

Report Demonstrating Compliance

Code for Sustainable Homes

Code Level 4

PRE- ASSESSMENT

DMW/JB/594: September 2014

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M&E Consultants Energy Consultants

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ME7

17 Branch Hill Hampstead
London NW3 7NA

Report Demonstrating Compliance

Code for Sustainable Homes

Code Level 4

PRE- ASSESSMENT

CONTENTS

Executive Summary

- The proposed redevelopment of 17 Branch Hill can achieve CSH Level 4, based on the requirements of the Code for Sustainable Homes, November 2010 Version incorporating Code Addendum 2014

- Based on the assumptions of this Assessment the proposed development can satisfy all the mandatory sections within the Energy, Water & Materials Categories and achieve Code Level 4 status with a predicted overall score of 68.5%

- From the following Pre- Assessment Report, it can be seen that the proposed development at 17Branch Hill is an excellent example of sustainability in a residential dwelling.

- This Pre-Assessment is based on early design information and is intended to provide guidance upon which the design team can rely in order to achieve Certification to Code Level 4 at Design and Final Construction Stage subject to verification by the BRE following accepted independent documentation, calculations and reports.

The Proposals

The proposed development at 17 Branch Hill comprises a considerable property containing 4 family bedrooms, a Guest Bedroom and Staff Bedroom. General living accommodation above ground extends into semi and basement areas providing social and leisure facilities together with storage and plant rooms for the property

The purpose of this report is to demonstrate compliance with the Code to achieve Level 4 in support of the Planning Application for the site.

The Code for Sustainable Homes BRE Global Pre–Assessment Calculation Summary sheet is attached in Appendix (i) in confirmation of the achievable Code Level

The Code for Sustainable Homes is divided into nine main elements;

- Energy
- Water
- Materials
- Surface Water
- Waste
- Pollution
- Health and Wellbeing
- Management
- Ecology

Overleaf, we show how in each Category the proposed development at Branch Hill can achieve Level 4 under the November 2010(Addendum 2014) version of the Code.

Code for Sustainable Homes Level 4 Pre – Assessment Summary

Category 1: Energy

Ene 1: Dwelling Emission Rate - The **mandatory element** of this category to achieve Code Level 4 requires a 19% improvement of Dwelling Emission Rate (DER) over the Target Emission Rate (TER) as defined in Approved Document Part L1A 2013. However, the London Plan requires reduction of 35% in regulated CO^2 emissions. Design Draft SAP calculations prepared based on enhanced fabric values, efficient services and the incorporation of a Combined Heat and Power plant reveal that this enhanced requirement is met by achieving a 37% improvement achieving **Code Level 4** and contributing **4.4 Credits** to the overall score.

Ene 2: Fabric Energy Efficiency - Design Draft SAP calculations reveal the specification for the proposed development achieves a FEE rating of 51.8 Wh/m2/year contributing **5.0 Credits** to the overall score

Ene 3: Energy Display Devices –EDD's can be provided that will allow the occupants to monitor fuel consumption related to primary heating and current electricity enabling them to reduce energy use contributing **2 Credits** to the overall score

Ene 4: Drying Space – Externally secure drying facilities can be provided comprising a minimum 6m+ line length in accordance with the requirements of a 3+ bedroomed dwelling contributing **1 Credit** to the overall score.

Ene 5: Energy Labelled White Goods – A+ Fridge/Freezers and A rated Washing Machines and Dishwashers should be supplied together with EU Efficiency Labelling advice contributing **2 Credits** to the overall score

Ene 6: External and Security Lighting – Low energy fittings should be provided with PIR or DtD controls in line with Code requirements contributing **2 Credits** to the overall score

Ene 7: Low or Zero Carbon (LZC) Technologies – The CHP technologies being proposed will supply a significant proportion of energy demand, reducing CO^2 emissions as a result by at least 15%. Draft SAP calculations reveal 29% reduction in CO^2 emissions contributing **2 Credits** to the overall score

Ene 8: Cycle Storage – It is assumed that secure space for the storage of minimum 2 No. cycles can be provided within the garage providing direct access to the public highway contributing **1 Credits** to the overall score

Ene 9: Home Office – A Study has been incorporated within the design complete with Code compliant services, adequate ventilation and is assumed to achieve an average daylight factor of 1.5% contributing **1 Credit** to the overall score

Category 2: Water

Wat 1: Internal Potable Water Use – The provision of Dual flush WC's, attention to bath size and restricted flow to showers, basins and kitchen taps will ensure that water consumption will be restricted to 105 litres/person/day achieving the **mandatory requirement** for **Code Level 4** and contributing **3 Credits** to the overall score

Wat 2: External Potable Water Use – Water storage for external irrigation purposes and top-up provision for the swimming pool is proposed within the overall drainage strategy for the site contributing **1 Credit** to the overall score

Category 3: Materials

Mat 1: Environmental Impact of Materials - The **mandatory requirement** of the Code that specifies at least three of the five key building elements have to achieve BRE Green Guide 2008 ratings of A+ to D should be met on the assumption that the property will be of traditional construction comprising timber/slate roof, cavity brick/block external walls, timber upper floors, timber double glazed windows & timber or metal stud internal walls. It is assumed at this stage that a minimum **10 Credits** (of the 15 available) are achievable

Mats 2&3: Responsible Sourcing of Basic Building & Finishing Materials - It is a requirement in these Categories that suppliers of building materials will need to have compliant certified Environmental Management Systems in place in respect of the Key Process and Supply Chain, and that Timber will need to be sourced through FSC or similar schemes in order to be compliant with the Code. Experience has shown that reliance on Credits achievable in these Categories at early Design Stage should be avoided unless critical to the overall score as Contractors are reluctant to pursue suppliers to produce the requisite EMS Certification from their suppliers. Consequently, no Credits have been assumed to contribute to the Code score at this time

Category 4: Surface Water Run-Off

Sur 1: Reduction of Surface Water Run-Off - Peak rate of run off from the development is to be reduced by 50% post development compared to pre-development satisfying **mandatory requirements** in this Category. The surface water design also takes advantage of SUDs techniques such as infiltration, permeable areas, irrigation reuse and green roofs to ensure that the first 5mm of any rainfall is dealt with on-site and that any discharge from the site is appropriately treated in order to minimise the risk of pollution of the receiving waters contributing **2 Credits** to the overall score

Sur 2: Flood Risk - A Flood Risk Assessment will be required to justify the assumption but for the purposes of this Assessment it is assumed that the development is in a low flood risk area contributing **2 Credits** to the overall score

Category 5: Waste

Was 1: Household Waste Storage – In order that **mandatory requirements** are met and maximum Credits obtained for waste, dedicated internal storage will need to be provided with minimum 30 litre capacity to be located in the kitchen and external space provided for waste bins with min 450 litre capacity in compliance with minimum Code requirements related to a 6 Bedroomed property. Access to the storage area will need to be in compliance with Inclusive Design Principles . Local Authority weekly collections for waste and recyclable materials is assumed. Waste Storage provisions as described will contribute **4 Credits** to the overall score

Was 2: Site Waste Management – The Contractor will need to operate a Site Waste Management Plan to include procedures for monitoring and minimising site waste, recycling and sorting waste generated as a result of the construction work ensuring that a minimum of 85% of waste generated will be diverted from landfill contributing **3 Credits** to the overall score.

Was 3: Composting – Either the Local Authority responsible for waste collections provides a green and kitchen waste service and/or an individual composting facility can be provided that satisfies this Category and contributes **1 Credit** to the overall score.

Category 6:Pollution

Pol 1: Global Warming Potential of Insulants - All insulation materials to be used in the Development to have a Global Warming Potential (GWP) of less than 5 contributing **1 Credit** to the overall score.

Pol 2: Nox Emissions – Primary space and hot water energy to be provided by a Boiler providing dry NOx emissions $\leq$ 40mg/kWh contributing **3 Credits** to the overall score

Category 7:Health and Wellbeing

Hea 1: Daylighting – In due course a Daylight Factor Analysis will be required to justify Credits claimed but a cursory inspection of the design proposals suggests that the development could achieve the minimum 1.5% daylight factor, over min 80% of the working plane required in the Living & Dining Rooms and achieve 2% required in the Kitchen contributing **3 Credits** to the overall score

Hea 2: Sound Insulation – A detached dwelling is proposed for the development of the site satisfying the Code default case in this Category contributing **4 Credits** to the overall score

Hea 3: Private Space - The garden area proposed for the property is in excess of the Code requirement related to this Category. However, for Credits to be achieved it will need to be accessible in accordance with Inclusive Design Principles. The patio area to the rear of the Family Lounge is of adequate size and access in accordance with IDP can be designed in to the proposals allowing the contribution of **1 Credit** to the overall score

Hea 4: Lifetime Homes – It is assumed that all the principles of Lifetime Homes that are applicable to the dwelling can be included within the design contributing **4 Credits** to the overall score.

Category 8:Management

Man 1: Home User Guide - Maximum credits can be achieved by provision of a home user guide incorporating information relating to the site and its surroundings contributing **3 Credits** to the overall score.

Man 2: Considerate Constructors Scheme – The Contractor employed will need to register the site with the Considerate Constructors Scheme and will require to meet Best Practice standards of the Scheme contributing **1 Credit** to the overall score

Man 3: Construction Site Impacts – The Contractor will need to pursue procedures that cover 4 or more best practice policies in respect of energy use, CO^2 production, water consumption, water pollution and air (dust) pollution contributing **2 Credits** to the overall score

Man 4: Security - An ALO/CPDA from local Police Force will need to be consulted with recommendations incorporated into the design to comply with *Section 2 – Physical Security from 'Secured by Design – New Homes'* contributing **2 Credits** to the overall score.

Category 9: Ecology

Eco 1-4: Ecological Value,Enhancement&Protection – At this stage no Credits have been assumed to be available in any of these Categories principally as it appears that a number of trees that can be considered to be of ecological value are proposed for removal. It is possible that an SQE could provide sufficient evidence to justify the awarding of some Credits relating to Enhancement and Change in Site Value but such information is not available at preparation of this pre-assessment

Eco 5: Building Footprint – It is anticipated that the ratio of Net Internal Floor Area to Net Internal Ground Floor Area exceeds 2.5:1 contributing **1 Credit** to the overall score

APPENDIX (i)

PRE-ASSESSMENT SUMMARY SHEET
DEMONSTRATING CSH LEVEL 4 COMPLIANCE

breglobal

Results

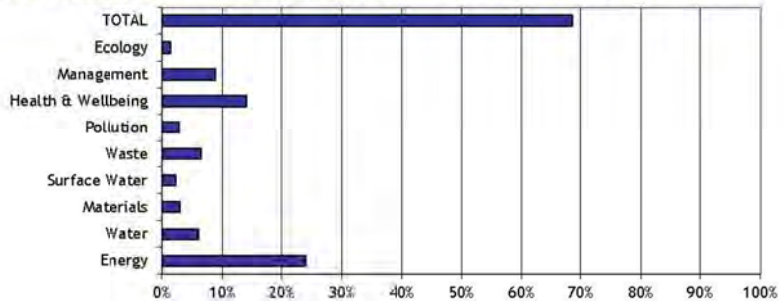
Development Name:	17 Branch Hill Hampstead W3 7NA
Dwelling Description:	Detached Dwelling
Name of Company:	ME7 Ltd
Code Assessor's Name:	Dudley Walker - Assessor No. BREAM-1698
Company Address:	Unit 2 Rays Farm Barns Roman Road Ingatestone Essex CM4 9EH
Notes/Comments:	Pre Assessment 1.0 - Planning Submission

PREDICTED RATING - CODE LEVEL: 4

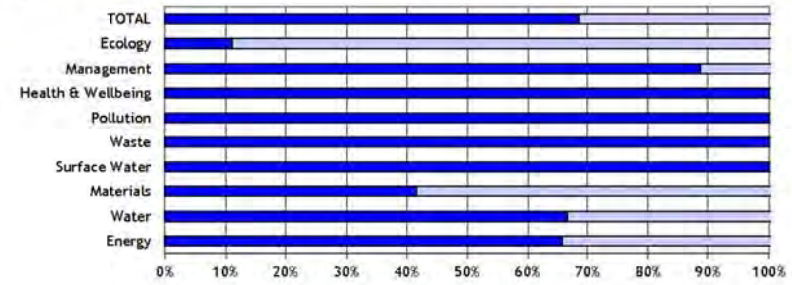
Mandatory Requirements: **All Levels**

% Points: **68.56%** **- Code Level: 4**
Breakdown: **Energy** **- Code Level: 4**
Water **- Code Level: 4**

Graph 1: Predicted contribution of individual sections to the total score and percentage of total achievable score



Graph 2: Predicted percentage of credits achievable: Total and by Category



NOTE: The rating obtained by using this Pre Assessment Estimator is for guidance only. Predicted ratings may differ from those obtained through a formal assessment, which must be carried out by a licensed Code assessor.

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APPENDIX (ii)

SAP L1A 2010 REGULATIONS COMPLIANCE REPORT
(EFFICIENT BASELINE)

SAP WorkSheet: New dwelling design stage

User Details

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Software Name:	Stroma FSAP 2012	**Software Version:**	Version: 1.0.1.8

Property Address: Efficient Baseline

Address : 17, Branch Hill, LONDON, NW3 7NA

1 Overall dwelling dimensions:

	Area(m²)		Av. Height(m)		Volume(m³)	
Basement	65.6	(1a) x	2.7	(2a) =	177.12	(3a)
Ground floor	162.6	(1b) x	3	(2b) =	487.8	(3b)
First floor	69.4	(1c) x	4	(2c) =	277.6	(3c)
Second floor	135.4	(1d) x	3.1	(2d) =	419.74	(3d)
Third floor	166.4	(1e) x	2.8	(2e) =	465.92	(3e)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)+.....(1n)	599.4	(4)				
Dwelling volume			(3a)+(3b)+(3c)+(3d)+(3e)+.....(3n) =		1828.18	(5)

2 Ventilation rate

	main heating		secondary heating		other		total		m³ per hour	
Number of chimneys	0	+	0	+	0	=	0	x 40 =	0	(6a)
Number of open flues	0	+	0	+	0	=	0	x 20 =	0	(6b)
Number of intermittent fans							11	x 10 =	110	(7a)
Number of passive vents							0	x 10 =	0	(7b)
Number of flueless gas fires							0	x 40 =	0	(7c)

			Air changes per hour	
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(7a)+(7b)+(7c) =	110	÷ (5) =	0.06	(8)
If a pressurisation test has been carried out or is intended, proceed to (17), otherwise continue from (9) to (16)				
Number of storeys in the dwelling (ns)			0	(9)
Additional infiltration		[(9)-1]x0.1 =	0	(10)
Structural infiltration: 0.25 for steel or timber frame or 0.35 for masonry construction			0	(11)
if both types of wall are present, use the value corresponding to the greater wall area (after deducting areas of openings); if equal user 0.35				
If suspended wooden floor, enter 0.2 (unsealed) or 0.1 (sealed), else enter 0			0	(12)
If no draught lobby, enter 0.05, else enter 0			0	(13)
Percentage of windows and doors draught stripped			0	(14)
Window infiltration		0.25 - [0.2 x (14) ÷ 100] =	0	(15)
Infiltration rate		(8) + (10) + (11) + (12) + (13) + (15) =	0	(16)
Air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area			5	(17)
If based on air permeability value, then (18) = [(17) ÷ 20]+(8), otherwise (18) = (16)			0.31	(18)
Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used				
Number of sides sheltered			3	(19)
Shelter factor		(20) = 1 - [0.075 x (19)] =	0.78	(20)
Infiltration rate incorporating shelter factor		(21) = (18) x (20) =	0.24	(21)

SAP WorkSheet: New dwelling design stage

Infiltration rate modified for monthly wind speed

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Monthly average wind speed from Table 7												
(22)m=	5.1	5	4.9	4.4	4.3	3.8	3.8	3.7	4	4.3	4.5	4.7
Wind Factor (22a)m = (22)m ÷ 4												
(22a)m=	1.27	1.25	1.23	1.1	1.08	0.95	0.95	0.92	1	1.08	1.12	1.18
Adjusted infiltration rate (allowing for shelter and wind speed) = (21a) x (22a)m												
	0.31	0.3	0.29	0.26	0.26	0.23	0.23	0.22	0.24	0.26	0.27	0.28

Calculate effective air change rate for the applicable case

If mechanical ventilation: 0 (23a)

If exhaust air heat pump using Appendix N, (23b) = (23a) × Fmv (equation (N5)) , otherwise (23b) = (23a) 0 (23b)

If balanced with heat recovery: efficiency in % allowing for in-use factor (from Table 4h) = 0 (23c)

a) If balanced mechanical ventilation with heat recovery (MVHR) (24a)m = (22b)m + (23b) × [1 – (23c) ÷ 100]

(24a)m=	0	0	0	0	0	0	0	0	0	0	0	0	(24a)

b) If balanced mechanical ventilation without heat recovery (MV) (24b)m = (22b)m + (23b)

(24b)m=	0	0	0	0	0	0	0	0	0	0	0	0	(24b)

c) If whole house extract ventilation or positive input ventilation from outside
if (22b)m < 0.5 × (23b), then (24c) = (23b); otherwise (24c) = (22b) m + 0.5 × (23b)

(24c)m=	0	0	0	0	0	0	0	0	0	0	0	0	(24c)

d) If natural ventilation or whole house positive input ventilation from loft
if (22b)m = 1, then (24d)m = (22b)m otherwise (24d)m = 0.5 + [(22b)m² x 0.5]

(24d)m=	0.55	0.55	0.54	0.54	0.53	0.53	0.53	0.52	0.53	0.53	0.54	0.54	(24d)

Effective air change rate - enter (24a) or (24b) or (24c) or (24d) in box (25)

(25)m=	0.55	0.55	0.54	0.54	0.53	0.53	0.53	0.52	0.53	0.53	0.54	0.54	(25)

3. Heat losses and heat loss parameter

ELEMENT	Gross area (m²)	Openings m²	Net Area A ,m²	U-value W/m2K	A X U (W/K)	k-value kJ/m²·K	A X k kJ/K	
Doors			2	x 1	= 2			(26)
Windows Type 1			1.39	x1/[1/(1.3)+ 0.04]	= 1.72			(27)
Windows Type 2			1.61	x1/[1/(1.3)+ 0.04]	= 1.99			(27)
Windows Type 3			1.61	x1/[1/(1.3)+ 0.04]	= 1.99			(27)
Windows Type 4			2.7	x1/[1/(1.3)+ 0.04]	= 3.34			(27)
Windows Type 5			0.36	x1/[1/(1.3)+ 0.04]	= 0.44			(27)
Windows Type 6			0.8	x1/[1/(1.3)+ 0.04]	= 0.99			(27)
Windows Type 7			0.64	x1/[1/(1.3)+ 0.04]	= 0.79			(27)
Windows Type 8			14.11	x1/[1/(1.3)+ 0.04]	= 17.44			(27)
Windows Type 9			8.18	x1/[1/(1.3)+ 0.04]	= 10.11			(27)
Windows Type 10			9.63	x1/[1/(1.3)+ 0.04]	= 11.9			(27)
Windows Type 11			11.5	x1/[1/(1.3)+ 0.04]	= 14.21			(27)
Windows Type 12			5.75	x1/[1/(1.3)+ 0.04]	= 7.11			(27)

SAP WorkSheet: New dwelling design stage

Wincows Type 13			5.7	x1/[1/(1.3)+ 0.04]	=	7.04			(27)
Wincows Type 14			2.45	x1/[1/(1.3)+ 0.04]	=	3.03			(27)
Wincows Type 15			9.52	x1/[1/(1.3)+ 0.04]	=	11.76			(27)
Wincows Type 16			10.42	x1/[1/(1.3)+ 0.04]	=	12.88			(27)
Wincows Type 17			11.33	x1/[1/(1.3)+ 0.04]	=	14			(27)
Wincows Type 18			8.72	x1/[1/(1.3)+ 0.04]	=	10.78			(27)
Wincows Type 19			30.79	x1/[1/(1.3)+ 0.04]	=	38.05			(27)
Wincows Type 20			3.97	x1/[1/(1.3)+ 0.04]	=	4.91			(27)
Wincows Type 21			2.66	x1/[1/(1.3)+ 0.04]	=	3.29			(27)
Wincows Type 22			6.08	x1/[1/(1.3)+ 0.04]	=	7.51			(27)
Wincows Type 23			8.39	x1/[1/(1.3)+ 0.04]	=	10.37			(27)
Wincows Type 24			2.8	x1/[1/(1.3)+ 0.04]	=	3.46			(27)
Wincows Type 25			2.8	x1/[1/(1.3)+ 0.04]	=	3.46			(27)
Wincows Type 26			0.25	x1/[1/(1.3)+ 0.04]	=	0.31			(27)
Wincows Type 27			0.64	x1/[1/(1.3)+ 0.04]	=	0.79			(27)
Wincows Type 28			0.72	x1/[1/(1.3)+ 0.04]	=	0.89			(27)
Rooflights Type 1			21.7	x1/[1/(1.3) + 0.04]	=	28.21			(27b)
Rooflights Type 2			4.42	x1/[1/(1.3) + 0.04]	=	5.746			(27b)
Rooflights Type 3			2.38	x1/[1/(1.3) + 0.04]	=	3.094			(27b)
Rooflights Type 4			1.08	x1/[1/(1.3) + 0.04]	=	1.404			(27b)
Floor Type 1			234	x 0.13	=	30.42			(28)
Floor Type 2			1.3	x 0.13	=	0.169			(28)
Walls Type1	219	2	217	x 0.16	=	34.72			(29)
Walls Type2	569.42	170.74	398.68	x 0.16	=	63.79			(29)
Roof Type1	57	6.8	50.2	x 0.15	=	7.53			(30)
Roof Type2	8	0	8	x 0.15	=	1.2			(30)
Roof Type3	165	22.78	142.22	x 0.15	=	21.33			(30)
Total area of elements, m²			1253.71						(31)

** for windows and roof windows, use effective window U-value calculated using formula 1/[(1/U-value)+0.04] as given in paragraph 3.2*

*** include the areas on both sides of internal walls and partitions*

Fabric heat loss, W/K = S (A x U)	(26)...(30) + (32) =	408.7 (33)
Heat capacity Cm = S(A x k)	((28)...(30) + (32) + (32a)...(32e) =	0 (34)
Thermal mass parameter (TMP = Cm ÷ TFA) in kJ/m²K	Indicative Value: Medium	250 (35)

For design assessments where the details of the construction are not known precisely the indicative values of TMP in Table 1f can be used instead of a detailed calculation.

Thermal bridges : S (L x Y) calculated using Appendix K	63.27 (36)

if details of thermal bridging are not known (36) = 0.15 x (31)

Total fabric heat loss	(33) + (36) =	471.97 (37)

Ventilation heat loss calculated monthly (38)m = 0.33 × (25)m x (5)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(38)m=	330	328.92	327.83	322.77	321.8	317.4	317.4	316.55	319.09	321.8	323.73	325.72	(38)

Heat transfer coefficient, W/K (39)m = (37) + (38)m

(39)m=	801.98	800.89	799.8	794.74	793.77	789.37	789.37	788.52	791.06	793.77	795.7	797.69	
Average = Sum(39)$_{1...12}$ /12=													794.72 (39)