Building a better future

The Wienerberger e4 brick house™

Wienerberger
Building Material Solutions

Our innovative approach

Founded in 1819, Wienerberger is the world's leading manufacturer of bricks and clay products. Our success over the last 200 years has been based upon our ability to adapt and innovate to meet our customers' needs; to proactively contribute to the future of our industry.

By considering what economic and social trends will influence society in the future and acting accordingly today, Wienerberger is able to offer new and compelling building solutions - solutions designed to enrich the built environment and create a proud construction legacy.

Our clay brick and wall technology has the ability to create the blueprint for the house of the future – a house that is as sustainable and innovative as it is practical and liveable; a house that will work as well now as it will in 150 years.

Most importantly, a house that people will aspire to make a home.

The Wienerberger e4 brick house™ is that house.

Contents

The principle aims

The principle aims of The Wienerberger e4 brick house™ project are:

- To address identified market needs for economic, sustainable and customer-focused homes
- To promote the fabric first approach and demonstrate the unique qualities and advantages of a clay building fabric in the context of the evolving UK housing market
- To provide a long-term approach to UK housing stock; 150 years + lifecycle while achieving the imperatives of sustainability and end-user appeal

The Wienerberger e4 brick house™ has been designed to comply with a number of legislative and guidance documents:

Conforms to current Building Regulations (2010)

- Incorporates changes proposed in 2012 Building Regulation Consultation
- Provisional 2016 requirements for Part L also incorporated

Final designs suitable for certification approval by a number of authorities including:

- LANTAC (Local Authority National Type Approval Confederation)
- NHBC (National House-Building Council)
- BLP Building Defects Insurance
- LABC Warranty

Designed to meet Code for Sustainable Homes Code Level 4

- Without renewables
- Using materials that are available now
- Includes options for upgrading to levels 5 and 6

Refers to Zero Carbon Hub Guidance

- Particularly those related to 'fabric first' strategies

Design guides

- The London Housing Design Guide
- Housing Corporation Design and Quality Standards

Functional dimensions and detailed configuration of accommodation will comply with:

- Lifetime Homes, London Development Agency
- Building for Life 2008
- ACPO Secured by Design

The four e's

The aim of The Wienerberger e4 brick house™ is to create an archetype for the future of UK housing.

Designed in conjunction with ARUP, The Wienerberger e4 brick house™ is a fully realised proposition for a two storey, three bedroom detached home - from cutting-edge architectural design right down to individual product costings. It is a house designed to give developers the opportunity to build houses that meet market, environmental and social needs.

Making full use of Wienerberger's market leading building products, solutions and innovations, The Wienerberger e4 brick house™ has been designed according to four founding principles:

economy

To provide a house that not only gives optimum build performance and meets a growing market need, but that is financially affordable and accessible.

energy

To provide a house that meets the latest energy performance standards and will continue to meet these standards for every day of its 150 years plus lifecycle.*

*See pages 24 to 27 for details

environment

A house that minimises its environmental impact, is responsibly sourced and meets Level 4 of the Code for Sustainable Homes as Standard.

emotion

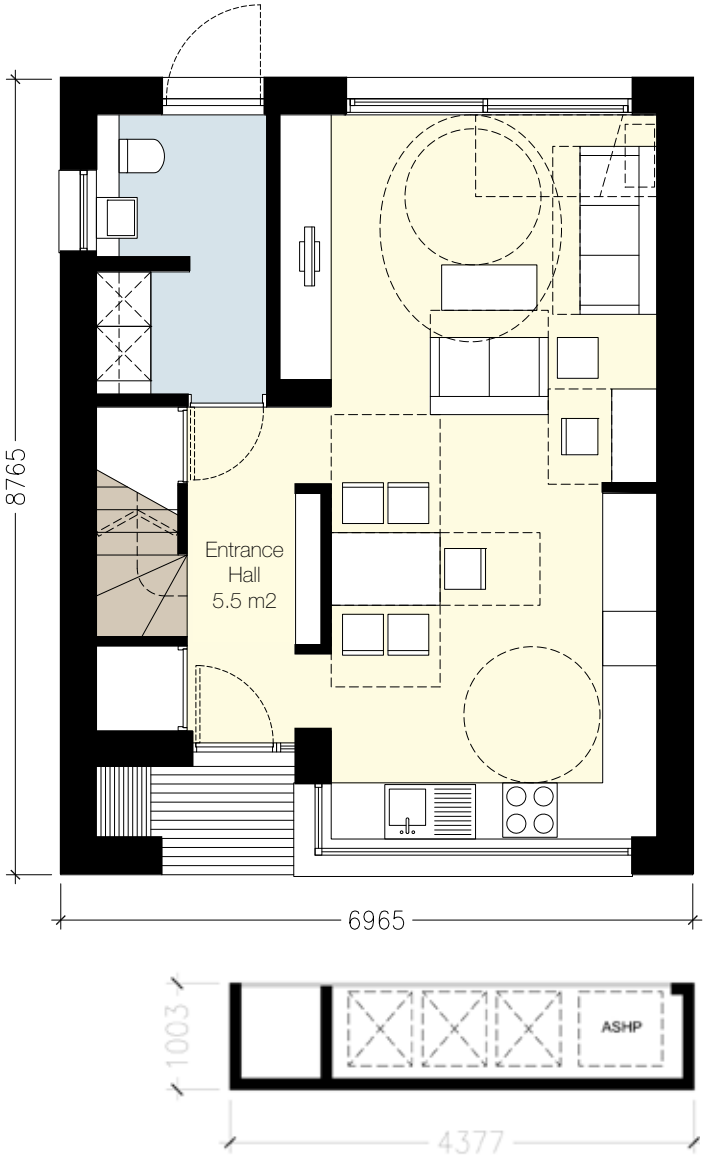
A house that people will want to live in; a house that not only provides flexibility and practicality, but will allow for a higher quality of living.

These four key principles have been embedded into The Wienerberger e4 brick house™ at every stage; from the architect's designs right through to the construction material and method.

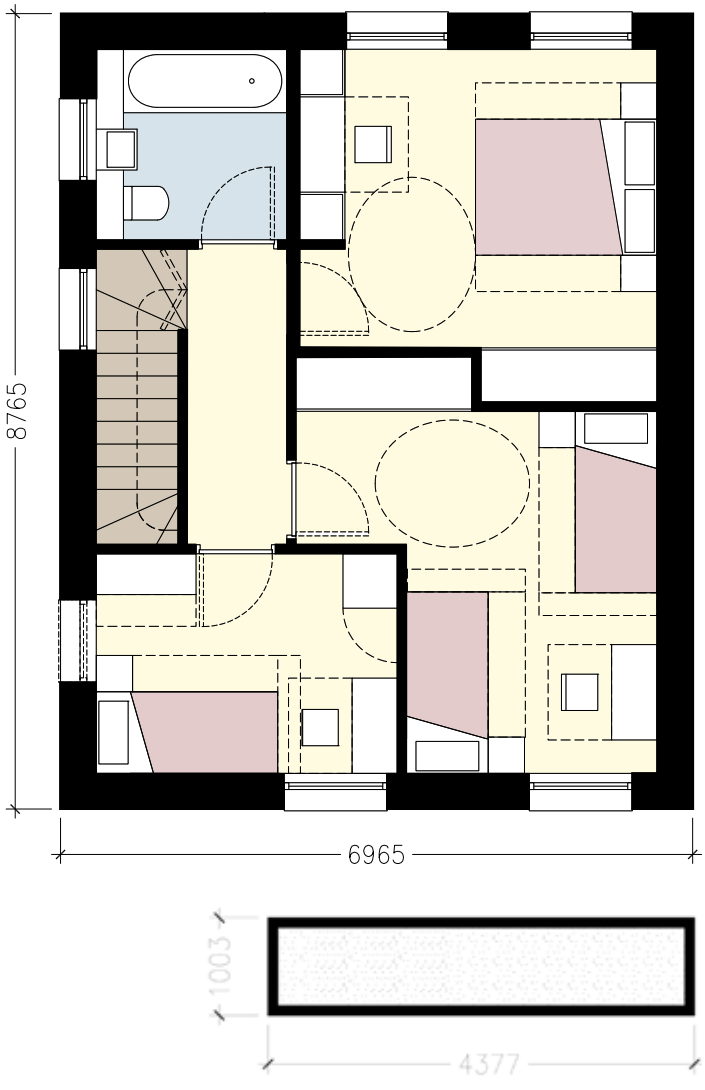
The Wienerberger e4 brick house™

1. Ceramic/metal coping
2. Enhanced gutter profile
3. 65mm brick
4. Window reveals
5. English Bond on gable
6. Porotherm return
7. Room in the roof trusses
8. Porotherm internal wall with clay loam plaster

Ground floor plan



First floor plan



A design that is adaptable to the whole Wienerberger product range

Whilst the design is flexible enough to accommodate the whole range of Wienerberger products, a specific selection has been made for the whole concept house.


Chartham Multi Stock


Telford Promenade Square Edged


Cassius Antique Slate

Fabric first, foremost and future

The Wienerberger e4 brick house™ is designed to function as well in the next century as it will in the present.

The reason for this is simple – clay.

Clay retains the inherent strength, durability and economy that has made it the UK's building material of choice for centuries. Over the last 200 years, Wienerberger has added range, variety, and led the industry in ever-more sophisticated low-carbon product manufacture.

The primary option for sustainability, quality and value, The Wienerberger e4 brick house™ represents the pinnacle of the fabric first approach.

By maximising the natural properties of clay bricks, blocks and roof tiles, and combining this with the latest in construction innovation, the true environmental value and performance of The Wienerberger e4 brick house™ is permanently embedded in the building's fabric.

The walls

Wienerberger is the biggest producer of clay bricks and blocks in the world, harnessing a rich construction lineage.

From the first 'baked bricks' discovered in 3500 BC in Mesopotamia, to the product portfolio of thousands that Wienerberger currently offers, The Wienerberger e4 brick house's™ primary technology is one that has stood the test of time through decades, centuries and even millennia.

The brick/external wall

The Wienerberger e4 brick house™ will offer housebuilders the choice of the entire Wienerberger brick portfolio for the external walls.

The brick bond will take inspiration from the patina and techniques articulated throughout the UK's architectural heritage (see page 20), and will position the house as a UK building that references the past, and yet heralds the future.

The recommended bond will be the Stretcher Bond, though there is scope for a number of bond variations in the specifications, including the English Garden Wall Bond on the gable end.

The block/internal wall

The inner walls will be constructed from Wienerberger's Porotherm clay block walling system, a market leading construction technology that allows speed, quality, cost and sustainability to be delivered all at once.

The precision-engineered block, equipped for load and non-load bearing applications, has a unique interlocking design that rules out the need for mortar in the vertical joints.

Not only does this save 95% of typical water usage and allows the wall to dry up to a third quicker, it can also be laid much faster than traditional masonry.

The roof

The roof of The Wienerberger e4 brick house™ has been created to make the best possible use of product, while delivering cost efficiencies to the housebuilder and potential to add value to the homeowner.

The pitch

The roof will have a 40 degree pitch, something that has been explicitly designed to facilitate the possibility of future development of the internal 'loft' area (either at the build stage, or indeed later by the homeowner).

Space will be provided within the machine manufactured roof trusses, with the pitch angle creating sufficient vertical height to allow full conversion without the need for dormers.

By future proofing the house in this way, it provides potential owners with significant savings on development/extension costs while delivering only a small cost premium to the housebuilder.

The 40 degree pitch and roof overhangs mean that The Wienerberger e4 brick house™ offers excellent shelter and protection to the walls below, while also delivering superb rainwater collection potential – up to 95% depending on aspect and location.

The tiles

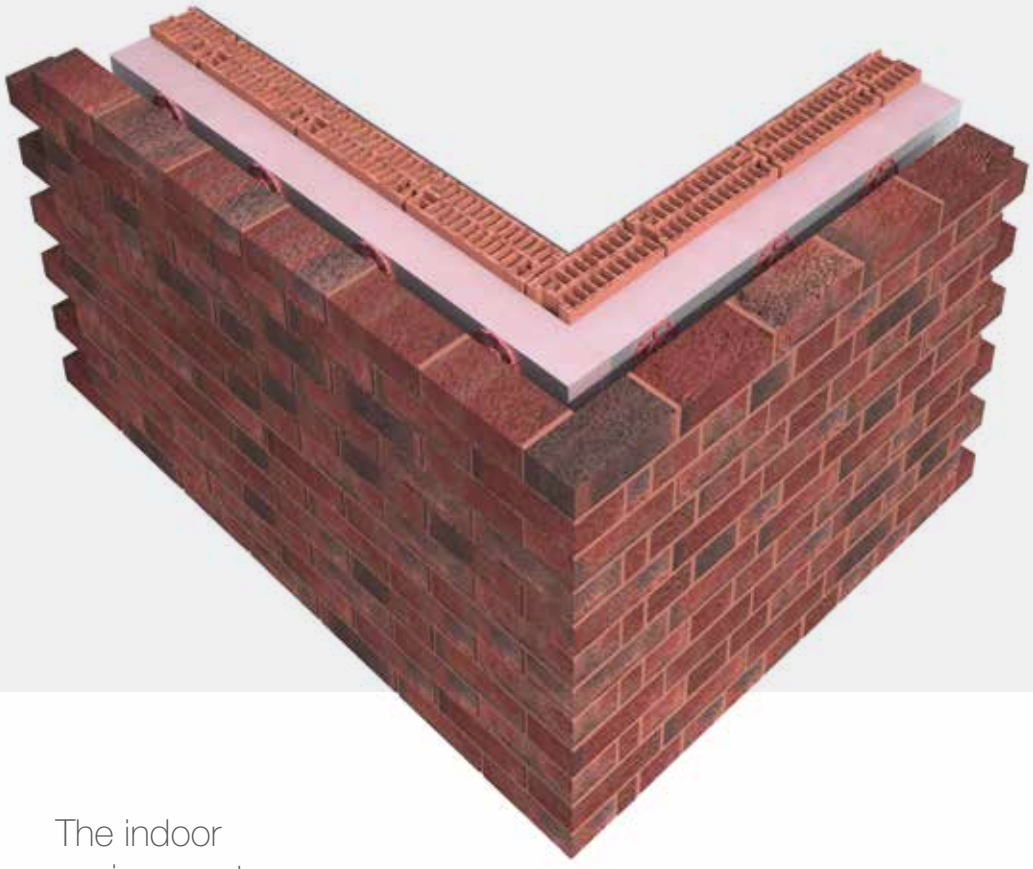
The roof is adaptable to a variety of different tile profiles in Wienerberger's Sandtoft range – and aims to make the tiles a key aesthetic feature of the house.

This is a result of a special design, with the gable wall terminated in a one-and-a-half brick parapet, protected with a ceramic metal coping. This parapet frames the tiling area, obscuring cut edges and emphasising the character and prominence of the tiles.

As with virtually every aspect of the house, these choices can be altered according to the preferences of the housebuilder.

393mm wall specification:

102.5mm brick
50mm void
110mm Foil Backed PIR
100mm Porotherm
15mm Dabs
12.5mm Plasterboard



Wall insulations and floor construction

The walls

The walls will make use of foil backed PIR insulation, which provides one of the thinnest wall sections – minimising the embodied carbon of the building.

Ground floor

To complement the use of Wienerberger's Porotherm clay block walling system, the recommended floor would be beam and block as a means of offering the best balance of thermal performance, speed, cost and application for different ground conditions. However, The Wienerberger e4 brick house™ would also make use of an EPS infill system as a means of ensuring a Green Guide rating of A+.

First floor

I-Joists are proposed for use for the first floor as they are lighter and easier to handle than traditional softwood joists. I-Joists do not shrink and warp, and the quality control gained means that these joists align with the benefits of the Porotherm system.

The indoor environment

The benefits of a fabric first approach are not limited to those of strength, durability and sustainability.

By using natural clay based products throughout the construction, The Wienerberger e4 brick house™ will provide an ideal living environment.

- Natural materials help create a pollutant free environment. Emphasis is on low volatile organic compound (VOC) materials to reduce chemical emissions
- The Porotherm system uses breathable blocks that help regulate the humidity of the house
- High acoustic performance fabric will be used throughout the house

The Porotherm block is able to accept wet plaster, and The Wienerberger e4 brick house™ utilises a clay loam plaster rather than plasterboard in areas such as the bathroom, downstairs toilet and the utility room.

The plaster will further help moderate and absorb excess humidity, with the added ability to release it back into the air should the levels drop too low. Although there is a small time and cost premium involved in using the plaster, it is crucial towards achieving the living comfort and desirability that makes The Wienerberger e4 brick house™ distinct.

A 21st century home

The Wienerberger e4 brick house™ does not simply aim to meet or comply with existing standards and regulations. Wherever possible the design aims to exceed them; to go that bit further to achieve truly comfortable and desirable homes.

This might be through the house's flexibility, functionality, its adaptable configuration or size. Whatever it may be, The Wienerberger e4 brick house™ intends to give homeowners what they want; a home that suits their lifestyle today and tomorrow.

Space and light

Providing a house that can deliver both the space and the light to appeal to consumers is one of the biggest challenges that housebuilders in the UK face.

The Wienerberger e4 brick house™ is different. It has been designed in full accordance with the London Housing Design Guide (LHDG) recommendation that a three-bedroom house (typically for five people) should have an internal area of **96 sqm** and generous storage space.

Housebuilder	Average size of 3 bedroom house
Berkeley	98 sqm
The Wienerberger e4 brick house™	**96 sqm**
Galliford Try	90 sqm
Barratt	89 sqm
Taylor Wimpey	88 sqm
Persimmon	88 sqm
Bellway	86 sqm
Lovell Partnerships	85 sqm
Crest Nicholson	84 sqm

The Future Homes Commission investigation into the quality and suitability of housebuilding to meet the needs of growing and changing populations found that 63% of people ranked high levels of daylight as important in a home.

Once more, The Wienerberger e4 brick house™ is different. The large windows in the design deliver an internal daylight factor that significantly exceeds average standards to meet Level 4 of the Code for Sustainable Homes.

Room	Average Daylight factor	The Wienerberger e4 brick house™
Kitchen	2%	4.23%
Living room	1.5%	4.23%
Master bedroom	1.5%	3.04%
Bedroom one	1.5%	1.76%

Adaptable homes

In order to give the greatest possible flexibility and functionality to housebuilders and homeowners alike, The Wienerberger e4 brick house™ is designed to be as adaptable as possible; to work as well through shared ownership as it would as a family home.

From room configuration, size and dimension, to sustainability upgrades and even construction scale, it can all be done with minimal cost and maximum efficiency.

Configurations

The Wienerberger e4 brick house™ is designed for everyone – something that is reflected in the inherent flexibility of the designs.

From pre-planned loft space for expanding families, en suites for young couples, separated upstairs areas for shared ownership and even lifts for older residents, The Wienerberger e4 brick house™ is easily converted to deliver comfortable living to suit modern lifestyles.

The Wienerberger e4 brick house™ can be adapted to suit:

Households without children

- Space to work
- Private areas for older adult children to stay

Households with children

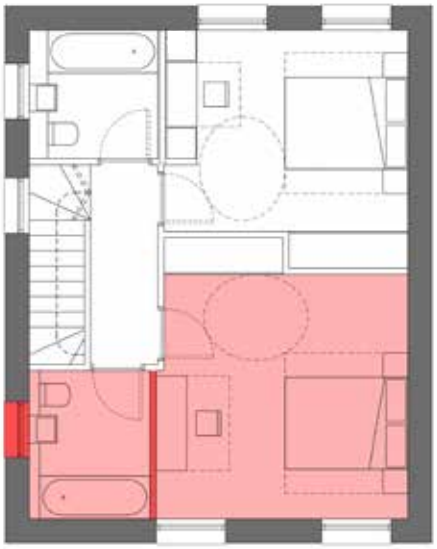
- Safe play areas
- Homework area
- Supervise children from the kitchen
- Use of the kitchen for family meals
- Separation of parents work space from children

Older residents

- Adaptations to reflect changing health requirements (lift etc.)

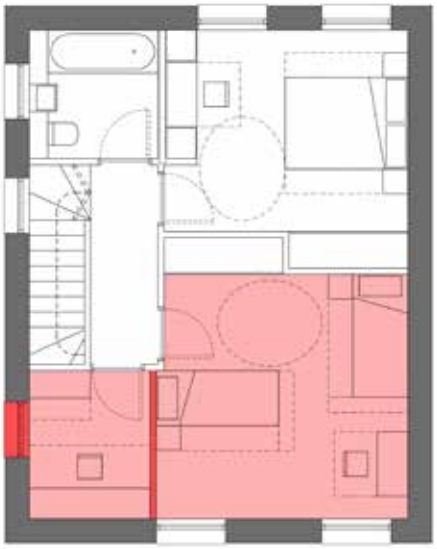
Shared ownership

- Property can be divided to allow for a shared ownership configuration, giving young couples a greater opportunity to get on to the property ladder



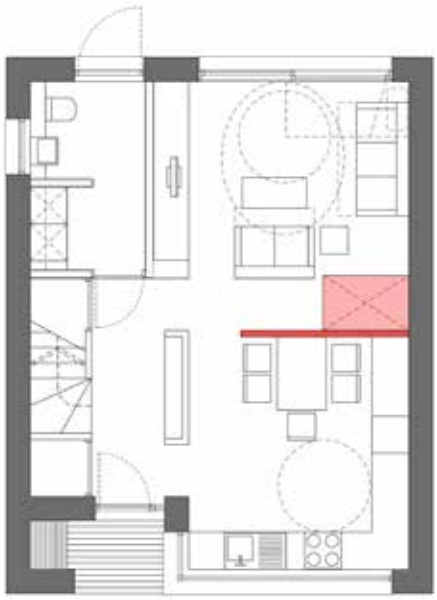
1. Households without children

- Space to work
- 2 sharing couples - 2 x generous double bedrooms
- Separate Bathrooms



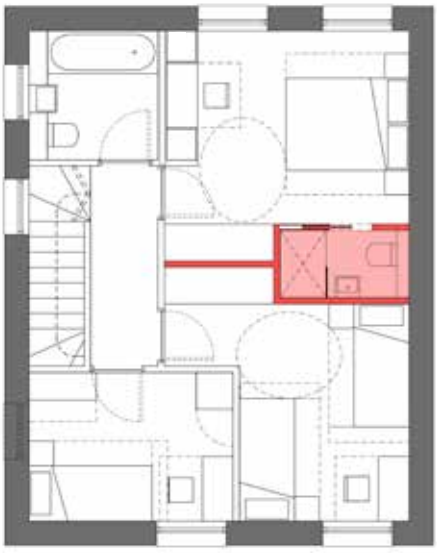
2. Households with children (variation of smaller family)

- Dedicated study added
- Larger nursery/play room



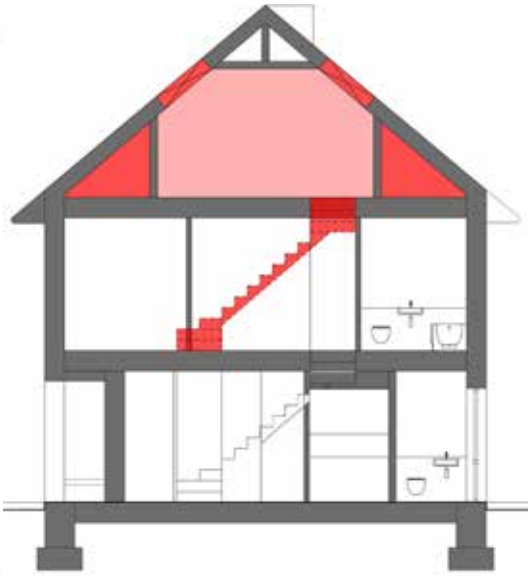
3. Older residents

- Lift added to first floor master bedroom



4. En suite option

- Addition of small en suite to master bedroom



5. Loft living

- Approximately 20 sqm of habitable space in the roof for conversion to bedroom or study
- Storage available beneath eves
- Additional stair required
- Rooflights required

Specifications

The Wienerberger e4 brick house™ has been developed for different markets and a range of specification options are offered. This is illustrated by the three categories below: **Bronze** (standard house), **Silver** (enhancement for high end development), and **Gold** (using ideas developed in showcase form).

Build options

The house is a detached two story, three-bedroom home, but it has been designed so that the materials, methods and principles can be easily transferable to housing types of different scales and archetypes.

Whether scaled up to five-bedrooms or scaled down to two, the basic design is able to accommodate all manner of specific choices, including individual, brick, roof tile and window type.

The quality, cost efficiency and sustainability credentials would remain as strong as ever.

Typical House

English Garden Wall Bond on Gable Wall

Gable Wall with Metal Coping

Half Brick Returns Outward Opening Windows

Timber Seat and Porch

Upgraded House

English Bond on Gable Wall

Gable Wall with Ceramic Coping Tile

High Specification Windows with Concealed Frame with Half or Full Brick Returns

Clay Plaster to Wet Rooms and Porotherm Internal Walls

Showhouse

Glazed Porotherm Internal Walls

Glazed Back to Bench Internal Walls

Corbelled Wall Illustrating 65mm Brick

An aesthetic heritage

The Wienerberger e4 brick house™ has been designed to deliver buildings that articulate the strength and quality of its construction.

Its aesthetic values and features will reference the rich construction history of clay products, creating a future orientated brick home that maintains a clear lineage with the past.

Brick bond

Like many Georgian and Victorian buildings, The Wienerberger e4 brick house™ proposes using a more elaborate brick bond on the elevation of primary importance. For the e4 design, this is likely to be the gable walls as they often provide the first impression when entering a housing development. The aesthetic effect will be to give the wall greater character and visual interest, with the knowledge that it will develop an attractive patina as it weathers.

Roof parapet

A one-and-a-half-brick parapet frames the tiling area of the roof, giving a sleek and modern appearance that complements both front and back elevation.

Gutter

While the roof boasts recessed gutters within the gable parapets, on the front and back elevations we propose Victorian Ogee gutters to continue the line of the roof and emphasise the roof overhangs.

Window Reveals

The reveals take their design cues from Georgian buildings; the recessed windows deliver elegance of proportion while the exposed returns demonstrate the substance and solidity of the walls. The inward opening windows allow for the frames to be concealed within the recess, maintaining the aesthetic integrity of the design.

Porch

An inset porch gives the building a distinct appearance; not only providing shelter and a small bench but also a visual connection to visitors via a glazed corner window to the kitchen. Once more, the inset will express the quality and strength of the brick construction.

The fabric first approach

This means that The Wienerberger e4 brick house™ has many of its key sustainability credentials embedded in its very materials; the brick, the block, the roof tiles and the thermal and energy saving properties they provide.

This is central to Wienerberger's long-term sustainability strategy for The Wienerberger e4 brick house™. While the embodied carbon impact of The Wienerberger e4 brick house™ is likely to be slightly higher than certain other construction methods, its operational efficiency and life-cycle will mean that it will comfortably outperform other similar constructions.

In comparison to a house designed to meet more demanding Building Regulations (in terms of energy performance) surveyed by the National House-Building Council (NHBC), The Wienerberger e4 brick house™ would outperform the equivalent in terms of operational carbon emissions over the duration of 120 years by almost 50%.

The code for sustainable homes

The Wienerberger e4 brick house™ has been designed to achieve the Code for Sustainable Homes (CSH) Level 4, without renewables and with the potential to upgrade to Level 5. This has been achieved by maximising the energy, materials and health and well-being credits in line with Wienerberger's e4 principles.

Materials

- The building achieves 21 of the 24 available credits in the materials section of the CSH
- All of the key building elements achieve an A or A+ rating according to the Green Guide for Specification
- 80% of the materials in the basic building elements are responsibly sourced
- 80% of the materials in the finishing elements are responsibly sourced

Energy

- The Wienerberger e4 brick house™ delivers in excess of a 50% improvement on Part L 2010 building energy regulations
- The Fabric Energy Efficiency (FEE) is 46kWh/m^2/yr

Heating, water and drainage

- The heating is to be provided to the house via a low temperature hot water (LTHW) system
- The heat source will be a high efficiency air source heat pump (according to SAP calculations)
- Electricity and primary heating fuel consumption data is displayed to occupants through an energy display device, while separated zones within the house will have their own time and temperature controls allowing occupants to manage their usage efficiently and responsibly
- Secure storage for two bicycles per three-bedroom house
- The house will have water saving devices that aim to limit the consumption of water to 105L per person per day, which includes:
  - Low flow showers 6L/min
  - Flow reducing valves on taps 3L/min
  - Low flush toilets 2.4 and 4L
  - Water and energy efficient washing machines and dishwashers
  - As potential enhancements, The Wienerberger e4 brick house™ is able to accommodate solar thermal panels to further reduce CO_2 emissions and rainwater collection from the roof drainage for WC flush use and water saving

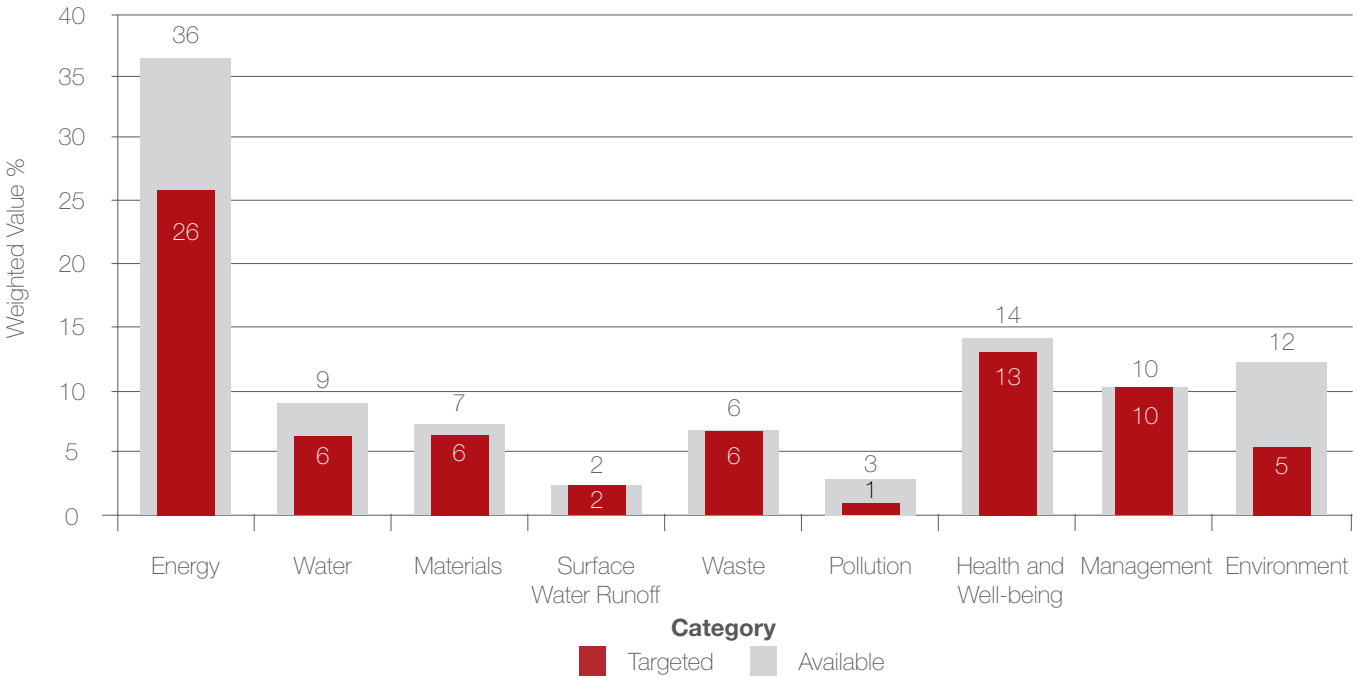
Electrical

- Well day-lit rooms will help reduce energy consumption
- External security lighting will be controlled by presence detection with time delay off to save energy
- As an enhancement, presence detection can be added to internal lighting
- The Wienerberger e4 brick house™ will have smart metering of utilities, allowing energy use to be monitored and any problems detected early. Occupants can see their energy usage in real time, which can be visualised on dedicated displays or via laptops and smart phones

Code for Sustainable Homes Level 4 without renewables

One of the objectives for The Wienerberger e4 brick house™ was to achieve Code for Sustainable Homes Level 4 without renewables. This was achieved through adopting a 'fabric first' strategy. The focus has been on maximising the energy, materials and health & well-being credits in line with Wienerberger's e4 principles.

The graph below shows a summary of weighted credits assumed to be achievable in each category to meet the requirements of CfSH Level 4. Details of the focus credit areas are covered on the following pages.



Energy

The building achieves 22 of the 31 available credits in the energy section.

The key aspects to achieving this are:

- 50.25% improvement on the 2010 DER/TER calculation. This assumes high efficiency air source heat pump and hot water system.
- Fabric Energy Efficiency (FEE) of 46kWh/m2.yr;
- Electricity and primary heating fuel consumption data are displayed to occupants through an energy display device;
- All external space lighting is provided by energy efficient fittings with appropriate control systems;
- Secure storage for 2 cycles per 3 bedroom house;
- Sufficient space provided for a home office in a room which achieve an average daylight factor of 1.5%.

The results from the SAP calculation are shown to the right.

The materials

The building achieves 21 of the 24 available credits in the materials section. This is based on all the key building elements achieving a rating of A or A+ according to the Green Guide for Specification, as shown in the table below. In addition the responsible sourcing credits have been targeted as shown below.

Element	Specification	GG Rating
Roof	Timber trussed rafters and joists with insulation, roofing underlay, counter-battens, battens and UK produced clay plain tiles	A+
External Walls	Blockwork Cavity Wall-Brickwork outer leaf, insulation, Porotherm clay block work inner leaf, cement mortar, plaster-board on battens, paint	A+
Internal Walls	Frames partitions- Timber stud, plasterboard, paint & Masonry partition (for bathroom), Porotherm clay blockwork with cement mortar, plaster and paint	A+ A
Floor-Upper	Upper- Chipboard decking on timber joists	A+
Floor-Ground	Ground- Suspended Concrete- Screed on insulation laid on grouted beam, and aircrete block flooring OR dense solid block flooring OR medium dense solid block flooring	A+
Windows (Baronze Home)	Powder coated aluminium window with softwood internal frame, double glazes, water based stain internally: aluminium profile <0.87 kg/m and timber profile <2 kg/m OR PVC-U window with steel reinforcement, double glazed	A A

Element	Material	Scheme
Ground Floor	Concrete	BES 6001 very good
Upper Floor	Timber	FSC
Roof	Timber Clay tiles	FSC BES 6001 very good
External Walls	Brick	BES 6001 very good
Internal Walls	Timber Plasterboard	FSC BES 6001 very good
Foundations	Concrete and reinforcement	BES 6001 very good
Staircase	Timber	FSC

80% of the materials in the basic building elements are responsibly sourced

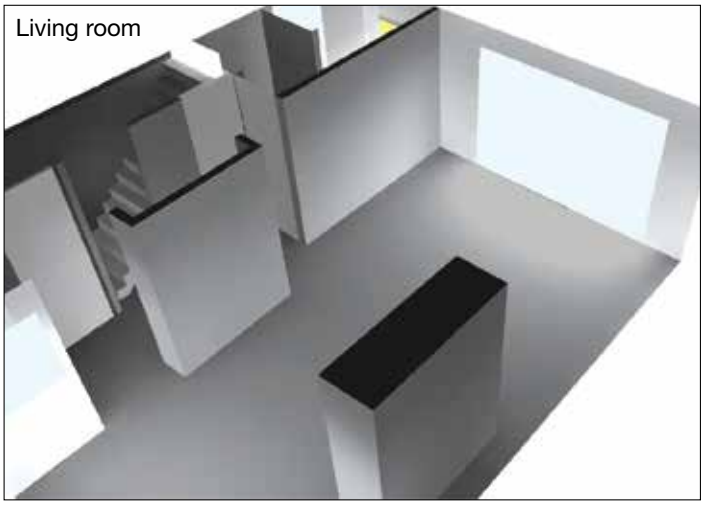
Element	Material	Scheme
Stairs	Timber	FSC
Windows	PVCU	EMS certified
Doors	External door- PVCU Internal door- Timber	EMS certified FSC
Skirting	Timber	FSC
Furniture	Mixed	EMS certified OR Not certified

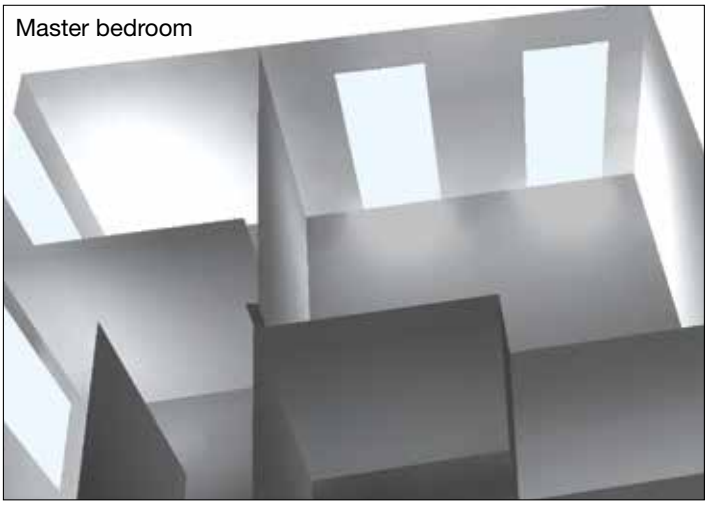
80% of the materials in the finishing elements are responsibly sourced

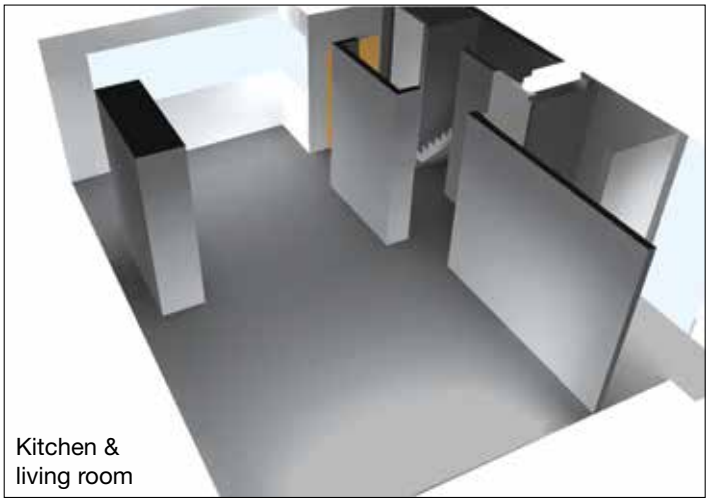
Health and well-being

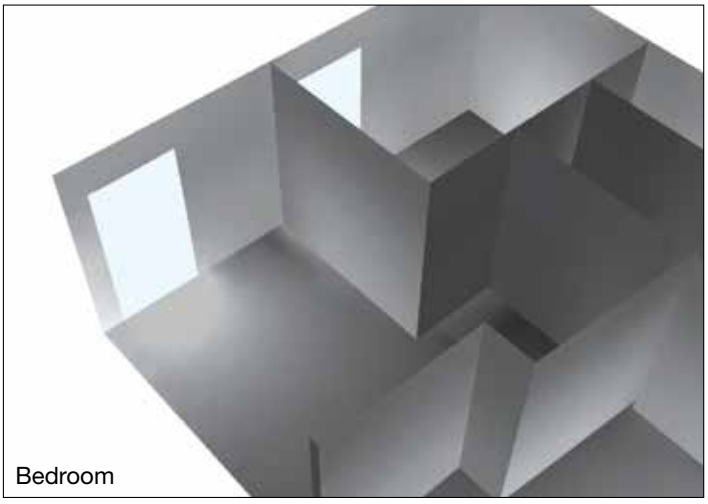
The building achieves 11 of the 12 available credits in the health and well-being section.

Key to this has been a high level of daylighting in the home.


Living room


Master bedroom


Kitchen &
living room


Bedroom

The average daylight factor required to meet Code for Sustainable Homes Level 4 is 2% in the kitchen and 1.5% in the living room and any study room. The bedrooms will aim to meet the study room daylighting requirements.

A daylighting study has been carried out using the software Dialux. The following average daylighting factors were calculated;

Kitchen and living room	4.23%
Master bedroom	3.04%
Bedroom 1	1.76%

Sustainability framework

A sustainability framework was developed based on Wienerberger's e4 principles; economy, energy, environment and emotion. Each of these principles has been expanded into some strategic aims. This section summarises how the project has fulfilled these aims.

	Strategy	Response
economy	**Affordable (purchasing and operation)**	Consideration has been given to the life cycle cost implications of decisions made. The fabric first approach minimised operational energy use and therefore makes the home more affordable to run for the owner.
	Reasonable construction costs and programme	The upfront costs and programme have been considered in the design process though aspects such as selection of a quick to install ground floor system, considering the balance between initial cost and wall thickness in insulation choice and selectively applying more expensive options such as the English Bond pattern in the masonry elements.
	Easily maintainable	A preference has been given to products and solutions that have longevity and require minimal maintenance. The life expectancy of the building elements has been considered as part of the whole life carbon study.
energy	**Low energy use in operation - for heating and cooling**	The design achieves its aim of 46kWh/m^2.year for heating and cooling, recognised as best practice for a fabric efficiency approach. It has also achieved over a 50% improvement on the 2010 DER/TER calculation, required by Building Regulations.
	Low carbon throughout lifecycle	A whole life carbon assessment of the building showed that over a 150 year study period, including embodied and operational aspects, the house would be responsible for emitting 167 tonnes of CO_2e. This was found to be within the expected range for similar buildings and that over the life cycle the emissions are likely to be lower than what might be considered as average.
environment	**Low water use**	The building requires 105 litres/person/day. This will be achieved through specifying low water use sanitary ware.
	Low environmental impact	The building has used A and A+ rated elements from the Green Guide to assessment to ensure low environmental impact.
	Responsibly sourced	The building has maximised the use of responsibly sourced products.
	Positive impact on environment	Improvements in the environment of the area will be dependent upon the site chosen.
	Code Level 4	The building achieves Code Level 4 without the need for renewables and can be upgraded to achieve Code Level 5.
emotion	**Maximise indoor air quality and comfort**	Comfort has been ensured through providing good day lighting levels to all living areas within the home and through providing openable windows. The relative humidity is regulated in humidity-prone areas such as the bathroom and utility room through the use of clay plaster on Porotherm blocks.
	Be a quality home	Quality has been ensured though complying with best practice guidance in terms of space requirements and future adaptability of the home.
	Reflect traditional values	A definition of a desirable home was created to ensure the home met the requirements of a 21st century home owner. Brick, mortar and roof tiles options were selected to reflect the aesthetic of a traditional British house.
	Be easy to use	Low technology solutions to achieving high energy performance have been adopted such as achieving natural cooling through cross ventilation and focussing on fabric improvements to reduce energy demand as opposed to using renewables to meet energy demand in a low carbon way.
	Represent solidarity, security, longevity	Specific design features have emphasised the long term approach that has lead the project. These include selecting English/English Garden Bond patterns to convey the impression of solidarity and durability and incorporating deeper window reveals and expressed gable walls to articulate the thickness of the construction.

The bottom line

The Wienerberger e4 brick house™ is a house of impeccable design, built with high quality materials and founded on strong sustainability principles.

And yet it also delivers on economy. It will be affordable to both housebuilders and homeowners.

The following table demonstrates the comparison between the three e4 house models and a traditional new-build three-bedroom detached house:

	10 Houses	One House
• Bronze	10% Saving	Cost neutral
• Silver	4% more expensive	17% more expensive
• Gold	7% more expensive	22% more expensive

As with any build, The Wienerberger e4 brick house™ responds to economies of scale. With the basic Bronze package, developers will be able to deliver a superior quality product to market while making significant savings.

The above figures are based on detailed costing calculations. Each part of The Wienerberger e4 brick house™, from materials to time and labour, has been considered and incorporated into the plans and drawings.

A sustainable solution

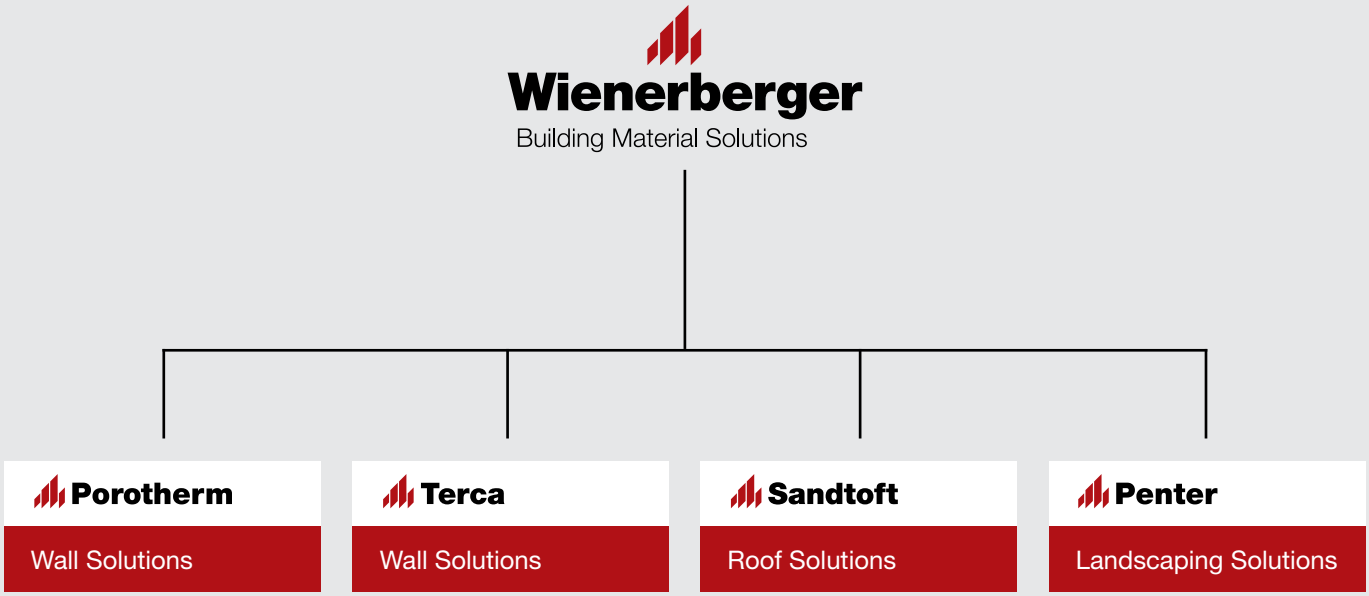
The Wienerberger e4 brick house™ is about providing genuine value; value of economy, energy, environment and emotion.

For housebuilders it is practical and realistic, for consumers it is aspirational and affordable.

It's a solution that meets market requirements in a way that is immediate, yet long-term and sustainable.

The Wienerberger e4 brick house™ represents a new way of building and a new way of living.

Complete Building Solutions



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