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PROPOSED REPLACEMENT FENESTRATION AT THE LONG BARN, HAWTHORN HILL FARM, GREEN END, GOATHLAND, WHITBY, NORTH YORKSHIRE, YO22 5LL

2021/92(2024)/DAS

DESIGN & ACCESS STATEMENT

PLANNING APPLICATION REFERENCE NUMBER NYM/2024/0101 (PLANNING PORTAL REFERENCE NUMBER PP-127817756)

To be read in full accordance with the following appended drawings, as scheduled below:

| | | |
|------------------------|--|--------------------|
| 2021/92/01B (20.08.22) | Ground Floor Plan as Existing | scale 1:100 @ A3 |
| 2021/92/02B (20.08.22) | First Floor Plan as Existing | scale 1:100 @ A3 |
| 2021/92/03E (21.06.23) | Dwelling Elevations as Existing & Proposed | scale 1:100 @ A3 |
| 2021/92/04A (20.08.22) | Site Plan as Existing | scale 1:200 @ A3 |
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| 2021/92/09 | Location Plan | scale 1:5,000 @ A3 |
| 2021/92/17E (02.03.24) | Ground Floor Plan (East End) as Proposed | scale 1:50 @ A3 |
| 2021/92/18A (02.03.24) | Ground Floor Plan (West End) as Proposed | scale 1:50 @ A3 |
| 2021/92/19E (02.03.24) | First Floor Plan (East End) as Proposed | scale 1:50 @ A3 |
| 2021/92/20C (02.03.24) | First Floor Plan (West End) as Proposed | scale 1:50 @ A3 |
| 2021/92/21C (02.03.24) | Cross Sections (East End) as Proposed | scale 1:50 @ A3 |
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Dated – 2nd March 2024

SAMUEL KENDALL ASSOCIATES LTD - CHARTERED ARCHITECT - ARCHITECTURAL TECHNOLOGIST – PRINCIPAL DESIGNER (CDM) - SURVEYOR

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Registered Company Number 5591217

A Royal Institute of British Architects Chartered Practice (1843970) operating a policy of continuing professional development.

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INTRODUCTION

Samuel Kendall Associates Limited – RIBA Chartered Architect – Architectural Technologist have been engaged by Becky Hewitt & Paul Bullimore to provide Professional Architectural Services in connection with the preparation of design proposals for a sustainable residential upgrade to the fenestration at their existing dwelling, a private residential family dwelling converted around thirty four years ago from a rural barn laid out over two floors at Hawthorn Hill Farm, north of the village settlement of Goathland, near Whitby in the North York Moors National Park.

This Design & Access Statement is consequently prepared as an explanatory supporting document to this Planning Application for the replacement of the existing timber framed, double glazed fenestration with timber framed triple glazed fenestration to meet PassivHaus Standards of thermal performance and airtightness.

This proposal will enable the construction of a highly sustainable, zero carbon, passive solar EnerPHit-standard upgrade whilst enabling the existing residential accommodation to be upgraded without affecting the external appearance of the dwelling.

An assessment of the current energy efficiency rating has established a very low energy efficiency performance rating of F (37) and also a very low environmental Rating of F (37), which is proposed to be significantly improved to achieve an “A” rating (95+) for both these factors. The current carbon footprint of this existing dwelling is a huge 15.9 tonnes of CO₂. These proposed sustainable improvements will reduce it to 0.9 tonnes, a substantial carbon reduction of 15 tonnes, which will be commendable.

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A strategy has been duly developed to sympathetically and contextually remodel this existing dwelling incorporating cutting edge sustainable design philosophies, whilst seeking to create a highly contextual and sympathetic dwelling enabling the replacement dwelling to achieve EPC “A” ratings in excess of 95 for both categories through a variety of means, both passive and active driven sustainable design philosophies.

The existing detached dwelling currently provides residential accommodation of some 209 square metres of internal residential floor area, which it is not intended to increase as part of these proposed works.

A thorough appraisal has been undertaken of this existing dwelling in terms of its existing environmental performance and energy efficiency, given it is currently heated with a highly inefficient oil fired boiler central heating and hot water system that is highly inefficient, a very high carbon system and very expensive to run.

A strategy to significantly reduce the in-use carbon footprint has been explored and a decision has been made to improve the thermal performance in conjunction with works to replace the fossil-fuel-rich oil fired boiler with a carbon neutral 14kW air source heat pump system, that will significantly reduce the dwelling’s carbon footprint and also its excessive energy costs.

THE WORLD CLIMATE EMERGENCY

It is now the accepted and ever increasing understanding that the World upon which we all live is heating up at an alarming rate, caused principally by massive carbon emissions, releasing locked-up carbon into the Planet’s atmosphere. This is having an increasing negative affect upon the World’s climate to the detriment of us all.

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This major problem is now accepted at Government Level and steps have been put in place to address this issue, principally by reducing carbon emissions into the atmosphere. The UK Government recently committed to a target reduction in carbon emissions by 2035 (only 11 years away!) of 78 per cent against UK 1990 carbon emissions, with the aim to a 2050 zero emission target (only 26 years away!). These targets are now set into UK Law and must therefore be met.

According to the Technology Strategy Board, buildings (including their operational phase) produce 45 per cent of the UK's total carbon emissions, which breaks down into 27 percent from domestic buildings and 18 per cent from other buildings. Domestic buildings produce more than a quarter of all carbon emissions in the UK and to ensure the Government meets these legally embedded targets, the domestic buildings sector must play its part in significantly reducing carbon emissions.

Target reductions can be generally met in two principal ways (i) a reduction in embodied carbon during the construction phase through the use of low embodied carbon materials and (ii) a reduction in the use of high carbon (i.e. fossil fuel based) heating and cooling mechanisms in use, once construction is complete.

In reality, this means adopting building construction materials and methodologies that are low embodied carbon based and installing heating and cooling systems that are based upon renewable technology for the generation of heating, cooling and electrical requirements and **NOT** fossil fuels such as oil, gas or coal. A typical annual carbon footprint of nearly sixteen tonnes in use should be reduced by 95% through the adoption of this environmental upgrading strategy.

The adoption of passive solar design techniques dramatically assists in being able to better temper the internal environment of buildings, particularly residential dwellings, where site orientation and earth sheltering significantly assist in reducing reliance upon active technology and the associated carbon costs.

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The concept of ultra-high-efficiency Passivhaus & EnerPHit design techniques are now well established in Western Europe amongst the building design community. Passivhaus design has been in existence since 1990, when the first Passivhaus-standard dwellings were built in Darmstadt, Germany.

In 1996, the Passivhaus Institut was formed in this city and commenced the certification of a range of compliant building types, extending from dwellings through to schools and factories, measured against a rigorous and thoroughly policed standard. Initially, homes achieved a 90 percent reduction in space heating requirements, achieved through a combination of high insulation levels and rigorous air-tightness levels, combined with compact design and passive solar design techniques, which was commendable.

Clients, their design team and building contractors drive procurement and, if the UK is to meet (or exceed!) these set carbon goals both nationally and internationally, the whole industry needs to thoroughly embrace a comprehensive approach offered by Passivhaus/EnerPHit low/zero carbon design principles.

Their positive adoption will significantly assist in drastic carbon emissions reductions, both in construction and also in use which will make a significant positive difference in achieving the 2035 and 2050 zero carbon targets.

To meet this now accepted design standard, passivhaus/EnerPHit-standard design needs to address the construction of buildings in a manner that meets these low carbon targets and the rigorous adoption of low embedded carbon construction materials will massively assist in meeting the first part of this target initiative. **The use of high carbon materials requiring a significant carbon investment in their manufacture must be avoided.**

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This, matched to passive solar design techniques and the use of suitably selected renewable technology, incorporated into a heavily insulated and airtight building, following defined and accepted EnerPHit design techniques will enable the UK Government 2035 & 2050 Zero Carbon Targets to be met and indeed exceeded.

This particular design proposal follows accepted EnerPHit design philosophy in the design and detailing of this extended and remodelled detached private residential family home for the applicants, whilst completely eliminating reliance upon fossil fuel based heating and high embodied carbon materials in the upgrading of this existing dwelling.

PLANNING STATEMENT - FULL PLANNING APPLICATION

This Full Planning Application Submission comprises the completed application forms, this explanatory written Design & Access Statement, together with copies of the following scaled design proposal drawings:-

| | | |
|-------------------------------|---|---------------------------|
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This application seeks planning permission for the following works:-

It is intended to replace all existing 25 year old decaying timber framed windows and doors and windows to both the existing dwelling and existing pole barn with triple glazed timber framed doors to achieve a 0.65W/m²K heat loss to meet and indeed exceed EnerPHit standards.

This work, together with the previously approved works, will eliminate all fossil-fuel based heating and hot water systems in favour of a holistic, environmentally friendly carbon neutral EnerPHit-compliant solution that will be of benefit not only to the occupants, but also to the immediate National Park and consequently to Planet Earth.

This design is to be constructed to insulation standards far in excess of current Building Regulations requirements and in accordance with expansive insulation standards set to match a “EnerPHit-standard” with performance targets for a northern European Climate.

Planning Applications should be determined in accordance with the Development Plan unless material considerations indicate otherwise. The following planning policies and guidance are considered to be of most relevance to this planning application.

National Planning Policy Framework (NPPF) 2021 - Initially introduced on 27th March 2012, the NPPF has been now twice updated and rewritten in part, in 2019 and now in its latest 2021 rendition, rewritten and republished - July 2021 in its current guise. The NPPF (paragraphs 11-14) sets out a presumption in favour of sustainable development.

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In respect of decision making, this means that development proposals that accord with the Development Plan should be approved without delay and where the Development Plan is absent, silent or relevant policies are out of date, planning permission should be granted unless any adverse impacts of so doing would significantly and demonstrably outweigh the benefits when assessed against the policies in the NPPF, or specific policies within the NPPF indicate that development should be restricted.

The NPPF sets out the core planning principles and states that planning practice should proactively drive and support sustainable economic development to deliver homes and businesses, not simply be about scrutiny, but instead be a creative exercise in finding ways to enhance and improve development.

The following Core Planning Principles of the NPPF are applicable to this development proposal:-

Part 2. Achieving sustainable development.

Part 6. Building a strong, competitive economy.

Part 12. Achieving well-designed places.

Part 14. Meeting the challenge of climate change, flooding and coastal change.

The Development Plan

This development proposal is in respect of the sustainable remodelling of this existing detached private residential dwelling, utilising the existing dwelling footprint to advantage in the design & construction of an extremely high performance, remodelled dwelling where thermal comfort will be achieved solely by post-heating or post-cooling the fresh air flow required for good internal air quality without the need for additional recirculation of additional air.

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Part of this project to internally remodel and sustainably improve this private residential dwelling is to mitigate the potential and very real long term climate effects to their residential amenity. Through active airborne noise reduction into the dwelling, given the use of 150mm thick layer of internal wall insulation combined with new extremely high performance triple glazed windows and doors (the outer leaf of all fenestration comprising additional noise reducing (6.4dB) laminated outer glazed leaf), an intent to create an airtight dwelling serviced with a sophisticated high performance EnerPHit standard mechanical ventilation with full heat recovery system that will significantly reduce airborne pollution into the dwelling is also proposed.

These positive steps will enable substantial mitigation of the negative effects of the existing site and its setting in a manner that will significantly reduce this negative impact upon the applicants, Becky Hewitt & Paul Bullimore.

These fenestration improvements together with the removal of natural light-reducing muntins enables high quality “skylight-component” natural lighting to a significant part of the proposed dwelling, again reducing reliance upon artificial lighting and thereby further lowering the carbon footprint of this replacement dwelling in use going forward.

The design therefore positively addresses the site’s orientation and setting to advantage to maximise upon the benefits of passive solar design techniques in harvesting solar gain, thereby eliminating all reliance upon the use of fossil fuels to temper the internal environment.

This proposed “EnerPHit-standard” remodelled dwelling has been designed to fully accord with all applicable planning policies and guidance, further increasing the sustainability of this established rural residential location.

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PLANNING POLICY HISTORY

An investigation of recent Planning History applicable to this particular property has identified that there is planning history for this site. A 1999 Planning Permission (NYM/4/30/176/PA) was granted conditionally for the conversion of the stone barn to a dwelling and the existing barns to domestic outbuildings. Condition 18 of this 1999 permission removed permitted development rights under Schedule 2 Part 1A to H and Part 2 A to C of the Town & Country (General Permitted Development) Order 1990 as amended.

A pre-application enquiry was made on Wednesday, 7th September 2022 to North York Moors National Park Authority, with a written response prepared by Senior Planning Officer, Mr A Muir, reference **NYM/2022/ENQ/19078** received from him, dated Thursday, 2nd September 2022.

PLANNING POLICY STATEMENT

Planning Applications should be determined in accordance with the Development Plan unless material considerations indicate otherwise. Section 38(6) of the Planning & Compulsory Purchase Act 2004 and Section 70(2) of the Town & Country Planning Act 1990 require that planning applications are determined in accordance with the Development Plan unless material considerations indicate otherwise. The following planning policies and guidance are considered to be of most relevance to this application.

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National Planning Policy Framework (NPPF) - Initially adopted on 27th March 2012, it has been updated and rewritten in part and was recently published in its revised format on 24th July 2018. The NPPF (paragraphs 11-15) sets out a presumption in favour of sustainable development and particularly NPPF 12 – Conserving and Enhancing the Historic Environment.

NYMNPA Local Plan (Proposed Submission), Supplementary Planning Documents & Local Planning Policy Guidance - Policy CO17 (Householder Development) is applicable.

In respect of decision making, this means that development proposals that accord with the Development Plan should be approved without delay and where the Development Plan is absent, silent or relevant policies are out of date, planning permission should be granted unless any adverse impacts of so doing would significantly and demonstrably outweigh the benefits when assessed against the policies in the NPPF, or specific policies within the NPPF indicate that development should be restricted.

THE NPPF sets out the core planning principles and states that planning should proactively drive and support sustainable economic development to deliver homes and businesses, not simply be about scrutiny, but instead be a creative exercise in finding ways to enhance and improve development.

Paragraph 14 of the NPPF states:-

“At the heart of the National Planning Policy Framework is the presumption in favour of sustainable development which should be seen as the Golden Thread running through both plan making and decision taking”.

It further states:

...approving development proposals that accord with the Development Plan without delay...”

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Paragraph 49 of the NPPF states:

“Housing applications should be considered in the context of the presumption in favour of sustainable development...”

Paragraphs 186 & 187 of the NPPF states:

“should approach decision-taking in a positive way to foster the delivery of sustainable development ... look for solutions rather than problems and ...seek to approve applications for sustainable development where possible”.

ASSESSMENT

The main consideration concerning this particular planning application is the impact of the proposal upon the appearance of the property, the character of the National Park and the potential impact upon residential amenity.

The Principal of the Design

The site is currently an established residential detached dwelling (since 1999). A full professional dimensional and level survey has been undertaken by Samuel Kendall Associates to enable full design consideration to be made of the site and its setting, details of which form part of this Full Planning Application submission.

This sustainable development proposal is in respect of works to eliminate the current carbon footprint of the existing dwelling and immediate site curtilage to this existing detached private residential dwelling, together with works to significantly upgrade the thermal performance of this remodelled dwelling, following pressure being brought to bear upon the existing built environment of the country, where embedded carbon design philosophy is rapidly becoming a significant factor is the development of the built environment into the Twenty-First Century.

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The sustainable design proposal seeks to ensure that the scale, design and materials are suitable and appropriate, its relationship to adjoining development and the character of the National Park is not adversely affected.

It is not considered that this proposed sustainable upgrading works will have any adverse effect and consequently is not considered to harm the character of the designated National Park and its considered local distinctiveness, in accordance with Section 12 of the NPPF.

The design positively addresses the site's orientation to advantage to maximise upon the benefits of passive solar design techniques in harvesting solar gain in the tempering of the dwelling's internal environment, thereby significantly reducing this sustainably remodelled dwelling's reliance upon the use of fossil fuels to temper the internal environment.

This proposed sustainably remodelled private residential dwelling has been designed to fully accord with all applicable planning policies and guidance, further increasing the sustainability of this location. The proposed development fully complies with the planning policy requirements of the NPPF and the policies of the relevant and emerging plans.

Design & Access

The existing dwelling is to be the family home of Becky Hewitt & Paul Bullimore and as such it is the intention for the family to maintain residential occupation of this reconfigured and sustainably upgraded EnerPHit-standard dwelling, as their forever family home.

This dwelling's orientation carefully addresses this passive solar gain design ethos with careful and involved discussion through the design phase being proposed with the immediate surrounding residents.

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With regard to the consideration of embodied carbon, it is estimated that buildings are responsible for one third of greenhouse gas emissions globally. There are six ways buildings can cut these emissions:-

Reduce operational energy use;

Decarbonise operational energy use;

Reduce construction material use;

Decarbonise the manufacture of construction materials;

Reduce activities on construction sites;

Decarbonise activities on construction sites.

As buildings become more energy efficient and with a rapidly decarbonising National Grid, the balance between the carbon emitted when running a building (the operational carbon) and the carbon emitted to build it (the embodied carbon) is changing. The whole life carbon footprint is a way to assess both operational carbon and embodied carbon. It runs “from cradle to grave” that is from product material extraction to ultimate building demolition or deconstruction. The whole life carbon footprint therefore gives a good indication of the carbon impact of a building through its lifetime.

In new buildings embodied carbon can represent as much as 40-70% of a buildings whole life carbon footprint. Both the RIBA 2030 Climate Challenge and the LETI Climate Emergency Design Guide have set minimum standards for embodied carbon and the lack of embodied carbon calculations in UK Building Regulations is being challenged through the proposed introduction of Part Z in England.

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The Government's approach to achieving zero carbon homes in the UK is based upon the decarbonisation of the National Grid and the switch to heat pumps. This will require a huge increase in Grid capacity to meet the electrical needs of housing alone, unless we continue to drive down the operational energy used in our buildings. Passivhaus and EnerPHit standard buildings are optimised for a decarbonised grid by slashing the peak energy demand thus facilitating a smooth transition to renewable energy for all sectors, not just buildings. In addition, well insulated buildings allow for "load-shifting" which means you can be more flexible with the timing of heating whilst still retaining comfortable internal temperatures. This means that you can heat your home outside peak times when energy prices are cheaper.

Consequently, we need to rethink how we design, construct and supply energy to our buildings. Once the Grid has completely decarbonised, the only emissions associated with a building will be the whole life carbon of its construction materials, component replacement and the infrastructure needed to generate and supply its energy demand.

Whole life carbon calculations are also important when considering retrofit, such as this particular project. Improving the thermal performance of the building will add embodied carbon but this can be offset against operational carbon improvements of the embodied carbon cost of demolition or replacement.

As a model example the planned refurbishment of a Scottish school, St Sophia's Primary School in 2022 found that reducing space heating from 210 to 22kWh/m²a (a 90% reduction) using EnerPHit principles added an additional 162tCO₂ of upfront embodied carbon on average per year in maintenance/replacement of which just over half was attributed to building services (assessment undertaken in accordance with BS EN15978 for a refurbishment area of 981m²).

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It is more than reasonable to be concerned with the embodied carbon in the construction materials used, but as set out below, the embodied carbon impacts upon the fabric improvements and are less than half those required for mechanical, electrical and plumbing (MEP) services:-

1. Cladding 3%
2. Glazing 5%
3. Structural Works 6%
4. Other 8%
5. Floor finishes 14%
6. Insulation 14%
7. MEP (Other Services) 25%
8. MEP (heat pump installation) 25%

This proportion would be even higher if heating demand was not significantly reduced using the EnerPHit methodology. This reminds us that simply changing the heating systems in our existing buildings without insulating and tackling air tightness means locking in high levels of embodied carbon into equipment that needs regular replacement and relies wholly on a decarbonised grid investing in the building fabric means less embodied and operational carbon, which results in a faster carbon payback.

In this model, Glazing is just 5% of the total embodied carbon, which is recovered in proportion to that apportioned to other scheduled carbon elements. In reality, embodied carbon is negligible relative to the EnerPHit strategy employed in this project as a whole.

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The previous Planning Application sought to achieve these aims through (i) the use of a zero carbon air source heat pump to replace the 25 year old carbon intensive fossil-fuel-fed oil boiler, (ii) the installation of a whole house mechanical ventilation with heat recovery system (94% heat recovery), the installation of a solar PV array to generate 10kW of solar generated electricity, (iv) a substantial insulation strategy to all existing floors, walls and roof, with fenestration improvements to reduce the current carbon footprint by 90%+. The lack of approval for the ultra-high performance triple glazing previously proposed fails to enable this project to achieve these target improvements, where the embodied carbon is well offset against the reductions in operational carbon. This particular Planning Application seeks to regularise this anomaly.

Using the above quoted St Sophia's Primary School example, the carbon payback period (where the embodied carbon is offset by the savings in operational carbon) was 6-7 years using the National Grid's FES, the school has all the benefits of a new sustainable building – that is summer and winter comfort, reduced running costs and good indoor air quality – without the need for a costly and carbon intensive demolition and rebuild process, given this would be possible in this particular location. By retrofitting rather than rebuilding, the embodied carbon of the project was cut by 40%, largely through the reuse of the foundations and superstructure, two of the highest embodied elements in a new building.

In conclusion, the relationship between embodied and operation carbon is rapidly changing as energy supplies decarbonise worldwide. The embodied carbon of construction materials is locked into a building, based upon the energy supply conditions now whereas operational carbon changes as energy supplies change and at the moment (2022) is steadily decarbonising.

However, continuing to reduce energy demand is still important as it reduces peak loads and shrinking our collective winter heating energy demand will reduce the level of future zero carbon energy infrastructure and storage needed.

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PLANNING APPLICATION REFERENCE NUMBER NYM/2024/0101
(PLANNING PORTAL REFERENCE NUMBER PP-12781776)**

Emerging research shows that designing to the Passivhaus/EnerPHit standard be that for new or existing buildings does not need to result in increased embodied carbon and that choice of materials, rationalisation of built form and reduction of building services play a significant part in reducing whole carbon. The multiple EnerPHit benefits comprise:-

Reduced Operational Carbon;

Reduced Whole Life Carbon;

Reduced operational and maintenance costs;

Increased summer and winter comfort;

Increased indoor air quality.

Therefore, we should not be looking to reduce either operational or embodied carbon but to tackle both and these can be done simultaneously. EnerPHit buildings are optimised for net zero, providing the best route to minimum whole life carbon. Outstanding levels of building performance minimise operational carbon, while EnerPHit design methodology encourages optimisation of embodied carbon through efficient use of materials and radically reducing the heat and cooling plant.

Reliable, accurate and up-to-date information on the whole life carbon assessment of building materials, services and national grid is vital to allow comparisons and informed choices to be made.

In summary, the proposed replacement fenestration will be triple glazed, krypton filled sealed glazed units set into sustainably sourced timber frames that is to achieve a “U” Value of 0.62W/m²K, replacing double glazed timber framed fenestration (U Value of 1.8W/m²K) now 25 years old and in need of replacement.

SAMUEL KENDALL ASSOCIATES LTD - RIBA CHARTERED ARCHITECT - ARCHITECTURAL TECHNOLOGIST – PRINCIPAL DESIGNER (CDM) - SURVEYOR

Joint Managing Directors

Linda Samuel HND(ArchTech) CPHD Stephen N Samuel HND(ArchTech) BA(Hons) DipArch(Leics) RIBA

Company Secretary – Linda Samuel HND(ArchTech) CPHD

Registered Company Number 5591217

A Royal Institute of British Architects Chartered Practice (1843970) operating a policy of continuing professional development.

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The incorporation of passive solar design principles in the design of this dwelling will enable its ability to be naturally well lit and heated passively by the sun and allows the principal rooms to be orientated southwards and northwards to capitalise upon its solar orientation and its setting.

An assessment has been made through a comparison between the use of Double Glazing verses Triple Glazing. This planning application seeks to replace the existing life expired and poorly performing double glazed timber framed windows with triple glazed timber framed windows. Intuition tells us that triple glazing should have a lower carbon footprint. The addition of a third pane of glass as part of the window make-up comes with an additional embodied carbon footprint.

Embodied carbon is the carbon footprint of a material. It considers the amount of carbon dioxide emissions (CO₂) that are released to extract, refine transport and process the materials of the fenestrated element. To compare the carbon footprint of double glazing against triple glazing the embodied carbon of producing each glazing unit and its operational carbon in use should be considered.

Dr Chris Jones, Director and environmental consultant of the body “Circular Ecology” (www.circularecology.com) who specialise in embodied energy, carbon footprint, carbon offsetting and life cycle assessment (LCA) undertook a thorough exploration of these factors, prior to publishing their findings on their own website and in Building Magazine on Tuesday, 27th August 2019 entitled “Not so clear. There is more to a low carbon window choice than whether you opt for double or triple glazing.”

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It stated the following:-

“Taking an average domestic window (assumed 1770mm x 1200mm) our research showed that wooden frames are, as expected the lowest embodied carbon option, at 85kg of CO2 per double glazed window...” It further stated through the publishing of a table that wooden framed triple glazed windows have an embodied carbon footprint at 130kg of CO2 per triple glazed window. The embodied carbon of windows framed in uPVC or aluminium was always higher than timber framed windows, by 50% to 100% for uPVC and aluminium framed windows respectively.

Furthermore, it stated:-

“The higher embodied carbon footprint will need to be compared to the lower operational carbon footprint so that we can see if it pays back. Our assumptions on operational carbon are outlined further in the original Building Design Magazine article and the results are as follows:-

| Operational Carbon emissions per year For a typical window | Wood framed -kgCO2/annum | uPVC & aluminium framed - kgCO2/annum |
|---|---------------------------------|--|
| Double Glazed | 16.9 | 18.2 |
| Triple Glazed | 14.3 (15.38% less) | 15.6 (14.28% less) |

The results also reveal a more interesting insight. Frame type is more important than the choice of double glazing or triple glazing. Over 20 years, the embodied carbon plus the operational carbon is the same at 400kgCO2e per window for timber framed windows. It is noted that uPVC frames and aluminium frames are higher at 450kgCO2e per window and 500kgCO2e per window, respectively.

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In this instance, this application seeks to replace the existing double glazed timber framed windows with triple glazed timber framed windows, given the existing double glazed timber windows have been installed since 1999 with a design “U” Value of 1.8 W/m²K and are life expired.

Also, whilst the 1999 Planning Change of Use Approval sought to place these timber framed windows deeply into the masonry reveal to each fenestrated opening, in 1999 they were actually placed in line with the external face of each masonry opening which, combined with the works executed at that time to line the external walls with an internal face of concrete blockwork, plaster finished, encourages severe cold bridging to occur to the deep reveals of each fenestrated opening, substantially adding to the heating burden of this dwelling and accentuating the issues of excessive condensation. The frames and the reveals are mould ridden and are therefore causing the timber frames to rot, with a detrimental impact upon the internal air quality and the health of the occupants.

This application seeks to replace the existing life expired double glazed timber framed windows and doors with ultra-high “Passivhaus-standard” triple glazed timber framed windows, designed and constructed to achieve a thermal performance of 0.65W/m²K, almost three times better thermal performance of the existing fenestration, with the added benefit of eliminating the current cold bridging evident to every fenestrated opening by placing the replacement frames deeply into each masonry recess, which in combination with works to internally line all external walls with high performance “Supaquit” insulation and an airtightness layer will significantly reduce the existing dwelling’s heating demand and therefore the fuel burden accordingly.

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Samuel Kendall Associates RIBA – AECB Registered Sustainable Design Architects

Led by ARB-Registered (055134A) RIBA Chartered Architect (6160179), Stephen N Samuel as Managing Director, Samuel Kendall Associates, a fully PII insured, Registered & Chartered Architects (1843970) Practice, now approaching its fourth decade of offering independent architectural service, Samuel Kendall Associates have an enviable track record of architectural design with a driving focus on the principles of Low Carbon Design.

Following a five-year programme of prescribed study at DeMontfort University, Leicester, Stephen then enrolled in 1987 and attended the world famous Rensselaer Polytechnic Institute, Troy, New York, USA to undertake further post graduate study in “Passive Solar Building Design”.

This area of study explored and encouraged the use of the elements of a building to collectively be utilised to best take advantage of orientation and local climate, utilising thermal mass, glazing, mass insulation and shading in the composition of a building that minimises and eventually eliminate its reliance upon carbon fuelled devices to temper the internal environment.

This specialist expertise has been developed by Samuel Kendall Associates over the last 35+ years or so to also encompass the use of mechanical ventilation with heat recovery, solar photovoltaics, solar hot water, ground & air source heat pumps and airtightness technology to expand the opportunity of not only developing a Carbon Neutral building format completely independently of fossil fuel based resources, but in recent years taking this a step further into the realms of buildings becoming solar power stations, exporting their surplus energy to the National Grid.

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The Certified Passive House Designer accreditation held by Mrs. Linda Samuel, Co-Director of Samuel Kendall Associates enables a specialist professional service to be offered, further reinforcing the applicant's desire to upgrade and remodel their building to meet the highest zero carbon sustainable standards possible at this location.

Recent examples of such projects recently completed by Samuel Kendall Associates can be viewed on their website, www.samuelkendall.co.uk.

Some examples of a new-build being designed as mini-power stations are the following (i) a two storey, nine bed, six bathroom bespoke dwelling at Etton, near Beverley, East Yorkshire (hotlink:- <https://www.samuelkendall.co.uk/bespoke-dwellings#/etton-house-3/>) and (ii) the design, detailing and construction of a four storey (with basement), eight bed six bathroom passive solar carbon neutral dwelling on the northern edge of the ANOB Chiltern Hills village of Stoke Row, near Henley on Thames, Oxfordshire (hotlink:- <https://www.samuelkendall.co.uk/bespoke-dwellings#/chilterns-passive-house-3/>).

A further Passivhaus-standard partially earth sheltered three storey three bedroom dwelling for a steep site in the centre of Scarborough is close to being completed having recently granted Full Planning Permission (hotlink: <https://www.samuelkendall.co.uk/scarborough-passivhaus/>) and building works to construct this dwelling are reaching a conclusion.

This particular low embedded carbon footprint dwelling is designed in such a manner so as not to require any additional heating over and above the passive solar gain accumulated through orientation, extremely high level of airtightness (less than 1m³/hr/m²) and a high performance mechanical ventilation with full heat recovery system and has no carbon footprint whatsoever, well exceeding the 2050 Zero Carbon Targets, now set in UK Law.

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A fundamental re-appraisal of the use of this proposed residence going forward has been undertaken and the design proposal addresses their on-going requirements as their family use requirements develop. It is proposed that their new home should be zero carbon, highly energy and water efficient, and future climate resilient following proven principles set out by the National Government's "Committee on Climate Change".

The principal and ambitious driving ethos behind this design is to design and construct a contextual, sympathetic zero-carbon dwelling. It is proposed to create a hermetically sealed dwelling constructed in such a way so as to ensure an air permeability well below 1m³/h.m², well in excess of the currently required Building Regulations air permeability of only 8m³/hr.m², to maximise airtightness and thereby minimise heat loss from the existing upgraded dwelling.

Residential Amenity

This will be carefully designed to protect and indeed enhance the amenity of the current residents and future occupiers of both the retained and extended dwelling and immediately adjoining neighbouring properties. The principal triple glazed fenestration will be concentrated into the north and south elevations, to maximise upon the orientation of the dwelling in harvesting solar gain and the elevated view across the open countryside.

DESIGN & ACCESS STATEMENT

The applicants are looking to undertake certain building works to envelope the existing structure with an externally insulated envelope that will achieve passivhaus "U" Value standards of 0.10W/m²K heat loss, whilst replacing the existing fossil fuel heated central heating provision with a replacement Air Source Heat Pump System that will provide all central heating and hot water provision to this extended and remodelled dwelling.

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Using this existing poorly insulated, poorly remodelled and environmentally modest donor dwelling, design decisions have been made to extend and remodel the existing layout to create residential accommodation fit and suitable for the twenty-first century and beyond, based upon established passive solar design principles, to eliminate all mains electrical and fossil fuel demand in favour of a carbon free provision.

As you will note from reference to the accompanying detailed design proposals, this proposed sustainably remodelled dwelling is designed to benefit to its southern orientation to enable more powerfully the remodelled and extended internal living spaces to relate with their immediate setting.

It is proposed to construct a hermetically sealed remodelled dwelling constructed in such a way so as to ensure an air permeability well below 1m³/h.m², well in excess of the currently required Building Regulations air permeability of only 8m³/hr.m², to maximise airtightness and thereby minimise heat loss from the dwelling.

This dwelling's orientation carefully addresses this passive solar gain design ethos, whilst fundamentally respecting the setting. All new fenestration will be triple glazed, krypton filled sealed glazed units set into sustainable acetylated timber sustainably sourced frames that will achieve a "U" Value of 0.65W/m²K. All fenestration will be Low-VOC painted throughout.

This development proposal is in respect of a remodelled sustainable detached private residential dwelling, utilising the existing setting to advantage in the design & construction of an extremely high performance dwelling where thermal comfort will be achieved solely by post-heating or post-cooling the fresh air flow required for good internal air quality without the need for additional recirculation of additional air.

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This proposed remodelled and extended “passivhaus-standard” private residential dwelling has been designed to fully accord with all applicable planning policies and guidance, further increasing the sustainability of this location.

These sympathetic and contextual design proposals are composed to complement the existing setting and are designed to enhance and further reinforce the residential use of this site. No additional indigenous planting is proposed, given the proliferation of existing mature soft landscaping, which is to be retained as existing. The potential visual impact will be minimal, the site being well screened from the public domain by existing buildings, existing soft landscaping and soft planting.

FLOOD RISK ASSESSMENT

The Environment Agency’s website has been consulted to ascertain the site’s potential flood risk. The LLFA is North Yorkshire. It clearly states that this property is located within Flood Zone 1, an area with a very low probability of flooding.

TREES & LANDSCAPING ASSESSMENT

The site is well landscaped with mature tree cover and mature shrubbery and is well “locked” into its immediate setting. The existing hard and soft landscaping is to be retained as existing, as are the stockproof surrounding dry stone boundary walls. A formal tree survey is therefore not considered to be necessary.

SCREENING & LANDSCAPING

The existing boundaries to the dwelling are already well defined with well-established and stockproof characterful dry stone boundary walling. All boundaries provide satisfactory screening to both this dwelling and adjoining surrounding dwellings. The proposed works, by their very nature and form will be well screened from the public domain by the site topography, other dwellings and established planting and will not impinge in any way on the amenity of surrounding dwellings.

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SURFACE WATER & FOUL DRAINAGE

The surface water drainage will be discharged to the existing system within the site curtilage. All foul drainage from this extended and remodelled dwelling will similarly discharge into to the existing foul waste system within the site curtilage.

DESIGN & MATERIALS

This design proposal has been professionally designed by a fully qualified and well experienced Chartered Architect (of 46 years+ experience) to harmoniously integrate and be complementary to the existing setting, without any loss of amenity to the surrounding dwellings.

WELL INTEGRATED DESIGN SOLUTION

In preparing the design for this proposed scheme, professional decisions have been made to ensure a full aesthetic integration into the fabric of this setting.

It comprises a small-scale, wholly sustainable design proposal which fully accords with the National Planning Policy Framework, National Park Planning Policy and the consequent Local Development Plan, whilst positively addressing the Climate Emergency that is currently having such a detrimental effect on our Planet.

SUMMARY

This planning application comprises a low embedded carbon, small-scale residential development proposal. The principal of remodelling the existing dwelling in a sustainable, sympathetic, contextual manner is considered to be supported by applicable Local Plan Policies and the revised and updated Policies of the NPPF (revised July 2021).

It offers a sustainable contribution to the existing, well-established residential setting and will further support the local economy in a thoroughly sustainable manner.

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These design proposals cause no unacceptable harm or any unacceptable visual intrusion and will not be detrimental to the character or setting in this locality. This design proposal has been carefully considered and is judged to be entirely acceptable. This application accords with both the adopted National and Local Plan Policies, are genuinely small scale and wholly sustainable in nature.

This work is designed to offer (i) exceptional thermal efficiency well exceeding current requirements through the incorporation of sophisticated, high performance insulation to floors, walls and the pitched roof over and in conjunction with (ii) high performance (ca. 0.65W/m²K “U” Value) thermal break triple glazed fenestration, (iii) an air source heat pump system, (iv) a sophisticated EnerPHit-standard environmental heating and controlled ventilation system with full heat recovery (v) a full rainwater harvesting system together with (vi) excellent thermal mass to offer excellent levels of modern accommodation, expected of an “EnerPHit-Standard” dwelling. It represents a highly sustainable form of development in a highly sustainable location.

BENEFITS

- Professionally designed, sensitive and sympathetic “EnerPHit-standard” dwelling, respecting its setting;
- Zero Carbon design ethos, no fossil fuelled appliances and a low embodied carbon footprint;
- Use of recyclable, sustainable, natural, locally sourced matching and complimentary building materials;
- Ultra-high performance building and insulation package offering ultra-low demand for heating and cooling;
- Thermal Bridge-free construction;
- An EnerPHit compliant design solution that positively addresses the World Climate Emergency, meeting and actually exceeding the 2050 UK Government Law target reduction, 26 years early!
- No loss of amenity to surrounding dwellings, or its setting;
- Use of Solar Gain to positively temper the internal environment of this dwelling, with a Zero Carbon Footprint;
- A futureproofed, private, residential family dwelling, fit for the twenty-first century and beyond.

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This planning application comprises a small-scale residential development proposal. The principal of a sympathetic, highly site specific, contextual, sustainable private residential dwelling is supported by applicable Local Plan Policies and the revised and updated Policies of the NPPF (further revised July 2021).

This zero-carbon “EnerPHit-standard” dwelling design will enable the applicants to retain their residence as a characterful, attractive, well insulated and fit-for-purpose dwelling that is specifically designed to enhance its setting and offer a positive contribution to the existing setting, in a harmonious and sympathetic manner without any loss of amenity to the immediate dwellings, or its setting.

This work is designed to offer (i) exceptional thermal efficiency well exceeding current legislative requirements through the incorporation of sophisticated, high performance insulation to walls and the roof and in conjunction with (ii) high performance thermal break triple glazed fenestration, (iii) an air source heat pump system (previously approved), (iv) a sophisticated environmental heating and controlled ventilation system with full heat recovery together with (v) excellent embedded thermal mass to offer excellent levels of modern accommodation, expected of a “EnerPHit-Standard” dwelling. It represents a highly sustainable form of development in a highly sustainable location.

These design proposals cause no unacceptable harm or any unacceptable visual intrusion and will not be detrimental to the character or setting in this locality. This design proposal has been carefully considered and is considered to be entirely acceptable. This application accords with both the adopted National and Local Plan Policies, are genuinely small scale and wholly sustainable in nature.

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We trust the enclosed information provided within this Design & Access Statement will form a material part of this Full Planning Application Submission, enabling it to be approved without delay in accordance with the National Planning Policy Framework, but should you require any further supplementary information, please do not hesitate to contact us.

Following Planning Approval of this EnerPHit-standard dwelling, we understand that it will act as an exemplar for others to emulate in positively tackling the current World Climate Emergency, brought so vividly to our television screens in recent months, the wildfires in Australia and North America, the massive flooding with much loss of life in Germany, Belgium & Holland, severe flooding in London and also in China, where a whole underground railway system was flooded, again sadly with much loss of life. A full understanding of this emerging catastrophe must be immediately tackled, otherwise the world upon which we all live will become an untenable place, to the detriment of all.

We trust the enclosed information provided within this Design & Access Statement, incorporating a statement regarding the World Climate Emergency, a Planning Statement, a Statement on Planning Policy History and a Flood Risk Statement will form a material part of this Full Planning Application Submission, enabling it to be approved without delay in accordance with the 2021 National Planning Policy Framework, but should you require any further supplementary information, please do not hesitate to contact us.

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This design and access statement is prepared as part of this particular Full Planning Application submission, **PLANNING APPLICATION REFERENCE NUMBER NYM/2024/0101 (PLANNING PORTAL REFERENCE NUMBER PP-12781776)** by:-

Signed

Stephen N Samuel HND(ArchTech) BA(Hons) DipArch(Leics) RIBA

RIBA Chartered Architect - Architectural Technologist - Principal Designer (CDM) - Surveyor - RIBA Adjudicator

Specialists in zero carbon, wholly sustainable passive solar design solutions

for and on behalf of Samuel Kendall Associates Limited (Company Registration Number 5591217)

Dated: **2nd March 2024**

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SAMUEL KENDALL ASSOCIATES LIMITED

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