35 Cumberland Avenue, Fixby, Huddersfield
Design & Access Statement

ANDREW LEES **ARCHITECT**
MSc MArch BA (Hons) ARB RIBA

48 Norwich
South Street
Park Hill
Sheffield
S2 5AY

T: 07941 328 353
E: andrew@andrewleesarchitect.co.uk
www.andrewleesarchitect.co.uk

DOC. No. ALA-045-REP-02

12/04/24

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1. Introduction

This Design and Access Statement is in support of an application for full planning permission for a **whole house deep retrofit, alterations, new rear extension and rationalisation of roof structure** at 35 Cumberland Avenue, Fixby, Huddersfield. A D&A Statement is not a validation requirement for a householder application such as this, but this report is included to provide further detail on the climate change mitigation measures that are integrated into the design, and to provide further background on the design intentions generally.

The site is located near the top of the cul-de-sac on Cumberland Avenue, which is on the outskirts of Huddersfield near the Bradley Bar roundabout. It is a primarily residential area with substantial, individually designed detached houses, each set in its own grounds. As demonstrated in the pictures indicated in the appendices, the houses of the area exhibit considerable diversity in form, scale and detailing.

35 Cumberland Avenue has been much altered and extended over the years since its original construction, resulting in a muddled and illogical current form – notable issues are the negative impact on natural light of the current two storey rear extension and the complexity of the roof.

A previously withdrawn application proposed demolition and replacement of the building. This application is for the more sustainable option of reconfiguration and deep retrofit. Rationalising the spatial design of the house while at the same time taking the opportunity afforded by extensive refurbishment to radically improve its energy efficiency.

The intention is to provide a "forever home" for a young family which is an exemplar for low energy design and aesthetically positively contributes to the quality of its environment.

Fig. 1 – Aerial view of site from north-east

Fig. 2 – View from Cumberland Avenue, photographed 25/01/24

Fig. 3 – South facing garden elevation, photographed 02/12/22

2. Relevant Planning History

Previous applications are listed and summarised below:

2023/92847 – 25th September 2023: Demolition and replacement with new detached house – application withdrawn.

2023/90502 - 13th February 2023: Additional storey above existing ground floor rear extension to form full-height double storey across entire rear - approved but not built.

2019/91250 - 12th April 2019: Further extension to two storey block behind garage and larger adjacent single storey extension – approved and built.

2016/90558 - 18th February 2016: Further extension to two storey block behind garage and adjacent single storey extension – superseded by 2019/91250.

2010/91451 - 14th May 2010: Extension over and to rear of garage – approved and built.

3. Retrofit and Low Energy Design Strategy

Application 2023/92847 cited structural and technical challenges as a driver for replacing the building. Since the withdrawal of that application a new strategy of stripping the house back to essentially its original footprint has emerged as a viable means of refurbishment and extension ahead of demolition and replacement. This is in line with central and local government targets for low energy and sustainable development.

Structural issues are largely confined to elements of the various extensions, which are also the elements that impact the usability and practicality of the house. Therefore, a synergy exists between selective demolition for structural reasons and selective demolition for an improved spatial layout. The proposal seeks to minimise demolition and makes use of most current internal structural elements.

The house has an extremely favourable south-facing aspect which offers opportunities for both passive and active utilisation of solar energy. A comparison of the existing and proposed ground floor plans illustrates how the current "knotty" internal layout is compromised in its ability to make use of both natural light and solar gain (heat for free). The open-plan design and upward-angled section profile of the proposed replacement single-storey extension is in contrast optimised to maximise these effects. Energy simulation has been used in the design development to fine-tune performance of the building form and envelope, resulting in predicted in-use space heating requirements as low as 21.22 kWh/m^2, which exceeds the Passivhaus Institute EnerPHit standard for retrofits (25 kWh/m^2).

Meanwhile, replacing the complex multi-hipped roof with a simple gabled roof creates an optimally positioned south facing slope for a large photovoltaic array. This solar installation could be a 10-12 kW peak power system generating up to 8,500-10,300 kWh per year.

Fig. 4 – Building energy simulation results during design development. The heating energy intensity of 21.22 kWh/m^2 falls short of new build Passivhaus standards (15 kWh/m^2) but exceeds the 25 kWh/m^2 requirement for EnerPHit. Interestingly it was found that the building performs better if the south facing glazing is double rather than triple glazed (as used elsewhere). This is because double glazing would allow more solar energy into the building, outweighing the effect of increased losses due to this lower specification glazing. *NOTE: the simulation at this stage does not yet include the proposed on-site PV generation.*

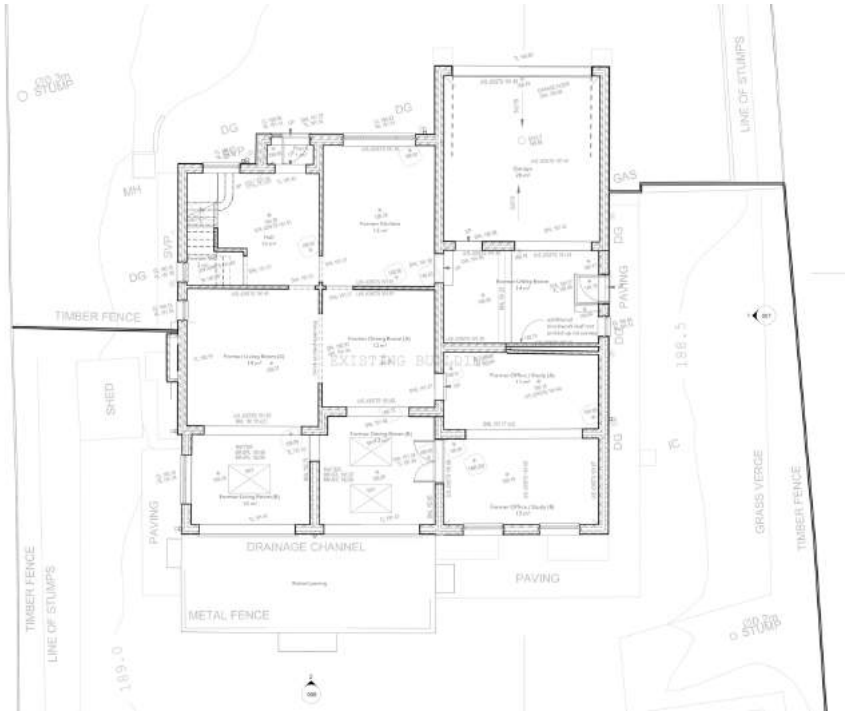

Fig. 5 – Ground floor plan as existing (south to bottom of page) – the accrued extensions with their small congested rooms buffer the original house interior from natural light penetration.

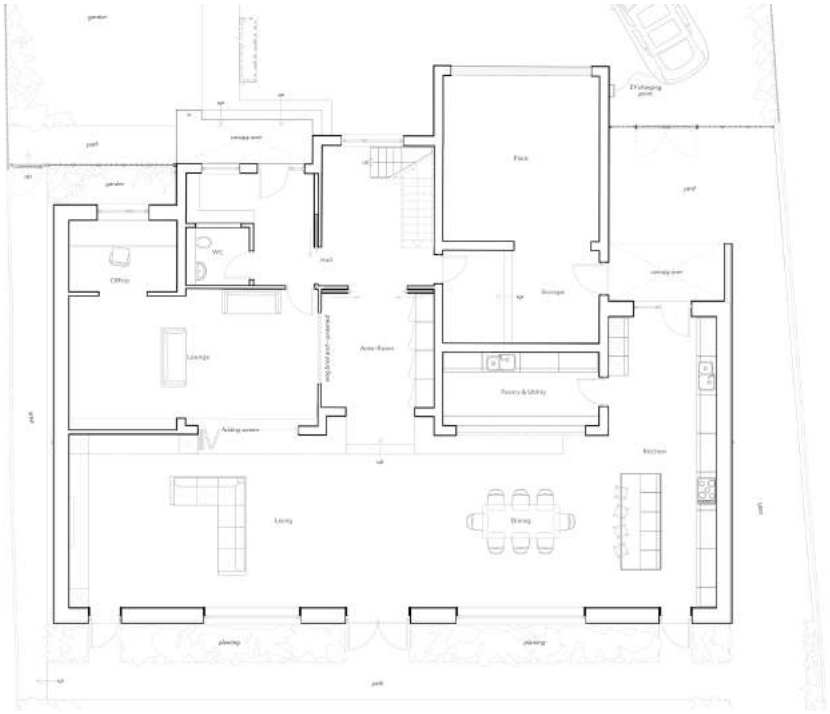

Fig. 6 – Ground floor plan as proposed– the large area of glazing and southerly breadth of the proposed single storey extension captures as much solar energy as possible. The open plan layout allows light penetration into the deeper internal spaces.

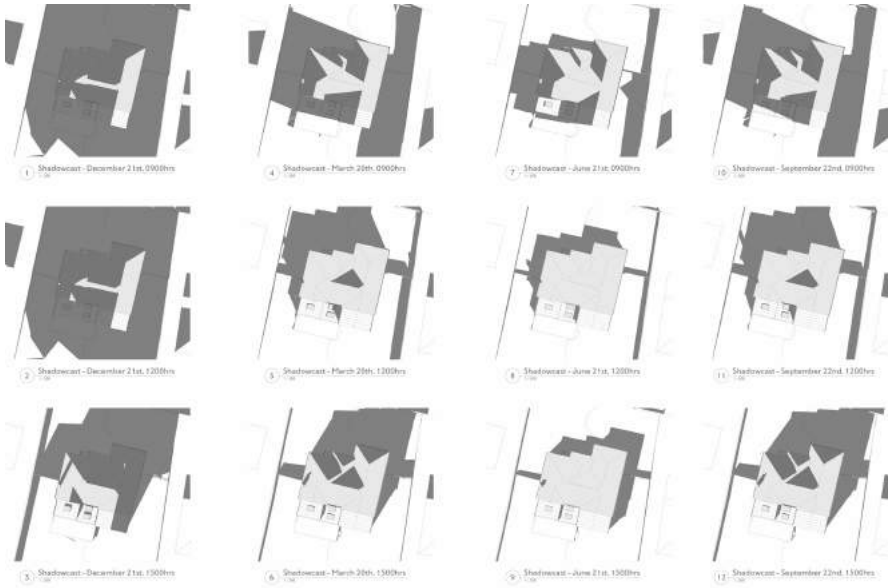

Fig. 7 – Roof plan shadowcast studies EXISTING building (winter and summer solstices and spring and autumn equinoxes). Note how the current two-storey rear extension excessively shades the southerly roof slope in winter and in the morning throughout the year.

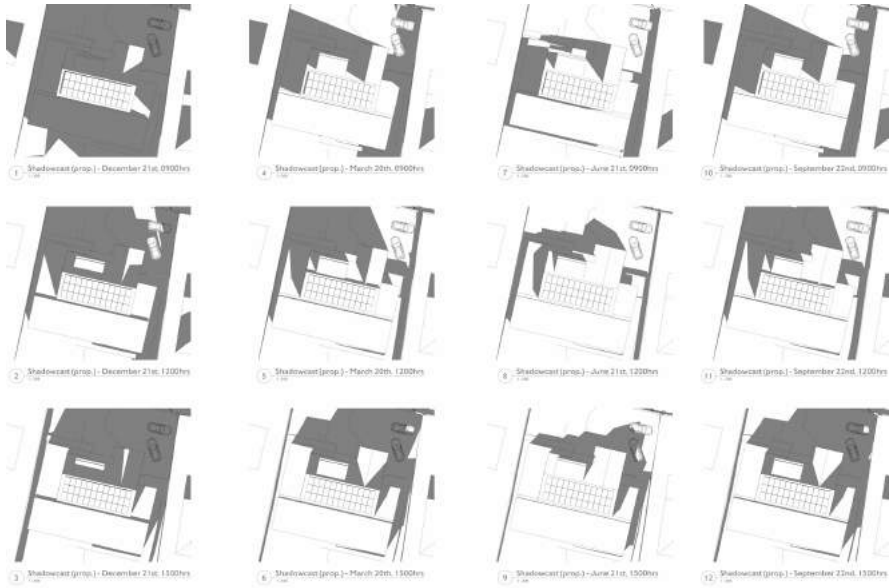

Fig. 8 – Corresponding roof plan shadowcast studies for the PROPOSED building. The simple gable form south facing roof slope (shorn of two storey extension) receives full sun throughout the year. The increased width afforded by gabling the roof maximises the size of the PV array.

The low energy design principles can be summarised as follows:

- The existing building envelope is overly complex. The proposed simple form factor reduces the ratio of conditioned internal volume to external surface area, making a more thermally efficient building form.
- A simple building form also makes for simpler detailing to achieve exacting airtightness standard of 1.0 1/h (the EnerPHit benchmark). Good airtightness is key to achieving the desired energy performance.
- The above two drivers are part of "fabric first" approach. This is pursued further with a strategy of upgrading existing elements (only the masonry walls) as well as practically possible, while all new-build elements (including all floors and roofs) are specified to U-values surpassing the requirements of new build elements in the building regulations.
- As discussed, the building is orientated and its massing attuned to maximise passive solar gain and light. Functionally, the proposed open-plan ground floor extension focuses family life in the most effectively passively conditioned part of the house, reducing reliance on artificial lighting and heating.
- The building will incorporate a Mechanical Ventilation with Heat Recovery (MVHR) system to conserve energy while maintaining optimal internal air quality and humidity levels.
- The building will incorporate low temperature underfloor heating compatible with an air source heat pump.
- The PV array will be combined with a battery storage system coupled with EV charging ports. This will enable a degree of self-sufficiency from grid, and the potential to export significant electricity back to the grid

4. Massing and Materiality

The roof restructure is based on characteristics of existing houses in the area to maintain familiarity - see houses on Cumberland Avenue, Dorchester Road and Fixby Road in the appendices. The remodelling of the roof to a more positive, clearer outline makes for a more attractive building.

There are few proposed alterations to existing street facing façade. It is more an exercise in adjustment to restore architectural clarity. The existing porch is cramped and is a trip hazard, the minimal replacement canopy structure is modern without detracting from look and feel of the existing character.

Views of alterations to the rear of the house are limited from the street scene to maintain balance with neighbouring buildings. The extension depth is based on extension protrusions from neighbouring homes.

The proposed rear extension is modern in form (see Section 2c for the rationale behind it) and uses similar materials as the current rear extensions - approved in application 2019/91250 which are timber cladding and a standing seam roof. The reduction in the depth of the first-floor rear extension (the original rear façade building line is restored at first floor level) reduces the bulk and resultant shading at the back of the house. The new side door provided by the extension also provides level threshold access to the house.

The proposal seeks to impart a distinct feel of what is the original structure and what is new using materiality – the old structure is white render (render is a precedent on many other houses nearby) freshening up its appearance, and new is timber clad (as existing) and in keeping with houses nearby that have used such cladding for new extensions. The white render also alludes to an Arts & Crafts aesthetic, which is an archetype for suburban housing of this kind.

With regard to mitigation of potential overlooking, the distribution of clear and obscure glazing to existing openings on the side elevations maintains the current condition. New clear glazing (to Bedroom 5 and the dormer on the second floor) are of a sufficient height (to clear adjacent dwellings) and / or distance to mitigate concerns. Neighbours have been consulted prior to submission with a walkthrough of the plans.

Fig. 9 – Precedent image for the overall house aesthetic to the street: white render, standing seam dormers and clay tile. Middle Avenue by Rural Office.

5. Appendix – images of houses in surrounding area

The following pictures are included not necessarily as exemplars, but as precedents of the diversity of form in the housing of the area.

Fig. 10 – 27 Cumberland Avenue – house filling full width of plot.

Fig. 11 – 22 Cumberland Avenue – multiple extension house filling full width of plot.

Fig. 12 – 23 Dorchester Road – gabled house form, similar in outline to the proposals.

Fig. 13 – 14 Fixby Road – gabled house form.